

4 August 2020

Lauren Evans

Team Leader, Energy and Resource Assessments
NSW Department of Planning, Industry and Environment
GPO Box 39
Sydney NSW 2001

By email: Lauren.Evans@planning.nsw.gov.au

Dear Lauren,

RE: MAXWELL PROJECT (SSD-9526) – RESPONSE TO INFORMATION REQUEST

I refer to the Department of Planning, Industry and Environment's (DPIE) information request (dated 24 July 2020). The matters raised in the Department's information request are addressed below and in the enclosures to this letter.

Assessment Addendum

The Department has requested an addendum to the Commonwealth Assessment in Section 7 of the Biodiversity Development Assessment Report (BDAR) (Hunter Eco, 2019) to include potential impacts on *Eucalyptus glaucina*, *Prasophyllum petilum*, *Ozothamnus tessellatus* and *Thesium australe*.

The potential presence of these species is based on the advice provided by the New South Wales (NSW) Biodiversity and Conservation Division (BCD) in its letter dated 14 July 2020. The BCD describes that these species are 'candidate species' for the Maxwell Project area and require appropriate targeted surveying and/or an expert report to determine their presence (i.e. they are not necessarily assumed to be present). In the absence of further survey or an expert report, the BCD has determined potential offset requirements for these species.

Dr Colin Driscoll (Hunter Eco) has subsequently completed further surveys for *Eucalyptus glaucina*, *Ozothamnus tessellatus* and *Thesium australe* in accordance with survey techniques described in the *Surveying Threatened Plants and Their Habitats: NSW Survey Guide for the Biodiversity Assessment Method* (DPIE, 2020b).

Dr Colin Driscoll (Hunter Eco) acknowledges that the survey timing was outside of the recommended timing as per the *BioNet Threatened Biodiversity Data Collection* (TBDC) (DPIE, 2020a) for *Ozothamnus tessellatus* and *Thesium australe*. However, *Thesium australe* is considered unlikely to occur as it is generally associated with Kangaroo Grass (*Themeda triandra*) and there are no records of Kangaroo Grass within the Project disturbance areas. Further, TBDC data referenced for the BDAR (as at July 2019) stated that this species was not associated with any of the vegetation present within the proposed disturbance areas. *Ozothamnus tessellatus* is also unlikely to occur as the nearest record is approximately 15 km to the north-west of the Project area. Further, TBDC data referenced for the BDAR (as at July 2019) suggested that this species could be surveyed all year, as it is a perennial species and does not seasonally die back.

Eucalyptus glaucina, *Ozothamnus tessellatus* and *Thesium australe* were not found within the Project disturbance areas, confirming the results of the original surveys. The survey addendum is provided in Enclosure 1. On this basis, no credits should be produced under the *NSW Biodiversity Assessment Method* (BAM) and a more detailed Commonwealth Assessment for *Eucalyptus glaucina*, *Ozothamnus tessellatus* and *Thesium australe* should not be required as it would only describe how the species are not likely to be adversely (or significantly) impacted. Notwithstanding, an assessment of *Ozothamnus tessellatus* and *Thesium australe* is provided in Enclosure 2.

Given the survey timing was not suitable to detect *Prasophyllum petilum* (if present), Dr Colin Driscoll (Hunter Eco) has provided a more detailed Commonwealth Assessment for this species and it is provided in Enclosure 2. In addition, Dr Colin Driscoll has prepared an assessment of *Prasophyllum* sp. Wybong (which is synonymous with this species) as a 'potential SAI entity' under the *NSW Biodiversity Conservation Act, 2016* as outlined in Enclosure 2.

Conservation Advice, Recovery Plans or Threat Abatement Plans

The Department has requested review of relevant Conservation Advice, Recovery Plans or Threat Abatement Plans for EPBC-listed threatened species and communities relevant to the Project. Malabar responded to a similar request from the Department in Section 6.1.6 of the Maxwell Project Submissions Report.

Conservation advice, recovery plans and threat abatement plans for relevant EPBC Act-listed species and communities were considered in detail in Section 7.3 of the BDAR. These were summarised in Table 40 of the BDAR, which has been reproduced in Enclosure 3 (Table 3-1).

A reconciliation table of all conservation advice, recovery plans and threat abatement plans provided for relevant EPBC listed species is also provided in Enclosure 3 (Table 3-2).

Subsidence Impacts on Threatened Flora

The Department has requested clarification as to how potential impacts on threatened flora within the subsidence area are intended to be mitigated, particularly in regards to *Eucalyptus glaucina*, *Prasophyllum petilum*, *Pterostylis chaetophora*, *Ozothamnus tessellatus* and *Thesium australe*.

Potential subsidence impacts on native vegetation and habitat are considered in Section 5.3.1 of the BDAR. This includes an assessment of potential impacts on threatened flora species and populations.

As described above, Dr Colin Driscoll (Hunter Eco) has completed further surveys for *Eucalyptus glaucina*, *Ozothamnus tessellatus* and *Thesium australe*, confirming the results of the original surveys that these species are not present (Enclosure 1).

Prasophyllum petilum and *Pterostylis chaetophora* have not previously been identified within the Underground Mining area.

Prior to any remediation of surface cracks, Malabar would undertake a review of environmental impacts that may result from the remediation at the specific location and consider if remediation of surface cracks is environmentally beneficial or if alternative methods of remediating the crack is warranted (e.g. without machinery). The review would consider, among other factors, the known locations of threatened flora species and populations.

In the event that *Prasophyllum petilum* or *Pterostylis chaetophora* are identified within the Maxwell Underground Area, Malabar would erect a livestock proof fence around a 20 m buffer from the population. The area would be signed 'Environmental Protection Area'. Accordingly, the Project is likely to have a positive impact on these species if they are identified within the Maxwell Underground area.

Access Road Speed Limit

The Department has requested further justification for the proposed 80 km per hour speed limit on the site access road given the likelihood of vehicle strikes, particularly in respect of the Pink-tailed Legless Lizard, Striped Legless Lizard and Spotted-tailed Quoll.

Potential impacts on threatened fauna species were assessed in Section 5.4.6 of the BDAR.

The Pink-tailed Legless Lizard and Striped Legless Lizard were recorded on site. There is little likelihood of either of the legless lizards becoming road kill given their preference for covered habitat and low mobility. A change in speed limit is also unlikely to result in any further reduction in the risk to the legless lizards.

The Spotted-tailed Quoll was not recorded on site. Were Spotted-tailed Quoll present, individuals moving across road ways could be susceptible to vehicle strike. The potential impacts of vehicle strikes have been minimised for the Project through:

- use of the existing site access road to Maxwell Infrastructure from Thomas Mitchell Drive, directing traffic to and from the Project site primarily along Thomas Mitchell Drive and the New England Highway, which are existing high-volume traffic routes;
- use of a covered overland conveyor, rather than trucks, to transport longwall ROM coal from the MEA to the existing Maxwell Infrastructure;
- imposing speed limits on internal roads.

With the implementation of these mitigation and management measures, the likelihood and consequence of residual impacts due to vehicle strike were determined to be low (refer Table 29 of the BDAR). Vehicle strike of animals along the site access road is possible, however, it is not expected to be of a magnitude that would threaten the local persistence of any species.

Accordingly, a further reduction in speed limit for the site access road is not considered warranted.

Biodiversity Offsets Figure

A figure showing the location of the Drayton Wildlife Refuge, Northern Offset Area, Southern Offset Area and the indicative Biodiversity Stewardship Site for the Project is provided in Enclosure 4.

Revised Listing for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community

Malabar would also like to draw the DPIE's attention to the recent revised listing for *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community*. On 17 July 2020, the NSW Threatened Species Scientific Committee revised the listing status for this community from Endangered Ecological Community to Critically Endangered Ecological Community. This change in listing advice is outlined in the enclosed letter from Dr Colin Driscoll. The assessment in accordance with the Biodiversity Assessment Method (BAM) (Office of Environment and Heritage, 2017) and *Biodiversity Conservation Regulation, 2017* remains the same as the assessment presented in the BDAR.

Please do not hesitate to contact the undersigned should you wish to discuss.

Yours sincerely,



Bill Dean
General Manager – Projects
Malabar Coal Limited

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| Enclosure 1 | Threatened Flora Survey Addendum (Hunter Eco, 2020) |
| Enclosure 2 | Assessment Addendum |
| Enclosure 3 | Summary of Conservation Advice, Recovery Plans or Threat Abatement Plans |
| Enclosure 4 | Existing and Proposed Biodiversity Offset Areas |

References

Department of Planning, Industry and Environment (2020a) *BioNet Threatened Biodiversity Data Collection*. Website: https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/Default.aspx?a=1

Department of Planning, Industry and Environment (2020b) *Surveying Threatened Plants and Their Habitats: NSW Survey Guide for the Biodiversity Assessment Method*. Published by the Environment, Energy and Science Department of Planning, Industry and Environment, April 2020.

