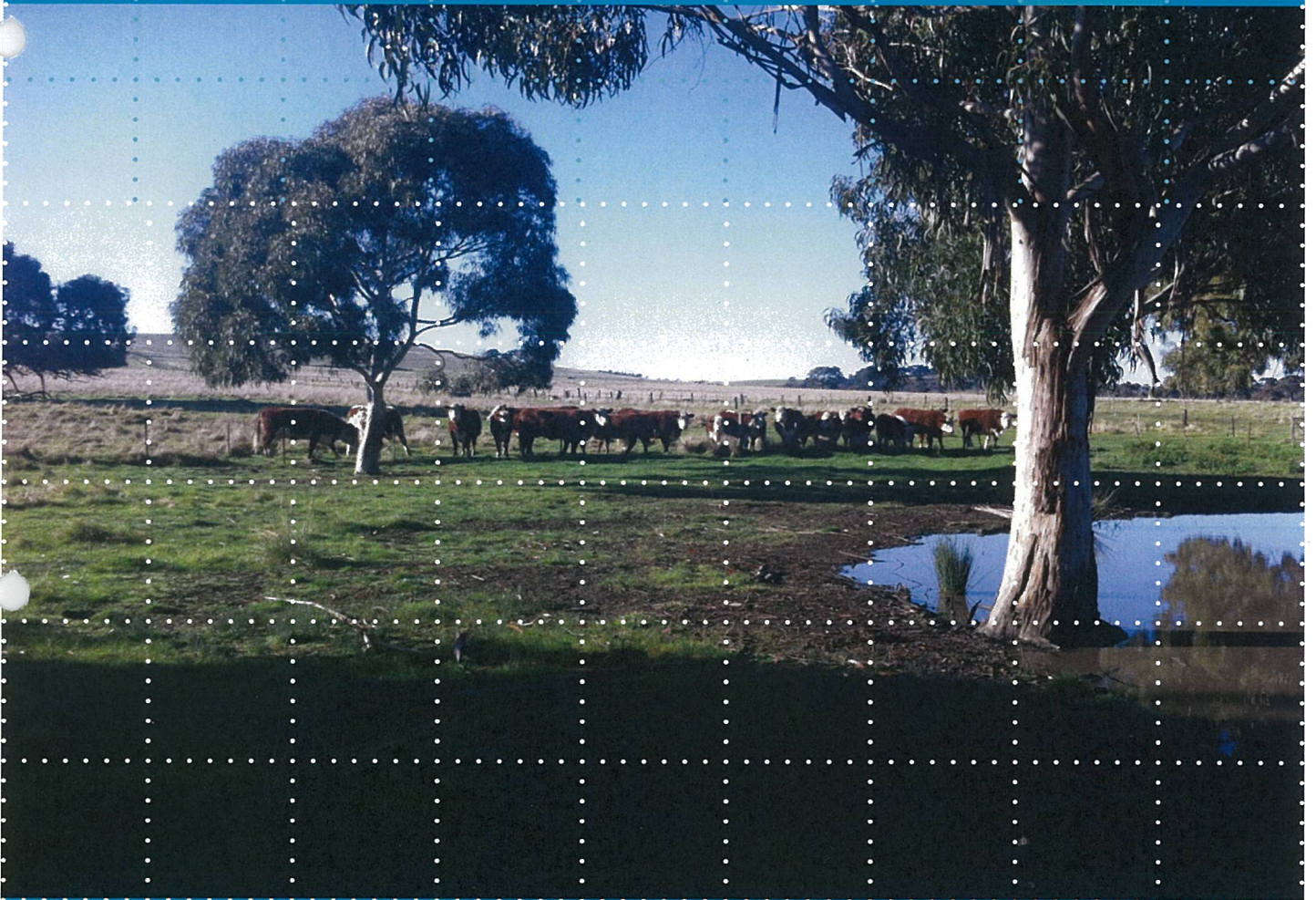


# **Statement of Expert Evidence: 130-150 Bindts Road Wollert, Growing Grass Frog Advice Whittlesea C188 Quarry Hills Precinct Structure Plan (PSP 94)**

Prepared for:

**Best Hooper Lawyers Pty Ltd**

November 2015



**Ecology and Heritage Partners Pty Ltd**

Aaron Organ

## DOCUMENT CONTROL

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| Report author(s)   | Aaron Organ (Director / Principal Ecologist)   |
| Report reviewer    | Andrew Hill (Director / Principal Ecologist)   |
| Other EHP staff    | Dave Fleming (Principal Ecologist)   |
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## **1 AUTHOR'S EXPERTISE**

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This Statement of Expert Evidence has been prepared by Mr Aaron Organ, Director/ Principal Ecologist of Ecology and Heritage Partners Pty Ltd, of 292 Mt Alexander Road, Ascot Vale, Victoria. It is based on the findings of investigations by staff at Ecology and Heritage Partners Pty Ltd.

Aaron has over 20 years' experience in the environmental field, including 15 years in an environmental consultant capacity. Aaron has a broad working knowledge of flora and fauna throughout Victoria and has either managed or played an important role in providing environmental advice on a number of large infrastructure projects such as proposed pipelines, and road and rail developments, and numerous urban development projects (residential, industrial and commercial).

He has also been a lead author and/ or co-author for over 450 project reports and has provided expert advice to a range of private and government clients. Some of these projects include a large number of proposed wind farms in Victoria, South Australia and Tasmania, long-term flora and fauna monitoring throughout the Illawarra escarpment of New South Wales, and various residential developments across Victoria (including many projects in north east Victoria).

## **2 AUTHOR'S STATEMENT**

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I, Aaron Organ of Ecology and Heritage Partners Pty Ltd, have prepared this Statement of Expert Evidence pertaining to the appropriateness of the proposed broad span bridge crossing of Darebin Creek as opposed to culverts at 130-150 Bindts Road, Wollert, Victoria for facilitating movement by Growling Grass Frog *Litoria raniformis*. The proceeding statement is based on a literature review and expert knowledge of Growling Grass Frog habitat usage of such structures to facilitate movement.

I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the tribunal.

