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Paula Stagg
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South-Eastern Australia Environment Assessment Branch
Department of Environment
PO Box 787
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7 May 2015
File No: QD2960777

Dear Ms Stagg

PRINCES HIGHWAY DUPLICATION – WINCHELSEA TO COLAC, VICTORIA (EPBC 2012/6568)
PRELIMINARY DOCUMENTATION INFORMATION REQUEST

I refer to a letter from the Department of Sustainability, Environment, Water, Population and Communities on 15 November 2012, advising the Decision on referral of the Princes Highway Duplication under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The proposed action is to undertake the duplication of approximately 37 kilometres of the Princes Highway from Deans-Marsh Road, Winchelsea to the Geelong-Warrnambool Rail Line, Colac. The letter stated that the proposed action is a controlled action and, as such, requires assessment and approval under the EPBC Act before it can proceed, including consideration of preliminary documentation including a public consultation phase.

VicRoads has worked with staff from the Australian Department of Environment and Victorian Department of Environment, Land, Water and Planning in preparing the required information. The attached document (EPBC Preliminary Documentation – Request Response – EPBC Ref: 2012/6568) provides the additional information requested. VicRoads hereby submits the document for final review and seeks the Minister's approval to seek public comment in line with the approval and EPBC guidelines.

Should you require any further information, Mr Tony Hedley, VicRoads' Project Director (Tel: 03 4243 3800), would be pleased to assist.

Yours sincerely

TONY HEDLEY
PROJECT DIRECTOR

PRINCES HIGHWAY DUPLICATION

WINCHELSEA TO COLAC

EPBC PRELIMINARY DOCUMENTATION REQUEST RESPONSE

EPBC REF:2012/6568

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Document information

Criteria	Details
Document title:	Princes Highway West Duplication – Winchelsea to Colac – EPBC Preliminary Documentation Request Response (QD 2957690)
Document owner:	VicRoads – Geelong Ring Road –Princes Highway Duplication Project
Document author:	Jie Cui / Luis Agudelo / Matthew Armitstead
Version:	1.0 Final
Issue date:	4 May 2015

Background

VicRoads submitted the EPBC referral for assessment in mid 2012 regarding the Princes Highway Duplication - Winchelsea to Colac, Victoria (EPBC 2012/6568)

A decision was issued by the Department on 25 November 2012 nominating the action as a Controlled Action, requiring assessment and a decision on approval under the EPBC Act before it can proceed.

For the last two years VicRoads have been progressing with additional studies aimed to quantify the extent of the impact on the Growling Grass Frog (GGF). Also, it has been engaged with the Department of Environment and Primary Industries (DEPI) regarding their requirements for the GGF, reviewing the best approach and developing a number of specific measures to address the likely impact to be caused by the Duplication Project.

A Cultural Heritage Management Plan (CHMP) has been prepared over the last two years ensuring a systematic investigation of the entire site. The CHMP is yet to be formally submitted to Aboriginal Affairs Victoria (AAV) for assessment.

VicRoads also progressed with the application to the Victorian Minister for Planning regarding the Planning Scheme Amendment (PSA) process. The changes to the PSA were adopted on 6 November 2014.

The Department of Sustainability, Environment, Water, Population and Communities has determined that the Project would be assessed through preliminary documentation provided with the referral submitted under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This document provides further information in response to the information request included in Appendix I accompanying the decision on referral letter.

Project Description.

The Princes Highway is the key east-west route in south-western Victoria, providing a strategic transport link between Melbourne, south west regional Victoria and South Australia. The Princes Highway is identified as a key freight route for various industries such as dairy, wood processing, beef and mineral sands. The Princes Highway also provides access to a number of regional towns including Winchelsea, Colac, Camperdown, Warrnambool and Portland. It is the inland alternative route to the Great Ocean Road for tourism and it also services the coastal towns within the south west region.

The location of the project is between west of Deans Marsh Road, Winchelsea and Corangamite Street, Colac. The total length of the project is 37 kilometres. The rural section (between west of Deans Marsh Road and Baillie Street, Colac) of the highway is 35 kilometres and the urban section within Colac is two kilometres. The existing road reserve is generally 60 metres wide with an 'A' standard - single carriageway two lane-two way road with sealed shoulders. There are currently two major structures within the project length, one bridge over the Geelong-Warrnambool railway (near Prices Lane) and one major culvert structure over Birregurra Creek. There are four medium

structures over two creeks. There is also an at-grade railway crossing of the Geelong-Warrnambool railway at Warncoort.

The recommended solution incorporates:

- Two additional lanes to reduce the stop-start nature of the trip.
- Wide median treatment between the two carriageways to separate traffic and allow for a clear zone.
- Improved road geometry for road safety.
- Increased shoulder widths to improve access and incident management and allow a safer environment for cyclists.
- Grade separation of the existing at grade level crossing at Warncoort-Birregurra Road.
- Duplication of rail overpass near Prices Lane.
- Upgrade of the existing rest area and the construction of a new rest area.
- One way crossfall correction on the existing two way crossfall carriageway to improve safety.
- Pavement rehabilitation works on the existing carriageway.
- Existing structures upgrades to meet current standards and requirements.
- Intersection safety and accessibility improvements through Colac.
- The removal of utility poles away from the road to provide safer driving conditions.

The highway will be posted at 100km/h and will be designed to Austroads and VicRoads standards.

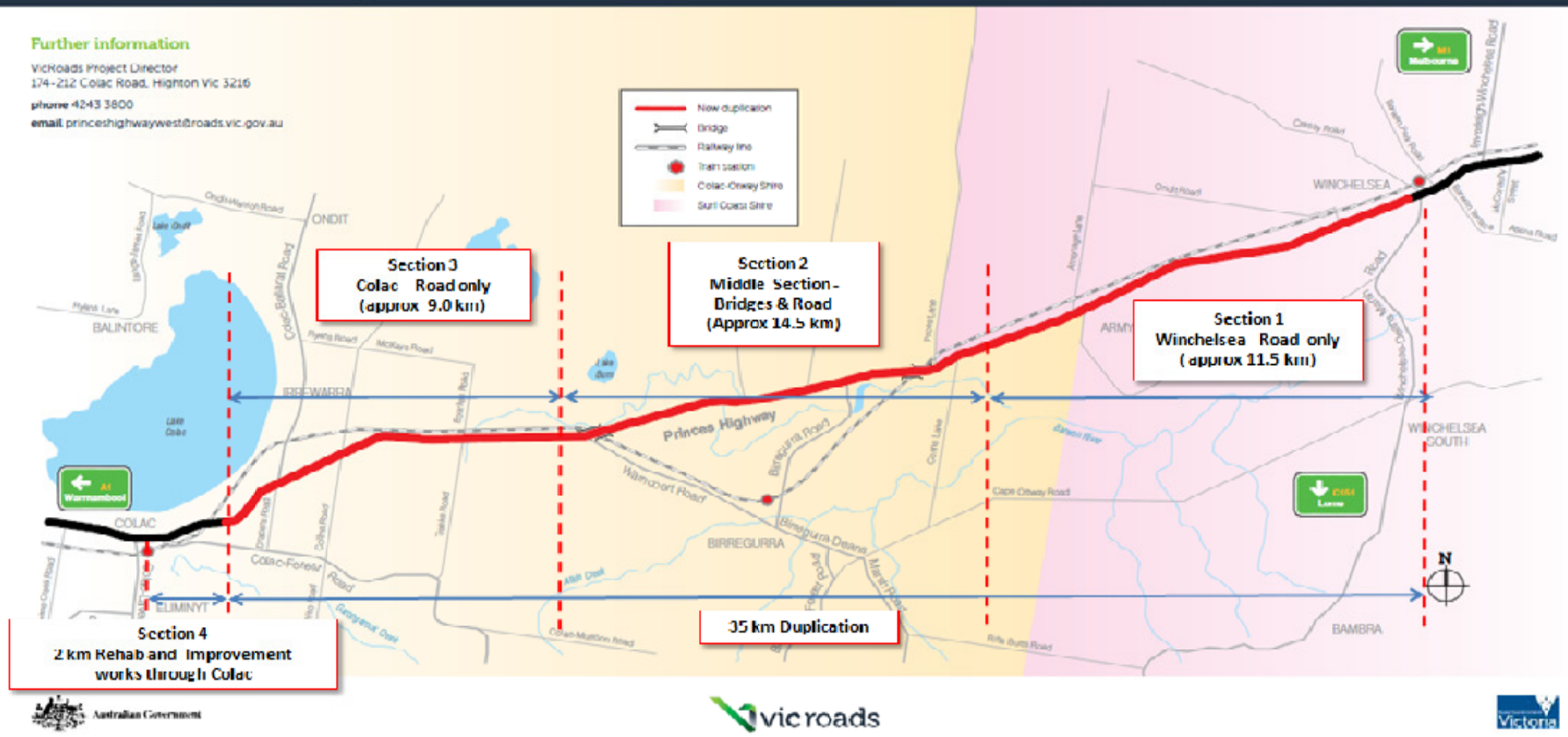
Most of the land required for the Project is currently in private ownership. Following a public Planning Scheme Amendment process, a Public Acquisition Overlay has been introduced on the required land to allow VicRoads to compulsorily acquire the land for road purposes.

The Procurement Strategy prepared for the Victorian Department of Treasury and Finance divides the works up into the following sections shown on the following figure.

Princes Highway

Winchelsea to Colac

OCTOBER 2013



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Responses to "DOE's Preliminary Documentation request letter - Appendix A" (See Letter attached in Appendix I.

1. General

Additional information is required about the potential impact of the proposed action to listed threatened species and ecological communities. The following information is required:

A. Confirmation of the preferred design of the proposed action, including alternative design options and precautionary clearance thresholds, if the final design is not available. All construction and operational components of the action that likely to have potential impacts on listed threatened species and ecological communities, where known or able to be predicted, must be described in detail. This must include the date or time period over which construction will take place, a detailed description of structures and supporting infrastructure to be built and materials, equipment and machinery to be used.

