Appendix A. Flora

The following abbreviations and symbols are relevant to this Appendix.

Code	Meaning	Reference
National listings		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
PMST	Protected Matters Search Tool	
State listings		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (public land only)	
(e)	Endangered	DEECA's Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014a)
(v)	Vulnerable	
(r)	Rare	
(k)	Poorly known	
Weed status (CaLP Act)		
SP	State prohibited species	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
R	Restricted species	

Appendix A.1. Flora species recorded from the study area

Table 23 Flora species recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
P	*Acacia genistifolia*	Spreading Wattle
P	*Acacia longifolia* subsp. *longifolia*	Sallow Wattle
P	*Acacia longifolia* subsp. *sophorae*	Coast Wattle
P	*Acacia mearnsii*	Black Wattle
P	*Acacia oxycedrus*	Spike Wattle
	Acaena echinata	Sheep's Burr
	Acaena novae-zelandiae	Bidgee-widgee
P	*Acianthus* spp.	Mosquito Orchid
P	*Acrotriche serrulata*	Honey-pots
	Allocasuarina littoralis	Black Sheoak
	Amperea xiphoclada var. *xiphoclada*	Broom Spurge
	Amyema pendula subsp. *pendula (s.s.)*	Drooping Mistletoe
	Apodasmia brownii	Coarse Twine-rush
	Austrostipa mollis	Supple Spear-grass
	Banksia marginata	Silver Banksia
	Banksia serrata	Saw Banksia
	Billardiera spp.	Apple Berry
	Bossiaea cinerea	Showy Bossiaea
	Bossiaea prostrata	Creeping Bossiaea
	Bossiaea spp.	Bossiaea
	Bursaria spinosa subsp. *spinosa*	Sweet Bursaria
	Caesia parviflora	Pale Grass-lily
P	*Caladenia carnea* s.s.	Pink Fingers
P	*Caladenia catenata* s.s.	White Fingers
P	*Caladenia* spp.	Caladenia
P	*Caleana major*	Large Duck-orchid
P	*Caleana minor*	Small Duck-orchid
	Callistemon citrinus	Crimson Bottlebrush
P	*Calochilus robertsonii* s.s.	Western Beard-orchid
P	*Calochilus* spp.	Beard Orchid
P	*Calytrix tetragona*	Common Fringe-myrtle
	Carpobrotus spp.	Pigface
	Cassytha melantha	Coarse Dodder-laurel
	Cassytha spp.	Dodder Laurel
	Centrolepis strigosa subsp. *strigosa*	Hairy Centrolepis
	Chamaescilla corymbosa var. *corymbosa*	Blue Stars
P	*Cheilanthes* spp.	Rock Fern
	Clematis microphylla s.s.	Small-leaved Clematis

	Comesperma calymega	Blue-spike Milkwort
	Comesperma volubile	Love Creeper
	Coprosma quadrifida	Prickly Currant-bush
cr, P, v	*Coronidium gunnianum*	Pale Swamp Everlasting
P	*Correa reflexa* var. *reflexa*	Common Correa
P	*Corybas* spp.	Helmet Orchid
P	*Cotula australis*	Common Cotula
	Crassula decumbens var. *decumbens*	Spreading Crassula
	Crassula sieberiana s.s.	Sieber Crassula
P	*Cyrtostylis* spp.	Gnat Orchid
	Dampiera stricta	Blue Dampiera
	Deyeuxia scaberula	Rough Bent-grass
	Deyeuxia spp.	Bent Grass
	Dianella revoluta var. *revoluta s.l.*	Black-anther Flax-lily
	Dianella spp.	Flax Lily
	Dichelachne crinita	Long-hair Plume-grass
	Dichondra repens	Kidney-weed
	Dillwynia glaberrima	Smooth Parrot-pea
	Dillwynia sericea	Showy Parrot-pea
P	*Dipodium* spp.	Hyacinth Orchid
	Distichlis distichophylla	Australian Salt-grass
P	*Diuris chryseopsis*	Golden Moths
P	*Diuris pardina*	Leopard Orchid
P	*Diuris* spp.	Diuris
P	*Diuris sulphurea*	Tiger Orchid
	Drosera auriculata	Tall Sundew
	Drosera macrantha subsp. *planchonii*	Climbing Sundew
	Einadia nutans	Nodding Saltbush
	Eleocharis acuta	Common Spike-sedge
P	*Epacris impressa*	Common Heath
e, r	*Eucalyptus arenicola*	Gippsland Lakes Peppermint
	Eucalyptus consideniana	Yertchuk
	Eucalyptus conspicua	Silver Swamp Stringybark
	Eucalyptus ovata	Swamp Gum
	Eucalyptus radiata subsp. *radiata*	Narrow-leaf Peppermint
	Eucalyptus viminalis subsp. *pryoriana*	Coast Manna-gum
P	*Euchiton japonicus* s.s.	Creeping Cudweed
	Exocarpos cupressiformis	Cherry Ballart
	Fabaceae spp.	Legumes
	Gahnia radula	Thatch Saw-sedge
	Gahnia sieberiana	Red-fruit Saw-sedge
	Gahnia spp.	Saw Sedge

	Gahnia trifida	Coast Saw-sedge
P	*Glossodia major*	Wax-lip Orchid
	Glycine clandestina	Twining Glycine
	Gonocarpus humilis	Shade Raspwort
	Gonocarpus tetragynus	Common Raspwort
	Goodenia humilis	Swamp Goodenia
	Goodenia lanata	Trailing Goodenia
P	*Hardenbergia violacea*	Purple Coral-pea
	Hibbertia acicularis	Prickly Guinea-flower
	Hibbertia fasciculata var. *prostrata*	Bundled Guinea-flower
	Hibbertia spp.	Guinea Flower
	Hibbertia virgata	Twiggy Guinea-flower
	Hovea heterophylla	Common Hovea
	Hydrocotyle hirta	Hairy Pennywort
	Hypericum gramineum	Small St John's Wort
	Hypolaena fastigiata	Tassel Rope-rush
	Hypoxis hygrometrica var. *hygrometrica*	Golden Weather-glass
	Hypoxis	Hypoxis
	Juncus bufonius	Toad Rush
	Juncus continuus	Pithy Rush
	Juncus pallidus	Pale Rush
	Juncus spp.	Rush
	Kennedia prostrata	Running Postman
	Kunzea ericoides	Burgan
	Lachnagrostis filiformis	Common Blown-grass
	Lachnagrostis spp.	Blown Grass
P	*Lagenophora stipitata*	Blue Bottle-daisy
P	*Laphangium luteoalbum*	Jersey Cudweed
r	*Laxmannia gracilis*	Slender Wire-lily
	Lepidosperma filiforme	Common Rapier-sedge
	Lepidosperma laterale	Variable Sword-sedge
	Lepidosperma longitudinale	Pithy Sword-sedge
	Lepidosperma spp.	Sword Sedge
	Leptocarpus tenax	Slender Twine-rush
	Leptospermum laevigatum	Coast Tea-tree
	Leptospermum myrsinoides	Heath Tea-tree
	Lepyrodia muelleri	Common Scale-rush
P	*Leucopogon* spp.	Beard Heath
P	*Leucopogon virgatus*	Common Beard-heath
P	*Leucopogon virgatus* var. *virgatus*	Common Beard-heath
	Lobelia spp.	Lobelia
	Lomandra filiformis	Wattle Mat-rush

	Lomandra longifolia	Spiny-headed Mat-rush
	Lomandra multiflora subsp. *multiflora*	Many-flowered Mat-rush
	Machaerina rubiginosa s.s.	Soft Twig-sedge
	Malva spp.	Mallow
	Melaleuca ericifolia	Swamp Paperbark
P	*Melaleuca squarrosa*	Scented Paperbark
P	*Microseris walteri*	Yam Daisy
P	*Microtis parviflora*	Slender Onion-orchid
P	*Microtis* spp.	Onion Orchid
	Montia spp.	Water Blinks
	Myoporum insulare	Common Boobialla
	Myoporum spp.	Myoporum
P	*Orchidaceae* spp.	Orchid
	Phragmites australis	Common Reed
	Pimelea humilis	Common Rice-flower
	Pimelea spp.	Rice Flower
	Pittosporum undulatum	Sweet Pittosporum
	Plantago gaudichaudii	Narrow Plantain
	Platylobium obtusangulum	Common Flat-pea
	Platysace lanceolata	Shrubby Platysace
	Poa morrisii	Soft Tussock-grass
	Poranthera microphylla	Small Poranthera
	Pteridium esculentum subsp. *esculentum*	Austral Bracken
P	*Pterostylis concinna*	Trim Greenhood
P	*Pterostylis nutans*	Nodding Greenhood
P	*Pterostylis* spp.	Greenhood
	Pultenaea spp.	Bush-pea
P	*Pyrorchis nigricans*	Red-beaks
	Rhagodia candolleana subsp. *candolleana*	Seaberry Saltbush
	Rytidosperma geniculatum	Kneed Wallaby-grass
	Rytidosperma setaceum	Bristly Wallaby-grass
	Rytidosperma spp.	Wallaby Grass
	Schoenus apogon	Common Bog-sedge
	Schoenus brevifolius	Zig-zag Bog-sedge
P	*Senecio minimus*	Shrubby Fireweed
P	*Senecio pinnatifolius*	Variable Groundsel
P	*Senecio* spp.	Groundsel
	Solanum americanum	Glossy Nightshade
	Spergularia spp.	Sand Spurrey
	Stackhousia monogyna	Creamy Candles
	Tetragonia implexicoma	Bower Spinach
P	*Thelymitra ixioides*	Spotted Sun-orchid

P	*Thelymitra* spp.	Sun Orchid
	Themeda triandra	Kangaroo Grass
e, P, r	*Thryptomene micrantha*	Ribbed Thryptomene
P	*Thysanotus patersonii*	Twining Fringe-lily
P	*Thysanotus tuberosus* subsp. *tuberosus*	Common Fringe-lily
	Tricoryne elatior	Yellow Rush-lily
P	*Triptilodiscus pygmaeus*	Common Sunray
	Veronica calycina	Hairy Speedwell
	Viminaria juncea	Golden Spray
	Viola hederacea sensu Entwisle (1996)	Ivy-leaf Violet
	Wahlenbergia gymnoclada	Naked Bluebell
	Wahlenbergia spp.	Bluebell
	Wahlenbergia stricta subsp. *stricta*	Tall Bluebell
	Wurmbea dioica	Common Early Nancy
P	*Xanthorrhoea minor* subsp. *lutea*	Small Grass-tree
P	*Xanthorrhoea resinosa*	Spear Grass-tree
e, r	*Zieria veronicea* subsp. *veronicea*	Pink Zieria
Introduced species		
	Acetosella vulgaris	Sheep Sorrel
	Aira spp.	Hair Grass
	Aizoon pubescens	Galenia
	Anthoxanthum odoratum	Sweet Vernal-grass
	Arctotheca calendula	Cape Weed
	Briza maxima	Large Quaking-grass
	Bromus diandrus	Great Brome
	Bromus hordeaceus	Soft Brome
	Cenchrus clandestinus	Kikuyu
	Centaurium erythraea	Common Centaury
	Cerastium glomeratum	Sticky Mouse-ear Chickweed
RC	*Cirsium vulgare*	Spear Thistle
	Coprosma repens	Mirror Bush
	Cotula coronopifolia	Water Buttons
	Cynodon dactylon var. *dactylon*	Couch
	Cynosurus echinatus	Rough Dog's-tail
	Dactylis glomerata	Cocksfoot
	Ehrharta calycina	Perennial Veldt-grass
	Ehrharta longiflora	Annual Veldt-grass
	Festuca arundinacea	Tall Fescue
	Fumaria bastardii	Bastard's Fumitory
	Fumaria muralis subsp. *muralis*	Wall Fumitory
RC	*Genista monspessulana*	Montpellier Broom
	Holcus lanatus	Yorkshire Fog

	Hordeum spp.	Barley Grass
	Isolepis levynsiana	Tiny Flat-sedge
RC	*Juncus acutus* subsp. *acutus*	Spiny Rush
	Leontodon saxatilis subsp. *saxatilis*	Hairy Hawkbit
	Lepidium africanum	Common Peppercress
	Lolium rigidum	Wimmera Rye-grass
RC	*Lycium ferocissimum*	African Box-thorn
	Lysimachia arvensis var. *arvensis*	Scarlet Pimpernel
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago coronopus	Buck's-horn Plantain
	Romulea rosea	Onion Grass
RC	*Rubus anglocandicans*	Common Blackberry
	Rumex spp. (naturalised)	Dock (naturalised)
	Sonchus asper s.s.	Rough Sow-thistle
	Sporobolus africanus	Rat-tail Grass
	Stellaria media	Chickweed
	Trifolium repens var. *repens*	White Clover
	Urtica urens	Small Nettle
	Vulpia bromoides	Squirrel-tail Fescue

Appendix A.2. Listed flora species – likelihood of occurrence

The following table includes threatened flora species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 11 April 2023). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur. A proportion of the flora habitat descriptions have been reproduced with permission from the Royal Botanic Gardens Victoria (RBGV 2020).

Table 24 Threatened flora species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
National significance									
Amphibromus fluitans	River Swamp Wallaby-grass	VU		2015	PMST	Swampy areas, mainly along the Murray River between Wodonga and Echuca with scattered records from southern Victoria.	**Low**	**Low**	Limited suitable habitat and closest record is approximately 10 km away.
Caladenia tessellata	Thick-lip Spider-orchid	VU		2013	PMST	Heathlands, heathy woodlands and lowland forest in coastal areas east from Port Phillip Bay.	**Medium**	**Low**	Record within 10 km of alignment. Suitable habitat in areas of heathland. Targeted survey planned for the next flowering period.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Commersonia prostrata	Dwarf Kerrawang	EN	e	2012	PMST	Swampy, sometimes ephemeral, wetlands and lake margins, that are often dominated by Lepidosperma spp.	**Before TS: Medium. After TS: Low**	**Low**	Record within 10 km of alignment. Suitable habitat around wetlands. Species not recorded during Spring targeted surveys.
Dianella amoena	Matted Flax-lily	EN	cr		PMST	Lowland grassland and grassy woodland, on well-drained to seasonally waterlogged fertile sandy loam soils to heavy cracking clays.	**Low**	**Low**	Closest records are around Traralgon (approx. 50 km away). No suitable habitat.
Dodonaea procumbens	Trailing Hop-bush	VU		2012	PMST	Sandy or clay soils in low-lying, winter-wet areas in grasslands, woodlands, and low-open forest.	**Low**	**Low**	Record close to the study area is an outlier from 1883 and is of unknown provenance (VicFlora)
Glycine latrobeana	Clover Glycine	VU	v		PMST	Grasslands and grassy woodlands, particularly those dominated by Kangaroo Grass.	**Low**	**Low**	No recent records within 50 km of the study area.
Lepidium hyssopifolium	Basalt Pepper-cress	EN	e		PMST	Basalt plains grassland and woodland communities.	**Low**	**Low**	No recent records within 50 km of the alignment.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Prasophyllum frenchii	Maroon Leek-orchid	EN	e	2012	PMST	Grassland and grassy woodland environments on sandy or black clay loam soils, that are generally damp but well drained.	**Before TS: Medium. After TS: Low**	**Low**	Several restricted records close to the study area. Suitable habitat within grassland or woodland environments. Not recorded during Spring targeted survey.
Prasophyllum spicatum	Dense Leek-orchid	VU	cr		PMST	Heath and heathy woodlands.	**Low**	**Low**	Suitable habitat in healthy woodlands however no records within 50 kilometres of the study area.
Prostanthera galbraithiae	Wellington Mint-bush	VU	e	2011	PMST	Heathy open forest, heathland and heathy woodland, usually on gravelly sand.	**Before TS: Medium. After TS: Low**	**Low**	Several records close to the study area. Suitable habitat in heathland areas. Not recorded during Spring targeted surveys.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Pterostylis chlorogramma	Green-striped Greenhood	VU	e		PMST	Heathy woodland; more specific habitat requirements are poorly known.	**Medium**	**Low**	No recent records within 10km of the study area. Suitable habitat in heathy areas however species not recorded within the disturbance footprint during targeted surveys.
Senecio psilocarpus	Swamp Fireweed	VU			PMST	Seasonally inundated herb-rich swamps, growing on peaty soils or volcanic clays.	**Low**	**Low**	One herbarium record close to the study area from 1987, however record is on Lake Wellington. All other records occur further west.
Thelymitra epipactoides	Metallic Sun-orchid	EN	e	2013	PMST	Moist or dry sandy loams or loamy sands, primarily in coastal heaths, grasslands and woodlands, but also in similar communities at drier inland sites.	**Medium**	**Low**	Several recent records close to the study area. Suitable habitat in grasslands and heaths. Targeted survey planned for the next flowering period.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Xerochrysum palustre	Swamp Everlasting	VU	cr		PMST	Sedge-swamps and shallow freshwater marshes and swamps in lowlands, on black cracking clay soils.	**Before TS: Medium. After TS: Medium**	**Low**	One recent roadside record close to the study area. Suitable habitat in wet areas. Not recorded during Spring 2022 targeted survey.
State significance									
Allocasuarina nana	Stunted Sheoak		e	2011		Known only from Mt Elizabeth and the upper Genoa River, growing in heath on sandstone in exposed situations.	**Before TS: Medium. After TS: Low**	**Low**	Recent record close to study area. Suitable habitat in heath. Not recorded during Spring targeted survey.
Amphibromus sinuatus	Wavy Swamp Wallaby-grass		e	2013		Confined to permanent swamps in cool sites.	**Low**	**Low**	Recent record close to study area however no suitable habitat within study area.
Billardiera scandens s.s.	Velvet Apple-berry		e	1976		Common in heathland, woodland and forests from near sea level to the subalps.	**Before TS: Medium. After TS: Low**	**Low**	No recent records close to the study area, however records generally scattered. Suitable habitat in heathland and woodlands. Not recorded during Spring targeted survey.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Bossiaea heterophylla	Variable Bossiaea		e	2016		Sandy soils in a range of habitats including heathland and open woodland.	**Medium**	**Low**	Many records close to the study area. Suitable habitat in heathland and woodland. Flowers April - June. Species would have likely been recorded within disturbance footprint, hence the low likelihood.
Calochilus imberbis	Naked Beard-orchid		cr	2012		Mainly found in heath, heathy woodlands and lowland forests.	**Medium**	**Medium**	Two records close to the study area. Suitable habitat in heathland and Lowland Forest. Not recorded during Spring targeted survey, however species had finished flowering.
Coronidium gunnianum	Pale Swamp Everlasting		cr	2013		Widespread and sometimes locally common, particularly in high-rainfall areas of Victoria; often in moist sites in open forests and woodlands.	**Recorded**	**Recorded**	Several recent records close to the study area. Recorded during Spring targeted survey.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Corybas aconitiflorus	Spurred Helmet-orchid		e	1995		Coastal scrubs, heath, heathy woodland and moist foothill forest in damp, shady sites.	**Medium**	**Medium**	Record from 1995 close to the study area. Suitable habitat in heathland areas. Flowers May - July
Cycnogeton microtuberosum	Eastern Water-ribbons		e	2013		Common in fresh, still or slow-flowing water 50-120 cm deep, in small creeks, swamps and farm dams. Can also be found in stagnant water that is often highly eutrophic and humic from farmland run-off.	**Medium**	**Low**	Several records close to the study area along the La Trobe River. Suitable habitat in wet areas within study area. No suitable habitat within disturbance footprint. Fruits various times of year
Eucalyptus arenicola	Gippsland Lakes Peppermint		e	2019		Sandy soils in both coastal and near coastal environments.	**Recorded**	**Recorded**	Several records close to the study area. Recorded during targeted survey.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Eucalyptus bosistoana	Coast Grey-box		e	1983		Occurs mostly on loamy soils east from Woodside, around the Gippsland Lakes and near the coast, extending further inland (east) along the Cann and Genoa River Valleys. Commonly associated with Eucalyptus globoidea.	**Low**	**Low**	Several records close to the study area. Suitable habitat potentially throughout unfarmed areas. Species would have likely been detected during survey if present.
Eucalyptus willisii s.s.	Promontory Peppermint		v	1969		Restricted to sandy areas and granite hills in Wilsons Promontory.	**Negligible**	**Negligible**	Species is restricted to Wilsons Promontory. All records of *E. willisii* close to the study area are now E. *arenicola*.
Fimbristylis velata	Veiled Fringe-sedge		e	2013		Drying mud beside lakes and rivers and in seasonally wet depressions.	**Before TS: Medium After TS: Low**	**Low**	Records along La Trobe River. Potentially suitable habitat in wet areas. Flowers Spring and Summer

