

1. Please provide a table combining the predicted direct biodiversity impacts of the Project on vegetation communities by Biometric Vegetation Type (BVT) and Plant Community Type (PCT) including threatened ecological communities listed under both the BC Act and EPBC Act (refer to Table 6.22 of the EIS and Table 2.3 of Appendix 24); and

Table 1 documents the predicted direct biodiversity impacts of the MCCO Project on vegetation communities by Biometric Vegetation Type (BVT) and Plant Community Type (PCT) including Threatened Ecological Communities (TEC) listed under both the Biodiversity Conservation Act 2016 (BC Act) and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Table 1 Predicted Direct Impacts of the MCCO Project on Vegetation Communities

| BVT | PCT | Community Name | Area of Impact (ha) | BC Act TEC | EPBC Act TEC |
|-------|------|--|---------------------|--|---|
| HU812 | 1598 | Forest Red Gum grassy open forest on floodplains of the lower Hunter | 14.67 | Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC | 9.4 ha of impacted area is White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC |
| HU812 | 1598 | Forest Red Gum grassy open forest on floodplains of the lower Hunter – Moderate to Good - Derived Native Grassland | 15.24 | 8.53 ha of impacted area is White Box Yellow Box Blakely's Red Gum Woodland EEC | 8.4 ha of impacted area is White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC |
| HU816 | 1602 | Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter | 6.30 | Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions EEC | - |
| HU817 | 1603 | Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter | 295.25 | Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC | - |

| BVT | PCT | Community Name | Area of Impact (ha) | BC Act TEC | EPBC Act TEC |
|-------|------|--|---------------------|---|--|
| HU817 | 1603 | Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter – Moderate to Good – Derived Native Grassland | 197.49 | - | - |
| HU821 | 1607 | Blakely's red Gum - Narrow-leaved Ironbark - Rough-barked apple shrubby woodland of the Hunter | 6.46 | White Box Yellow Box Blakely's Red Gum Woodland EEC | White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC |
| HU906 | 1692 | Bull Oak grassy woodland of the central Hunter Valley | 30.76 | - | - |
| HU906 | 1692 | Bull Oak grassy woodland of the central Hunter Valley – Moderate to Good – Derived Native Grassland | 1.64 | - | - |
| HU945 | 1731 | Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley | 2.95 | - | - |
| | | Total | 570 | | |

2. Please provide a table combining the proposed biodiversity offsetting strategy required to compensate for all biodiversity impacts, including specifying those offsets which related to MNES (refer to Table 6.23 of the EIS and Table 2.6 of Appendix 24). This table should also include the revised orchid offsets, including the number of credits available from both Mangoola Offset and the Mangrove Offset (ie an additional column in Table 3.7 of the RTS indicating the credits available from each site).

Table 2 and **Table 3** below document the proposed biodiversity offsetting strategy to compensate for all residual biodiversity impacts. **Table 2** outlines the offsets proposed for entities listed under the BC Act (using credits in accordance with the FBA) and **Table 3** identifies the offsets for MNES.

The updated credits presented below in relation to *Diuris tricolor* and *Prasophyllum petilum* represent the revised credits as documented in the revised *Expert Report Expected Presence of Threatened Terrestrial Orchids (Diuris tricolor & Prasophyllum petilum):Mangoola Coal Continued Operations Project* (Bell, Dec 2019).

Table 2 - Proposed Biodiversity Offsetting Strategy for Residual Biodiversity Impacts in accordance with the FBA

| BVT/PCT/Species Credit | Credits Required | Credits from Proposed Offset Sites | | Credits from Existing Offset Sites | | Credits from Ecological Rehabilitation | Total Credits Available | Biodiversity Conservation Fund | Total Offset Credits to be Used | Is Credit Requirement Met? |
|--|------------------|------------------------------------|------------------------|------------------------------------|---------------|--|-------------------------|--------------------------------|---------------------------------|----------------------------|
| | | Mangoola Offset | Wybo ng Heights Offset | Highfields Site | Mangrove Site | | | | | |
| HU812 Forest Red Gum grassy open forest on floodplains of the lower Hunter | 1,874 | 510 | 0 | 0 | 0 | 1,364 | 1,874 | 0 | 1,874 | Yes |