Enclosure 1
Threatened Flora Survey Addendum (Hunter Eco, 2020)



Bill Dean
Malabar Coal Limited
PO Box R864
Royal Exchange NSW 1225

04 August 2020

Dear Bill

Maxwell Project Threatened Flora Survey Addendum

This letter documents the survey effort primarily aimed at targeting Slaty Red Gum (*Eucalyptus glaucina*) and Tiger Orchid (*Cymbidium canaliculatum*) within the Biodiversity Assessment Development Footprint (development footprint) for the Maxwell Project. Other threatened flora species, including Tesselate Everlasting (*Ozothamnus tessellatus*) and Austral Toadflax (*Thesium australe*), were also targeted during surveys. As described in the Biodiversity Development Assessment Report (BDAR), the development footprint includes (Figures 1 and 2):

- the mine entry area at the Maxwell Underground;
- the transport and services corridor between the Maxwell Underground and Maxwell Infrastructure;
- the extension to the existing product coal stockpile area and additional ROM stockpile at the Maxwell Infrastructure (Stockpile Area);
- two areas of potential ponding impacts associated with subsidence; and
- the potential Edderton Road realignment.

In April 2020, the *Surveying Threatened Plants and Their Habitats: NSW Survey Guide for the Biodiversity Assessment Method* (2020 Flora Survey Guideline) (Department of Planning, Industry and Environment [DPIE] 2020a) was released. This letter demonstrates how the previous targeted surveys for threatened flora undertaken as part of the *Maxwell Project - Baseline Flora Report* (dated July 2019) and supplementary targeted surveys are in accordance with the 2020 Flora Survey Guideline (DPIE 2020a).

Targeted Surveys in 2018 that met the 2020 Flora Survey Guideline Requirements

As part of the *Maxwell Project - Baseline Flora Report* (dated July 2019), the Stockpile Area was searched thoroughly for threatened species (including Slaty Red Gum, Tiger Orchid, Tesselate Everlasting and Austral Toadflax) on 9 September 2018 and 30 November 2018 (Figure 3). The Edderton Road Realignment, consisting almost entirely of derived native grassland, was searched thoroughly on 8 February 2018 and 6 December 2018 (Figure 4).

The total area of suitable habitat for the targeted threatened species within the development footprint is less than 50 hectares (ha). For an area of this size, the parallel field traverse survey technique is the required survey approach in the 2020 Flora Survey Guideline (DPIE 2020a).

The vegetation within the development footprint was determined to be mid-dense to sparse (not dense) as per Walker and Hopkins (1990), therefore the parallel field traverse distances for open vegetation were used in the survey.

For trees (such as Slaty Red Gum) in open vegetation the recommended maximum distance between parallel field traverses is 40 metres (m) (DPIE 2020a). As the Tiger Orchid grows in the hollows and forks of eucalypts and wattles, including Slaty Red Gum, the above survey effort is considered efficient for targeting this species.

The Edderton Road Realignment (Figure 4) and Stockpile Area (Figure 3) are less than 40 m wide. For these areas, multiple parallel field traverses along their length exceeded the sampling method in the 2020 Flora Survey Guideline (DPIE 2020a), i.e. observing the entire disturbance area.

There are also two small areas that have been modelled as possibly subject to ponding as a result of subsidence (Figure 1). All trees in these areas were inspected on 8 February 2018. Again, this survey effort exceeded the sampling method in the 2020 Flora Survey Guideline (DPIE 2020a).

Preliminary to vegetation community classification and mapping, 53 canopy trees were identified and their locations recorded within the development footprint, in both woodland and paddock trees. These are referred to as Rapid Data Points (RDP) and none of the identified species were Slaty Red Gum and none were host to the Tiger Orchid.

The development footprint includes 1.4 ha of Plant Community Type (PCT) 1655 *Grey Box – Slaty Box shrub – grass woodland on sandstone slopes of the upper Hunter and Sydney Basin*. This area is in isolation of the main development footprint woodland areas and was surveyed on 15 January 2018, 12 September 2018 and 24 October 2018 (see inset Figure 1). No Tiger Orchid, Tesselate Everlasting or Austral Toadflax were found in this area or in the immediate surrounding habitat.

Supplementary Survey Methods

The supplementary survey for threatened species (including Slaty Red Gum and Tiger Orchid) was conducted by Dr Colin Driscoll on 8 July 2020 within the transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (Figure 5).

The surveys were primarily aimed at targeting Slaty Red Gum and Tiger Orchid. Both species can be surveyed at any time of year (DPIE 2020b). During the survey, two other species were also targeted, Tesselate Everlasting and Austral Toadflax. The *BioNet Threatened Biodiversity Data Collection* (TBDC) places the required survey period for both of these plants in September and October. However, Tesselate Everlasting is perennial and does not seasonally die back and the search for Austral Toadflax was focused on the potential host species Kangaroo Grass (*Themeda triandra*). Kangaroo Grass was previously surveyed as part of the *Maxwell Project - Baseline Flora Report* (dated July 2019) and not found within the development footprint.

Table 1 lists the woodland PCTs within the development footprint and the association of the target threatened flora species with those PCTs as per the TBDC (DPIE 2020b).

Table 1
Plant Community Types within the Development Footprint and the Association of the Target Threatened Flora Species

PCT	PCT Name	Area (ha)	Slaty Red Gum (<i>Eucalyptus glaucina</i>)	Tiger Orchid (<i>Cymbidium canaliculatum</i>)	Tesselate Everlasting (<i>Ozothamnus tessellatus</i>)	Austral Toadflax (<i>Thesium australe</i>)
1604	Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter	1.3	Y	x	Y	Y
1606	White Box - Narrow-leaved Ironbark – Blakely's Red Gum shrubby open forest of the central and upper Hunter	9.6	x	Y	Y	Y



1655	Grey Box - Slaty Box shrub - grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	1.4	x	Y	Y	Y
1691	Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	9.6	Y	Y	x	x
1692	Bull Oak grassy woodland of the central Hunter Valley	2.8	Y	Y	x	x
Total		24.7	-	-	-	-

The survey was conducted according to the methods in the 2020 Flora Survey Guideline (DPIE 2020a). The total area of suitable habitat for the targeted threatened species within the development footprint is less than 50 ha. For an area of this size, the parallel field traverse survey technique is the required survey approach in the 2020 Flora Survey Guideline (DPIE 2020a).

The vegetation within the development footprint was determined to be mid-dense to sparse (not dense) as per Walker and Hopkins (1990), therefore the parallel field traverse distances for open vegetation were used in the survey. Transects at 40 m distance were undertaken within relevant PCTs in Table 1 as shown on Figure 5.

Results

Tiger Orchid (*Cymbidium canaliculatum*)

No Tiger Orchids were found during the transect survey.

There were only three trees within the Edderton Road Realignment with the potential to be host trees for Tiger Orchid, with none present. These were a single Grey Box (*Eucalyptus moluccana*) and two Slaty Box (*Eucalyptus dawsonii*). The remainder of the trees present were regrowth *Acacia salicina* and Swamp Oak (*Casuarina glauca*), not Tiger Orchid host trees.

Slaty Red Gum (*Eucalyptus glaucina*)

No Slaty Red Gums were recorded during the transect survey.

Austral Toadflax (*Thesium australe*)

No Austral Toadflax were found during the transect survey. No potential host species Kangaroo Grass was recorded in the Project disturbance area.

Tesselate Everlasting (*Ozothamnus tessellatus*)

While this species is listed by the TBDC as occurring in the Hunter sub-region the probability of occurrence would be low given that there is only one record in the sub-region adjacent to the north-east boundary. There were few shrubs present with the following table listing the shrub and shrub-like species recorded, none of which even faintly resemble Tesselate Everlasting.

Common Name	Scientific Name
Sickle Wattle	<i>Acacia falcata</i>
Kangaroo Thorn	<i>Acacia paradoxa</i>
Native Blackthorn	<i>Bursaria spinosa</i>
Bitter Cryptandra	<i>Cryptandra amara</i>
Dwarf Cherry	<i>Exocarpos strictus</i>
Wilga	<i>Geijera parviflora</i>
African Boxthorn	<i>Lycium ferocissimum</i>



Native Olive	<i>Notelaea microcarpa</i>
Shiny-leaved Canthium	<i>Psydrax odorata</i>
Square-stemmed Broom	<i>Teucrium junceum</i>

The TBDC places the required survey period for this plant in September and October. However, given the results of the current survey, and the fact that the species is perennial and does not seasonally die back, it is unlikely to become present in September or October.

