2nd February 2014

Dr Paul Vogel
Chairman
Environmental Protection Authority
Locked Bag 10
EAST PERTH WA 6892

Dear Dr Vogel

Comment on the Public Environmental Review (PER) for Keane Road Strategic Link Proposal by City of Armadale

The Wildflower Society of Western Australia (Inc.) is a non-profit community organisation that was established in 1958 for the purpose of encouraging the conservation and preservation of Western Australia's unique flora. The organisation's member base currently stands at over 700 members.

The City of Armadale proposes to construct a central portion of the road reserve set aside for Keane Road Strategic Link (KRSL) (the proposal). It is understood that the construction of KRSL will require clearing of 1.65 ha of native vegetation. After reviewing the PER for KRSL the Society recommends that the **EPA recommend in its advice to the Minister that the proposal be not approved and that it cannot be made environmentally acceptable.**

Several reasons provide justification for the Society's recommendation including:

- The proposal area lies within Bush forever Site 342 which is one of the largest, most intact and highest quality representations of the Southern River Complex in the Perth metropolitan area;
- The Southern River complex is under-represented in Bush Forever with less than 3% protected in reserve or conservation estate;
- The proposal area contains conservation significant flora and fauna;
- The proposal area is floristically diverse;
- Indirect impacts to Bush Forever Site 342 cannot be mitigated; and
- The offset proposed by the proponent is inadequate.

The following section provides detail on the reasons why the proposal is environmentally unacceptable.

PO BOX 519, FLOREAT, WA 6014 PHONE 08 9383 7979
Email wildflowers@ozemail.com.au Website www.members.ozemail.co.au/~wildflowers

1 Conservation Significance of Area

The conservation significance of the proposal area has previously been recognised in its inclusion in Bush Forever Site 342 which covers an area of 311.6 ha. Recognition of the conservation significance of the proposal area is for good reason as the area contains many biological factors that require protection including:

- The occurrence of two Priority Threatened Ecological Communities (PECs;
- The occurrence of one 'Critically Endangered' (EPBC Act) Threatened Ecological Community (TEC) SCP 10a directly adjacent to the proposal area;
- The intersection of a Conservation Category Wetland (CCW);
- The occurrence of conservation significant flora and fauna;
- High floristic diversity (Bush Forever Site 342 is the second most plant species diverse area within the Perth region); and
- More than 50% of the proposal area containing vegetation in 'good' to 'very good' condition.

The proposal area also plays an important role as an ecological corridor as it forms a linkage between Bush Forever Site 342, Gibbs Road Nature Reserve and Forrestdale Lake Nature Reserve.

Under *EPA Guidance Statement Number 33* a site that includes the above mentioned biological factors is recognised as an area of high conservation significance on the Perth Metropolitan Region. For this reason the proposal area should be a priority for protection and the proposal should **not be approved.**

Additionally due to the KRSL intersecting a CCW, the proposal is immediately at variance to *EPA Guidance Statement Number 33* which states 'no development or clearing is considered appropriate (in a CCW) as these are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate' (EPA 2008). The Society expects that the EPA will uphold its position on development within CCW wetlands and recommend the proposal **not be approved.**

1.1 Southern River Complex

Bush Forever Site 342 contains one of the largest and most intact remnants of the Southern River complex. In table 22 of the PER it is stated that 'the Southern River complex is not currently considered threatened with approximately 20% (11,501 ha) of the pre-European extent remaining on the Swan Coastal Plain' (EnviroWorks Consulting 2013, p. 102). However the Southern River complex can be considered regionally significant due to 2013 figures showing that only 2.88% of the Southern River complex remains formally protected in conservation areas (Local Biodiversity Program 2013). Under EPA Guidance Statement Number 10, *Level of Assessment for Proposals Affecting Natural Areas Within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region* a vegetation complex is considered regionally significant where 10% of the pre-European extent remains vegetated in the Bush Forever study area but 10% or less of the complex is protected or proposed for protection. On a local level at least 30% of the Southern River Complex should also be retained and protected in the local government's Local Biodiversity Strategy.

