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Dear Matthew

Re: Glendell Continued Operations Project (SSD-9349) – Review of Response to Submissions Report

We are pleased to provide our response to Biodiversity Conservation Division's (BCD) comments on Part A of the Responses to Submission. We trust that our additional information meets the Departments requirements.

Our response below relates to point s 1 and 2 of BCD's letter of 11 June 2020, being:

1. *Dichanthium setosum* and *Thesium australe* surveys are not described, and
2. The proponent will conduct targeted surveys for *Delma impar*.

1. BCD recommends that the proponent provides details on the surveys undertaken for *Thesium australe* and *Dichanthium setosum* and demonstrates their adequacy against the 2016 NSW Guide to Surveying Threatened Plants (OEH 2016). If adequate surveys have not been undertaken, BCD recommends the creation of a consent condition to allow for such surveys to be undertaken post approval and if present, for both species to be assessed and offset in accordance with the Biodiversity Assessment Method and Biodiversity Offset Scheme.

The NSW Guide to Surveying Threatened Plants (the Guideline) (OEH 2016) guides accredited persons (assessors) in applying the Biodiversity Assessment Method (BAM) to survey for threatened plant species or their habitat and is applied in conjunction with the BAM. Umwelt design and undertake surveys with consideration of the Guideline during all BAM assessments, including for the Glendell Continued Operations Project.

Section 3.3 of the Guideline states that only the suitable habitat of the target species within the subject land needs to be surveyed. As part of the Referral process (which was conducted prior to the commencement of the BDAR), both *Thesium australe* and *Dichanthium setosum* were identified as candidate species through review of the DAWE Protected Matters Search Tool which predicted that the species' could occur based on known ranges.

Section 3.3 of the Guideline requires the threatened plant surveyor to consider the subject land in relation to its range of known plant habitats to identify suitable habitat for *Thesium australe* and *Dichanthium setosum*.

While both candidate species are known to occur in the Hunter Valley, neither species has been recorded in proximity to the Development Footprint despite extensive seasonal surveys undertaken by Umwelt and other ecologists over the last twenty years. **Table 1** details the preferred habitat for both *Thesium australe* and *Dichanthium setosum*.

Table 1 - Habitat Preferences of *Thesium australe* and *Dichanthium setosum*

Candidate Species	Habitat Preferences
<i>Thesium australe</i>	<p>Austral Toadflax is semi-parasitic on roots of a range of grass species, notably Kangaroo Grass (<i>Themeda triandra</i>). This species often occurs in in grassland on coastal headlands or grassland and grassy woodland away from the coast (DPIE 2018). <i>Themeda triandra</i> was recorded in one plot sampled in the Development Footprint.</p> <p>The species is associated with 187 Plant Community Types (PCTs), of which two occur in the study area. These are PCT 1603 - Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter and 1604 - Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter (DPIE 2020a), however it was not predicted to occur in the Development Footprint by the BAM-C.</p> <p>The closest record of the species is approximately 33 kms west of the study area (Bionet Atlas 2020; Atlas of Living Australia (ALA) 2020). This record was collected by the lead botanist for the Glendell Continued Operations Project, and familiarity with this species is considered to increase the likelihood of its detection due to its cryptic nature.</p>
<i>Dichanthium setosum</i>	<p>This species is associated with heavy basaltic black soils and red-brown loams with clay subsoil and is often found moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture (DPIE 2019). These soil profiles do not occur in the Development Footprint.</p> <p>Its distribution occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland (DPIE 2019). It is not predicted to occur within the Sydney Basin Region/Hunter Subregion and the North Coast Region/Upper Hunter Subregion (DPIE 2020b).</p> <p>The species is associated with 163 PCTs, of which none occur in the study area.</p> <p>The closest Bionet Atlas record is approximately 65 kms west of the study area (Bionet Atlas 2020). The closest ALA record is approximately 10 km south west of the study area (ALA 2020).</p>

Extant records of the species' were re-examined as part of this response. Using the Bionet search tool, an initial search radius from the Development Footprint of approximately 65 square kilometres was undertaken. This search resulted in two records of *Thesium australe*. In order to find the closest record of *Dichanthium setosum* the search radius was extended to 135 square kilometres. This search resulted in four locations of *Dichanthium setosum*.

The closest *Dichanthium setosum* record was approximately 65 km west of the Development Footprint while the closest *Thesium australe* record was approximately 33 km west of the Development Footprint.

The Atlas of Living Australia was then examined for any additional species records. The Atlas of living Australia returned a further record of *Dichanthium setosum* approximately 10 km from the Development Footprint. The closest record of *Thesium australe* remained the same (33 km). Based on the extent of floristic survey conducted on the Hunter Valley floor, it is considered unlikely that *Thesium australe* and *Dichanthium setosum* will occur in the Development Footprint.

It is considered that the threatened species assessment undertaken for the Glendell Continued Operation Project consideration of *Thesium australe* and *Dichanthium setosum* has been conducted in accordance with the NSW Guide to Surveying Threatened Plants, with the outcome being that targeted surveys were not required. This approach is consistent with **Section 6.4 Steps for identifying habitat suitability for threatened species** of the BAM which states that:

6.4.1.12 Where the assessor determines that none of the habitat constraints are present in a vegetation zone for a threatened species predicted for assessment, the species is considered unlikely to occur and no further assessment is required for that species in that vegetation zone. The assessor must record in the BAR the reasons for determining that a predicted species is unlikely to occur in the vegetation zone.

6.4.1.13 Where the assessor determines that none of the habitat constraints are present on the entire subject land for the threatened species predicted for assessment, the species is considered unlikely to occur and no further assessment is required for that species. The assessor must record in the BAR the reasons for determining that a predicted species is unlikely to occur on the subject land.