| BVT/PCT/Species Credit | Credits Required | Credits from Proposed Offset Sites | | Credits from Existing Offset Sites | | Credits from Ecological Rehabilitation | Total Credits Available | Biodiversity Conservation Fund | Total Offset Credits to be Used | Is Credit Requirement Met? |
|--|------------------|------------------------------------|------------------------|------------------------------------|---------------|--|-------------------------|--------------------------------|---------------------------------|----------------------------|
| | | Mangoola Offset | Wybo ng Heights Offset | Highfields Site | Mangrove Site | | | | | |
| HU816 Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter | 369 | 742 | 2,042 | 0 | 0 | 0 | 2,784 | 0 | 369 | Yes |
| HU817 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter | 13,457 | 8,991 | 3,015 | 790 | 0 | 681 | 13,477 | 0 | 13,457 | Yes |
| HU821 Blakely's red Gum - Narrow-leaved Ironbark - Rough-barked apple shrubby woodland of the Hunter | 253 | 860 | 2,549 | 0 | 0 | 0 | 3,409 | 0 | 253 | Yes |

| BVT/PCT/Species Credit | Credits Required | Credits from Proposed Offset Sites | | Credits from Existing Offset Sites | | Credits from Ecological Rehabilitation | Total Credits Available | Biodiversity Conservation Fund | Total Offset Credits to be Used | Is Credit Requirement Met? |
|---|------------------|------------------------------------|------------------------|------------------------------------|---------------|--|-------------------------|--------------------------------|---------------------------------|----------------------------|
| | | Mangoola Offset | Wybo ng Heights Offset | Highfields Site | Mangrove Site | | | | | |
| HU906 Bull Oak grassy woodland of the central Hunter Valley | 1,597 | 0 | 1,597 | 0 | 0 | 0 | 1,597 | 0 | 1,597 | Yes |
| HU945 Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley | 168 | 17 | 0 | 0 | 0 | 151 | 168 | 0 | 168 | Yes |
| Tarengo leek orchid (<i>Prasophyllum petilum</i>)* | 8,983 | 12,325 | 0 | 0 | 3,067 | 0 | 15,392 | 0 | 15,392 | Yes |
| pine donkey orchid (<i>Diuris tricolor</i>)* | 17,238 | 121,740 | 0 | 0 | 26,202 | 0 | 147,942 | 0 | 147,942 | Yes |
| large-eared pied bat (<i>Chalinolobus dwyeri</i>) | 27 | 667 | 0 | 0 | 0 | 0 | 667 | 0 | 27 | Yes |
| southern myotis (<i>Myotis macropus</i>) | 20 | 0 | 11 | 0 | 0 | 0 | 11 | 9 | 20 | Yes |

* As per RTS commitment Mangoola has agreed to retire all credits for these species generated on the proposed offset properties

Table 3 - Proposed Biodiversity Offsetting Strategy for Residual Biodiversity Impacts on Matters of National Environmental Significance

| EPBC Act listed species or community | Area of Direct and indirect Impact | Area At Mangoola Offset Site | Area At Wybong Heights Offset Site | At Mangrove Offset Site | Area At Highfields Offset Site | Area proposed as ecological rehabilitation | Total area of Proposed Offset |
|---|--|---|---|--|--------------------------------|--|---|
| Matters Likely to Have a Significant Impact | | | | | | | |
| <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> CEEC | 24 hectares | Approx. 91 ha | 297.6 ha of HU730 | - | Approx. 60 ha | - | Approx. 449 ha |
| Regent honeyeater | 147 hectares | 60.1 ha of HU702 17.1 ha of HU826 48 ha HU816 206.9ha HU817 54.6 ha HU821 | 15.3 ha of HU701 105.8 ha of HU868 130.6 ha of HU816 132.8 ha of HU821 | - | - | 142 ha HU817 | Approx. 912 ha |
| <i>Prasophyllum</i> sp. Wybong | 691 individuals and associated habitat | 1735 individuals and associated habitat | - | 431 Individuals and associated habitat | - | - | 2,166 individuals and associated habitat |

