



MOLONGLO STAGE 3

S211 Application
Supporting Documentation

FINAL

June 2017



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Prepared by
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on behalf of
ACT Land Development Agency

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APPENDICES

- 1 Preliminary Risk Assessment, Risk Matrix

1.0 Introduction

This report is provided for the information of the Environment, Planning and Sustainable Development Directorate (EPSDD) as supporting documentation for a request for an exemption from requiring an Environmental Impact Statement (EIS) for the development of the Molonglo Stage 3 Urban Area (defined in **Section 2** below).

The application for exemption is made under Section 211 (s211) of the *Planning and Development Act 2007* (PD Act).

The application is sought on the basis that sufficient environmental research and studies have been undertaken, and these have adequately identified the potential environmental impacts of the development in the Molonglo Stage 3 Urban Area. Information presented in this document and the accompanying risk assessment matrix (**Appendix 1**) demonstrates the level of knowledge and comparative risk associated with any information gaps such that further research through an EIS would not be informative.

Information requirements to support the s211 Exemption Form 1M¹ are outlined in **Table 1.1** below.

Table 1.1 – Form 1M Information Requirements

Required information under Form 1M		Location in this report
1	a statement outlining the objectives of the project and why it is needed.	Section 2
2	a description of the nature/type of project proposed by providing location map(s) of the project site(s), preliminary design drawings and satellite/aerial photographs	Section 2
3	a preliminary risk assessment (PRA) based on the guidance document	Section 6, Appendix 1
4	a description of the natural conservation values of the site based on the considerations listed in the 'Preparation of an application for scoping and preparation of an ESO' guideline available from the EPSDD website	Section 3
5	a description of measures within the proposal that seek to avoid and minimise (and as a last resort offset) impact on identified conservation values	Section 5
6	Any decision made under the EPBC Act in relation to this proposal.	Section 4
7	For s211 applications only, the following additional information is required:	
i.	details of qualifications, expertise and experience of the person(s) who conducted previous studies supporting the application;	Section 7
ii.	details of public consultation undertaken, as part of statutory requirement, for projects or previous studies included as supporting documentation undertaken. Details of public consultation not required for a statutory process should also be included;	
iii.	verification from a qualified person that the information in the previous studies supporting the application is still current.	

¹ Approved form AF2017-37 approved by Dorte Ekelund, *Chief Planning Executive* Planning and Land Authority on 19 January 2017 under section 425 of the *Planning and Development Act 2007* and revokes approved form AF2014-88. [online: <http://www.legislation.act.gov.au/>]

2.0 The Project

2.1 Objectives of the Project

The project is for development of the Molonglo Stage 3 urban area. Molonglo Stage 3 covers an approximate area of 800 hectares located north of the Molonglo River, bounded by the Tuggeranong Parkway and National Arboretum to the east, William Hovell Drive to the north, and Kama Nature Reserve to the west.

Urban development of the Molonglo Valley is a key component of the ACT Government's greenfield urban development program. The Government's intentions are reflected in the Indicative Land Release Program (EDD, 2014)² which identifies Molonglo Stage 3 for land release commencing in 2017–18.

Molonglo Stage 3 is the third and final stage in the Molonglo Valley urban development project. Stage 1 comprises the suburbs of North Weston, Coombs and Wright and is currently being developed and sold. Stage 2 is comprised of the suburbs of Denman Prospect and Molonglo and is in its detailed planning phase. **Figure 2.1** shows the staged development of the Molonglo Valley. When fully developed, the Molonglo Valley is expected to accommodate approximately 55,000 people. **Figure 2.2** is an indication of the expected land uses within Molonglo Stage 3 and their boundaries, subject to the preparation of final estate development plans.

2.2 Description of the Project

Molonglo Stage 3 is expected to house approximately 27,000 people living in 11,000 dwellings by 2042 (GHD, 2014)³. The project would include all activities generally associated with the urban development of a greenfield site. Activities that would occur as part of the development phase would include (but not be limited to):

- Land clearing and earthworks;
- Contaminated land remediation;
- Construction of storm water management infrastructure;
- Construction of utility services;
- Construction of roads and transport infrastructure⁴ (including for pedestrian and cycle transport);
- Construction of community facilities, commercial buildings, and infrastructure; and
- Landscaping.

All three stages of Molonglo Valley were assessed and approved concurrently through a strategic assessment prepared under Part 10 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Molonglo Valley Plan for the Protection of Matters of

² Economic Development Directorate (2014). *Indicative Land Release Program 2014-15 to 2017-18*, ACT Government, Canberra (June, 2014).

³ GHD (2014). *Molonglo Stage 3: Study of Community, Sport and Recreation Facilities*, prepared for the Environment and Sustainable Development Directorate, Canberra (July, 2014).

⁴ **Note:** The construction of roads is not an applicable trigger under Part 4.2 of the PD Act, as they will be within land designated as a future urban area.

National Environmental Significance (the NES Plan)⁵ gained approval in 2011 and describes the approach to development in accordance with the Molonglo Valley Structure Plan, in a manner that achieves defined outcomes for conservation of matters of national environmental significance (MNES). The NES Plan and associated documents prepared as part of the Molonglo Valley Strategic Assessment consider all three stages of the development; however, under the Territory's PD Act, each stage has to be planned, assessed and approved separately with regard to the staged land release schedule.

This document relates to the assessment of Stage 3 under the PD Act. Note: that all of the following planning figures are indicative only.

⁵ ACT Planning and Land Authority (2011) *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance (the NES Plan)*, ACT Government, Canberra (September, 2011)

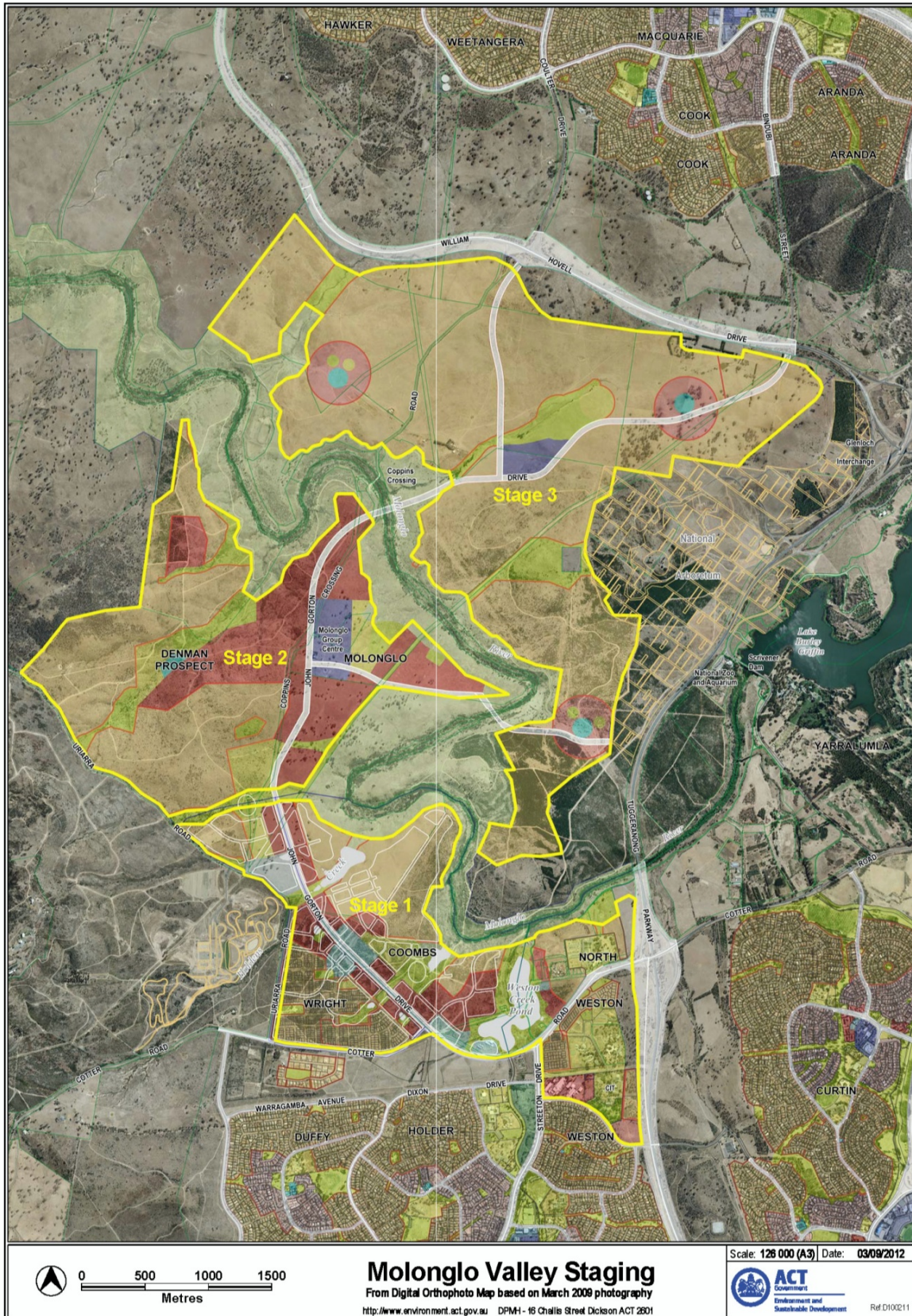
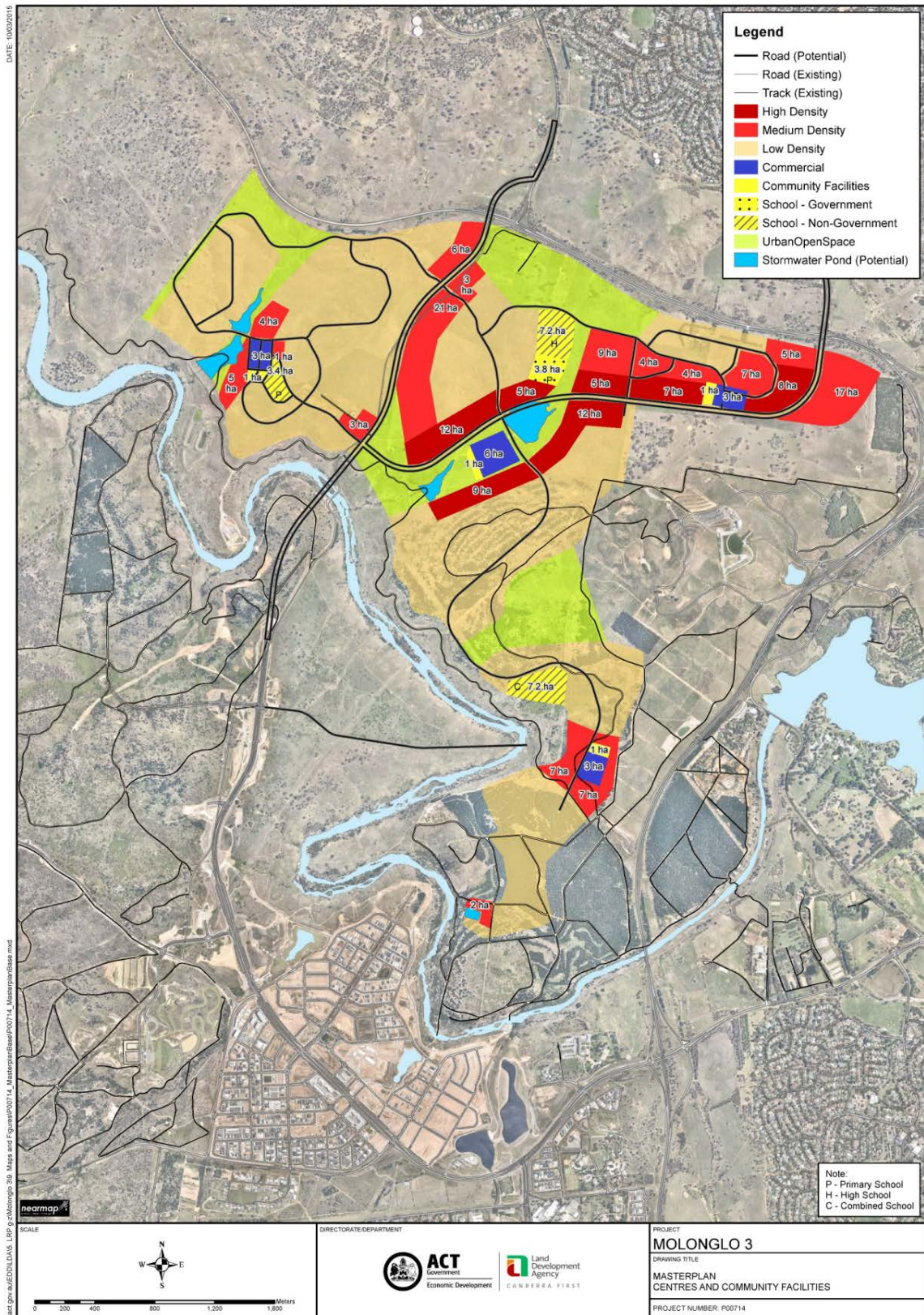


Figure 2.1 – Molonglo Valley Staging Plan with Current Territory Plan



This document seeks approval for residential, community and commercial development, open space and associated infrastructure within Molonglo Stage 3 within the footprint shown in **Figure 2.3**.

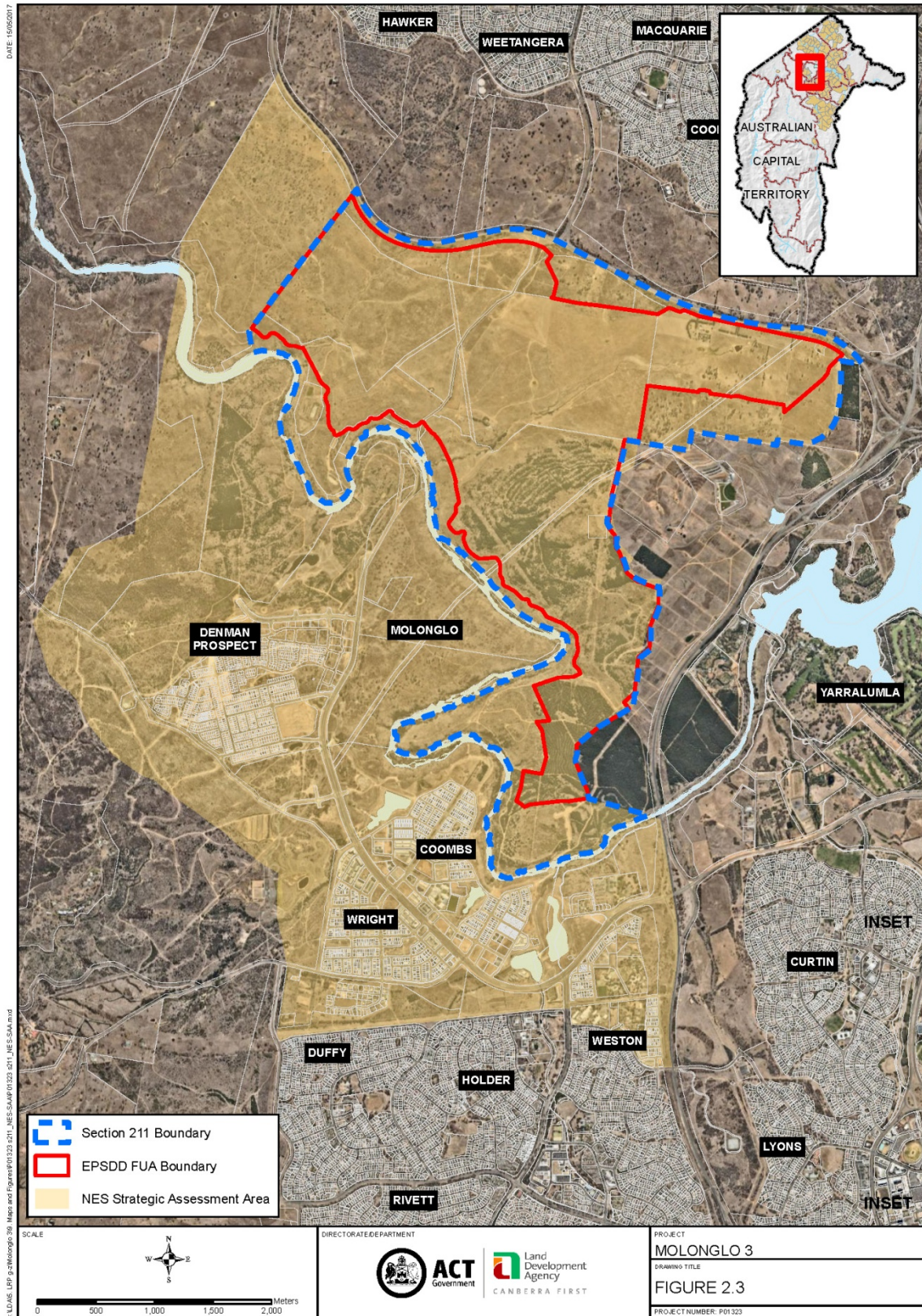


Figure 2.3 – Blue broken outline indicates the Area Subject to S211 Application

Any development outside the NES Plan footprint such as road connections, electrical and water infrastructure, has not been considered under the EPBC Act, and would need to be assessed separately if it is likely to result in any significant impact to MNES.

2.3 Planning and Development Act Triggers

During preparation of this document, a literature review of all available documentation relating to the Molonglo Stage 3 project area was completed. The findings of the literature review were compared against the triggers for impact track assessment under Schedule 4 of the PD Act.

The items that will, or may potentially be triggered by the development of Molonglo Stage 3 are listed in **Table 2.1**. This table does not include items that have been determined to be not applicable.

Note: The development of Molonglo Stage 3 does not allow for the construction of a dam. All urban stormwater will be captured in a series of ponds or the like.

Table 2.1 – Relevant Schedule 4 Triggers

Part	Item	Trigger	Applicable?	Primary Information Sources
4.2	2	proposal that involves— a) electricity transmission line construction, including additions or realignment works, outside an existing easement or exceeding 500m in length, that are intended to carry underground or above-ground transmission lines with a voltage of 132kV or more.	Yes Refer to Section 2.3.1.	Molonglo 3 Major Electrical Infrastructure Relocation Feasibility Study Consultancy Services (Brown Consulting, 2014) NES Plan (ACTPLA, 2011)
4.3	1	proposal that is likely to have a significant adverse environmental impact on 1 or more of the following, unless the conservator of flora and fauna provides an environmental significance opinion indicating that the proposal is not likely to have a significant adverse environmental impact: a) a critically endangered species; b) an endangered species; c) a vulnerable species; d) a conservation dependent species; e) a regionally threatened species; f) a regionally conservation dependent species; g) a provisionally listed threatened species; h) a listed migratory species; i) a threatened ecological community; j) a protected native species; k) a Ramsar wetland; l) any other protected matter	Yes Refer to Section 2.3.2.	Molonglo Stage 3 Vegetation Classification and Condition Assessment (Biosis, 2016) ⁶ NES Plan (ACTPLA, 2011) Molonglo Adaptive Management Strategy (TAMS, 2013) ⁷
4.3	2	proposal involving— b) the clearing of more than 5.0ha of native vegetation in a native vegetation area, on land that is designated as a future urban area (FUA) under the territory plan unless the conservator of flora and fauna produces an environmental significance opinion that the clearing is not likely to have a significant adverse environmental impact	Yes Refer to Section 2.3.3.	Molonglo Stage 3 Vegetation Classification and Condition Assessment (Biosis, 2016)

⁶ Biosis (2016) *Molonglo Stage 3 Vegetation Classification and Condition Assessment*, prepared for the Land Development Agency (February 2016)

⁷ Territory and Municipal Services (2013) *Molonglo Adaptive Management Strategy*, ACT Government, Canberra (May, 2013)

4.3	4	proposal that is likely to have a significant adverse environmental impact on— c) a prescribed environmental value mentioned in the territory plan (water use catchment general code) of a natural waterway or aquifer	Potential Refer to Section 2.3.4.	Molonglo River Park Concept Plan Report (Hassell, 2012) ⁸
4.3	6	proposal that is likely to have a significant adverse impact on the heritage significance of a place or object registered under the <i>Heritage Act 2004</i> , unless— a) the heritage council produces an environmental significance opinion that the proposal is not likely to have a significant adverse impact; or b) the proposal is the demolition of a building that is affected residential premises, and the heritage council has approved a statement of heritage effect in relation to the proposal	Potential Refer to Section 2.3.5.	Molonglo Stage 3 Future Urban Release: Detailed Heritage Assessment – Aboriginal and Historic Heritage (Biosis, 2012) ⁹ Molonglo Stage 3 Future Urban Release: Sub Surface testing report and further studies (Biosis, 2013) ¹⁰ Molonglo Stage 3 Additional Areas Cultural Heritage Assessment (Biosis 2014) ¹¹
4.3	7	proposal involving land included on the register of contaminated sites under the <i>Environment Protection Act 1997</i>	Yes Refer to Section 2.3.6.	Phase 2 Environmental Site Assessment, Area A, Molonglo Valley Stage 3 (WSP, 2016) ¹² Phase 2 Environmental Site Assessment, Area B, Molonglo Valley Stage 3 (WSP, 2015) ¹³

⁸ Hassell (2012) *Molonglo River Park Concept Plan Report*, prepared for Environment and Sustainable Development Directorate, Canberra (August, 2012)

⁹ Biosis (2012) *Molonglo Stage 3 Future Urban Release: Detailed Heritage Assessment – Aboriginal and Historic Heritage*, prepared for Environment and Sustainable Development Directorate, Canberra (2012)

¹⁰ Biosis (2013) *Molonglo Stage 3 Future Urban Release: Sub Surface testing report and further studies*, prepared for the Environment and Sustainable Development Directorate, Canberra (March, 2013)

¹¹ Biosis (2014) *Molonglo Stage 3 Additional Areas Cultural Heritage Assessment*, prepared for the Environment and Sustainable Development Directorate, Canberra (April, 2014)

¹² WSP (2016) Molonglo Valley Stage 3 (Area A) Stage 2 Detailed Site Investigation, prepared for the Land Development Agency (April 2016)

¹³ WSP (2015) Molonglo Valley Stage 3 (Area B) Stage 2 Detailed Site Investigation, prepared for the Land Development Agency (November 2015)

2.3.1 Part 4.2, Item 2 – Electricity Line Construction

Two 132kV steel tower transmission lines currently traverse the Molonglo Stage 3 area. These lines connect:

- The TransGrid Canberra 330/132kV Substation in Holt to Woden Zone Substation in Lyons; and
- Civic Zone Substation (at the base of Black Mountain) to Woden Zone Substation.