Stockpile Area

This area was searched thoroughly on 9 September 2018 and 30 November 2018 (Figure 3) and no threatened flora species were present. Note that these surveys were within the recommended survey time for Tesselate Everlasting.

Conclusion

The current survey combined with surveys previously conducted have confirmed that no Slaty Red Gum (*Eucalyptus glaucina*), Tiger Orchid (*Cymbidium canaliculatum*), Tesselate Everlasting (*Ozothamnus tessellatus*) or Austral Toadflax (*Thesium australe*) are present in or near the Biodiversity Assessment Development Footprint.

Yours Faithfully
HUNTER ECO

Dr Colin Driscoll
Environmental Biologist

Department of Planning, Industry & Environment (2020a) *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method*, April 2020.

Department of Planning, Industry and Environment (2020b) *BioNet Threatened Biodiversity Data Collection*.

https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/Default.aspx?a=1

Walker, J. and Hopkins, M. S. (1990) 'Vegetation' in McDonald, R. C., Isbell, R. F., Speight, J. R., Walker, J. and Hopkins, M. S. (eds), *Australian soil and land survey – field handbook*, 2:58-77, Inkata Press, Melbourne and Sydney.



FIGURE 1

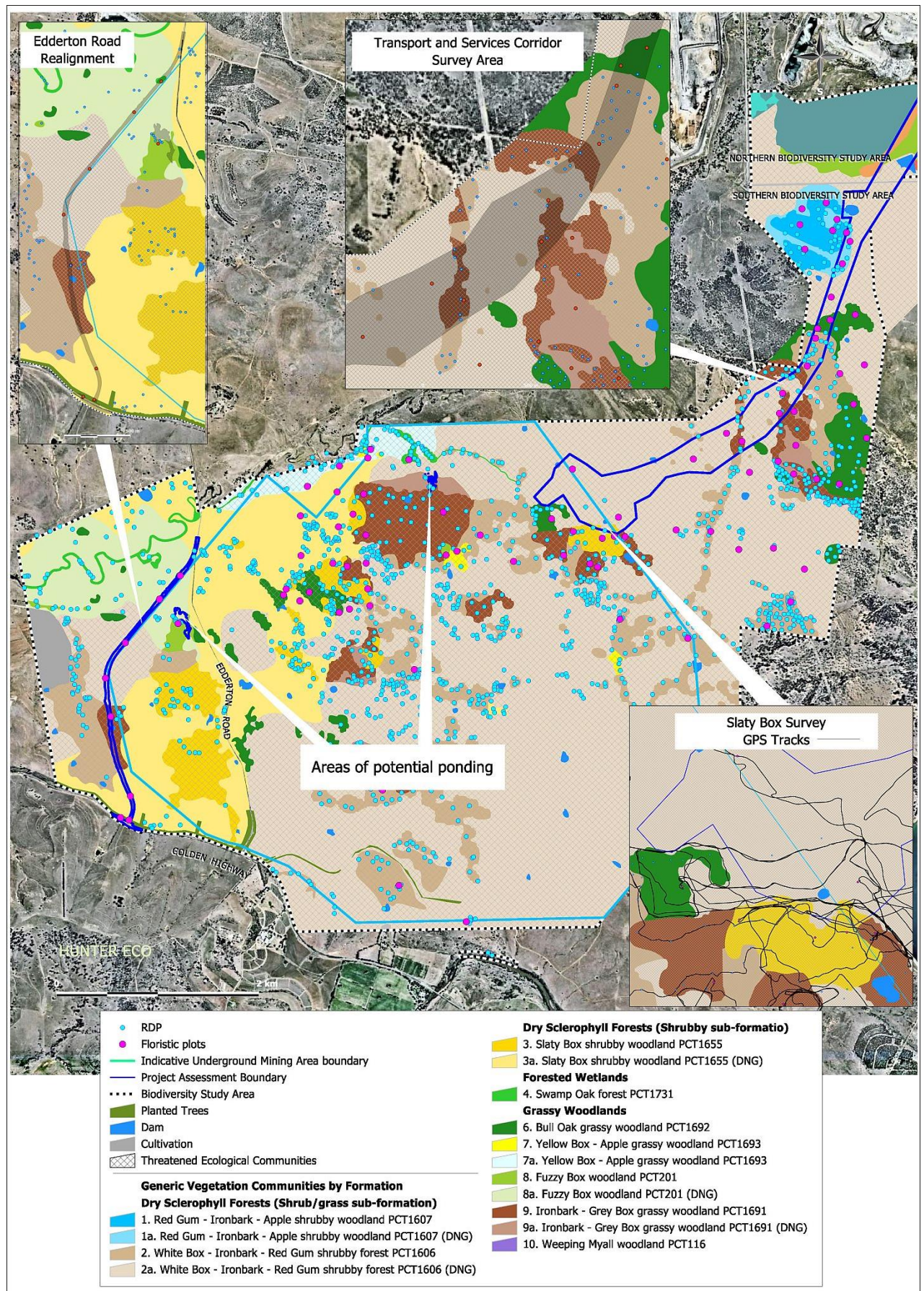


FIGURE 2

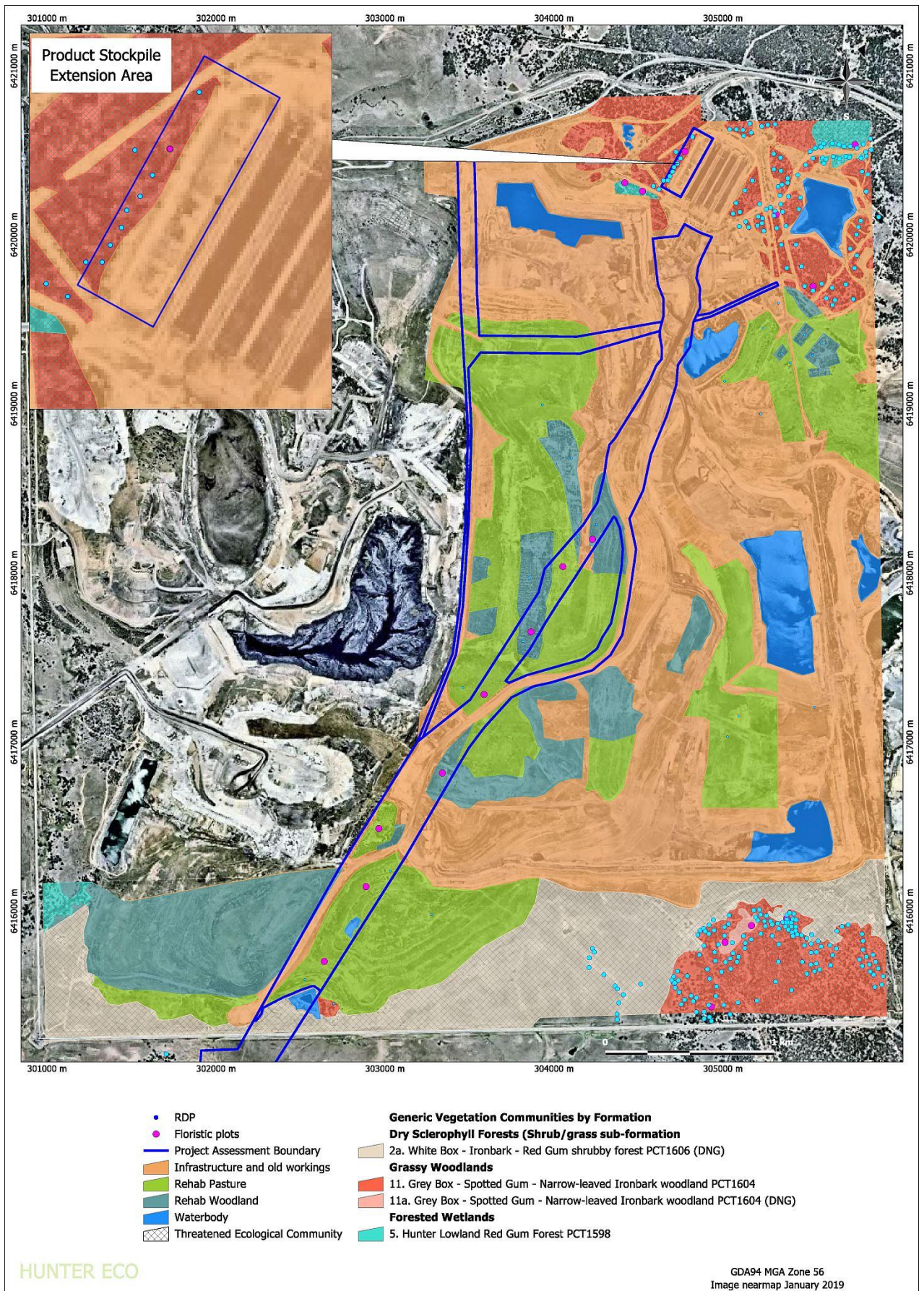


FIGURE 3



— Product Stockpile Extension Area GPS Survey Tracks
— Project Assessment Boundary