Since the submission of referral in 2012, a concept plan has now been completed for Princes Highway Duplication works between Winchelsea and Colac and the extents of the road corridor have now been defined. The plans showing the concept alignment, extents of batters/embankments, and other works including structure locations can be seen in Appendix A. Detailed design for the project will be undertaken in 2015/16 and will be based on the concept plans that have been developed.

Construction and operational components:

Given the findings of the Ecology and Heritage Partners (EHP) Addendum Report (Feb 2014) (See Appendix 3) the primary risk of impact from activities associated with this Project is to the Growling Grass Frog (GGF). Below is a list of the construction or operational components that have the potential to impact upon listed threatened species or ecological communities:-

- Earthworks (Including clearing and stripping) –
    - The removal of GGF habitat i.e. water bodies and the surrounding terrestrial habitat used for foraging.
    - Reduction in Water quality of remaining GGF habitat and in waterways.
    - Stockpiling materials at inappropriate locations that will impact on habitat and waterways.

- Plant operation –
    - Soil and habitat contamination resulting from fuel/oil leaks and hydraulic hose ruptures.
    - Soil or habitation contamination resulting from refuelling activities. Injury to GGF that enter the construction zone while plant is in operation.

- Drainage works –
    - The construction of culverts under the new and existing road carriageways may restrict GGF movement through the landscape.

- Bridge construction –
    - Restriction of habitat movement during construction activities
    - Impact on water quality due to concreting activities
    - Impact on water quality due to a chemical spill from chemicals used for bridge construction activities.

- Carriageway Sealing works – over spraying or laying of bitumen may discharge into habitat that's suitable for the GGF.

- Services Relocations
    - GGF may become trapped in excavation trenches established for service relocation.

- Site compounds/Human Impacts/ Parking –
    - Establishment of site compound could result in an impact on GGF habitat .

- Road Operation (post construction)
    - The restriction of GGF movement through that landscape, primarily from one side of the Highway to the other.
    - Inadequate wetland habitat remaining in proximity to the highway that will ultimately restrict the movement/connectivity between existing habitat in the surrounding farm land.

Timing of works:

Based on an analysis of the entire works to be delivered, including section lengths, interface requirements and locations, environmental constraints and local topography, the project shall be broken up into four packages of works as outlined below including the anticipated package start and finish dates.

SECTION	LOCATION	WORKS DESCRIPTION	START DATE	FINISH DATE	DURATION
Section 1	Winchelsea to Armytage	Roadworks Only – Approx 11.5 km ($60-80M).	October 2015	January 2017	28-30 months
Section 2	Armytage to Warncoort	Bridges and Roadworks – Approx 14.5km ($80-100M).	April 2016	April 2019	38-42 months
Section 3	Warncoort to Colac East	Roadworks Only – Approx 9km ($60-80M).	January 2017	May 2019	28-30 months
Section 4	Colac Township	Minor works including pavement rehabilitation, signal upgrades, bridge strengthening and footpath works. ($5-10M).	March 2015	May 2016	14 months

Note the dates provided are indicative only and may vary somewhat as a result of state /federal funding.

Materials, Equipment and Machinery:

As the construction associated with the duplication of this length of the highway is reasonably straightforward, it is anticipated that standard machinery and materials will be utilised by VicRoads contractors to deliver the works.

Roads construction materials to be utilised for this project are likely to include but not limited to:

- Imported clean fill (consisting of clay material that addresses the 'structural' requirements for road construction)
- Harvested clean fill (extracted from sections within the site where the road alignment is situated in 'cut' and material is ultimately to be excavated)
- Crushed rock, cement treated crushed rock, bituminous materials,
- Concrete, steel reinforcement, formwork/falsework, scaffolding, pre-cast concrete culverts and other items for drainage.

Bridge and drainage construction materials to be utilised for this project are likely to include but not limited to:

- concrete (utilised in situ),
- steel reinforcement,
- concrete beams
- formwork/falsework and scaffolding,
- pre-cast concrete culverts and pipes (for drainage)

A variety of equipment and machinery will be utilised on the worksite including:

- excavation equipment (Dozers, excavators, scrappers, backhoes etc),
- earthmoving vehicles, (Tippers of various sizes, graders etc)
- compaction equipment, (rollers etc)
- cartage vehicles (including water trucks, delivery vehicles, man movers etc),
  light construction equipment including vibrating plate compactors etc or hand tools.

The components of the proposed action to be described in this preliminary document must include specifications or details of:

i) All watercourse crossings requiring additional infrastructure works, including bridge works, culverts, embankments, temporary in-stream barriers and flow diversion structures;

<u>Existing Waterbodies</u>

Section 9 of the Ecology and Heritage Partners Preliminary Documentation Request includes Figures 2a to 2y which show the water way bodies located along the section of Princes Highway West Duplication Project. The figures show those water bodies that will be removed and those that will

not be impacted upon. It also indicates the habitat quality of each water body and also where no-go zones will be required during construction.

As summarised in the table below, in total there were 73 water bodies (predominantly privately owned dams) identified within the new road alignment and acquired land that may be impacted by the Princes Highway Duplication works between Winchelsea and Colac. Of the 73 water bodies considered, 58 (79.5%) were deemed to be of Low quality habitat, 9 (12.3%) of Moderate quality habitat and only six (8.2%) were deemed to be of High quality habitat.

Of the 73, 29 waterbodies will be impacted upon by the project and 23 of these will need to be removed. Of the 23 to be removed, 21 (28.7%) were deemed to be of low quality habitat, 2 (2.7%) a moderate level of habitat quality and no high level quality habitat were to be removed.

The remaining waterbodies to be impacted will be zoned as No-Go Zones with a further 11 (15.1%) waterbodies not expected to be impacted identified for protection with No-Go zones. The remaining 33 (45.2%) of the waterbodies will not be impacted and do not require protection with No-Go zones.

During the development of the concept design and where possible VicRoads have tried to minimise the impact on waterbodies by aligning the road, position the duplicated road or reducing median widths to move the works away from existing waterbodies or create more room to build new habitat. Further to this, during the detailed design and construction stage of the project, VicRoads will be requesting further investigations into the possibility of further minimising the impacts on waterbodies and the possibility of retaining some of the existing waterbodies that are expected to be impacted upon. Additional clusters of waterbodies will be provided at 6 locations which have be discussed further in response to Item 2 Impacts on the Growling Grass Frog.

Total No. Water bodies	73 (100%)			
	Water body Quality			
	Low	**Moderate**	**High**	**Total**
No. of Water bodies	58 (79.5%)*	9 (12.3%)*	6 (8.2%)*	73 (100%)
No. of Water bodies –to be impacted	22 (30.1%)*	4 (5.4%)*	3 (4.1%)*	29 (39.7%)*
No. of Water bodies – to be removed	21 (28.7%)*	2 (2.7%)*	0 (0%)*	23 (31.5%)*
No. of Water bodies – impacted to be No-Go zone protected	1 (1.4%)*	2 (2.7%)*	3 (4.1%)*	6 (8.2%)*
No. of Water bodies – not impacted but to be No-Go zone protected	8 (11%)*	1 (1.4%)*	2 (2.7%)*	11 (15.1%)*
No. of Water bodies – not impacted or requiring No-Go zone protection	28 (38.4%)*	4 (5.4%)*	1 (1.4%)*	33 (45.2%)*

*: as a Percentage of the Total No. of water bodies

A complete table of all water bodies including comments and commitments is attached in Appendix B.

Water Course / Drainage Crossings

There is currently a total of 54 locations along the existing Highway were either bridges, cuverts or pipes have been established for either drainage purposes or to allow the road to pass over a watercourse. (See Appendix D for their locations.) The maps in Appendix D have been extracted from a Hydraulics and Hydrology Assessment report completed by AECOM in November 2013. At each location a second structure will need to be installed as part of the works associated with the new carriageway.

Currently there are 4 main structures to be constructed over watercourses at the following locations:

- Tributary of Birregurra Creek – proposed culvert (Reinforced Concrete Crown Units), wingwalls, earthworks and beaching.
- Birregurra Creek – demolition of existing bridge and construction of two small single span bridges for each carriageway, piled foundations and earth retaining walls to minimise impact on waterway.
- Sheep Wash Creek – proposed culvert (Reinforced Concrete Crown Units), wingwalls, earthworks and beaching.

Appendix D provides the concept plans for the proposed bridge and culverts for the above locations.

Ultimately there will not be a barrier created to obstruct frog movement where an existing connection exists under the highway. There will be locations where the size of the existing infrastructure will be increased. There will however be some minor interruption to drainage, undertaken progressively, both as the various contracts (sections) are awarded, and as each of them is delivered. Drainage will not be blocked off for any long period as the contractor will need to maintain current connectivity. This in turn will maintain connectivity for the GGF.

The maps (Appendix D) indicate the location, culvert size and catchment areas for all the existing crossings. Appendix E also includes a table that provides a comparison of the existing culvert sizes and the proposed culverts to be installed.

Based on the preliminary concept design analysis, 10 of these crossings do not require upgrade works but 43 of the sites will ultimately have larger pipes or culverts installed. A new culvert is also to be installed at a location where currently none exists.

Other Bridge Structures:

The project includes the construction of 3 major bridges over the Geelong-Warrnambool rail line. Appendix D provides the concept plans for the proposed bridge and culverts at the following locations:

- Railway overpass near Prices Lane - Proposed duplication of bridge over railway line near Prices Lane including piling, abutments, 2 piers for a 3 span bridge.
- Railway overpass near Warncoort-Birregurra Road – Two single span bridges to be constructed including piling, retaining walls, earthworks and concrete decking.

ii) Water quality monitoring and management programs, including erosion, sediment and runoff controls, water quality testing and other measures to maintain or enhance aquatic habitats in the vicinity of the road route;

Water quality monitoring is a standard requirement for any VicRoads project where a water course passes through the site or is in proximity to the works. Monitoring is undertaken at a predetermined frequency (nominally weekly where flows are evident) and for all rain events and/or when there's discharge from the site.