## 3 INTRODUCTION

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### 3.1 Background

Ecology and Heritage Partners Pty Ltd was instructed by Best Hooper Lawyers Pty Ltd on behalf of the Property Solutions who are current landowner of 130-150 Bindts Road, Wollert, to prepare the following expert evidence relating to the appropriateness of culverts as opposed to broad span bridges for facilitating movement by the nationally threatened [currently listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)] Growling Grass Frog *Litoria raniformis*. A broad span bridge is proposed by the Metropolitan Planning Authority (MPA) across Darebin Creek at 130-150 Bindts Road, Wollert (the study area). The study area is located within the Quarry Hills Precinct Structure Plan (PSP) area within the City of Whittlesea and lies within the Port Philip and Westernport Catchment Management Authority.

The PSP and the Quarry Hills Development Contributions Plan (DCP) (MPA, City of Whittlesea 2015) propose a broad span bridge across Darebin Creek in the far northern portion of the precinct area and along the mid northern boundary of the study area. The bridge, designated as CR-01 in the Quarry Hills DCP, is stated to accommodate the Category 1 Growling Grass Frog habitat that occurs along Darebin Creek as a buffer (Quarry Hills PSP, City of Whittlesea & MPA 2015). Property Solutions propose to replace the broad span bridge with a culvert that is sensitive to Growling Grass Frog movement along the creek.

This statement of evidence aims to assist the Panel by providing an accurate account of the use or otherwise of culvert structures by Growling Grass Frog, based on the currently available scientific literature and expert knowledge of the species.

### 3.2 Scope

I have been engaged to undertake the following:

- Background review of relevant documents;
- Provide information on the relative importance and proposed habitat improvement options along Darebin Creek for Growling Grass Frog;
- Provide advice regarding the appropriateness of the use of culverts at the proposed crossing locations as opposed to the use of broad span bridges for Growling Grass Frog; and
- Provide advice around the potential adjustment of the boundary of the Category 1 Growling Grass Frog habitat across the study area.

### 3.3 Study Area

For the purposes of this statement, the term 'study area' refers to a small portion of land occurring within the property described as Lot A on PS720094. The property is located at 130 – 150 Bindts Road, Wollert, approximately 30 kilometres north east of Melbourne CBD.

The study area is more accurately described as the location of the proposed broad span bridge crossing over Darebin Creek along the mid northern boundary of the property. The study area has largely been cleared for

agriculture and is dominated by exotic vegetation. However there are several mature trees remaining along Darebin Creek within the vicinity of the study area.

The Background Report (MPA 2015) notes that a number of conservation areas have been identified within the Quarry Hills PSP area that have been included to protect nature conservation values such as Growling Grass Frog and scattered trees. Conservation Area 34 comprises part of the Darebin Creek Growling Grass Frog reserve. The Melbourne Biodiversity Conservation Strategy (BCS) identifies Darebin Creek as Growling Grass Frog Conservation Area (Category 1 habitat). Category 1 habitat areas includes suitable habitat for the Growling Grass Frog and are intended to be retained within the Precinct. The rationale for this within the BCS is that it 'protects important population of Growling Grass Frog and ensures connectivity between populations within the northern growth corridor' (DEPI 2013).

## 4 METHODS

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### 4.1 Literature Review

The following resources and literature were reviewed to inform this Statement:

- City of Whittlesea Council Meeting Minutes dated 26/5/2015;
- Brett Lane and Associates. 2014. Quarry Hills PSP Submission to Council – Ecological Advice. A letter prepared for Spiire on behalf of Stockland Developments;
- DEPI 2013. Sub-regional Species Strategy for the Growling Grass Frog. The Department of Environment and Primary Industries, East Melbourne;
- Ecology and Heritage Partners Pty Ltd. 2011. Sub-regional Growling Grass Frog *Litoria raniformis* Conservation Strategy within the Revised Urban Growth Boundary and Associated 28 Precincts: Technical Background and Guidelines. A report prepared for the Department of Sustainability and the Environment; and
- Koehler, S. and Gilmore, D. 2014. First Documented Use of Underpass Culverts by the Endangered Growling Grass Frog *Litoria raniformis* in Australia. *Herpetological Review*, 2014, 45(3), 404–408. Society for the Study of Amphibians and Reptiles.
- Quarry Hills PSP;
- Quarry Hills DCP;
- Quarry Hills PSP 1094 Background Report (MPA 2015);
- Submission to Amendment C188 to the Whittlesea Planning Scheme, Quarry Hills PSP & Quarry Hills DC, April 2015 10A Bindts Road, Wollert. Prepared by Spiire on behalf of Stockland Developments;

## 5 REVIEW OF FINDINGS

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This section details relevant information from the literature and report review, and provides an assessment of the appropriateness of the use of culverts as opposed to the use of broad span bridges to facilitate Growling Grass Frog movement along Darebin Creek.

### 5.1 Relative Importance and Habitat Improvement Options along Darebin Creek

**Key points:**

- Darebin Creek currently contains sub-optimal breeding habitat for Growling Grass Frog;
- Growling Grass Frog has not been detected within the PSP, although has previously been documented along the creek and other sites to the north of the study area;
- Darebin Creek may be used as a dispersal corridor for Growling Grass Frog during favourable conditions;
- Creation of dedicated Growling Grass Frog waterbodies either side of Darebin Creek will facilitate dispersal opportunities through the proposed crossing structure; and
- Crossing structures over Darebin Creek must allow dispersal by Growling Grass Frog.

The relative importance of Growling Grass Frog habitat with the Category 1 habitat area along Darebin Creek was reviewed. Brett Lane and Associates Pty Ltd (BLA) (2014) provides a summary of the recent Growling Grass Frog records from the Quarry Hill PSP area and surrounding areas. They found that the most recent records of Growling Grass Frog from the Precinct were from 1988 – one record near Harvest Home Road (approximately 1.8 kilometres to the south-west of the study area) and two records approximately 250 metres south of Boundary Road (approximately 2.6 kilometres to the north-west of the study area). Targeted surveys for the Growling Grass Frog were undertaken between 2007 and 2011 along Darebin Creek within the PSP area, however no frogs were detected. Frogs were detected at the Boundary Road location and in a farm dam north of the study area.

