

TECHNICAL MEMO

From: Simon Danielsen, Astrebla Ecological Services
To: Waratah Coal
Date: 17 January, 2020
Subject: Ecological assessment of the proposed Galilee Power Station material change of use site, Alpha

1. Objective

Waratah Coal Proprietary Limited (Waratah Coal), a wholly owned subsidiary of Mineralogy Proprietary Limited, proposes to develop the Galilee Power Station - a proposed 1400 MW power station adjacent to the Mining Lease Application for their Galilee Coal Project coal mine.

Waratah Coal is seeking approval for the Galilee Power Station under the Queensland *Planning Act 2016* (Qld). As part of the approvals process, pre-lodgement meetings have been held with the Commonwealth government, who have identified, among other things, the need to undertake an ecological assessment of the proposed material change of use (MCU) site to update and confirm findings made by previous consultants for the Environmental Impact Statement (EIS) for the adjacent Galilee Coal Project (Northern Export Facility)¹ (EPBC 2009/4737). In addition, the project is the subject of a referral to the Commonwealth government under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

This memorandum outlines the outcome of that site inspection, which was conducted on December 19-20, 2019 by Principal Ecologist Simon Danielsen. As the site inspection was designed to confirm findings undertaken during previous extensive surveys across the MCU site and the associated mining lease application area, it relies heavily on the findings as reported in the Nature Conservation chapter of the Waratah Coal Environmental Impact Statement for the Commonwealth Government (Volume 2 August 2013) and it also references the MNES Fauna Assessment for the Galilee Power Station (AustEcology 2019). Therefore, this memo should be read in conjunction with the EIS Nature Conservation Chapter and the MNES Fauna Assessment for the Galilee Power Station.

2. Vegetation and site description

The Power Station Site covers an area of 1,310 ha. This is the area that is currently the subject of an Application for a Material Change of Use (MCU) for a Public Utility under the Qld *Planning Act 2016*. Within the 1,310 ha, 518 ha will be subject to land disturbance in the form of land clearing and earthworks to facilitate the construction and operation of the Power Station – this area is referred to as the ‘disturbance footprint’. The MCU area (or MCU site) contains 414.519 ha of vegetation mapped as remnant least concern vegetation, and 896.371 ha of mapped non-remnant vegetation. As mentioned above, the disturbance footprint is approximately 518 ha in area, and is located entirely within the area of mapped non-remnant vegetation – that is, no mapped remnant vegetation is proposed to be cleared within the MCU area.

¹ The Galilee Power Station site was, until recently, part of the Mining Lease Application area for the Galilee Coal Project. As such, the environmental values of, and potential impact to, the Power Station site were assessed as part of the EIS for that project. The Power Station site has since been excised from the Mining Lease Application area.

The remnant vegetation present on the MCU site is currently mapped by the Queensland government (regional ecosystem mapping version 11) into seven individual regional ecosystems (REs), mostly within mixed polygons containing up to four REs. Ground truthing conducted during the site inspection determined that only five REs are actually present, and in most cases it was possible to re-map the vegetation into single (homogenous) polygons. The REs present are outlined and discussed in Table 1, and the ground truthed RE mapping is provided in Figure 1.

There are no vegetation communities within the MCU site or other areas assessed as part of the EIS that are listed as Threatened Ecological Communities (TECs) under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The MCU area slopes generally to the west from a low ridgeline running roughly concurrent with the south-eastern boundary. The highest point is located in the far south-eastern corner, at 392 m (elevations along the western boundary are between 330 and 340 m). The landscape within the MCU site is comprised of a broad sand plain that dominates the majority of the site, and a low rise with patches of exposed laterite in the south eastern corner.

The sand plain is dissected by three shallow drainage lines draining from east to Saltbush Creek, located approximately one kilometre to the west of the western boundary of the MCU. These drainage lines are roughly located in the north, centre and south of the MCU area and appear to have intermittent flow only – they lack a defined riparian zone and are generally only poorly defined.

The majority of the MCU site is comprised of cleared, non-remnant vegetation with improved pasture, primarily buffel grass (*Cenchrus ciliaris**). However, in places in the northern half of the MCU site, long strips up to 50 m wide comprised of low woodland dominated by *Eucalyptus melanophloia* (silver-leaf ironbark) have been retained. Elsewhere in non-remnant areas in the north of the MCU site, land clearing has retained large areas of standing *E. melanophloia* woodland that are too short to meet remnant status.