Water quality monitoring parameters are based on Victorian State Environment Protection Policy (Waters of Victoria) (SEPP (WoV)), and reflect aspects of water quality that may be impacted on by construction activities. They include turbidity, dissolved oxygen, pH, temperature, together with a visual assessment for oil and litter. Water quality monitoring for rain events is required within the first hour and then every four hours of a continuous rain event or within 12 hours of an out of work hours rain event.

Water quality is undertaken to measure for any construction impacts by comparing upstream and downstream results (where the upstream measurement forms the 'background' readings for the monitoring period). Further investigations to determine the cause is required where there is a worsening of water quality downstream.

See Appendix G for VicRoads' standard contract specification requirements. Water quality monitoring is addressed in Section 177 Part B.

VicRoads requires the contractor to establish erosion and sediment controls in accordance with EPA 'best practice' environmental management guidelines (in particular Publications 275 - *Construction Techniques for Sediment Pollution Control*, 480 – *Environmental Guidelines for Major Construction Sites* and 960 – *Doing it right on subdivisions*). This includes but is not limited to:

• minimising the amount of exposed erodible surfaces during construction including the staging of works;

• prompt temporary and/or permanent progressive revegetation of the site as work proceeds;

• installation, stabilisation and maintenance of catch and diversion drains that segregate water runoff from catchments outside of the construction site from water exposed to the construction site;

• installation and maintenance of erosion and sedimentation controls, established in accordance with EPA best practice guidelines for the treatment of sediment laden run off resulting from construction activities;

• adequately control and route runoff within the construction site to the appropriate sedimentation controls; stockpiles to be located not less than 10 metres from waterways and

• the installation of temporary sediment basins, to be utilised as the primary sediment control for the works unless the Contractor can demonstrate that the implementation of a sedimentation basin in not technically feasible i.e. if there's insufficient space within the site to install one.

The timing for the monitoring of the effectiveness of erosion and sediment controls is similar to water quality monitoring, i.e. weekly and during rain events, to ensure their effectiveness.

See Appendix G for VicRoads' standard contract specification requirements. Specific requirements for erosion and sediment control and monitoring is addressed in Section 177 Part B.

iii) Indicative details of supporting infrastructure for construction and road operations, such as machinery storage areas, access tracks, work or office sheds, wash down facilities, additional water, sewage, drainage and electricity facilities and associated installation works;

VicRoads standard contractual requirements include the identification of areas where works are not to be undertaken, i.e. No-Go Zones (NGZ). NGZ generally delineate ecological areas of significance that have been identified and are to be protected from all impacts during construction. These areas will preclude:

- The storage of machinery and fuel and chemicals,
- The establishment of access tracks, site sheds, compounds and wash down facilities; or
- Service installation
- Waste Management and fuel and chemical storage facilities.
- The location of stockpiles

The Contractor will be advised that works are located in an area of high environmental sensitivity in the construction contract specification. Further to the requirements of VicRoads' standard contract specification Standard Section 177 the Contractor shall be required to include the following environmental restrictions in developing its construction program and EMP:

- The Contractor shall arrange a joint inspection with the Superintendent to confirm the locations for site compound sites, no go zones and other restricted areas.
- No go zones identified and confirmed shall be temporarily fenced by the Contractor with parawebbing.

iv) Waste management arrangements, including storage and disposals of fuels, chemicals and other waste products during construction and ongoing use of the road; and

This project will be undertaken in accordance with the VicRoads Contract Specifications. The requirements include waste management to be managed in accordance with the hierarchy, to avoid, reuse, recycle or dispose of waste material.

All work under the Contract shall comply with the following requirements:

- The nature of wastes generated as a consequence of works under the Contract shall be identified.
- Wastes shall be stored prior to reuse or disposal to minimise any impact on the site or surrounding environment.
- Vehicles transporting waste shall be covered and appropriately licensed.

Within VicRoads Standard Contract Specification, there is a list of resource management requirements outlined in Table 177.F1.01. The table is attached below.

Table 177.F1.01 Resource Management Requirements

Material	Waste Management Option
Asbestos	EPA licensed landfill
Asphalt	Recycle or reuse - not to landfill
Concrete and concrete washings	Recycle or reuse - not to landfill
Contaminated soil	Recycle or reuse on site if opportunity exists If removed from site, transported by an EPA licensed contractor and disposed in accordance with EPA regulations
Felled woody vegetation (except fragments of noxious or environmental weeds capable of regeneration)	Mulched for reuse, or used for habitat logs
Woody weed fragments capable of regeneration	Burial on site (deeper than 500 mm and not in fill, pavement or other critical areas), composting, or disposal to landfill
Formwork	Reuse or dispose to landfill
Plastics (Recycle Nos. 1, 2, 3, 4, 5, 6, 7)	Recycling facility - not to landfill
Metal	Recycle or reuse - not to landfill
Oil containers and lead acid batteries	Recycling facility - not to landfill
Packaging materials	Recycle where possible or dispose to landfill
Empty paint tins	Recycling facility - not to landfill
Petroleum products from spills (absorbed in spill kit material or contaminated soil)	Recycle or reuse with rehabilitation of contaminated soils if opportunity exists Transported by an EPA licensed contractor and disposed in accordance with EPA regulations
Timber (untreated)	Recycle - not to landfill
Litter	Recycle or dispose to landfill
Office waste	Recycle where possible or dispose to landfill
Other waste excluding the above wastes	Recycle or reuse if opportunity exists

The specification also requires the contractor to mitigate the effects on the environment from fuels and chemicals, including herbicides and pesticides. The contractor is required to:

- Nominated fuel and chemical storage areas that comply with Dangerous Goods (Storage and Handling) Regulations 2000 and EPA Bunding Guidelines (EPA Publication 347) including the placarding of compounds and bulk storage containers;
- Nominated points for the refuelling and fluid top up of vehicles and plant which shall be undertaken in a designated area at least 20 metres from any drainage point or waterways.
- Provision of readily accessible and maintained spill kits for the purpose of cleaning up chemical, oil and fuel spillages on the site at all times.
- Ensuring that personnel trained in the efficient deployment of the spill kits are readily

available in the event of spillages; and

- A contingency plan that shall address the containment, treatment and disposal of any spill.

v) Details of the induction provided to workers, particularly in relation to potential impacts on threatened species.

Prior to commencement of construction onsite, the Contractor shall ensure that personnel directly involved in the development and implementation of EMPs, and the monitoring, installation and maintenance of control measures attend an environmental workshop to review the key environmental issues associated with the works including information about the threatened species.. The workshop will be planned with VicRoads staff to ensure that the agenda addresses all key issues, focusing on the key risks, primarily focusing on EPBC listed species

VicRoads requires that the contractor implement an induction and training plan that ensures all site personnel understand the Environmental Management Plan that's prepared for the works. The induction will outline all the potential impacts on threatened species. The specific management requirements for the threatened species will be addressed and site personnel will be informed of relevant environmental requirements in relation to the works including emergency response procedures.

B. For all species that are considered unlikely to be impacted by the proposed action, but for which apparently suitable habitat is present and could be impacted by the proposed action, detailed information to demonstrate that impacts on the species are unlikely to occur must be included; and

The response to this request for information in provided in the responses to Items 2-8 following.

C. The referral states that an Environmental Management Plan (EMP) and Construction EMP is currently in preparation. Please provide copies of these plans or at a minimum, details of the key commitments and measures. The CEMP should contain specific and enforceable measure to ensure that impacts to species (particularly Growling Grass Frog Litoria raniformis) and ecological communities listed under the EPBC Act are avoided or minimised.

VicRoads has prepared a Project Environment Protection Strategy (PEPS) titled 'Princes Highway Winchelsea to Colac Project Environment Protection Strategy (PEPS)'. This document is in essence VicRoads 'Environmental Management Plan'.

The PEPS details amongst other things:

- VicRoads project management procedures and roles and responsibilities for the delivery of the project;
- Identifies all significant environmental issues that need to be addressed by the project. (This includes the Growling Grass Frog);
- Potential impacts to the environment and the identification of objectives to avoid or mitigate them (See the Environmental Risk Assessment contained within the PEPS);

- Environmental commitments in the form of permit and approval conditions and commitments made to stakeholders;
- Summary of all environmental investigations and recommendations provided.

The PEPS is a live document that is regularly reviewed. See Appendix H for a copy of the PEPS.

The PEPS is utilised in the preparation of the contract specification. In addition to the standard contractual requirements, the PEPS will 'inform' the specification of any specific requirements that are required to ensure the appropriate level of environmental management.

Based on standard VicRoads requirements, VicRoads contractor will prepare an EMP for the management of all construction activities, prior to commencement of construction activities. The EMP must address the requirements of VicRoads specification including any specific requirements for the management of the Growling Grass Frog. (See Appendix G for VicRoads' standard contract specification requirements. The requirements of an EMP are addressed in Section 177 Part A).

Note – VicRoads ensures the adequacy of the contractors EMP prior to the commencement of works through the thorough review by VicRoads staff and an independent audit of the EMP by a qualified environmental auditor (listed on VicRoads prequalification register) who is familiar with 'best practice' environmental management for road construction.

Response Items 2-9

Consultants, Ecology and Heritage Partners Pty Ltd, were engaged to provide the additional information to enabling VicRoads to respond to the request for information Items 2 – 9 (note that an Item 7 was not present in the information request – See Appendix I) from the EPBC Preliminary Documentation Request. Responses to each of the items has been extracted from the Ecology and Heritage Partners Pty Ltd Princes Highway Duplication Winchelsea to Colac EPBC Preliminary Documentation Response Report (EHPR) which has been attached in Appendix C.

2 Potential impacts on Growling Grass Frog (Litoria raniformis)

Additional information is required to quantify the potential impacts to the Growling Grass Frog (GGF) from the proposed action.

To address Item 2 of the Preliminary Documentation Request, the responses for Items 2a, b, c, and D have been merged to discuss the likely impacts to Growling Grass Frog and impacts associated with construction works as part of the proposed action. A description and analysis of the relevant impacts likely to be associated with the Princes Highway Duplication project and appropriate mitigation measures to reduce any such impacts are discussed below.