Ecology and Heritage Partners (2011a) noted that “Darebin and Edgars Creeks are variable and much of the sections within the Growth Area provide low habitat quality for Growling Grass Frog as they lack deep open pools with key habitat attributes (e.g. high water quality and high percentage cover of aquatic vegetation). However, individuals may use both of these creeks within the Growth Area for dispersal between any extant populations to the north and south, where habitat quality is generally higher” (p. 57). Darebin Creek at the proposed crossing location is ephemeral and does not contain deep, open pools with fringing vegetation that is favoured by Growling Grass Frog. Therefore, while the proposed crossing location of Darebin Creek is likely to be suitable for Growling Grass Frog dispersal, in its current habitat condition, it is unlikely to provide suitable breeding habitat for a resident population.

Habitat enhancement requirements for Category 1 Growling Grass Frog habitat have been detailed in DEPI (2013) and Ecology and Heritage Partners (2011a) for sites that contain known populations of Growling Grass Frog, or where the species has the potential to colonise and use sites in the future (i.e. after habitat creation and enhancement measures are undertaken). The retention of suitable terrestrial habitats between breeding sites is an important requirement for the long-term viability of Growling Grass Frog populations.

In the case of the study area, crossing structures should be installed in appropriate locations in an effort to ameliorate against habitat fragmentation and isolation.

Relevant habitat enhancement measures that could be undertaken within the study area include:

- Creation of waterbodies to augment existing habitats and to reduce the distance between sites;
- Excavation of sections of Darebin Creek to increase the hydroperiod of sites, thus potentially increasing the suitability of sites for breeding and recruitment;
- Planting of aquatic vegetation in the form of emergent, submerged and floating vegetation in created or enhanced waterbodies;
- Improvement of water quality within Darebin Creek;
- Control of aquatic and terrestrial weeds. A staged process of weed removal along Darebin Creek to ensure that Growling Grass Frog is not negatively impacted may be required;
- Provision of suitable shelter sites such as basalt boulders or rocks, and other suitable ground debris around the perimeter of waterbodies, and provision of suitable dispersal habitat between sites;
- Implementation and management of the Category 1 Growling Grass Frog habitat along Darebin Creek to facilitate ongoing movement between sites; and
- Removal of exotic aquatic predators through the periodic draining of off-stream waterbodies and the management of native waterfowl.

Habitat enhancement measures will need to consider the potential impacts on other flora and fauna species. An example of actions that may lead to direct impacts to other species include changes to wetland hydroperiods, excavation and disturbance of sites to remove dense emergent vegetation such as Cumbungi *Typha* spp., and extensive weed control, thus removing vegetation cover.

Through the enhancement of existing in-stream aquatic habitats along Darebin Creek, together with the creation of dedicated Growling Grass Frog waterbodies adjacent to the creek and either side of the crossing structure, this would promote colonisation and dispersal by Growling Grass Frog from existing populations to the north and south of the property.

## 5.2 Dispersal of Growling Grass Frogs through Crossing Structures

### Key points:

- Growling Grass Frog movement underneath bridges has not been comprehensively studied. However, there have been documented accounts of the species crossing underbridges along waterways (e.g. moving along Toomuc Creek under the Pakenham Bypass).
- Despite some positive studies showing use of underpasses by Growling Grass Frog, their use as the primary means of mitigating impacts of fragmentation is considered experimental.
- Important questions such as what design features facilitate use by Growling Grass Frog are yet to be addressed, however culvert design considerations are listed in Ecology and Heritage Partners (2011) and draft design guidelines for the use of crossing structures has recently been released by DELWP (report not finalised and not formally released). The size of the culverts that are proposed to be used at the Darebin Creek crossing are quite large and will contain water at times, and therefore this will maximise the potential for Growling Grass Frog to pass through them.
- A list of case studies where urban developments have included underpasses and culverts for Growling Grass Frog within Victoria is included.
- Within the PSP the E6 Outer Metropolitan Ring Road is proposed to be built over a large section of Darebin Creek (to the south west of the study area), and therefore the connectivity along the creek for Growling Grass Frog is likely to be seriously compromised.
- It is reasonable to conclude that Growling Grass Frog would be likely to disperse through a culvert within Darebin Creek with habitat modifications to enhance movement opportunities. However, there is insufficient evidence to determine the efficacy of culverts or bridges to facilitate movement.

Interconnectivity between breeding sites is critical for the long-term viability of Growling Grass Frog populations. Where crossing structures (e.g. bridges, culverts, underpasses) are proposed across waterways that provide dispersal opportunities for Growling Grass Frog, the structures must facilitate dispersal by Growling Grass Frog. Ecology and Heritage Partners (2011a) notes that there is a lack of scientific evidence to determine which crossing structures, if any, are used by Growling Grass Frog “While there are several design features (e.g. underpasses, culverts) that can be used in an attempt to allow frog permeability across the landscape...further detailed research is required to determine whether culverts and other crossing structures are used by Growling Grass Frog and other amphibian species. More importantly, empirical data is required to determine whether such structures allow for population dynamics and genetic exchange to occur.”. Furthermore, Hamer *et al.* (2014; 2015) states that the effectiveness of wildlife tunnels in mitigating the impact of roads on frog species in Australia and tropical region requires further investigations.

### Bridges

Bridges have been installed over several waterways as part of residential development or urban expansion. Such examples are Kororoit Creek, Caroline Springs (traversed by Caroline Springs Boulevard and along a suburban road separating the Serpentine Wetlands [Case Study 9]), Kalkallo Creek and Merri Creek, Donnybrook (traversed by Donnybrook Road [Case Study 16]) and Moonee Ponds Creek, Jacana Wetlands (traversed by the M80 Ring Road [Case Study 20]). Growling Grass Frog movement beneath these bridges has not been studied comprehensively. However, given that Growling Grass Frog populations, along with successful breeding (i.e. presence of tadpoles, metamorphs and juvenile frogs) have been recorded at each of these locations in close proximity to the bridge crossings it is likely that frogs are using the bridges to

move along the waterways. The use of a culvert beneath the Hume Highway by Growling Grass Frog has also been suggested as the access route to Kalkallo Dam from Kalkallo Creek (Case Study 15).