When examined in more detail, it is evident that the conservation of the Southern River complex is under greater threat than acknowledged in the PER. The *South East Sub-Region Plan for the Outer Metropolitan Perth and Peel Sub-Regional Strategy* (DoP and WAPC 2010), earmarks substantial areas occurring on Southern River complex for future development including West Martin, Piara Waters North and Forrestdale East. These areas

cover approximately 400 ha and are indicated as urban expansion areas (DoP and WAPC 2010, p.81). The *Southern River/Forrestdale/Brookdale/Wungong District Structure Plan* shows that 547 ha in Southern River and 662 ha in Forrestdale (all located on Southern River complex) are also earmarked for proposed residential development (WAPC 2001, p. 88). At this development rate, it is unlikely that the target of protecting and retaining at least 10-30% of the complex will be met.

Bush Forever Site 342 is also extremely valuable as it not only provides the 6th largest, intact representation of the Southern River complex in the Perth Metropolitan area, it also provides the *only* representation of Southern River complex in 'excellent' to 'pristine' condition, the highest vegetation condition rating attributed to a Bush Forever site containing Southern River complex (see Table 1). Given the large size and unfragmented nature of Bush Forever Site 342, the proposal is against the guidelines stated in EPA Bulletin *No. 20. Protection of Natural Vegetated Areas Through Planning* to 'protect large consolidated naturally vegetated areas' and approval of the proposal would be contrary to the EPA objective to 'maintain regional representation of ecological community'. For this reason is environmentally unacceptable and should **not be approved**.

Table 1. Top six largest Bush Forever Sites containing Southern River Complex (Government of Western Australia 2000)

Bush Forever Site	Area (ha)	Vegetation Condition
304	1547.90	70% 'excellent' to 'very good'
386	629.50	60% 'excellent' to 'very good'
198	431.40	<10% 'excellent' >90% 'very good' to 'good'
77	364.95	50% 'very good' to 'excellent'
345	344.50	50% 'excellent' to 'very good'
342	**311.60**	**>75% 'excellent' to 'pristine'**

1.2 Flora

In addition to the proposal area containing the only representation of Southern River complex in 'excellent' to 'pristine' condition, the proposal area also contains Priority flora with higher conservation significance than is acknowledged in the PER. *Jacksonia sericea* (Priority 4) is listed as Endangered on the International Union for Conservation of Nature (IUCN) *Red List* due to its 'restricted range (extent of occurrence is ~1,800 km²) in a highly populated area of Perth, Western Australia (from Waneroo to Mandurah)' and the fact that '*J. sericea* is only known to occur in the woodlands of the suburbs of Perth. However, these are highly fragmented' (IUCN 2014). Clearing of habitat and dieback continues to be a threat to this species and the seeds of *J. sericea* have been banked as an ex situ conservation measure (IUCN 2014). *Stylidium longitubum* (Priority 3) is also another species restricted to damplands in the Perth metropolitan area of which the populations remaining in fragmented vegetation is unknown (Florabase 2014).

Approximately 50 plants of *J. sericea* (out of an estimated >2000 found in Bush Forever Site 342) occur in the proposal area. More than 1000 plants of *S. longitubum* occur in Bush Forever Site 342 and although none of the plants occur in the proposal area, the population is still susceptible to edge effects such as weed invasion. The populations of the two species are already extremely vulnerable to dieback, off road vehicles (ORV) and competition from exotic species. Given the unknown status of other populations of the two species in the Perth metropolitan area, it is critical that the populations of the two species in Bush Forever Site 342 be protected in their entirety. For this reason the Society believes the proposal is against

the EPA objective 'to maintain representation, diversity, viability and ecological function at the species, population and assemblage level' of flora and should therefore **not be approved**.

The proposal area is also thought to be more floristically diverse than acknowledged in the PER. In table 15 of the PER, it is stated there are no *Lechenaultias* sp. or *Scaevolas* sp. near the proposed road site (EnviroWorks Consulting 2012 p. 68). On Sunday 19/1/2014, several members of the Wildflower Society WA Murdoch Branch observed Lechenaultia/Scaevola flowering on the edge of the current track only 100 metres from the intersection of Keane and Skeet Roads where the proposed Keane road extension will be going (see Figure 1). The members reported there were numerous Scaevola plants, too many to count.