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Grevillea chrysophaea	Golden Grevillea		v	2009		Silty sand and sandy loam soils in woodlands and heath.	**Before TS: Medium. After TS: Low**	**Low**	Records close to the study area. Suitable habitat in woodlands and heaths. Not recorded during Spring targeted survey,
Lachnagrostis rudis subsp. rudis	Rough Blown-grass		e	2011		Uncommon, occurs in moist, shaded forests and swamp margins near the coast.	**Before TS: Medium. After TS: Low**	**Low**	Recent record close to the study area. Suitable habitat around wet areas. Flowering time unknown. Not recorded during Spring targeted survey
Lawrencia spicata	Salt Lawrencia		e	2008		Fringe habitats of coastal saltmarsh communities.	**Low**	**Low**	No suitable habitat. Study area does not fringe coastal saltmarsh.
Melaleuca armillaris subsp. armillaris	Giant Honey-myrtle		e	2013		Near coastal heath/scrub, rocky coast and foothill outcrops.	**N/A**	**N/A**	Outside of natural range.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Muellerina celastroides	Coast Mistletoe		cr	1978		Confined to coastal areas mostly on Banksia spp. and Allocasuarina spp.	**Before TS: Medium. After TS: Low**	**Low**	Records from 1978 close to study area. Potentially suitable habitat with the presence of *Allocasuarina* or *Banksia* species. Not recorded during Spring targeted survey.
Platysace ericoides	Heath Platysace		e	2010		Dry forests on coastal plains, foothills and lowland woodlands - typically on shallow, rocky soils.	**Before TS: Medium. After TS: Low**	**Low**	Several records close to the study area. Potential habitat in woodlands. Not recorded during Spring targeted survey.
Pseudanthus ovalifolius	Oval-leaf Pseudanthus		v	1972		Dry sandy or shallow, shale soils.	**Before TS: Medium. After TS: Low**	**Low**	Record from 1972 close to the study area. Suitable habitat in dry, sandy areas. Not recorded during Spring targeted survey.
Ranunculus amplus	Lacey River Buttercup		cr	2013		Shallow margins of freshwater swamps, billabongs and dams.	**Low**	**Low**	Records close to the study area along the La Trobe River. No suitable habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Schoenus imberbis	Beardless Bog-sedge		v	2012		Occasional in near-coastal heathland and woodland eastward from about Sale.	**Before TS: Medium. After TS: Low**	**Low**	Recent record close to the study area. Suitable habitat in heathland and woodland areas. Not recorded during Spring targeted survey.
Senecio diaschides	Shingle Fireweed		e	2011		Confined to river valleys in the east, with records from along the Avon, Macalister, Murrindal, Buchan and Snowy Rivers, commonly occurring on sand or among rocks near the watercourse.	**Low**	**Low**	Recent record close to the study area, however generally found along Rivers.
Senecio glomeratus subsp. longifructus	Annual Fireweed		v	2011		Areas adjacent to streams, swamps and saline flats.	**Before TS: Medium. After TS: Low**	**Low**	Recent record close to the study area around Lake Coleman. Not recorded during Spring targeted survey.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in the disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Thryptomene micrantha	Ribbed Thryptomene		e	2016		Heath or heathy woodland on sandy soils near the Gippsland Lakes, with some populations in low shrubland on exposed rocky slopes.	**Recorded**	**Recorded**	Recorded during survey in Heathy Woodland.
Triglochin mucronata	Prickly Arrowgrass		e	1983		Herbfields on damp saline soils of salt flats and coastal saltmarshes.	**Low**	**Low**	Records from 1983 close to study area, however no suitable habitat within the study area.
Zieria veronicea subsp. veronicea	Pink Zieria		e	2016		Sandy mallee and heathy mallee habitats within the Wimmera and southern Mallee.	**Recorded**	**Recorded**	Recorded during survey in Heathy Woodland.

Appendix A.3. Threatened ecological communities

The following table includes the threatened ecological communities that have potential to occur within the project area. The list of threatened ecological communities has been compiled with reference to characteristics of FFG Act threatened communities (SAC 2013) and predictive output from the PMST (accessed on 11 April 2023).

Table 25 Threatened ecological communities predicted to occur within 10 km of the project area.

Community Name	Conservation status	Source	Description
National significance			
Gippsland Red Gum (*Eucalyptus tereticornis subsp. mediana)* Grassy Woodland and Associated Native Grassland	Critically Endangered	PMST	**Not recorded - Gippsland Red Gum and native grasslands not recorded in the study area**
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	PMST	**Not recorded – Natural grasslands not recorded in the study area**
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	PMST	**Not recorded - No areas occur where coastal saltmarsh species were dominant within the study area**
State significance			
Central Gippsland Plains Grassland Community	Threatened		**Not recorded - No natural grasslands recorded in the study area**
Coastal Moonah (Melaleuca lanceolata subsp. lanceolata) Woodland Community	Threatened		**Not recorded - Coastal Moonah not recorded in the study area**
Forest Red Gum Grassy Woodland Community	Threatened		**Not recorded - No Forest/Gippsland Red Gum recorded in the study area**

Appendix B. Fauna

The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
NT	Near threatened	
CD	Conservation dependent	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (fish only)	
Pest animal status (CaLP Act and Fisheries Act)		
PS	Declared pest animal	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
N	Declared noxious aquatic species	*Victorian Fisheries Act 1995*
Other		
*****	Introduced species	Victorian Biodiversity Atlas (VBA)

Appendix B.1. Fauna species recorded from the study area

Table 26 Fauna recorded from the study area

Status	Scientific Name	Common Name
Indigenous species		
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill
	Acanthiza pusilla	Brown Thornbill
	Acritoscincus duperreyi	Eastern Three-lined Skink
	Amphibolurus muricatus	Tree Dragon
	Anas gracilis	Grey Teal
	Anas superciliosa	Pacific Black Duck
	Anthochaera carunculata	Red Wattlebird
	Aquila audax	Wedge-tailed Eagle
	Cacatua galerita	Sulphur-crested Cockatoo
	Cacatua sanguinea	Little Corella
	Cacomantis flabelliformis	Fan-tailed Cuckoo
	Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo
	Chenonetta jubata	Australian Wood Duck
	Colluricincla harmonica	Grey Shrike-thrush
	Coracina novaehollandiae	Black-faced Cuckoo-shrike
	Coracina papuensis	White-bellied Cuckoo-shrike
	Cormobates leucophaea	White-throated Treecreeper
	Corvus mellori	Little Raven
	Cracticus torquatus	Grey Butcherbird
	Crinia signifera	Common Froglet
	Dacelo novaeguineae	Laughing Kookaburra
	Dromaius novaehollandiae	Emu
	Drysdalia coronoides	White-lipped Snake
	Egretta novaehollandiae	White-faced Heron
	Elanus axillaris	Black-shouldered Kite
	Eolophus roseicapilla	Galah
	Epthianura albifrons	White-fronted Chat
	Grallina cyanoleuca	Magpie-lark
	Gymnorhina tibicen	Australian Magpie
e	*Haliaeetus leucogaster*	White-bellied Sea-Eagle
	Haliastur sphenurus	Whistling Kite
	Hirundo neoxena	Welcome Swallow
EN, en	*Isoodon obesulus*	Southern Brown Bandicoot (indirect evidence of Bandicoot activity, presence assumed)
	Lampropholis delicata	Delicate Skink
	Lampropholis guichenoti	Garden Skink
	Lerista bougainvillii	Bougainville's Skink
	Limnodynastes dumerilii dumerilii	Pobblebonk Frog

Status	Scientific Name	Common Name
	Limnodynastes tasmaniensis	Spotted Marsh Frog
VU	*Litoria aurea*	Green and Golden Bell Frog
	Litoria ewingii	Southern Brown Tree Frog
	Litoria peronii	Peron's Tree Frog
	Macropus giganteus	Eastern Grey Kangaroo
	Malurus cyaneus	Superb Fairy-wren
	Manorina melanocephala	Noisy Miner
	Manorina melanophrys	Bell Miner
	Ocyphaps lophotes	Crested Pigeon
	Oriolus sagittatus	Olive-backed Oriole
	Pachycephala rufiventris	Rufous Whistler
	Pardalotus striatus	Striated Pardalote
	Pelecanus conspicillatus	Australian Pelican
	Phascolarctos cinereus	Koala
	Platycercus elegans	Crimson Rosella
	Platycercus eximius	Eastern Rosella
	Podargus strigoides	Tawny Frogmouth
	Pseudechis porphyriacus	Red-bellied Black Snake
e	*Pseudemoia rawlinsoni*	Glossy Grass Skink
	Pseudonaja textilis	Eastern Brown Snake
	Rhipidura albiscapa	Grey Fantail
	Rhipidura leucophrys	Willie Wagtail
	Saproscincus mustelinus	Weasel Skink
	Strepera graculina	Pied Currawong
	Tachyglossus aculeatus	Short-beaked Echidna
	Threskiornis molucca	Australian White Ibis
	Threskiornis spinicollis	Straw-necked Ibis
	Tiliqua nigrolutea	Blotched Blue-tongued Lizard
	Tiliqua scincoides	Common Blue-tongued Lizard
	Trichoglossus molucannus	Rainbow Lorikeet
	Trichosurus vulpecula	Common Brush-tailed Possum
	Tyto alba	Barn Owl
	Vombatus ursinus	Bare-nosed Wombat
	Wallabia bicolor	Black-tailed Wallaby
Introduced species		
	Acridotheres tristis	Common Myna
	Axis porcinus	Hog Deer
PS	*Mus musculus*	House Mouse
PS	*Oryctolagus cuniculus*	European Rabbit
	Sturnus vulgaris	Common Starling
PS	*Sus scrofa*	Pig (feral)

Status	Scientific Name	Common Name
PS	*Vulpes vulpes*	Red Fox

Appendix B.2. Listed fauna species - likelihood of occurrence

The following table includes a list of threatened fauna species that have potential to occur within the study area. The list of threatened species is sourced from the VBA and PMST (accessed on 11 April 2023). Where years are specified for the most recent database records, these refer to records from the VBA unless otherwise specified. Where no year is specified, the PMST has predicted that the species has potential to occur.