On the sand plain, the majority of remnant vegetation within the MCU site is characterised by open woodland and woodland of *E. melanophloia*, which is generally grassy with a sparse shrub layer. There are smaller areas of grassy woodland (and minor areas of shrubby woodland) dominated by *E. populnea* (poplar box).

The vegetation on the low rise in the south east of the MCU site is entirely comprised of remnant vegetation, primarily low open grassy woodland dominated by *Corymbia setosa* on a red sand plain, with areas of *E. melanophloia* open woodland and minor areas on the edge comprised of outcropping laterite dominated by *Acacia shirleyii* low forest.

3. Flora values

Two flora species of conservation significance under the Qld *Nature Conservation Act 1992* (NC Act), were identified as either known to occur or likely to occur within the Mining Lease Application area in the EIS). These species are discussed below. No flora species listed under the EPBC Act have been recorded, or are predicted to occur, within the MCU site or other areas assessed as part of the EIS.

Acacia spania (western rosewood)

Acacia spania, listed as near threatened under the NC Act, was not recorded during the EIS surveys. However, it had been recorded within the Mining Lease Application area previously, approximately 12 kilometres to the west of the MCU site growing in red soil amongst 'cleared *Eucalyptus melanophloia*' (AVH, 2020 – record BRI AQ0769467).

A review of collection records suggests that habitat for this species occurs within the MCU site, including in areas that may be subject to disturbance by this project, and it is considered the likelihood that this species may be present within the disturbance footprint is 'possible'², i.e. there is a low to medium probability of its occurrence. This is because:

- The species has been recorded in the surrounding area, 12 km to the west of the MCU site – it is noted that it was not recorded during EIS surveys, however these surveys were not conducted at a comprehensive, pre-clear intensity.
- Habitat information available for this species is low on detail but collection notes indicate it has been found in habitat described as 'cleared *E. melanophloia*'. At least 80 ha of *E. melanophloia* regrowth in an advanced stage of recovery is present in the northern portion of the disturbance area and this habitat type is very similar to the habitat notes from the local collection record.

***Micromyrtus rotundifolia* (round-leaved heath-myrtle)**

Micromyrtus rotundifolia (listed as vulnerable under the NC Act) was not recorded during the EIS surveys, however the EIS concluded it may be present in places. This species occurs in the Alpha area within shrubland of *Calytrix* spp. and *Acacia julifera* or in woodland of *Acacia catenulata*, *Eucalyptus exserta* and *Eucalyptus trachyphloia*, always on shallow sandy soils (Bean, 1997). This habitat type was not observed during the MCU site survey and the likelihood that *M. rotundifolia* will be present is considered to be highly unlikely/negligible.

4. Fauna values

The MCU site contains primarily non-remnant vegetation and was not identified as containing any key habitat areas in the EIS. There is no remnant vegetation within the MCU disturbance footprint.

As part of the work to support the Material Change of Use Application and the referral to the Commonwealth government, an assessment has been undertaken addressing the potential impacts of noise and air emissions from the proposed Galilee Power Station upon fauna listed under the EPBC Act (AustEcology 2019). AustEcology had previously undertaken much of the fauna assessment for the EIS and their assessment makes reference to the findings of the field work undertaken for the EIS. As part of the assessment for the Power Station, the following work was undertaken:

- A number of threatened species were assessed in relation to their likelihood of occurrence on the MCU site,
- those considered likely or possible to occur were further assessed in relation to the potential for impacts as a result of air and noise emissions from the project.

² The likelihood of species occurrence assessment used here adopts that presented in the Austecology (2019) report on page 18, in which 'possible' is defined as:

Where there is a low to medium probability of occurrence within the project area. The species has been recorded within the extent of desktop searches (as defined in the existing information review) though habitat within the project area is considered to be only moderately suitable and/or ecological connectivity between record locations and the project area is considered to be a noteworthy constraint. This category may also apply to species rarely recorded in the bioregion that have been recorded within the wider surrounding area, but whose occurrence in areas of suitable habitat within region is highly erratic and unpredictable.

The MCU area itself is not considered likely to support suitable habitat for any of the threatened species that could occur there. The AustEcology (2019) report makes the following observation regarding habitat values for fauna on the MCU site (page 32):

These relatively small remnant patches and linear bands, and the power plant infrastructure itself, are located within an extensive area of cleared pastoral land which does not support suitable remnant habitat for any of the threatened fauna species considered in this report.