While 10 m parallel field traverses (preferred survey methodology prescribed in the Guideline) were not conducted during the nominated seasonal survey period (November to February - which represents the recommended survey period that both species could be concurrently surveyed), a total of 69 vegetation integrity plots were undertaken in the Development Footprint between November and February 2018. This represents approximately 207 surveyor hours (1.5 hours per plot x 2 botanists) of intensive survey within the designated survey period for the candidate species. In addition, extensive 10m parallel field traverses across the entire Development Footprint were undertaken during October 2017 and 2018.

Table 2 summarises Umwelt’s survey methodology against the recommendations in NSW Guide to Surveying Threatened Plants (OEH 2016).

Table 2 - Umwelt’s survey methodology against the recommendations in NSW Guide to Surveying Threatened Plants (OEH 2016)

NSW Guide to Surveying Threatened Plants (OEH 2016) Section 3 Field Survey Design Requirements	Umwelt Response
3.1 Create a candidate species list	<i>Thesium australe</i> and <i>Dichanthium setosum</i> identified as candidate species in the Commonwealth referral (Umwelt 2018).
3.2 Optimise the time of year for the survey	The Threatened Species Data Collection identifies the following seasonal survey periods: <i>Thesium australe</i> November to February <i>Dichanthium setosum</i> November to May

NSW Guide to Surveying Threatened Plants (OEH 2016) Section 3 Field Survey Design Requirements	Umwelt Response
<p>3.3 Identify areas of suitable habitat on the subject land</p> <ul style="list-style-type: none"> • Only the suitable habitat of the target species within the subject land needs to be surveyed. • To identify suitable habitat, the threatened plant surveyor will need to consider the subject land in relation to its range of known plant habitats. • The TBDC and the Threatened Species Profile website, along with appropriate published or peer-reviewed references and/or data, must be used to determine suitable habitat 	<p>An analysis of potential habitat in the Development Footprint was initially undertaken as part of the referral process following identification of the species' as potentially occurring – no potential habitat identified (refer to Table 1 above)</p> <p>Neither species predicted to occur by the BAM-C as part of the BAM assessment – indicating that the species is not generally predicted to occur in the PCTs identified in the Development Footprint.</p> <p>Detailed and extensive flora surveys undertaken in the Development Footprint and surrounding areas did not identify areas of potential habitat that warranted additional targeted survey.</p> <p>The species' have not previously been recorded within 10 km of the Development Footprint, despite extensive surveys in the general Ravensworth locality.</p>
<p>3.4 Prepare the field survey plan</p> <ul style="list-style-type: none"> • 1. Identify areas of the subject land considered suitable habitat for the target species. Only those parts of the subject land that are considered suitable habitat for a target threatened plant species require survey. • 2. Determine survey methods and effort for each target threatened plant species. • 3. Group species based on survey effort, survey timing and suitable habitat. • 4. Select survey sites based on steps 1 and 2. Select dates based on step 3, allowing flexibility for unfavourable conditions. 	<p>No areas of suitable habitat identified in the Development Footprint either prior to surveys during the survey design phase or following the completion of floristic surveys in the Development Footprint.</p> <p>Targeted parallel field traverses therefore not undertaken in the Development Footprint during November to February seasonal survey period.</p>
<p>Section 4 Field Survey Technique</p> <ul style="list-style-type: none"> • Parallel field traverses – 10m 	<p>While targeted parallel field traverses were not undertaken in the Development Footprint during November to February seasonal survey period, extensive 10 m parallel field traverses were undertaken during October and extensive plots based survey was undertaken during the seasonal survey period, which equated to approximately 207 person hours of survey.</p>

Umwelt contend that significant and appropriate survey was undertaken in the Development Footprint, in accordance with the methodology identified in NSW Guide to Surveying Threatened Plants (OEH 2016) such that further surveys should not be required.

2. BCD recommends that a consent condition is created that requires post approval surveys for *Delma impar* in accordance with the Survey Guidelines for Australia's Threatened Reptiles (DSEWPC, 2011). If *Delma impar* is recorded it should be assessed and offset in accordance with the Biodiversity Assessment Method and Biodiversity Offset Scheme.

Surveys have commenced in the Development Footprint in accordance with the recommendations in the *Survey Guidelines for Australia's Threatened Reptiles*. Survey methods outlined by the Commonwealth (DoE 2020) for a site such as Glendell Continued Operations Project are as follows:

- Shelter sites installed at least three months prior to the initial survey/checks (preferably by June)
- Tile grids consist of 50 tiles, at 5 m spacing between tiles, arranged in a grid of 10 tiles by five
- As a minimum, two tile grids for sites less than two hectares in size. One grid per three hectares for sites up to 30 hectares. 10 grids for sites greater than 30 hectares in size
- Grid orientation is important: grids should preferably be positioned on a northerly aspect
- Artificial shelter sites should be checked at least twice a month, and ideally once a week during spring to early summer (i.e. between early September to December). Shelter sites should not be checked more than once per week as this may lead to striped legless lizards abandoning the artificial shelters
- Shelter sites should be checked when ambient temperatures do not exceed 28°C. Grids may be checked during summer/autumn for the presence of shed skin

In the event that *Delma impar* is recorded in the Development Footprint, the species will be assessed and offset in accordance with the BAM.

We hope that the responses above satisfy BCD's requirements. Please do not hesitate to contact Allison Riley, NSW Ecology Manager (ariley@umwelt.com.au) or myself if you would like any further information.

Yours sincerely



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