Table 27 Threatened fauna species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
National significance									
Isoodon obesulus obesulus	Southern Brown Bandicoot	EN	e	No local database records. Evidence of Bandicoot presence recorded within the study area.		Heathland, shrubland, sedgeland, heathy open forest and woodland; also exotic vegetation, such as blackberry thickets and rank grasses where native vegetation has been removed.	**High/ Recorded (presence assumed)**	**High/ Recorded (presence assumed)**	Suitable shelter habitat in contiguous patches of woodland, forest, heathland and swamp scrub. Suitable foraging habitat in cleared easement adjacent to shelter habitat. Bandicoot diggings (potentially including those of Long-nosed *Bandicoot Perameles nasuta*) recorded throughout the study area and disturbance footprint. Presence of Southern Brown Bandicoot assumed.
Rostratula australis	Australian Painted-snipe	EN	cr	1991	PMST	Shallows of well-vegetated freshwater wetlands.	**Negligible**	**Negligible**	No suitable wetland habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Botaurus poiciloptilus	Australasian Bittern	EN	cr	2017	PMST	Shallow freshwater and brackish wetlands with abundant emergent aquatic vegetation.	**Low**	**Low**	No suitable wetland habitat within the study area.
Falco hypoleucos	Grey Falcon	VU	v		PMST	Lightly timbered plains and Acacia scrub.	**Negligible**	**Negligible**	Species is largely restricted to arid and semi-arid inland regions, study area is well outside of the species usual range.
Calyptorhynchus lathami	Glossy Black-Cockatoo	VU	cr		PMST	Forests and woodlands with Buloke *Allocasuarina* spp.	**Low**	**Low**	No local records, species is rarely recorded within the region. Minimal *Allocasuarina* cover within the study area.
Callocephalon fimbriatum	Gang-gang Cockatoo	EN			PMST	S Vic to E NSW. Forests and woodlands from coast to alpine areas. Autumn-winter dispersal from highlands to lower elevations. Forages in eucalypts, acacias and some exotic garden trees and shrubs.	**Medium**	**Medium**	No local records, however, study area falls within the species range and contains suitable eucalypt woodland habitat. Some potential feed trees within the disturbance footprint.
Neophema chrysogaster	Orange-bellied Parrot	CR	cr		PMST	Coastal vegetation including saltmarshes, dunes, pastures, shrublands, sewage plants, saltworks, islands, and beaches.	**Low**	**Low**	No local records. No suitable coastal saltmarsh habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Neophema chrysostoma	Blue-winged Parrot	VU		2007	PMST	A range of coastal, sub-coastal and semi-arid regions throughout south-eastern Australia. Favours heathy woodland for breeding, particularly sites recently disturbed by fire or logging. Nests in tree hollows in coastal eucalypt forests and woodlands. Feeds on seeds of a range of native grasses and herbs. Flocks of several thousand occasionally recorded in winter, when majority of Tasmanian population migrates to Victoria.	**Medium**	**Medium**	Recent local records. Suitable foraging and nesting habitat throughout the study area and disturbance footprint.
Lathamus discolor	Swift Parrot	CR	cr		PMST	A range of forests and woodlands, especially those supporting nectar-producing tree species. Also found in well-treed urban areas.	**Medium**	**Medium**	No local records, however, study area falls within the species range and contains suitable eucalypt woodland habitat. Some potential feed trees within the disturbance footprint.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Hirundapus caudacutus	White-throated Needletail	VU	v	2019	PMST	An almost exclusively aerial species within Australia, occurring over most types of habitat, particularly wooded areas. May roost in tall trees.	**High**	**High**	Species is widespread within the region. Recent local records. Species is likely to fly over the study area.
Pachyptila turtur subantarctica	Fairy Prion (southern)	VU			PMST	Open ocean over continental shelves and slopes, and rarely coming close to shore except at breeding islands and during rough weather.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Diomedea antipodensis gibsoni	Gibson's Albatross	VU			PMST	A marine, pelagic species that ranges widely throughout the Pacific region of the Southern Ocean. It visits off-shore waters of southern Australia.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche bulleri platei	Northern Buller's Albatross	VU			PMST	Buller's Albatross breeds in New Zealand and is a seasonal visitor to Victorian coastal waters where it occurs in pelagic and inshore waters.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Fregetta grallaria	Storm-Petrel (Australasian)	VU			PMST	Occurs across sub-tropical and tropical waters in the Tasman Sea, Coral Sea and, possibly, the central Pacific Ocean. In the non-breeding season, it reaches and forages over near-shore waters along the continental shelf of mainland Australia.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Pterodroma leucoptera leucoptera	Gould's Petrel	EN			PMST	The Gould's Petrel is a marine pelagic spending the majority of its time at sea. It has breeding colonies on Cabbage Tree Island and Boondelbah Island.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Halobaena caerulea	Blue Petrel	VU			PMST	A marine species, usually pelagic but sometimes observed over shallow waters. A regular visitor to southern Australian waters.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Diomedea exulans	Wandering Albatross	VU	cr		PMST	Occurs from Antarctic to subtropical areas in the southern hemisphere. In Australia, observed over continental shelves often in areas of continental upwellings. Regularly recorded feeding in sheltered harbours, often gathering at sewerage outfalls.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche melanophris	Black-browed Albatross	VU		1978	PMST	Breeds in antarctic and sub-antarctic islands, but commonly occurs in pelagic waters off the coast of Victoria.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche carteri	Indian Yellow-nosed Albatross	VU	e		PMST	Sub-Antarctic to subtropical waters off southern Australia, mostly in winter. Often close inshore. Breeds on Indian Ocean sub-Antarctic islands.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Thalassarche chrysostoma	Grey-headed Albatross	EN	e		PMST	Occurs in warmer areas over winter, its breeding grounds are found in the Antarctic and subantarctic islands. Generally, forages over the open oceans. There have been a small number of records over inshore and offshore areas along the Victorian coast.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche cauta	Shy Albatross	EN	e	2007	PMST	Sub-Antarctic to temperate waters off southern Australia, in all months. Often close inshore. Breeds on Albatross Is. (Bass Strait); the Mewstone & Pedra Branca Is. (S. Tas.).	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Phoebetria fusca	Sooty Albatross	VU	cr		PMST	Subantarctic and subtropical marine waters.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Macronectes giganteus	Southern Giant-Petrel	EN	e		PMST	Adults of this species are present all year round at Antarctic breeding colonies, from where immature birds disperse, some as far north as subtropical areas.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Thalassarche bulleri	Buller's Albatross	VU	e		PMST	Pelagic sub-antarctic to subtropical waters off SE Australia, mostly Mar - June. Infrequent in Bass Strait. Breeds on NZ islands.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Macronectes halli	Northern Giant-Petrel	VU	e		PMST	Breeds in coastal habitats on subantarctic islands. Dispersal movements of juveniles are poorly known but have been observed along temperate coastal areas of Australia. Often seen around sewer outfalls or seal and penguin colonies.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Diomedea epomophora	Southern Royal Albatross	VU	cr		PMST	Pelagic sub-antarctic to temperate waters off SE Australia, may occur in all months but mostly Jul - Oct. Breeds on NZ islands.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Diomedea sanfordi	Northern Royal Albatross	EN			PMST	Pelagic sub-antarctic to temperate waters off SE Australia, may occur in all months but mostly May - Sept. Breeds Chatham Is. and single mainland site in NZ.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Diomedea antipodensis	New Zealand Wandering Albatross	VU			PMST	A marine, pelagic species that ranges widely throughout the Pacific region of the Southern Ocean. It visits off-shore waters of southern Australia.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche salvini	Salvin's Albatross	VU			PMST	Infrequent occurrence in pelagic sub-antarctic to temperate waters off southern Australia. Breeds on Indian Ocean and NZ islands.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche steadi	White-capped Albatross	VU			PMST	Infrequent occurrence in pelagic sub-antarctic to temperate waters off southern Australia. May be more common off southern NSW. Breeds on Auckland Is group, NZ.	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.
Thalassarche impavida	Campbell Albatross	VU			PMST	Antarctic to subtropical waters from pelagic to shelf-break water including off-shore waters of southern and eastern Australia, mostly in winter. Breeds on Campbell Is. (NZ).	**Negligible**	**Negligible**	Offshore seabird, unlikely to visit inland regions.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Limosa lapponica baueri	Bar-tailed Godwit (baueri)	VU		1977	PMST	Non-breeding migrant to Australia. Shallow tidal, brackish or freshwater wetlands, mudflats and margins. Generally concentrated in coastal habitats, but may occur widely across continent during migration passage. They are social birds and are often seen in large flocks and in the company of other waders.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Sternula nereis nereis	Australian Fairy Tern	VU			PMST	Fairy Terns inhabit coastal environments including intertidal mudflats, sand flats and beaches. Nests above high-water mark on sandy shell-grit beaches.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Sternula nereis nereis	Australian Fairy Tern	VU	cr	1990		Coastal fresh and saline wetlands, intertidal mudflats, sand flats and beaches.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Thinornis cucullatus	Hooded Plover	VU	v	2002	PMST	Sandy ocean beaches, margins of estuaries and coastal lakes.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of sandy wetland habitat.
Charadrius leschenaultii	Greater Sand Plover	VU	v		PMST	Intertidal mudflats and sandbanks of sheltered bays and estuaries.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Numenius madagascariensis	Eastern Curlew	CR	cr	1977	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, coastal lagoons and bays.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Calidris ferruginea	Curlew Sandpiper	CR	cr	1999	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Calidris canutus	Red Knot	EN	e	1977	PMST	Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Calidris tenuirostris	Great Knot	CR	cr	1986		Large intertidal sandflats, banks, mudflats, estuaries, inlets, sewage farms, saltworks, harbours, coastal lagoons and bays.	**Low**	**Low**	May inhabit nearby Lake Coleman and coastal habitat. May fly over the study area occasionally but is unlikely to inhabit it due to lack of suitable wetland habitat.
Pycnoptilus floccosus	Pilotbird	VU			PMST	E Vic to SE NSW. Largely ground-dwelling among leaf litter, logs and lower storey vegetation of wet sclerophyll forests and rainforest. Less often, alpine and coastal woodlands.	**Medium**	**Medium**	No local records. Study area and disturbance footprint contains potentially suitable coastal woodland habitat with leaf litter and understorey vegetation.
Grantiella picta	Painted Honeyeater	VU	v		PMST	Dry open woodlands and forests. Typically forages for fruit and nectar in mistletoes and in tree canopies.	**Low**	**Low**	No local records. Some potentially suitable woodland habitat with mistletoes within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Anthochaera phrygia	Regent Honeyeater	CR	cr	1933	PMST	A range of dry woodlands and forests dominated by nectar-producing tree species. Species extinct from much of historic range. Distribution within Victoria limited to north-east.	**Negligible**	**Negligible**	Historic local records, but is now extinct in Victoria other than in the north-east of the state.
Stagonopleura guttata	Diamond Firetail	VU	v		PMST	Open forests and woodlands with a grassy ground layer.	**Low**	**Low**	No local records. Forest and woodland within the study area contains minimal grass cover required for foraging.
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern subspecies)	VU			PMST	Often observed feeding on insects as it spirals up trees or when hopping along the ground or on fallen litter. Generally inhabits open eucalypt forests, woodlands and Mallee, often where there are stands of dead trees.	**Medium**	**Low**	Regional records. Potentially suitable forest and woodland habitat throughout the study area. Disturbance footprint unlikely to be used as habitat due to lack of sufficient tree cover.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Megaptera novaeangliae australis	Humpback Whale	VU			PMST	Migrate between summer feeding grounds in the Southern Ocean to Northern waters where birthing and mating occurs. Increasingly recorded along the Victorian coast, occasionally entering Port Phillip and Western Port.	**Negligible**	**Negligible**	No marine habitat within the study area.
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll	EN			PMST	Rainforest and wet and dry sclerophyll forests and woodlands.	**Low**	**Low**	No local records. No suitable rainforest or wet forest habitat within the study area.
Antechinus minimus maritimus	Swamp Antechinus	VU	v		PMST	Dense wet heath and heathy woodland, sedgeland and dense tussock grassland.	**Low**	**Low**	No local records, study area is outside the species known and predicted distribution. Closest known population resides at Wilsons Promontory.
Petaurus australis	Yellow-bellied Glider	VU			PMST	Sclerophyll forest with large hollow-bearing trees, prefers mature eucalypt dominated forest and woodland. Distributed along South-eastern Australia.	**Negligible**	**Negligible**	No local records. No suitable wet forest habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Pseudomys novaehollandiae	New Holland Mouse	VU	e	2020	PMST	Coastal heathland, heathy woodland and dry sclerophyll forest.	**High**	**High**	Recent local records in suitable woodland habitat extending into the study area. High quality habitat throughout the study area.
Mirounga leonina	Southern Elephant Seal	VU		1992		Occurs in Antarctic and subantarctic areas. Victorian records likely to be of vagrants, which have been found on rare occasions along the entire Victorian coast, including Port Phillip and Hobsons Bay.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Eubalaena australis	Southern Right Whale	EN	e	1991	PMST	Migrates between summer feeding grounds in the Southern Ocean to warmer northern waters over winter, where it can be found along the Victorian coastline. The coast 8 km east of Warrnambool is a locally important calving and nursing site until late October or early November.	**Negligible**	**Negligible**	No marine habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Balaenoptera musculus	Blue Whale	EN	e		PMST	Found throughout the Southern Ocean, though migration paths appear to be diffuse and widespread. Often enters coastal waters, including Victoria (particularly the smaller subspecies Balaenoptera physalus).	**Negligible**	**Negligible**	No marine habitat within the study area.
Arctophoca tropicalis	Subantarctic Fur Seal	EN		2014		Near coastal and offshore waters.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	v		PMST	Rainforest, wet and dry sclerophyll forest, woodland, and urban areas.	**Medium**	**Medium**	No local records, however, permanent camp established at Bairnsdale, and nearby temporary camps at Sale and Woodside. Species may occasionally forage in flowering trees and temporarily roost within the study area and disturbance footprint.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Chelonia mydas	Green Turtle	VU			PMST	Marine species with a pan-tropical distribution throughout the world. More abundant along the tropical coasts of Australia and the Great Barrier Reef. Green Turtles spend their first five to ten years drifting on ocean currents.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Dermochelys coriacea	Leathery Turtle	EN	cr		PMST	Marine species usually sighted along the eastern seaboard often in bays, estuaries and rivers. No major nesting events have been recorded in Australia.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Delma impar	Striped Legless Lizard	VU	e		PMST	Natural temperate grassland, grassy woodland and exotic grassland.	**Negligible**	**Negligible**	No local or regional records. Study area is outside the species usual range.
Lissolepis coventryi	Swamp Skink	EN	e	2019 (ALA record)	PMST	Densely vegetated swamps and associated watercourses, and adjacent wet heaths, sedgelands and saltmarshes.	**Medium**	**Medium**	Recent 2019 record of species from Heathy Woodland/Estuarine Wetland habitat at nearby Lake Reeve. Potentially suitable wet grassland, sedgeland and swamp scrub habitat found throughout the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Caretta caretta	Loggerhead Turtle	EN			PMST	Loggerhead Turtles forage widely in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. Nesting occurs in coastal environments of northern WA, NT and QLD.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Heleioporus australiacus	Giant Burrowing Frog	VU	cr		PMST	Forests, woodlands and heathland with slow-flowing streams or other waterbodies for breeding.	**Negligible**	**Negligible**	No local records. No suitable wetland habitat with surrounding vegetation within the study area.
Litoria aurea	Green and Golden Bell Frog	VU		2021	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation.	**High/ Recorded**	**High**	Drainage channel within study area connected to wetland with several recent records. Several potentially suitable habitat dams with high quality aquatic vegetation adjacent to study area. Species recorded in wetland adjacent to study area during targeted surveys.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Litoria raniformis	Growling Grass Frog	VU	v	2017	PMST	Still or slow-flowing waterbodies and surrounding terrestrial vegetation. [NOTE Due to recent taxonomic changes: Nth Vic GGF is *L. raniformis raniformis* and Sth Vic GGF *L. raniformis major*. No legislative implications]	**Medium**	**Medium**	Drainage channel within study area connected to wetland with several recent records. Several potentially suitable habitat dams with high quality aquatic vegetation adjacent to study area. Species not recorded during targeted surveys, however, occupies similar range and habitat to recorded Green and Golden Bell Frog.
Thunnus maccoyii	Southern Bluefin Tuna	CD	cd		PMST	The species is highly migratory, occurring globally in waters between 30-50 degrees Celsius.	**Negligible**	**Negligible**	No marine habitat within the study area.
Carcharodon carcharias	Great White Shark	VU	e		PMST	Near coastal and offshore waters.	**Negligible**	**Negligible**	No marine habitat within the study area.
Prototroctes maraena	Australian Grayling	VU	e		PMST	Adults inhabit cool, clear, freshwater streams.	**Low**	**Low**	No local records. Waterways and wetlands within study area do not connect with waterways containing records.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Galaxiella pusilla	Dwarf Galaxias	VU	e	1993	PMST	Slow-flowing or still freshwater wetlands such as swamps, drains and backwaters of streams.	**Medium**	**Medium**	Local records from nearby Boundary Creek. The Regional Outfall Sewer running within study area may contain suitable habitat, and passes within 750 meters of Boundary Creek.
Seriolella brama	Blue Warehou	CD	cd		PMST	The species occurs predominantly in coastal shelf, upper continental slope and seamount waters offshore from New South Wales, Tasmania, Victoria and South Australia. The species occurs at depths between 3 and 550 m.	**Negligible**	**Negligible**	No marine habitat within the study area.
Rhincodon typus	Whale Shark	VU			PMST	An oceanic and coastal, tropical to warm-temperate pelagic shark. In Australia, the Whale Shark is known from NSW, Queensland, Northern Territory, Western Australia and occasionally Victoria and South Australia.	**Negligible**	**Negligible**	No marine habitat within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Galeorhinus galeus	School Shark	CD			PMST	School Shark is most abundant in cold to temperate continental seas, from the surf line and very shallow water to well offshore. Females and juveniles utilise inshore coastal areas around Victoria, Tasmania and parts of South Australia for nursery areas.	**Negligible**	**Negligible**	No marine habitat within the study area.
Melanodryas cucullata	Hooded Robin	EN	v	1991	PMST	Woodlands of eucalypt, Mallee, semi-cleared farmland.	**Medium**	**Low**	Some potentially suitable woodland throughout the study area. Species recorded throughout the region. Disturbance footprint unlikely to be used as habitat due to lack of sufficient contiguous woodland habitat cover.
State Significance									
Egretta garzetta	Little Egret		e	2019		Swamps, billabongs, floodplain pools, mudflats, mangroves and channels; breeds in trees standing in water.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Ardea intermedia plumifera	Plumed Egret		cr	2013		Densely-vegetated freshwater wetlands including lakes, swamps and billabongs. Breeds in trees standing in water. Rarely reliably recorded in southern Victoria.	**Negligible**	**Negligible**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area, but is rarely recorded in southern Victoria.
Ardea alba modesta	Eastern Great Egret		v	2019		Flooded crops, pasture, swamps, lagoons, saltmarsh, sewage ponds, estuaries, dams, roadside ditches. Breeds in trees standing in water.	**Medium**	**Medium**	Recent local records. Species may forage within seasonally flooded pasture and along drainage lines within the study area.
Ixobrychus dubius	Australian Little Bittern		e	1991		Freshwater swamps, lakes and rivers with dense reedbeds, saltmarsh and coastal lagoons.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.
Spatula rhynchotis	Australasian Shoveler		v	2019		Variety of wetlands, with a preference for large, permanent, freshwater lakes/swamps with dense fringing vegetation.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.
Stictonetta naevosa	Freckled Duck		e	2013		Large freshwater wetlands, generally with dense vegetation.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Aythya australis	Hardhead		v	2018		Deep freshwater swamps and wetlands, with abundant aquatic and terrestrial vegetation for roosting. Can occur in sheltered estuaries.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.
Oxyura australis	Blue-billed Duck		v	2007		Open or densely vegetated wetlands.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.
Biziura lobata	Musk Duck		v	2017		Deep, permanent freshwater wetlands with areas of open water and patches of dense aquatic vegetation.	**Low**	**Low**	No suitable wetland habitat within the study area. Species may occasionally fly over the study area.
Accipiter novaehollandiae	Grey Goshawk		e	1999		Rainforest, gallery forest, tall wet forest and woodland. Also partially cleared agricultural land.	**Low**	**Low**	Species is rarely recorded within the region. Lack of preferred tall wet forest habitat within the study area. Species may fly through the study area occasionally, but is unlikely to inhabit it.
Hieraaetus morphnoides	Little Eagle		v	1999		Woodland and open areas. Rabbits are a key component of their diet. Nesting occurs in mature trees in open woodland or riparian vegetation.	**Medium**	**Medium**	Several local records and suitable nesting and hunting habitat throughout the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Haliaeetus leucogaster	White-bellied Sea-Eagle		e	2019		Coastal areas such as beaches and estuaries, inland wetlands and major inland streams.	**High/ Recorded**	**High/ Recorded**	Species observed during fieldwork. Recent local records. Species is likely to occur within nearby coastal and lakeside habitat, but is unlikely to inhabit the study area due to a lack of suitable wetland habitat. Species likely to regularly fly over the study area.
Falco subniger	Black Falcon		cr	1999		Woodlands, open country and around terrestrial wetlands areas, including rivers and creeks. Mostly hunts over open plains and undulating land with large tracts of low vegetation. Primarily occurs in arid and semi-arid zones in the north, north-west and west of Victoria, though can be forced into more coastal areas by droughts and subsequent food shortages.	**Negligible**	**Negligible**	Species is rarely found in the region, one local record from 1999.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Ninox strenua	Powerful Owl		v	2007		Eucalypt forests and woodlands, well-treed urban areas.	**Medium**	**Medium**	Recent local records in woodland patches extending into the Study area. Suitable woodland habitat with numerous tree hollows throughout the study area.
Tyto novaehollandiae	Masked Owl		cr	2007		A variety of lowland forests and woodlands.	**Medium**	**Medium**	Recent record within the study area. Suitable woodland habitat with numerous hollow trees throughout the study area.
Hydroprogne caspia	Caspian Tern		v	2019		Estuaries, inlets, bays, lagoons, inland lakes, flooded pasture, sewage ponds.	**Low**	**Low**	No suitable coastal or wetland habitat within the study area. Local records from Lake Coleman and nearby coast. Species may occasionally fly over the study area or forage in flooded pasture, but is unlikely to inhabit the study area.
Sternula albifrons	Little Tern		cr	2002	PMST	This bird is mostly recorded in sheltered coastal environments, including bays, lagoons and estuaries. Nests on sandy substrates containing much shell-grit, which provides good camouflage for their eggs.	**Low**	**Low**	No suitable coastal or wetland habitat within the study area. Local records from Lake Coleman and nearby coast. Species may occasionally fly over the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Arenaria interpres	Ruddy Turnstone		e	1977		Mainly found on coastal beaches, exposed reefs, and rock platforms.	**Negligible**	**Negligible**	No recent local records, or suitable rocky coastal habitat within the study area.
Pluvialis fulva	Pacific Golden Plover		v	1999		A range of coastal habitats including mudflats, sandflats rocky shores and saltmarsh.	**Negligible**	**Negligible**	No suitable coastal or wetland habitat within the study area.
Actitis hypoleucos	Common Sandpiper		v	1901	PMST	Migrates to Australia from Eurasia in August where it inhabits a wide variety of coastal and inland wetlands with muddy margins before departing north in March.	**Low**	**Low**	No recent local records, or suitable coastal or wetland habitat within the study area.
Tringa nebularia	Common Greenshank		e	2019	PMST	A variety of ephemeral and permanent inland wetlands and sheltered coastal wetlands.	**Low**	**Low**	No suitable coastal or wetland habitat within the study area. Local records from the nearby La Trobe River.
Tringa stagnatilis	Marsh Sandpiper		e	2018		Permanent or ephemeral wetlands, mudflats and saltmarshes in coastal and inland environments.	**Low**	**Low**	No suitable coastal or wetland habitat within the study area. Local records from the nearby La Trobe River.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Calamanthus pyrrhopygius	Chestnut-rumped Heathwren		v	1977		Woodland habitat with a dense, shrubby understorey.	**Medium**	**Low**	No recent local records, however, suitable heathy woodland is present throughout the study area. Disturbance footprint unlikely to be used as habitat due to lack of sufficient woodland habitat cover.
Pyrrholaemus sagittatus	Speckled Warbler		e	1978		Eucalypt woodland with rocky gullies, ridges, tussock grasses and a sparse shrub understorey.	**Low**	**Low**	Only one local record, from 1978. No suitable rocky eucalypt gullies with grassy understorey.
Arctophoca forsteri	Long-nosed Fur Seal		v	2018		Breeds on islands off the southern Australian coast.	**Negligible**	**Negligible**	No marine or coastal habitat within the study area.
Tursiops australis	Burrunan Dolphin		cr	2006		Marine waters in Port Phillip and the Gippsland Lakes.	**Negligible**	**Negligible**	No marine habitat within the study area.
Ornithorhynchus anatinus	Platypus		v	1972		A variety of freshwater waterbodies, particularly those with stable banks suitable for burrows, and shallow waters for foraging.	**Negligible**	**Negligible**	No suitable water bodies within the study area. Drainage line passing through the study area is of low quality and does not connect with waterways containing records.
Saccolaimus flaviventris	Yellow-bellied Sheathtail Bat		v	2007		A variety of habitats, ranging from wet forests to desert. Forages above canopy, and low in open areas.	**Medium**	**Medium**	Widespread rarely recorded species. Recent local records, species may occasionally forage and roost within the study area.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Varanus varius	Lace Monitor		e	2017		A variety of wooded habitats, including woodlands; shelters in hollow trunks, limbs and logs. Relies on active termite mounds for nesting.	**High**	**Medium**	Several recent local records. Suitable wooded habitat and termite mounds for nesting throughout the study area. Unlikely to utilise cleared land, but may regularly pass through the existing cleared easement between habitat patches.
Pseudemoia rawlinsoni	Glossy Grass Skink		e	2007		Damp environments like drainage lines, soaks and the margins of creeks, particularly in dense vegetation including rank grass, Kikuyu, reeds and sedges. Also, the fringes of coastal saltmarshes.	**High/ Recorded**	**High/ Recorded**	Suitable habitat adjacent to wetlands and within seasonally flooded vegetation throughout the study area. Species recorded utilising Kikuyu grass beside waterway during targeted surveys.
Pseudophryne semimarmorata	Southern Toadlet		e	2020		A wide variety of woodland, forest and grassland habitats, where it shelters under leaf litter and other debris in moist soaks and depressions. Breeds in swamps and inundated habitats, and along creek lines.	**High**	**High**	Recent records from within the study area in seasonally moist woodland habitat. Suitable habitat within the study area, and disturbance footprint.

Scientific name	Common name	Conservation status		Most recent database record	Other records	Habitat description	Likely occurrence in study area	Likely occurrence in disturbance footprint	Rationale for likelihood ranking
		EPBC	FFG						
Uperoleia martini	Martin's Toadlet		cr	2021		Dry grasslands, woodlands and heathlands at scattered locations on the coastal border of eastern Victoria and New South Wales.	**High**	**High**	Recent records from woodland extending into the study area. Suitable woodland habitat throughout the study area.
Nannoperca sp. 1	Flinders Pygmy Perch		v	1993		Slow flowing, deep shaded pool with abundant instream aquatic vegetation. A population occurs east of the La Trobe River in Gippsland.	**Medium**	**Medium**	Local records from nearby Boundary Creek. Potentially suitable habitat within the Regional Outfall Sewer.