### Culverts / underpasses

Road underpasses designed specifically to increase the permeability of roads for frogs can potentially be an effective measure to reduce the artificial barrier effects. Several recent road developments around Melbourne such as Craigieburn Bypass, Pakenham Bypass and Edgars Road extension have underpasses incorporated into their design in proximity to existing populations in an effort to ameliorate impacts on Growling Grass Frog (Robertson 2002; Organ 2003, 2005c; Ecology Partners Pty Ltd 2006c). However, given the paucity of evidence concerning the efficacy of underpasses for mitigating the isolation effects of roads, information regarding the value of underpasses as a way to reduce the impacts associated with habitat isolation and fragmentation for Growling Grass Frog is lacking (Ecology and Heritage Partners Pty Ltd. 2011a). Consequently, the installation of underpasses as a primary measure to mitigate the impacts of urban development is currently considered to be experimental (DEWHA 2009a; Heard et al. 2010; Ecology and Heritage Partners Pty Ltd. 2011b).

A recent mark-recapture study documented Growling Grass Frog movements through a road culvert at Aurora Estate, Epping with a total of 63 movements recorded (Case Study 1). A separate mark-recapture study of Growling Grass Frog along the Pakenham Bypass recorded Growling Grass Frog movement underneath the Pakenham Bypass via Toomuc Creek (Case Study 25). Growling Grass Frog has also been observed perched or floating within culverts or beneath bridges at Aurora Estate (Case Study 1), Kalkallo Creek, Donnybrook (Case Study 16) and the Edgars Road extension, Epping (Case Study 17).

Hamer *et al.* (2014) conducted a study on the efficacy of a 12 metre under road tunnel in controlled conditions (i.e. the tunnel was not installed as part of a road project) to facilitate movement by three species of frog, Striped Marsh Frog *Limnodynastes peronii*, Broad-palmed frog *L. latopalmata* and Green and Golden Bell Frog *Litoria aurea*. They found that the proportion of all three species entering the tunnel was 13% and those exiting the tunnel at the other end was 5%. However, the habitat conditions in the artificial tunnel did not accurately reflect the conditions at many actual crossing structures, particularly the fact that areas of many underpasses / culverts are inundated periodically or permanently at creek crossings, and may be more suitable or attractive for frog movement.

### 5.2.1 Case Studies

With urban expansion throughout Melbourne's growth areas, there are numerous examples of crossing structures being installed as a mitigation measure for the construction of roads, residential and industrial estates, or other developments. Several examples are provided below (Table 1).

**Table 1. Use of artificial wetlands and structures by Growling Grass Frog**

| Site                     |   |
|--------------------------|---|
| 1. Aurora Estate, Epping | <p>A wetland and culvert system was installed in the drainage line of Edgars Creek, Wollert to mitigate impacts associated with the construction of a road crossing east to west over Edgars Creek, associated with the Aurora Estate development. Two artificial wetlands were connected under the road via four box culverts in the drainage (Koehler and Gilmore 2014).</p> <p>Mark-recapture surveys were undertaken in 2010 and 2011, and documented movements through the road culvert for 53 individuals, with a total of 63 movements recorded. During nocturnal surveys adult Growling Grass Frog was observed on two occasions within the inundated culverts, on one occasion within the dry passage culvert and two individuals were observed perched on, or</p> |

| Site   |   |
|--|---|
|  | <p>in, the outlets of drainage pipes within the culverts (Koehler and Gilmore 2014).</p> <p>Growling Grass Frog was recorded most recently within the artificial wetlands during 2014/15 survey season.</p>   |
| 2. Caroline Springs, Kororoit Creek: Treatment wetland (west), treatment wetland (east) and Caroline Springs Boulevard underpass | <p>The Kororoit Creek water treatment wetland (west) receives and treats stormwater runoff from surrounding development prior to entering Kororoit Creek. The wetland was surveyed over six seasons between 2005/06 and 2010/11 (Organ 2004a, 2005a, 2005b; Gilmore 2006; Ecology Partners Pty Ltd 2009b, 2010d, 2011c). Growling Grass Frog were recorded in the wetland during all surveys completed, with the number of Growling Grass Frog individuals recorded ranging from 1 to 31. Successful breeding was recorded in 2005 (Gilmore 2006).</p> <p>Caroline Springs Boulevard also crosses Kororoit Creek at this location with an underpass created to allow continued passage of aquatic fauna. Although detailed studies of Growling Grass Frog movement beneath this underpass have not been undertaken, the persistence of Growling Grass Frog in Kororoit Creek at this location suggests that frogs are using the underpass to move along Kororoit Creek.</p> <p>A second water treatment wetland is located in Kororoit Creek, approximately two kilometres east of Caroline Springs Boulevard (Kororoit Creek water treatment wetland [east]). The wetlands receive stormwater runoff from surrounding development before running in to Kororoit Creek. Growling Grass Frog was recorded at this location during nocturnal surveys undertaken in 2004 (A. Organ, pers. obs.).</p> |
| 3. Donnybrook, Kalkallo Dam, Hume Hwy  | <p>During construction of the Hume Highway, a culvert was included to allow continued passage of Growling Grass Frog between Kalkallo Creek and a farm dam to the west of the highway, described as 'Kalkallo Dam' in Ecology Partners (2007c, 2008b, 2009c, 2010b, 2011b).</p> <p>Growling Grass Frog was recorded in Kalkallo Dam during targeted surveys undertaken in 2005/06 (Venosta 2006). Given the lack of a source population on the western side of the Hume Highway, Geoff Heard suggests it is possible that Growling Grass Frog migrate to Kalkallo Dam from Kalkallo Creek after periods of high rainfall via the culvert beneath the Hume Highway (G. Heard pers. comm. in Ecology Partners 2008b). A genetic study of Growling Grass Frog in the Merri Creek system found a genetic division between frogs in Kalkallo Dam and those in Kalkallo Creek, however the data indicates there is some gene flow between the two groups, suggesting at least some migration between the two locations (Hale et al. 2013).</p>  |
| 4. Donnybrook, Merri Creek and Kalkallo Creek at Donnybrook Road   | <p>Donnybrook Road, Donnybrook crosses Kalkallo Creek and Merri Creek via two bridges to allow continued passage of aquatic fauna. Growling Grass Frog populations at these locations have been the subject of extensive survey (Heard et al. 2004; Venosta 2006; Ecology Partners 2007c, 2008b, 2009c, 2010b, 2011b), with the population identified as 'important' for the species in northern Melbourne (Heard et al. 2004; Ecology and Heritage Partners 2011b).</p> <p>Although Growling Grass Frog movement beneath the Donnybrook Road bridges has not specifically been studied, Growling Grass Frog individuals, along with successful breeding (i.e. presence of metamorphs and tadpoles) has been recorded in both Merri Creek and Kalkallo Creek at the bridge locations. In addition, Growling Grass Frog individuals were recorded floating directly beneath the bridge at Kalkallo Creek during nocturnal surveys undertaken in 2009 and 2010 (Author pers. obs.). This provides evidence that frogs are using the Donnybrook Road bridges to move along Kalkallo Creek and Merri Creek.</p>   |
| 5. Edgars Road extension, Epping   | <p>A series of constructed wetlands and culverts were installed along the length of the Edgars Road extension, Epping, to compensate for habitat removed as part of the road construction and to reduce barrier effects / isolation associated with the road development.</p> <p>Nocturnal Growling Grass Frog surveys were undertaken in the newly created wetlands in 2005/06 and 2006/07 (Ecology Partners Pty Ltd 2006b, 2007b). During nocturnal surveys in 2005/06 one individual Growling Grass Frog was recorded within the culvert of Underpass 3, immediately south of intersection of Edgars Road and Cooper Street, Epping (A. Organ pers. obs.).</p> <p>Growling Grass Frog was also recorded in 2006 and 2007 at Underpass 3 (Ecology Partners Pty Ltd 2006b, 2007b), in the wetlands on both the eastern and western side of Edgars Road. The observation of Growling Grass Frog on the western side of the underpass (during the 2005/06 and 2006/07 survey seasons) suggests that juveniles had dispersed from the quarry pits at the Epping Waste Disposal site to the east and using the underpass or drainage culvert to move under Edgars Road (Ecology Partners Pty Ltd 2006b, 2007b).</p>  |
| 6. Jacana Wetlands   | <p>The Jacana Wetlands are two of 52 wetlands constructed since 1999 in order to meet the 100 tonne KPI of the Nitrogen Reduction Program (Melbourne Water 2014). Of this target the Jacana</p>   |