2.1 Growling Grass Frog

2.1.1 The risk of transfer of disease or pathogens

Whilst in many circumstances salvage and translocation of threatened species, including Growling Grass Frog, is considered to be a measure to reduce impact, its appropriateness and applicability should be assessed on a case by case basis. This is especially important for species such as Growling Grass Frog whereby individuals, populations and the species are particularly vulnerable to readily transferrable diseases such as Chytrid Fungus and whereby there is minimal evidence that salvage and translocation is successful at an individual, population or species level. In some instances, investment into other conservation measures, such as landscape scale habitat design and creation, may be more appropriate.

Where possible and practicable it may be most appropriate to avoid impacts through mitigation measures (i.e. salvage and translocation), or if impacts are not avoidable they should be minimised as much as possible (DEWHA 2009a). Consideration must also be made to the 'environmental context' of the habitat being removed and that sites history, current use and condition of the environment which is likely to be impacted (DEWHA 2009a).

Recent studies have also investigated the practicality of salvage and translocation as a management approach (Heard *et al.* 2010). As per Heard *et al.* (2010), it is stated that 'the aim of translocation is to ensure there is either no net reduction in the abundance of Growling Grass Frog, or no net reduction in the number of populations present'. However, Heard *et al.* (2010) raises several important points regarding the use of translocating individuals and are summarised as follows:

- Ensuring there is no net reduction in abundance: with the likely end result leading to reduced connectivity between remaining populations, and the potential for a reduction in the likelihood of persistence in the long–term.
- Ensuring there is no net reduction of populations: this is poorly documented and there is currently no evidence that populations of Growling Grass Frog can be successfully relocated. This has been attempted is a closely related species, the Green and Golden Bell Frog *Litoria aurea*, and results have indicated that the success of translocations for this species have not been successful (Smith and Clemann 2008; White and Pyke 2008).
- It is important to flag the potential risks associated with translocating individuals at both the broader population and individual based levels also. The possible spread of disease (i.e. Chytrid fungus) and heightened predation risk are both additional examples of the risks associated with salvage and translocation.

To minimise the risk of spreading disease and pathogens, salvage and translocation of Growling Grass Frog as part of the Princes Highway Duplication project is not proposed. In addition, the number of Growling Grass Frog likely to be detected during construction is not considered to be high based on the results of targeted surveys and the general quality of habitats within or immediately adjoining the Princes Highway which are proposed to be impacted. Overall, the risk of spreading Chytrid Fungus through the relocation of individuals is therefore considered to be low.

Construction works will be confined to a specific work area and all top-soils which are removed are to be re-used in order to reduce the likely spread of Chytrid Fungus to surrounding habitats outside the project area. Standard construction procedures such as sedimentation control and use of clean-fill will also eliminate the risk of transferring diseases or pathogens into potential Growling Grass Frog habitats surrounding the construction zone.

Mitigation Measures

- The relocation of Growling Grass Frog will only be undertaken within distances ≤100 metres when detected during pre-clearance surveys or construction activities in accordance with EHPR Appendix 3.
- Pre-clearance surveys at waterbodies to be removed or impeded by construction works will only be undertaken where an existing waterbody or suitable habitat(s) (i.e. waterway or drainage line) are available to relocate individuals within ≤100m.
- The relocation of Growling Grass Frog within ≤100m of a removed waterbody will not occur across the Princes Highway or the Geelong-Warrnambool railway as these are considered to be current barriers to dispersal.
- The contact details of a suitably qualified zoologist should be readily available to all staff if a Growling Grass Frog is detected or injured during construction works.

2.1.2 The Impact of the permanent removal of waterbodies (GGF Habitat)

During construction activities the permanent removal of waterbodies within the construction zone is likely to have a direct impact on Growling Grass Frog which may be seeking refuge in terrestrial habitats. The permanent removal of waterbodies may also have the potential to impact Growling Grass Frog indirectly in the short-term by reducing the species ability to disperse throughout the landscape during the construction phase of the Princes Highway Duplication.

Recent studies have revealed that the spatial orientation of waterbodies across the landscape is one of the most important habitat determinants influencing the presence of the species at a given site (Robertson *et al*. 2002; Heard *et al*. 2004a, 2004b; Hamer and Organ 2008). For example, waterbodies that are located in proximity of each other are more likely to support a population of Growling Grass Frog, compared with isolated sites lacking important habitat features (Hamer and Organ 2008).

As Growling Grass Frogs are mobile species, it is possible during surveys to detect frogs 'passing through' an area which may imply the use of a dam (DEPI 2012; 2013), however, the dam may not be adequate for prolonged occupancy or breeding. Rather these sites should be considered as 'stepping stone' habitat for an individual dispersing between more suitable breeding habitat (DEPI 2012; 2013). While low quality waterbodies containing poor water quality and low levels of aquatic and semi–aquatic vegetation are unlikely to support Growling Grass Frog for prolonged periods of time they may provide important dispersal habitat for Growling Grass Frog and opportunistic breeding habitat under suitable conditions.

Overall, the landscape provides a high number of artificial waterbodies with the majority of low quality waterbodies proposed to be removed having multiple habitats of similar quality nearby (i.e. within 500-1000 metres or less). On a landscape scale, the availability and connectivity of artificial waterbodies in proximity to the Princes Highway Duplication is considered good, albeit the quality of most waterbodies is similar to those being removed, within the landscape.

The removal of potential Growling Grass Frog habitats during construction is likely to impact likely 'stepping stone' dispersal habitat. To reduce the long term impacts of the Princes Highway Duplication project on the species; the avoidance of high quality waterbodies and creation of new habitats at locations considered important for the species ability to disperse throughout the local area will be undertaken.

Important locations for Growling Grass Frog along the Princes Freeway alignment were based broadly on Heard *et al.* (2010), which prepared a detailed report outlining several key factors to assist predicting the probability of Growling Grass Frog occupancy within a known population north of Melbourne. Heard *et al.* (2010) looked at factors including i) the percentage (%) of emergent, submergent, floating aquatic vegetation cover ii) annual permanency of water (including during extreme drought) and iii) connectivity to surrounding waterbodies.

An assessment to determine important sections of the Princes Highway which had the potential to limit connectivity to Growling Grass Frog as a result of habitat loss were identified (as 'clusters') and

selected as potential sites for newly created Growling Grass Frog habitat. It should be noted that the methodology did not focus on all three factors outlined in Heard *et al*. 2010, and focused primarily on connectivity within the landscape given over 90% of the waterbodies proposed to be removed were generally considered to be a permanent water source with low overall aquatic vegetation cover.

Other limiting factors associated with the selection of clusters included the availability of public land along the construction footprint where the creation of newly constructed wetlands were required. Hydrology has also been a key factor to ensure flows at post-construction stages are the same as pre-construction levels along formed drainage lines, waterways and most importantly the private waterbodies on land adjoining the road development.

The assessment first looked at the location of waterbodies which were proposed to be removed; these were grouped and named as Clusters 1–7 (EHPR Appendix 1; Figures 2a-2y). All artificial waterbodies, on the same side of the highway as the proposed habitat removal, which were located within 1000 metres from habitat to be removed were counted using aerial photography. **Note:** when all waterbodies within 1000m for both sides of the highway are counted (i.e. north and south), there is a considerably higher number of waterbodies within 1000m and may suggest the relative connectivity of waterbodies within the local area is good (albeit their overall quality is likely to be low).

A polygon was then created to outline a broad area in which a new waterbody could be created to replace the loss of habitat associated with the road development. A buffer of 200 metres was created around all waterbodies associated with the cluster to provide an indicative area for habitat creation; this was also aimed at providing flexibility to VicRoads where land acquisition on private property was limited. Given the limitations of habitat creation listed above and good overall connectivity within the immediate landscape to other waterbodies of similar quality, only one waterbody is proposed for each cluster.

While in several instances two or more low quality waterbodies are proposed to be removed, the creation of new waterbodies by VicRoads is likely to adequately substitute the loss of poorer quality habitats. Overall, this will provide suitable breeding, foraging and dispersal habitat(s) for the relatively low abundance of Growling Grass Frogs within the local area.

As part of the detailed design phase of this project all artificial waterbodies found to contain the Growling Grass Frog or provide important Growling Grass Frog habitat during the initial targeted surveys have been avoided. The following areas are considered to be important habitat(s) for Growling Grass Frog in which mitigation measures to protect existing ecological values will be undertaken during construction, as shown in EHPR Figures 2a-2y:

- Birregurra Creek
- Drainage Line: 52DL
- Waterbodies: 19a, 28, ***26a,*38a**, 42, 43, 52a and 66a **(*Growling Grass Frog detected)**

Of the 73 potential habitats recorded as part of the Princes Highway Duplication project initial flora and fauna assessment, **21 low quality** and **two moderate quality** artificial waterbodies (i.e. farm dams) are proposed to be removed (with quality based on habitat criteria outlined in EHPR Figures 2a–2y). The remaining 50 waterbodies will not be impacted as part of the project works; however, additional mitigation measures will apply to 17 of these waterbodies which are in proximity to the construction footprint for the protection of potential Growling Grass Frog habitat.

Overall, a total of seven important waterbodies clusters and potential locations for the creation of **six** new Growling Grass Frog habitats have been identified through a 'Habitat Offset Analysis' (EHPR Appendix 1; Figures 2a-2y).

Previous Monitoring Works

Long–term monitoring has not been undertaken within the local area and it is unknown how frogs move across the existing Princes Highway or whether there is likely to be increased mortalities associated with the Princes Highway Duplication project. As outlined above, the length of occupancy within waterbodies proposed to be removed is also unknown and the frequency in which such waterbodies are visited by Growling Grass Frog.