FIGURE 4

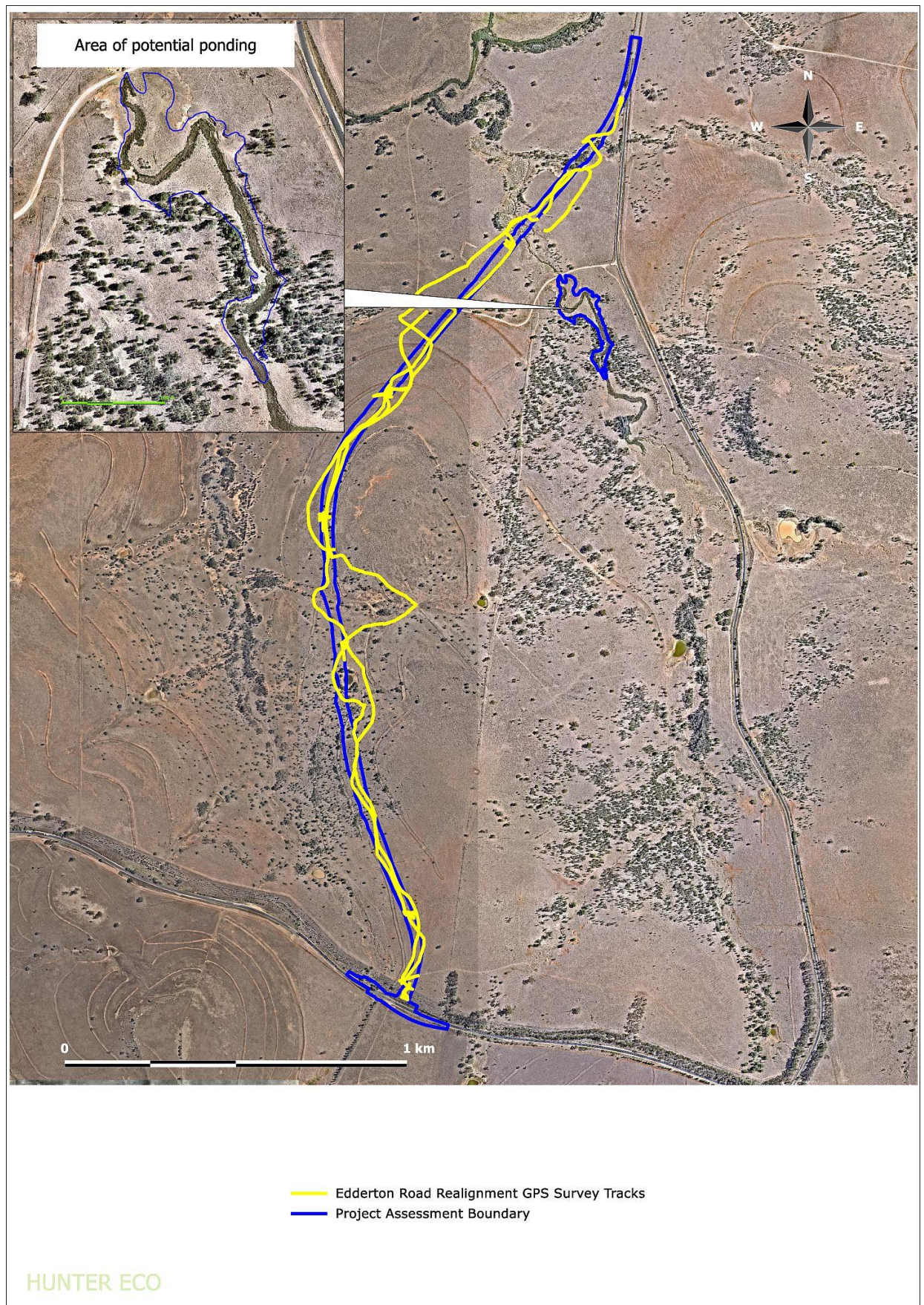
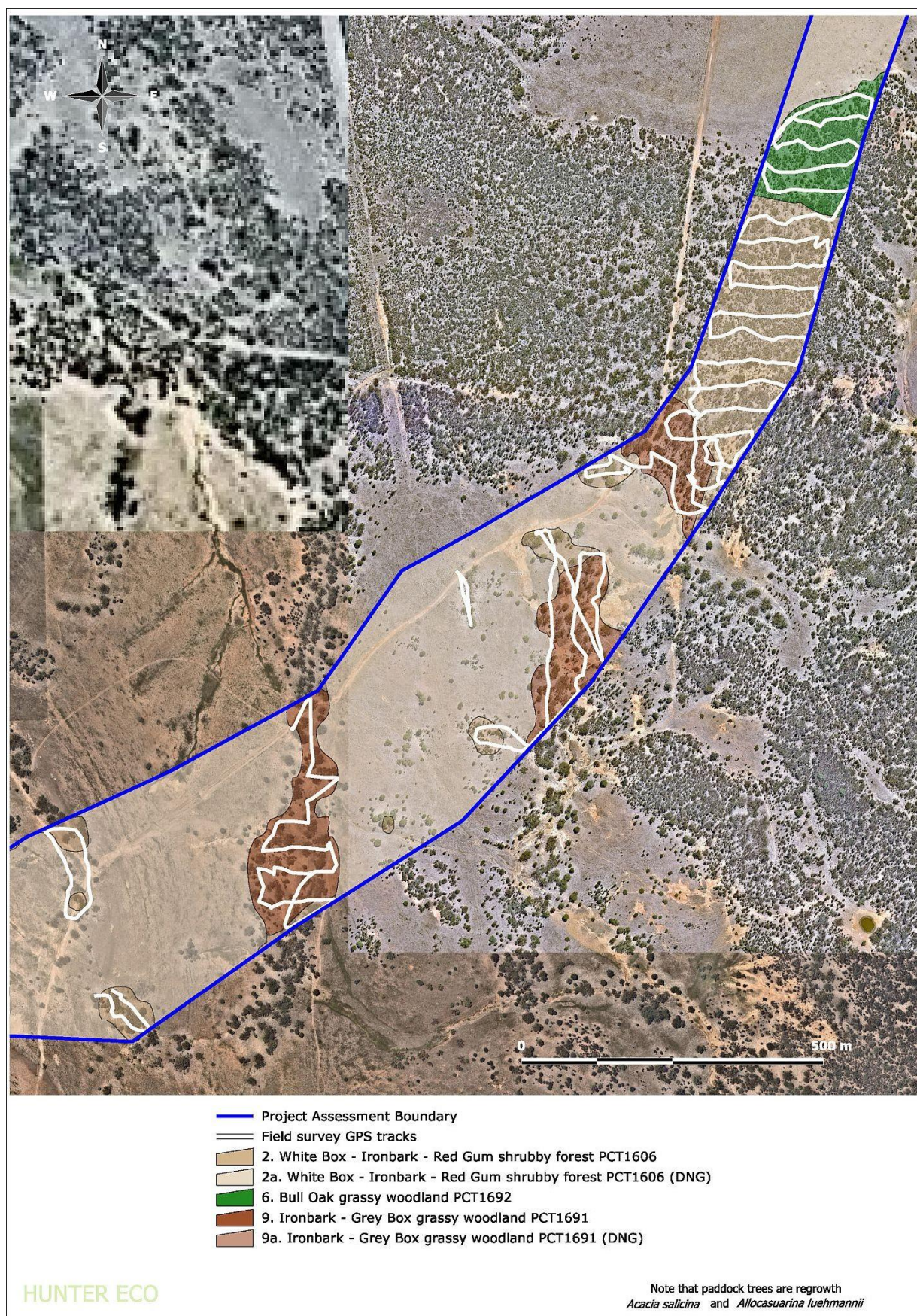


FIGURE 5



Enclosure 2
Biodiversity Development Assessment Report - Addendum



Bill Dean
Malabar Coal Limited
PO Box R864
Royal Exchange NSW 1225

04 August 2020

Dear Bill

**Maxwell Project
Biodiversity Development Assessment Report - Addendum**

Assessments of potential impacts of the Project on threatened species and communities listed under the New South Wales (NSW) *Biodiversity Conservation Act, 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) are provided in Sections 6 and 7.2 respectively of the *Maxwell Project – Biodiversity Development Assessment Report* (BDAR) (Hunter Eco 2019).