As such, the objective of this work with reference to fauna habitat, was to confirm that the habitat features of the MCU site, are still as previously described in the EIS, and as described in the AustEcology report. The field assessment did not reveal any new, or previously undescribed habitat features and demonstrated that the fauna habitat values of the MCU site correspond to those previously described in the EIS, and by AustEcology (2019).

5. Conclusion

Consequently, the following conclusions are made:

- Remnant vegetation within the MCU site will not be directly impacted by clearing for this project, which is entirely located within areas correctly mapped as non-remnant vegetation.
- It is possible that the near threatened flora species *Acacia spania* may be present within the proposed disturbance footprint, and a pre-clearance survey for this species should be conducted by a suitably qualified person in a suitable season (February to May).
- All of the listed fauna species considered likely or possible to occur in or around the MCU site are likely to be restricted to remnant habitats, and the cleared areas that will be disturbed to facilitate the Galilee Power Station would provide any important or unique habitat values for any threatened species. The Galilee Power Station project will not involve the clearing of remnant vegetation – consequently, it is considered unlikely that any of these species will be impacted to any significant degree.

6. References

Austecology, 2019, *MNES Fauna – Emissions and Noise Assessments, Galilee Power Station, Central Queensland*. Unpublished report produced for Waratah Coal.

AVH, 2020, *The Australasian Virtual Herbarium*, Council of Heads of Australasian Herbaria, <http://avh.chah.org.au>, accessed 6 January, 2020.

Bean, A.R., 1997, A revision of *Micromyrtus* Benth. (Myrtaceae) in Queensland. *Austrobaileya* 4 (4): 460.

O2 Ecology, 2013, *Flora and Vegetation Technical Report for the Galilee Coal Mine Site*. Unpublished report produced for Waratah Coal.

Waratah Coal, 2013, *Galilee Coal Project Environmental Impact Statement. Nature Conservation chapter 3*. Unpublished report produced by Waratah Coal.

Table 1 Regional ecosystem descriptions

RE	Biodiversity status	VMA status	Land form	Community description	Comments
Land zone 3					
10.3.27a	OC	LC	Occurs on alluvial plains with sandy duplex soils and sometimes clayey soils.	<p><i>Eucalyptus populnea</i> dominates the very sparse tree layer occasionally with understorey of <i>Archidendropsis basaltica</i>.</p> <p>10.3.27a: <i>Eucalyptus populnea</i> dominates the very sparse to sparse tree layer. A very sparse to sparse small tree layer can be present sometimes dominated by <i>Eremophila mitchellii</i>. <i>Carissa ovata</i> commonly dominates the very sparse to sparse shrub layer. The ground layer is variable ranging from very sparse to mid-dense. <i>Enteropogon acicularis</i>, <i>Bothriochloa ewartiana</i>, <i>Dichanthium fecundum</i>, <i>Aristida calycina</i>, <i>Themeda triandra</i>, <i>Chloris pectinata</i>, <i>Eriachne mucronata</i>, <i>Eragrostis lacunaria</i>. Occurs on alluvial plains.</p>	Occurs on a narrow alluvial plain in a 29 ha patch associated with a drainage line near the centre of the MCU site.
Land zone 5					
10.5.1d	NC	LC	Occurs on deep red earths on Tertiary sandplain.	<p>Largely <i>Eucalyptus similis</i> and/or <i>Corymbia brachycarpa</i> and/or <i>Corymbia setosa</i> dominate the very sparse low tree layer. There is frequently a dense shrub layer. Small areas of <i>Eucalyptus chartaboma</i> and/or <i>E. tetradonta</i>, or <i>E. drepanophylla</i> or <i>Lysicarpus angustifolius</i> occur in the north.</p> <p>10.5.1d: <i>Corymbia setosa</i> dominates the very sparse canopy. <i>Melaleuca nervosa</i>, <i>Acacia sericophylla</i>, <i>A. elachantha</i>, <i>Bursaria incana</i>, <i>Grevillea glauca</i> and <i>Petalostigma pubescens</i> are frequently present in the very sparse low trees layer or occur as scattered small trees. <i>Acacia</i> spp. and <i>Carissa lanceolata</i> dominate the very sparse shrub layer. The ground layer is usually dominated by <i>Triodia pungens</i>. Occurs on sandplains.</p>	Located in one area of 113 ha along the western boundary of the MCU site on a red sandy plain at higher elevation as a low open woodland dominated by <i>Corymbia setosa</i> .