Mitigation Measures

- A list of waterbody locations and pre-construction requirements (i.e. pre-clearance surveys and 'No-Go Zone' fencing) associated with construction work is outlined below in EHPR Appendix 2.
- An induction for all Contractors will include information regarding the appearance of Growling Grass Frog and management actions requirements to be undertaken during all stages of the project.
- A 'species fact sheet' will be provided to all work sheds so that the procedures for managing the detection of Growling Grass Frog for all staff are clearly accessible.
- Any waterbody or potential Growling Grass Frog terrestrial habitat located within 30 metres of the waterbody which is to be retained will have appropriate 'No-Go Zone' fencing located along the boundary of the construction footprint for protection (EHPR Figures 2a-2y).
- All 'No-Go Zone' areas will be clearly marked using highly visible para-webbing type fencing with appropriate signage to be displayed at all times (i.e. 'No-Go Zone – Important Fauna Habitat').
- The relocation of Growling Grass Frog will only be undertaken within distances ≤100 metres when detected during pre-clearance surveys or construction activities in accordance with EHPR Appendix 3.
- Pre-clearance surveys at waterbodies to be removed or impeded by construction works will only be undertaken where an existing waterbody or suitable habitat(s) (i.e. waterway or drainage line) are available to relocate individuals within ≤100m.
- The relocation of Growling Grass Frog within ≤100m of a removed waterbody will not occur across the Princes Highway or the Geelong-Warrnambool Railway as these are considered to be current barriers to dispersal.

- Any Growling Grass Frogs which are detected will be relocated appropriately as per the recommendations outlined in EHPR Appendix 3.
- The creation of Growling Grass Frog habitat will include six new waterbodies at targeted locations to ensure that any frog dispersal is not inhibited by excessive distances between surrounding waterbodies within the landscape (methods for determining the number and location of created waterbodies are detailed below in EHPR Appendix 1).
- NOTE - A number of private properties containing waterbodies will be acquired, and under the purchase agreements landowners will have the opportunity to replace waterbodies which have been removed from their land as part of the Princes Highway Duplication project. This may provide further habitat in addition to the six waterbodies which will be created by VicRoads as offsets; however, the location and number of waterbodies which will be replaced by landowners is unknown and these will not require the same design and creation specifications for waterbodies to be created as offsets.
- The creation of Growling Grass Frog habitat will follow the guidelines outlined in EHPR Appendix 4. Waterbodies will be designed and located in areas which provide suitable natural hydrology regimes to allow for the filling of waterbodies during or after rainfall events.
- Monitoring of created Growling Grass Frog habitat will be conducted bi-annually for three years once the waterbodies contain water and are planted with the vegetation densities outlined in EHPR Appendix 4.
- Each monitoring event will comprise two annual surveys (during September and February each year), and will include the following (as a minimum):
    1. Habitat assessment documenting: the type and cover of fringing, emergent, submerged and floating aquatic vegetation, and other refugia; evidence of disturbance such as soil disturbance and erosion.
    2. *In-situ* water quality will also be measured including; Temperature (^{o}C), DO (mg/L), pH, Conductivity (mS/cm), TDS and Turbidity.
    3. Completion of a field assessment sheet and relevant provision of site photos as detailed in EHPR Appendix 5.
    4. Monitoring will be reported back to VicRoads and DEPI and a short letter report outlining the monitoring results will be provided annually.
- Any deterioration in habitat will be provided in the annual report so additional measures can be implemented (i.e. extra plantings, addition of water or extra habitats). This may also require extensions to the three year monitoring program to ensure the offsets have successfully been established prior to DEPI and SEWPaCs approval.

Likelihood of significant impacts for the permanent removal of waterbodies

While a number of waterbodies will be removed as part of the Princes Highway Duplication project, the provision of six newly created waterbodies in key areas along the project alignment is considered to be a sufficient offset for their removal.

This is based on the following factors:

- Six newly created waterbodies will provide high quality habitat which will aim to act as suitable breeding habitat for the species in addition to being located in proximity to those waterbodies to be removed.
- Growling Grass Frog is unlikely to use low quality habitats to be removed on a permanent basis and/or for breeding purposes.
- The landscape is highly modified and there is a high proportion of waterbodies of similar quality (i.e. artificial farm dams used for stock) which may be used by Growling Grass Frog as temporary dispersal or refuge habitat(s).
- Appropriate mitigation measures including staff inductions, pre-clearance surveys and contingency measures (i.e. relocation) will be undertaken to prevent direct impacts to the species during construction or the removal of habitats.

Overall, the removal of low quality waterbodies is not considered likely to have a significant impact on the species provided the recommendations and mitigation measures outlined in this addendum are adhered to.

2.1.3 The impact of habitat degradation

The majority of habitats proposed to be impacted are void of native terrestrial and aquatic vegetation, while remaining habitats throughout the road reserve are highly modified, with the exception of remnant vegetation patches outlined in EHPR - Figures 2a-2y. For example, few of the existing low quality waterbodies proposed to be removed have extensive terrestrial or aquatic vegetation (i.e. native flora species, logs, rocks or ground debris) surrounding them and/or have been subject to historical grazing pressures associated with agricultural practices (Plates 1 and 2).

Plate 1: Low quality waterbody within the project alignment with little native terrestrial or aquatic vegetation (Source: Ecology and Heritage Partners Pty Ltd).

Plate 2: Low quality waterbody within the project alignment subject to grazing (Source: Ecology and Heritage Partners Pty Ltd).

While there will be direct vegetation removal during construction throughout areas surrounding artificial waterbodies and waterways/drainage lines, this vegetation is comprised predominantly of exotic pasture grasses which are unlikely to provide anything more than marginal refuge or dispersal habitat(s) for the species.

Given that current vegetation quality both within the Princes Highway road reserve and adjoining private properties is highly modified, further habitat degradation is unlikely to result from the Princes Highway Duplication project.

Previous Monitoring Works

Long–term monitoring has not been undertaken within the local area and it is unknown how frogs move across the existing Princes Highway.

Mitigation Measures

- An induction for all Contractors will include information regarding the appearance of Growling Grass Frog and management actions requirements to be undertaken during all stages of the project.
- A 'species fact sheet' will be provided to all work sheds so that the procedures for managing the detection of Growling Grass Frog for all staff are clearly accessible.
- Any waterbody or potential Growling Grass Frog terrestrial habitat located within 30 metres of the waterbody which is to be retained will have appropriate 'No-Go Zone' fencing located along the boundary of the construction footprint for protection (EHPR - Figures 2a-2y).
- All 'No-Go Zone' areas will be clearly marked using highly visible para-webbing type fencing with appropriate signage to be displayed at all times (i.e. 'No-Go Zone – Important Fauna Habitat').

- All waterbodies which are to be removed and/or located within 30 metres of the construction footprint will require a pre-clearance survey to be undertaken prior to the removal of terrestrial or aquatic vegetation.
- Pre-clearance surveys will involve a suitable ecologist to inspect all areas surrounding waterbodies to be removed within a 30 metre radius immediately prior to works that will impact on them.
- Any Growling Grass Frogs which are detected will be relocated appropriately as per the recommendations outlined in EHPR - Appendix 3 Growling Grass Frog Relocation Procedure.

  NOTE - A number of private properties containing waterbodies will be acquired, and under the purchase agreements landowners will have the opportunity to replace waterbodies which have been removed from their land as part of the Princes Highway Duplication project. This may provide further habitat in addition to the six waterbodies which will be created by VicRoads as offsets; however, the location and number of waterbodies which will be replaced by landowners is unknown and these will not require the same design and creation specifications for waterbodies to be created as offsets.
- The creation of Growling Grass Frog habitat will follow the guidelines outlined in EHPR - Appendix 4. Waterbodies will be designed and located in areas which provide suitable natural hydrology regimes to allow for the filling of waterbodies during or after rainfall events.
- Monitoring of created Growling Grass Frog habitat will be conducted bi-annually for three years once the waterbodies contain water and are planted with the vegetation densities outlined in EHPR - Appendix 4.
- Each monitoring event will comprise two annual surveys (during September and February each year), and will include the following (as a minimum):
    5. Habitat assessment documenting: the type and cover of fringing, emergent, submerged and floating aquatic vegetation, and other refugia; evidence of disturbance such as soil disturbance and erosion.
    6. *In-situ* water quality will also be measured including; Temperature (^{o}C), DO (mg/L), pH, Conductivity (mS/cm), TDS and Turbidity.
    7. Completion of a field assessment sheet and relevant provision of site photos as detailed in EHPR - Appendix 5.
    8. Monitoring will be reported back to VicRoads and DEPI and a short letter report outlining the monitoring results will be provided annually.

    - Any deterioration in habitat will be provided in the annual report so additional measures can be implemented (i.e. extra plantings, addition of water or extra habitats). This may also require extensions to the three year monitoring program to ensure the offsets have successfully been established prior to DEPI approval.

Significance of impacts (With mitigation measures applied)

While a number of waterbodies will be removed as part of the Princes Highway Duplication project, the provision of six newly created waterbodies in key areas along the project alignment is considered to be a sufficient offset for their removal.

This is based on the following factors:

- Six newly created waterbodies will provide high quality habitat which will aim to act as suitable breeding habitat for the species in addition to being located in proximity to those waterbodies to be removed.

- Growling Grass Frog is unlikely to use low quality habitats to be removed on a permanent basis and/or for breeding purposes.
- The landscape is highly modified for rural farming and there is a high proportion of waterbodies of similar quality (i.e. artificial farm dams used for stock) which may be used by Growling Grass Frog as temporary dispersal or refuge habitat(s).
- Appropriate mitigation measures including staff inductions, pre-clearance surveys and contingency measures will be undertaken to prevent direct impacts to the species during construction or the removal of habitats.

Overall, the removal of low quality waterbodies is not considered likely to have a significant impact on the species.

2.1.4 The impact of works in waterways on hydrology and dispersal

Given the nature of works within waterways there will be temporary disturbance to potential dispersal habitat for Growling Grass Frog and the natural hydrology (i.e. the duration or frequency of flooding events) associated within waterways during construction activities. As part of the Princes Highway Duplication project, direct impacts to Growling Grass Frog dispersal habitat will occur during the installation of infrastructure associated with works in waterways.
Based on the hydrology assessment undertaken by AECOM (2013), there will be 54 crossings comprising 2 waterways and 52 culvert/pipe crossings. There is expected to be direct short-term impacts associated with all 46 crossings given the high level of infrastructure required to be added to complete the road duplication.