Additional assessments of EPBC Act-listed species are provided below and discussion of serious and irreversible impacts (SAII) for 'potential SAI entities', namely the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community* (Box-Gum Woodland CEEC) and *Prasophyllum* sp. Wybong, is provided in Attachment 1.

Tesselate Everlasting (*Ozothamnus tesselatus*)

Tesselate Everlasting (*Ozothamnus tesselatus*) was assessed in the BDAR as not likely to be present in the Project disturbance areas. Notwithstanding, the Department has requested an additional assessment for this species.

The *BioNet Threatened Biodiversity Data Collection* (Department of Planning, Industry and Environment [DPIE] 2020b) currently links Tesselate Everlasting to the following Plant Community Types (PCTs) on the Project area:

- PCT 1604: Grey Box – Spotted Gum – Narrow-leaved Ironbark Woodland;
- PCT 1606: White Box – Ironbark – Red Gum Shrubby Forest; and
- PCT 1655: Slaty Box Shrubby Woodland.

The Biodiversity Conservation Division (BCD) advises the woodland forms of the above vegetation communities are potential habitat for Tesselate Everlasting. Accordingly, BCD considers the maximum potential area of habitat for Tesselate Everlasting is 12.3 hectares (ha).

As described in Section 5.1 of the BDAR, a number of measures have been adopted to avoid and minimise impacts to vegetation and habitat disturbance. Measures that have specifically avoided clearance of the above PCTs include:

- locating multiple infrastructure within the same transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (a site access road, a covered overland conveyor, power supply and other ancillary infrastructure and services);
- locating the mine entry area predominately within an area of derived native grassland rather than woodland; and



- reducing the disturbance footprint required for the mine entry area.

In the long-term, the surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified.

Other than for areas of potential subsidence ponding, changes in landform due to subsidence are unlikely to have an impact on PCTs listed above. Subsidence is unlikely to materially impact the native vegetation within the predicted subsidence area as surface cracks would be remediated.

No Tesselate Everlasting was recorded during targeted threatened flora surveys for the BDAR (Hunter Eco 2019) and the absence of the species during further supplementary surveys undertaken in July 2020 (Hunter Eco 2020) indicate that Tesselate Everlasting is not present within the Project disturbance areas.

In the unlikely event that Tesselate Everlasting is present within the Project disturbance areas, it could be conservatively considered that the Project is likely to have a significant impact on the species in accordance with the criteria set out in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. (Department of the Environment [DotE] 2013b). Accordingly, if further survey work or an expert report does not demonstrate the absence of Tesselate Everlasting from the Project disturbance areas, the species would be offset in accordance with the NSW Biodiversity Offsets Scheme in accordance with the maximum potential credits determined by BCD (letter dated 14 July 2020).

Notwithstanding, after thorough field surveys for the species with none being recorded, my opinion is that Tesselate Everlasting is not likely to be present in the Project disturbance areas. I have considerable experience in surveying for Tesselate Everlasting, having discovered and documented several populations in the Goulburn River catchment where the majority of *BioNet Atlas* records occur (DPIE 2020a). Invariably the species has occurred in moderate to dense shrubby understorey. The vegetation in and around the Maxwell Project area is open grassy woodland/forest with negligible shrub cover. Furthermore, the *BioNet Atlas* records of Tesselate Everlasting nearest to the Project are approximately 20 kilometres (km) east and 20 km north west (DPIE 2020a).

Tarengo Leek Orchid (*Prasophyllum petilum*) (syn. *Prasophyllum* sp. Wybong)

Tarengo Leek Orchid (*Prasophyllum petilum*) is accepted as synonymous with *Prasophyllum* sp. Wybong by the NSW Scientific Committee and DPIE (DPIE 2020b). The taxa are regarded as separate species, however, by the Australian Plant Census and the Commonwealth Threatened Species Scientific Committee (Department of Agriculture, Water and the Environment 2020; DPIE 2020b). *Prasophyllum* sp. Wybong (listed under the EPBC Act, but not the BC Act) is listed as a potential 'serious and irreversible impact entity' (SAII entity) (DPIE 2020b) and is therefore assessed further in Attachment 1 in consideration of the *Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact* (DPIE 2019).

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas. Notwithstanding, the Department has requested an additional assessment for this species.

The *BioNet Threatened Biodiversity Data Collection* currently links *Prasophyllum petilum*/*Prasophyllum* sp. Wybong to one PCT on the Project area (PCT 201: Fuzzy Box Woodland). However, the BCD advises that this species is recorded in other vegetation communities in the upper Hunter Valley. Therefore, BCD considers that the following vegetation communities are potential habitat for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong:

- PCT 201: Fuzzy Box Woodland;
- PCT 1604: Grey Box – Spotted Gum – Narrow-leaved Ironbark Woodland;
- PCT 1606: White Box – Ironbark – Red Gum Shrubby Forest;
- PCT 1607: Red Gum – Ironbark – Apple Shrubby Woodland;
- PCT 1655: Slaty Box Shrubby Woodland; and
- PCT 1691: Ironbark – Grey Box Grassy Woodland.

Accordingly, BCD considers the maximum potential area of habitat for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong is 139.8 ha.

The main threats to *Prasophyllum petilum*/*Prasophyllum* sp. Wybong are (Department of Environment, Climate Change and Water 2010; DEWHA 2009):

- competition from other native species;
- weed invasion;
- grazing;
- habitat clearance;
- vehicle traffic; and
- inappropriate disturbance regimes.

As described in Section 5.1 of the BDAR, a number of measures have been adopted to avoid and minimise impacts to vegetation and habitat disturbance, including weed management, site access control and a vegetation clearance protocol. Measures that have specifically avoided clearance of the above PCTs include:

- locating multiple infrastructure within the same transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (a site access road, a covered overland conveyor, power supply and other ancillary infrastructure and services);
- locating the mine entry area predominately within an area of derived native grassland rather than woodland; and
- reducing the disturbance footprint required for the mine entry area.

In the long-term, the surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified.

Other than for areas of potential subsidence ponding, changes in landform due to subsidence are unlikely to have an impact on PCTs listed above. Subsidence is unlikely to materially impact the native vegetation within the predicted subsidence area as surface cracks would be remediated.

In the unlikely event that *Prasophyllum petilum*/*Prasophyllum* sp. Wybong is present within the Project disturbance areas, it could be conservatively considered that the Project is likely to have a significant impact on the species in accordance with the criteria set out in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. (DotE 2013b). Accordingly, if further survey work or an expert report does not demonstrate the absence of *Prasophyllum petilum*/*Prasophyllum* sp. Wybong from the Project disturbance areas, the species would be offset in accordance with the NSW Biodiversity Offsets Scheme in accordance with the maximum potential credits determined by BCD (letter dated 14 July 2020).

Notwithstanding, my opinion is that *Prasophyllum petilum*/*Prasophyllum* sp. Wybong is not likely to be present in the Project disturbance areas. The majority of *Prasophyllum petilum*/*Prasophyllum* sp. Wybong records in proximity to the Maxwell project occur immediately to the north west in the Wybong district (DPIE 2020a). Bell (2019) describes the habitat for the species in that area to be woodland and grassland associated with Narrow-leaved Ironbark (*Eucalyptus crebra*) and Grey Box (*Eucalyptus moluccana*). This habitat would equate to PCT 1691, of which there are only 7.6 ha of woodland and 0.3 ha of grassland in the Project area. Bell (2019) also notes that a threatening process for the species is intensive stock grazing which the Project area has been subjected to over many years.

Austral Toadflax (*Thesium australe*)

Austral Toadflax (*Thesium australe*) was assessed in the BDAR as not likely to be present in the Project disturbance areas. Notwithstanding, the Department has requested an additional assessment for this species.

The *BioNet Threatened Biodiversity Data Collection* currently links Austral Toadflax to the following PCTs on the Project area (Austral Toadflax was not known to be associated with any of the PCTs on the Project area as at July 2019):

- PCT 1604: Grey Box – Spotted Gum – Narrow-leaved Ironbark Woodland;
- PCT 1606: White Box – Ironbark – Red Gum Shrubby Forest; and
- PCT 1655: Slaty Box Shrubby Woodland.