| Site               |   |
|--------------------|---|
|                    | <p>Wetlands were designed to remove a combined annual load of 8.8 tonnes of nitrogen (Melbourne Water 2014). The Jacana Wetlands lie adjacent to Moonee Ponds Creek, to the north and south of the Western Ring Road (M80) in Jacana (north) and Glenroy (south), Melbourne. The system is fed from a catchment area that includes the Moonee Ponds Creek and the Yuroke Creek.</p> <p>Since their construction in 2003, the Jacana Wetlands (Melbourne Water 2014) have become host to a diversity of native fauna species taking advantage of revegetation efforts in the wetlands and along the creek, including Growling Grass Frog (Moonee Ponds Creek Coordination Committee Inc. 2011) (David Carew, Melbourne Water, pers. comm. 24/04/2015). Growling Grass Frog was recorded in the Jacana Wetlands to the south of the Western Ring Road immediately after their construction in 2006 (A. Organ pers. obs.), and to the north and south of the Ring Road during surveys undertaken in 2010/11 (Ecology and Heritage Partners 2011b). The species has also regularly been recorded within the wetlands during the annual Melbourne Water Frog Census (Ecology and Heritage Partners Pty Ltd 2012), and more recently during surveys undertaken in 2012/13 (SKM 2013) and 2013/14 (David Carew, Melbourne Water, pers. comm. 24/04/2015). The species was first document in 2003 when the wetlands were constructed (A. Organ, pers. obs.)</p> |
| 7. Pakenham Bypass | <p>A series of constructed wetlands and culverts were installed along the length of the Pakenham Bypass, between Beaconsfield and Officer, to compensate for habitat removed as part of the road construction and to reduce barrier / habitat isolation effects associated with the road development.</p> <p>Monitoring of the local Growling Grass Frog population was undertaken over seven seasons before, during and after completion of the road to determine whether the recent road development has had, or is having a significant impact on this nationally significant population, with Growling Grass Frog recorded in numerous wetlands along its length (Organ 2004b; Ecology Partners Pty Ltd 2006a; Ecology Partners Pty Ltd 2007a; Ecology Partners Pty Ltd 2008a; Ecology Partners Pty Ltd 2009a; Ecology Partners Pty Ltd 2010a; Ecology Partners Pty Ltd 2011b).</p> <p>One individual was originally marked in a constructed wetland on the northern side of the Pakenham Bypass on 2 March 2009, and was recaptured in a wetland on the southern side of the bypass on 20 October 2009. It is likely that the frog moved underneath the Bypass via Toomuc Creek (Ecology Partners Pty Ltd 2010c).</p>  |

From the above studies, Growling Grass Frog is known to have used crossing structures such as box culverts and tunnels to disperse between sites, albeit when structures are designed and constructed with adequate measures to facilitate usage. It is therefore reasonable to conclude that Growling Grass Frog, should a population exist in the PSP in the future, would be likely to disperse through culverts within Darebin Creek with habitat modifications to enhance movement opportunities. Indeed, the species is likely to move under roads using culverts at the point where the road dissects the Darebin Creek, as it is an aquatic habitat where higher concentrations of frogs, and higher relative use of habitats is likely to be higher, compared with terrestrial habitats where usage is expected to be lower.

Finally, within the PSP the E6 Outer Metropolitan Ring Road is proposed to be built over a large section of Darebin Creek (south west of the study area), and therefore the connectivity along the creek for Growling Grass Frog is likely to be seriously compromised.

## 5.3 Potential Boundary Adjustment of the Category 1 Growling Grass Frog Habitat

### Key points:

- Category 1 Growling Grass Frog habitat form relatively uniform buffers along waterways.
- The overall width of buffers along Darebin Creek is not necessarily the most important habitat considerations for the Growling Grass Frog, rather the actual treatment and quality of habitat (i.e. the presence of off-stream breeding wetlands and high quality terrestrial habitats) is likely to be more important for Growling Grass Frog in the future.
- The slight adjustment of the buffer along Darebin within the study area is not likely to prevent frogs moving through the area, nor is it likely to undermine the functionality of the corridor for frog dispersal and use for foraging.

The majority of the Growling Grass Frog Conservation Area (Category 1 habitat) identified in the Quarry Hill PSP has an approximately 50 metres buffer (100 metres total) either side of Darebin Creek (Plan 9 in DEPI 2013). Within the study area, the total width of the Category 1 habitat is approximately 175 metres.