Works in Waterways and Drainage Lines

Birregurra Creek

The works proposed for Birregurra Creek will involve the construction of a single span bridge for the new carriageway (east bound) which will have a short term impacts on the waterway during construction.
The section of Birregurra Creek associated with construction works is likely to dry out during summer as has been observed during previous seasons (A, Taylor. pers. obs.).

The timing of construction activities, including bridge works will be prioritised during the summer/drier months although they may extend into wetter periods of the year when the species is still active and/or construction activities may encounter high rainfall once works they have commenced. .

Connectivity under the bridge will be maintained during construction for two purposes:

- to allow flows to pass through the site should there be sufficient rain that will result in a flow, and
- to allow for Growling Grass Frog dispersal through the creek.

Sheepwash Creek (Drainage Line (52DL) and Waterbodies 51a/52a)

Sheepwash Creek forms a tributary of Birregurra Creek although the flow has been halted through the creation of a stock crossing running under the Princes Highway which has the stopped natural water flows under normal conditions.

A large culvert will be placed on the northern side of the Princes Highway to duplicate the existing culvert under the highway. While there are permanent areas of water both north and south of the Princes Highway (Plates 3 and 4), there are likely to be minimal impacts to these habitats during construction. Waterbody 51a will be removed during construction; however, appropriate mitigation measures will be implemented (Plate 5).

Plate 3: 52DL south of the Princes Highway (Source: Ecology and Heritage Partners Pty Ltd).

Plate 4: 52a north of the Princes Highway 2011 (Source: Ecology and Heritage Partners Pty Ltd).

Plate 5: 51a north of the Princes Highway (Source: Ecology and Heritage Partners Pty Ltd).

Given Sheepwash Creek has now been modified and rarely flows under normal conditions, dispersal by Growling Grass Frog under the Princes Highway is unlikely to occur via this crossing on a regular basis. The hydrology of this crossing will not be further impacted as flows under the Princes Highway have already been modified by the cattle underpass.

Culvert Crossings and Minor Drainage Lines

Forty four (44) culvert and pipe crossings will be installed as part of the Princes Highway Duplication project as outlined in the AECOM (2013) report. All culvert crossings will ensure there is no restriction to the flow of water under the Princes Highway or the movement of fauna following their installation. As outlined above, it is unknown if or how often Growling Grass Frog currently use culverts to move under the Princes Highway.

Culverts will not be installed under the full length of both roads: instead two separate culverts will be installed ensuring that natural light enters both ends of the culvert enabling the ability for fauna (including Growling Grass Frog) to continue to disperse under the highway. While there will be temporary ground disturbances associated with construction works, the impact will be short term only for a number of months at each location and staged for the length of the project. Only a small number of crossings will be impeded from connectivity at any one time.

Mitigation Measures

- Estabilish a designated No-Go Zone at Birregurra Creek to restrict the movement of contractor staff and equipment from the works area into the creek and maintain a habitat movement corridor for the Growling Grass Frog (EHPR - Figures 2q and 2o).
- Reinstatement works will ensure the hydrology and impacts outside the construction footprint such as erosion and sediment run-off is managed appropriate during all phases of construction.
- Pre-clearance surveys will be undertaken for any culvert that is within a designated 30 metre buffer area of GGF habitat (Figure 2a-2y).
- The construction site should be left in a condition that promotes the re-growth of vegetation, without remnant fill and rubble covering the channel.
- Any Growling Grass Frog detected during pre-clearance surveys or general construction works must be relocated in accordance with the measures outlined in EHP report - Appendix 3 .
- Frog dispersal corridors must be maintained outside related construction activities through appropriate protective measures (i.e. No-Go Zones).
- Works within waterways must ensure that the flows within the creek are maintained.

Significance of impacts of works in the waterways

Given the nature of flows within waterways, drainage lines and stand-alone waterbodies which intersect or are located in proximity to the Princes Highway currently, there is likely to be no significant impact to Growling Grass Frog or associated hydrology during the construction works associated with the project.

While the species may be encountered during construction activities, pre-construction surveys and maintaining hydrology and dispersal corridors outside construction works will assist in minimising the short-term impacts to the species within the local area.

The focus to undertake the timing of works in waterways during dry conditions will also minimise the likelihood of flooding events and associated downstream impacts such as sedimentation. In addition, Growling Grass Frogs are likely to be more active during warmer months in which detect ability will be greater for relocation.

2.1.5 The impact of barriers for dispersal and road mortalities

Major construction activities associated with the Princes Highway Duplication project have the cumulative potential to increase the short-term barrier effects to Growling Grass Frog which may cross the highway during favourable conditions (i.e. heavy rains). Road mortalities may also be an impact associated with construction given the increased plant and light vehicle traffic associated with construction activities.

Results of targeted surveys undertaken by Ecology and Heritage Partners Pty Ltd (2012b), indicated a total of three Growling Grass Frogs within two waterbodies along the project alignment and an additional incidental record outside the project investigation area. Monitoring by DEPI located a further three Growling Grass Frog records in proximity to the Princes Highway and areas identified by Ecology and Heritage Partners (EHPR - Figures 2a-2y). The total number of frogs in proximity to the project is currently unknown but the densities in proximity to the project are expected to be low.

The Princes Highway and east-west railway line between Colac and Winchelsea currently acts as a barrier for Growling Grass Frog. The project will be maintaining key existing dispersal corridors traversing the highway; such as Birregurra Creek, drainage lines and existing culvert crossings (EHPR - Figures 2a–2y).

Culverts will not be installed under the full length of both roads: instead two separate culverts will be installed ensuring that natural light enters both ends of the culvert enabling the ability for fauna (including Growling Grass Frog) to disperse under the highway.

Also , Appendix E shows how many of the existing pipes and culverts are to be increased in size or number which will provide improved dispersal under the highway.

Although there will be a barriers at each of the culverts while construction is underway, in each instance it will only be for a relatively short period (a number of months), and only within limited sections of the project at any one time (given the staging of contracts for the delivery of the project and also due to the staging of works within contracts.)

Based on the historical data and discussions with relevant herpetologist expert Garry Peterson (DEPI), major watercourses such as Birregurra Creek appear to act as an important dispersal corridor for Growling Grass Frog and these will be maintained for dispersal at all times outside site-specific construction works.

Mitigation Measures

- Ensure that Birregurra Creek is bridged to ensure that there is acceptable connectivity from one side of the highway to another.
- Dispersal opportunities and north-south connectivity for the Growling Grass Frog will be retained within Birregurra Creek at all times during construction through the implementation of No-Go Zones (Figure 2o).
- The relocation of Growling Grass Frog within ≤100m of a removed waterbody will not occur across the Princes Highway or the Geelong-Warrnambool Railway as these are considered to be current barriers to dispersal.

Likelihood of significant impacts

With the exception of relevant construction works, the Princes Highway Duplication project is unlikely to further fragment and isolate local Growling Grass Frog populations provided the project is undertaken in according with the mitigation measures outlined in this addendum response. There will be continuous measures to assist the dispersal and reduce direct mortalities to Growling Grass Frog during construction works (i.e. pre-clearance surveys, staff awareness and relocation measures).

The Princes Highway and adjoining east-west railway line are considered to already create some form of barrier affect for the dispersal of Growling Grass Frog across the landscape. It is considered that if the duplication of the Princes Highway is undertaken in the manner proposed in this submission there is unlikely to be a significant impact to the long-term persistence or additional barriers to dispersal for Growling Grass Frog within the local area.

2.1.6 Construction Associated Impacts

Standard VicRoads contract clauses (i.e. Section 177 Environmental Management) will be utilised as a minimum to address the management requirements for all elements of the environment.
The contract specification will then be supplemented to address any additional requirements, including where appropriate, any of the mitigation measures proposed in this addendum to avoid/minimise the impacts on the Growling Grass Frog.

The Contractor is required to prepare an Environment Management Plan (EMP) to address the requirements of the specification and to document how all of the objectives of the specification are to be met.

The following section discusses the key mitigation measures from VicRoads Section 177 Environmental Management contract clauses to be implemented during the project as a minimum requirement for Growling Grass Frog. A full copy of the standard environmental requirements (i.e prior to the development/inclusion of specific requirements for) as found in Section 177 - Environment Management (Major) is provided as EHPR - Appendix 6.

2.1.7 The impact of erosion and sedimentation

Given the extensive areas of vegetation to be cleared as part of the Princes Highway Duplication project, there is the potential for direct or indirect impacts through erosion and sedimentation run-

off into potential Growling Grass Frog habitats adjoining the construction zone if not managed appropriately.

High levels of sedimentation or erosion has the ability to decrease water quality within waterways or waterbodies used by Growling Grass Frog for potential breeding, foraging or refuge habitat (i.e. Waterbodies 26a and 38a where Growling Grass Frog were detected).
Poor water quality is thought to render potential habitats less favourable for breeding purposes by Growling Grass Frog, and given the low number of high quality habitats in proximity to the Princes Highway; the management of sedimentation and future erosion is a critical aspect of construction works for the project.

Mitigation Measures

All exposed surfaces shall be free of or treated to minimise erosion. Erosion and sediment controls shall include but are not limited to:

- Ensure the protection of key habitats in proximity to the construction zone are protected from the impact of erosion sedimentation discharge in accordance with EPA 'best practice' environmental management guidelines, during all stages of the project (primarily waterbodies 19a, 28, 26a,38a, 42, 43, 52a and 66a; EHPR - Figures 2a-2y).

- Any waterbody or drainage line which is located within 30 metres of the construction footprint will have appropriate erosion and sediment controls installed, in accordance with EPA 'best practice' environmental management guidelines, to manage sediment laden water that enters the waterbody.

- Prompt temporary and/or permanent progressive revegetation/stabilisation of the site as work proceeds.

- Installation, monitoring and maintenance of erosion and sedimentation controls, established in accordance with EPA 'best practice' environmental management guidelines for construction activities.

- Where soil is stockpiled on site, such stockpiles shall be located, where possible, to provide a clearance of not less than 10 m from waterways. Where it is not possible to provide a clearance of 10 m, the stockpile shall be above the normal high water level of the waterways and additional protection shall be provided to prevent the stockpiled material entering the waterways.