3. Please provide a figure showing the terrestrial GDEs and potential GDEs that are predicted to be impacted by the Project (ie. all 16 PCTs listed in Table 2.4 of the response to IESCs advice dated 14 Feb 2020), in relation to the proposed disturbance area and the 10 m groundwater drawdown contour;

Summary Response

To clarify there are not 16 PCTs that are potential terrestrial GDEs predicted to be impacted by the MCCO Project. The 16 PCTs relate to the broader GDE study area which was defined by the extent of the groundwater model and areas where existing groundwater is present <10m from the surface (as identified on Figure 6.25 in the EIS). The majority of the broader GDE study area was not predicted to be impacted by the MCCO Project. A more detailed response is provided below along with reference to the relevant figure that should be referred to.

Detailed Response

The potential direct and indirect impacts on terrestrial GDEs were considered and assessed within the MCCO Project EIS including clearing of native vegetation within the MCCO Additional Disturbance Area and drawdown of groundwater within the vicinity of the MCCO Project.

Figure 6.25 of the MCCO Project EIS shows the extent of the MCCO Project Groundwater Dependent Ecosystem (GDE) Study Area. Within this area some terrestrial vegetation was identified in regional studies as having potential to be terrestrial GDEs. There are 16 PCT's within the GDE Study Area that occur within shallow groundwater areas (i.e. pre-mining groundwater <10m from surface) and were identified as terrestrial GDEs, the other portions of these PCTs are not GDEs. It should be noted that not all 16 of these PCTs are predicted to be impacted by the MCCO Project.

As stated in the GDE Assessment Chapter (Section 6.10.3) of the EIS, the MCCO Project will result in clearing of native vegetation within the MCCO Additional Disturbance Area. As shown on Figure 6.25 this will include some woodland/forest vegetation that has access to shallow groundwater and was therefore identified as a potential GDE. Parts of 6 PCT's identified as potential terrestrial GDEs were identified within the MCCO Project Additional Disturbance Area.

The MCCO Project will also result in drawdown of groundwater within the vicinity of the MCCO Project. With regard to GDEs, the predicted drawdowns of relevance are those in layer 1 of the groundwater model which relates to drawdown in alluvium, colluvium and regolith (affecting saturated zone, capillary zone and unsaturated zones). As part of a conservative assessment of potential drawdown impacts, layer 2 which relates to drawdown in shallow weathered bedrock (saturated zone) was also considered but is unlikely to support GDEs due to the relative depth of this layer in the groundwater model.

In this regard as requested please find attached to this response a new figure (Figure 1) which shows the areas of 1 m or greater drawdown resulting from mining of the MCCO Additional Mining Area in layer 1 where potential GDEs occur. This figure shows the potential terrestrial GDEs that are predicted to be impacted by the MCCO Project both by direct clearing (ie. within the MCCO Additional Disturbance Area) and those within the predicted area of drawdown.

4. Please provide a revised Table 2.4 [from IESC Response] to show the potential GDE impact areas (ha) and the type of impact (ie direct due to clearing or indirect through groundwater drawdown);

As requested by DPIE, updated impact areas (ha) for each PCT comprising a potential terrestrial GDE within the MCCO Project GDE Study Area is provided below. The proposed impacts to potential terrestrial GDEs within or in proximity to the MCCO Project is limited to clearing of native vegetation within the MCCO Additional Disturbance Area and drawdown of groundwater within the vicinity of the MCCO Project. No additional significant impacts are predicted on terrestrial GDEs from the MCCO Project. It is noted that the clearing of native vegetation will be offset as per the FBA.