Figure 1. Scaevola from the proposed KRSL. Photo taken 27/1/2014 by Marilyn Honeybun

The members also observed flora within the first 50 m of the proposal area that had not been recorded in the PER including *Calytrix flavescens* and *Arnocrinum preissii*. The members recordings suggest that the proposal area is more floristically diverse than is acknowledged in the PER (and this would make sense given that Bush Forever Site 342 is the second most plant species diverse area within the Perth region). If the floristic diversity of the proposal area is higher than acknowledged in the PER, this increases the conservation significance of the proposal area and subsequently the need for the proposal to **not be approved**.

2 Indirect Impacts Cannot be Mitigated

2.1 Weeds

The proposal requires clearing of 1.65 ha of vegetation. Although the area to be cleared is small given the scale of the area, it is the indirect and permanent or 'residual' impacts of the road which have the potential to cause significant degradation of the entire Bush Forever Site 342. It is stated in the PER that the 'activities associated with the proposal have the potential to introduce additional weed species not already present in the area and spread weeds that may already be present in the proposal area' (EnviroWorks Consulting 2013, p.131). The proponent has stated that weeds will be managed by the City of Armadale who will control declared weeds (EnviroWorks Consulting 2013, p.131). Out of a total of 76 exotic species

found to be present in the proposal area, only three were found to be Declared species. This leaves the impact of 73 other weed species at risk of being uncontrolled.

Research and local experience has shown that roads serve multiple functions that enhance exotic species invasion in a native landscape: they act as corridors or agents for dispersal, provide suitable habitat, and contain reservoirs of propagules for future episodes of invasion (Parendes and Jones, 2001). Additionally, the CCW occurring in the proposal area is described as an ephemeral wetland, and research has shown ephemeral wetlands to be particularly vulnerable to weed invasion (Champion and Reeves 2009). Weeds pose a threat to ephemeral wetlands as they can modify the structure or function of the wetland (including nutrient and hydrology regimes), out-compete native plants, change the vegetation, alter the habitat and resources available for native insects, birds and fish, and affect access or restoration activities (Landcare Research 2012). Without adequately mitigating weed invasion in Bush Forever Site 342, the Society believes the proposal is at variance to the EPA's objective to 'to maintain representation, diversity, viability and ecological function at the species, population and assemblage level' of flora and therefore is environmentally unacceptable and **should not be approved**.

2.2 Fauna

The City of Armadale proposes to install seven fauna underpasses in the proposal area to mitigate fauna mortality and habitat dissection. Some species of conservation significant fauna occurring in the proposal area, such as the Western Brush Wallaby, feed on plants and thus play an important role in seed dispersal across the site. Their movement across and between vegetation associations is thus critical to the sustainability of these flora species.

The PER states that the fauna underpasses will be in the form of a box culvert with the dimensions of 1200 mm wide and 450 mm high and states that 'the fauna underpasses will be utilised by all of the seven species of terrestrial conservation significant fauna expected to occur in the area (which is assumed to include the Western Brush Wallaby as listed on p. 66 of the PER)' (EnviroWorks Consulting 2013, p. 86). However further investigation shows that the dimensions of the fauna underpass are unsuitable for utilisation by the Western Brush Wallaby and other macropods such as kangaroos.

The Western Brush Wallaby has been known to grow to a height of 1090 mm in males (Staker 2006) and is known to have a head and body length of between 1200 mm and 1530 mm (DEC 2012). Not only do the height of the fauna underpasses restrict access of the Western Brush Wallaby, but the dimensions also do not provide enough width in the event that the animal must turn around to avoid an oncoming predator. Given that Western Brush Wallabies have been recorded to consume around 29 species of plants per day (DEC 2012) it is important that populations of the species occurring in the proposal area be protected and enhanced.