RE	Biodiversity status	VMA status	Land form	Community description	Comments
10.5.5a	NC	LC	Occurs on loamy red and yellow earths on undulating sandplains.	<p>Mostly <i>Eucalyptus melanophloia</i> dominates the very sparse tree layer with very sparse ground layer of <i>Aristida</i> spp. and/or <i>Triodia</i> spp. Occasionally present are small areas of <i>Acacia sericophylla</i> or <i>Archidendropsis basaltica</i> or rarely grassland.</p> <p>10.5.5a: <i>Eucalyptus melanophloia</i> dominates the very sparse canopy. <i>Corymbia plena</i> and <i>C. dallachiana</i> are occasionally codominants in the canopy. <i>Petalostigma pubescens</i> and <i>Acacia</i> spp. occasionally occur as dominants or as scattered tress in the very sparse to mid-dense low tree layer. <i>Carissa lanceolata</i>, <i>Psydrax oleifolia</i> and <i>Denhamia cunninghamii</i> frequently occur in the very sparse to sparse shrub layer. <i>Triodia pungens</i> is often dominant in the very sparse to mid-dense ground layer. <i>Aristida</i> spp., <i>Bothriochloa ewartiana</i>, <i>Eriachne mucronata</i>, <i>Eragrostis lacunaria</i> and <i>Heteropogon contortus</i> occasionally occur as dominant or codominant graminoids. Occurs on sandplain.</p>	<p>This is the main remnant vegetation type within the MCU site, present over 205 ha as a woodland to open woodland dominated by <i>Eucalyptus melanophloia</i>.</p> <p>Potential habitat for <i>Acacia spania</i>.</p>
10.5.12	NC	LC	Occurs on undulating terrain with sandy loam to sandy clay soils on Cainozoic sandplains.	<p><i>Eucalyptus populnea</i> dominates the very sparse tree layer with sparse ground layer of <i>Triodia pungens</i> and/or tussock grasses. Intermediates between <i>E. populnea</i> and <i>E. brownii</i> occur in some areas such as to the south of Barcardine. <i>Eucalyptus populnea</i> dominates the very sparse canopy. <i>Archidendropsis basaltica</i> and/or <i>Eremophila mitchellii</i> occasionally dominate the very sparse to sparse low tree layer and <i>Lysiphyllum carronii</i>, <i>Acacia excelsa</i>, <i>Ventilago viminalis</i>, <i>Geijera parviflora</i>, <i>Grevillea striata</i> and <i>Acacia sericophylla</i> are frequently present. <i>Carissa lanceolata</i> frequently dominates the very sparse to sparse shrub layer and <i>Erythroxylon australe</i> and <i>Psydrax oleifolia</i> are often present. <i>Olearia subspicata</i> occurs occasionally. <i>Triodia pungens</i> often dominates the very sparse to mid-dense ground layer.</p>	<p>A minor component (approximately 34 ha overall) of two mixed polygons that are dominated by the RE 10.5.5.</p>

RE	Biodiversity status	VMA status	Land form	Community description	Comments
Land zone 7					
10.7.3b	NC	LC	Occurs on the exposed mottled zone on scarps with skeletal soils, and above scarps with red earths usually on ferricrete, at the margins of Tertiary plateaus.	<p><i>Acacia shirleyi</i> and/or <i>A. catenulata</i> and /or <i>Corymbia lamprophylla</i> and/or <i>C. leichhardtii</i> dominate the sparse low tree layer. Includes small areas <i>Acacia microcybe</i> and <i>Corymbia blakei</i> in the far west, and <i>A. burdekensis</i> in White Mtns NP. Also, there are small areas of <i>A. shirleyi</i> and rarely <i>A. catenulata</i>.</p> <p>10.7.3b: <i>Acacia shirleyi</i> dominates the sparse tree layer. <i>Eucalyptus exilipes</i> is occasionally present and sometimes a codominant in the canopy in northern areas. <i>Erythroxylon australe</i> occasionally occurs as scattered shrubs in the shrub layer. <i>Cleistochloa subjuncea</i> is commonly present and frequently dominates the very sparse to mid-dense ground layer. <i>Triodia pungens</i> is occasionally present and sometimes dominant. Occurs on scarps.</p>	<p>Present as a low closed to open forest dominated by <i>Acacia shirleyii</i> over 34 ha in the south-eastern corner of the MCU site.</p> <p>Potential habitat for <i>Acacia spania</i>.</p>
All information in this table is taken from the Regional Ecosystem Description Database version 11 (updated December 2018) (Science Delivery, Department of Environment and Science, 2018).					