Table 1 Assessment of terrestrial GDE groundwater dependence and areas of potential impact

| PCT Comprising a Potential GDE (where there is shallow groundwater only) | Assessment of Dependence on Groundwater | Extent of Clearing of PCT that is potential GDE (ha)* | PCT impacted by 1 m groundwater drawdown contour (Layer 1 - alluvium, colluvium and regolith) |
|---|---|---|---|
| HU654/PCT1310 - White Box - Yellow Box grassy woodland on basalt slopes in the upper Hunter Valley, Brigalow Belt South Bioregion | Low | Nil | Nil |
| HU757/PCT1543 - <i>Ficus rubiginosa/Alectryon subcinereus/Notelaea microcarpa</i> /dry rainforest of the Central Hunter Valley | Low | Nil | Nil |
| HU812/PCT1598 - Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter | Moderate | 0.003 | Nil |
| HU817/PCT1603 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter | Low | 45.1 | Nil |
| HU818/PCT1604 - <i>Eucalyptus crebra/Eucalyptus moluccana/Corymbia maculate</i> shrub/grass open forest of the central and lower Hunter | Low | Nil | Nil |
| HU819/PCT1605 - <i>Eucalyptus crebra/Notelaea microcarpa</i> shrubby open forest of the central and upper Hunter | Low | Nil | Nil |
| HU821/PCT1607 - Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter | Moderate | 5.3 | Nil |

| PCT Comprising a Potential GDE (where there is shallow groundwater only) | Assessment of Dependence on Groundwater | Extent of Clearing of PCT that is potential GDE (ha)* | PCT impacted by 1 m groundwater drawdown contour (Layer 1 - alluvium, colluvium and regolith) |
|---|---|---|---|
| HU825/PCT1611 - <i>Eucalyptus crebra</i> / <i>Callitris endlicheri</i> shrub/grass woodland upper Hunter and northern Wollemi | Low | Nil | Nil |
| HU826/PCT1612 - <i>Eucalyptus crebra</i> / <i>Eucalyptus punctata</i> / <i>Notelaea macrocarpa</i> woodland of Central Hunter | Low | Nil | Nil |
| HU869/PCT1655 - Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin | Low | Nil | Nil |
| HU883/PCT1669 - <i>Eucalyptus fibrosa</i> / <i>Eucalyptus punctata</i> / <i>Eucalyptus sparsifolia</i> / <i>Corymbia trachyphloia</i> shrubby open forest on sandstone ranges of the Sydney Basin | Low | Nil | Nil |
| HU884/PCT1670 - <i>Eucalyptus sparsifolia</i> / <i>Eucalyptus punctata</i> shrubby open forest on sandstone ranges of the Sydney Basin | Low | Nil | Nil |
| HU905/PCT1691 - <i>Eucalyptus crebra</i> / <i>Eucalyptus moluccana</i> grassy woodland of the central and upper Hunter | Low | 0.04 | 12.4 |
| HU906/PCT1692 - Bull Oak Grassy Woodland of the Central Hunter Valley | Low | 30.7 | Nil |
| HU928/PCT1714 - <i>Eucalyptus camaldulensis</i> / <i>Casuarina cunninghamiana</i> grassy riparian woodland of the Hunter Valley | High | Nil | Nil |
| HU945/PCT1731 - Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley | Moderate | 2.9 | 9.6 |
| Total | | 84.1 | 22.0 |

* Note: The area of each PCT that is a potential GDE is defined by the extent of that PCT where pre-mining groundwater level is within 10m of the surface

5. Under PA 06_0014 blasting is approved to occur until 3 pm, however the EIS notes that blasting is already approved to occur until 5 pm. Please clarify existing and proposed blasting hours.

Schedule 3 Condition 11 of PA 06_0014 states that *“The Proponent must only carry out blasting on site between 9am and 3pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of EPA”*.

Written approval from the EPA is provided under condition L4.5 in EPL 12894 which states that *“Blasting in or on the premises must only be carried out between 09:00 hours and 17:00 hours, Monday to Saturday”*.

As per the requirements of Schedule 3 Condition 11 of PA 06_0014 this provides Mangoola with approval to conduct blasting within these hours (9.00am to 5.00pm). As part of the MCCO Project,

Mangoola is seeking that the condition in a new Development Consent reflects approval to conduct blasting within the hours 9.00am to 5.00pm Monday to Saturday inclusive .