Appendix B.3. Migratory species (EPBC Act listed)

Table 28 Migratory fauna species recorded or predicted to occur within 10 km of the study area

Scientific name	Common name	Most recent record	Assessed as likely to inhabit study area for EPBC Act SIC Assessment
Migratory species			
Limicola falcinellus	Broad-billed Sandpiper	1986	-
Gallinago hardwickii	Latham's Snipe	2019	Yes
Plegadis falcinellus	Glossy Ibis	2017	Yes
Hirundapus caudacutus	White-throated Needletail	2019	Yes
Apus pacificus	Fork-tailed Swift	PMST	Yes
Pandion haliaetus	Osprey	PMST	-
Ardenna grisea	Sooty Shearwater	PMST	-
Ardenna tenuirostris	Short-tailed Shearwater	2006	-
Ardenna carneipes	Flesh-footed Shearwater	PMST	-
Diomedea exulans	Wandering Albatross	PMST	-
Thalassarche melanophris	Black-browed Albatross	1978	-
Thalassarche carteri	Indian Yellow-nosed Albatross	PMST	-
Thalassarche chrysostoma	Grey-headed Albatross	PMST	-
Thalassarche cauta	Shy Albatross	2007	-
Phoebetria fusca	Sooty Albatross	PMST	-
Macronectes giganteus	Southern Giant-Petrel	PMST	-
Thalassarche bulleri	Buller's Albatross	PMST	-
Macronectes halli	Northern Giant-Petrel	PMST	-
Sterna hirundo	Common Tern	2002	-
Diomedea epomophora	Southern Royal Albatross	PMST	-
Diomedea sanfordi	Northern Royal Albatross	PMST	-
Diomedea antipodensis	New Zealand Wandering Albatross	PMST	-
Thalassarche salvini	Salvin's Albatross	PMST	-
Thalassarche steadi	White-capped Albatross	PMST	-
Thalassarche impavida	Campbell Albatross	PMST	-
Chlidonias leucopterus	White-winged Black Tern	2019	-
Hydroprogne caspia	Caspian Tern	2019	-
Thalasseus bergii	Crested Tern	2010	-
Sternula albifrons	Little Tern	2002	-
Arenaria interpres	Ruddy Turnstone	1977	-
Pluvialis fulva	Pacific Golden Plover	1999	-
Charadrius bicinctus	Double-banded Plover	1999	-
Charadrius leschenaultii	Greater Sand Plover	PMST	-
Numenius madagascariensis	Eastern Curlew	1977	-
Limosa lapponica	Bar-tailed Godwit	1977	-

Scientific name	Common name	Most recent record	Assessed as likely to inhabit study area for EPBC Act SIC Assessment
Migratory species			
Actitis hypoleucos	Common Sandpiper	1901	-
Tringa nebularia	Common Greenshank	2019	-
Tringa stagnatilis	Marsh Sandpiper	2018	-
Calidris ferruginea	Curlew Sandpiper	1999	-
Calidris ruficollis	Red-necked Stint	2007	-
Calidris acuminata	Sharp-tailed Sandpiper	2013	-
Calidris canutus	Red Knot	1977	-
Calidris tenuirostris	Great Knot	1986	-
Calidris alba	Sanderling	1901	-
Calidris melanotos	Pectoral Sandpiper	1986	-
Motacilla flava	Yellow Wagtail	PMST	-
Rhipidura rufifrons	Rufous Fantail	PMST	Yes
Myiagra cyanoleuca	Satin Flycatcher	PMST	Yes
Monarcha melanopsis	Black-faced Monarch	PMST	Yes
Lagenorhynchus obscurus	Dusky Dolphin	PMST	-
Megaptera novaeangliae	Humpback Whale	PMST	-
Eubalaena australis	Southern Right Whale	1991	-
Caperea marginata	Pygmy Right Whale	PMST	-
Balaenoptera musculus	Blue Whale	PMST	-
Physeter macrocephalus	Sperm Whale	2020	-
Orcinus orca	Killer Whale	PMST	-
Chelonia mydas	Green Turtle	PMST	-
Dermochelys coriacea	Leathery Turtle	PMST	-
Caretta caretta	Loggerhead Turtle	PMST	-
Lamna nasus	Porbeagle	PMST	-
Carcharodon carcharias	Great White Shark	PMST	-
Rhincodon typus	Whale Shark	PMST	-

Appendix B.4. Targeted frog survey comprehensive results

The results of targeted frog surveys, including site name, survey date and time, relevant weather conditions at the start and end of the survey, and species recorded are detailed in.

Table 29 below.

Table 29 Comprehensive results of targeted frog surveys

Survey site	Date	Start Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	Species recorded
B	5/12/2022	20:55	14.2	100	3.5	S	Light rain	100	21:05	14.1	100	3.2	S	Nil	100	• Common froglet • Southern Brown Tree Frog
C	5/12/2022	21:10	14.1	100	2.3	S	Nil	100	21:35	14.2	100	2.3	S	Nil	100	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
F	5/12/2022	22:20	14.5	94.1	3.2	SE	Drizzle	100	22:40	14.4	87.5	2.1	SE	Nil	100	• No frogs seen or heard calling.
Additional 1	5/12/2022	21:45	14.5	90.8	2.6	SE	Nil	100	22:05	14.8	84.8	2.1	E	Drizzle	100	• Common froglet • Pobblebonk • Peron's Tree Frog
Additional 2	5/12/2022	22:45	14.2	87.7	5.4	S	Nil	100	22:55	14.2	87.2	4.3	S	Nil	100	• No frogs seen or heard calling. No standing water, site dropped from survey program.
Additional 3	5/12/2022	23:10	14.2	73.5	4.5	SE	Nil	100	23:35	14.1	72.7	3.6	SE	Nil	100	• No frogs seen or heard calling. No standing water, site dropped from survey program.

Survey site	Date	Start Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	Species recorded
A	6/12/2022	20:55	14.6	84.3	1.2	SW	Nil	90	21:30	12.4	77.3	0	-	Nil	80	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
B	6/12/2022	21:50	14.4	78.5	0	-	Nil	90	22:20	12.7	82.2	0	-	Nil	90	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
C	6/12/2022	22:35	13.9	83.6	0	-	Nil	60	22:50	12.5	88.4	0	-	Nil	40	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog
D	6/12/2022	23:10	13.3	89.5	0	-	Nil	80	23:25	11.8	87.3	0	-	Nil	45	• No frogs seen or heard calling.
F	6/12/2022	23:40	12.9	80.3	1.4	S	Nil	20	23:50	12	79.4	1.3	S	Nil	15	• Southern Brown Tree Frog
E	6/12/2022	00:00	12.7	87.9	1.6	S	Nil	10	00:15	10.8	82.8	1.8	S	N8l	15	• Common froglet • Southern Brown Tree Frog
G	6/12/2022	00:35	11.9	91.5	0	-	Nil	30	00:45	10.7	92	0	-	Nil	30	• No frogs seen or heard calling.
H	6/12/2022	00:55	11.8	92.1	0	-	Nil	25	01:05	8.3	98.6	0	-	Nil	25	• Green and Golden Bell Frog (heard calling before starting call playback survey)
A	7/12/2022	21:10	13.9	63.6	2.6	S	Nil	5	21:45	13.6	67.5	4.8	NW	Nil	90	• Common froglet • Pobblebonk

Survey site	Date	Start Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	Species recorded
																• Southern Brown Tree Frog • Spotted Marsh Frog
B	7/12/2022	22:00	13.5	59.4	3.3	NW	Nil	100	22:25	13.4	69.5	3.5	NW	Nil	100	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
C	7/12/2022	22:30	13.5	76.5	2.5	NW	Drizzle	100	22:40	13.4	76.8	3.2	NW	Drizzle	100	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
H	7/12/2022	23:05	13.5	75.8	1.7	NW	Nil	100	23:40	12.7	81.6	1.6	NW	Light rain	100	• Pobblebonk
G	7/12/2022	23:45	13.2	84.7	2.8	NW	Drizzle	100	23:55	12.2	90.7	5.6	NW	Nil	100	• No frogs seen or heard calling.
E	7/12/2022	00:10	12.7	68.6	1.2	NW	Nil	20	00:25	12.4	76.7	2.3	NW	Nil	5	• Southern Brown Tree Frog
F	7/12/2022	00:35	12.8	80.2	5.5	NW	Nil	10	00:45	12	78.9	5	NW	Nil	5	• Southern Brown Tree Frog
D	7/12/2022	01:00	12.5	78.4	2.9	NW	Nil	10	01:20	11.4	74.9	4.2	NW	Nil	10	• No frogs seen or heard calling.
H	8/12/2022	21:10	12.7	67.9	2.6	NW	Nil	25	21:45	12	66.8	3.2	W	Nil	30	• Pobblebonk
G	8/12/2022	21:50	12.4	66.2	3.5	W	Nil	15	22:05	10.7	55.8	2.1	W	Nil	15	• No frogs seen or heard calling.

Survey site	Date	Start Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	Species recorded
E	8/12/2022	22:20	11.9	74.1	2.3	W	Nil	5	22:30	10.9	73.2	3.4	W	Nil	10	• Southern Brown Tree Frog
F	8/12/2022	22:40	11.3	67.6	2.2	NW	Nil	15	22:50	11.2	68.1	3.1	NW	Nil	15	• Southern Brown Tree Frog
D	8/12/2022	23:00	10.6	75.8	2.6	NW	Nil	10	23:15	9.9	74.7	2.2	NW	Nil	20	• No frogs seen or heard calling.
C	8/12/2022	23:35	12.2	67.4	2.3	NW	Nil	90	23:45	12.1	72.4	1.3	NW	Nil	90	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
B	8/12/2022	23:50	11.4	61.4	1.8	NW	Nil	80	00:10	10.2	60.5	1.7	NW	Nil	70	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog • Peron's Tree Frog
A	8/12/2022	00:20	10.1	72.8	1.2	NW	Nil	70	00:40	9.9	74.5	5.3	SW	Nil	50	• Common froglet • Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog
H	25/1/2023	21:00	21.6	75	4.8	NE	Nil	5	21:40	20.6	77.8	2.3	NE	Nil	5	• No frogs seen or heard calling.
G	25/1/2023	21:45	20.8	76.4	2.6	NW	Nil	5	22:00	20.6	76.8	3.1	NW	Nil	5	• No frogs seen or heard calling.
E	25/1/2023	22:15	19.2	72.6	1.5	NE	Nil	5	22:25	18.9	73.4	0.8	NE	Nil	5	• Spotted Marsh Frog

Survey site	Date	Start Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temperature (c)	Relative Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	Species recorded
F	25/1/2023	22:35	18.7	72.9	3.4	SE	Nil	10	22:50	18.6	72.5	1.3	SE	Nil	10	• No frogs seen or heard calling.
D	25/1/2023	23:00	17.4	86	2	SE	Nil	0	23:25	17.3	84.9	1.9	SE	Nil	0	• Spotted Marsh Frog
C	25/1/2023	23:35	17.2	86	2.2	S	Nil	0	23:45	17.2	86.2	2.4	S	Nil	0	• Pobblebonk • Spotted Marsh Frog
B	25/1/2023	23:55	16.9	85.6	0.9	S	Nil	0	00:10	16.7	87.4	1.2	S	Nil	0	• Southern Brown Tree Frog
A	25/1/2023	00:20	16.7	87.4	2.3	S	Nil	0	00:40	16.6	87.4	1.8	S	Nil	0	• Pobblebonk • Southern Brown Tree Frog • Spotted Marsh Frog

Appendix B.5. Targeted reptile survey comprehensive results

The results of targeted reptile surveys, including site name, survey date and time, temperature of three representative tiles and associated substrate, relevant weather conditions at the start and end of the survey, and species recorded are detailed in

Table 30 and Table 31 below.

Table 30 Comprehensive results of targeted reptile surveys – tile and substrate temperature and species recorded

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
2	31/1/2023	13:35	14:10	29, 30, 28	24, 24, 22	41, 41, 41	29, 28, 27	• 4x Pale-flecked Garden Sunskink
1	31/1/2023	14:25	15:00	40, 45, 40	34, 26, 30	31, 31, 30	25, 24, 22	• No reptiles recorded
11	31/1/2023	15:35	16:24	56, 58, 51	41, 40, 38	40, 54, 27	34, 33, 24	• 1x Eastern three-lined skink (active in vegetation) • 1x Pale-flecked Garden Sunskink (under tile in vegetation)
10	31/1/2023	16:35	17:05	42, 42, 46	32, 31, 33	35, 37, 38	32, 34, 33	• 1x Common Blue-tongued Lizard (active in vegetation)
4	1/2/2023	09:20	09:55	41, 40, 40	32, 28, 28	36, 23, 29	28, 21, 24	• 1x Pale-flecked Garden Sunskink (under tile in vegetation)
5	1/2/2023	10:00	10:30	34, 35, 42	23, 25, 28	29, 27, 35	24, 22, 25	• 1x Tree Dragon (active in vegetation) • 2x Pale-flecked Garden Sunskink (active in vegetation) • 2x Bougainville's Skink (under tiles on edge of vegetation)
8	1/2/2023	11:05	11:35	51, 49, 50	31, 34, 36	21, 25, 38	20, 21, 23	• No reptiles recorded
9	1/2/2023	11:50	12:25	47, 43, 46	34, 31, 32	37, 41, 37	25, 34, 26	• 1x Eastern Brown Snake (found dead and partially scavenged in vegetation)
6	1/2/2023	12:55	13:25	52, 52, 51	38, 39, 37	32, 39, 25	28, 28, 20	• 1x Pale-flecked Garden Sunskink (under tile in vegetation)
7	1/2/2023	13:35	14:05	48, 53, 50	37, 40, 39	35, 40, 40	28, 32, 30	• No reptiles. Animal movement heard in Kikuyu grass
12	1/2/2023	14:25	14:55	52, 49, 51	42, 37, 40	38, 41, 46	32, 34, 35	• 1x Skink Sp. (under tile in vegetation - woodland)
3	1/2/2023	15:15	15:45	48, 51, 49	41, 39, 38	26, 38, 23	23, 28, 21	• 6x Pale-flecked Garden Sunskink (under tiles in vegetation)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
2	1/2/2023	14:00	14:35	47, 53, 55	36, 40, 37	31, 38, 34	27, 29, 28	• 3x Pale-flecked Garden Sunskink (under tiles in vegetation)
8	2/2/2023	09:50	10:20	33, 38, 36	26, 24, 28	22, 28, 23	18, 23, 20	• No reptiles recorded
9	2/2/2023	10:35	11:10	48, 50, 50	39, 40, 41	43, 34, 41	28, 25, 27	• 1x Bougainville's Skink (under tile in easement) • 1x Common Blue-tongued Lizard (under tile in vegetation)
11	2/2/2023	11:30	11:55	42, 42, 41	34, 35, 36	39, 35, 31	26, 25, 24	• 2x Skink Sp. (under tile in vegetation)
10	2/2/2023	12:05	12:40	41, 46, 46	32, 33, 34	25, 35, 35	22, 28, 29	• No reptiles recorded
12	2/2/2023	13:05	13:40	48, 49, 48	34, 35, 39	24, 23, 30	22, 20, 25	• 2x Tree Dragon (active in vegetation) • 2x Eastern three-lined skink (active in vegetation) • 2x Bougainville's Skink (under tiles in easement)
7	2/2/2023	13:55	14:30	61, 66, 64	40, 38, 42	56, 61, 60	34, 40, 31	• No reptiles recorded
6	2/2/2023	14:40	15:05	53, 55, 54	46, 38, 42	55, 48, 41	43, 35, 31	• 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 1x Common Blue-tongued Lizard (active in vegetation) • 1x Eastern three-lined skink (active in vegetation)
4	2/2/2023	15:45	16:15	45, 43, 46	36, 33, 35	42, 36, 31	37, 29, 28	• No reptiles recorded
5	2/2/2023	16:20	16:50	28, 28, 29	24, 25, 26	23, 26, 25	22, 25, 24	• 1x Bougainville's Skink (under tile on edge of vegetation)
1	3/2/2023	09:55	10:25	28, 34, 28	22, 25, 23	22, 26, 30	20, 22, 24	• 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 1x Weasel Skink (under tile in vegetation)
3	3/2/2023	10:40	11:15	26, 25, 25	22, 20, 20	25, 22, 21	22, 18, 17	• 1x Pale-flecked Garden Sunskink (basking on tile in vegetation) • 6x Pale-flecked Garden Sunskink (under tiles in vegetation) • 4x Weasel Skink (under tiles in vegetation) • 2x Weasel Skink (under tiles in easement) • 1x Pale-flecked Garden Sunskink (under tile in easement • 1x Bougainville's Skink (under tile in easement) • 1x Common Blue-tongued Lizard (active in vegetation)
2	6/2/2023	15:30	14:05	52, 54, 57	37, 38, 35	27, 33, 47	24, 30, 36	• 3x Pale-flecked Garden Sunskink (under tiles in vegetation)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
								• 3x Pale-flecked Garden Sunskink (active in vegetation)
3	6/2/2023	16:20	14:45	48, 48, 52	37, 36, 37	27, 39, 25	24, 28, 23	• 2x Pale-flecked Garden Sunskink (under tiles in vegetation) • 1x Weasel Skink (under tile in vegetation)
8	7/2/2023	10:45	11:20	29, 29, 32	26, 23, 25	26, 25, 25	22, 22, 23	• No reptiles recorded
9	7/2/2023	11:30	11:55	39, 37, 40	26, 30, 28	30, 28, 29	24, 22, 25	• 1x Bougainville's Skink (under tile in easement) • 2x Common Blue-tongued Lizard (under tiles in vegetation) • 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 1x Eastern three-lined skink (under tile in vegetation)
11	7/2/2023	12:05	12:35	39, 39, 38	29, 30, 29	33, 27, 29	27, 24, 25	• 1x Bougainville's Skink (under tile in vegetation) • 2x Eastern three-lined skink (under tiles in vegetation)
10	7/2/2023	12:40	13:10	44, 43, 49	31, 29, 36	29, 36, 32	24, 25, 24	• 1x Eastern three-lined skink (active in vegetation) • 1x White-lipped Snake (active in vegetation) • 1x Bougainville's Skink (under tile in vegetation) • 1x Pale-flecked Garden Sunskink (under til in vegetation) • 1x Delicate Skink (under tile in easement)
12	7/2/2023	13:25	13:55	50, 51, 50	36, 33, 37	19, 21, 29	18, 22, 26	• 2x Bougainville's Skink (under tile in easement) • 2x Pale-flecked Garden Sunskink (active in vegetation)
5	7/2/2023	14:15	14:45	54, 54, 53	36, 32, 31	52, 42, 45	44, 35, 36	• No reptiles recorded
4	7/2/2023	14:55	15:20	60, 59, 62	40, 39, 42	45, 48, 45	34, 38, 35	• 1x Pale-flecked Garden Sunskink (under tile on edge of vegetation) • 1x Bougainville's Skink (active in vegetation)
1	8/2/2023	09:35	10:05	28, 30, 29	22, 22, 23	26, 28, 22	23, 23, 20	• 2x Bougainville's Skink (under tiles in vegetation)
6	8/2/2023	11:05	11:35	28, 26, 28	23, 22, 22	27, 23, 25	22, 20, 22	• 2x Eastern three-lined skink (under tiles in vegetation) • 2x Pale-flecked Garden Sunskink (under tiles in vegetation) • 3x Eastern three-lined skink (under tile in easement • 1x Bougainville's Skink (under tile in easement)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
7	8/2/2023	11:40	12:15	26, 26, 27	21, 21, 22	23, 22, 22	20, 20, 19	• 2x Glossy Grass Skink (under tiles in vegetation, on dense, deep Kikuyu grass) (tile/soil temperature 23/20 and 24/20 degrees) • 2x Pale-flecked Garden Sunskink (under tiles in vegetation) • 1x Eastern three-lined skink (under tile in easement) • 1x Weasel Skink (under tile in vegetation)
3	7/2/2023	15:40	16:05	58, 58, 59	48, 46, 47	32, 40, 38	29, 32, 34	• 1x Weasel Skink (under tile in vegetation) • 3x Pale-flecked Garden Sunskink (under tiles in vegetation) • 1 Weasel Skink (active in easement)
2	8/2/2023	10:15	10:45	27, 26, 25	20, 21, 19	21, 23, 23	19, 20, 20	• 2x Pale-flecked Garden Sunskink (under tiles in vegetation) • 1x Weasel Skink (under tile in vegetation) • 2x Pale-flecked Garden Sunskink (basking on tile in vegetation) • 2x Pale-flecked Garden Sunskink (under tiles in easement)
4	8/2/2023	12:35	13:05	33, 36, 35	28, 26, 25	26, 29, 25	22, 25, 21	• 1x White-lipped Snake (under tile on edge of vegetation) • 1x Bougainville's Skink (under tile on edge of vegetation) • 1x Tree Dragon (active in vegetation)
5	8/2/2023	13:10	13:30	38, 42, 41	24, 28, 28	27, 25, 28	23, 22, 23	• 1x Pale-flecked Garden Sunskink (active in vegetation) • 1x Bougainville's Skink (under tile on edge of vegetation) • 1x Delicate Skink (active on edge of vegetation) • 1x Bougainville's Skink (under tile in easement) • 1x Delicate Skink (under tile in easement)
8	8/2/2023	13:50	14:15	46, 48, 49	36, 38, 37	30, 41, 31	24, 25, 25	• 1x House Mouse (under tile in vegetation)
9	8/2/2023	14:25	15:00	68, 62, 56	52, 45, 38	47, 52, 47	27, 32, 30	• 1x Glossy Grass Skink (under tile in vegetation, on Salt Grass adjacent to Juncus Sp.) (tile/soil temperature 52/32 degrees)
11	8/2/2023	15:20	15:45	59, 60, 52	41, 41, 29	43, 45, 42	28, 27, 26	• No reptiles recorded
10	8/2/2023	15:50	14:15	44, 48, 43	29, 34, 27	40, 33, 35	27, 27, 29	• 1x Delicate Skink (under tile in vegetation) • 1x Delicate Skink (active in vegetation)
1	9/2/2023	09:50	10:15	21, 20, 21	19, 19, 19	20, 20, 21	18, 19, 19	• 1x Bougainville's Skink (active in vegetation)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
								• 1x Bougainville's Skink (under existing plastic sheet in vegetation)
12	9/2/2023	11:30	12:05	41, 42, 42	31, 31, 31	24, 42, 39	23, 29, 27	• 1x Bougainville's Skink (under tile in easement) • 1x Tree Dragon (under tile in easement) • 1x Tree Dragon (active in vegetation) • 1x Eastern three-lined skink (active in vegetation) • 2x Bougainville's Skink (active in vegetation)
6	9/2/2023	12:15	12:50	45, 42, 37	33, 31, 26	40, 46, 46	26, 28, 28	• 1x Weasel Skink (under tile in vegetation)
7	9/2/2023	13:00	13:30	45, 44, 44	36, 30, 31	33, 32, 44	28, 27, 29	• 1x Bougainville's Skink (under tile in easement)
11	13/2/2023	13:50	14:20	49, 53, 52	28, 32, 35	53, 46, 43	32, 30, 32	• 1x Eastern three-lined skink (under tile in vegetation) • 1x Delicate Skink (under tile in vegetation)
10	13/2/2023	14:25	14:55	58, 57, 62	36, 36, 39	30, 60, 36	26, 45, 29	• 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 1x Eastern three-lined skink (under tile in vegetation)
12	13/2/2023	15:05	15:35	48, 46, 50	36, 38, 30	23, 43, 29	22, 32, 25	• 1x Pale-flecked Garden Sunskink (under tile in vegetation)
4	13/2/2023	16:10	16:40	31, 31, 29	25, 24, 23	27, 28, 31	23, 24, 27	• 1x Pale-flecked Garden Sunskink (under tile in easement) • 1x Eastern three-lined skink (under tile in easement)
5	13/2/2023	16:50	17:15	25, 25, 25	22, 21, 22	23, 18, 22	22, 16, 20	• 1x Pale-flecked Garden Sunskink (under tile in easement) • 1x Bougainville's Skink (active in vegetation)
1	14/2/2023	09:30	10:00	26, 28, 25	21, 23, 20	26, 20, 27	22, 23, 22	• 1x Bougainville's Skink (under tile in vegetation) • 3x Bougainville's Skink (under existing plastic sheet in vegetation)
2	14/2/2023	10:05	10:30	39, 33, 34	24, 21, 22	28, 27, 31	22, 21, 26	• 1x Bougainville's Skink (under tile in vegetation)
3	14/2/2023	10:40	11:10	49, 49, 47	35, 35, 28	19, 20, 36	16, 16, 25	• 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 1x Weasel Skink (under tile in vegetation) • 1x Weasel Skink (active in vegetation) • 1x Bougainville's Skink (active in vegetation)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
								• 3x Pale-flecked Garden Sunskink (under existing wooden door in vegetation) • 1x Weasel Skink (under existing wooden door in vegetation) • 1x Weasel Skink (under tile in easement) • 1x Bougainville's Skink (under tile in easement)
8	14/2/2023	11:30	11:55	45, 41,48	34, 31, 34	20, 38, 34	16, 25, 22	• 1x Skink Sp. (under tile in easement)
9	14/2/2023	12:15	12:45	37, 37, 34	30, 29, 26	37, 36, 30	27, 26, 22	• 2x Bougainville's Skink (under tiles in vegetation)
6	14/2/2023	13:05	13:30	43, 43, 39	28, 33, 29	22, 35, 42	19, 24, 31	• 1x Pale-flecked Garden Sunskink (under tile in vegetation) • 2x Weasel Skink (under tiles in vegetation)
7	14/2/2023	13:40	14:05	58, 52, 51	32, 33, 25	63, 60, 63	45, 47, 49	• 2x House Mouse (under tiles in easement)
4	14/2/2023	14:25	14:50	63, 62, 64	44, 43, 43	58, 56, 56	42, 39, 41	• 1x Eastern three-lined skink (under tile in easement) • 1x Bougainville's Skink (under tile in vegetation)
5	14/2/2023	14:55	15:20	62, 58, 60	45, 48, 48	32, 34, 42	28, 29, 30	• No reptiles recorded
12	14/2/2023	15:35	16:00	49, 45, 47	32, 30, 34	39, 42, 46	29, 31, 34	• 1x Bougainville's Skink (under tile in vegetation)
11	15/2/2023	09:55	10:40	43, 44, 45	29, 30, 31	19, 42, 42	16, 25, 32	• 2x Pale-flecked Garden Sunskink (under tiles in vegetation)
8	15/2/2023	11:00	11:45	48, 45, 51	35, 39, 38	24, 35, 51	18, 28, 25	• 1x Red-bellied Black Snake (active in vegetation)
9	15/2/2023	12:00	12:35	51, 54, 49	32, 36, 34	46, 52, 52	26, 33, 31	• No reptiles recorded
1	15/2/2023	14:20	15:00	64, 68, 65	38, 42, 41	68, 60, 42	43, 38, 36	• 1x Tree Dragon (active in vegetation)
2	15/2/2023	15:05	15:35	51, 51, 50	31, 32, 34	50, 50, 48	36, 40, 37	• 2x Pale-flecked Garden Sunskink (active in vegetation)
3	15/2/2023	15:45	16:10	61, 58, 64	43, 39, 42	33, 32, 46	26, 24, 32	• 1x Bougainville's Skink (under tile in vegetation)
10	16/2/2023	09:15	09:50	35, 35, 36	28, 29, 29	23, 26, 20	21, 21, 18	• 1x Pale-flecked Garden Sunskink (under tile in vegetation)
7	16/2/2023	10:05	10:35	35, 36, 36	21, 24, 24	36, 35, 32	22, 24, 23	• 1x House Mouse (active in vegetation)