The travel of fauna along bare ground also increases the vulnerability of fauna to predators such as foxes and dogs. To protect fauna, a continuum of habitat must be provided to the underpass entrance. The PER states that for the Keane Road fauna underpasses, cover in terms of intact native vegetation areas will be a short distance from all underpasses (EnviroWorks Consulting 2013, p. 87). In order for fauna to be adequately protected, the fauna underpasses for Keane Road should be designed to allow for immediate adjacent cover of habitat at underpass entrances. Without the provision of adequate cover, the fauna underpasses are inadequate and do not mitigate the impacts of the proposal on conservation

significant fauna. In addition local experience has shown that macropods are likely to jump roadside fences and road kill is subsequently inevitable. This occurs at other major reserves severed by roads. Given that impacts to conservation fauna cannnot be mitigated, the proposal is against the EPA objective 'to maintain representation, diversity, viability and ecological function at the species, population and assemblage level' of fauna and for this reason should **not be approved**.

3 Proposal Offsets

To offset residual impacts associated with the proposal area, the City of Armadale proposes in the PER to excise approximately 103 ha from Crown Reserve No. 27165 and 12 ha from Gibbs Reserve 32635 and transfer the vesting in the land from the City of Armadale to the Conservation Commission (EnviroWorks Consulting 2013, p. 126). These offsets are inadequate as they do not produce a 'net environmental benefit'. The areas are already protected under Bush Forever policy. Native vegetation within the Bush Forever Sites is not subject to threatening processes and thus the acquisition and inclusion of the sites in conservation estate cannot be considered a direct offset.

The Society trusts that the recommendations made will be considered, and that this proposal is **not approved.** In addition representatives of the Wildflower Society request the opportunity to make a presentation to the Chairman and Authority members before finalising your advice and recommendations to the Minister. We may be contacted by phone as below.'

Yours sincerely

Conservation Committee
Wildflower Society WA (Inc.)

PO BOX 519, FLOREAT, WA 6014 PHONE 08 9383 7979
Email wildflowers@ozemail.com.au Website www.members.ozemail.co.au/~wildflowers

4 References

Champion, P.D. and Reeves, P.N. 2009. *Factors Causing Dune Ephemeral Wetlands to be Vulnerable to Weed Invasion*, New Zealand Department of Conservation

Department of Environment and Conservation [DEC] 2012. *Fauna Profile – Western brush Wallaby Macropus irma (Jourdan, 1837)*, Government of Western Australia.

Department of Planning [DoP] and Western Australian Planning Commission [WAPC] 2010. *South East Sub-Region Plan for the Outer Metropolitan Perth and Peel Sub-Regional Strategy*, Government of Western Australia.

Department of Transport and Main Roads 2010. *Fauna Sensitive Road Design Manual Technical Document Volume 2: Preferred Practices*, Queensland Government.

Environmental Protection Authority [EPA] 2008. *Environmental Guidance Statement Number 33 Environmental Guidance for Planning and Development*, Government of Western Australia.

Environmental Protection Authority [EPA] 2006. *Position Statement Number 9 Environmental Offsets*, Government of Western Australia.

Florabase 2014. *Stylidium longitubum*, accessed 28 January 2014 from http://florabase.dpaw.wa.gov.au/browse/profile/7756

Government of Western Australia 2000. *Bush Forever: Keeping the Bush in the City: Final Report: Volume 2: Directory of Bush Forever Sites*, Department of Environment Protection, WA.

International Union for Conservation of Nature [IUCN] 2014. *Red List - Jacksonia sericea*, accessed 21 January 2014 from http://www.iucnredlist.org/details/19891688/0

Landcare Research 2012. *Wetland Restoration a Handbook for New Zealand Freshwater Systems*, edited by Monica Peters [and] Beverley Clarkson. -- Lincoln, N.Z, Manaaki Whenua Press.

Local Biodiversity Program 2013. *2013 Native Vegetation extent by Vegetation complexes on the Swan Coastal Plain south of Moore River*, Government of Western Australia.

Parendes, L.A. and Jones, J.A. 2001. 'Role of Light Availability and Dispersal in Exotic Plant Invasion along Roads and Streams in the H. J. Andrews Experimental Forest, Oregon', Conservation Bioology, Vol. 14. Issue. 1.

Staker, L., 2006. *The Complete Guide to the Care of Macropods*, Matilda's Publishing, 1st Edition.

Western Australian Planning Commission [WAPC] 2001. *Southern River/Forrestdale/Brookdale/Wungong District Structure Plan*, Government of Western Australia.