The BCD advises the woodland form of PCT 1604 is potential habitat for Austral Toadflax. Accordingly, BCD considers the maximum potential area of habitat for Austral Toadflax is 1.3 ha.

The main threats to Austral Toadflax are (DotE 2013a):

- lack of fire/disturbance;
- existing and intensified grazing by livestock, native herbivores and feral herbivores;
- residential, infrastructure and agricultural development;
- weed invasion (e.g. blackberry [*Rubus* spp.]); and
- infrastructure (road and rail) maintenance, particularly road widening and re-routing.

As described in Section 5.1 of the BDAR, a number of measures have been adopted to avoid and minimise impacts to vegetation and habitat disturbance, including feral animal and weed management. Measures that have specifically avoided clearance of the above PCTs include:



- locating multiple infrastructure within the same transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (a site access road, a covered overland conveyor, power supply and other ancillary infrastructure and services);
- locating the mine entry area predominately within an area of derived native grassland rather than woodland; and
- reducing the disturbance footprint required for the mine entry area.

In the long-term, the surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified.

Other than for areas of potential subsidence ponding, changes in landform due to subsidence are unlikely to have an impact on PCTs listed above. Subsidence is unlikely to materially impact the native vegetation within the predicted subsidence area as surface cracks would be remediated.

No Austral Toadflax was recorded during targeted threatened flora surveys for the BDAR (Hunter Eco 2019). Given the absence of the species during further supplementary surveys undertaken in July 2020 (Hunter Eco 2020), and that the species has been observed to germinate in disturbed areas and after drought (DotE 2013a), it is indicated that Austral Toadflax is not present within the Project disturbance areas.

In the unlikely event that Austral Toadflax is present within the Project disturbance areas, it could be conservatively considered that the Project is likely to have a significant impact on the species in accordance with the criteria set out in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. (DotE 2013b). Accordingly, if further survey work or an expert report does not demonstrate the absence of Austral Toadflax from the Project disturbance areas, the species would be offset in accordance with the NSW Biodiversity Offsets Scheme in accordance with the maximum potential credits determined by BCD (letter dated 14 July 2020).

Notwithstanding, after thorough field surveys for the species with none being recorded, my opinion is that Austral Toadflax is not likely to be present in the Project disturbance areas. The search for Austral Toadflax was particularly focused on the potential host species Kangaroo Grass (*Themeda triandra*). Kangaroo Grass was previously surveyed for as part of the targeted threatened flora surveys for the BDAR (Hunter Eco 2019) and not found within the development footprint.

Yours Faithfully
HUNTER ECO

Dr Colin Driscoll
Environmental Biologist



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Attachment 1 SAII Assessment

Under the BC Act, a determination of whether an impact is serious and irreversible must be made for 'potential SAI entities' identified in the BAM Credit Calculator.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community

The *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland Threatened Ecological Community* is assessed as a 'potential SAI entity' in Section 6.1 of the BDAR (Hunter Eco 2019). It is noted that since finalisation of the BDAR, the listing status of this community under the BC Act has been updated and is now listed as the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community*. However, assessment in accordance with the Biodiversity Assessment Method (BAM) (Office of Environment and Heritage [OEH] 2017) and *Biodiversity Conservation Regulation, 2017* (BC Regulation) remains the same.

Prasophyllum sp. Wybong

Prasophyllum sp. Wybong was not identified in the BAM Credit Calculator as a candidate species credit species for the Project. However, given its synonymy with *Prasophyllum petilum* and its status as a 'potential SAI entity', a SAI assessment is provided below.

For impacts on potential SAI entities, the BAM (OEH 2017) requires the following information to be provided:

(a) the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAI

The following measures (outlined in Section 5.1 of the BDAR [Hunter Eco 2019]) avoid the potential direct and indirect impact on *Prasophyllum petilum*/*Prasophyllum sp. Wybong*:

- the use of the substantial existing Maxwell Infrastructure (including the Coal Handling and Preparation Plant and rail loop), limiting the requirement to develop new infrastructure;
- locating multiple infrastructure within the same transport and services corridor between the Maxwell Underground and Maxwell Infrastructure (a site access road, a covered overland conveyor, power supply and other ancillary infrastructure and services);
- locating the mine entry area predominately within an area of derived native grassland rather than woodland; and
- reducing the disturbance footprint required for the mine entry area.

Measures to mitigate and manage impacts are described in Section 5.6 of the BDAR (Hunter Eco 2019).



(b) the size of the local population directly and indirectly impacted by the development, clearing or biodiversity certification

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas (Hunter Eco 2019). The *BioNet Threatened Biodiversity Data Collection* (DPIE 2020b) currently links *Prasophyllum petilum*/*Prasophyllum* sp. Wybong to one PCT on the Project area (PCT 201: Fuzzy Box Woodland). However, the BCD advises that this species is recorded in other vegetation communities in the upper Hunter Valley. Therefore, BCD considers that the following vegetation communities are potential habitat for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong:

- PCT 201: Fuzzy Box Woodland;
- PCT 1604: Grey Box – Spotted Gum – Narrow-leaved Ironbark Woodland;
- PCT 1606: White Box – Ironbark – Red Gum Shrubby Forest;
- PCT 1607: Red Gum – Ironbark – Apple Shrubby Woodland;
- PCT 1655: Slaty Box Shrubby Woodland; and
- PCT 1691: Ironbark – Grey Box Grassy Woodland.

Accordingly, BCD considers the maximum potential area of habitat for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong is 139.8 ha.

Elsewhere in NSW, the species is known from seven populations with an area of occupancy about 150 ha and an estimated total population size of 460 mature individuals (Holzinger, pers. comm.; Copeland, pers. comm., as cited in DEWHA 2009).

(c) the extent to which the impact exceeds any threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact

DPIE (2019) has not set any thresholds for impacts on potential SAI entities.

(d) the likely impact (including direct and indirect impacts) that the development, clearing or biodiversity certification will have on the habitat of the local population, including but not limited to:

- (i) an estimate of the change in habitat available to the local population as a result of the proposed development**
- (ii) the proposed loss, modification, destruction or isolation of the available habitat used by the local population, and**
- (iii) modification of habitat required for the maintenance of processes important to the species' life cycle (such as in the case of a plant – pollination, seed set, seed dispersal, germination), genetic diversity and long-term evolutionary development.**

BCD considers the maximum potential area of habitat for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong is 139.8 ha. This is a small subset of the total area of similar vegetation mapped on Figure 7 of the BDAR (Hunter Eco 2019).

In the long-term, the surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified.

Other than for areas of potential subsidence ponding, changes in landform due to subsidence are unlikely to have an impact on *Prasophyllum petilum*/*Prasophyllum* sp. Wybong. Subsidence is unlikely to materially impact the native vegetation within the predicted subsidence area as surface cracks would be remediated.

(e) the likely impact on the ecology of the local population. At a minimum, address the following:

(i) for flora, address how the proposal is likely to affect the ecology and biology of any residual plant population that will remain post development including where information is available:

- **pollination cycle**
- **seedbanks**
- **recruitment, and**
- **interactions with other species (e.g. pollinators, host species, mycorrhizal associations)**

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas (Hunter Eco 2019). Orchids have complex and generally poorly understood interrelationships with species-specific mycorrhizal fungi and insect pollinators. Native bees, wasps and beetles are known to be effective pollinators of other *Prasophyllum* species. while some species can also be self-pollinating (Jones *et al.*, as cited in TSSC 2009).

(f) a description of the extent to which the local population will become fragmented or isolated as a result of the proposed development

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas (Hunter Eco 2019).

Elsewhere in NSW, the species occurs in seven relatively small and isolated populations surrounded by large areas of cleared land. The Committee considers this distribution to be severely fragmented (TSSC 2009). The Project is not likely to impact on the level of isolation and fragmentation for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong.

(g) the relationship of the local population to other population/populations of the species. This must include consideration of the interaction and importance of the local population to other population/populations for factors such as breeding, dispersal and genetic viability/diversity, and whether the local population is at the limit of the species' range

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas (Hunter Eco 2019). *Prasophyllum* sp. Wybong is known from seven populations in NSW, the closest of which is near Wybong. The species' area of occupancy is estimated to be 150 ha (Holzinger, pers. comm; Copeland, pers. comm., as cited in DEWHA 2009) and the seven populations are separated by large areas of cleared land, making cross pollination and genetic exchange highly unlikely (TSSC 2009). It is not likely that a local population would be important to other populations for factors such as dispersal and genetic viability/diversity.