Site	Date	Start Time	End Time	Temperature of tiles and associated substrate (c)				Species recorded
				Tile Easement	Ground Easement	Tile Vegetation	Ground Vegetation	
6	16/2/2023	11:45	11:10	49, 48, 50	31, 32, 33	36, 31, 46	27, 23, 32	• 1x Bougainville's Skink (under tile in vegetation) 1x Eastern three-lined skink (active in vegetation)

Table 31 Comprehensive results of targeted reptile surveys – weather conditions at start and end of tile check and active search

Site	Date	Start Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %
2	31/1/2023	13:35	21.2	66.4	1.8	SW	Nil	100	14:10	24.8	62.5	1	SW	Nil	100
1	31/1/2023	14:25	23.2	63.5	6.3	SE	Nil	90	15:00	25.5	53.5	5.6	SE	Nil	80
11	31/1/2023	15:35	24.6	57.5	4.8	SE	Nil	15	16:24	22.5	61.5	3.6	SE	Nil	10
10	31/1/2023	16:35	23	61.7	7.1	S	Nil	10	17:05	22.9	64	4.6	SW	Nil	10
4	1/2/2023	09:20	21.8	52	4.5	W	Nil	0	09:55	23	48.3	6.2	W	Nil	5
5	1/2/2023	10:00	21.9	49.9	6.7	W	Nil	0	10:30	23.2	46.8	6.4	W	Nil	5
8	1/2/2023	11:05	24	48.3	3.9	W	Nil	10	11:35	23.5	47.3	7.4	W	Nil	15
9	1/2/2023	11:50	24.1	46	7.8	SW	Nil	25	12:25	24.9	43.6	3.7	S	Nil	50
6	1/2/2023	12:55	25.3	44.2	3.4	SW	Nil	60	13:25	25.5	43.6	7.3	SW	Nil	45
7	1/2/2023	13:35	25.4	44	6 1	SW	Nil	60	14:05	24.2	43.1	10.7	SW	Nil	65
12	1/2/2023	14:25	24.2	47.8	5.2	S	Nil	55	14:55	25	44.8	7.9	SE	Nil	45
3	1/2/2023	15:15	22.1	56.8	11.9	E	Nil	30	15:45	21.2	61.8	14.2	SE	Nil	20
2	1/2/2023	14:00	22.7	53.5	4.6	SE	Nil	15	14:35	23.3	47.7	5.2	SW	Nil	15
8	2/2/2023	09:50	19.3	60	3.2	SE	Nil	95	10:20	21	62.9	1.6	SE	Nil	80
9	2/2/2023	10:35	21.1	57.9	1.9	S	Nil	70	11:10	22	58.5	2.3	SW	Nil	85
11	2/2/2023	11:30	22.3	52.7	2.2	SW	Nil	90	11:55	21.2	62.7	1.2	W	Nil	75
10	2/2/2023	12:05	21.2	64.4	2.3	W	Nil	80	12:40	22.9	62.4	2.3	W	Nil	45
12	2/2/2023	13:05	23	46.2	2.3	W	Nil	60	13:40	25.5	42	4.4	SE	Nil	40

Site	Date	Start Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %
7	2/2/2023	13:55	24.9	42	13.6	W	Nil	20	14:30	27.6	36	3.5	W	Nil	15
6	2/2/2023	14:40	27.1	47.1	4.4	NW	Nil	15	15:05	26.2	48.7	4.3	SW	Nil	65
4	2/2/2023	15:45	23.2	50.8	2.5	W	Nil	75	16:15	22.3	53.5	2.1	SE	Nil	60
5	2/2/2023	16:20	22.3	53.7	3.4	SE	Nil	60	16:50	22.3	54.9	5.3	SW	Nil	80
1	3/2/2023	09:55	15.6	53.7	4.7	NW	Nil	70	10:25	17.2	55.6	3.9	NW	Nil	60
3	3/2/2023	10:40	19.1	50.8	2.4	W	Nil	75	11:15	18.6	54.2	2.4	W	Nil	80
2	6/2/2023	15:30	27.6	44.3	2.6	NW	Nil	10	14:05	27.9	50.4	1.3	NW	Nil	10
3	6/2/2023	16:20	25.6	54.3	5.6	W	Nil	5	14:45	25	49	3.2	W	Nil	10
8	7/2/2023	10:45	21.5	51.5	1.7	SW	Nil	100	11:20	20.9	59.2	2.2	SW	Nil	95
9	7/2/2023	11:30	19.6	56.2	1.6	SW	Nil	90	11:55	21	55.2	3.6	SW	Nil	70
11	7/2/2023	12:05	21.3	61.2	5.6	SW	Nil	75	12:35	22.4	53.4	5	W	Nil	75
10	7/2/2023	12:40	22.5	57.2	4.3	W	Nil	75	13:10	21.2	55.5	4.3	W	Nil	45
12	7/2/2023	13:25	20.9	56.9	10.3	SW	Nil	45	13:55	21.9	52.3	4.3	NE	Nil	30
5	7/2/2023	14:15	24.3	49.5	5.6	NE	Nil	10	14:45	26.2	45.5	4.2	S	Nil	5
4	7/2/2023	14:55	26.3	45.8	2.3	S	Nil	5	15:20	24.9	48	3	S	Nil	5
1	8/2/2023	09:35	19.2	60.9	4.1	SW	Nil	75	10:05	21.7	55.2	1.4	SW	Nil	80
6	8/2/2023	11:05	20.8	60.4	2.6	SW	Nil	95	11:35	19.1	62.1	3.3	SW	Nil	90
7	8/2/2023	11:40	19.6	63.5	4.1	SW	Nil	90	12:15	19	64.2	6.9	E	Nil	86
3	7/2/2023	15:40	21.3	60.5	5.5	SW	Nil	0	16:05	22.4	55.5	3.3	SW	Nil	0

Site	Date	Start Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %
2	8/2/2023	10:15	21.6	53.9	2.3	SW	Nil	90	10:45	21.4	55.8	4.3	SW	Nil	90
4	8/2/2023	12:35	19.8	59.7	3.2	SE	Nil	90	13:05	19.6	59.6	5.7	SE	Nil	85
5	8/2/2023	13:10	19.7	60.2	6.4	SE	Nil	80	13:30	20.3	58.3	4.2	SE	Nil	70
8	8/2/2023	13:50	20.4	51.8	5.8	S	Nil	20	14:15	20.5	52	4.9	S	Nil	20
9	8/2/2023	14:25	23.1	51.9	3.3	SE	Nil	10	15:00	25.5	46.9	2.6	SE	Nil	15
11	8/2/2023	15:20	22.5	50.5	3.3	E	Nil	30	15:45	24.7	50.3	5.2	E	Nil	35
10	8/2/2023	15:50	24.7	50.5	6.4	E	Nil	40	14:15	22.7	56	5.2	SE	Nil	80
1	9/2/2023	09:50	20	73.2	7.2	E	Nil	100	10:15	20.7	77.6	3	E	Nil	100
12	9/2/2023	11:30	22.5	69.7	8	NE	Nil	65	12:05	25.1	65.9	7.2	NE	Nil	50
6	9/2/2023	12:15	23.4	66.9	9.5	E	Nil	70	12:50	23.4	67	3.4	E	Nil	70
7	9/2/2023	13:00	23.9	64.4	5.7	NE	Nil	80	13:30	23	66.6	7.7	NE	Nil	70
11	13/2/2023	13:50	22	49	6.3	SW	Nil	40	14:20	20.5	53.3	6.4	SW	Nil	40
10	13/2/2023	14:25	21.4	52.8	5.3	SW	Nil	30	14:55	22.2	57.9	5.6	SW	Nil	40
12	13/2/2023	15:05	21.4	53.3	6.4	SW	Nil	45	15:35	21.8	50.5	3	SW	Nil	40
4	13/2/2023	16:10	19.3	57	3.6	SW	Nil	90	16:40	19.4	60.5	3.9	SW	Nil	95
5	13/2/2023	16:50	19.3	61	1.9	SW	Nil	95	17:15	19.8	54.6	2.7	SW	Nil	95
1	14/2/2023	09:30	18	60.4	3.8	SW	Nil	65	10:00	18.2	60.8	4.6	SW	Nil	60
2	14/2/2023	10:05	18.1	63	1.9	SW	Nil	65	10:30	20.4	60	2.8	SW	Nil	90
3	14/2/2023	10:40	20.8	57.7	2	SW	Nil	80	11:10	22.3	50.4	1.2	SW	Nil	70

Site	Date	Start Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %	End Time	Air Temp (c)	Rel Humid %	Wind Speed (km/h)	Wind Direction	Precipitation	Cloud cover %
8	14/2/2023	11:30	22.1	52.4	2	SW	Nil	55	11:55	22.6	54.7	2.1	SW	Nil	60
9	14/2/2023	12:15	19.4	60.8	8	SE	Nil	50	12:45	22.6	51.2	3.3	SE	Nil	30
6	14/2/2023	13:05	20.1	57.4	5.1	SE	Nil	35	13:30	20.7	51.1	12.1	SE	Nil	15
7	14/2/2023	13:40	21	55.9	4.2	SE	Nil	5	14:05	22.4	52.8	2.8	SE	Nil	5
4	14/2/2023	14:25	22	53	3	E	Nil	5	14:50	22.6	52.4	8.4	E	Nil	5
5	14/2/2023	14:55	21.9	56.6	2.5	SE	Nil	5	15:20	22.7	49.3	4.6	SE	Nil	5
12	14/2/2023	15:35	23	48.3	4.5	SE	Nil	0	16:00	21.3	56.4	5	SE	Nil	0
11	15/2/2023	09:55	21.5	55.4	2.9	SW	Nil	0	10:40	23.4	57.2	3.5	SW	Nil	0
8	15/2/2023	11:00	23.4	53.1	5.3	SW	Nil	0	11:45	24.2	55.1	3.7	SE	Nil	10
9	15/2/2023	12:00	24.3	58.9	8	S	Nil	5	12:35	24.9	55.4	3.4	SE	Nil	5
1	15/2/2023	14:20	27.5	46	2.4	SE	Nil	5	15:00	27.8	5.4	4.3	E	Nil	15
2	15/2/2023	15:05	27.6	46.2	4.4	E	Nil	15	15:35	26.7	50.4	4.6	E	Nil	20
3	15/2/2023	15:45	25.7	49.6	7.7	E	Nil	25	16:10	26.8	47.1	2.9	E	Nil	20
10	16/2/2023	09:15	24	57.5	3.4	NE	Nil	20	09:50	25.4	56.5	3.2	SW	Nil	30
7	16/2/2023	10:05	25.7	54.7	5.1	SW	Nil	15	10:35	26.5	48.1	3.8	SW	Nil	10
6	16/2/2023	11:45	26.9	50	3.6	SW	Nil	10	11:10	27.8	47.1	2.2	SW	Nil	15

Appendix C. Significant Impact Criteria Assessments

Swamp Everlasting *Xerochrysum palustre* (VU)

No individual plant or populations of Swamp Everlasting have been recorded within the study area. Habitat for this species includes vegetation that could be considered native wetland vegetation following inundation. This may include environments that are modelled as Freshwater Marsh by DEECA datasets.

An assessment of impacts to this species against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 32.