These lines are considered critical infrastructure that supply power to large areas of Canberra. The current 132kV power transmission lines are suspended on large steel lattice towers (**Figure 2.4**), on the alignment shown in **Figure 2.5**, and are each located on 30 metre wide reservations which converge at the southern end of Molonglo Stage 3 near the southern limit of the National Arboretum.

As a component of the Project, the infrastructure would be realigned with the proposed configuration of the urban area. The old lines will subsequently be decommissioned and demolished. A total of 8.4 kilometres of the existing 132kV transmission line would be removed, including 29 towers, and replaced with a currently undetermined length of 132 kV transmission line.

This application includes the relocation of transmission lines within the urban development boundary of Molonglo Stage 3. It does not include any activities to the north of William Hovell Drive or west of the proposed urban boundary, as the alignment of these sections are not sufficiently progressed at this stage. These excluded areas will be subject to a separate approvals process as required at a later date.

The realignment is currently subject to a detailed feasibility study by Calibre Consulting (ACT) Pty Ltd (Calibre). A number of options are being considered in terms of existing and proposed infrastructure, access, land value, environmental and heritage constraints, and health impacts (i.e. potential electromagnetic radiation (EMR)). The preferred alignment will be identified through a triple bottom line assessment; considering social, economic and environmental factors as relevant throughout the design, construction and operation phases. The alignment would minimise the amount of developable land lost to easements, setbacks and maintenance tracks; construction access and operation requirements; minimise visual impacts from proposed community spaces; and not result in significant environmental or heritage impacts. Impacts to native flora and fauna as a result of this project component have been considered in the total development footprint in **Sections 2.3.3** and **2.3.4**.

The current preferred option is to use underground powerlines in order to reduce visual impacts. The final decision is subject to the completion of the feasibility study and detailed design stage. Following detailed design, the final proposed construction type and alignment option will be included in the estate development plan (EDP) and assessed as part of the development application process. In the event that underground powerlines are pursued as the final alignment option, they will be built to ActewAGL standards, consisting of a maximum 6.2 metre wide trench.



Figure 2.4 – Existing Steel Towers

Conclusion

It is considered that the options study and design reports currently being completed for the proposed alignment will adequately identify and mitigate the impacts associated with the infrastructure, including potential health risks associated with EMR, through the detailed design process. The final alignment option will be included in the EDP for Molonglo 3 and all impacts assessed as part of the development application process.

As the alignment would be within the area assessed by the NES Plan and subsequent ecological assessments, it is considered to be within the scope of impact assessed for the development of Molonglo 3. Any work on lines located outside the future urban area will be subject to the triggers and requirements for environmental impact assessment under the PD Act and the Territory Plan.

It is considered likely that the risks are well understood, and could be managed appropriately without the need for an EIS.

References

- Molonglo 3 Major Electrical Infrastructure Relocation Concept Design Report (Calibre, 2015); and
- Molonglo 3 132kV Transmission Line Relocations Options Study Assessment of the Electro Magnetic Field (EMF) Profile Adjacent to the Proposed ActewAGL Distribution 132kV Transmission Line and Underground Cable Assets (L3D, 2014).

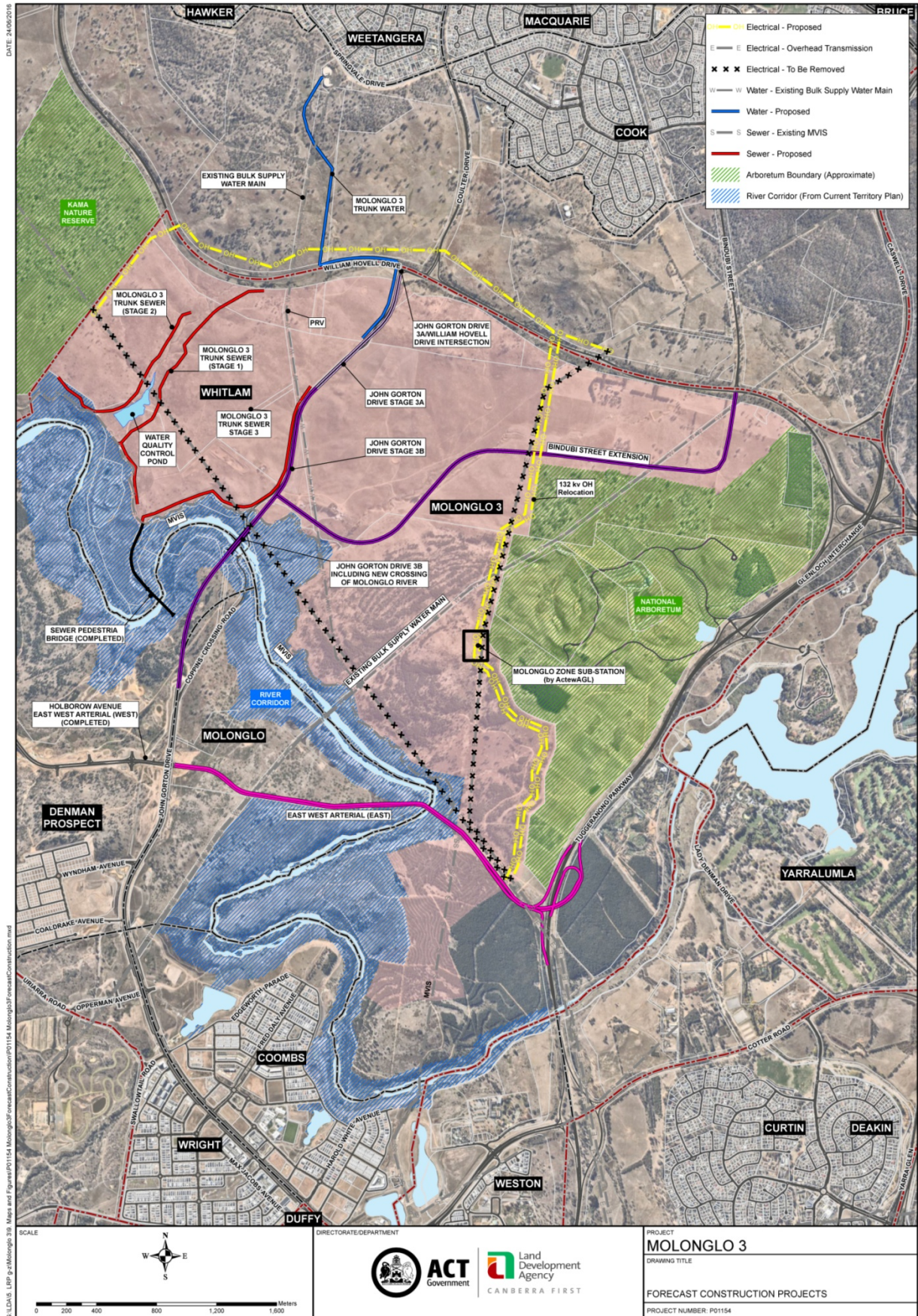


Figure 2.5 – Electricity Line Relocation (*indicative only*)

Note: The indicative proposed alignment (yellow) within the pink zone (Molonglo Stage 3) only is subject to this assessment. The length north of William Hovell Drive is not included.

2.3.2 Part 4.3, Item 1 – Impact to Threatened Species or Community

The development of Molonglo Stage 3 would have impacts on a number of threatened species and communities, as assessed in the NES Plan.

The NES Plan considered impacts to all matters of national environmental significance (MNES) within the Strategic Assessment Area, and concluded that the unavoidable impacts were effectively mitigated and compensated for through the avoidance and offset strategy described in the NES Plan. The offset strategy placed the majority of identified box gum woodland in Molonglo Stage 3 into protected areas (**Figure 2.6**).

As illustrated in **Figures 2.6** and **2.7**, the MNES assessed by the NES Plan in Molonglo Stage 3 were:

- Box gum woodland (critically endangered ecological community);
- Natural temperate grassland (endangered ecological community);
- Pink-tailed worm lizard habitat (a vulnerable species);
- Superb parrot (*Polytelis swainsonii*) (a vulnerable species); and
- Swift parrot (*Lathamus discolor*) (an endangered species).

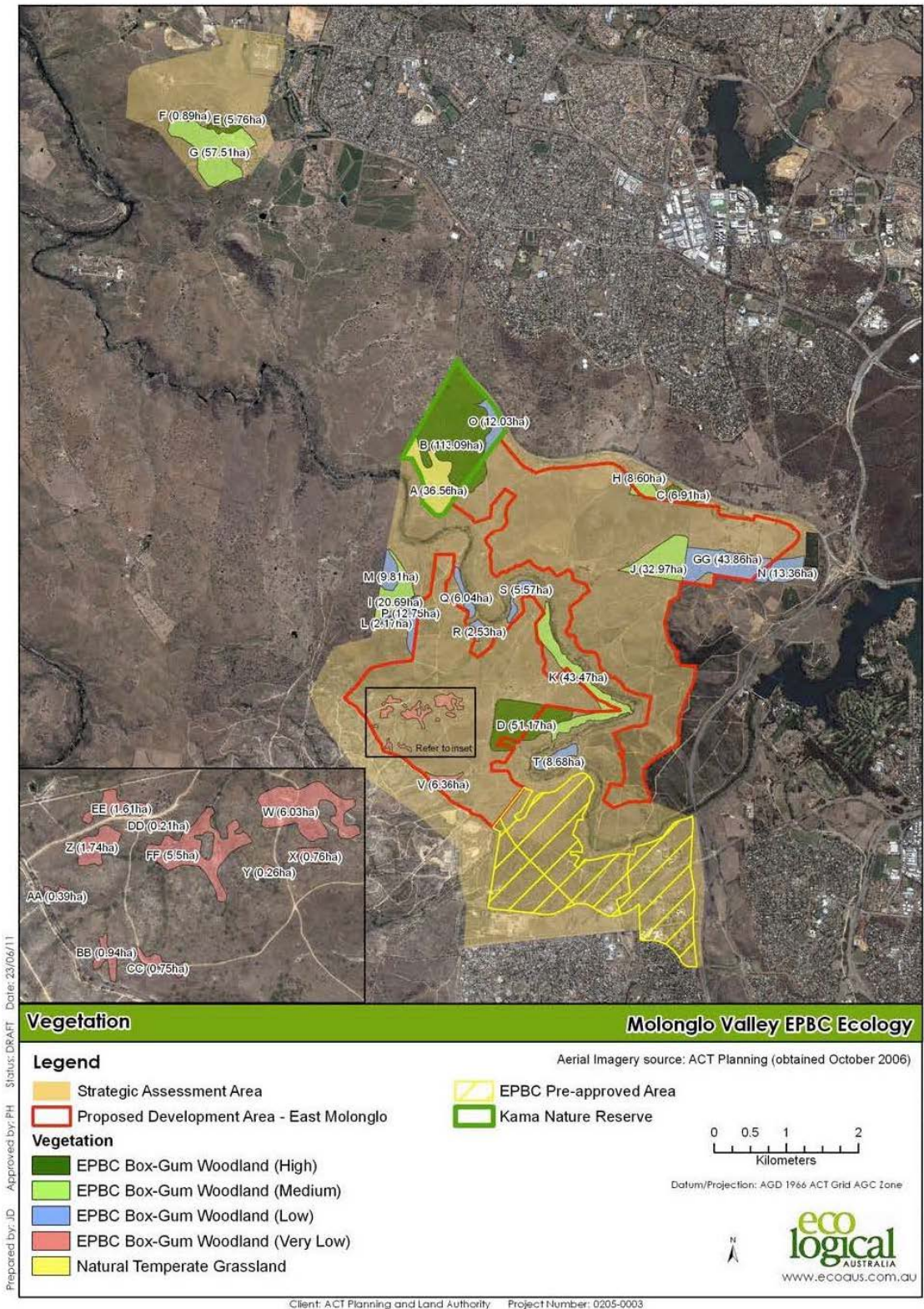


Figure 2.6 – NES Plan: Box Gum Woodland and Natural Temperate Grassland
(Source: ACTPLA, 2011)

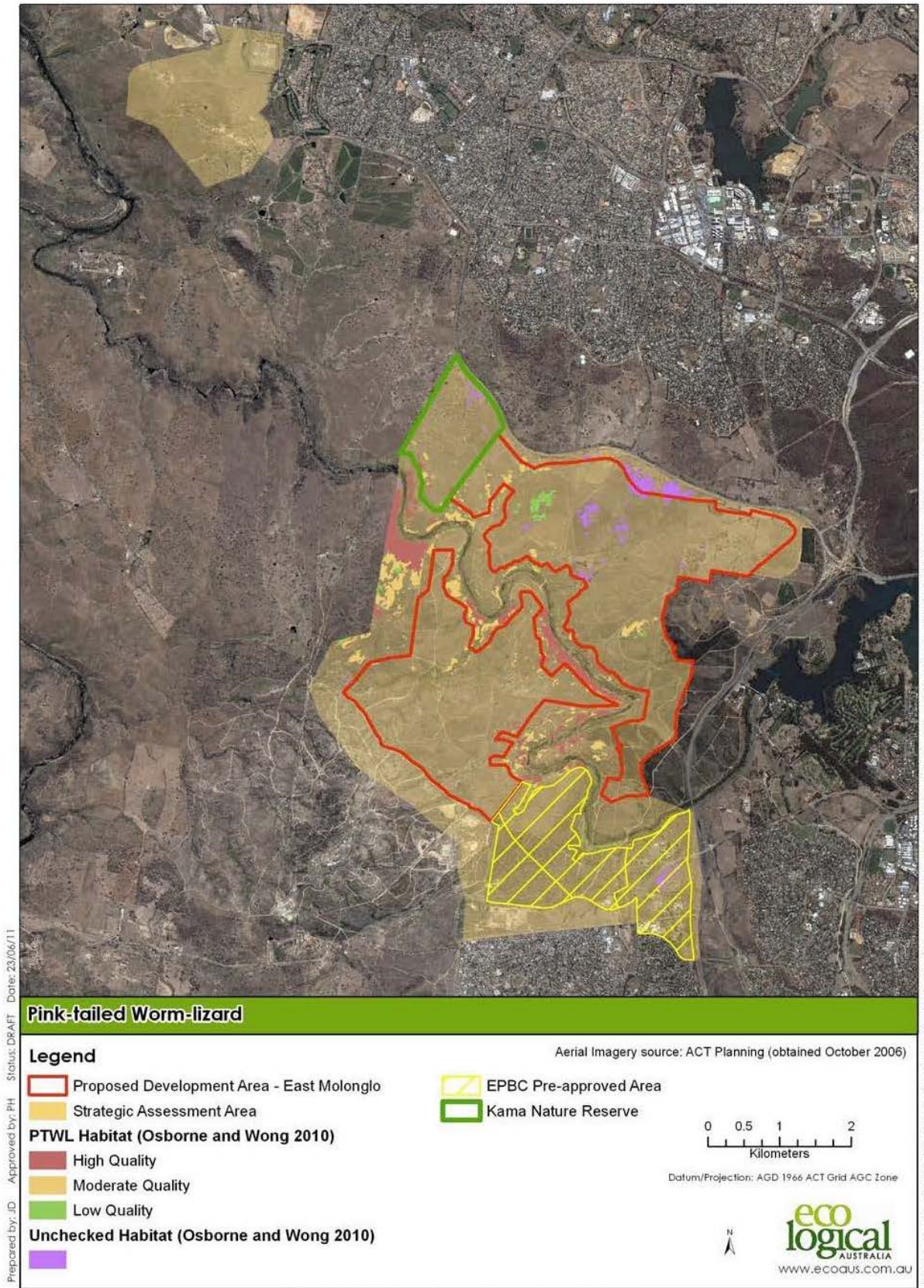


Figure 2.7 – NES Plan: Pink-Tailed Worm-Lizard
(Source: ACTPLA, 2011)

In 2016, Biosis (Biosis 2016) undertook a detailed assessment of vegetation and habitat within the Molonglo Stage 3 area. This provides an up to date assessment of the distribution and condition of ecological values likely to be impacted by the Project.

Biosis (2016) identified 0.3 hectares of moderately modified box gum woodland ecological community within their survey area. They also identified a small patch (0.05 hectares) of natural temperate grassland, however since their report, this community has been relisted, and the updated conservation advice specifies that this patch is too small to qualify as the ecological community (minimum patch size of 0.1 hectares).

An additional 2.3 hectares of low quality box gum woodland was identified by Umwelt (2013b)¹⁴ to the west of offset site 'GG' (**Figure 5.1**) that was not resurveyed by Biosis (2016). This patch of woodland also would be impacted by the future urban area (FUA).

The mapping of pink-tailed worm lizard habitat by Biosis (2016) (**Figure 2.8**) was based on habitat features and vegetation quality, rather than detailed reptile survey. As such, the previous mapping by Osborne and Wong (2010)¹⁵ as used in the NES Plan (**Figure 2.7**) has been utilised for this application, and is considered the most appropriate mapping available. **Table 2.2** summarises the quality of habitat that will be impacted by the plan.

Table 2.2 – Pink Tailed Worm Lizard Habitat Future Urban Area (ACTPLA, 2011)

Quality	Area of Impact (ha)
Moderate – High	8.5
Low – Potential	9.1

In summary, the following MNES would be impacted:

- 2.6 hectares of box gum woodland; and
- Up to 17.6 hectares of known and potential pink-tailed worm lizard habitat.

These impact areas are calculated based on the entire Molonglo Stage 3 FUA footprint (excluding offset areas identified by the NES Plan). This has assumed 100 per cent clearance of vegetation within the footprint (although some impacts may be further avoided through detailed design), and would allow for all development and associated infrastructure required within the FUA footprint.

Impacts to these MNES were identified and approved through the NES Plan. In addition to the above matters, potential habitat was considered by Biosis (2016) for a number of threatened flora and fauna species. These are listed in **Table 2.3** below and shown in **Figure 2.8**.

