Briefing Note

To: [redacted] ACT Land Development Agency
cc: [redacted] ACT Land Development Agency
From: [redacted] Umwelt (Australia) Pty. Limited
Author: [redacted] Umwelt (Australia) Pty. Limited
Date: 11 October 2013
Subject: Vegetation Mapping for Kama Nature Reserve, Molonglo

Purpose

Accurate vegetation mapping is required to determine values within Kama Nature Reserve for use as an advanced offset for the Molonglo stage 3 development. The purpose of this briefing note is to update the ACT Land Development Agency on the extent and spatial distribution of vegetation communities within Kama Nature Reserve.

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Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

Perth

PO Box 8177
Subiaco East WA 6008
33 Ventnor Avenue
West Perth WA 6005

Ph. 08 6260 0700

Canberra

PO Box 6135
56 Bluebell Street
O'Connor ACT 2602

Ph. 02 6262 9484

www.umwelt.com.au

1.0 Existing vegetation maps

There are at least four existing vegetation maps for Kama Nature Reserve, being:

- Vegetation mapping as part of the Molonglo Valley NES plan (ACT Government 2011);
- Box-gum and natural temperate grassland mapping on ACTMAPi (ACT Government 2012a);
- Lowland woodland extent in the ACT Lowland Woodland Conservation Strategy (Action Plan No. 27) and Natural temperate grassland extent in the ACT Lowland Native Grassland Conservation strategy (Action Plan No. 28) (ACT Government 2004, 2005; considered as one product); and
- Vegetation mapping as part of the Kama 'Heritage (Decision about Registration of Kama Woodland/Grassland, Belconnen) Notice 2012' (ACT Government 2012b).

All four map products were assessed in the field through rapid map validation. This involved meandering searches through each map polygon to determine the spatial of mapped boundaries, and the thematic (vegetation type) accuracy within each polygon. Comments of the review of each map are in Table 1.

Table 1 – Review of Existing Vegetation Map Products

Map product	Comments
Molonglo NES Plan	Large areas dominated by scribbly gum (*Eucalyptus rossii*) are mapped as Box-Gum woodland in high and low condition. These areas are not consistent with the 'white box-yellow box-Blakely's red gum grassy woodland and derived native grassland' critically endangered ecological community definition as per the community's listing advice. Perhaps due to scale issues, this product does not appear to be a suitable base for determining reserve offset values.
ACTMAPi (Box-Gum and NTG)	Similar to the Molonglo NES plan, however the Box-Gum woodland polygon extends into the natural temperate grassland in the south-west of the reserve. This product is not considered a suitable base for determining reserve offset values.
ACT Lowland Woodland / Native Grassland Conservation Strategies	Mapping within the hard copy reports are of a coarse scale, and it is difficult to determine accuracy. GIS layers linked to the report revealed that much of the Box-Gum woodland area is mapped as partially modified lowland woodland and moderately modified lowland woodland. The typology of the mapping is not consistent with Commonwealth and ACT legislation, as 'lowland woodland' includes vegetation types dominated by other lowland species including those not characteristic of 'white box-yellow box-Blakely's red gum grassy woodland and derived native grassland' critically endangered ecological community. The natural temperate grassland area is not mapped in Action Plan No. 28. These products are not considered a suitable base for determining reserve offset values.
Kama Heritage Notice 2012	The mapping is available as hard copy, and includes areas of mapped scribbly gum woodland. There are areas mapped as dominated by Blakely's red gum (*Eucalyptus blakelyi*) which are either co-dominated or exclusively dominated by scribbly gum in the north-east of the reserve. This product is not considered a suitable base for determining reserve offset values. However, given that the majority of the mapping in the Kama Heritage Notice 2012 is, for the most part, spatially and thematically accurate, it is considered the best starting point for refinement. As it is not available digitally, it is desirable to map the area with consideration of this product as well as up to date reconnaissance information.

The 'vegetation mapping as part of the Kama 'Heritage (Decision about Registration of Kama Woodland/Grassland, Belconnen) Notice 2012' was considered the best existing product, however it required refinement to accurately reflect vegetation distribution in some areas.