Likelihood of significant impacts

While there is likely to be some short-term sedimentation associated with the project during times of rainfall, these will be managed appropriately through specific mitigation measures. Long-term impacts are unlikely to result from this project given that areas which have been cleared will be reinstated as soon as practicable to pre-construction levels to ensure future erosion or sedimentation levels are controlled.

Provided appropriate sediment and erosion controls are implemented and functioning ask required during rain events there is considered to be no significant impacts associated with the Princes Highway Duplication project and Growling Grass Frog habitat(s) in proximity to the construction zone.

2.1.8 Noise and Light Pollution

There are no proposed night time works associated with the Princes Highway Duplication project. Given Growling Grass Frog are typically more active during the night impacts to foraging, breeding and hunting activities are not likely to be associated with noise or light pollution during construction.

Ecology and Heritage Partners has undertaken long term monitoring along the Pakenham Bypass located in Victoria between Beaconsfield and Officer, continuing eastwards on the southern side of Pakenham for a distance of approximately 20 kilometres. The bypass has a high level of traffic and associated noise and light pollution in which Growling Grass Frog has been recorded using created habitats within the road reserve over consecutive monitoring seasons for foraging, dispersal and breeding purposes (Ecology and Heritage Partners Pty Ltd 2008; 2009; 2010c; 2011).

Mitigation Measures

- Hours of work shall be between 7am and 6pm weekdays and Saturday.

Likelihood of significant impacts

Growling Grass Frog in proximity to the Princes Highway Duplication project are not likely to be impacted by noise and light pollution during construction works. While there will be increased noise levels associated with construction, this is unlikely to directly impact the species ability to use habitats within the landscape for breeding, foraging or dispersal as has been observed along the Pakenham Bypass (Ecology Partners Pty Ltd 2011). Overall, there are likely to be no significant impacts related to noise and light pollution associated with the project.

2.1.9 Fuels and Chemicals

Fuels and chemicals which are used during construction have the risk of leakage or spillage and the potential to run-off site into creeks or culverts containing aquatic or terrestrial habitat(s) where Growling Grass Frog may occur and/or be residing.

Based on VicRoads experience, the most common incident involves the failure of a hydraulic hose rather than a spill during refuelling activities resulting in only minor impacts that are easy to clean up.

Stroage of bulk fuels and chemicals is not common for VicRoads contraction contracts as plant is generally refuelled utilising mobile tankers and earthworks generally don't require the use of chemicals. Some chemicals are used for bridge construction.

Mitigation Measures

- Nominated points for the refuelling and fluid top up of vehicles and plant and the storage of fuels and chemicals shall be undertaken in a designated area within the construction footprint at least 30 metres from any existing waterbodies, drainage lines or waterway.
- The relevant EMP will include specific procedures (i.e. bunding of fuels and chemicals that are stored on site and the use of spill kits to clean up spills and leaks) to mitigate the effect on the environment from fuels and chemicals, including herbicides and pesticides utilised throughout all phases of construction.

- A spill kits will be available at various locations throughout the site while construction activities are underway primarily in proximity to storage locations and at creeks while works are underway.

Likelihood of significant impacts

There is unlikely to be any associated impacts to Growling Grass Frog and associated habitats with respect to the storage and management of fuels and chemicals as part of the Princes Highway Duplication project provided appropriate mitigation measures are adhered to during all phases of the project.

2.1.10 Weeds, Pests and Diseases

There is likely to be some initial use of herbicides to manage the encroachment of weeds post-construction before they become a significant problem. However, given the pressures from surrounding agricultural and historical land-use practices, the level of biocides associated with the management of the Princes Highway Duplication project is considered to be low in comparison to the level of chemicals used in the adjoining landscape.

Mitigation Measures

- A frog sensitive herbicide (non-residual herbicide) will be used within 30 metres of waterways, artificial waterbodies or drainage lines. The use of other herbicides or pesticides within, or in proximity to these areas will be prohibited.

Likelihood of significant impacts

There is unlikely to be any associated impacts to Growling Grass Frog and associated habitats with respect to the management of weeds and pests as part of the Princes Highway Duplication project provided appropriate mitigation measures are adhered to during all phases of the project.

3 Potential for impacts on listed threatened fish species

Information is required to quantify the impact of the proposed action on listed threatened fish species as a result of the proposed action in or near waterbodies and drainage lines. This must include:

a) **Further information as to why targeted aquatic fauna surveys have not been undertaken for the Australian Grayling (Prototractes maraena), Macquarie Perch (Macquaria australasica), Dwarf Galaxias (Galaziella pusilla) and Yarra Pygmy Perch (Nannoperca obscura) at relevant waterbodies and drainage lines within or near to the proposed action. If it is believed that targeted surveys are not necessary an explanation of why, including evidence that the existing habitat conditions are unlikely to support populations of these species, should be provided.**
b) **If present, a description of potential impacts of the proposed action on these species; and**
c) **If relevant, information on avoidance and mitigation measures proposed to reduce potential impacts to water quality or species in the waterways.**

Australian Grayling

Targeted surveys for Australian Grayling have been undertaken within the Barwon River (at Winchelsea) and the species was not detected (Ecology Partners Pty Ltd 2010a; 2010b). However, the species is notoriously difficult to detect during targeted surveys.

With the exception of the Barwon River, there is considered to be a low likelihood of Australian Grayling occurring within the majority of the study area; the ephemeral waterways such as Birregurra Creek and associated tributary drainage lines are considered to be too high within the local catchment, with not enough permanent water and fast flows to provide suitable habitat for the species.

Given no major works adjoining the Barwon River (at Winchelsea) are associated with this project, no significant impacts to Australian Grayling will be associated with the Princes Highway duplication project.

Macquarie Perch

Although there are some historical records of Macquarie Perch in Barwon River, there are no longer considered to be self–sustaining populations occurring there.

As per the *Draft referral guidelines for the endangered Macquarie perch Macquaria australasica* (SEWPaC 2011a), the project is outside the known range of suitable habitat for the species. As such, no significant impacts are likely.

Dwarf Galaxias and Yarra Pygmy Perch

Given the presence of suitable habitat for Dwarf Galaxias and Yarra Pygmy Perch within the Princes Highway Duplication alignment, targeted surveys were recently undertaken by Ecology and Heritage Partners (Ecology and Heritage Partners Pty Ltd 2013b).

While some suitable habitat for both Dwarf Galaxias and Yarra Pygmy Perch were found in the study area, the likely use of these habitats by these species is subject to their persistence in refuge pools within the local catchment; no such refuge pools were detected during the current survey (Ecology and Heritage Partners Pty Ltd 2013b). Yarra Pygmy Perch in particular are known to favour systems that have local permanent water, and thus are unlikely to occupy the habitats within the study area even after significant flooding events.

While Dwarf Galaxias exploit infrequently inundated habitats such as those found throughout the study area, and are known to travel significant distances upstream under high–flow conditions for spawning, the lack of records for Dwarf Galaxias in the immediately connected Barwon River, and the lack of suitably vegetated refuge pools within the local catchment makes their presence highly unlikely (Ecology and Heritage Partners Pty Ltd 2013b).

While there was some suitable ephemeral habitat present for Yarra Pygmy Perch and Dwarf Galaxias located within or in proximity to the study area, further investigation identified that there were no suitable refuge pools from which a source–population could be sustained during dry periods. Therefore, the habitats implicated in the development are highly unlikely to be utilised by these species, regardless of the presence of potentially suitable habitat features, and no significant impacts are likely.

4 Potential impacts on Golden Sun Moth (Synemon plana)

Additional information is required to quantify the impact of the proposed action on the Golden Sun Moth. This includes:

a) **Clarification of the survey approach to this species and additional evidence to support the statement in the referral that the species is unlikely to occur due to the lack of suitable habitat; and**
b) **If the species absence/presence cannot be conclusively determined, please provide details of any measures proposed to avoid or mitigate the risk of impact.**

Golden Sun Moth has not been recorded within 10 kilometres of the study area (DSE 2011a), although SEWPaC's PMST predicted suitable habitat for the species to occur within 10 kilometres of the study area (SEWPaC 2013). Extant DSE mapping shows isolated occurrences of Plains Grassy Woodland and Grassy Woodland, with occurrences of Floodplain Riparian Woodland (EVC 56) following DSE's Ecological Vegetation Class (EVC) benchmarks, Stony Rises Woodland (EVC 203), Plains Sedgy Wetland (EVC 647) and Swamp Scrub (53) (DSE 2011a). EVCs recorded within the study area during the assessment are outlined in Table below.

EVC	Number	Significance
Otway Plain bioregion		
Grassy Woodland	175	Endangered
Plains Grassy Wetland	125	Endangered
Swamp Scrub	53	Vulnerable
VVP bioregion		
Plains Grassy Woodland	55	Endangered
Plains Sedgy Wetland	647	Endangered
Floodplain Riparian Woodland	56	Endangered

While small remnant patches of vegetation were recorded, canopy tree species were largely absent from all vegetation types within the study area, therefore EVC classification was largely based on the presence/abundance of native understorey species such as Kangaroo Grass Themeda triandra, Bristly Wallaby–grass Rytidosperma setaceum, Spear–grasses Austrostipa spp. and Grey Tussock–grass Poa sieberiana.

The majority of land surrounding the Princes Highway alignment is highly modified as a result of previous agricultural practices (i.e. cropping and grazing), dominated by introduced pastures grasses and planted vegetation. As outlined in the Significant impact guidelines for the critically endangered Golden Sun Moth (Synemon plana) (DEWHA 2009b), the species is vulnerable to disturbance regimes including ploughing, heavy grazing and the removal or degradation of grass plants which is consistently observed in land adjoining the Princes Highway. Overall, there is limited connectivity to large areas of remnant vegetation within the local area. Furthermore, many of the remnant patches do not contain remnant trees perhaps indicating that vegetation had been once cleared.

This may also explain the presence of extensive sections of planted vegetation and colonising ground species such as Golden Wattle Acacia pycnantha, Bristly Wallaby–grass and Spear–grasses located

within the road reserves. There is considered to be a low likelihood that Golden Sun Moth (or a resident population) is present within the Princes Highway Duplication project alignment given the modified nature of remnant habitat(s) which are small in size, degraded and have poor connectivity to more suitable habitat within the local area.