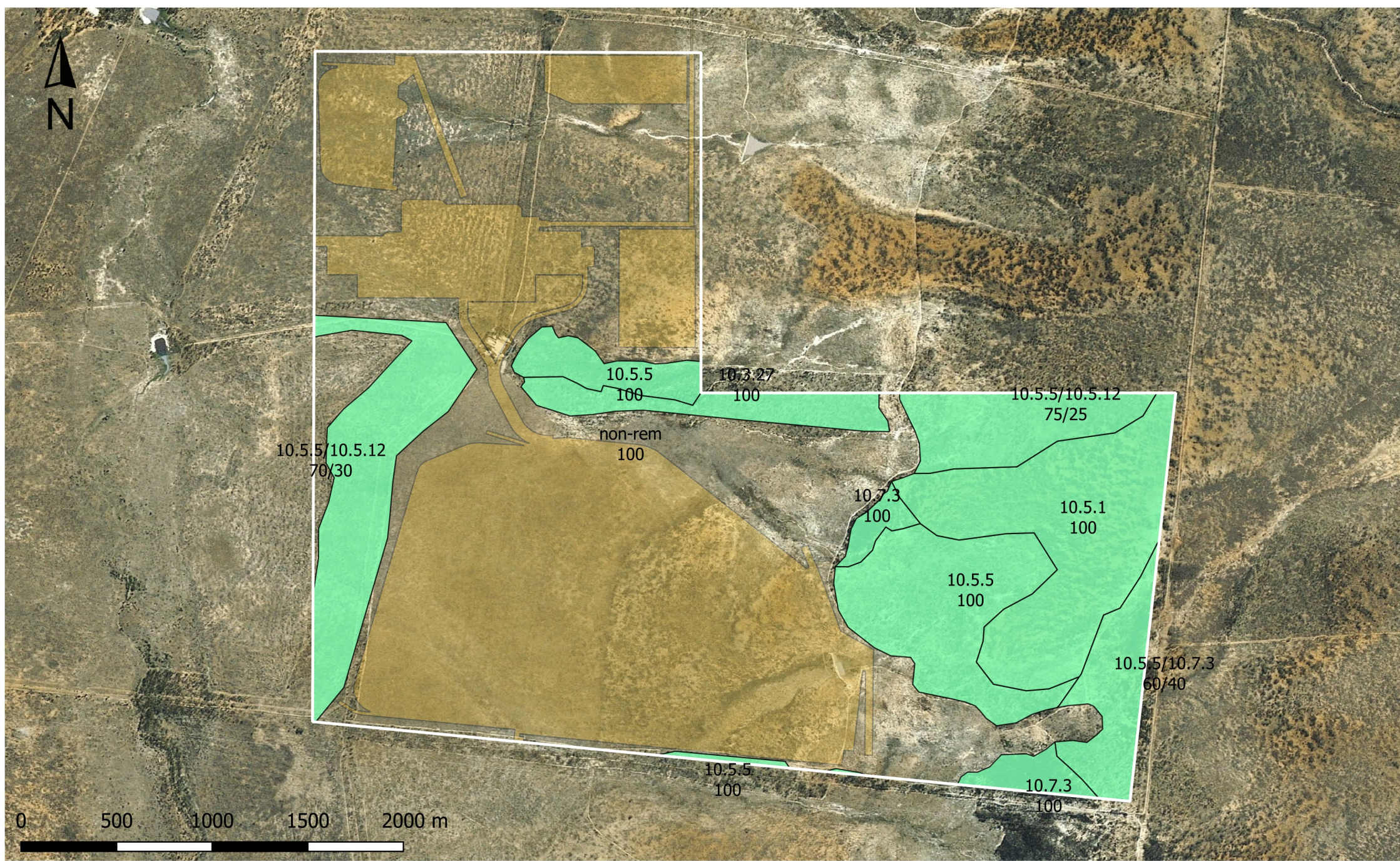


Figure 1 Ground-truthed regional ecosystem mapping

- Proposed disturbance footprint
- Least concern regional ecosystem
- MCU area located within bold white line



Aerial imagery © Google Earth, 2019
 Regional ecosystem mapping version 11 © Department Natural Resources and Mines, Queensland government, 2019
 GIS by Simon Danielsen, Astrebla Ecological Services, 06/01/2020.