2.0 Updated vegetation information

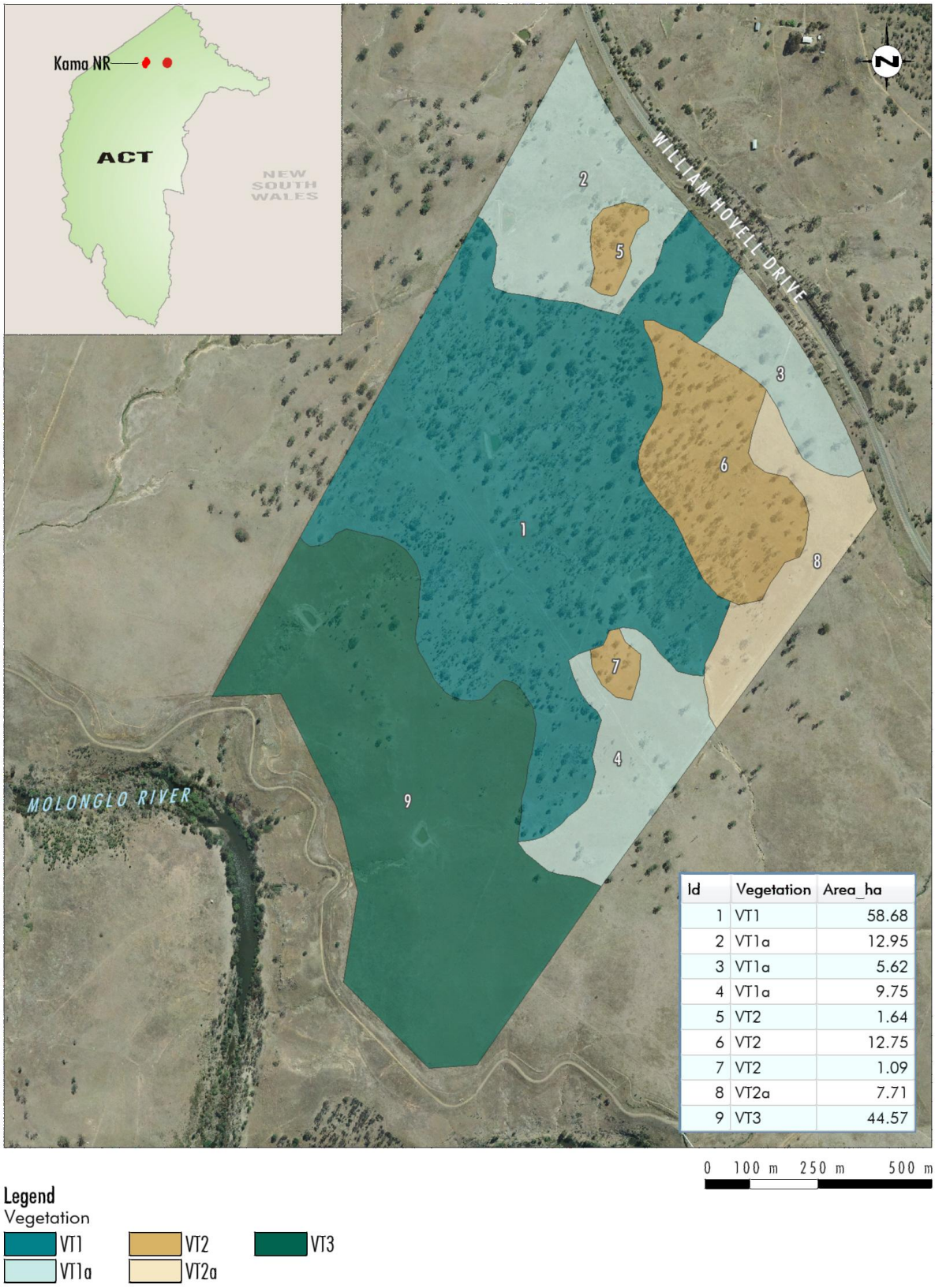
Table 2 summarises the vegetation of Kama Nature Reserve. This information has been adapted from the 'Kama Heritage Notice 2012', with new polygons created and floristic information updated as required. An updated vegetation map, based on the 'Kama Heritage Notice 2012' and field surveys undertaken by Umwelt as part of this investigation is shown in **Figure 1**.