Table 32 Swamp Everlasting: self-assessment against Significant Impact Criteria (CoA 2013)

Significant Impact Criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population	Unlikely	No populations of this species have been recorded in the study area. The disturbance area may provide suitable habitat for Swamp Everlasting in vegetation that could be considered native wetland vegetation following inundation, which includes environments considered Freshwater Marsh. There are several records of this species around the Gippsland Lakes area and near Bairnsdale, as well as a recent record approximately 10 kilometres west from the study area along the South Gippsland Highway. Swamp Everlasting conservation advice indicates that any population of this species should be considered an important population (DAWE 2021a). Areas that hold water within the study area have been searched for threatened species, however no formal targeted survey has been undertaken for Swamp Everlasting as conditions within the study area have remained relatively dry, even following wetter than usual conditions. The project is proposing trenchless construction methods to reduce the likelihood of impact to threatened species in areas considered high value i.e. permanent open freshwater waterbodies. Other areas of mapped wetland that are being impacted by the proposed new pipeline were dry at the time of assessment and no native or wetland species were recorded. It is considered unlikely that the proposed works will lead to a long-term decrease in the size of an important population of Swamp Everlasting, given most of the disturbance footprint is dry.
Reduce the area of occupancy of an important population	Unlikely	In Victoria, Swamp Everlasting has a wide, but patchy distribution, known to occur from the South Australian border to near Bairnsdale (DAWE 2021a). The species grows in wetlands and marginal wetland habitats such as

Significant Impact Criteria (vulnerable species)	Likelihood of significant impact	Justification
		seasonally wet areas of native grassland and heath communities. Swamp Everlasting was not recorded during the site assessment, and assessments were undertaken during the species known flowering period, however no formal targeted surveys have been undertaken. It is considered unlikely that the proposed works will reduce the area of occupancy of an important population of Swamp Everlasting.
Fragment an existing population into two or more populations	Unlikely	Swamp Everlasting has not been recorded within the study area. Habitat within the study area is already partially fragmented by historical and recent land clearings. Given the relatively narrow disturbance area(15 metres) it is considered unlikely that the works would result in fragmentation of an existing population into two populations.
Adversely affect habitat critical to the survival of a species	Unlikely	Habitat critical to the survival of the species has not been identified within the Swamp Everlasting conservation advice (DAWE 2021a). Until further information is available on the species, all habitat for Swamp Everlasting in all known extant and historical populations should be considered important for the species' long-term survival. No Swamp Everlasting has been recorded within the study area. The species would likely only occur following inundation. Areas of mapped wetland that are being impacted by the proposed new pipeline were dry at the time of assessment, despite higher then usual rain, and dominated by introduced flora. Thus, it is considered unlikely that the proposed works will adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	Unlikely	Swamp Everlasting is a rhizomatous perennial with a rootstock that can persist following fire and drought conditions. As such, individual plants are thought to be long lived between 50 and 100 years. No Swamp Everlasting has been recorded during the site assessments and wetland habitat has been avoided through trenchless construction where possible. Thus, is considered unlikely the proposed works will disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The species has not been recorded in the study area. At the time of assessment the disturbance footprint was mostly dry few wetland species were recorded. With little confirmed habitat within the disturbance footprint it is considered unlikely the pipeline construction will cause the species to decline.
Result in invasive species	Unlikely	The localised occurrences of habitat for Swamp Everlasting is

Significant Impact Criteria (vulnerable species)	Likelihood of significant impact	Justification
that are harmful to a critically endangered or endangered species becoming established in the vulnerable species' habitat		subject to existing weed invasion as a result of land clearing and surrounding agricultural land use. It is considered a low likelihood that the proposed works would result in the establishment of invasive species that are not already present in the local area. A detailed Construction Environmental Management Plan will ensure that all inductions highlighting the conservation value of native vegetation are undertaken prior to works and that all vehicles, machinery, equipment and PPE travelling on and off the site are washed and blown down to remove soil and invasive soil propagules to avoid the introduction and spread of new invasive weeds.
Introduce disease that may cause the species to decline	Unlikely	There is a low likelihood for the proposed action to result in the introduction of a disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere with the recovery of the species	Unlikely	The National Recovery Plan for Swamp Everlasting aims to minimise the probability of extinction of Swamp Fireweed in the wild and increase the probability of important populations becoming self-sustaining in the long term. The plan outlines seven objectives for the recovery of the species: • Acquire information on population abundance and trends for management and conservation • Identify habitat that is critical, common or potential. • Ensure that key populations and their habitat are protected and managed appropriately. • Identify and manage threats to populations. • Identify key biological characteristics. • Monitor the growth response and viability of populations to allow adaptive management. • Build community support for conservation. The proposed new pipeline construction is unlikely to interfere with the recovery of Swamp Everlasting

Conclusion for Swamp Everlasting

It is considered unlikely the project will result in a significant impact to Swamp Everlasting. No individuals or populations have been recorded during the site assessments and there is minimal suitable habitat being impacted by the proposed new pipeline construction.

Swamp Skink *Lissolepis coventryi* (EN)

A description of Swamp Skink ecology, distribution, and habitat extent within the study area is found in Section 3.3.5. Impact mitigation measures are outlined in section 4.3. An assessment of impacts to Swamp Skink against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 33 below.

Table 33 Swamp Skink: self-assessment against Significant Impact Criteria

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Swamp Skink were not recorded within the study area during targeted surveys; however, the species has been recently recorded offsite within the local area, approximately 2 kilometres south-east of the study area in Estuarine Wetland habitat on the shore of Lake Reeve. Targeted surveys were focused in areas identified as potentially suitable habitat for the species (vegetation adjacent to seasonal wetlands, and open Sand Heathland and Swamp Scrub). Absence from targeted surveys indicates that the study area is unlikely to support a large viable population. The disturbance footprint contains minimal suitable habitat and is unlikely to be impacted by the proposed works to the extent that it leads to long-term decrease in the size of any potentially present local population. Impacts to potential habitat are likely to be temporary in nature, with works planned for summer months when ephemeral wetlands are dry, and trenches backfilled and revegetated after installation of the new pipeline. Impacts to potential habitat have been minimised through largely restricting the disturbance footprint to a narrow corridor and proposing trenchless construction under areas of high habitat value where possible (including vegetation adjacent to the ROS). Direct impacts to individuals to be minimised by ensuring: • Clearing of mapped skink habitat should be supervised by an ecologist or appropriately experienced fauna advisor to salvage and relocate any displaced fauna to suitable habitat outside the impact area. • Open trenches are regularly inspected to retrieve and relocate any trapped fauna. • Open pipes are capped at the end of each day to prevent Animals from entering the open pipeline.
Reduce the area of occupancy of the species.	Unlikely	The existing land use and habitat vegetation will not be substantially altered long-term. Short-term impacts from the proposed works are minimal and largely restricted to areas that have a history of regular disturbance (clearing and maintenance slashing). Works are planned for summer

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		months when ephemeral wetlands are dry, and trenches backfilled and revegetated after installation of the new pipeline. Juvenile Swamp Skinks are known to disperse up to 200 meters, allowing recolonisation of any disturbed habitat (DCCEEW 2023c). No Swamp Skinks were recorded during targeted reptile surveys at sites identified as potentially suitable habitat (reptile survey site 4, 7, 9, 10, 11 and 12). The project is not likely to lead to a long-term reduction in available habitat, or reduction in the area occupied by the species.
Fragment an existing population into two or more populations.	Unlikely	The Swamp Skink is often found in isolated 'subpopulations' in small areas of suitable wetland-adjacent habitat within larger patches of vegetation, with individuals defending small territories. No Swamp Skinks were recorded during targeted reptile surveys at sites identified as potentially suitable habitat. Habitat disturbance is largely restricted to a narrow corridor within the existing cleared easement, which is subject to annual slashing. Impacts to potential habitat are likely to be short-term, with trenches backfilled and revegetated after installation of the new pipeline.
Adversely affect habitat critical to the survival of a species.	Likely to impact small area of critical habitat. Unlikely to significantly impact the species.	Habitat critical to the survival of the Swamp Skink is defined within the species conservation advice as: A. All typical habitat (dense, low vegetation adjacent to wetlands with minimal canopy cover, preferably including rocks, logs and woody debris) across the species distribution. B. Habitat supporting a population that may be viable in the medium to long term, or that occurs between disjunct subpopulations is also considered critical to the survival of the species. C. Habitat that does not fit these descriptions now, but that has a potential to fit the description in the future, or that could be restored to support a population is also considered critical to the survival of the species. These definitions are extremely broad, encompassing all current habitat, and currently unsuitable habitat that could potentially be restored in the future. While the project may temporarily impact small areas of critical habitat (defined by A and C) it is unlikely to cause a significant impact to the species. The proposed works include modification and short-term disturbance of small areas of potentially suitable habitat, including: • Kikuyu grass along the ROS. • Low vegetation surrounding ephemeral wetlands and drainage lines with minimal or absent canopy, primarily

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		in the eastern extent of the study area in mapped EVCs, including: – Sand Heathland (1.34 ha, 16% of extent within the study area) – Swamp Scrub (0.8 ha, 9% of extent within the study area) The majority of DEECA mapped wetland habitat throughout the study area was not observed to hold water throughout the duration of fauna surveys (October 2022 – February 2023), despite higher than average rainfall during the period. Wetlands that do not regularly flood, or hold permanent water are unlikely to support Swamp Skinks. The species is unlikely to inhabit woodland and forest EVCs due to the tall closed canopy or cleared agricultural land due to the lack of suitable low vegetation. Impacts to potential habitat have been minimised through largely restricting the disturbance footprint to a narrow corridor and proposing trenchless construction under areas of high habitat value where possible. It is unlikely that the proposed habitat disturbance will have a significant long-term effect to any potential population of Swamp Skink within the study area.
Disrupt the breeding cycle of a population.	Unlikely	Breeding occurring in November, with young born from late January to February. Swamp Skinks are estimated to live up to ten years, reaching sexual maturity at two to three years (DCCEEW 2023c). The proposed works are planned to occur over summer months, coinciding with the Swamp Skink breeding season. The proposed works have the potential to disturb individual Swamp Skinks during the breeding season, however, impacts are unlikely to significantly disrupt the breeding cycle of any local populations as: • Young are born live, fully independent, and can disperse up to 200 meters to suitable habitat. • Individuals are long living, producing several litters over their life. Clearing of mapped skink habitat to be supervised by an ecologist or appropriately experienced fauna advisor, and open trenches will be regularly inspected, to salvage and relocate any displaced fauna to suitable habitat outside the impact area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that	Unlikely	The existing land use and habitat vegetation will not be substantially altered long-term. Short-term impacts from the proposed works are minimal and largely restricted to areas that have a history of regular disturbance (clearing and

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
the species is likely to decline.		maintenance slashing). Habitat disturbed by the proposed works will be rehabilitated through staged trench backfilling to restore the topsoil profile, and revegetation of suitable low native vegetation for habitat. The project is not likely to lead to a long-term reduction in available habitat or lead to a decline in the species.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere with the recovery of a species.	Unlikely	It is unlikely that the proposed works will have a significant impact on the natural recovery of the species. No specific recovery plan has been published for the species within Victoria, and no known recovery actions are underway within the local area that may be affected by the proposed works.

Conclusion for Swamp Skink

Impacts to habitat have been minimised by largely restricting the disturbance footprint to a narrow corridor within the existing cleared easement and agricultural land, rehabilitation and revegetation of the impact area, and the proposed use of trenchless construction under areas of key habitat value. Impacts to individual Swamp Skinks will be minimised through supervision of habitat clearing and inspection of open trenches by an ecologist or appropriately experienced fauna advisor, to salvage and relocate any displaced fauna to suitable habitat outside the impact area.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the Swamp Skink.

Southern Brown Bandicoot *Isoodon obesulus obesulus* (EN)

A description of Southern Brown Bandicoot ecology, distribution, and habitat extent within the study area is found in Section 3.3.4. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Southern Brown Bandicoot against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 34 below. An assessment against species-specific EPBC Act referral guidelines is present in

Table 35 below.

Table 34 Southern Brown Bandicoot: self-assessment against Significant Impact Criteria

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Impacts to shelter and nesting habitat have been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land, and the proposed use of trenchless construction under areas of key habitat value. Impacts to low quality foraging habitat within the easement will be short-term and are unlikely to pose a greater impact than the approved maintenance slashing regime of vegetation within the existing easement. Direct impacts to individual Bandicoots are unlikely, as the species is wary of human presence. Regular checks of open trenches will be conducted to catch and relocate any trapped animals. Open pipes will be capped at the end of each day to prevent ingestion of animals. It is unlikely that the proposed works will significantly impact any local Southern Brown Bandicoot population or lead to a long-term reduction in the size of a population.
Reduce the area of occupancy of the species.	Unlikely	The existing land use and vegetation will not be substantially altered long-term, and short-term impacts from the proposed works are minimal, and restricted to low quality habitat that has a history of regular disturbance. The project is not likely to lead to a reduction in the area occupied by the species
Fragment an existing population into two or more populations.	Unlikely	The proposed works are unlikely to cause any long-term fragmentation of the local population, or individual Bandicoot's home range. Impacts to potential foraging or dispersal may occur in the short-term when slashing and trenching works are underway, however, these impacts are unlikely to be significantly greater than the approved maintenance slashing regime within the existing pipeline easement since its construction. Revegetation of the impact area with local native grass and herbs after trench backfilling will promote quick recovery of habitat connectivity.
Adversely affect habitat critical to the survival of a species.	Unlikely	No specific habitat critical to the survival of the species is outlined in relevant conservation advice or recovery plans (DoEE 2016). Impacts to habitat within the study area are

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		largely restricted to short-term loss of low-quality foraging habitat within the existing cleared pipeline corridor, where vegetation is regularly slashed and prevented from reaching the height or density required for shelter or nesting. It is unlikely that the planned works will impact on any habitat critical to the survival of the species, as defined in the MNES SIC Guidelines (Commonwealth of Australia 2013).
Disrupt the breeding cycle of a population.	Unlikely	Proposed works are planned for summer months, outside of the species peak breeding season in spring. Impacts are largely limited to low quality foraging habitat and will have a negligible impact to shelter or nesting habitat. The project is unlikely to result in an impact to the breeding cycle or succuss of any local population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The existing land use and vegetation will not be substantially altered long-term, as impacts from the proposed works are minimal and largely restricted to foraging habitat within the existing cleared pipeline corridor. The proposed works include modification or short-term disturbance of 7.65 ha of the following potential habitat EVCs: • Damp Sands Herb-rich Woodland (4.98 ha) • Sand Heathland (1.34 ha) • Lowland Forest (0.01 ha) • Heathy Woodland (0.53 ha) • Swamp Scrub (0.79 ha) Impacts to this habitat are likely to be short-term as the pipeline will be backfilled and revegetated with low native vegetation that will likely provide suitable foraging habitat. The majority of EVC disturbance falls within low-quality vegetation within the existing cleared pipeline corridor which is subject to regular disturbance (maintenance slashing). The extent and scale of the proposed habitat disturbance are unlikely to result in overall species decline, falling below 0.001% of the modelled 2,243,791 ha of habitat within Victoria.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere with the recovery of a species.	Unlikely	It is unlikely that the proposed works will have a significant impact on the natural recovery of the species. No specific recovery plan has been published for the species within Victoria, and no known recovery actions are underway within the local area that may be affected by the proposed works.

Table 35 Southern Brown Bandicoot: self-assessment against species-specific referral guidelines

Referral guideline criteria	Likelihood of significant impact	Justification
Loss or long-term modification of suitable habitat known or likely to support Southern Brown Bandicoots, of: • **Greater than 1% in patches less than 100 ha; or** • **Greater than 5% in patches greater than 100 ha.**	Unlikely	Suitable habitat is defined as 'any patches of native or exotic vegetation, within the distribution of the southern brown bandicoot which contains understorey vegetation structure with 50-80% average foliage density in the 0.2-1 m height range'. Habitat patches extending into the study area are a minimum of 400 hectares. Upper limit estimates of native vegetation disturbance from the proposed works include 13.632 hectares of native vegetation, approximately 12.692 hectares (93%) occurs within the existing easement and is of a highly modified derived state. This falls below the 1% threshold and is unlikely to be deemed a significant impact. Impacts to this habitat are likely to be short-term as the pipeline will be backfilled and revegetated with low native vegetation that will likely provide suitable foraging habitat.
Reduced connectivity or fragmentation of suitable habitat known or likely to support Southern Brown Bandicoots, that results in: • **a distance greater than 50 m over natural surfaces; or** • **a distance greater than 10 m over artificial surfaces.**	Unlikely	The proposed works to not involve any long-term fragmentation of habitat or creating of artificial surfaces. Works are planned to be largely restricted to the existing cleared pipeline corridor. Partial fragmentation may occur during trenching works; however, impacts will be short-term and unlikely to significantly impact or fragment any local population.
Reduction in suitable vegetation corridor core width to less than 50 metres.	Unlikely	The proposed works do not involve vegetation disturbance to an extent that any existing corridors would be reduced to a width less than 50 metres. Habitat disturbance is restricted to the existing cleared pipeline corridor, and immediately adjacent vegetation. Trenchless construction is planned in
Any reduction in width of suitable vegetation corridors, which are less		

Referral guideline criteria	Likelihood of significant impact	Justification
than 50 m in width and likely to be utilised by Southern Brown Bandicoots.		some areas that may act as dispersal corridors.
As a result of fire management procedures, at any given time, greater than 20% of suitable habitat has a reduced understorey vegetation structure below an average of 50% foliage density.	Unlikely	The proposed works do not involve alteration of fire management procedures or regimes.
Degradation of suitable habitat within a 30 m buffer of the edge of known or likely habitat which may lead to the long-term modification of suitable habitat or reduce its suitability for Southern Brown Bandicoots.	Unlikely	Works are planned to occur within 30 meters of potential habitat; however, impacts will be short-term, with trenches backfilled and revegetated, and trenchless construction planned under areas of key habitat. The proposed works are unlikely to have a significant or long-term impact on any local population.
Broad scale removal of important exotic habitat which is likely to be utilised by Southern Brown Bandicoots.	Unlikely	Impacts to exotic vegetation are limited to low grasses and herbs within the existing cleared pipeline corridor. Impacts will be short-term, with trenches backfilled and revegetated. Impacts will be minimal and localised within existing disturbed habitat, not broad-scale.

Conclusion for Southern Brown Bandicoot

Impacts to habitat have been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land, and the proposed use of trenchless construction under areas of key habitat value. The study area is unlikely to contain habitat critical to the survival of the species.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the Southern Brown Bandicoot.

Gang-gang Cockatoo *Callocephalon fimbriatum* (EN)

A description of Gang-gang Cockatoo ecology, distribution, and habitat extent within the study area is found in Section 3.3.3. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Gang-gang Cockatoo against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 36 below.

Table 36 Gang-gang Cockatoo: self-assessment against Significant Impact Criteria

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	It is unlikely that the proposed works will have a long-term impact on the Gang-gang Cockatoo. Habitat loss has been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land, which contains no suitable habitat for the species, and with trenchless construction under wooded habitat where possible. Minimal loss of habitat from the removal of 5.51 ha of Woodland and 0.01 ha of Forest is unlikely to have a significant impact on any local population due to the presence of extensive wooded habitat surrounding the study area
Reduce the area of occupancy of the species.	Unlikely	The proposed works will result in minimal habitat loss of foraging or nesting habitat for the Gang-gang Cockatoo and is unlikely to have a significant impact on any local population due to the presence of extensive wooded habitat surrounding the study area.
Fragment an existing population into two or more populations.	Unlikely	It is unlikely that the proposed works will fragment any local population as the species is highly mobile (capable of flight) and is unlikely to be significantly impacted by the minimal habitat loss proposed. The species is partially migratory, with extent of local populations size and distribution fluctuating based on season and availability of food.
Adversely affect habitat critical to the survival of a species.	Likely to impact small area of critical habitat. Unlikely to significantly impact the species.	Habitat critical to the survival of the Gang-gang Cockatoo is defined within the species conservation advice as all foraging habitat during breeding and non-breeding seasons (excluding exotic feeding habitat within urban areas), and any suitable hollow bearing trees for nesting (Commonwealth of Australia 2022). This definition is broad, encompassing every individual seed or hollow bearing tree within southern Victoria, including Hawthorn in rural areas. The proposed works include clearing of small areas of potentially suitable foraging and nesting habitat. Impacts have been minimised through largely restricting the disturbance footprint to the existing cleared easement and agricultural land (which contains no suitable habitat for the species) and proposing trenchless construction under areas of high habitat value. The extent of habitat loss is minimal, with all large and scattered trees to be retained. The proposed works will impact

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		small sections of habitat considered critical to the survival of the species; however, the impacts on any local population of Gang-gang Cockatoo are likely to be negligible.
Disrupt the breeding cycle of a population.	Unlikely	It is unlikely that the proposed works will disrupt the breeding cycle of a population within the local area. The Gang-gang Cockatoo prefers to nest in old growth forest with a dense understorey, in large hollows around 7.5 meters above the ground, with a 20 cm diameter floor, and 50 cm deep (Commonwealth of Australia 2022). Trees proposed for removal are located within low coastal forest adjacent to an existing cleared easement and are relatively small (all large trees within the study area are to be retained) and unlikely to contain suitable hollows. Clearing is planned to occur in summer months when the majority of individuals migrate to high altitude wet forests. Clearing of potentially suitable nesting trees will be supervised by an ecologist or appropriately experienced fauna advisor to salvage and relocate any displaced fauna.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The proposed works will result in minimal loss of habitat for the Gang-gang Cockatoo and is unlikely to have an impact on the species or cause it to decline in numbers or distribution. All large and scattered trees are to be retained. Potential habitat loss includes 5.52 ha of woodland and forest EVC loss, the majority falling within the existing cleared pipeline corridor.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere with the recovery of a species.	Unlikely	The Gang-gang Cockatoo was listed as Endangered under the EPBC Act partially in response to large scale habitat loss in NSW from bushfire in 2019/2020. It is unlikely that the proposed works will interfere with the natural recovery of the species following the fires as minimal foraging and nesting habitat loss is

Significant impact criteria (endangered species)	Likelihood of significant impact	Justification
		predicted. No specific recovery plan has been published for the species, and no known recovery actions are underway within the local area that may be affected by the proposed works

Conclusion for Gang-gang Cockatoo

Habitat loss has been minimised through largely restricting works to within the existing cleared pipeline corridor and agricultural land, retaining all large trees, and through proposed trenchless construction under high value woodland habitat.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the Gang-gang Cockatoo.