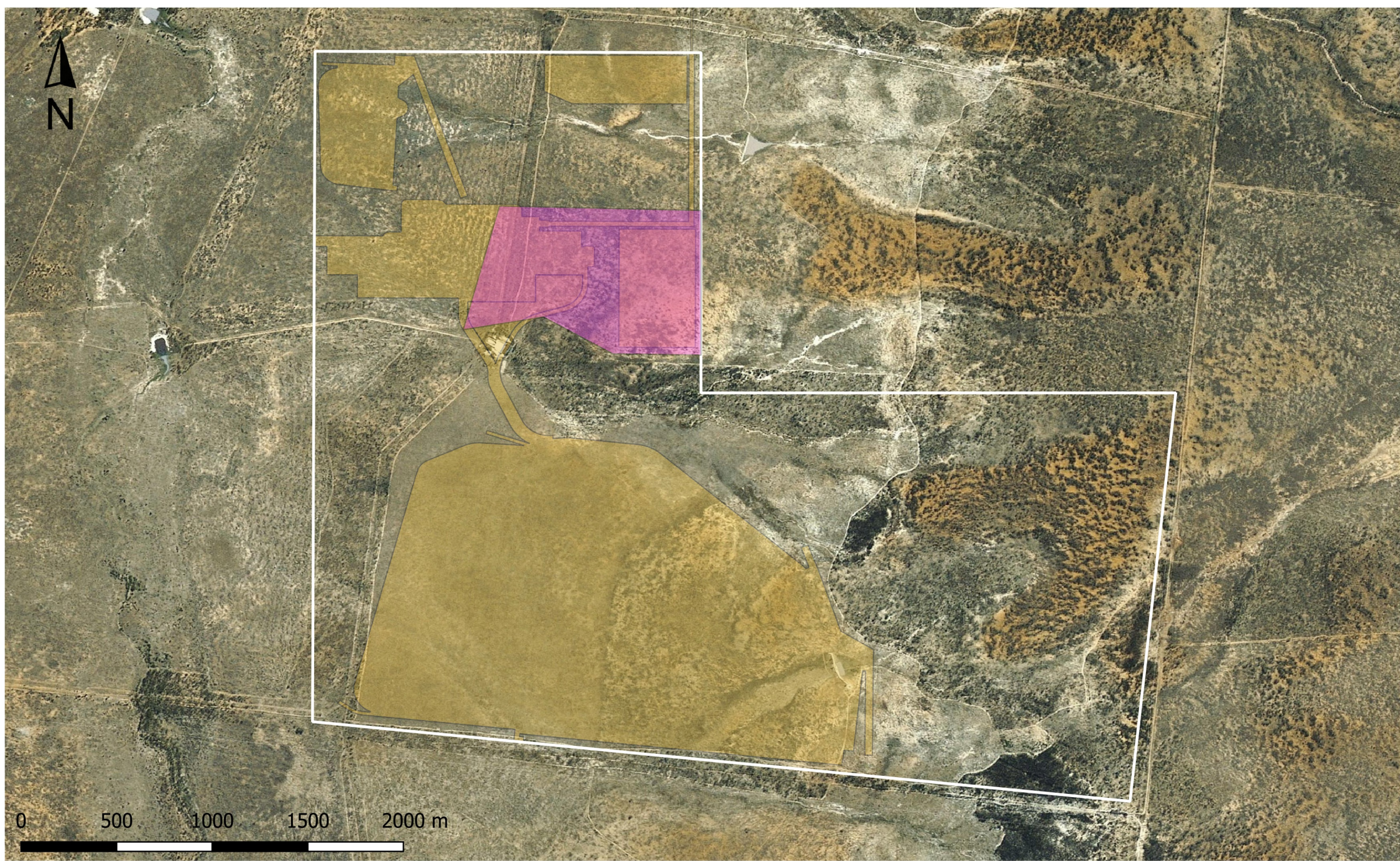




Figure 2 Potential Acacia spania habitat within the disturbance footprint

-  Acacia spania disturbance footprint potential habitat
-  Proposed disturbance footprint
- MCU area located within bold white line

Aerial imagery © Google Earth, 2019
GIS by Simon Danielsen, Astrebla Ecological Services, 17/01/2020.