¹⁴ Umwelt (2013b) *Review of ACT Environmental Offsets Calculator Stage 2*. Final Report to the Land Development Agency, November 2013

¹⁵ Osborne, W., and Wong, D. (2010) *Extent of potential pink-tailed worm-lizard (Aprasia parapulchella) habitat in the Stage 2 Investigation Area – East Molonglo downstream of Coppins Crossing*. Report commissioned by ACTPLA (2010)

**Table 2.3 – Potential Threatened Species Habitat within the Future Urban Area
(Biosis, 2016)**

Protected Matter	Status		Area of Potential Habitat
	EPBC Act	NC Act	
Superb parrot (<i>Polytelis swainsonii</i>)	Vulnerable	Vulnerable	13 ha
Swift parrot (<i>Lathamus discolor</i>)	Endangered	Vulnerable	13 ha
Glossy black cockatoo (<i>Calyptorhynchus lathamii</i>)	-	Vulnerable	0 ha – all habitat within River Corridor
Little eagle (<i>Hieraaetus morphnoides</i>)	-	Vulnerable	686 ha (potential foraging habitat)
Hoary sunray (<i>Leucochrysum albicans</i> var. <i>tricolor</i>)	Endangered	-	0.3 ha potential habitat (corresponding to the location of moderately modified box gum woodland)
Small purple pea (<i>Swainsona recta</i>)	Endangered	Endangered	
Tarengo leek orchid (<i>Prasophyllum petilum</i>)	Endangered	Endangered	
Button wrinklewort (<i>Rutidosis leptorrhynchoides</i>)	Endangered	Endangered	

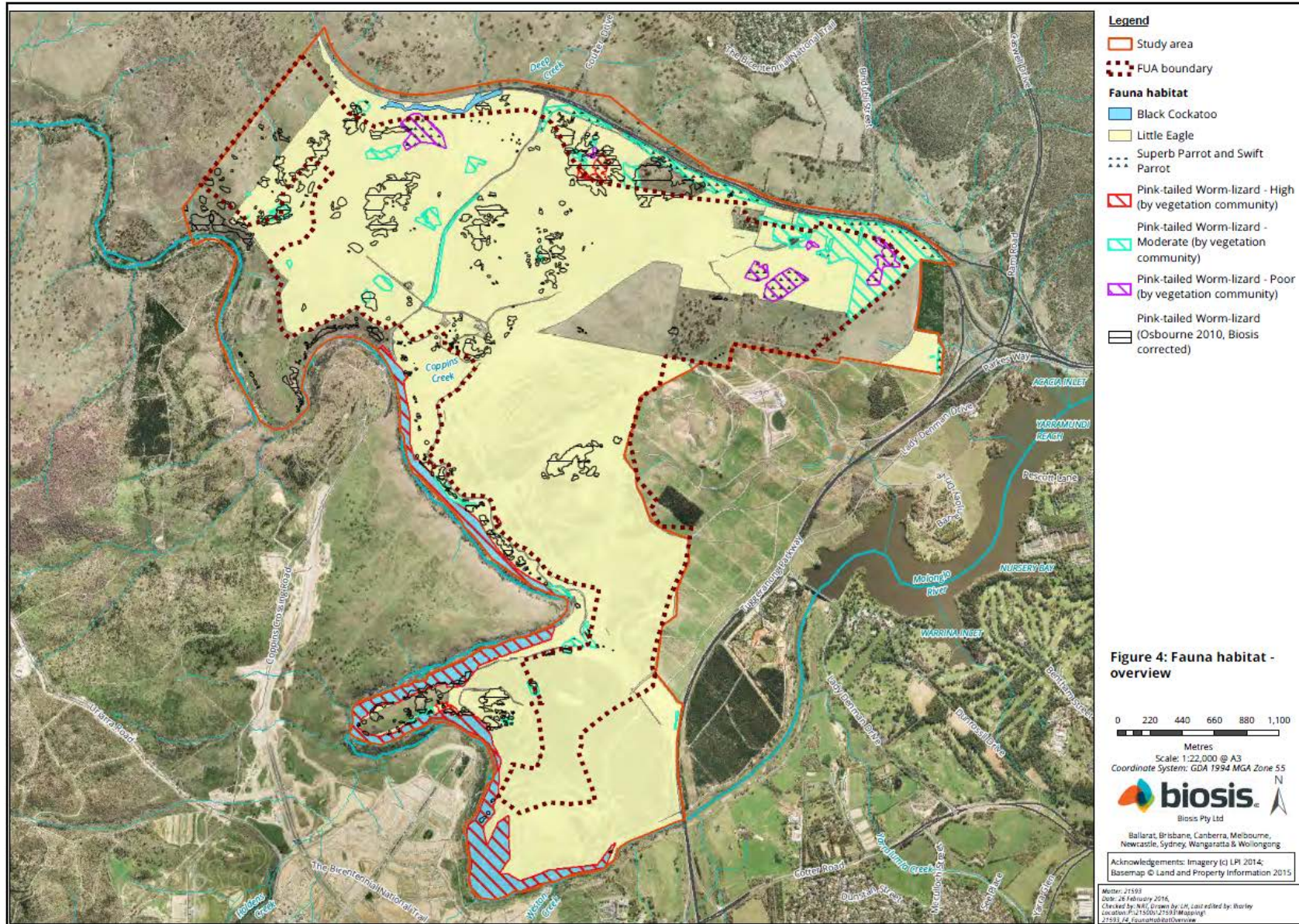


Figure 2.8 – Molonglo Stage 3 Fauna Habitat (Biosis, 2016)

Umwelt (2014)¹⁶ also undertook a review of potential habitat for all NC Act listed species within Molonglo Stage 3 not already considered by the NES Plan. A probability of likelihood was determined for the following species (Table 2.4), based on habitat availability within the FUA.

Table 2.4 – Likelihood of Occurrence of Species Not Considered in the NES Plan (Umwelt, 2014)¹⁷

Species	Status	Habitat	Likelihood of Occurrence
Birds			
Little Eagle (<i>Hieraaetus morphnoides</i>)	Vulnerable (NC Act)	Open eucalypt forest, woodland or open woodland, and riparian areas throughout the entire ACT. Require tall, living trees for nesting. This may include paddock trees in poor vegetation conditions.	Known to occur in the Molonglo valley. Unlikely to nest within Molonglo Stage 3.
Brown Treecreeper (<i>Climacteris picumnus victoriae</i>)	Vulnerable (NC Act)	Dry woodlands and open forest below 1000m. Mainly woodlands dominated by stringybarks or other rough-barked <i>Eucalyptus</i> with an open grassy understory with few shrubs. Require hollow bearing trees, coarse woody debris, stumps or dead trees. Required land size is >5 hectares, though range may be as small as 1.1 hectares. No occupancy of poor quality vegetation.	Known to occur in Kama Nature Reserve, may occur in high quality red stringybark open forest north of William Hovell Drive. Opportunistically observed in 2013 in the Arboretum Woodland area (ELA, 2014). Unlikely to occur within FUA.
Hooded Robin (<i>Melanodryas cucullata cucullata</i>)	Vulnerable (NC Act)	Prefers lightly wooded country, usually open eucalypt woodland, Acacia scrub, and mallee. Often in or near open areas. Requires structurally diverse habitats with at least patches of dense midstorey. Does not occupy poor quality vegetation. Territories range from 10-30 hectares.	Moderate potential to occur in box gum woodland.
Painted Honeyeater (<i>Grantiella picta</i>)	Vulnerable (NC Act)	Migrant species found in boree, brigalow, and box gum woodlands, and box-ironbark forests to feed on mistletoes growing in these environments. It will occupy low vegetation condition areas with paddock trees.	Moderate potential to occur in box gum woodland where mistletoes are prevalent.

¹⁶ Umwelt (2014) *Molonglo Stage 3: Major Electrical Infrastructure Relocation, Environmental and Heritage Constraints*, prepared for Brown Consulting, Canberra (August 2014).

¹⁷ All habitat information (unless otherwise specified) is from NSW OEH (2015) *Saving NSW Threatened Species* [URL: <http://www.environment.nsw.gov.au/threatenedspecies/>] and ACT Government (2015) *Information for Threatened Species* [URL: http://www.environment.act.gov.au/cpr/conservation_and_ecological_communities/information_on_action_plans]

Varied Sittella (<i>Daphoenositta chrysoptera</i>)	Vulnerable (NC Act)	Woodland and dry forests containing rough-barked species, mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland. A preference for red stringybark in the ACT region.	Known to occur in Kama Nature Reserve, may occur in high quality red stringybark open forest north of William Hovell Drive. Unlikely to occur within FUA.
White-winged Triller (<i>Lalage sueurii</i>)	Vulnerable (NC Act)	In the ACT it is found in or near open grassy woodland areas including yellow box (<i>Eucalyptus melliodora</i>), Blakely's red gum (<i>E. blakelyi</i>), apple box (<i>E. bridgesiana</i>), candlebark (<i>E. rubida</i>), or less commonly snow gum (<i>E. pauciflora</i> subsp. <i>pauciflora</i>) woodlands. Lightly timbered, with an open mid-storey layer and grassy understory (Australian Museum 2011 ¹⁸).	Known to occur in Kama Nature Reserve, may occur in high quality red stringybark open forest north of William Hovell Drive. Unlikely to occur within FUA.
Regent Honeyeater (<i>Anthochaera phrygia</i>)	Endangered (NC Act, EPBC Act); Migratory (EPBC Act)	Found in the northern ACT woodlands, open forest, and street plantings. Will occupy paddock trees in poor vegetation conditions. Preferably these woodlands have large numbers of mature trees, high canopy cover and an abundance of mistletoes.	Moderate potential to occur in box gum woodland where mistletoes are prevalent.
Invertebrates			
Perunga Grasshopper (<i>Perunga ochracea</i>)	Vulnerable (NC Act)	Found in grassland and open woodland which incorporates natural temperate grassland or secondary natural temperate grassland derived from box gum woodland. Dominant grass species include wallaby grasses, kangaroo grass, and spear grasses with forbs located in the inter-tussock spaces. May also be found in native pasture in areas of poor vegetation (ACT Government 2006 ¹⁹).	Known to occur in Molonglo River corridor; moderate in natural temperate grassland in Kama Nature Reserve. Unlikely to occur within FUA.
Plants			
Button Wrinklewort (<i>Rutidosis leptorrhynchoides</i>)	Endangered (NC Act, EPBC Act)	Occurs in box gum woodland, secondary grassland derived from box gum woodland or in natural temperate grassland. Occupies areas with little competition from herbaceous species in shallow, stony, red-brown clay loams. May colonise disturbed areas, though susceptible to grazing.	Moderate potential to occur in Kama Nature Reserve, generally at ecotones between natural temperate grassland and woodland. Unlikely to occur within FUA.

¹⁸ Australian Museum (2011) *White-winged Triller*. [URL Accessed 30/07/2014: <http://australianmuseum.net.au/White-winged-Triller/>].

¹⁹ ACT Government (2006) *Threatened Species and Communities of the ACT: Perunga Grasshopper (Perunga ochracea)*. Information Sheet. Arts, Heritage and Environment Directorate.

Canberra Spider Orchid (<i>Arachnorchis actensis</i>)	Endangered (NC Act, EPBC Act)	Occurs in transitional vegetation zones between open grassy woodland dominated by Blakely's red gum, yellow box, and snow gum and dry sclerophyll forest dominated by scribbly gum (<i>E. rossii</i>). It grows on shallow, gravelly, brown clay loam soils, often among rocks (Australian Government 2014 ²⁰).	Moderate potential to occur at ecotones between box gum woodland and dry sclerophyll forest in Block 1550, Belconnen. Unlikely to occur within FUA.
Small Purple Pea (<i>Swainsona recta</i>)	Endangered (NC Act, EPBC Act)	Occurs in the grassy understory or woodlands and forests dominated by Blakely's red gum, yellow box, candlebark (<i>Eucalyptus rubida</i>) and long-leaf box (<i>E. goniocalyx</i>). Understory dominated by kangaroo grass, poa tussocks (<i>Poa</i> spp.), and spear-grasses.	Known to occur in Block 1550, Belconnen. Unlikely to occur within FUA.
Austral Toadflax (<i>Thesium australe</i>)	Vulnerable (NC Act, EPBC Act)	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with kangaroo grass. A root parasite that takes water and some nutrient from other plants, especially kangaroo grass.	Moderate potential to occur in natural temperate grassland and box gum woodland in Kama Nature Reserve and North of William Hovell Drive. Unlikely to occur within FUA.
Tarengo Leek Orchid (<i>Prasophyllum petilum</i>)	Endangered (NC Act, EPBC Act)	Grows in open natural temperate grasslands, grassy woodland with river tussock (<i>Poa labillardierei</i>), black gum (<i>Eucalyptus aggregata</i>) and tea-trees (<i>Leptospermum</i> spp.), as well as the grassy understory of box gum woodland dominated by kangaroo grass. Generally occurs in high condition sites with a minimal grazing history.	Low potential to occur, given the grazing disturbance history of box gum woodland within the FUA.
Hoary Sunray (<i>Leucochrysum albicans</i> var. <i>tricolor</i>)	Endangered (EPBC Act)	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. Bare ground is required for germination (Australian Government 2014b ²¹).	Moderate potential to occur in a variety of habitats within the FUA.

Those species considered to have a moderate or high potential to occur by Biosis (2016) or Umwelt (2014) are discussed in detail.

Superb Parrot and Swift Parrot

The NES Plan identified that remnant patches of box gum woodland may provide habitat for superb and swift parrots.

²⁰ Australian Government. (2014a) *Species Profile and Threats Database: Caladenia actensis – Canberra Spider Orchid*. Department of the Environment [URL Accessed 30/07/2014: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=76138].

²¹ Australian Government. (2014b) *Species Profile and Threats Database: Leucochrysum albicans var. tricolor – Hoary Sunray*. Department of the Environment [URL Accessed 01/08/2014: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=56204#habitat].

Targeted superb parrot surveys in Central Molonglo (Umwelt 2015)²² confirmed the presence of superb parrots to the west of Molonglo Stage 3, and it is considered that while birds may utilise box gum woodland within the proposed offset areas to forage, it is unlikely that any breeding occurs.

Swift parrots do not breed in the ACT, however may utilise box gum woodland within the proposed offset areas for foraging.

The box gum woodland within the FUA is not considered to represent important habitat to either of these species, and any use is likely to be transitory and opportunistic. Any loss of habitat within Molonglo Stage 3 would be unlikely to result in a significant impact to either species.

Little Eagle

In 2005, a report into the potential impacts of proposed urban development on raptors in the Molonglo Valley was prepared in order to determine levels of sensitivity of raptor species in the ACT (Debus 2005²³). This report identified that little eagles are known to breed in the Molonglo Valley. Following this, E.A. Systems (EAS 2006²⁴) completed a study into the location and characteristics of raptor nesting sites in the Molonglo Valley. This included two areas identified as potential raptor nesting sites north and west of Kama Nature Reserve, and adjacent to the river corridor.

The EAS (2006) study identified that there were potentially one or two breeding territories in the Molonglo Valley, representing at least two thirds, if not all, of the known ACT breeding pairs. EAS (2006) inspected the largest box gum woodland remnant in Molonglo Stage 3 as well as Kama Nature Reserve, finding no evidence of little eagle nesting sites. There have been no subsequent records of this species within the project area.

There are no currently known little eagle nesting sites within Molonglo Stage 3, and it is considered that should this species be present within the Molonglo Valley, it is likely to occur further to the west.

Little eagle are also generally excluded by competition from other raptors, in particular wedge-tailed eagles. Anecdotal evidence of a pair of wedge-tailed eagles occupying the hills and adjacent areas around Mount Painter and the Pinnacle²⁵ would also suggest the general absence of little eagles and probability that any occurrence by that species in the Molonglo Stage 3 area would be opportunistic. Any loss of this habitat within Molonglo Stage 3 would be unlikely to result in a significant impact to this species.

Woodland Birds

Six woodland bird species listed as threatened under the NC Act are likely to occur in close proximity to the project area (north of William Hovell Drive or within Kama Nature Reserve), however only three species have the potential to occur within the project area: hooded robin, painted honeyeater, and regent honeyeater.

²² Umwelt (2015) *Monitoring of the 2014 Superb Parrot Breeding Event, Australian Capital Territory*, report to the Land Development Agency (July 2015)

²³ Debus, S (2005) *Potential Impacts of Proposed Urban Development on Raptors in the Molonglo Valley, ACT*. Report produced by Dr Stephen Debus, Division of Zoology, University of New England for the ACT Planning and Land Authority, February 2005.

²⁴ EAS (2006) *Location and Characteristics of Raptor Nesting Sites in the Molonglo Valley, ACT*. Report produced by E.A. Systems for the ACT Planning and Land Authority, January 2006.

²⁵ Pers. Obs. P Cowper, Umwelt.

With the exception of the regent honeyeater, all of these are listed as vulnerable under the NC Act, and not listed under the EPBC Act. The regent honeyeater is listed as endangered under both the NC Act and the EPBC Act, as well as migratory under the EPBC Act.

Certain habitat features are preferentially used by individual species:

- hooded robin: woody debris, stumps, patches of dense shrub cover;
- painted honeyeater: mistletoes; and
- regent honeyeater: large numbers of mature trees with mistletoes or flowering eucalypts.

These habitat features are present in all woodland and open forest patches within the project area. The majority of woodland providing these habitat features is included within offsets established by the NES Plan, as such removal of habitat for these species would be minor. Loss of habitat associated with the development of Molonglo Stage 3 would be unlikely to result in a significant impact to these species.

Threatened flora

There are five threatened flora with the potential to occur in close proximity to the project area (including north of William Hovell Drive or within Kama Nature Reserve). Only one (hoary sunray) is considered likely to occur within the project area.

Hoary sunray occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat (Australian Government 2014b). Suitable habitat may occur in all areas containing native vegetation across the project area, particularly box gum woodland and natural temperate grassland.

In 2008, Eco Logical Australia (ELA) undertook targeted survey for button wrinklewort, hoary sunray, small purple-pea and Austral toadflax within the Molonglo NES Plan Area with no records being found (ELA 2009)²⁶.

Biosis (2016) also surveyed for threatened flora. They did not identify any of the species listed above, and concluded that no further targeted surveys for flora were required. Loss of habitat associated with the development of Molonglo Stage 3 would be unlikely to result in a significant impact to these species.

Conservation Areas

The Kama Nature Reserve was established as an offset under the NES Plan. A commitment of the NES Plan was to ensure that an adequate buffer was established between the conservation area and the urban edge to prevent any long-term degradation of this area and associated MNES.

Some of the key risks for this area include:

- weed management, particularly in association with ongoing bushfire management requirements (e.g. slashing);
- bushfire asset protection;

²⁶ Eco Logical Australia (2009) *Molonglo Valley Ecological Study: EPBC Listed Flora, Ecological Communities and Golden Sun Moth Mapping in the Molonglo Valley*. Prepared for ACT Planning and Land Authority, March 2009.

- control of urban associated exotic fauna species (e.g. cats and common myna);
- headlight glare into the conservation area; and
- selection of suitable landscaping species.

This buffer area has been included in a number of investigations as mentioned above. Further assessment of any impacts will be conducted at the EDP stage of the process.

Conclusion

In terms of the accuracy and certainty of information for Molonglo Stage 3, this section has identified a few inconsistencies with the NES Plan. The NES Plan has been tested a number of times, and has been found to have some issues, which are generally expected based on the broad scale of the original assessment. The scale of the NES Plan did not define vegetation boundaries at the accuracy necessary for detailed design, and as such some refinement has been required.

More recent studies have therefore been conducted at a finer scale and have greatly improved the understanding and knowledge of biodiversity within Molonglo Stage 3, to a level of detail appropriate for consideration under the Impact Track. The current state of knowledge is considered appropriate. These more recent studies utilised for this report are highlighted with an asterisk (*) in the references list below, and included as supporting documentation to this application.

The development of Molonglo Stage 3 would result in direct impact to pink-tailed worm-lizard habitat, and box gum woodland as originally proposed by the NES Plan. It may impact on small areas utilised for foraging by woodland birds (correlating with the 2.6 hectares of impacted box gum woodland), however is unlikely to result in any significant impacts to these species. No threatened flora species are expected to be impacted by the project. It is also considered unlikely that the project area contains habitat critical to any ACT listed species.

The development of Molonglo Stage 3 would include actions to manage the urban interface with the Molonglo River Corridor, and Kama Nature Reserve, reinforcing the commitments made in the NES Plan.

In conclusion, it is considered that the impacts to protected matters listed under the EPBC and NC Acts are well understood for the project area. While some species may be present or utilise the site for foraging, the management and offset measures established under the NES Plan (see **Section 5**), particularly the retention and management of key areas of box gum woodland, would effectively mitigate impacts to these species.