Table 2 – Updated vegetation descriptions for Kama Nature Reserve

Polygon	Area description	Vegetation Community	Area (ha)	Correspondence with legislation	Vegetation Condition (ACT Government 2013)
VT1	Woodland dominated by Blakely's red gum (*Eucalyptus blakelyi*) and yellow box (*E. melliodora*), with infrequent red stringybark (*E. macrorhyncha*), broad-leaved peppermint (*E. dives*) and scribbly gum (*E. rossii*) on a south-easterly to south-westerly hillslope. The mid-layer is comprised of sparsely distributed patches of Blakely's red gum saplings and seedlings, and sweet bursaria (*Bursaria lasiophylla*). The ground layer is dominated by kangaroo grass (*Themeda triandra*), wallaby grasses (*Rytidosperma* spp.) and tall speargrass (*Austrostipa bigeniculata*). There is a high diversity of native forbs present, including uncommon species. Pest plants of concern include a serious infestation of St. John's wort (*Hypericum perforatum*).	Blakely's red gum - yellow box grassy woodland	58.68	*Environment Protection and Biodiversity Conservation Act 1999* Consistent with high quality 'white box-yellow box-Blakely's red gum grassy woodland and derived native grassland' critically endangered ecological community. *Nature Conservation Act 1980* Consistent with partially modified lowland woodland as part of the 'yellow box – red gum grassy woodland' endangered ecological community (Action Plan No. 27).	Moderate/good. If vegetation is not in low condition (paddock trees or native pasture) then it is in moderate to good condition.
VT1a	Partially cleared version of VT1. The understorey is a mosaic native grasses including tall speargrass and wallaby grasses, along with large areas dominated by exotic pasture including wild oats (*Avena* spp.), barley grass (*Hordeum* spp.) and rat's-tail fescue (*Vulpia myuros*). Weeds of concern include St. John's wort and sweet briar (*Rosa rubiginosa*). It is estimated that approximately 30-40% of patches are dominated by exotic pastures.	Derived mixed exotic and native grassland	28.33	*Environment Protection and Biodiversity Conservation Act 1999* Not considered part of the 'white box-yellow box-Blakely's red gum grassy woodland and derived native grassland' critically endangered ecological community due to large areas of the understorey being dominated by perennial exotic pasture grasses. *Nature Conservation Act 1980* Consistent with moderately modified lowland woodland as part of the 'yellow box – red gum grassy woodland' endangered ecological community (Action Plan No. 27).	Paddock trees. Native over-storey percent foliage cover is less than 25% of the lower value of the overstorey percent foliage cover benchmark for the relevant vegetation type and less than 50% of ground cover perennial vegetation is indigenous species.