It is important to note that as outlined in Ecology and Heritage Partners (2011a):

“it may be appropriate that the width of these buffers within and between clusters (of Growling Grass Frog populations) are expanded and / or reduced in particular circumstances depending on the presence and relative importance of breeding sites and the surrounding landscape matrix.

Similarly, Table A1.3 in Ecology and Heritage Partners (2011a) notes that to protect habitat along Darebin Creek:

“A 30-100 metre buffer either side the creeks. The buffer width does not necessarily need to be consistent along the entire creek but contain suitable terrestrial habitat and connection to surrounding areas (i.e. to any off-stream waterbodies).”.

In addition, the Guidance Note to the Biodiversity Conservation Strategy (BCS) specifies four application criteria for proposing adjustments to a conservation area (Growling Grass Frog conservation, floodplain and open space) boundary (Guidance Note, Chapter 2) (DELWP 2015). As outlined in DELWP (2015), Criteria 3 and 4 require specific information relating to the ecology of the areas proposed to be added and subtracted from the conservation area, and this will need to be finalised prior to any approved adjustment to the Category 1 Growling Grass Frog habitat. The following information will assist in responding to these criteria.

### Criterion 1

As per the flow chart shown below (Plate 1), the proposed adjustment must be necessary to address one or more of the following site specific issues. These criteria have been determined in consideration of the requirement in the BCS that only slight adjustments may be made to address site-specific issues arising at the precinct structure planning stage and the broader context of the Program Report.

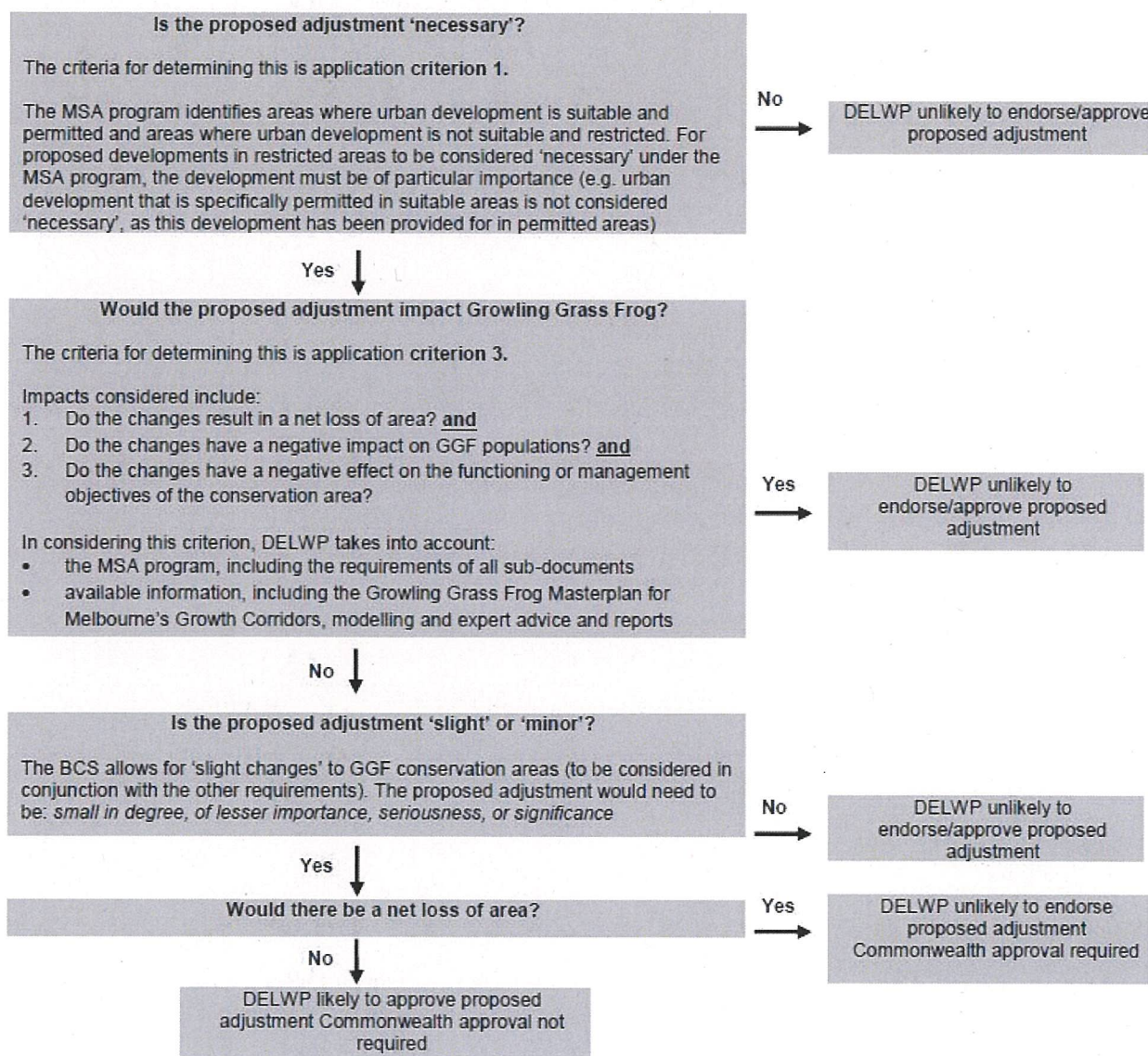
- To address issues associated with the construction and operation of any urban infrastructure shown in the Growth Corridor Plans (GAA 2012) or existing or proposed new infrastructure of state significance, where no feasible alternatives are available. DELWP will require confirmation from the MPA in determining whether this criterion has been met.

- To address issues necessary to meet the urban planning objectives of a precinct structure plan, such as appropriate urban form or the construction of roads, bridges, water management and other infrastructure, where no feasible alternatives are available. DELWP will require confirmation from the MPA in determining whether this criterion has been met.
- To exclude existing buildings or other infrastructure on or near the boundary of a conservation area.
- To allow access to land made inaccessible as a result of a conservation area, where no feasible alternatives are available.

The decision making process for Growling Grass Frog conservation area is shown in the flow chart below (Plate 1).

**Plate 1.** Decision making process for Growling Grass Frog conservation areas (Page 13, DELWP 2015).

**Figure 1: Decision making process for Growling Grass Frog conservation areas**



## Criterion 2

The proponent must obtain the written agreement of all landowners who are materially affected by the proposed adjustment (e.g. the adjustment reduces the area of developable land on their property).