References

The following assessments were reviewed in consideration of the impacts to threatened species and communities:

- The NES Plan (ACTPLA 2011);
- Molonglo Stage 3 Vegetation Classification and Condition Assessment (Biosis 2016)*;
- Mapping of Vegetation Communities East and West of Coppins Crossing within River Corridor (Butler and Associates 2012);
- Molonglo NES Plan Superb Parrot Survey – Baseline Surveys 2013 (ELA 2013)*;
- Molonglo Valley Ecological Study: EPBC Listed Flora, Ecological Communities and Golden Sun Moth Mapping in the Molonglo Valley (ELA 2009);
- Molonglo Adaptive Management Strategy (TaMS 2013);
- Molonglo Valley Vegetation Survey: Baseline Condition Assessment (Eco Logical Australia 2013);
- Vegetation Mapping for Kama Nature Reserve, Molonglo (Umwelt 2013a);

- Review of ACT Environmental Offsets Calculator Stage 2 (Umwelt 2013b)*;
- Ecological Values of Block 1550, Belconnen (Umwelt 2013c);
- Molonglo Stage 3: Major Electrical Infrastructure Relocation, Environmental and Heritage Constraints (Umwelt 2014)*; and
- Monitoring of the 2014 Superb Parrot Breeding Event, Australian Capital Territory (Umwelt 2015).

2.3.3 Part 4.3, Item 2 – Clearing of Native Vegetation

Development of Molonglo Stage 3 will result in the clearing of more than five (5) hectares of native vegetation as defined by the NC Act.

Biosis (2016) mapped the extent of native vegetation within the Molonglo Stage 3 project area (**Figure 2.9**). Molonglo Stage 3 has historically been managed as grazing land, which is apparent as the majority of the area is comprised of exotic pasture. A large proportion of the area to the south is pine plantation, also exotic. The majority of native vegetation would be protected within the offsets established under the NES Plan (**Figure 5.1**).

A total of 43 hectares of native vegetation would be impacted by the development of Molonglo Stage 3. The vegetation communities effected and the extent of the impact is outlined in **Table 2.5** below. Vegetation descriptions are from Biosis (2016).

Table 2.5 – Native Vegetation within the Future Urban Area (Biosis, 2016)

Vegetation Type	Vegetation Description	Impact (ha)
Box Gum Woodland - Moderately Modified (Critically Endangered Ecological Community (CEEC))	<p>The structural formation of the community consists of two well defined strata, a canopy layer of woodland trees up to 15 metres tall and an understorey layer comprising of herbs and grasses. A third under-developed strata was present within this community, consisting entirely of exotic shrubs. The canopy layer is dominated by yellow box (<i>Eucalyptus melliodora</i>) and Blakely's red gum (<i>Eucalyptus blakelyi</i>) interspersed with occasional apple box (<i>Eucalyptus bridgesiana</i>), all of which were mature. No juvenile eucalyptus species were evident within this community, demonstrating a lack of active recruitment.</p> <p>The community occurs in one medium sized patch atop a low hill located to the north of the eastern half of the project area. The patch is surrounded by a matrix of exotic pasture. Grazing impacts were evident throughout the margins of the community, generally being confined to the slopes and areas lacking rocky outcrops.</p> <p>The community contains potential habitat for threatened flora species, although none were detected during searches. It contains roosting, nesting and foraging habitat features, in addition to rocky outcrops that may be used by reptiles.</p>	0.3

Box Gum Woodland - Substantially Modified (not CEEC)	<p>The structural formation of the community consists of two well defined strata, a canopy layer of woodland trees up to 15 metres tall and an understorey layer comprising of herbs and grasses. The canopy layer is dominated by Blakely's red gum and brittle gum (<i>Eucalyptus mannifera</i>) interspersed with occasional yellow box, of which all were mature. No juvenile eucalypts were evident within this community, demonstrating a lack of active recruitment.</p> <p>Patches of the community were located throughout the northern and western half of the project area, in addition to the William Hovell Drive road reserve. Grazing impacts were evident throughout the margins of the vegetation patches surrounded by exotic pasture, whereas the vegetation existing in the roadside interface was highly edge affected.</p> <p>The community was considered too degraded to provide habitat for any threatened flora species. One hollow bearing tree, and some rocky outcrops were identified.</p>	0.6
Box Gum Woodland - Severely Modified (not CEEC)	<p>The structural formation of the community consists of two well defined strata, a canopy layer of woodland trees up to 15 metres tall and an understorey layer comprising predominantly of grasses. The canopy layer is dominated by Blakely's red gum intermixed with the subdominant yellow box, all of which were mature. No juvenile eucalypts were evident within this community, demonstrating a lack of active recruitment.</p> <p>The understorey consists of a depauperate representation of native grasses which are severely impacted by competitive interactions with exotic species.</p> <p>Patches of the community were located within the central and eastern half of the project area. These patches are surrounded by a matrix of exotic pasture and evidence of grazing was evident throughout the entirety of this community.</p>	12
Native Pasture	<p>This community comprises of multiple small, medium and large patches within a matrix of exotic pasture. All patches of the community are subject to an intense grazing regime primarily by cattle and sheep as well as native fauna such as the eastern grey kangaroo.</p> <p>The structural formation of the community essentially consists of two separate strata, an upper groundcover layer of native perennial grasses up to 1 metre tall and a lower groundcover layer of native perennial grasses (85%) and herbs (15%) up to 0.5 metres tall.</p> <p>The community possesses low species diversity although there is a high cover of native species. These patches display low regenerative potential and are unlikely to regain their former diversity in response to ecological restoration.</p> <p>The community contains some rocky outcrops, which may provide habitat for reptile species.</p>	22.4

Burgan Tableland Shrubland	<p>This community was also found atop a hill located in the southern end of the eastern half of the project area, as secondary regrowth after prior vegetation clearance. The patches of Burgan Tableland Shrubland growing within the vicinity of the Molonglo River have been fenced off and are protected from livestock grazing.</p> <p>The structural formation of the community consists of two well defined strata, a midstorey layer of shrubs overtopping an understorey layer of native perennial grasses and herbs up to 0.7 metres tall.</p> <p>Burgan Tableland Shrubland within the project area is not considered to provide habitat for threatened flora species known or likely to occur within the locality and no threatened species were detected during the site assessment. It contains a variety of ecological features which may form habitat for generalist species.</p>	1.4
Sedgeland	<p>Sedgeland occurs as a linear strip lining the tributary of the Molonglo River traversing the project area adjacent to its western and northern perimeter. It was also found fringing a dam located in the western half of the project area.</p> <p>The structural formation of the community essentially consists of two separate strata, an upper groundcover layer of tall sedges and a lower groundcover layer of small sedges.</p> <p>The upper groundcover layer is dominated by common fringe-sedge (<i>Fimbristylis dichotoma</i>) and cumbungi (<i>Typha</i> spp.).</p> <p>The community is not considered to provide habitat for threatened flora species known or likely to occur within the locality and no threatened species were detected during the site assessment. It contains a variety of ecological features which may form habitat for generalist species.</p>	1
Revegetated Land	<p>There is approximately 17.15 hectares of land within the wider area which is currently undergoing a revegetation and ecological restoration program administered by Greening Australia. Of this, only 3.07 hectares of revegetated land occurs within the FUA boundary, in the south-west, adjacent to the Pine Plantation.</p> <p>Species used for revegetation in this area include broad – leaved peppermint (<i>Eucalyptus dives</i>), yellow box, Blakely's red gum, snow gum, red – stemmed wattle (<i>Acacia rubida</i>), silver wattle (<i>Acacia dealbata</i>), kangaroo grass, etc.</p> <p>These areas are not considered to provide habitat for threatened flora species and no threatened species were detected during the site assessment. The Revegetated Land contains very few ecological features which may form habitat for generalist species within the locality, mainly limited foraging habitat for eastern grey kangaroos and other opportunistic species.</p>	3.1

In addition to these areas, **Figure 2.9** shows a number of 'previously assessed' areas. The hatched zone east of Kama Nature Reserve was previously mapped by ELA (2013), while the area to the west of Offset GG (refer **Figure 5.1** for offset location) was mapped by Umwelt (2013b).

ELA (2013) determined that the area east of Kama Nature Reserve was comprised exotic pasture, dominated by *Phalaris*, which is consistent with the adjacent vegetation mapped by Biosis (2016).

Umwelt (2013b) found the area to the west of Offset GG comprised approximately 31 hectares of exotic pasture, also dominated by *Phalaris*, and 2.3 hectares of low quality box gum woodland. This area would be consistent with the 'Box Gum Woodland - Moderately Modified CEEC' community in **Table 2.5**, and has been included in the overall determination of native vegetation to be impacted. This area has also been included in the impact assessment of MNES in **Section 2.3.2**.

No other areas mapped as 'previously assessed' by Biosis (2016) are within the S211 development boundary.

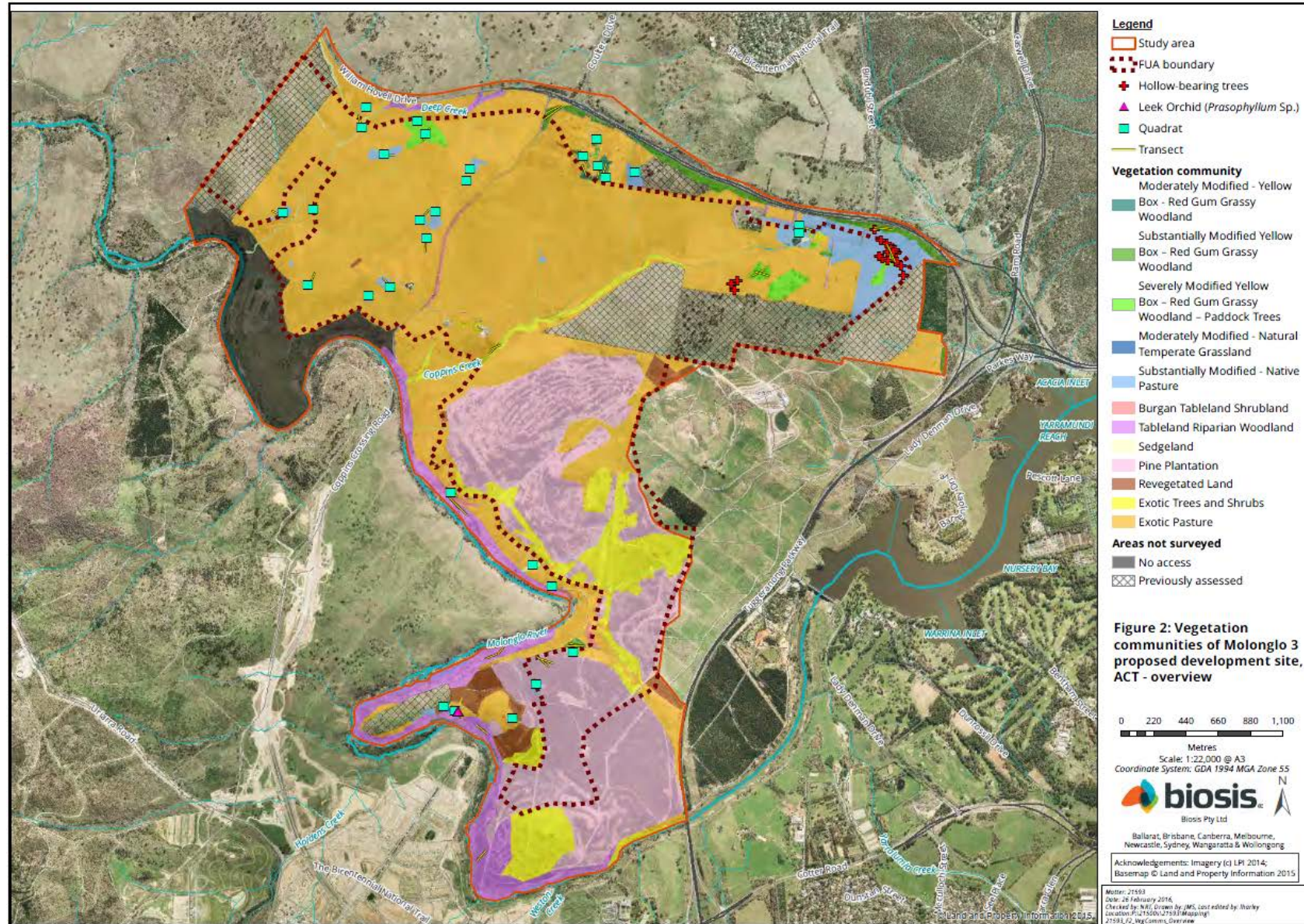


Figure 2.9 – Molonglo Stage 3 Vegetation Classification (Biosis, 2016)

This clearing of native vegetation may impact upon ecological values, diversity and species habitat and foraging opportunities. It may also reduce habitat connectivity and result in impacts to abiotic conditions such as soil and water.

The impacts associated with this action may include:

- removal of over- and mid-storey vegetation;
- removal of surface vegetation;
- soil disturbance and surface rock collection;
- introduction of weeds due to construction activities and subsequent occupation of urban areas; and
- modification of retained vegetation for the ongoing management of open space and bushfire asset protection zones.

The conservation actions, mitigation measures (including CEMPs), and offsets committed to by the NES Plan will minimise indirect impacts to adjacent native vegetation and systems, and will also protect the highest quality vegetation in the area.

The following actions will benefit native vegetation, species and ecosystems in the Molonglo District:

- weed control;
- erosion and sedimentation protection for the river corridor;
- habitat improvement and rehabilitation in proposed offset areas;
- relocation of habitat features, including rocks and logs; and
- restoration and management in river corridor.

Conclusion

Impacts to threatened ecological communities have been considered, mitigated and offset in the NES Plan. Impacts to the general environment and non-threatened flora would be managed through a CEMP to address avoidable impacts to retained and adjacent areas, minimise the spread of weeds, and prevent harm to fauna during construction. Management of environmental values during the post construction phase would be guided by operational plans implemented by the Environment, Planning & Sustainable Development Directorate (EPSDD) in relation to the Molonglo River Park and Kama Nature Reserve, as well as management of urban areas in accordance with obligations under the NES Plan and ACT legislation as appropriate.

The non-threatened woodland, native pasture and riparian vegetation are not considered to represent critical vegetation for maintaining species diversity or connectivity in the region, nor do they provide important habitat for fauna species. As such, no significant adverse impacts to native vegetation are expected as a result of the project that have not already been assessed and approved under the EPBC Act.

It is considered that the outcomes of the NES Plan appropriately account for losses to native vegetation and species.

References

The following assessments were reviewed in consideration of the impacts to native vegetation:

- Molonglo Stage 3 Development Area: Vegetation Classification and Condition Assessment (Biosis, 2016);
- Bushfire Risk Strategy Molonglo Stage 3, Denman Prospect and The Molonglo River Corridor, prepared for the Land Development Agency, Canberra (ABPP 2016)
- The NES Plan (ACTPLA 2011);
- Mapping of Vegetation Communities East and West of Coppins Crossing within River Corridor (Butler and Associates 2012);
- Molonglo Valley Ecological Study: EPBC Listed Flora, Ecological Communities and Golden Sun Moth Mapping in the Molonglo Valley (ELA 2009);
- Molonglo River Corridor Boundary Study for the NCA (Red Gum Consulting 2007);
- Molonglo Adaptive Management Strategy (TaMS 2013);
- Vegetation Mapping for Kama Nature Reserve, Molonglo (Umwelt, 2013a);
- Review of ACT Environmental Offsets Calculator Stage 2 (Umwelt, 2013b); and
- Ecological Values of Block 1550, Belconnen (Umwelt, 2013c).

2.3.4 Part 4.3, Item 4 – Impact on Environmental Value of a Natural Waterway

Development of Molonglo Stage 3 has the potential to trigger Item 4 of Part 4.3 (PD Act), by having a ‘significant adverse environmental impact on a prescribed environmental value mentioned in the territory plan (water use catchment general code) of a natural waterway or aquifer’.

This trigger was identified in the Preliminary Risk Assessment for Molonglo Valley Urban Development Stage 2 and Supporting Infrastructure (NGH, 2011)²⁷, however was not assessed in the s211 applications for the Molonglo Valley (‘Molonglo Urban Land Development and Associated Works’ (Stage 1) or ‘Molonglo Valley Stage 2 – Urban Development, Infrastructure and Link Bridge’). Regardless, it has been discussed below.

The Molonglo River from Scrivener Dam to Lower Molonglo Water Quality Control Centre (LMWQCC) has the following water use / environmental values listed in the Territory Plan:

- STOCK (water supply);
- VIEW (Passive recreation);
- AQUA/2 (Aquatic habitat – lowland stream);
- Discharge – storm water;

²⁷ NGH Environmental (2011) *Preliminary Risk Assessment Molonglo Valley Urban Development Stage 2 and Supporting Infrastructure*, report prepared for Environment and Sustainable Development Directorate, Canberra (August, 2011)

- REC/2 (Water based recreation – boating); and
- IRRIG (Irrigation Water Supply).

The Molonglo River Corridor would be protected and enhanced under the development of Molonglo Stage 3, based on commitments made in the NES Plan.

The urban development of the Molonglo Valley would, however have impacts on the use of the river for agricultural and irrigation purposes, due to the loss of rural land.

Stormwater runoff and discharge into the river would be managed during design of the suburb, with the use of water sensitive urban design (WSUD) principles and water quality ponds. The principles of WSUD including the protection of natural systems, water quality, and reducing runoff (and maintaining pre-development flows) would be met through effective design. Any runoff during construction and operation would be captured and/or treated as per ACT Government requirements, and is not expected to significantly impact aquatic habitat.

Passive and active recreation in the context of environmental values listed in the Territory Plan is expected to increase and improve with the establishment of the River Corridor Park.

Conclusion

With appropriate design, construction, and operation in accordance with ACT legislation and policy, it is considered that the development of Molonglo Stage 3 is unlikely to have significant adverse impacts on the prescribed environmental values of the Molonglo River under the Territory Plan, in fact, the treatment of runoff, and active erosion management may result in some localised improvements to water quality.

2.3.5 Part 4.3, Item 6 – Impact on a Heritage Place or Object

The Molonglo Stage 3 FUA has been assessed from a heritage perspective in two separate stages. Biosis (2012 and 2013) assessed the majority of the FUA, which was summarised by Umwelt (2014). Biosis then assessed the eastern part of the FUA, Blocks 6 and 7 Molonglo in 2014. The results of these three assessments are compiled below.

The ACT Heritage Register identifies four Aboriginal archaeological sites that have management constraints within or in the vicinity of the project area; in addition to four artefact scatters and two scarred trees [REDACTED]. Two previously recorded isolated finds [REDACTED] [REDACTED] have been salvaged and no heritage constraints remain and have therefore not been mapped or described.

Biosis (2014) noted the registered artefact scatters [REDACTED] from their search of the Heritage Register; however, these sites could not be relocated during a targeted field survey.

Biosis (2014) also identifies an Aboriginal site extent listed on the Heritage Register [REDACTED] [REDACTED] however provides no information on the significance of this site. This area would be outside the development area, and as such, impacts could be avoided.

The ACT Heritage register lists one historic structure in close proximity to the project area, Riverview (Isaac and Emily Blundell hut), which is within the Molonglo Stage 2 boundary. A second historic structure, the Kallenia Woolshed, is located within the project area, however

this woolshed has been determined to not meet any of the listing criteria for registration under the *Heritage Act 2004*²⁸.

A further two areas are listed on the ACT Heritage Register near the project area; Kama Nature Reserve and Lower Molonglo Geological Site, Stromlo. The Kama Nature Reserve is listed due to native species diversity and the endangered ecological communities present. The Lower Molonglo Geological Site is an outcrop of limestone that includes specimens of Middle Silurian (425 million BP) marine fossils. Heritage guidelines under the Heritage Act are applicable to this site, with the guiding conservation objective being 'the site shall be conserved and appropriately managed in a manner respecting its heritage significance, and any works that have a potential impact on it shall be guided by a professionally documented assessment and conservation policy'. The Geological Site is outside the Molonglo Stage 3 area, and would not be impacted by the project. [REDACTED]

In addition to sites on the Heritage Register, Biosis (2012) identified 17 previously recorded, 33 new Aboriginal archaeological sites including artefact scatters and isolated finds, and 9 new PADs within their project area.

Biosis (2014) identified an additional four artefact scatters [REDACTED] and one isolated find [REDACTED] during their site surveys. These were all assessed as being of low conservation value.

