HUNTER ECO

Wilpinjong Coal Mine
Peabody Energy Australia
1434 Ulan-Wollar Rd
Wilpinjong NSW 2850

Attention: Ian Flood

27 September 2016

Dear Ian,

Wilpinjong Extension Project – Identification of Box-Gum Woodland Critically Endangered Ecological Community

This letter has been prepared in response to comments received from Department of the Environment and Energy (DoEE) (via email from Mike Smith dated 8 September 2016). The comments are in relation to the extent of the EPBC Act listed *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community* (Box-Gum Woodland CEEC) I mapped in the Wilpinjong Extension Project (the Project) surface disturbance footprint.

This letter provides further justification for the adopted classification and mapping of cleared grazing land.

Vegetation Classification

I have provided further detail of the classification and mapping method I undertook, which may not have been clear to DoEE based on my previous letter, although details were provided in the original application document.

Table 1 provides a summary of the classification and mapping method I undertook against the mapping method/steps DoEE advised should be followed (email from Mike Smith dated 8 September 2016).

The diversity across plots was not averaged to determine the presence of Box-Gum Woodland CEEC or determine the boundary of a patch. A more complex analysis was undertaken as described in Table 1.

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Table 1
Classification and Mapping Method Used at Wilpinjong

DoEE Mapping Method/Steps (8 September 2016)	Classification and Mapping Method Used at Wilpinjong
1. Identify any area which is, or is likely to have been dominated or co-dominated by the most common over storey species	• Areas were identified which are, or were possibly likely to have been dominated or co-dominated by the most common overstorey species. This was informed by the Rapid Data Points (RDP) process (i.e. prior to plot data collection, data on the dominant species present in the canopy, shrub and ground structural layers was collected at numerous spot points). • As explained in my report all cleared land was initially conservatively assumed to be once Box-Gum Woodland CEEC: *'because of the sparseness of canopy trees, and the fact that the grassland bordered footslopes of mostly different vegetation, it was difficult to determine with certainty how much, if any, of the grassland once supported the Box-Gum Woodland EEC/CEEC. To be conservative, all of the grassland was treated as having supported Box-Gum Woodland EEC/CEEC and the present condition was compared to the appropriate guidelines'.*
2. Test if any areas meet the minimum condition thresholds	• A visual inspection and plot sampling was undertaken across the cleared land and the results were analysed. It is not practical to sample every 0.1 ha of cleared land and therefore it is necessary to take representative samples (plots). • Agricultural history details were obtained for the subject cleared grasslands. This was summarised in the report as pasture improved grasslands. The specific note for Slate Gully (containing 140611P3) was that there was a long history of super phosphate fertilisation and sowing with subterranean clover. Parts were also periodically sown to oats. The specific note for the area containing 140612P4 was that the area has a long history of cropping and fertilising with super phosphate as well as sowing with clover. • The visual inspection, plot sampling and statistical analysis indicated that the ground layer is predominantly not native cover (rather pasture improved) and has a low diversity of native plant species. The original application provided similarity analysis that showed the 23 cleared land plots were clearly different to plots taken in natural derived native grassland. • No sub-areas of cleared land were identified as meeting the minimum condition thresholds for the Box-Gum Woodland CEEC. In summary, – Most plots (14 out of 23) have a predominantly exotic cover (greater than 50%). – Most plots (20 of 23) do not have 12 or more native species (other than grasses). – Only one plot (from 23) has a predominantly native cover (60% native and 40% exotic), over one important species and greater than 12 native species (other than grasses) (i.e. plot 140612P1). Detailed review of this plot (relative to surrounding vegetation and landform) indicated that it was most likely previously alluvial Rough-barked Apple Woodland consistent with the nearby vegetation (and there was no evidence that it was formerly Box-Gum Woodland CEEC). Therefore, Plot 140612P1 also would not qualify as Box-Gum Woodland CEEC. • Note, the ground cover sampled by the two plots highlighted by DoEE (Plot 140611P3 and 140612P4) also does not meet the minimum condition thresholds (see Table 2).

Table 1 (Continued)
Classification and Mapping Method Used at Wilpinjong

DoEE Mapping Method/Steps (8 September 2016)	Classification and Mapping Method Used at Wilpinjong
As above	• The woodland areas and associated understorey (Vegetation Communities 1 and 5) were the only areas to meet the minimum condition thresholds for the Box-Gum Woodland CEEC. • Plot sampling intensity was undertaken in exceedance of the NSW *Biodiversity Offsets Policy for Major Projects* (and underlying *Framework for Biodiversity Assessment*) (OEH 2014a, 2014b). The *NSW Assessment Bilateral Agreement* (dated 26 February 2015) accredits the use of these methods. Note that 23 plots were sampled which is over three times the required number of plots under the accredited NSW methodology.
3. If any areas within the patch do meet the condition thresholds, then the next step is to apply the patch definition.	• The woodland areas and associated understorey (Vegetation Communities 1 and 5) did meet the minimum condition thresholds and the patch definition was therefore applied. • The patch of Box-Gum Woodland CEEC did not extend past the woodland areas (Vegetation Communities 1 and 5) as the surrounding ground cover has a low diversity of native plant species i.e. pasture improved grazing land.