Response: Given the proposed changes are minor, written agreement of neighbouring landowners is not likely to be required.

### Criterion 3

The proposed adjustment must maintain the biodiversity values of the conservation area, must not result in negative impacts on Growling Grass Frog populations and must have no negative effect on the functioning or management objectives of the conservation area. In considering this criterion, DELWP will take into account the following:

- a) Whether the proposed adjustment results in a net loss of area of a conservation area within the precinct.

Response: The proposed adjustment does not result in a net loss of area of a conservation area.

- b) Impacts of the proposed adjustment on habitat known to be currently or previously occupied by Growling Grass Frog, as indicated by records shown in the BCS or the Victorian Biodiversity Atlas, the Growling Grass Frog Masterplan, or new surveys undertaken by suitably qualified consultants (where surveys are required by DELWP).

Response: The site of the proposed adjustment lies at the northern extent of Conservation Area 34, along Darebin Creek. This area is not known to be currently occupied by Growling Grass Frog. The species is known to occur to the north of the study area, however this area will not be impacted by the proposed adjustment.

- c) Impacts of the proposed adjustment on areas of strategic importance for the Growling Grass Frog and the ecological functioning and effective management of the conservation area. In determining this, DELWP will consider the Growling Grass Frog Masterplan and Growling Grass Frog habitat design and construction standards. These areas include:

- o High quality habitat (wetland or terrestrial).

Response: The area proposed to be subtracted from the conservation area is highly modified and is dominated by introduced pasture grasses with scattered occurrences of native rushes and sedges. The creek and adjacent paddocks have been historically used for cattle grazing. At this location habitat for Growling Grass Frog is currently of low quality (i.e. contains sub-optimal breeding habitat for the species) and a resident population within the study area is unlikely.

- Areas required for habitat construction or enhancement and associated buffers, in accordance with DELWP's Growling Grass Frog habitat design and construction standards.

Response: Areas required for habitat construction or enhancement are expected to be specified in the Growling Grass Frog Masterplan, which DELWP is currently preparing (the Masterplan has not yet been made publically available for comment). However, the proposed adjustment does not result in a significantly altered shape to the conservation area and appropriate buffers have been retained.

- Areas required for works to provide appropriate hydrological regimes and water quality for Growling Grass Frog.

Response: As above.

- Areas required for connectivity between populations of Growling Grass Frog.

Response: As above.

- Areas required for the improvement of waterway condition or ecological function.

Response: As above.

- Areas required to effectively implement conservation management actions, such as biomass management, weed control, restoration, or access for management or maintenance.

Response: As above.

- The shape of the conservation area resulting from the proposed adjustment.

Response: The proposed adjustment does not result in a significantly altered shape to the conservation area and appropriate buffers have been retained.

#### Criterion 4 and 5

As outlined in DEWLP (2015), the proposed adjustment should not result in a net loss in the amount and quality of native vegetation, habitat for matters of national environmental significance or areas of strategic importance for the Growling Grass Frog in the conservation area in the precinct. Where there are no feasible alternatives to the proposed adjustment and a net loss would occur, a net conservation gain elsewhere within the Melbourne Strategic Assessment area in the amount and quality of native vegetation, habitat for matters of national environmental significance or areas of strategic importance for the Growling Grass Frog must be achieved.

Response: The proposed adjustment will not result in any loss in the amount or quality of native vegetation or habitat for matters of national environmental significance.

#### Final evaluation

The creation of off-stream breeding habitat for Growling Grass Frog within Category 1 areas is considered to be appropriate for Darebin Creek along with habitat connectivity to the creek itself to allow dispersal.

As stated previously, Darebin Creek at the proposed crossing location provides sub-optimal habitat for Growling Grass Frog (currently would only be used for dispersal and foraging). There is an absence of deep pools with fringing vegetation that is preferred by the species for breeding and no frogs have been detected within the study area. With this in mind, an adjustment of the Category 1 habitat area either side of Darebin Creek is reasonable and practical, and if combined with the enhancement of terrestrial habitat (and ideally the creation of off-stream waterbodies either side of the proposed crossing) this would facilitate dispersal by Growling Grass Frog within and between waterbodies.

## 6 CONCLUSION

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With reference to the above, I make the following concluding statements regarding the Quarry Hills PSP and considerations pertaining to the Growling Grass Frog:

- Darebin Creek currently contains sub-optimal breeding habitat for Growling Grass Frog, and no specimens were detected within the PSP during targeted surveys. In its current form and given the surrounding habitat conditions, at best, Darebin Creek may currently be used as a dispersal corridor for Growling Grass Frog to existing populations north and south of the PSP;
- The creation of dedicated Growling Grass Frog waterbodies either side of Darebin Creek, and in close proximity to the creek crossing, will facilitate dispersal opportunities through the proposed crossing structures;
- Growling Grass Frog would be likely to disperse through appropriately designed culverts (i.e. those that are designed and constructed to facilitate frog movement) within Darebin Creek. However, there is insufficient evidence to determine the efficacy of culverts or bridges to facilitate movement of Growling Grass Frog, and to cater for long-term population viability;
- It is understood that the requirement of a bridge span of Darebin Creek, rather than the provision of a series of box culverts, will lead to a substantial increase in costs which could otherwise be directed into habitat enhancement and creation of high quality breeding and terrestrial habitat for Growling Grass Frog. It is also important to note that the species is not currently known to occupy habitats (not resident) and using that section of Darebin Creek as breeding habitat, and therefore the provision of higher quality waterbodies that are designed, constructed and managed for the primary purpose for Growling Grass Frog, would be a superior outcome than mandating the provision of a bridge crossing of Darebin Creek.
- An adjustment of the Category 1 Growling Grass Frog habitat area either side of Darebin Creek within the study area is reasonable and practical, and if combined with the creation of suitable aquatic and terrestrial habitat either side of the proposed crossing, this would facilitate Growling Grass Frog dispersal between sites.

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## 8 REQUIRED INFORMATION

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### Name and Address

This report has been prepared by Aaron Organ, Director of Ecology and Heritage Partners, 292 Mt Alexander Road, Ascot Vale, Ph: (03) 9377 0100, [aorgan@ehpartners.com.au](mailto:aorgan@ehpartners.com.au)

### Area of Expertise

Aaron Organ is an expert ecologist, with skills in all the major ecological environments of south-eastern Australia. He has particular expertise in the workings of ecological systems, both under natural conditions and when affected by unnatural disturbance regimes such as weed invasion and impacts of development projects. He has also considerable experience in the application and practical implementation of current Commonwealth and State environmental legislation and Government Policy.