[REDACTED]

²⁸ Heritage (Decision about Provisional Registration of the [REDACTED] Molonglo Valley) Notice 2015. Notifiable instrument NI2015-558: <http://www.legislation.act.gov.au/ni/2015-558/current/pdf/2015-558.pdf>

Biosis (2013) undertook detailed sub surface testing for the project area and made a number of conclusions regarding the management of sites within Molonglo Stage 3:

- All identified Aboriginal Cultural Heritage sites located within the project area have been the subject of archaeological salvage. There are no further requirements for these sites;
- Consultation with the Aboriginal community has identified a Cultural Area [REDACTED] that requires additional management considerations due to cultural values. This area poses an area of constraint on the development and impacts to this area should be avoided. In the event that impacts to the cultural area cannot be avoided advice should be sought from the ACT Heritage Unit. Information regarding this site is restricted and confidential due to cultural sensitivities; and
- If previously unidentified archaeological artefacts or sites are located during the course of development within the project area, the process outlined in the Unanticipated Discovery Plan (UDP) should be followed.

Further Cultural Heritage assessments of Blocks 6 and 7 will be submitted to the ACT Heritage Council. This will complete the Molonglo 3 heritage assessment process. Refer to **Figure 2.11**.

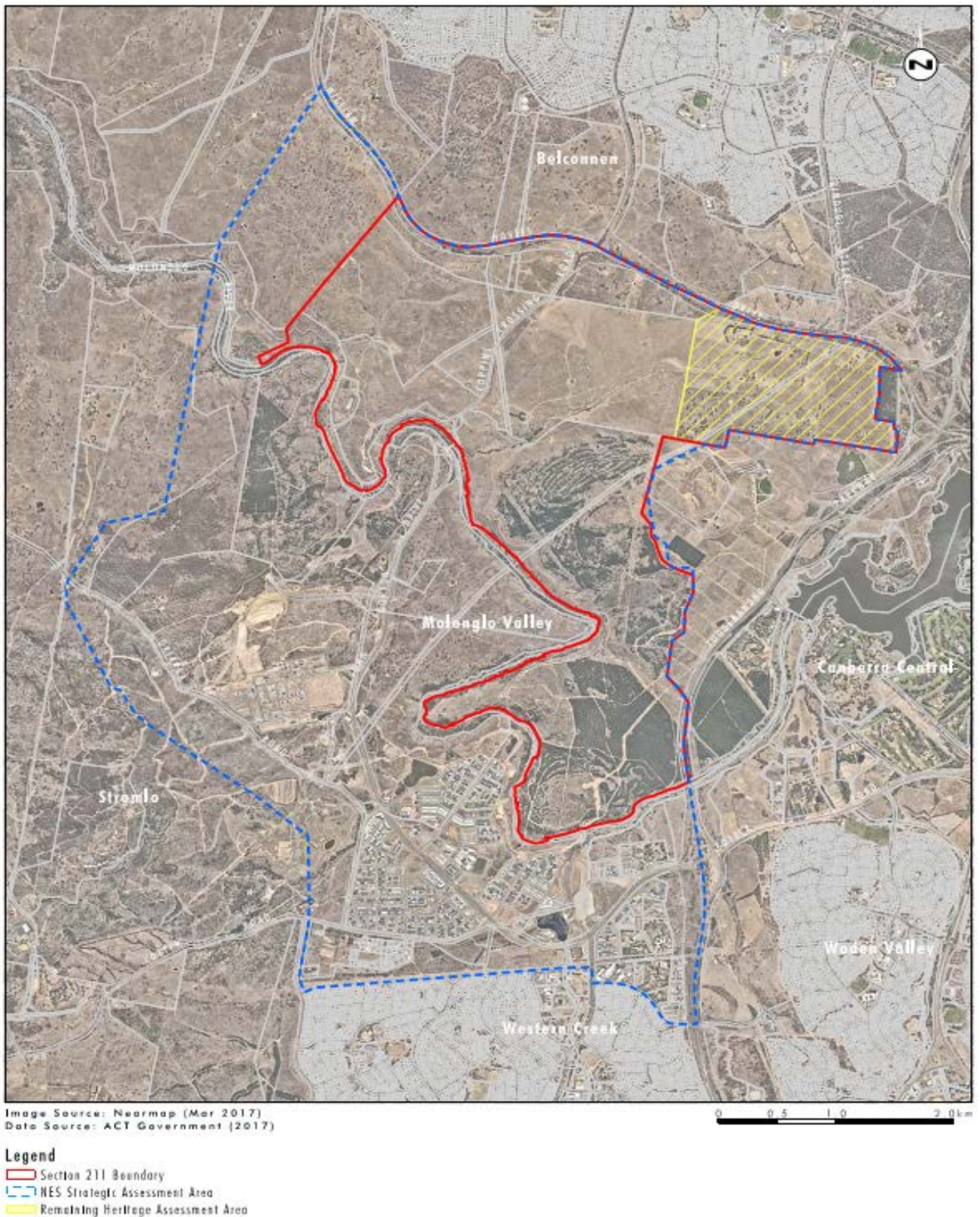


Figure 2.11 – Remaining Heritage Assessment Area

Conclusion

Based on the available information, two previously identified items listed on the ACT Heritage Register, [REDACTED] would be impacted by the development of Molonglo Stage 3. These were initially identified in 2003, yet have not been relocated in more recent surveys. Advice would need to be sought from the Heritage Council regarding the management of impact to these sites, however based on the information available, it is considered that an appropriate salvage or management program could be implemented to mitigate any potential impact associated with the removal of these two artefact scatters.

There are other heritage constraints that need to be considered during design and construction. Based on the current master plan, the Cultural Area [REDACTED] (Biosis, 2013) would be located within open space [REDACTED]. No direct impact is proposed to occur within this area; however, construction activities in proximity should be guided by a site-specific conservation management plan to prevent indirect impacts. No-go zones should also be implemented during construction, and any ongoing management of the site should involve consultation with the Representative Aboriginal Organisations (RAOs).

Should any impact to this site be required to occur, consultation would be undertaken with the Heritage Unit and RAOs prior to any works being undertaken.

All other archaeological scatters have been identified and salvaged, and an unexpected discovery plan will be implemented during construction to mitigate risk to any remaining items or sites.

The development of Molonglo Stage 3 is unlikely to result in any significant adverse impacts on items or places listed on the Heritage Register following the application of mitigation and management recommendations.

References

Studies included as supporting documentation to this application are marked with an asterisk (*).

- Molonglo Stage 3 Detailed Heritage Assessment: Aboriginal and Historic Heritage (Biosis 2012);
- Molonglo Stage 3 Future Urban Release: Sub Surface testing report and further studies (Biosis 2013)*;
- Molonglo Stage 3 Additional Areas Cultural Heritage Assessment (Biosis 2014)*; and
- Molonglo Stage 3: Major Electrical Infrastructure Relocation, Environmental and Heritage Constraints (Umwelt 2014)*.

2.3.6 Part 4.3, Item 7 – Land on the Register of Contaminated Sites

Numerous environmental site assessments have been completed within the Molonglo Stage 3 area as part of the site's due diligence assessments. The site has generally been assessed in two parts: 'Area A' – the southern half (**Figure 2.11**), and 'Area B' – the northern half (**Figure 2.12**).

A number of blocks are listed on the Environmental Protection Authority's (EPA) Register of Contaminated Sites (Robson 2014a and 2014b), including:

- Block 6, Molonglo Valley, which contains a sheep plunge dip;
- Blocks 7, 34, 46, 66, 70, 71 and 75 Molonglo Valley and Block 8 Section 3, Denman Prospect, which were previously occupied by a commercial forestry plantation; and
- Block 10, Molonglo Valley, which contains a number of disused sewage treatment ponds.

In addition to the sites listed on the contaminated sites register, there are numerous Areas of Environmental Concern (AECs) associated with the area's long use as rural land and adjacency to forestry.

These are shown in the following **Figures 2.11, 2.12 and 2.13**.

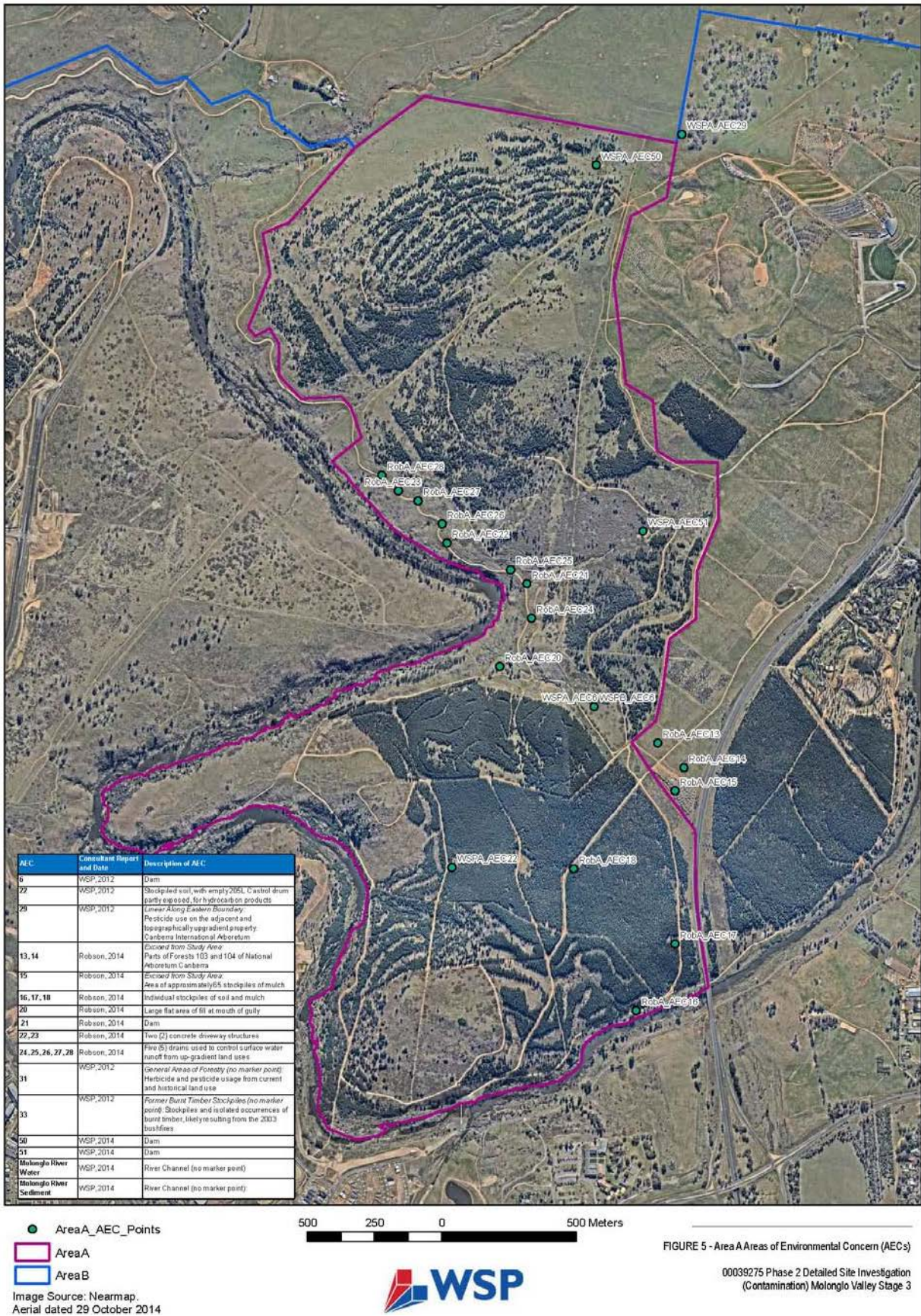


Figure 2.11 – Areas of Environmental Concern (Area A)

FIGURE 5 - Area A Areas of Environmental Concern (AECs)

00039275 Phase 2 Detailed Site Investigation (Contamination) Molonglo Valley Stage 3

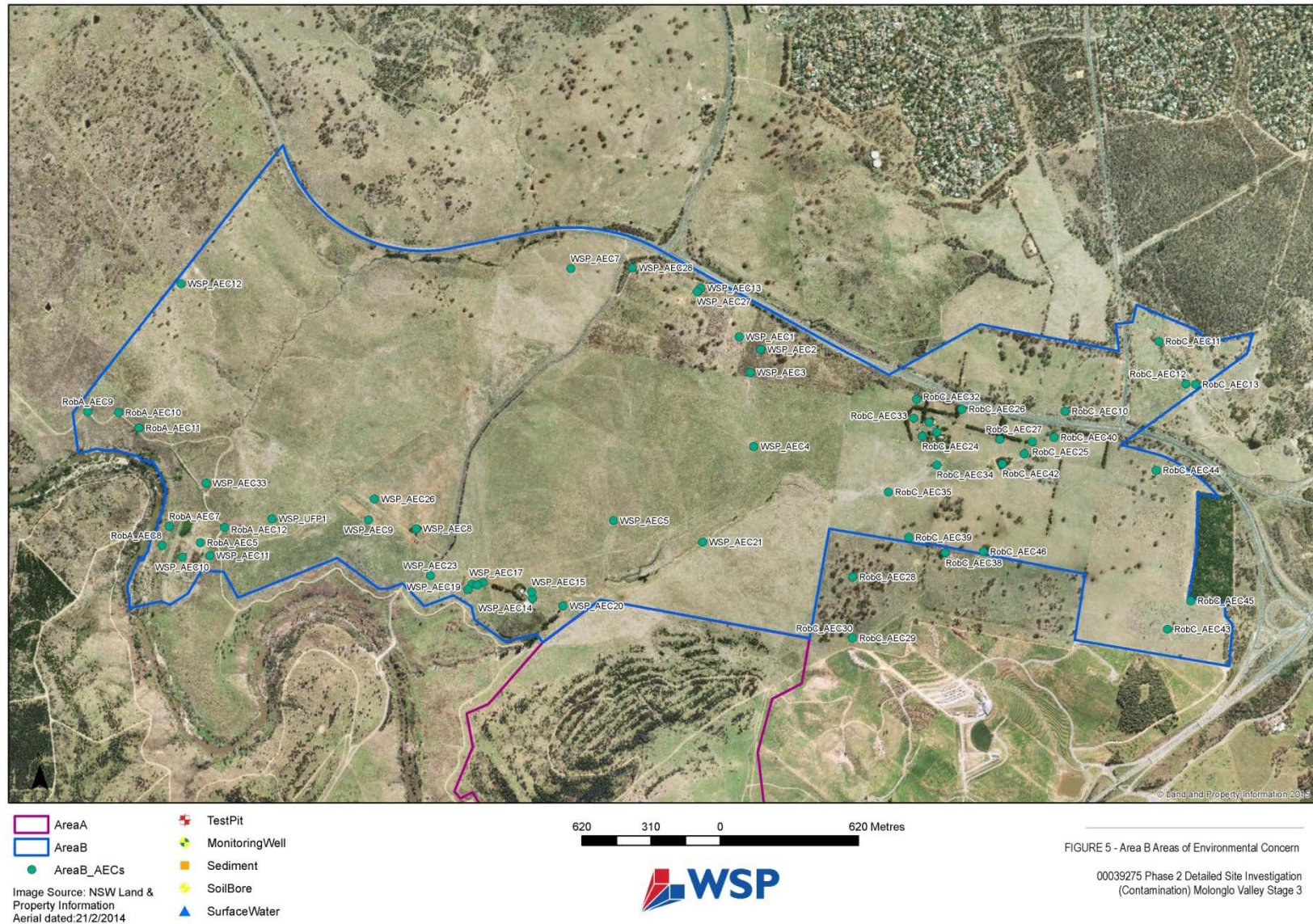
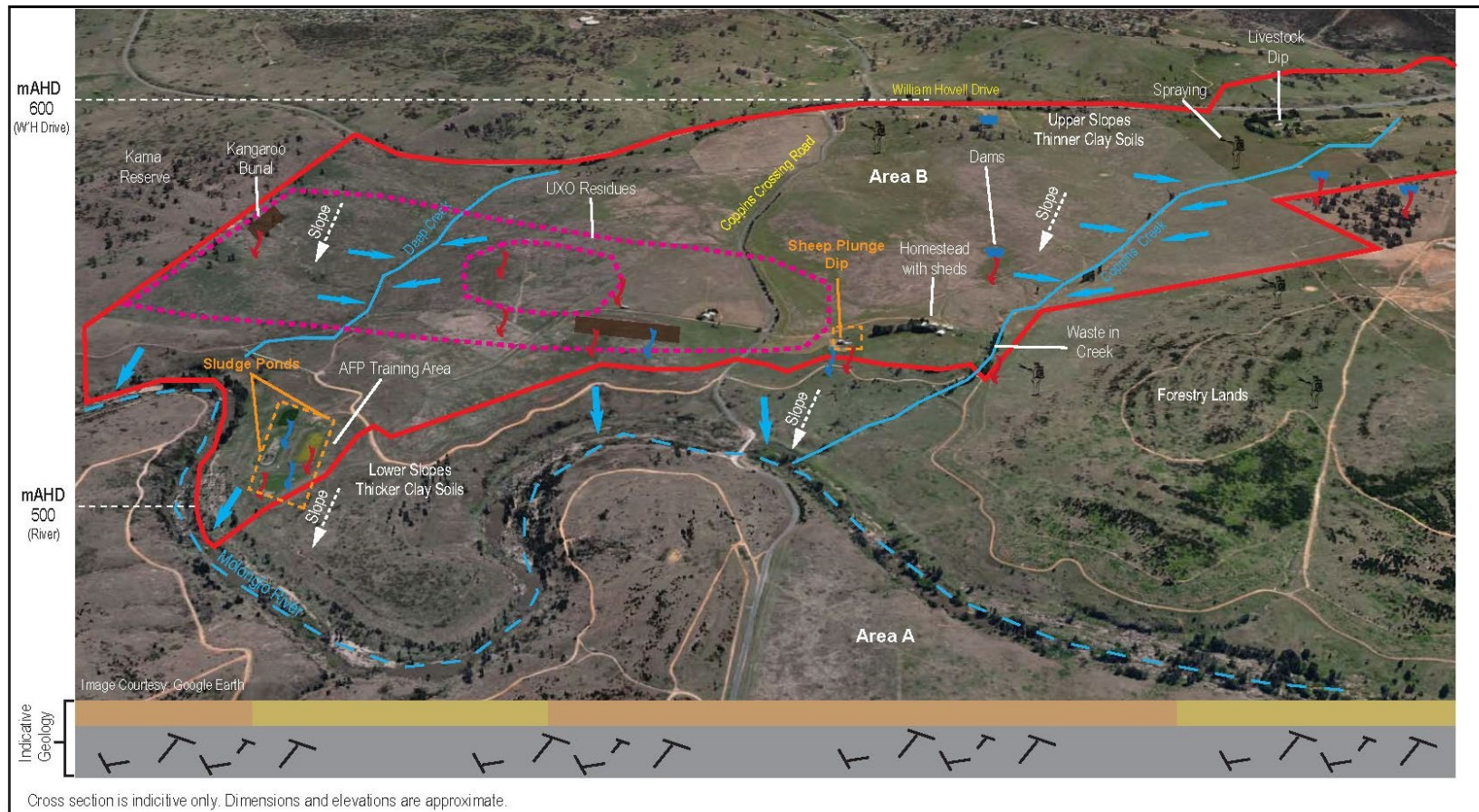


Figure 2.12 – Areas of Environmental Concern (Area B)



KEY

- | | | |
|---|--|---|
| Fill Material / Stockpiles / Livestock Burial | River | Potential Leaching of Contaminants |
| Natural clayey residual soils | Creeks | Spraying of Herbicides |
| Alluvium and Sediments | Site Boundary (approx.) | LIXO 'Impact Area' (approx.) |
| Silurian Volcanics | Horizontal groundwater flow | Remediation Areas - Sludge Ponds and Sheep Plunge Dip (approx.) |
| Fractures | Potential vertical infiltration of groundwater | |

Conceptual Site Model - Area B
 00039275 Phase 2 Detailed Site Investigation
 (Contamination) Molonglo Valley Stage 3

FIGURE 10



Figure 2.13 – Conceptual Site Model (WSP, 2015)²⁹

²⁹ WSP (2015) *Molonglo Valley Stage 3 (Area B) Stage 2 Detailed Site Investigation*, prepared for the Land Development Agency (November 2015)

Investigations Completed

Phase 2 Detailed Site Investigations (DSI) have been completed for both 'Area A' (WSP 2016a) and 'Area B' of the FUA (WSP 2016b). Further soil investigations were undertaken in the area around the 'Glenoch Property Sheep Dip' (RobC_AEC22) following the DSI (WSP 2016c).