Overall, none of the significant impact criteria outlined in SEWPaC's 'Significant impact guidelines 1.1 (pg. 10)' (DEWHA 2009), will be directly associated with this species and the Princes Highway Duplication project. There is only one patch of the remnant Plains Grassy Woodland (PGW3) located within the proposed alignment which reaches 0.5 hectares in area. Within this patch, the native grass cover accounts for less than 50% of the vegetative cover, the weed cover is greater than 25% and the understorey vegetation displays low flora diversity (<10 indigenous species).

Given that many of the remnant patches identified during detailed assessments are small and are rarely connected within 200 metres of one another, it is unlikely there will be any significant impacts to Golden Sun Moth associated with this project based on the significant impact thresholds identified within SEWPaC's guidelines (DEWHA 2009a; 2009b).

5 Potential impacts on listed threatened flora species

Additional information is required to quantify the impact of the proposed action on the following listed threatened species. Specifically, further scientific justification is needed to support the statement in the referral that these species are unlikely to occur on the project site. If habitat for these species exists on the project site, detailed information about potential impacts, mitigation and avoidance measures and proposed offsets must be provided.

- **Clover Glycine (Glycine latrobeana);**
- **Spiny Rice-flower (Pimelea spinescens subsp. Spinescens); and**
- **Spiny Peppercress (Lepidium aschersonii) and Basalt Peppercress (Lepidium hyssopifolium).**

The detailed flora surveys were undertaken during spring, which is considered to be an optimal time for identification of flora species within the study area (Ecology and Heritage Partners 2012c; 2012d).

While there are records of Clover Glycine, Spiny Rice–flower, Spiny Peppercress and Basalt Peppercress within close proximity to the study area (i.e. within 5km) (see Figure 3 of Ecology and Heritage Partners, 2012c; 2012d), no individuals were recorded during the detailed assessment.

Further targeted surveys were not recommended based on the timing of the original assessment being optimum (and sub optimal in the case of Spiny Rice–flower) for locating these threatened species and the modified nature of the understorey vegetation present within the study area.

Clover Glycine

No Clover Glycine plants were recorded within the study area during the detailed assessment. There has been one record of this species within the local area (dated 2001) recorded approximately 4 kilometres north of the proposed alignment.

Given the modified nature of the study area and the low diversity present within the understorey vegetation, it is considered unlikely for this species to occur within the proposed alignment. Based on this, it is not expected that any Clover Glycine plants would be impacted by the Princes Highway Duplication Project.

Spiny Rice–flower

No Spiny Rice–flower plants were recorded within the study area during the detailed assessment. There have been seven records of this species within the local area (most recent dated 2007), the closest recorded approximately 3 kilometres north of the proposed alignment.

Given the modified nature of the study area and the low diversity present within the understorey vegetation, it is considered unlikely for this species to occur within the proposed alignment. Based on this, it is not expected that any Spiny Rice–flower plants would be impacted by the Princes Highway Duplication Project.

Spiny Peppercress

No Spiny Peppercress plants were recorded within the study area during the detailed assessment. There have been six records of this species within the local area (most recently dated 2009), directly downstream along the banks of the Barwon River north of the Princes Highway bridge in Winchelsea.

Given the highly modified nature and low diversity of suitable habitat for this species (riparian vegetation) within the study area, it is considered unlikely for this species to occur within the proposed alignment. Based on this, it is not expected that any Spiny Peppercress plants would be impacted by the Princes Highway Duplication Project.

Basalt Peppercress

No Basalt Peppercress plants were recorded within the study area during the detailed assessment. There have been two records of this species within the local area (most recently dated 2000), the closest recorded approximately 2 kilometres north of the proposed alignment around Lake Colac.

Given the highly modified nature and low diversity of suitable habitat for this species (around the margins of freshwater and saline marshes and shallow lakes) within the study area, it is considered unlikely for this species to occur within the proposed alignment. Based on this, it is not expected that any Spiny Peppercress plants would be impacted by the Princes Highway Duplication Project.

6 Potential impacts on Striped Legless Lizard (Delma impar) and Corangamite Water Skink (Eulamprus tympanum marnieae)

Additional information is required to quantify the potential impact of the proposed action on these species. This includes:

a) **Further information to support the statement that Striped Legless Lizard and Corangamite Water Skink are unlikely to occur within the proposed action area. This may include the results of additional surveys undertaken in accordance with the species significant impact guidelines; and**
b) **If there is uncertainty/potential for species to occur, please provide details of appropriate avoidance and mitigation to ensure that no significant impacts are likely to occur.**

Striped Legless Lizard

The likelihood of Striped Legless Lizard being present within or in proximity to the proposed Princes Highway Duplication area was considered low during previous assessments (Ecology and Heritage Partners Pty Ltd 2012c; 2013a).

In addition, there is only one patch of Plains Grassy Woodland EVC that reaches the minimum size threshold of 0.5 hectares; however, the quality is considered to be poor overall (see below for a description in Item 7). All remaining patches are small and isolated and under pressure from exotic weeds associated with common agricultural practices and the existing Princes Highway.

Based on the current size and quality of habitat located in proximity to the Princes Highway, there is considered to be no direct impacts to Striped Legless Lizard or preferred habitats associated with the Princes Highway Duplication project.

Overall, there is considered to be no significant impacts on Striped Legless Lizard associated with the Princes Highway Duplication project as none of the significant impact criteria outlined in SEWPaC's 'Significant impact guidelines 1.1 (pg. 10)' (DEWHA 2009) will be directly associated with the species. This is based on a low likelihood of the species occurring within the project area and the lack of potentially suitable habitat(s).

Corangamite Water Skink

Corangamite Water Skink habitat typically consist of large rocky basalt outcrops located near remnant vegetation and adjacent permanent or ephemeral wetlands including deep freshwater marshes, permanent open freshwater lakes, semi-permanent saline marshes and permanent saline lakes (Peterson and Robertson 2011). Remnant vegetation comprises native plants such as Scrub Nettle *Urtica incisa*, Variable Groundsel *Senecio pinnatifolius*, Tall Sedge *Carex appressa* and Tree Violet *Melicytus dentata* (Peterson and Robertson 2011). These habitat characteristics are not present within the proposed Princes Highway Duplication alignment. This is likely to be the reason for this species being detected by the PMST; however, there is considered to be no suitable habitat within the study area for this species and no further consideration is required.

As no suitable habitat is present for this species and no extant populations are known to-occur and/or are likely to-occur within the Princes Highway Duplication alignment, there is considered to be no significant impacts on Corangamite Water Skink associated with the project as none of the significant impact criteria outlined in SEWPaC's 'Significant impact guidelines 1.1 (pg. 10)' (DEWHA 2009) will be directly associated with the species.

7 Ecological Communities

Further clarification is needed as to whether or not patches of state listed vegetation communities (i.e. EVC 55, 132_61, 125 and 55) meet condition thresholds for the below EPBC Act listed ecological communities. If EPBC Act listed threatened ecological communities are likely to be present, more information should be provided describing and quantifying the area that will be impacted (either through direct removal or indirect effects such as altered drainage, construction impacts and weed infestation) and any proposed measures to avoid or mitigate these impacts.

- **Grassy Eucalypt Woodland of the Victorian Volcanic Plain;**
- **Natural Temperate Grasslands of the Victorian Volcanic Plain;**
- **Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains;**
- **White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland**

Grassy Eucalypt Woodland of the Victorian Volcanic Plain

Only one patch of the habitat zone PGW3 within the proposed alignment meets the minimum size requirement of 0.5 hectares. Within this patch, the native grass cover accounts for less than 50% of the vegetative cover, the weed cover is greater than 25%, the understorey vegetation displays low flora diversity (<10 indigenous species) and there are no canopy trees present. Based on this, it was determined that it did not meet the condition thresholds for this EPBC Act listed community and is therefore not considered to be part of this nationally significant community.

Natural Temperate Grasslands of the Victorian Volcanic Plain

Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) is listed as critically endangered under the EPBC Act. This ecological community is typically associated with the Plains Grassland EVC, which was not recorded within the study area and therefore, this community was not considered any further as potentially occurring (SEWPaC 2011b).

Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains

The Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains ecological community was officially listed under the EPBC Act in March 2012. The detailed flora assessment was undertaken prior to this listing in October 2011, and therefore, was not considered in Ecology and Heritage Partners 2012.

As per the listing advice (SEWPaC 2012a), two wetland EVCs which are considered to most likely correspond to the Seasonal Herbaceous Wetland ecological community, were recorded within the study area (Plains Sedgy Wetland and Plains Grassy Wetland). Only one patch of Plains Grassy Wetland (PGWe1) within the proposed alignment meets the minimum size requirement of 0.5 hectares.

This patch contains greater than 50% cover of Common Tussock–grass Poa labillardierei, which is listed as a typical species of this ecological community; however, there were no other graminoid or for species present. Therefore, this wetland is not consistent with the key diagnostic characteristics of the Seasonal Herbaceous Wetlands and does not form part of this ecological community.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

White Box, Yellow Box and Blakely's Red Gum were not recorded within the study area and therefore vegetation within the study area was not considered to be part of this nationally significant community.

8 Offsets

Where impacts on matters of national environmental significance cannot be avoided or mitigated information must be provided that includes a description of any strategies proposed to offset (compensate for) those impacts. The proposed strategies must be in accordance with the requirements of the EPBC Act Offsets Policy, and in particular must:

- **Demonstrate how they will achieve long-term conservation outcomes;**
- **Have regard to the nature, scale and intensity of the impacts of the proposed action on the site;**
- **Consider the approach of the Victorian Government with regards to offsets.**

No additional offsets are required for the removal of vegetation under the EPBC Act Offset Policy as there are no matters of National Environmental Significance present within the study area (SEWPaC 2012b).

Further offsets relating to fauna will be determined at a later stage as required, if the proposed offset of six newly created waterbodies is deemed unsatisfactory under SEWPaC's decision process.

Appendices