Blue-winged Parrot *Neophema chrysostoma* (VU)

A description of Blue-winged Parrot ecology, distribution, and habitat extent within the study area is found in Section 3.3.3. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Blue-winged Parrot against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 37 below.

Table 37 Blue-winged Parrot: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population	Unlikely	The species is a partial migrant, with varying numbers migrating over the Bass Strait to Tasmania during their breeding period in autumn and winter, though some individuals remain and breed in southern Victoria. Suitable habitat for Blue-winged Parrot includes woodland and forest patches present throughout the study area. It is possible that the study area supports an important key source population for breeding or dispersal, or that are necessary for maintaining genetic diversity, as little is known about the species genetics. Habitat loss has been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land and proposed trenchless construction to avoid removing wooded habitat where possible. However, some areas within the easement may provide occasional low to moderate quality foraging habitat as the species forages on the ground for various seeds. It is unlikely that any potential breeding habitat will be impacted as the project design avoids the removal of all large and scattered trees. Minimal loss of habitat from the loss of 5.52 ha of woodland and forest EVC (the majority falling within the existing cleared pipeline easement) is unlikely to lead to the long-term decrease in the size of an important population of a species.
Reduce the area of occupancy of an important population	Unlikely	Some areas of potential habitat are proposed to be directly impacted or removed, the majority of which is low to moderate quality foraging habitat. This may result in a reduction in the potential area of occupancy for the species. However, individuals are wide ranging and highly mobile, likely to utilise a range of more suitable habitat in the surrounding landscape. Additionally, such reduction is likely to be short term or temporary in nature, and largely limited to areas of existing modification. Through post-construction site rehabilitation and revegetation of foraging habitat, the area of occupancy will likely be restored to its existing extent.
Fragment an existing important population into two or more populations.	Unlikely	It is unlikely that the proposed works will fragment any local population as the species is highly mobile (capable of flight) and

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		is unlikely to be significantly impacted by the minimal habitat loss or disturbance.
Adversely affect habitat critical to the survival of a species.	Likely to impact small area of critical habitat. Unlikely to significantly impact the species.	Habitat critical to the survival of Blue-winged Parrot as defined in the Conservation Advice relevant to this project includes all foraging and staging habitats found from coastal, sub-coastal and inland areas, grasslands, grassy woodlands; eucalypt forests and woodlands within the breeding range in southern Victoria and live and dead trees and stumps with suitable hollows within the breeding range. Based on this broad definition, some areas of potential critical habitat are proposed to be directly impacted or removed, the majority of which is low to moderate quality foraging habitat. However, individuals are wide ranging and highly mobile, likely to utilise a range of more suitable habitat in the surrounding landscape. Additionally, such reduction is likely to be short term or temporary in nature, and largely limited to areas of existing modification. Through post-construction site rehabilitation and revegetation, the area of occupancy will likely be restored to its existing extent. As such, adverse effects to habitat are unlikely to significantly impact any local population of Blue-winged Parrot.
Disrupt the breeding cycle of an important population.	Unlikely	Blue-winged Parrot breed primarily in Tasmania, though some individuals remain and breed in southern Victoria in heathy forests and woodlands. Nesting occurs in tree hollows. The proposed works are highly unlikely to disrupt the breeding cycle of the species, as all large and scattered trees will be retained, and very few small trees in forest or woodland patches are proposed to be removed, which are generally unlikely to provide breeding habitat.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Some areas of potential habitat are proposed to be directly impacted or removed, the majority of which is low to moderate quality foraging habitat (5.52 ha of woodland and forest EVC loss, the majority falling within the existing cleared pipeline easement). However, individuals are wide ranging and highly mobile, likely to utilise a range of more suitable habitat in the surrounding landscape. Additionally, such reduction is likely to be short term or temporary in nature, and largely limited to areas of existing modification. Through post-construction site rehabilitation and revegetation, the area of occupancy will likely be restored to its existing extent. As such, the project is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable becoming	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
established in the vulnerable species' habitat.		Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	The species Conservation Advice (DCCEEW 2023) identifies priority recovery and threat abatement actions to support Blue-winged Parrot recovery, though no specific recovery plan has been published for the species within Victoria. Habitat loss caused by land clearing is identified as a key conservation and recovery action for the species, including to '*cease all land clearing of habitat critical for the survival of Blue-winged Parrot*'. As outlined above, some areas of potential habitat are proposed to be directly impacted or removed, majority of which is low to moderate quality foraging habitat. However, individuals are wide ranging and highly mobile, likely to utilise a range of more suitable habitat in the surrounding landscape. Additionally, such reduction is likely to be short term or temporary in nature, and largely limited to areas of existing modification. Through post-construction site rehabilitation and revegetation, the area of occupancy will likely be restored to its existing extent. The project is unlikely to substantially interfere with the recovery of the species.

Conclusion for Blue-winged Parrot

Habitat loss has been minimised through largely restricting works to within the existing cleared pipeline easement and agricultural land, retaining all large trees, revegetation of foraging habitat post construction, and through proposed trenchless construction under high value woodland habitat.

It is unlikely that the proposed action will have a significant impact on the Blue-winged Parrot.

Swift Parrot *Lathamus discolor* (CR)

A description of Swift Parrot ecology, distribution, and habitat extent within the study area is found in Section 3.3.3. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Swift Parrot against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 38 below.

Table 38 Swift Parrot: self-assessment against Significant Impact Criteria

Significant impact criteria (critically endangered species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population or reduce the area of occupancy for the species.	Unlikely	The project area contains potential foraging habitat within the secondary range of the species (Birdlife Australia 2022), however no preferred foraging trees naturally occur within the project area, and the project is not within an area identified as priority habitat for conservation management of Swift Parrot in the species National Recovery Plan (Saunders & Tzaros 2011). The eucalypt canopy within the project area will largely be unaffected by retaining all large and scattered trees during the pipeline construction. The project area also does not contain breeding habitat, and the project will not result in the construction of any structures that could present a collision risk. The project therefore has no capacity to lead to a population decrease or reduce the area of occupancy for the species.
Fragment an existing population into two or more populations.	Unlikely	It is unlikely that the proposed works will fragment any local population as the species is highly mobile (capable of flight), occurs as a single migratory population, and is unlikely to be significantly impacted by the minimal habitat loss or disturbance.
Adversely affect habitat critical to the survival of a species.	Unlikely	The project area does not occur within an area identified as priority habitat for conservation management of Swift Parrot (Saunders and Tzaros 2011). Impacts to potential foraging habitat have been minimised through largely restricting works to the existing cleared easement and retaining all large and scattered trees. The project is not expected to result in the removal of habitat critical to the survival of the species.
Disrupt the breeding cycle of a population.	Unlikely	Swift Parrots only breed in eastern and south-eastern Tasmania and do not breed on mainland Australia. The project therefore has no capacity to disrupt the breeding cycle of Swift Parrots.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The project area contains potential foraging habitat within the secondary range of the species (Birdlife Australia 2022), however no preferred foraging trees naturally occur within the project area, and the project is not within an area identified as priority habitat for conservation management of Swift Parrot (Saunders & Tzaros 2011). The eucalypt canopy within the project area will largely be unaffected by avoiding the removal of any large trees and minimal loss of small canopy trees during the pipeline construction (5.52 ha of woodland and forest EVC loss, with the majority within the existing cleared pipeline

Significant impact criteria (critically endangered species)	Likelihood of significant impact	Justification
		easement). It is therefore considered highly unlikely that the project will result in any changes to availability or quality of habitat that could result in species decline.
Result in invasive species that are harmful to an endangered or critically endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	The project does not conflict with the objectives or actions outlined in the National Recovery Plan for the species (Saunders & Tzaros 2011).

Conclusion for Swift Parrot

Habitat loss has been minimised through largely restricting works to within the existing cleared pipeline easement and agricultural land, retaining all large trees, no loss of preferred foraging trees or priority habitat, and through proposed trenchless construction under high quality woodland habitat.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the Swift Parrot

White-throated Needletail *Hirundapus caudacutus* (VU)

A description of White-throated Needletail ecology, distribution, and habitat extent within the study area is found in Section 3.3.3. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to White-throated Needletail against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 39 below.

Table 39 White-throated Needletail: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	No important populations of White-throated Needletail are outlined in relevant conservation advice for the species (TSSC 2019). The study area is unlikely to support an important population (as defined in the MNES SIC Guidelines), as any potentially present population is unlikely to act as a key source population, support significant genetic diversity, or exist at the limit of the species range (Commonwealth of Australia 2013). Potential impacts of the planned works to the White-throated Needletail are restricted to minor loss of potential roosting habitat and are unlikely to cause any significant impact to a population of the species.
Reduce the area of occupancy of an important population	Unlikely	The White-throated Needletail is primarily aerial and is unlikely to be impacted by the proposed terrestrial works. The proposed works have no realistic potential to reduce the area of occupancy of the species.
Fragment an existing important population into two or more populations.	Unlikely	It is unlikely that the proposed works will fragment any local population as the species is highly mobile (capable of flight) and is unlikely to be significantly impacted by terrestrial works.
Adversely affect habitat critical to the survival of a species.	Unlikely	No specific habitat has been outlined as critical to the survival of the White-throated Needletail in relevant conservation advice (TSSC 2019). It is unlikely that the planned works will impact on any habitat critical to the survival of the species, as defined in the MNES SIC Guidelines (Commonwealth of Australia 2013).
Disrupt the breeding cycle of an important population.	Unlikely	White-throated Needletails breed exclusively in the northern hemisphere. The proposed works have no capacity to disrupt the breeding cycle of the population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Habitat loss and disturbance has been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land. It is unlikely that the proposed works will have any impact on the species or contribute to its decline.
Result in invasive species that are harmful to a	Unlikely	There are no known invasive species that pose a threat to the White-throated Needletail, and the project does not include any

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
vulnerable becoming established in the vulnerable species' habitat.		known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	The project does not conflict with the objectives or actions outlined in the National Recovery Plan for the species.

Conclusion for White-throated Needletail

The White-throated Needletail is predominantly aerial and is highly unlikely to be impacted by the planned terrestrial works. The study area supports no important population of the species, or habitat critical to the survival of the species.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the White-throated Needletail.

Pilotbird *Pycnoptilus floccosus* (VU)

A description of Pilotbird ecology, distribution, and habitat extent within the study area is found in Section 3.3.3. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Pilotbird against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 40 below.

Table 40 Pilotbird: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	No important populations of Pilotbird are outlined in the species conservation advice (DAWE 2022b). The study area is unlikely to support an important population (as defined in the MNES SIC Guidelines), as any potentially present population is unlikely to act as a key source population, support significant genetic diversity, or exist at the limit of the species range (Commonwealth of Australia 2013). Habitat loss has been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land, which contains no suitable habitat for the species. Vegetation loss outside of the existing easement is minimal, limited to small isolated patches in agricultural land, along roadsides, and on the edge of the existing easement. This vegetation is likely to be low habitat value for any potential Pilotbird population within the local area.
Reduce the area of occupancy of an important population	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. The proposed works are unlikely to reduce the area of occupancy of the species as habitat loss and disturbance has been largely restricted to areas unsuitable for the species.
Fragment an existing important population into two or more populations.	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. It is unlikely that the proposed works will fragment any local population as the species is mobile (capable of short flights) and is unlikely to be significantly impacted by the loss of low value habitat.
Adversely affect habitat critical to the survival of a species.	Unlikely	Habitat critical to the survival of the Pilotbird includes: wet sclerophyll forests in gullies with dense undergrowth, dry sclerophyll forests and woodlands on sloped and ridges, and breeding or foraging habitat there the species is mapped as known or likely to occur (DAWE 2022b). The study area does not contain any habitat critical to the survival of the species as described above, or as outlined in the EPBC SIC Guidelines (Commonwealth of Australia 2013). It is unlikely that the proposed works will have any impact to habitat critical to the survival of the species. Impacts to potential habitat within the study area have been minimised by largely restricting the disturbance footprint to the existing cleared

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		easement and agricultural land, which contains no suitable habitat for the species.
Disrupt the breeding cycle of an important population.	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. Nesting is unlikely to occur within habitat proposed for removal, as works are restricted to unsuitable habitat within the existing cleared easement, vegetation immediately bordering the easement, or isolated in agricultural land. It is unlikely that the works will have a significant impact on any breeding activity of any potential local population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The proposed works are unlikely to modify, isolate or destroy habitat for the Pilotbird to the extent that it will cause any decline in the species. Habitat loss has been limited to vegetation that is likely to be low value to the Pilotbird by restricting the disturbance footprint to; the existing cleared easement, agricultural land, small fragmented patches, and vegetation immediately bordering cleared land.
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	The Pilotbird was listed as was listed as Vulnerable under the EPBC Act primarily in response to significant population decline resulting from large scale habitat loss in NSW from bushfire in 2019/2020. It is unlikely that the proposed works will interfere with the natural recovery of the species following the fires as minimal foraging and nesting habitat loss is predicted. No specific recovery plan has been published for the species, and no known recovery actions are underway within the local area that may be affected by the proposed works.

Conclusion for Pilotbird

Proposed works are unlikely to impact any significant habitat for the species or cause significant direct impacts to any potentially present population within the local area. The study area supports no important population of the species, or habitat critical to the survival of the species.

With implementation of the proposed impact mitigation measures, it is unlikely the proposed action will have a significant impact on the Pilotbird.

Grey-headed Flying-fox *Pteropus poliocephalus* (VU)

A description of Grey-headed Flying-fox (GHFF) ecology, distribution, and habitat extent within the study area is found in Section 3.3.4. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Grey-headed Flying-fox against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 41 below.

Table 41 Grey-headed Flying Fox: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	The Australian population of Grey-headed Flying-fox is found throughout QLD, NSW, ACT, VIC and SA, and functions as a single, highly mobile unit, with individuals moving between permanent and temporary camps. An analysis of National Flying-fox Monitoring Program data found that the Australian population of GHFF is approximately 700,000 (CSIRO 2019). As such, no important population exists. Habitat for Grey-headed Flying-fox within the study area is limited to potential foraging habitat in flowering and fruiting trees. Loss of potential habitat trees has been minimised through retention of all large and scattered trees and restricting the disturbance footprint of the project to the existing cleared pipeline easement and agricultural land.
Reduce the area of occupancy of an important population	Unlikely	As outlined above, there are no important populations of the species. Grey-headed Flying-fox from a nearby camps at Sale and Woodside may occasionally fly through the study area and forage on flowering or fruiting plants but are unlikely to depend on it as key habitat.
Fragment an existing important population into two or more populations.	Unlikely	The Australian population of Grey-headed Flying-fox functions as a single, highly mobile unit, with no important populations. Minimal habitat loss within the study area does not have the potential to fragment the existing population.
Adversely affect habitat critical to the survival of a species.	Unlikely	Critical habitat for the species is defined in the National Recovery Plan for the Grey-headed Flying-fox (DAWE 2021). The study area is not within 20 kilometres of a nationally important camp, and no permanent or temporary camps have been recorded within the study area. The study area may contain winter and spring foraging habitat, including species of eucalypt and banksia that flower during this period, however the loss of potential foraging habitat is minimal, with all large and scattered trees to be retained, and is unlikely to have any significant effect on the species.
Disrupt the breeding cycle of an important population.	Unlikely	As outlined above, there are no important populations of the species. Grey-headed Flying Fox breed at roost camps. No permanent or temporary camps have been recorded within the study area. The project has no capacity to disrupt the breeding

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		cycle of the species.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Impacts to habitat are minimal (loss or disturbance of a total of 5.52 ha of forest and woodland EVCs), as works are almost entirely restricted to the existing cleared pipeline easement, with all large and scattered trees to be retained. The Grey-headed Flying-fox is highly mobile, with the proposed habitat loss unlikely to have any notable effect on the species.
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	As outlined in the responses above, the project is unlikely to have any notable impact to the species habitat or behaviour. The project is unlikely to interfere with the recovery of the species.

Conclusion for Grey-headed Flying-fox

No permanent or temporary camps have been recorded within the study area. The study area is unlikely to support an important population of the species. Loss of potential foraging habitat trees has been minimised through retention of all large trees and restricting the disturbance footprint to the existing cleared pipeline easement and agricultural land.

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the Grey-headed Flying-fox.

New Holland Mouse *Pseudomys novaehollandiae* (VU)

A description of New Holland Mouse ecology, distribution, and habitat extent within the study area is found in Section 3.3.4. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to New Holland Mouse against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 42 below.