The Phase 2 DSIs have been provided to a Site Auditor for review and endorsement. In summary of the Auditor's review of the Phase 2 DSIs, no contamination was identified in Area A and isolated areas of contamination were identified in Area B. Area A was reported to have several areas of filling (with anthropogenic inclusions potentially posing aesthetic issues) and some in-situ asbestos piping (water transfer piping) (WSP 2016a). Area B was reported to have areas of filling and three areas were identified as requiring soil remediation (WSP_AEC10: Former Sludge Ponds; WSP_AEC18: Livestock Plunge Dip and RobC_AEC22: Livestock Plunge Dip) due to elevated heavy metals (such as arsenic) and petroleum hydrocarbons (WSP 2016b) (noting the conclusions regarding RobC_AEC22 reflect the soil investigations conducted subsequent to the DSI (WSP 2016c)). It is noted that the contaminated sludge ponds are situated within the existing river corridor, and are, therefore, not within the FUA.

The Auditor recommended that a CEMP with an Unexpected Finds Protocol be prepared to manage areas of anthropogenic fill, contamination associated with localised surface staining, and any additional fill that may be encountered during the construction phase.

The Auditor concurred with WSP's conclusion that a remedial action plan (RAP) was required to manage contamination identified in Area B namely WSP_AEC18 and RobC_AEC22 (livestock plunge dips), WSP_AEC10 (sludge ponds), as well as localised hydrocarbon impacts (WSP 2016a; 2016b; and 2016c). This RAP has since been prepared.

The overarching conclusion was that Molonglo Stage 3 could be made suitable for future urban use and open space along the Molonglo River riparian corridor subject to these actions.

Molonglo Stage 3 also may contain unexploded ordnance (UXO) and explosive ordnance waste (EOW) associated with historical Department of Defence field firing ranges dating to the First World War period. A UXO Assessment was undertaken (Milsearch 2014)³⁰, which recommended the completion of a 100 per cent geophysical UXO survey and remediation prior to site works commencing. Subsequently a geophysical survey and remediation of UXO was undertaken across 195 hectares of the FUA, which was considered to meet this recommendation (Milsearch 2015)³¹. A small number of areas were not included in the survey and remediation works due to access restrictions. These areas would be assessed and remediated prior to any construction activities commencing.

Current Risk and Status

Following complete review of both DSIs by the Site Auditor, audit statements will be submitted to the EPA for approval.

No remediation is proposed to be completed prior to development, as it will be included as part of the civil works program. However, small areas excluded from previous UXO assessments UXO will require final clearance at the pre-development earthworks stage.

³⁰ Milsearch (2014) *Post Activity Report UXO Contamination Assessment: Molonglo Development Stage 3*, prepared for the Land Development Agency (2014)

³¹ Milsearch (2015) *Post Activity Report, Molonglo Stage 3 Urban Development: Geophysical Survey and Remediation of Unexploded Ordnance*, prepared for the Land Development Agency (April 2015)

Given remediation has not been completed, the PRA in **Appendix 1** reflects that this is a current risk, which will need to be managed during design and construction. Following implementation of all recommended remediation and mitigation measures, the residual risk is expected to be low.

Conclusion

The trigger for impact track assessment related to contaminated sites is based on presence of areas listed on the register of contaminated sites. As the Molonglo Stage 3 area contains sites listed on the register, it triggers this item.

Extensive assessment has been completed within Molonglo Stage 3 in regards to this contamination risk. It is considered that risks are well understood, and remediation actions are planned which will result in the area being made suitable for urban use.

Management plans have been prepared, or are in preparation to minimise any ongoing risk during construction of the project.

There are not considered to be any major information gaps associated with this item, and it is considered that the risk would not be further reduced by the preparation of an EIS.

References

- Phase 1 Environmental Site Assessment: Areas A and B, Molonglo Valley Stage 3, ACT (Robson 2014a);
- Phase 1 Environmental Site Assessment: Area C, Molonglo Valley Stage 3, ACT (Robson 2014b);
- Phase 1 Environmental Site Assessment, Molonglo Valley Stage 3 (WSP, 2012);
- Phase 2 Environmental Site Assessment, Molonglo Stage 3 Infrastructure Corridor (AECOM, 2013);
- Post Activity Report UXO Remediation and Contamination Assessment Survey: Molonglo Development Stage 3 Priority Works (Milsearch 2013);
- Post Activity Report UXO Contamination Assessment: Molonglo Development Stage 3 (Milsearch 2014);
- Post Activity Report, Molonglo Stage 3 Urban Development: Geophysical Survey and Remediation of Unexploded Ordnance (Milsearch 2015);
- Molonglo Valley - Preliminary Geotechnical and Environmental Constraints Study (Coffey 2005); Sampling and Analysis Quality Plan (SAQP) for Phase 2 ESA Molonglo Valley Stage 3, ACT (WSP 2012);
- Molonglo Valley Stage 3 (Area B) Stage 2 Detailed Site Investigation (WSP 2015);
- Molonglo Valley Stage 3 (Area A) Stage 2 Detailed Site Investigation (WSP 2016a);
- Molonglo Valley Stage 3 (Area B) Stage 2 Detailed Site Investigation (WSP 2016b); and
- Letter Report on Investigation of Soils around the Glenoch Property Sheep Dip located within Molonglo Valley Stage 3 Future Urban Area ("Area B"), Block No. 6 (WSP 2016c).

3.0 Description of Nature Conservation Values

Is the location important in maintaining existing processes or natural systems of the ACT?

The project area is located directly to the north of the Molonglo River, the major river system that runs through the centre of Canberra, which is an important natural system in the ACT. It is also located directly adjacent to Kama Nature Reserve to the west. Both the Molonglo River corridor and Kama Nature Reserve contain substantial ecological values and contribute to landscape connectivity, as illustrated in the modelling commissioned by the ACT Government (August, 2012)³² in **Figure 3.1**.

The project area in isolation is not considered particularly important in maintaining existing processes, and does not contain any significant movement corridors or natural systems. Its proximity and contribution to the larger landscape of the Molonglo River Corridor warrants management and protection during construction and operation. This can be managed through the existing requirement for CEMPs on all construction sites.

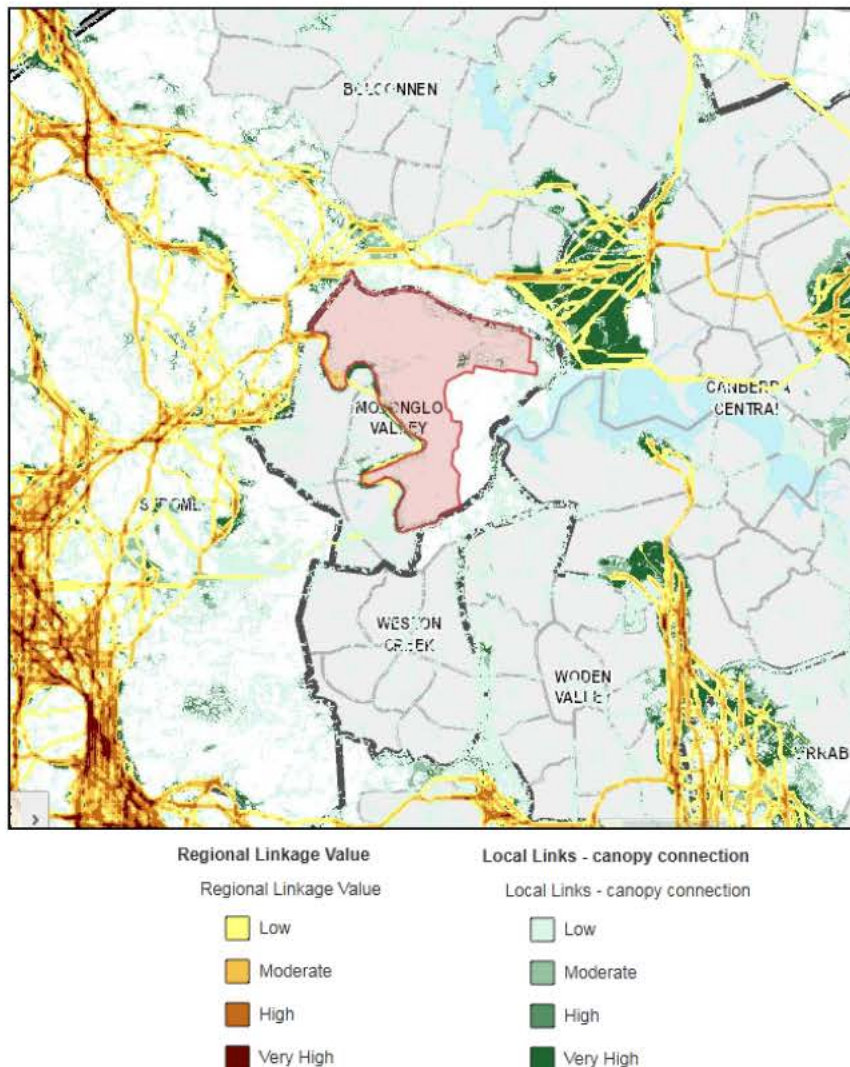


Figure 3.1 – Regional and Local Connectivity
(Source: ACTMAPi, 2014)

³² Barrett, T and Love, J (2012) *Draft Fine Scale Modelling Of Fauna Habitat And Connectivity Values In The ACT Region*, Unpublished report by NSW Office of Environment and Heritage, prepared for Conservation Planning and Research, ACT Government, Canberra (August, 2012)

Is the location important in exhibiting unusual richness of diversity of flora, fauna or landscapes?

Historically, much of the Molonglo Stage 3 area would have contained a range of woodland communities and at lower altitudes, potentially areas of natural grasslands. Directly adjacent to the Molonglo River, riparian shrubland and river she-oak (*Casuarina cunninghamiana*) open forest communities were dominant; which now persist in a disturbed state in a mosaic with exotic riparian vegetation such as crack willow (*Salix fragilis*).

Due to historic land clearing, only small patches of woodland remain, generally with a non-diverse native understorey, often forming a mosaic with annual or perennial exotic pasture grasses. Most open areas are dominated by phalaris (*Phalaris aquatica*), although patches dominated by native grasses persist in some areas.

Given these characteristics, the project area is not considered important in exhibiting unusual richness of flora, fauna or landscapes.

Is the location important in its possession of uncommon, rare or endangered flora, fauna, communities, natural landscapes or phenomena?

The project area contains a number of endangered fauna species, and vegetation communities as discussed in **Section 2.3.2**.

There are a number of rocky outcrops in the project area which are considered to represent pink-tailed worm lizard (*Aprasia parapulchella*) habitat of various qualities.

Patches of box gum woodland are also scattered throughout, which provides potential habitat for a number of additional flora and fauna species.

The most valuable areas in the Molonglo Valley were, however, identified and set aside as offsets or avoidance areas under the NES Plan, and it is considered that the remaining areas of Molonglo Stage 3 are highly modified from their agricultural use, and despite the presence of uncommon species, do not represent an important location for their conservation.

Development in accordance with the NES Plan has been determined to represent an appropriate balance between biodiversity conservation and urban intensification. Accordingly, those areas affected by the urban footprint are not considered important with respect to its characteristic biological and natural landscape characteristics or other related phenomena.

Is the location important in demonstrating the principal characteristics of the range of landscapes, environments or ecosystems, the attributes of which identify them as being characteristic of their class?

Molonglo Stage 3 is not considered important in demonstrating the principal characteristics of any landscapes, environments or ecosystems. It contains some remnant woodland community, however in general, is typical of the agriculturally modified landscape of the ACT and southern tablelands in general.

The broader area within which the project area is situated is characterised by a sequence of vegetation that transitions from the dry forest / woodland communities on the upper slopes through to box gum woodland, then natural grasslands on lower elevations. Dissecting these otherwise natural areas are expansive areas of pastoral land that has been affected to varying degrees by vegetation removal, principally trees, in addition to pasture improvement in places. This sequence of vegetation communities and modified landscapes has become

increasingly uncommon as a result of fragmentation and past removal of native vegetation for pastoral activities. The more intact areas of native vegetation demonstrating a catenary sequence of vegetation community transitions have already been retained or avoided in the conservation reserve or offset network associated with the broader Molonglo valley NES Plan.

The project area contributes only a limited extent to this by containing fragmented remnants of native vegetation. Development within Molonglo Stage 3 would not affect the current vegetation community sequence demonstrated within largely intact sequences such as within the Pinnacle - Kama Nature Reserve corridor.

Is the location important for information contributing to a wider understanding of the ACT's natural history, by virtue of its use as a research site, teaching site, type locality, reference or benchmark site?

The site is not considered of particular importance for contributing to a wider understanding of the ACT's natural history. The key areas of ecological and landscape value in the Molonglo Valley, namely the Kama Nature Reserve and the Molonglo River Corridor, are being conserved under the commitments of the NES Plan. It is not considered that the area of Molonglo Stage 3 retains any representative natural history values, not already represented within protected areas.

4.0 Decision under the EPBC Act

On 16 September 2008 the Federal Minister and the ACT Minister for Planning announced that a Strategic Assessment of the Molonglo and North Weston Structure Plan would be undertaken in accordance with section 146 of the EPBC Act.

The decision was amended to include the preparation and strategic assessment of *Molonglo Valley Plan for the Protection of Matters of National Environmental Significance* (the NES Plan), so as not to unduly constraint the Structure Plan's implementation.

On 7 October 2011, the Federal Environment Minister endorsed the NES Plan. The endorsement of the NES Plan allowed the Federal Environment Minister to consider giving approval to actions or class of actions that are taken in accordance with the endorsed Plan.

On 20 December 2011, the Federal Environment Minister approved actions associated with urban development in East Molonglo as described in the endorsed NES Plan.

Any activities outside the NES Plan Area, including road realignments, transmission line realignments and pipelines on land to the north of William Hovell Drive have not been subject to assessment or approval under the EPBC Act, and as such are not currently included within the scope of this assessment. A self assessment can be completed for these activities once sufficient detail has been gathered to allow consideration of ecological and heritage matters, to determine whether a separate EPBC Referral and/or Impact Track assessment is required.

5.0 Measures to Avoid, Mitigate and Offset

The net impact of development on the biodiversity of Molonglo Stage 3 was considered under the NES Plan, as part of avoidance, mitigation and offset measures for MNES.

The Kama Nature Reserve, the Molonglo River Corridor, and 'Block GG' (**Figure 5.1**) were established as offsets under the NES Plan. These offsets, and those located south of the river in Molonglo 2 were established to compensate for the unavoidable impacts from the development of the entire Molonglo Valley development.

The following conservation measures (**Table 5.1**) were also identified in the NES Plan to mitigate, manage and maintain/improve ecological values within the Molonglo Valley.

Table 5.1 – Conservation Outcomes from the NES Plan
(Source: NES Plan, 2011)

MNES	Conservation Outcomes from NES Plan
Box Gum Woodland	<ul style="list-style-type: none"> · Impacts to Box Gum Woodland will be limited to a maximum of 110 ha and a range of measures will be implemented to minimise this area of impact. · Three offset sites will be established within the strategic assessment area (Kama Nature Reserve, Molonglo River Park, Patch GG) that will provide for the long term protection of 234 ha of Box Gum Woodland. The three offset sites will be adaptively managed to maintain and enhance the ecological condition of the Box Gum Woodland that occurs there. · Adaptively manage 28 ha of Box Gum Woodland within the strategic assessment area to maintain and enhance its ecological condition. This will be made up of patches C, H and N. · Adaptively manage 45.4 ha of Box Gum Woodland within the strategic assessment area to maintain its ecological condition. This will be made up of patches I, L, M and P. · Maintenance and enhancement of the Box Gum Woodland that occurs within the West Molonglo component of the strategic assessment area. · Improving and applying the knowledge about the management of Box Gum Woodland.
Natural Temperate Grassland	<ul style="list-style-type: none"> · No direct or indirect impacts to natural temperate grassland. · Adaptive management of the natural temperate grassland that occurs within the Kama Nature Reserve to maintain and enhance its ecological condition.
Pink Tailed Worm Lizard	<ul style="list-style-type: none"> · Impacts to high and moderate quality PTWL habitat will be limited to a maximum of 27 ha and a range of measures will be implemented to minimise this area of impact. · Two offset sites will be established within the strategic assessment area (Kama Nature Reserve and the Molonglo River Park) that will provide for the long term protection of 66 ha of high and moderate quality PTWL habitat. These areas will be adaptively managed to maintain and enhance the ecological condition of the PTWL habitat that occurs there. · Continued protection of 28.1 ha of high and moderate quality PTWL habitat within the Lower Molonglo Nature Reserve. These areas will be adaptively managed to maintain the ecological condition of the PTWL habitat that occurs there. · Protection of an additional 23.3 ha of high and moderate quality PTWL habitat within the strategic assessment area outside of the development and offset areas. These areas will be adaptively managed to maintain and enhance the ecological condition of the PTWL habitat that occurs there. · Improving and applying the knowledge about the management of PTWL.

Superb Parrot and Swift Parrot	The most important conservation outcome for these species is the protection and ongoing management of the Kama Nature Reserve which includes approximately 117 ha of Box Gum Woodland. Most of the Box Gum Woodland in the reserve includes a healthy and diverse overstorey which provides potential habitat for the Superb and Swift Parrots.
General Environmental Impacts	<ul style="list-style-type: none">· Develop construction environmental management plans (CEMPs) to manage indirect impacts of construction· Develop and implement conservation management plans· Fund and undertake research projects.

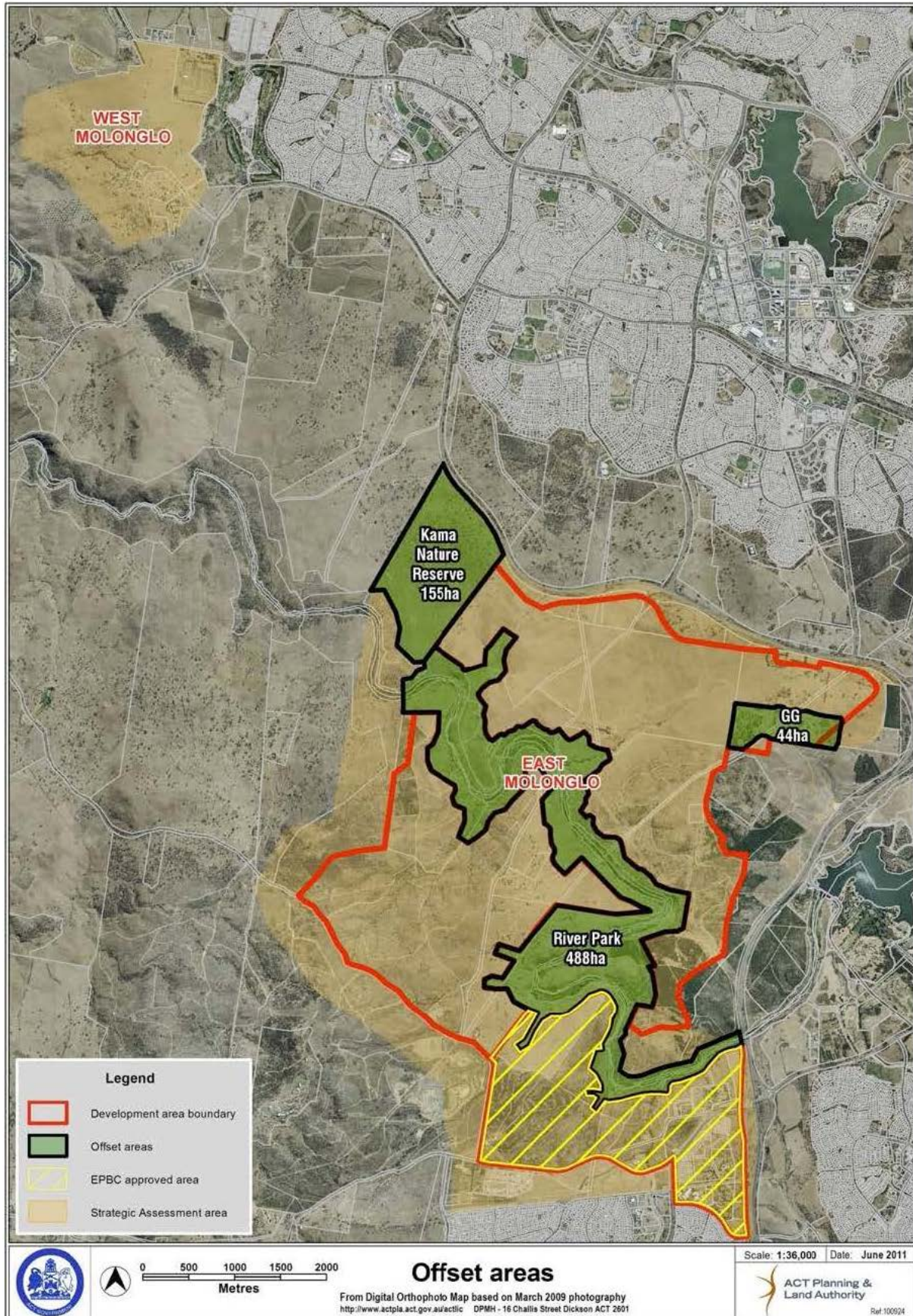


Figure 5.1 – NES Plan: Offset Areas
(Source: ACTPLA, 2011)

In addition to biodiversity, this report considers impacts to heritage, general environmental values (clearing of native vegetation, contaminated sites, amenity and waterways), and potential impacts due to the type of development proposed. Mitigation and management measures for design, construction and operational phases of the project for all environmental aspects are identified in the PRA attached as **Appendix 1**. The majority of impacts can be mitigated through environmental management to be implemented during construction as discussed in the PRA. High level mitigation will also be realised through detailed design.