Aaron has appeared as an expert witness for multiple large PSPs throughout Melbourne's growth areas, and previously prepared the Sub-regional Growling Grass Frog Conservation Strategy within the Revised Urban Growth Boundary and Associated 28 Precincts for DELWP (Ecology and Heritage Partners 2011a).

### Expertise to make the Report

Aaron Organ has considerable knowledge of the native flora and fauna throughout south eastern Australia, including areas across western Victoria. A selection of past VCAT and Panel appearances include:

- 2015: Yaringa Boat Harbour Expansion, Yaringa, Victoria – (Panel)
- 2015: Proposed residential development at 134-166 Aspinall Street, Golden Square, Victoria – (VCAT)
- 2015: Amended Permit Associated with the use and development of the land for the purpose of a Place of Worship – 171 – 197 Harkness Road, Melton West, Victoria – (VCAT).
- 2014: Proposed Development Plan Overlay and Planning Permit Applications for a Proposed Residential Development at 370A Riddell Road, Sunbury, Victoria – (VCAT).
- 2014: Kilmore – Wallan Bypass – (Panel).
- 2014. Proposed residential development at 107 Gipps Street, Port Fairy (VCAT)
- 2014: NBN Fixed Wireless Telecommunications Facility at 49D Eddy Avenue, Mt Helen, Victoria – Clayton Utz Lawyers (VCAT)
- 2014: Proposed residential development at 10 Fullarton Drive, Paynesville, Victoria – Hall & Wilcox Pty Ltd (VCAT)

- 2014: Proposed residential development at 95 Wests Road, Langwarrin South – Planning and Property Partners Pty Ltd (VCAT)
- 2014: Amendment C101 to the Manningham Planning Scheme and Proposed Eastern Golf Course Development Plan – Mirvac Doncaster Pty Ltd. (Panel)
- 2014: Princes Highway duplication, Winchelsea to Colac – HWL Ebsworth Lawyers Pty Ltd. (Panel)
- 2014: Proposed Commercial Development, Federation Drive, Melton – Best Hooper Lawyers Pty Ltd. (VCAT)
- 2013: Statement of Expert Evidence: 1 Hobbs Road Wyndham Vale, Victoria. Amendment C171 - Ballan Road Precinct Structure Plan (PSP 40)
- 2013: Statement of Expert Evidence: Review of time stamped data for Amendment C172 - Ballan Road, Wyndham Vale (PSP 92)
- 2013: Statement of Expert Evidence: 305-315 Craigieburn Road East, Wollert, Victoria. Wollert Developments Pty Ltd. (VCAT)
- 2013: Proposed Planning Scheme Amendment C164 - 275 Racecourse Road, Sunbury – Hume City Council (Panel)
- 2013: Western Highway Duplication - Section 3, Ararat to Stawell, Victoria – DLA Phillip Piper (Panel).
- 2013: Cherry Tree Wind Farm – Maddocks Lawyers (VCAT).
- 2012: Western Highway Duplication - Section 2, Beaufort to Ararat, Victoria – DLA Phillip Piper (Panel)
- 2012: Proposed Peninsula Link Freeway Service Centres, 83 Sages Road Baxter, Victoria – Rigby Cook Lawyers Pty Ltd (VCAT)
- 2011: Western Highway Duplication - Section 1, Burrumbeet to Beaufort, Victoria – DLA Phillip Fox (Panel)
- 2011: Old Warrandyte Road, flora and fauna review and Panel hearing, Donvale – Norton Rose Australia Pty Ltd. (Panel)
- 2010: Marquands Road and Leakes Road (Lot 9), Truganina, Truganina South Precinct Structure Plan – Stockland (Panel)
- 2010: Proposed Eastern Golf Course relocation to 'Windsor Park', 215–217 Victoria Road, Yering, Victoria – for Best Hooper (VCAT)
- 2010: Truganina South Community Precinct Structure Plan – for Central Equity and Stockland Limited (Panel)
- 2010: Craigieburn R2 Precinct Structure Plan – for Peet Limited (Panel)
- 2010: Proposed Mortlake Wind Farm – for Accionia Oceania Limited (Panel)

- 2009: Grenda Vehicle Storage Depot, Springvale Road, Keysborough - for Urbis Pty. Ltd. (VCAT)
- 2009: 1280 Boneo Road, Cape Schanck, development a proposed barn – for Hansen Planning Services (VCAT)
- 2009: Melton Planning Scheme Amendment C65 – 489-555 Robinsons Road South Precinct (Marksx Property), Truganina (Panel)
- 2008: Donald Mineral Sands Panel and associated works. Donald Mineral Sands project (Panel)
- 2008: Amendment C88 to the Bass Coast Shire Planning Scheme - Silverleaves, Phillip Island (Panel)
- 2008: Proposed medium density development located on the corner of 1587-1589 Point Nepean Road and 1-1A Chatfield Avenue, Rosebud – for Fulcrum Town Planning Pty. Ltd. (VCAT)
- 2008: Residential development at 2 Rowe Street, Alphington – for Rob Wignall Architects (VCAT)
- 2008: Officer Service Centres, Officer – for Clayton UTZ Pty. Ltd. (VCAT)
- 2007: Anglesea Golf Club proposed Amendment C32 – for TGM Group Pty. Ltd. (Panel)
- 2007: Medium density housing at 2 Ramptons Road, Eltham – for Nillimbik Shire Council (VCAT)
- 2007: Medium density unit development in Frankston (adjacent to Kananook Creek) – for Gary Testro Lawyer (VCAT)
- 2007: Single dwelling development at 683 Great Ocean Road, Eastern Views, Victoria – for SJB Planning Pty. Ltd (VCAT)
- 2006: Construction of a dwelling at 8 Charlotte Court, Warrandyte - for Glossop Town Planning Pty. Ltd. (VCAT)
- 2005: Dollar Wind Farm, Gippsland – for Freehills Lawyers (Panel)

#### Author's Declaration

I, Aaron Organ, have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the tribunal.



----- Date: 02/11/2015