(h) the extent to which the proposed development will lead to an increase in threats and indirect impacts, including impacts from invasive flora and fauna, that may in turn lead to a decrease in the viability of the local population

The management of weeds, animal pest species and other threats and indirect impacts are discussed in Section 5.3 of the BDAR (Hunter Eco 2019).

(i) an estimate of the area, or number of populations and size of populations that is in the reserve system in NSW, the IBRA region and the IBRA subregion

Prasophyllum sp. Wybong occurs within the Sydney Basin, New England Tablelands, Brigalow Belt South and NSW South Western Slopes Interim Biogeographic Regions of Australia (IBRA) bioregions (TSSC 2009). There are insufficient data to determine historic or current population trends for *Prasophyllum* sp. Wybong. The species is known from seven populations, with an estimated total population size based on surveys in 2006 of 460 mature individuals (Holzinger, pers. comm.; Copeland, pers. comm., as cited in TSSC 2009). The total population size could be larger as suitable habitat surrounding the population near Wybong has not been surveyed (Holzinger, pers. comm., as cited in TSSC 2009).

(j) the measure/s proposed to contribute to the recovery of the species in the IBRA subregion.

The Project area is within the Hunter IBRA subregion of the Sydney Basin bioregion. If determined to be present, species credits would be calculated for *Prasophyllum petilum*/*Prasophyllum* sp. Wybong and residual impacts would be offset in accordance with the NSW Biodiversity Offsets Scheme (Section 8 of the BDAR [Hunter Eco 2019]).

Impact Assessment

Clause 6.7 of the BC Regulation provides principles for the purposes of determining whether an impact on diversity values is a serious and irreversible impact for the purposes of the Biodiversity Offsets Scheme. These are addressed below in consideration of the DPIE (2019) *Guidance to assist a decision-maker to determine a serious and irreversible impact*.

Will the Project cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline?

During monitoring of the population near Muswellbrook from 1999 to 2005, fluctuations in the number of individuals visible (ranging from zero to 10 plants) were observed. However, during years when no individuals are visible above ground, some individuals are presumed to exist as dormant tubers underground (Holzinger, pers. comm., as cited in TSSC 2009). Therefore, the smaller number of individuals in some years may be a result of dormancy rather than population decline (TSSC 2009).

There are insufficient data available to judge whether the species has undergone or is suspected to have undergone a reduction in numbers. Future reductions in numbers are likely due to ongoing threats, however, based on current data, the Committee judges that the species is not likely to undergo at least a substantial reduction in numbers in the future (TSSC 2009).

The main threat to a decline of the species is the destruction of the second largest population near Wybong (TSSC 2009). As the Project would not impact this population, it is unlikely to cause a further decline of *Prasophyllum petilum*/*Prasophyllum* sp. Wybong.

Will the Project further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size?

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas. The Project is unlikely to further reduce the population size of *Prasophyllum petilum*/*Prasophyllum* sp. Wybong.



Will the Project impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution?

Prasophyllum sp. Wybong is endemic to NSW and has a very restricted geographic distribution (TSSC 2009). Residual impacts on this species would be offset in accordance with the NSW Biodiversity Offsets Scheme (Section 8 of the BDAR [Hunter Eco 2019]).

Is the impacted species or ecological community unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable?

Prasophyllum petilum/*Prasophyllum* sp. Wybong was assessed in the BDAR as not likely to be present in the Project disturbance areas (Hunter Eco 2019). The potential for this species to recover is moderate if appropriate management strategies are in place. *Prasophyllum* species generally favour some disturbance (TSSC 2009) and suggested priority actions to enable recovery of the species include investigating options for establishing additional populations in-situ, or ex-situ, such as implementing national translocation protocols (Vallee *et al.*, as cited in DEWHA 2009).

Enclosure 3
Summary of Conservation Advice, Recovery Plans or Threat Abatement Plans

Table 3-1
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage to adjoining areas during vegetation clearance activities or other works.	Effective if clearly delineated.	Rawlings et al. (2010), Threatened Species Scientific Committee (TSSC) (2006) and Department of Environment, Climate Change and Water (DECCW) (2010) describe protection of the threatened ecological communities (TEC).
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion). Preliminary assessment to minimise impact of remediation actions.	Effective when done in a controlled manner.	Rawlings et al. (2010), TSSC (2006) and DECCW (2010) describe protection of the TEC.
	Indirect Impacts on Native Vegetation and Habitat	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when done in a controlled manner.	Rawlings et al. (2010), TSSC (2006) and DECCW (2010) describe weed management of the threatened ecological communities (TEC).
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
		Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.

Table 3-1 (continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Central Hunter Valley Eucalypt Forest and Woodland	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	Department of the Environment (DotE) (2015a) and DEE (2016) describe protection of the TEC.
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	DotE (2015a) and DEE (2016) describe protection of the TEC.
	Indirect Impacts on Native Vegetation and Habitat	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when done in a controlled manner.	DotE (2015a) and DEE (2016) describe weed management of the TEC.
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
		Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.
Striped Legless Lizard	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2011).
	Loss of Individuals	Minimise Loss	Pre-clearance fauna surveys by suitably qualified personnel.	Relocation of captured individuals.	SEWPaC (2011).
			Impacts on fauna are managed during clearing activities by suitably qualified personnel.	Relocation of captured individuals.	

Table 3-1 (continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Striped Legless Lizard (continued)	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied.	SEWPaC (2011).
		Salvage and Re-Use of Material for Habitat Enhancement within Mine Site Rehabilitation	Identification of habitat features (e.g. surface rocks) that would be beneficial for habitat enhancement.	Effective when applied.	
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	SEWPaC (2011).
	Indirect Impacts on Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	SEWPaC (2011).
	Uncontrolled Spread of Weeds	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when applied.	SEWPaC (2011).
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		

Table 3-1 (continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Pink-tailed Legless Lizard	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	TSSC (2015).
	Loss of Individuals	Minimise	Pre-clearance fauna surveys by suitably qualified personnel.	Relocation of captured individuals.	TSSC (2015).
			Impacts on fauna are managed during clearing activities by suitably qualified personnel.	Relocation of captured individuals.	TSSC (2015).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied	McDougall et al. (2016) and TSSC (2015).
		Salvage and Re-Use of Material for Habitat Enhancement within Mine Site Rehabilitation	Identification of habitat features (e.g. surface rocks) that would be beneficial for habitat enhancement.	Effective when applied.	TSSC (2015).
	Subsidence Impacts on Native Vegetation and Habitat	Remediation of surface cracks considered too large to naturally close	Remediation of mine subsidence effects (e.g. surface cracking and minor erosion).	Effective when done in a controlled manner.	TSSC (2015).
	Indirect Impacts on Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	TSSC (2015).

Table 3-1 (continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Pink-tailed Legless Lizard (continued)	Uncontrolled Spread of Weeds	Weed Management	Where they have been taken off road, washdown of vehicles and mechanical equipment to minimise seed transport off the site.	Effective when applied.	Standard practice.
			Identification of weeds requiring control.		
			Mechanical removal of identified weeds and/or the application of approved herbicides.		
			Follow-up site inspections to determine the effectiveness of the eradication programs.		
	Bushfire	Bushfire Management	According to the Bushfire Management Procedure.	Effective when applied.	Standard practice.
Swift Parrot	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	TSSC (2016) and Saunders and Tzaros (2011).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified). Include recognised suitable feed trees in rehabilitation.	Effective when applied.	TSSC (2016) and Saunders and Tzaros (2011).
	Indirect Impacts on Native Vegetation and Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	TSSC (2016b) and Saunders and Tzaros (2011).

Table 3-1 (continued)
Impact Mitigation Measures Relevant to Threatened Species and Communities listed under the EPBC Act

Matter	Impact	Mitigation Measure	Techniques	Impact Mitigation Measures/Effectiveness	Basis for the Mitigation Measures
Regent Honeyeater	Clearance Impacts on Native Vegetation and Habitat	Vegetation Clearance Protocol	Areas to be cleared are delineated to prevent accidental damage during vegetation clearance activities or other works.	Effective if clearly delineated.	DotE (2015b and 2016).
	Loss of Habitat	Mine Site Rehabilitation and Revegetation	Surface disturbance areas associated with the Biodiversity Assessment Development Footprint would be rehabilitated and revegetated (when the surface facilities are no longer required or at the end of the mine life where no further ongoing beneficial use is identified).	Effective when applied.	DotE (2015b and 2016).
	Indirect Impacts on Native Vegetation and Habitat	Feral Animal Management	Maintain a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas by non-endemic fauna.	Effective if ongoing during development and operational stages.	DotE (2015b and 2016).