Patch Connectivity (Between Plots and the Mapped Box-Gum Woodland CEEC)

From looking at individual plot data, DoEE assumed that Plots 140611P3 and 140612P4 may likely form part of a contiguous patch of Box Gum Woodland CEEC, being the larger of either an area that contains five or more trees in which no tree is greater than 75 m from another tree, or grassland over which the understorey is predominantly native.

This assumption is incorrect in this particular case, because:

1. The groundcover is not continuous between Plot 140611P3 and the mapped woodland. Approximately one hectare of *Carex appressa* sedgeland (orange boundary) along a drainage line occurs between the woodland and Plot 140611P3 (Plate 1). This breaks the potential for continuity.
2. The original vegetation associated with Plot 140611P3 is also indeterminate because the Yellow Box Woodland (Box Gum Woodland CEEC) is 250 m north on shale substrate, different from the surrounding area. Grey Gum/Narrow-leaved Stringybark occurs 300 m west at the edge of clearing and Blakely's Red Gum occurs 375 m east. It is quite possible for community transitions to occur within these distances in such a landscape.
3. The area around plot 140612P4 was most likely riparian Rough-barked Apple. Paddock trees suggest that any Box Gum woodland was on the north side of the adjacent Yellow Box patch, outside of the Project disturbance area.

Plate 1
***Carex appressa* sedgeland (orange boundary) and drainage line (blue) between the Yellow Box (150629P1) and 140611P3.**

Plate 2
Photograph of Plot 140612P4 showing the dense green ground layer consisting primarily of Clover species (based on species composition)

4. Plots 140611P3 and 140612P4 also individually do not meet the criteria for the Box Gum Woodland TEC. Table 2 provides an analysis of Plots 140611P3 and 140612P4 against the condition thresholds. Plate 2 also provides a photograph of 140612P4 indicating the nature of the plot.

   The *EPBC Act Policy Statement 3.5 - White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands And Derived Native Grasslands* (Department of the Environment and Heritage (DEH), 2006) states:

   *Areas that are part of the listed ecological community **must have either**:*

   - *an intact tree layer and a predominantly native ground cover; **or***
   - *an intact native ground layer with a high diversity of native plant species but no remaining tree layer.*

   This is consistent with the condition 'states' recognised in the *Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Threatened Species Scientific Committee, 2006).

   It is not sufficient for groundcover (not associated with a woodland area) to be predominantly native without a tree layer, it must also have a high diversity of native plant species (≥12 native understorey species present [excluding grasses] plus one important species).

Table 2
Data for Plots 140611P3 and 140612P4

Diagnostic Steps	Condition Threshold	Plot 140611P3	Plot 140612P4
Pre-Clearance Vegetation	Once Box-Gum Woodland CEEC	Most likely not Box-Gum Woodland rather riparian Rough-barked Apple.	Indeterminate because the Yellow Box Woodland is 250 m north on different substrate. Grey Gum/ Narrow-leaved Stringybark occurs 300 m west at edge of clearing and Blakely's Red Gum occurs 375 m east (Plate 1)
% Native Perennial Vegetation Cover	>50%	64%	66%
Number Of Native Understorey Species Present (Excluding Grasses)	≥12	5	4
Important Species	1	5	7
Tree Density	20 trees/ha or natural regeneration	1.2 trees/ha no natural regeneration	0.16 trees/ha no natural regeneration
Does the plot meet the Box Gum Woodland CEEC condition threshold?	**-**	No, because the number of native understorey species present (excluding grasses) is less than 12 and the tree density is very low.	No, because the number of native understorey species present (excluding grasses) is less than 12 and the tree density is very low.

Highlighted cells = criteria not met.

It is also worth noting again that the subject land has been cleared for over 100 years and a 1955 aerial photo shows it was in a condition over 60 years ago that was similar to its condition today. Since initial clearing of the area, the Wilpinjong grassland was part of a local area that supported a significant population (i.e. approximately 90,000) of sheep and then a history of continual mixed sheep and cattle grazing, along with fertilisation, cropping and pasture seeding. Any native perennial seed bank other than readily dispersed grasses has been well and truly extinguished in these heavily disturbed grassland areas, leaving no scope for assisted natural regeneration of Box-Gum Woodland CEEC.

In consideration of the above information, I confirm that the boundaries of the Box-Gum Woodland CEEC have been defined in accordance with the Department's policies and guidelines. The boundaries of the Box-Gum Woodland CEEC in the vicinity of Plots 140611P3 and 140612P4 remains as mapped in my previous reports, following my detailed consideration of DoEE's comments dated 8 September 2016.

Yours Faithfully
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Dr Colin Driscoll
Environmental Biologist

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