The key risks (rated 'high' or above) prior to the application of mitigation measures, associated with the development are outlined in the following **Tables 5.2, 5.3 and 5.4**.

Table 5.2 – Summary of Key Risks: Design Phase

Activity	Risk	Mitigation (Summary)
Design Development	Development footprint exceeds the approved Strategic Assessment Area, resulting in potential non-compliance with EPBC Approval.	<ul style="list-style-type: none"> identify any required works (including services) to be undertaken outside Strategic Assessment Area, or within areas protected in the NES Plan seek EPBC Approval for any additional significant impacts to MNES (or implement adaptive management strategy)
	Changes to surface drainage result in changes to the water quality of the Molonglo River	<ul style="list-style-type: none"> incorporate Water Sensitive Urban design (WSUD) principles and water quality considerations in drainage design design stormwater system to ensure site runoff does not flow across retained areas of pink-tailed worm lizard habitat treat stormwater prior to entering Molonglo River
	Design of ecological buffer between Kama Nature Reserve and urban area is not adequate, and results in adverse impacts to the value of the conservation area	<ul style="list-style-type: none"> final urban edge of Molonglo 3 to be determined at EDP stage, in consultation with relevant Government agencies.
	Design of urban area results in loss of pink-tailed worm-lizard habitat	<ul style="list-style-type: none"> gain approval under EPBC Act for impacts to pink-tailed worm-lizard (complete) gain approval under PD Act for impacts to pink-tailed worm-lizard (underway) implement avoidance and mitigation measures specified in NES Plan Compensate for unavoidable impacts through offsets identified by the NES Plan
	Design of urban area results in loss of box gum woodland	<ul style="list-style-type: none"> gain approval under EPBC Act for impacts to box gum woodland (complete) gain approval under PD Act for impacts to box gum woodland (underway) implement avoidance and mitigation measures specified in NES Plan Compensate for unavoidable impacts through offsets identified by the NES Plan

	Design of urban area results in the loss of native vegetation	<ul style="list-style-type: none"> gain approval under PD Act for impacts to native vegetation (underway) minimise clearing footprints in areas of native vegetation manage urban interface with retained natural areas to prevent flow-on impacts <p>Compensate for unavoidable impacts through offsets identified by the NES Plan</p>
	Design of urban area results in loss of habitat for woodland birds	<ul style="list-style-type: none"> implement avoidance and mitigation measures specified in NES Plan <p>Compensate for unavoidable impacts through offsets identified by the NES Plan</p>
	Integration of heritage values of Cultural Area into urban landscape not appropriate and results in adverse impacts to the value of the site	<ul style="list-style-type: none"> consult with Heritage Unit regarding ongoing management of site and surrounding areas develop a conservation management plan and unanticipated discovery plan for implementation during construction engage with RAO's if any impact likely to occur
	Design of facilities and urban development adjacent to the river corridor and western edge results in adverse impacts to otherwise avoided or retained ecological values prescribed in the NES Plan	<ul style="list-style-type: none"> Masterplan to be considerate of ecological values in adjacent areas, including sympathetic adjacent land uses and adequate open space buffers
	Alignment of powerline infrastructure results in loss of developable land for easements and setbacks	<ul style="list-style-type: none"> undertake detailed design and options analysis of powerline alignment to ensure that loss of developable land is minimised (underway)
	Location of urban edge requires bushfire mitigation works outside of the Kama Nature Reserve, with potential impacts on conservation values	<ul style="list-style-type: none"> establish a (minimum) 60 metre inner asset protection zone urban edge development to be designed in consultation with relevant emergency services agencies and land managers responsible for implementing post-construction obligations under the NES Plan at EDP stage appropriate management regimes and bushfire asset protection zones to be established within and around urban area with consideration to conservation values in Kama NR
	Management of Strategic Fire fighting Advantage Zones (SFAZ) in Kama Nature Reserve	<ul style="list-style-type: none"> implement the Kama Operation Plan for any bushfire or maintenance works required within the reserve establish sensitive mowing regime to be undertaken
Engineering inspections, service location and site selection	Water infrastructure (including ponds and water main) are located within areas avoided by the NES Plan, or outside the strategic assessment area, potentially resulting in additional impacts to MNES and non-compliance with EPBC Approval	<ul style="list-style-type: none"> consult with C'wlth (DoEE) for any impacts (permanent or temporary) within areas protected by the NES Plan gain EPBC Approval for any impacts outside the approved area if MNES are identified seek approval under PD Act for any infrastructure outside the scope of this

		S211
	Siting of powerlines result in aesthetic impacts to the future residential areas	<ul style="list-style-type: none"> undertake detailed design and options analysis of powerline alignment to ensure that visual impacts and encroachment on urban area is minimised (underway)
	Existing road network does not have capacity to service new development	<ul style="list-style-type: none"> undertake traffic planning studies early in design process to ensure capacity of roads to handle additional traffic implement recommendations of studies prior to occupation of suburbs
	Subsurface conditions that may impact construction activities (contamination and UXO) not identified and inappropriate design concepts developed as a result	<ul style="list-style-type: none"> implement recommendations of assessment prior to construction commencing include provision for remediation in project budget
Approvals	Approval process delays construction of critical road infrastructure and connections required to service Molonglo 1 and 2	<ul style="list-style-type: none"> consult with EPSDD during design development to ensure clear communication of project timeframes and needs consider assessing critical roads separately if delays are expected
	Land acquisition process results in delays and community complaints	<ul style="list-style-type: none"> commence negotiations with landholders as soon as possible

Table 5.3 – Summary of Key Risks: Construction Phase

Activity	Risk	Mitigation (Summary)
Vegetation and Habitat Clearing	Vegetation clearing results in the loss of pink-tailed worm lizard habitat, box gum woodland, potential threatened bird and flora habitat, and native vegetation	<ul style="list-style-type: none"> implement mitigation measures in NES Plan, including preparation of a CEMP, weed control, and erosion and sediment control undertake habitat improvement and rehabilitation within offset areas, relocation of habitat features and restoration and management within river corridor prevent indirect additional impacts through comprehensive construction management plans
	Edge impacts or unauthorised clearing to vegetation communities adjacent to project area (e.g. in Kama Nature Reserve or the River Corridor) increases extent of MNES disturbed and requires additional restoration / remediation works	<ul style="list-style-type: none"> clearly mark limits for clearing prior to any construction commencing develop and implement industry best practice CEMP reseed disturbed areas with native grass mix where possible, particularly adjacent to areas of box gum woodland develop and implement management plans to avoid or minimise environmental risks (e.g. sedimentation, erosion, weeds, storm water runoff, etc.) monitor adjacent areas of box gum woodland during the construction phase

	Vegetation clearing results in a loss of visual amenity, particularly related to the prescribed environmental values of the Molonglo River	<ul style="list-style-type: none"> develop and implement industry best practice CEMP which includes rehabilitation/landscaping plan incorporate landscaping buffers and visual screens into design/construction plan for early establishment of landscaping features implement concepts in the Molonglo River Park Concept Plan Report (Hassell, 2012)
Site Access and Management	Increased volumes of construction traffic on William Hovell Drive and construction of road connections results in traffic disruptions	<ul style="list-style-type: none"> develop and implement industry best practice CEMP which includes construction traffic management plan
General Construction Activities	Discovery of previously unidentified contaminated soil during construction results in delays to program or increased costs due to remediation	<ul style="list-style-type: none"> undertake remediation of contaminated sites, as part of the Civil Works Contract in line with the RAP develop and implement an Unexpected Finds Protocol for all earthworks and construction activities on site, including training personnel in the procedure
	Construction activities impact upon the Aboriginal Cultural Area	<ul style="list-style-type: none"> implement conservation management plan and unanticipated discovery plan for implementation during construction define boundaries and no-go zones during construction
	Discovery of previously unidentified UXO during construction results in delays to program, increased costs due to remediation, and health and safety risks to personnel	<ul style="list-style-type: none"> implement recommendations of UXO assessment prior to construction commencing develop and implement an unexpected finds procedure for use during construction, and include training in site inductions and toolbox talks
	Sparks from machinery during construction may catch on dry grass and have the potential to start a bushfire	<ul style="list-style-type: none"> observe seasonal and daily fire hazard warnings issued by the ACT Emergency Services Agency. Do not work on extreme fire danger days implement an approved bushfire hazard management plan during construction and operation include fire prevention and fire control instructions in site inductions
Sustainability	Earthworks, vegetation clearing and construction activities result in release of sequestered carbon and greenhouse gases	<ul style="list-style-type: none"> include an assessment of carbon balance in environmental assessment to identify appropriate offsetting measures to be incorporated into the project design or managed separately consider carbon offsetting measures if appropriate
	Decommissioned power poles not disposed of appropriately	<ul style="list-style-type: none"> ensure decommissioning process has associated disposal plan, including recycling and reuse of components where possible to minimise waste to landfill

Table 5.4 – Summary of Key Risks: Operational Phase

Activity	Risk	Mitigation (Summary)
Public health and safety concerns	Contamination not fully remediated	<ul style="list-style-type: none"> undertake all necessary contamination assessments and remediation to ensure area is appropriate for proposed land use (complete and/or underway) engage a site auditor to have oversight of contamination remediation
	Health impacts result from high voltage powerlines in urban area	<ul style="list-style-type: none"> undertake an electromagnetic radiation (EMR) study to ensure that health limits would not be exceeded for the powerline alignment (completed)
Maintenance	Increased run off from impervious surfaces, such as car parks and roads, as well as landscaped areas impacts on water quality of Molonglo River	<ul style="list-style-type: none"> maintain water treatment systems during operation to ensure water quality entering Molonglo River is within EPA guidelines
	Commitments for habitat improvement and management of adjacent areas made in NES Plan are not achieved	<ul style="list-style-type: none"> undertake habitat improvement and rehabilitation within offset areas, relocation of habitat features and restoration and management within river corridor ensure ongoing management in line with conservation commitments
	Management of open space area impacts on Aboriginal Cultural Heritage Area	<ul style="list-style-type: none"> incorporate recommendations from conservation management plan into operational management plan engage with RAO's and/or Heritage Unit regarding long-term management of the site
	Fire hazard management conducted at an inappropriate interval and intensity leading to loss of biodiversity in retained areas of vegetation, and adjacent to the site (e.g. Kama NR)	<ul style="list-style-type: none"> following construction, operational management plans should be implemented to manage maintenance operations, particularly in conservation areas of box gum woodland and pink-tailed worm lizard habitat
Flow on impacts to adjacent areas	Residents of Molonglo Stage 3 rely on community facilities in adjacent suburbs until fully developed resulting in increased demand for services (Positive)	<ul style="list-style-type: none"> ensure recommendations made in the Study of Community, Sport and Recreation Facilities (GHD, 2014) are continually implemented based on their assigned priorities (short/medium/long term)
	Occupation of suburb results in increased numbers of domestic animals in adjacent nature reserves, impacting native fauna	<ul style="list-style-type: none"> implement a cat containment policy for the new suburb, particularly along the urban edge include management of urban birds, such as common myna in operational management plans

In summary of the above tables, the key risks for the development of Molonglo Stage 3 are considered to be:

- Ensuring compliance with the NES Plan and EPBC Act, particularly with the installation of any infrastructure outside the Strategic Assessment Area footprint;

- Managing the effects of the urban edge against ecologically valuable areas, including Kama Nature Reserve and the Molonglo River corridor;
- Managing the interface between the urban area, and areas retained for their cultural heritage values;
- Balancing bushfire management requirements with conservation outcomes;
- Managing known contamination risks;
- Lengthy approvals program delaying the construction of infrastructure critical to servicing other parts of the Molonglo Valley;
- Maintaining water quality in the Molonglo River during construction and operation;
- Ensuring adequate capacity of existing road network for construction and operational traffic; and
- Risks inherently associated with design and construction projects (bushfire, sustainability, and amenity).

The following summarise the key management components (i.e. measures to avoid and mitigate) described in the PRA:

- Design of urban area to minimise impacts to retained values (e.g. through the placement and management of urban open space) and character of the region;
- Development and implementation of a construction environmental management plan (CEMP) and associated sub plans to minimise impacts during land clearing and construction;
- Undertaking contamination remediation as part of the civil works contract;
- Undertaking research into optimal management solutions for balancing conservation and bushfire outcomes, as well as the urban interface;
- Ongoing operational management of culturally significant areas;
- Ensuring best practice design (including safety, amenity and water quality) in key aspects of urban design;
- Development and implementation of an operational management plan to provide ongoing management for the urban interface at Molonglo River and Kama Nature Reserve; and
- Implementation of the recommendations of due diligence studies completed for the project area.

Management of the interface between Molonglo Stage 3, Kama Nature Reserve and the River Corridor will be paramount during design, construction and operation. The following measures are considered key to minimise impacts to landscape function and the connectivity value of the Molonglo River:

- The urban interface with the Molonglo River Park should be designed to minimise adverse environmental impacts, such as weed invasion and other edge effects, in addition to eutrophication, sedimentation, erosion and stormwater runoff;

- The connectivity between Kama Nature Reserve, the Molonglo River and the Arboretum should be enhanced by landscaping and planting within urban open space to maintain movement corridors and landscape values;
- The urban interface with Kama Nature Reserve will need to be designed and managed to avoid indirect and edge impacts to the natural values reserved within as a commitment of the NES Plan, including deterring the establishment of weeds and urban fauna species; and
- The existing agreed inner asset protection zone (60 metres) and operational management plan for Kama will minimise the likelihood of any detrimental impacts of management within the Nature Reserve required to maintain bushfire protection for the future urban area.

6.0 Preliminary Risk Assessment

A Preliminary Risk Assessment (PRA) has been prepared and attached as **Appendix 1**. According to the 'Preparation of an Application for Scoping and Preparation of an ESO' guidelines (ACTPLA, undated), the purpose of a PRA is described as:

'Identifying possible impacts requires the consideration of all of the likely activities that will be involved in the construction, operation and decommissioning of the project with further consideration given to all the impacts that these activities could lead to'

Based on this objective, environmental risks during design, construction, and operation have been identified and assessed. Decommissioning was not considered relevant for the proposed development.

The key risks identified (rated as 'high' or above) were highlighted in **Section 5** above. It is not considered that these 'high' risks represent a major gap in understanding, or will have a high residual risk following the application of mitigation measures.

A large proportion of the risks identified are inherent to design and construction projects. These risks can be mitigated through standard management measures, such as the development and implementation of a CEMP, as demonstrated by the residual risks calculated in the PRA.

It is considered that the proponent has developed a thorough understanding of the environmental, heritage and engineering conditions and constraints of Molonglo Stage 3. This is demonstrated through the extent of background studies undertaken to date in addition to experience gained in the implementation of Stages 1 and 2 as well as selected infrastructure projects such as the southern alignment of John Gorton Drive.

There are no significant gaps remaining in understanding the condition of environmental values in the project area.

7.0 Additional Information Required

Form 1M requires the following verification for source documents:

- details of qualifications, expertise and experience of the person(s) who conducted previous studies supporting the application; and
- verification from a qualified person that the information in the previous studies supporting the application is still current.

All primary sources cited in this application for exemption and used as the basis for the attached PRA are listed in the references section of this report.

Section 50A of the *Planning and Development Regulation 2008* (PD Regulation) prescribes the criteria for a development application exemption from EIS with reference to Section 211 of the PD Act as follows:

The following criteria are prescribed:

- whether the study was conducted by an appropriately qualified person with relevant expertise and experience in relation to the environmental values of the land in the proposal;
- if the study does not relate directly to the proposal—whether there is sufficient detail to allow assessment of the environmental impacts likely to occur if the proposal proceeds;
- whether the part of the study relevant to the proposal required public consultation through a statutory process or as part of a government policy development;
- that the study is not more than 5 years old;
- if the study is more than 18 months old—that an appropriately qualified person with no current professional relationship with the proponent verifies that the information in the study is current.

The following primary sources (**Table 7.1**) were utilised by Umwelt for the assessment of the Molonglo Stage 3 project:

Table 7.1 – Information Sources Utilised

✓	Meets criteria
-	Criteria not applicable
X	Does not meet criteria

Source	Report Age	Principal Author(s)	Criteria					Verified as Current
			A	B	C	D	E	
NES Plan (ACTPLA, 2011)	5 years	The author(s) is not individually named in the report however it is a publically released ACT Government report.	✓	-	✓	✓	-	Yes. Statutory document. Has been through public consultation and is now policy.

Molonglo Stage 3 Detailed Heritage Assessment: Aboriginal and Historic Heritage (Biosis 2012)	5 years	The author is identified as Lyn O'Brien and on the understanding of the author of this document, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	✓	Yes. This assessment has been endorsed by the ACT Heritage Council, and is considered the most up to date information on the area.
Molonglo Stage 3 Future Urban Release: Sub Surface testing report and further studies (Biosis, 2013)	4 years	The author is identified as Lyn O'Brien and on the understanding of the author of this document, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	✓	Yes. This assessment has been endorsed by the ACT Heritage Council, and is considered the most up to date information on the area.
Molonglo Stage 3 Additional Areas Cultural Heritage Assessment (Biosis 2014)	3 years	The author is identified as Lyn O'Brien and on the understanding of the author of this document, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	✓	Yes. This assessment has not yet been endorsed by the ACT Heritage Council, subject to a number of minor changes requested on the draft report, however is considered the most up to date information relating to this area. As no activities have been undertaken on the ground within the area subject to the assessment since the time of its completion, it is considered to remain current.
Molonglo Stage 3 Vegetation Classification and Condition Assessment (Biosis 2016)	<18 months	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced	✓	-	-	✓	-	N/A. Less than 18 months old.

Molonglo 3 Major Electrical Infrastructure Relocation Concept Design Report (Calibre, 2015)	<18 months	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	-	-	-	-	N/A. Less than 18 months old.
Molonglo Stage 3: Study of Community, Sport and Recreation Facilities (GHD, 2014)	2 years	The authors and reviewer are not identified in the report.	?	-	-	✓	-	N/A. This report provides an assessment relevant for the point in time at which it was prepared. It has not been relied upon for any technical information, and as such has not been verified.
Molonglo Adaptive Management Strategy (TaMS, 2013)	3 years	The author(s) is not individually named in the report however it is a publically released ACT Government report.	?	✓	✓	✓	-	Yes. This report provides a baseline assessment relevant for the point in time at which it was prepared, and has been utilised as such. It was subject to public consultation, and is part of the Molonglo Strategic Assessment documents.
Molonglo Stage 3: Major Electrical Infrastructure Relocation, Environmental and Heritage Constraints (Umwelt, 2014)	2 years	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	✓	-	✓	✓	Yes. This report is still considered relevant, as was compiled as a literature review of other verified sources in this table.
Molonglo Valley Stage 3 (Area A) Stage 2 Detailed Site Investigation (WSP 2016).	< 12 months	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	-	Yes. Less than 18 months old.

Molonglo Valley Stage 3 (Area B) Stage 2 Detailed Site Investigation (WSP 2015).	< 18 months	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	-	Yes. Less than 18 months old.
Molonglo Valley Vegetation Survey: Baseline Condition Assessment (ELA 2013)	4 years	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	✓	Yes. The information used to support this S211 application was collected using current best practice ecological survey guidelines. As no activities have been undertaken on the ground within the area subject to the assessment since the time of its completion, it is considered to remain current, with the acknowledgement that seasonal variation and temporal fluctuations in vegetation community species composition and distribution in response to climatic conditions would be expected.