Table 3-2

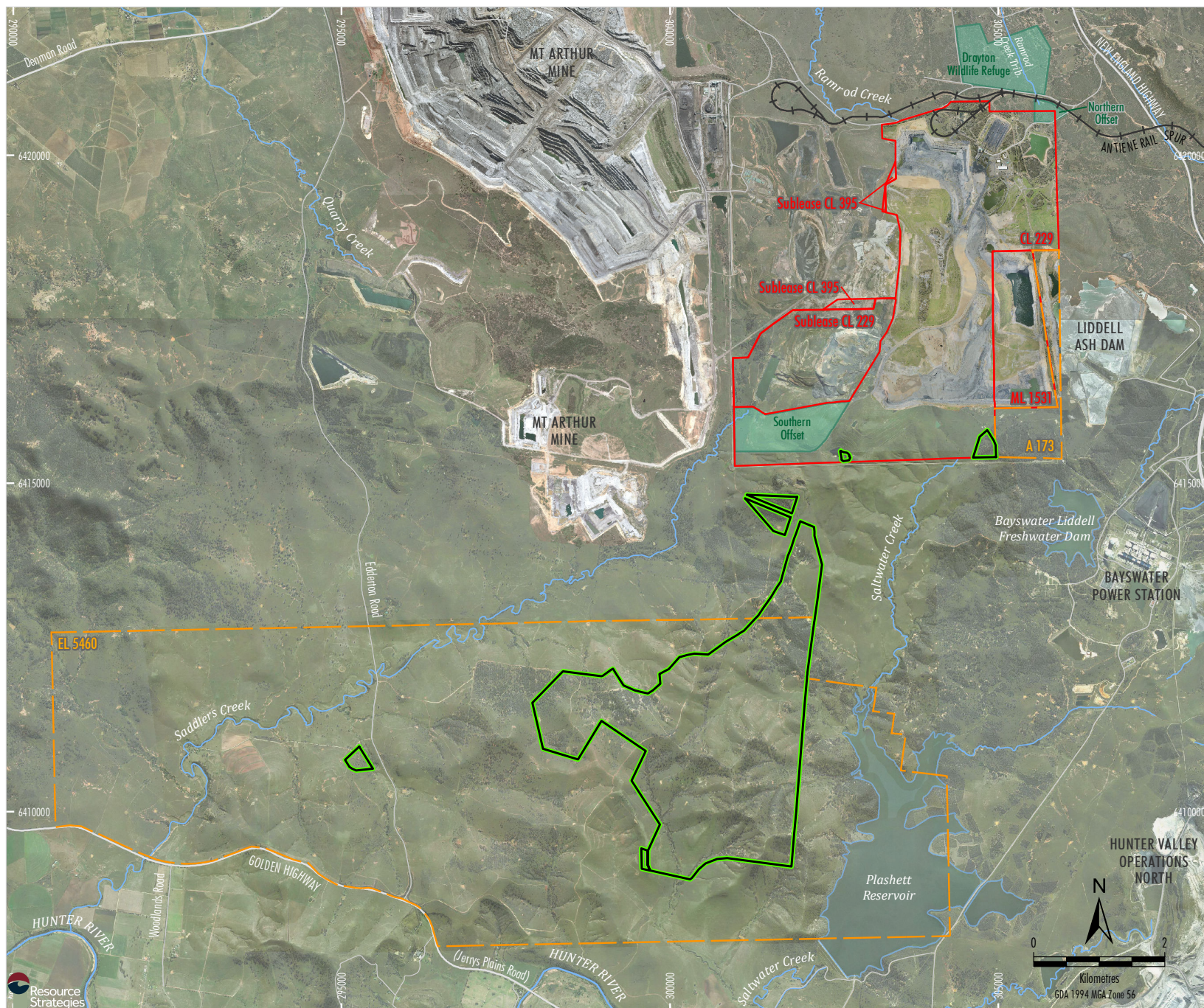
Summary of Conservation Advice, Recovery Plans or Threat Abatement Plans for EPBC Listed Species in the Project Area

Matter	Conservation Advice, Recovery Plans and Threat Abatement Plans (EPBC Species Profile and Threats Database)	BDAR Reference
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	<ul style="list-style-type: none"> No approved Conservation Advice. <i>National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> (NSW DECCW, 2010). <i>Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads</i> (DSEWPAC, 2011). <i>Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa) (2017)</i> (DEE, 2017). <i>Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomic</i> (DEE, 2018). 	<ul style="list-style-type: none"> No relevant Conservation Advice. Section 7.2.1 and Table 40. Not relevant as cane toads are not present in the vicinity of the Project. Sections 5.3.17, 5.3.18 and 7.3 and Table 40. Section 5.3.8.
Central Hunter Valley Eucalypt Forest and Woodland	<ul style="list-style-type: none"> <i>Approved Conservation Advice (including listing advice) for the Central Hunter Valley eucalypt forest and woodland ecological community</i> (DoE, 2015). There is no adopted or made Recovery Plan for this ecological community. No Threat Abatement Plan has been identified as being relevant for this ecological community. 	<ul style="list-style-type: none"> Section 7.2.2 and Table 40. No relevant Recovery Plan. No relevant Threat Abatement Plan.
Striped Legless Lizard	<ul style="list-style-type: none"> <i>Conservation Advice Delma impar striped legless lizard</i> (TSSC, 2016). <i>National Recovery Plan for the Striped Legless Lizard (Delma impar) 1999-2003</i> (Smith, W.J.S. & P. Robertson, 1999). <i>Threat abatement plan for predation by feral cats</i> (DoE, 2015). <i>Threat abatement plan for competition and land degradation by rabbits</i> (DoEE, 2016). <i>Threat abatement plan for predation by the European red fox</i> (DEWHA, 2008). 	<ul style="list-style-type: none"> Section 7.2.5. Baseline Fauna Report (Attachment B). BDAR Sections 5.3.17, 5.3.18 and 7.3 and Table 40. BDAR Sections 5.3.18 and 7.3 and Table 40. BDAR Sections 5.3.17, 5.3.18 and 7.3 and Table 40.

Table 3-2 (continued)
Summary of Conservation Advice, Recovery Plans or Threat Abatement Plans for EPBC Listed Species in the Project Area

Matter	Conservation Advice, Recovery Plans and Threat Abatement Plans (EPBC Species Profile and Threats Database)	BDAR Reference
Pink-tailed Legless Lizard	<ul style="list-style-type: none"> • <i>Conservation Advice Aprasia parapulchella Pink-tailed worm-lizard</i> (TSSC, 2015). • There is no adopted or made Recovery Plan for this species. • <i>Threat abatement plan for competition and land degradation by rabbits</i> (DEE, 2016). 	<ul style="list-style-type: none"> • BDAR Section 7.2.4 and Table 40. • No relevant Recovery Plan. • BDAR Sections 5.3.18 and 7.3 and Table 40.
Swift Parrot	<ul style="list-style-type: none"> • <i>Conservation Advice Lathamus discolor swift parrot</i> (TSSC, 2016). • <i>National Recovery Plan for the Swift Parrot (Lathamus discolor)</i> (Saunders, D.L. & C.L. Tzaros, 2011). • <i>Threat abatement plan for predation by feral cats</i> (DoE, 2015). 	<ul style="list-style-type: none"> • Section 7.2.6 and Table 40. • Table 40. • BDAR Sections 5.3.17, 5.3.18 and 7.3 and Table 40.
Regent Honeyeater	<ul style="list-style-type: none"> • <i>Conservation Advice Anthochaera phrygia regent honeyeater</i> (DoE, 2015). • <i>National Recovery Plan for the Regent Honeyeater (Anthochaera phrygia)</i> (DoE, 2016). • <i>Threat abatement plan for competition and land degradation by rabbits</i> (DEE, 2016). 	<ul style="list-style-type: none"> • Section 7.2.7 and Table 40. • Section 7.2.7 and Table 40. • BDAR Sections 5.3.18 and 7.3 and Table 40.

Enclosure 4
Existing and Proposed Biodiversity Offset Areas



- LEGEND**
- Maxwell Project Exploration Licence Boundary
 - Maxwell Project Mining and Coal Lease Boundary
 - Indicative Biodiversity Stewardship Site for the Project

Source: NSW Spatial Services (2020)
 Orthophoto Mosaic: 2018, 2016, 2011

MALABAR COAL
MAXWELL PROJECT
 Existing and Proposed
 Biodiversity Offset Areas