Polygon	Area description	Vegetation Community	Area (ha)	Correspondence with legislation	Vegetation Condition (ACT Government 2013)
VT2	Forest dominated by scribbly gum with some Blakely's red gum and broad-leaved peppermint on a hill slope with a westerly aspect. The patchy mid layer is comprised of Blakely's red gum, scribbly gum and broad-leaved peppermint saplings and small amounts of sweet bursaria. Exotic sweet briar and blackberry (*Rubus fruticosus* agg.) are present. The ground layer is dominated by speargrasses, wallaby grasses, redleg grass (*Bothriochloa macra*) and introduced annual pasture and weed species. Pest plants of concern include Paterson's curse (*Echium plantagineum*), St. John's wort and blackberry.	Scribbly gum grassy open forest	15.48	*Environment Protection and Biodiversity Conservation Act 1999* Nil. *Nature Conservation Act 1980* Nil.	Moderate/good. If vegetation is not in low condition (paddock trees or native pasture) then it is in moderate to good condition
VT2a	Partially cleared version of VT2. Open woodland dominated by scribbly gum, with occasional patches of Blakely's red gum, and broad-leaved peppermint on a north-easterly aspect. The ground layer is a mosaic of native grasses including tall speargrass, wallaby grasses and red-leg grass, and exotic grasses including wild oats, brome (*Bromus* spp.) and ryegrasses (*Lolium* spp.). Pest plants of concern include Paterson's curse, St. John's wort and blackberry.	Scribbly gum grassy open forest (partially cleared)	7.71	*Environment Protection and Biodiversity Conservation Act 1999* Nil. *Nature Conservation Act 1980* Nil.	Paddock trees Native over-storey percent foliage cover is less than 25% of the lower value of the overstorey percent foliage cover benchmark for the relevant vegetation type and less than 50% of ground cover perennial vegetation is indigenous species.
VT3	Southerly foot-slope containing natural temperate grassland, with isolated red stringybark and broad-leaved peppermint (as per ACT Government 2005, <10% projected foliage cover). The ground layer is dominated by kangaroo grass, wallaby grasses, speargrasses and common everlasting (*Chrysocephalum apiculatum*). Several uncommon forbs are present including blue devil (*Eryngium ovinum*). Common exotic species include rat's tail fescue, St. John's wort and wild oats. Other pest plants in lower abundance include saffron thistle (*Carthamus lanatus*) and spear thistles (*Cirsium vulgare*), Paterson's curse and sweet briar.	Natural temperate grassland	44.58	*Environment Protection and Biodiversity Conservation Act 1999* Natural temperate grassland of the Southern Tablelands of NSW and the Australian Capital Territory, a mosaic of high (Botanical Significance Rating 2) to low (BSR 4) significance (Action Plan No. 28). *Nature Conservation Act 1980* Natural temperate grassland endangered ecological community, a mosaic of high (BSR 2) to low (BSR 4) significance (Action Plan No. 28).	Moderate/good If vegetation is not in low condition (paddock trees or native pasture) then it is in moderate to good condition. Note that for natural temperate grassland communities this is relevant while it is technically native pasture, it is in a structurally natural condition.

Cattle grazing appears to be part of the management strategy for Kama Nature Reserve as at the time of survey (10 September 2013), with moderate grazing observed in paddocks in the north-west and south-east of the reserve. This disturbance is not likely to affect the outcomes of the vegetation condition component of this study.



Id	Vegetation	Area_ha
1	VT1	58.68
2	VT1a	12.95
3	VT1a	5.62
4	VT1a	9.75
5	VT2	1.64
6	VT2	12.75
7	VT2	1.09
8	VT2a	7.71
9	VT3	44.57

Figure 1 – Updated vegetation mapping for Kama Nature Reserve.

3.0 Conclusions and Recommendations

Through conduct of the study as described in this briefing note, it was apparent that varying degrees of inconsistency and inaccuracy occurs within the existing vegetation map products that relate to Kama Nature Reserve. In part, this could be attributable to temporal variation where ground layer vegetation is influenced by season and prevailing weather and others may be attributable to mapping scale wherein smaller patches are not separated. This investigation has sought to apply current identification guidelines and associated mapping scales to delineate structurally and floristically distinct areas and correlate those to vegetation communities defined under existing Territory and Commonwealth legislation. Given the outcomes of this process, the following recommendations are provided:

- The updated vegetation map should be adopted as the current description of vegetation communities within Kama Nature Reserve.

- The updated information should be considered when determining advanced offsets for the Molonglo Stage 3 development as the previous mapping products are not a sufficiently accurate representation of vegetation condition or distribution within Kama Nature Reserve.

- Umwelt was required to map the vegetation of Kama Nature Reserve as part of a broader project which included additional floristic sampling to finalise the review of the draft Environmental Offsets Calculator (Umwelt 2013; ACT Government 2013). As the mapping of Kama Nature Reserve has delineated the reserve into vegetation types and condition classes, this study has revealed that an additional five plots are required to complete the assessment if the draft Environmental Offsets Calculator (in its current form) is to be used as the basis for offset calculation.

References

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ACT Government (2012b) Heritage (Decision about Registration of Kama Woodland/Grassland, Belconnen) Notice 2012. Notifiable Instrument NI2012-541.

ACT Government (2013) Environmental Offsets Calculator Operational Manual. ACT Environment and Sustainable Development Directorate. Version 20130301.

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