Review of ACT Environmental Offsets Calculator Stage 2 (Umwelt 2013b).	3 years	The authors and reviewer are identified in the report and on the understanding of the author of this report, they are considered to be appropriately qualified and experienced.	✓	-	-	✓	✓	<p>Yes.</p> <p>The information used to support this S211 application was collected using current best practice ecological survey guidelines.</p> <p>As no activities have been undertaken on the ground within the area subject to the assessment since the time of its completion, it is considered to remain current, with the acknowledgement that seasonal variation and temporal fluctuations in vegetation community species composition and distribution in response to climatic conditions would be expected.</p>
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APPENDIX 1

Preliminary Risk Assessment

Molonglo 3 PRA

Phase of Development	Activity	Effects Without the application of mitigation or management measures	Category of Risk	Likelihood	Consequence	Risk Rating	Mitigation/Management Measures	Complexity, implementation risk	Residual		
									Likelihood	Consequence	Risk Rating
Design	Design Development	Development footprint exceeds approved Strategic Assessment Area (e.g. water supply infrastructure) resulting in potential non-compliance with EPBC Approval	Various	L	D	H	- confirm footprint and required services / infrastructure - gain EPBC Approval for any impacts outside the approved area if MNES are identified - establish no-go zones, site boundaries and fences (where required) prior to construction commencing to prevent unauthorised access into protected areas, particularly offsets, the river corridor and Kama NR	Moderate	P	D	M
		Design of surface drainage results in changes to hydrology and nutrient levels in river corridor and areas of retained MNES habitat	Ecological	P	J	H	- incorporate Water Sensitive Urban design (WSUD) principles and water quality considerations in drainage design - design stormwater system to ensure site runoff does not flow across protected areas of pink-tailed worm lizard habitat or native vegetation communities - treat stormwater prior to entering Molonglo River	Moderate	U	J	M
		Design of ecological buffer between Kama Nature Reserve and urban area not appropriate, and results in adverse impacts to the value of the conservation area	Ecological	P	J	H	- implement recommendations in ongoing management of Molonglo 3 / Kama NR - implement the 60 metre inner asset protection zone within the urban area	Moderate	U	J	M
		Design of urban area results in loss of up to 17.6 hectares of habitat for pink-tailed worm-lizard	Ecological	C	J	E	- gain approval under EPBC Act for impacts to pink-tailed worm-lizard (complete) - gain approval under PD Act for impacts to pink-tailed worm-lizard (underway) - implement avoidance and mitigation measures specified in NES Plan - <i>compensate for unavoidable impacts through offsets identified by the NES Plan</i>	Moderate	C	J	E
		Design of urban area results in loss of 2.6 hectares of box gum woodland	Ecological	C	D	V	- gain approval under EPBC Act for impacts to box gum woodland (complete) - gain approval under PD Act for impacts to box gum woodland (underway) - implement avoidance and mitigation measures specified in NES Plan - <i>compensate for unavoidable impacts through offsets identified by the NES Plan</i>	Moderate	C	D	V
		Design of urban area results in loss of habitat for woodland birds	Ecological	L	D	H	- implement avoidance and mitigation measures specified in NES Plan - <i>compensate for unavoidable impacts through offsets identified by the NES Plan</i>	Moderate	L	D	H
		Design of urban area results in loss of threatened flora species	Ecological	P	D	M	- minimise impact to potential habitats through avoidance of woodland offset areas identified by the NES Plan	Low	P	F	L
		Design of urban area results in the loss of >5 hectares of native vegetation	Ecological	C	J	E	- gain approval under PD Act for impacts to native vegetation (underway) - minimise clearing footprints in areas of native vegetation - <i>compensate for unavoidable impacts through offsets identified by the NES Plan</i>	Moderate	C	D	V
		Integration of heritage values of the Cultural Area into urban landscape not appropriate and results in adverse impacts to the value of the sites	Various	P	J	H	- consult with Heritage Unit regarding ongoing management of site and surrounding area - develop a conservation management plan and unanticipated discovery plan for implementation during construction - engage with RAO's if any impact likely to occur	Moderate	U	J	M
		Design of facilities and urban development adjacent to the river corridor and western edge results in adverse impacts to otherwise avoided or retained ecological values prescribed in the NES Plan	Ecological	P	J	H	- Masterplan to be considerate of ecological values in adjacent areas, including sympathetic adjacent land uses and adequate open space buffers	Moderate	U	J	M
		Management of Strategic Firefighting Advantage Zones (SFAZ) in Kama Nature Reserve is not appropriate for the ecological values present	Ecological	L	D	H	- implement the Kama Operation Plan for any bushfire or maintenance works required within the reserve - establish sensitive mowing regime to be undertaken outside the reserve to manage potential weed infestation	Moderate	U	D	W
		Location of urban edge requires substantial bushfire mitigation works outside of the Kama Nature Reserve, with potential impacts on conservation values	Ecological	L	D	H	- establish a (minimum) 60 metre inner asset protection zone - urban edge development to be designed in consultation with relevant emergency services agencies and land managers responsible for implementing post-construction obligations under the NES Plan at EDP stage - appropriate management regimes and bushfire asset protection zones to be established within and around urban area with consideration to conservation values in Kama NR	Moderate	U	D	W

Phase of Development	Activity	Effects Without the application of mitigation or management measures	Category of Risk	Likelihood	Consequence	Risk Rating	Mitigation/Management Measures	Complexity, implementation risk	Residual		
									Likelihood	Consequence	Risk Rating
		Opportunities for public transport and pedestrian access not fully realised in suburb design, resulting in car dependency and poor suburb functionality	Community	U	J	M	- implement recommendations made in the Study of Community, Sport and Recreation Facilities (GHD, 2014) based on their assigned priorities (short/medium/long term) - undertake community consultation to ensure community desires are incorporated into the design	Low	U	D	W
		Loss of developable land and additional planning requirements from implementation of the NES Plan have financial implications on ACT Government	Financial	P	D	M	- ensure commitments made in NES Plan are understood prior to detailed design to minimise any non-compliances - ensure requirements under NES Plan are communicated to all contractors working on design and site investigation studies	Moderate	P	I	W
	Site Investigations	Uncontrolled access of vehicles and personnel during site investigations results in degradation of adjacent (unapproved) areas through soil compaction, weed introduction, vegetation removal etc. resulting in non-compliance with EPBC Approval	Ecological	P	D	M	- establish no-go zones for site investigation studies - inform all contractors of constraints associated with the site, and approval conditions which must be complied with - ensure contractors implement an environmental management plan for intrusive works on site	Low	U	D	W
		Subsurface conditions that may impact construction activities not identified and inappropriate design concepts developed as a result	Infrastructure/Engineering	P	J	H	- incorporate recommendations of contamination and geotechnical assessments into project planning decisions	Moderate	U	J	M
		UXO investigations identify that significant remediation is required to make site safe	Infrastructure/Engineering	P	J	H	- implement recommendations of assessment prior to construction commencing - include provision for remediation in project budget	Moderate	U	J	M
	Engineering inspections, service location and siting	Water infrastructure (e.g. ponds or water main) are located within areas avoided by the NES Plan, or outside the strategic assessment area, potentially resulting in additional impacts to MNES and non-compliance with EPBC Approval	Ecological	P	J	H	- consult with C'wlth (DoEE) for any impacts (permanent or temporary) within areas protected by the NES Plan - gain EPBC Approval for any impacts outside the approved area if MNES are identified	Moderate	P	D	M
		Odour and visual impacts from the sewer vents result in amenity impacts, potential reduction in value of some residential areas, and health concerns	Various	P	D	M	- minimise visual impacts of sewer vents during design, in particular, height of vents - incorporate best practice odour mitigation practices into design and construction of sewer vents	Low	U	D	W
		Existing road network does not have capacity to service new development	Infrastructure/Engineering	P	J	H	- undertake traffic planning studies early in design process to ensure capacity of roads to handle additional traffic - implement recommendations of studies prior to occupation of suburbs	Moderate	P	D	M
							- commence planning and approvals processes early - have realistic expectations of potential delays / length of time required for approvals - undertake due diligence studies prior to commencing approvals processes to minimise scoping document requirements	Low	P	D	M
	Approvals	Approvals	Approval process delays construction of critical road infrastructure and connections required to service Molonglo 1 and 2	Service Delivery	L	D	H	- consult with EPD during design development to ensure clear communication of project timeframes and needs - consider assessing critical roads separately if delays are expected	Low	P	D
Construction of powerlines requires standalone Impact Track Assessment which results in time delays and additional project costs			Service Delivery	L	J	V	- undertake early consultation regarding environmental impact assessment requirements for the powerlines - include time and cost provisions in planning considerations - undertake constraints and impact analysis during design to fully understand impacts of alignment to support a S211 process	High	L	D	H
Land acquisition process results in delays and community complaints			Service Delivery	L	D	H	- commence negotiations with landholders as soon as possible	Low	L	I	M
Offset							- determine whether additional MNES would be impacted by works - prepare an EPBC Referral if required - identify suitable offset and commence process if determined to be required	Low	U	D	W
		Additional offsets may be determined to be required due to impacts outside the original approval area which are difficult to find and/or cause delays for development	Various	P	D	M					

Molonglo 3 PRA

Molonglo 3 PRA

Phase of development	Activity	Effects Without the application of mitigation or management measures	Category of Risk	Likelihood	Consequence	Risk Rating	Mitigation / Management Measures	Complexity, implementation risk	Residual		
									Likelihood	Consequence	Risk Rating
Construction	Vegetation and Habitat Clearing	Clearing vegetation outside approved disturbance area due to unclear demarcation of boundaries results in non-compliance with EPBC approval	Ecological	U	J	M	- establish no-go zones, site boundaries and fences prior to construction commencing to prevent unauthorised access into adjacent areas - inform DoE immediately if any impacts outside approved area occur	Low	R	J	W
		Edge impacts to vegetation communities adjacent to project area (in Kama Nature Reserve or the River Corridor) increases extent of MNES disturbed and requires additional restoration / remediation works	Ecological	P	J	H	- clearly mark limits for clearing prior to any construction commencing - develop and implement industry best practice CEMP - reseed disturbed areas with native grass mix where possible, particularly adjacent to areas of box gum woodland - develop and implement management plans to avoid or minimise environmental risks (e.g. sedimentation, erosion, weeds, storm water runoff, etc) - monitor adjacent areas of box gum woodland during the construction phase	Moderate	U	J	M
		Vegetation clearing results in the loss of pink-tailed worm lizard habitat, box gum woodland, potential threatened bird and flora habitat, and native vegetation	Ecological	L	J	V	- implement mitigation measures in NES Plan, including preparation of a CEMP, weed control, and erosion and sediment control - undertake habitat improvement and rehabilitation within offset areas, relocation of habitat features and restoration and management within river corridor - prevent indirect additional impacts through comprehensive construction management plans	Moderate	L	I	M
		Vegetation clearing results in a loss of visual amenity, particularly related to the prescribed environmental values of the Molonglo River	Various	L	D	H	- develop and implement industry best practice CEMP which includes rehabilitation/landscaping plan - incorporate landscaping buffers and visual screens into design/construction - plan for early establishment of landscaping features - implement concepts in the Molonglo River Park Concept Plan Report (Hassell, 2012)	Low	L	I	M
	Site Access and Management	Uncontrolled access by vehicles leads to dispersal of litter and other pollutants, damage to habitat in sensitive areas or areas to be retained, pollution of the Molonglo River, soil compaction, and spread of weeds resulting in larger area of impact to that approved	Environmental	P	D	M	- establish no-go zones, site boundaries and fences prior to construction commencing to prevent unauthorised access into adjacent areas - implement CEMP to manage construction activities and assign responsibilities for environmental management and monitoring	Low	U	D	W
		Increased occurrence of exotic and pest animals resulting from waste generated during construction degrade remaining habitat values	Ecological	P	D	M	- develop and implement management plans as appropriate - manage waste during construction to deter pest animals - manage weed infestations as required	Low	U	D	W
		Increased volumes of construction traffic on William Hovell Drive and construction of road connections results in traffic disruptions	Community	L	D	H	- develop and implement industry best practice CEMP which includes construction traffic management plan	Low	L	I	M
	General Construction Activities	Discovery of previously unidentified contaminated soil during construction results in delays to program or increased costs due to remediation	Various	P	J	H	- undertake remediation of contaminated sites, as part of the Civil Works Contract in line with the RAP - develop and implement an Unexpected Finds Protocol for all earthworks and construction activities on site, including training personnel in the procedure	High	P	D	M
		Discovery of previously unidentified UXOs during construction results in delays to program, increased costs due to remediation, and health and safety risks to personnel	Various	P	J	H	- implement recommendations of UXO assessment prior to construction commencing - develop and implement an unexpected finds procedure for use during construction, and include training in site inductions and toolbox talks	High	P	D	M
		Earthworks result in the destruction of previously unidentified Aboriginal or European cultural heritage items	Community	P	D	M	- implement recommendations of heritage assessment - develop and implement an Unanticipated Discovery Plan during clearing and construction activities, including training personnel in procedure	Moderate	P	I	W

	Construction activities impact upon the Aboriginal Cultural Area	Community	P	J	H	- implement conservation management plan and unanticipated discovery plan for implementation during construction - define boundaries and no-go zones during construction	Low	U	J	M
	Construction activities result in noise and vibration impacts, reducing local amenity, potentially resulting in non-compliance with EP Act, or impacting on local fauna	Environmental	L	I	M	- develop and implement industry best practice CEMP which includes a noise and vibration management plan - identify sensitive receptors - conduct construction activities in accordance with EPA requirements - maintain plant and equipment in accordance with manufacturers recommendations and best practice.	Low	P	I	W
	Construction activities result in impacts to air quality (vehicle emissions, dust, etc.), reducing local amenity, potentially resulting in non-compliance with EP Act	Environmental	L	I	M	- develop and implement industry best practice CEMP which includes an air quality and dust management plan - identify sensitive receptors - conduct construction activities in accordance with EPA requirements - maintain plant and equipment in accordance with manufacturers recommendations and best practice.	Low	P	I	W
	Sparks from machinery during construction may catch on dry grass and have the potential to start a bushfire	Various	P	J	H	- maintain plant and equipment in accordance with manufacturers recommendations and best practice - observe seasonal and daily fire hazard warnings issued by the ACT Emergency Services Agency. Do not work on extreme fire danger days - implement an approved bushfire hazard management plan during construction and operation - keep vehicles on formed roads and paths, and away from long grass where possible - provide appropriate parking areas for personnel that are away from long grass and other ignition sources - avoid unnecessary idling of vehicles - equip all vehicles on site with fire extinguishers - include fire prevention and fire control instructions in site inductions - do not undertake hotworks outside designated workshop areas	Low	U	J	M
	Fuel or chemical spills or inappropriate material storage contaminates soil, ground water and/or local waterways, which could result in fines under EP Act and damage to aquatic ecosystems	Financial	P	D	M	- develop and implement industry best practice CEMP which includes waste management plan, including storage and stockpiling of raw materials, transport of materials to site and disposal of materials - identify location of site sheds / storage areas and construction vehicle parking in CEMP away from sensitive areas - develop a spill management protocol - include spill management protocol in site inductions	Low	U	D	W
Compliance	Construction activities result in environmental impacts that are not reported or otherwise acted upon adequately	Environmental	P	D	M	- appoint a third party to conduct audits on environmental approvals and performance against criteria identified in the NES Plan and CEMP - results of audits are to be reported back to the ACT planning approval authority and other agencies (such as DoE) as appropriate - refer to requirements of DoE approval under EPBC Act for other monitoring and reporting obligations for associated offsets	Moderate	U	D	W
	CEMPs, including monitoring and auditing requirements, are not implemented effectively leading to various environmental, social and economic impacts	Various	P	D	M	- require as a condition of consent that contractors appoint an independent third party to conduct audits on environmental approvals and performance against criteria identified in the CEMP - results of audits are to be reported back to the ACT planning approval authority and other agencies as appropriate	Low	U	D	W
	Risk not adequately identified resulting in incomplete understanding of environmental constraints	Various	P	D	M	- update PRA as additional information becomes available - use most up to date information to inform risk assessment	Low	U	D	W
Sustainability	Earthworks, vegetation clearing and construction activities result in release of sequestered carbon and greenhouse gases	Environmental	L	D	H	- include an assessment of carbon balance in environmental assessment to identify appropriate offsetting measures to be incorporated into the project design or managed separately - consider carbon offsetting measures if appropriate	Moderate	L	I	M

Molonglo 3 PRA

Phase of development	Activity	Effects Without the application of mitigation or management measures	Category of Risk	Likelihood	Consequence	Risk Rating	Mitigation / Management Measures	Complexity, implementation risk	Residual		
									Likelihood	Consequence	Risk Rating
Operational	Functionality of suburb, community needs and expectations	Occupation of suburb increases vehicle traffic on local network resulting in traffic congestion, wear on local roads and increases in accidents	Infrastructure/ Engineering	P	D	M	- amend road upgrade schedule to manage increased traffic	Low	P	I	W
		Development does not satisfy community's expectations for employment, entertainment and community requirements	Community	U	J	M	- undertake a community needs analysis - ensure recommendations made in the Study of Community, Sport and Recreation Facilities (GHD, 2014) are implemented based on their assigned priorities (short/medium/long term)	Moderate	R	D	L
	Public health and safety	Contamination not fully remediated resulting in health and safety impacts	Community	P	J	H	- undertake all necessary contamination assessments and remediation to ensure area is appropriate for proposed land use (complete and/or underway)	High	U	J	M
	Maintenance (bushfire mgmt, landscape mgmt etc)	Management of asset protection zones impacts on retained areas of woodland, grassland and heritage sites	Various	P	D	M	- develop and implement an operational management plan to ensure site and adjacent areas (particularly the urban interface) are managed consistently with EPBC Approval conditions and ACT Government requirements - maintain implementation of adaptive management principles committed to under the NES Plan	Moderate	U	D	W
			Management of open space area impacts on Aboriginal Cultural Heritage Area	Community	P	J	H	- incorporate recommendations from conservation management plan into operational management plan - engage with RAO's and/or Heritage Unit regarding long-term management of the site	Low	U	J
		Management of ecological buffer between Kama Nature Reserve and urban area not appropriate, and results in adverse impacts to the value of the conservation area	Ecological	P	J	H	- implement recommendations from buffer area study into ongoing maintenance and management of buffer area - establish 60 metre inner asset protection zone within the urban area - implement Kama Operations Plan for managing activities within the reserve	Moderate	U	J	M
		Fire hazard management conducted at an inappropriate interval and intensity leading to loss of biodiversity in retained areas of vegetation, and adjacent to the site	Ecological	P	J	H	- following construction, operational management plans should be implemented to manage maintenance operations, particularly in adjacent areas of box gum woodland and pink-tailed worm lizard habitat	Moderate	U	J	M
		Commitments for habitat improvement and management of adjacent conservation areas made in NES Plan are not achieved	Ecological	P	J	H	- undertake habitat improvement and rehabilitation within offset areas, relocation of habitat features and restoration and management within river corridor - ensure ongoing management in line with conservation commitments	Moderate	U	J	M
		Increased run off from impervious surfaces, such as carparks and roads, as well as landscaped areas impacts on water quality of Molonglo River	Environmental	P	J	H	- maintain water treatment systems during operation to ensure water quality entering Molonglo River is within EPA guidelines	Low	P	I	W
		Flow on impacts to adjacent areas	Development of community facilities in Molonglo 3 draws business away from nearby areas of Belconnen resulting in economic impacts to established suburbs	Financial	P	D	M	- consider flow on effects to adjacent suburbs when undertaking community needs analysis	Moderate	P	I
	Residents of Molonglo 3 rely on community facilities in adjacent suburbs until fully developed resulting in increased demand for services			Financial	L	D	H	- ensure recommendations made in the Study of Community, Sport and Recreation Facilities (GHD, 2014) are implemented based on their assigned priorities (short/medium/long term)	Moderate	P	D
	Occupation of suburb results in increased numbers of domestic animals in adjacent nature reserves, impacting native fauna		Ecological	L	D	H	- implement a cat containment policy for the new suburb, particularly along the urban edge - include management of urban birds, such as common myna in operational management plans	Moderate	P	D	M