Table 42 New Holland Mouse: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	Important populations are those key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species range. All populations within Victoria are considered important populations, due to fragmentation and loss of habitat and loss of genetic variation. The key area of habitat for the species within the study area is the most eastern extent of the alignment near the offsite Gippsland Lakes Coastal Park. Impacts in this area are largely limited to the existing pipeline easement, with only a small extent of vegetation requiring removal. Whilst the species may be impacted by works in this area due to their small home range (0.44 - 1.4 ha, (DEWHA 2010b), these impacts are likely to be small scale and short term in nature, such that the project is unlikely to lead to the long-term decrease in size of the population if recommended mitigation and management measures are employed. Studies indicate active recolonisation of sites occurs following disturbance (DES 2003). Construction is proposed to be undertaken using trenchless methods where feasible, and all areas of soil disturbance will be subject to revegetation. Existing and ongoing management within the easement permits slashing vegetation once every 12 months to a height of no less than 10 cm to maintain suitable habitat for New Holland Mouse.
Reduce the area of occupancy of an important population	Unlikely	Works in the eastern extent of the study area will result in the direct removal or modification of habitat that is likely to be utilised by individuals including small extents of Heathy Woodland, Damp Sands Herb-rich Woodland and Swamp Scrub. Under the assumption that the local population occupies this habitat either for dispersal foraging or nesting, the project is likely to reduce the area of occupancy for the species, however, such reduction is likely to be short term in nature, and largely limited to areas of existing modification. It is likely that following the pipeline construction and rehabilitation and revegetation of the impact area, the area of occupancy will be restored to its existing extent. Existing soil profile will be restored following

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		construction to avoid modification of potential nest burrow habitat.
Fragment an existing important population into two or more populations.	Unlikely	New Holland Mouse have small home ranges and relatively poor dispersal capability, with studies typically recording individuals remaining within 100 meters of their recorded locations (Burns & Phillips 2020). Given the existing modification within the impact area and nearby continuous vegetation, the project is unlikely to permanently fragment the population, providing that disturbed areas are subject to rehabilitation of vegetation to a condition compatible with the surrounding land use.
Adversely affect habitat critical to the survival of a species.	Unlikely	No specific habitat has been outlined as critical to the survival of New Holland Mouse in relevant conservation advice (DEWHA 2010b). No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat, however, the species Consultation Document broadly defines critical habitat as the current area of occupancy of the taxon; possible other areas used; and potential habitat into which the New Holland mouse could disperse or be translocated (DAWE 2021). Habitat for the species within the study area in the most eastern extent of the alignment will be impacted by the project. However, reduction in habitat is likely to be short term in nature, and largely limited to areas of existing modification. It is unlikely that the planned works will impact on any habitat critical to the survival of the species, as defined in the MNES SIC Guidelines (Commonwealth of Australia 2013).
Disrupt the breeding cycle of an important population.	Potential to disrupt breeding cycle Unlikely to significantly impact the species.	As outlined above, the study area is likely to support an important population of the species. New Holland Mouse breed between late winter to early summer and sometimes into autumn, with individuals reaching breeding maturity within 13 to 20 weeks (DEWHA 2010b). Females live for up to two years, producing one to two litters in their first year, and three or four in their second year. Individuals or small colonies primarily use underground burrows for shelter and breeding and have also been recorded sheltering in surface nests under dense low growing vegetation. Works are proposed to occur in summer months, partially within the species peak breeding season in August to January. Females that may have their breeding disrupted by the works are likely to breed again in the season, reducing the chance of the breeding cycle of the local population being significantly disrupted. Impacts are largely limited to foraging and dispersal

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		habitat with existing modification and will have a minimal impact to a small area of potential shelter or nesting habitat.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	The proposed works include modification or short-term disturbance of 7.64 ha of the following potential habitat EVCs: • Damp Sands Herb-rich Woodland (4.98 ha) • Sand Heathland (1.34 ha) • Heathy Woodland (0.53 ha) • Swamp Scrub (0.79 ha) The majority of EVC disturbance falls within low-quality vegetation within the existing cleared pipeline easement which is subject to regular disturbance (maintenance slashing). The extent and scale of the proposed habitat disturbance are unlikely to result in overall species decline, falling below 0.01% of the modelled 116,376 ha of habitat within Victoria.
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of a species.	Unlikely	The species Conservation Advice (DEWHA 2010b) identifies priority recovery and threat abatement actions to support New Holland Mouse recovery, though no specific recovery plan has been published for the species within Victoria. It is unlikely that the proposed works will have a significant impact on the natural recovery of the species. No known recovery actions underway within the local area, such as the Enhancing Biodiversity at Dutson Downs project, are likely to be affected by the proposed works.

Conclusion for New Holland Mouse

Impacts to habitat have been minimised by largely restricting the disturbance footprint to the existing cleared easement and agricultural land, rehabilitation and revegetation of the impact area, and the proposed use of trenchless construction under areas of key habitat value. The study area is unlikely to contain habitat critical to the survival of the species. With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on the New Holland Mouse.

Green and Golden Bell Frog *Litoria aurea* (VU)

A description of Green and Golden Bell Frog ecology, distribution, and habitat extent within the study area is found in Section 3.3.6. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Green and Golden Bell Frog against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 43 below. An assessment against species-specific EPBC Act referral guidelines is present in Table 44 below.

Table 43 Green and Golden Bell Frog: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	The study area has the potential to contain habitat for an important population of the Green and Golden Bell Frog. Database records from the local region indicate that populations of the species are found within the La Trobe River (particularly the western extent of the Dowd Morass Wildlife Reserve), and wetlands within the Gippsland Water Regional Organics and Agribusiness properties, the termination point of the ROS. While these populations may meet the criteria to be considered important populations, as they exist at the southernmost known range limit of the species and may act as key source populations (Commonwealth of Australia 2013) the study area itself contains minimal suitable habitat and is unlikely to be significantly impacted by the proposed works to the extent that it leads to any decrease in the size of a local population. DEECA mapped wetland habitat is minimal and was not observed to contain suitable breeding habitat throughout the duration of fauna surveys (October 2022 – February 2023), despite the higher than average rainfall for the period. Significant impacts to potential ephemeral habitat are unlikely, with works planned for summer months when wetlands are dry, and trenches backfilled and revegetated after installation of the new pipeline. Impacts to potential terrestrial hibernation habitat are also unlikely, as vegetation clearing works will be conducted outside of the species hibernation period. The primary habitat within the study area is the ROS, which may act as a dispersal corridor for the population in the Gippsland Water wetlands where the ROS terminates. Trenchless construction is planned under the ROS to avoid impacts to potential habitat and avoid disrupting any potential dispersal throughout the duration of the works.
Reduce the area of occupancy of an important population	Unlikely	It is unlikely that the planned works will have any significant impact on the area of occupancy of the Green and Golden Bell Frog. No long-term impacts to suitable wetland habitat are

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		predicted, as trenchless construction is planned under the ROS, works are proposed to be conducted in summer months when ephemeral habitat is dry, and trenches backfilled after pipeline installation. The Green and Golden Bell Frog is highly mobile, and if present within the local area, will likely recolonise any seasonal habitat within the study area after works are concluded
Fragment an existing important population into two or more populations.	Unlikely	Any local permanent or seasonal populations of Green and Golden Bell Frog are unlikely to be permanently fragmented by the proposed works. The species is highly mobile, and capable of crossing significant distances over land. Trenchless construction proposed under the ROS will reduce disturbance to any individuals moving within the waterway. Records and surveys indicate that the species is widely distributed throughout the local area, north and south of the existing cleared pipeline easement.
Adversely affect habitat critical to the survival of a species.	Unlikely	The ROS has the potential to act as a dispersal corridor for the Green and Golden Bell Frog population in the Gippsland Water wetlands where the ROS terminates, and may meet the criteria for habitat critical to the survival of the species (Commonwealth of Australia 2013). The ROS is unlikely to be impacted by the proposed works, with trenchless construction planned, to avoid disruption of waterflow and disturbance of fringing vegetation. The study area does not contain any suitable breeding habitat, minimal wetland habitat, and minimal suitable foraging habitat, which is unlikely to be disturbed to the extent that it would adversely affect the survival of the species.
Disrupt the breeding cycle of an important population.	Unlikely	Within Victoria, the Green and Golden Bell Frog primarily breeds over spring/summer, spawning from December – February. Breeding habitat is restricted to still fresh water, primarily permanent shallow wetlands devoid of native fish, with abundant aquatic vegetation. Works are proposed to be undertaken during the species breeding season; however, no suitable breeding wetlands exist within the study area. It is unlikely that the proposed works will disrupt the breeding cycle of any local population of the species.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Proposed works are unlikely to impact potential habitat for the species within the study area to the extent that it will cause a decline of the species. Habitat within the study area is minimal; limited to the ROS, small ephemeral wetlands and surrounding terrestrial vegetation. Works are proposed to occur during summer, when ephemeral wetlands are dry, and trenchless construction is planned under the ROS and one ephemeral wetland. Long-term impacts to terrestrial vegetation are

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		unlikely, and as works are planned for summer, they will not affect any hibernating frogs. Staged trench backfilling to reinstate topsoil, and revegetation of the disturbance footprint will promote quick recovery of potential habitat vegetation.
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. Strategies to reduce the likelihood of potential spread of amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) within the study area will be outlined within the CEMP.
Interfere substantially with the recovery of the species	Unlikely	It is unlikely that the proposed works will have a significant impact on the natural recovery of the species. No specific recovery plan has been published for the species within Victoria, and no known recovery actions are underway within the local area that may be affected by the proposed works.

Table 44 Green and Golden Bell Frog: self-assessment against species-specific significant impact guidelines

Significant impact criteria	Likelihood of significant impact	Justification
Threshold 1: The removal or degradation of aquatic or ephemeral habitat either where the Green and Golden Bell Frog has been recorded since 1995, or habitat that has been assessed as being suitable according to the significant impact guidelines.	Unlikely	Impacts to aquatic and ephemeral habitat have been largely avoided through proposed trenchless construction under areas of potential habitat, including the ROS. Works will occur in summer months, when ephemeral habitat is likely to be dry, and any local frogs are likely to retreat to permanent wetlands and waterways.
The removal or degradation of terrestrial habitat within 200 metres of habitat identified in Threshold 1.	Potential to cause short-term impact to habitat. Unlikely to significantly impact the	Short-term habitat disturbance and removal of terrestrial vegetation is planned within 200 metres of wetland identified to support the species (Figure 4), and the ROS. Impacts to this habitat are minimal and restricted to disturbed vegetation within the existing cleared pipeline corridor and agricultural land. Impacts are further minimised by restricting works to summer months, when frogs are unlikely to be overwintering in vegetation

Significant impact criteria	Likelihood of significant impact	Justification
	species.	fringing wetlands.
Breaking the continuity of vegetation fringing ephemeral or permanent waterways or other vegetated corridors linking habitats meeting the criteria in Threshold 1.	Unlikely	Proposed trenchless construction under the ROS avoids disturbance of vegetation fringing the waterway, maintaining habitat connectivity acting as a potential dispersal corridor.

Conclusion for Green and Golden Bell Frog

The study area has the potential to support an important population of the species and contain habitat critical to the survival of the species. Mitigation measures have been developed to reduce the impact to any potential population or habitat, including constraints mapping to minimise the disturbance footprint, and proposed trenchless construction under key habitat.

With implementation of the proposed impact mitigation measures, it is unlikely the proposed action will have a significant impact on the Green and Golden Bell Frog.

Growling Grass Frog *Litoria raniformis* (VU)

A description of Growling Grass Frog ecology, distribution, and habitat extent within the study area is found in Section 3.3.6. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Growling Grass Frog against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 45 below. An assessment against species-specific EPBC Act referral guidelines is present in Table 46 below.

Table 45 Growling Grass Frog: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	Important populations for the Growling Grass Frog are defined in the National Recovery Plan (Clemann & Gillespie 2012) and the Species Significant Impact Guidelines (DEWHA 2009) as viable populations that have the opportunity to interact with waterbodies and other populations, and are capable of dispersal and establishment of new populations when suitable habitat becomes available. Important populations may also include populations near the limit of the species range, and those that are well-studied or have a history of monitoring, and hence provide opportunities for further research. The species cannot be ruled as absent from the study area as it is mobile, and recent records exist within the local area, however, the study area is unlikely to currently support a permanent viable population, and thus unlikely to support an important population. The study area itself contains minimal suitable habitat and is unlikely to be significantly impacted by the proposed works to the extent that it leads to any decrease in the size of a local population. Wetland habitat mapped in DEECA datasets is minimal and was not observed to contain suitable breeding habitat throughout the duration of fauna surveys (October 2022 – February 2023), despite higher than average rainfall for the period. Significant impacts to potential ephemeral habitat are unlikely, with works planned for summer when wetlands are dry, and trenches backfilled and revegetated after installation of the new pipeline. Impacts to potential terrestrial hibernation habitat are also unlikely, as vegetation clearing works are planned to be conducted outside of the species hibernation period. The primary habitat within the study area is the ROS, which may act as a dispersal corridor for any potential local population. Trenchless construction is planned under the ROS to avoid impacts to potential habitat and avoid disrupting any potential dispersal throughout the duration of the works.
Reduce the area of occupancy of an important population	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. No Growling Grass Frogs

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
		were recorded within the study area and adjacent wetlands during targeted surveys. No long-term impacts to wetland habitat are predicted, as works are proposed to be conducted in summer when ephemeral habitat is dry, and trenches backfilled after pipeline installation. The Growling Grass Frog is highly mobile, and if present within the local area, will likely recolonise any seasonal habitat within the study area after works are concluded.
Fragment an existing important population into two or more populations.	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. Any local permanent or seasonal populations of Growling Grass Frog are unlikely to be permanently fragmented by the proposed works. The species is highly mobile, and capable of crossing significant distances over land. Trenchless construction proposed under the ROS will reduce disturbance to any individuals moving within the waterway. Records indicate that the species is widely distributed throughout the local area, north and south of the existing cleared pipeline easement.
Adversely affect habitat critical to the survival of a species.	Unlikely	It is unlikely that any habitat within the study area is critical to the survival of the species. The study area contains minimal wetland habitat, and no suitable breeding habitat. The ROS may be used as a dispersal corridor but is unlikely to be significantly impacted during the proposed works as trenchless construction is proposed under the waterway.
Disrupt the breeding cycle of an important population.	Unlikely	As outlined above, the study area is unlikely to support an important population of the species. The species breeds in spring-summer in shallow still freshwater wetlands with aquatic vegetation. Works are proposed to be undertaken in summer; however, no suitable breeding wetlands exist within the study area. Wetlands within the study area contain minimal aquatic vegetation. Ephemeral wetlands within the study area dry over summer, and the permanent ROS is fast-flowing. Regular checks of open trenches will be conducted to catch and relocate any trapped animals.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Proposed works are unlikely to significantly impact potential habitat for the species within the study area. Habitat within the study area is minimal, limited to small ephemeral wetlands, the ROS, and surrounding terrestrial vegetation. Works are proposed to occur during summer, when ephemeral wetlands are dry, and trenchless construction is planned under the ROS and one ephemeral wetland. Long-term impacts to potential terrestrial habitat disturbed during trenching is unlikely, with staged backfilling to replace topsoil and revegetation of disturbed habitat.

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. Strategies to reduce the likelihood of potential spread of amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) within the study area will be outlined within the CEMP.
Interfere substantially with the recovery of the species	Unlikely	The proposed works will not interfere with the recovery of the species in respect to the specific objectives for recovery outlined in the in the species National Recovery Plan (Clemann & Gillespie 2012).

Table 46 Growling Grass Frog: self-assessment against species-specific referral guidelines

Significant impact criteria	Likelihood of significant impact	Justification
Permanent removal or degradation of terrestrial habitat within 200 metres of a water body in temperate regions that results in the loss of dispersal or overwintering opportunities for an important population.	Unlikely	As outlined in Table 45, the study area is unlikely to support an important population of the species, and the species was not recorded within or adjacent to the study area during targeted surveys. Habitat disturbance within 200 metres of waterways is minimal, short-term, and unlikely to lead to permanent degradation or loss of habitat, or loss of dispersal or overwintering opportunities.
Introduction of predatory fish and/or disease agents.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species or diseases that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation. Strategies to reduce the likelihood of potential spread of amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) within the study area will be outlined within the CEMP.
Construction of physical barriers to movement between water bodies, such as roads or buildings.	Unlikely	No permanent physical barriers will be constructed between water bodies or wetlands.

Significant impact criteria	Likelihood of significant impact	Justification
Alteration of aquatic vegetation diversity or structure that leads to a decrease in habitat quality.	Unlikely	The study area contains minimal wetland habitat, and no suitable breeding habitat. Impacts to potential dispersal corridor and high-quality wetland habitat at the ROS have been avoided with trenchless construction. No notable aquatic vegetation was observed within the disturbance footprint, or at wetlands adjacent to the study area. The proposed works have no reasonable likelihood of altering wetland hydrology, number or diversity. Works are planned to be conducted in summer months, when potential ephemeral wetland habitat is likely to be dry, and flood events are unlikely.
Alteration to wetland hydrology, diversity and structure that leads to a decrease in habitat quality.		
Net reduction in the number and/or diversity of water bodies available to an important population.		
Removal or alteration of available terrestrial or aquatic habitat corridors (including alteration of connectivity during flood events).		

Conclusion for Growling Grass Frog

The Growling Grass Frog was not recorded within the study area during targeted surveys. Minimal habitat is present, and no suitable breeding habitat. Impacts to potential wetland habitat have been mitigated with summer/dry season trenching and proposed trenchless construction. It is unlikely that the study area supports an important population, or significant habitat critical to the survival of the species.

With implementation of the proposed impact mitigation measures, it is unlikely the proposed action will have a significant impact on the Growling Grass Frog.

Dwarf Galaxias *Galaxiella pusilla* (VU)

A description Dwarf Galaxias ecology, distribution, and habitat extent within the study area is found in Section 3.3.7. Impact mitigation measures are outlined in Section 4.3. An assessment of impacts to Dwarf Galaxias against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 47 below.

Table 47 Dwarf Galaxias: self-assessment against Significant Impact Criteria

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population.	Unlikely	No defined important populations are outlined in published recovery plans for the Dwarf Galaxias (Saddlier, Jackson, & Hammer 2010). The study area is unlikely to support an important population (as defined in the MNES SIC Guidelines), as any potentially present population is unlikely to act as a key source population, support significant genetic diversity, or exist at the limit of the species range (Commonwealth of Australia 2013). Habitat within the study area is limited to the ROS, with other DEECA mapped wetlands observed as dry or ephemeral during the site investigation and targeted surveys. The proposed works are unlikely to have any notable impact on Dwarf Galaxias within the study area. Impacts to potential habitat within the ROS have been avoided through the planned use of trenchless construction under the man-made waterway.
Reduce the area of occupancy of an important population	Unlikely	The proposed works are unlikely to have any notable impact on Dwarf Galaxias within the study area. Impacts to potential habitat within the ROS have been avoided through the planned use of trenchless construction under the waterway.
Fragment an existing important population into two or more populations.	Unlikely	Potential fragmentation of habitat for the Dwarf Galaxias has been avoided through use of trenchless construction under the ROS waterway.
Adversely affect habitat critical to the survival of a species.	Unlikely	Impacts to potential habitat for the Dwarf Galaxias have been avoided through the planned use of trenchless construction under the ROS waterway.
Disrupt the breeding cycle of an important population.	Unlikely	The species has an annual lifecycle, with adults dying after spawning. Works are planned to occur in summer, avoiding the late winter – spring spawning season. Trenchless construction under the ROS will avoid impacts to any potentially present population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely	Impacts to potential habitat for the Dwarf Galaxias have been avoided through the planned use of trenchless construction under the ROS waterway.

Significant impact criteria (vulnerable species)	Likelihood of significant impact	Justification
Result in invasive species that are harmful to a vulnerable becoming established in the vulnerable species' habitat.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Introduce disease that may cause the species to decline.	Unlikely	The project does not include any known mechanism that would result in introduction of any disease that is not already present in the relevant environment. A detailed Construction Environmental Management Plan (CEMP) should include weed management strategies to avoid the introduction and spread of disease.
Interfere substantially with the recovery of the species	Unlikely	The proposed action will not interfere with the recovery of the species in respect to the specific objectives for recovery outlined in the in the species National Recovery Plan (Saddlier, Jackson, & Hammer 2010).

Conclusion for Dwarf Galaxias

The study area is unlikely to support an important population of the species, or habitat critical to the survival of the species. Impacts to potential habitat will be avoided through the proposed use of trenchless construction under the ROS.

With implementation of the proposed impact mitigation measures, it is unlikely the proposed action will have a significant impact on the Dwarf Galaxias.

Migratory species

An assessment of impacts to Migratory bird species against the Significant Impact Criteria 1.1 (Commonwealth of Australia 2013) is present in Table 48 below. This assessment covers the following species which have been assessed as likely to inhabit the study area:

- White-throated Needletail *Hirundapus caudacutus*
- Fork-tailed Swift *Apus pacificus*
- Black-faced Monarch *Monarcha melanopsis*
- Rufous Fantail *Rhipidura rufifrons*
- Satin Flycatcher *Myiagra cyanoleuca*
- Latham's Snipe *Gallinago hardwickii*
- Glossy Ibis *Plegadis falcinellus*.

Table 48 Migratory Species: self-assessment against Significant Impact Criteria

Significant impact criteria	Likelihood of significant impact	Justification
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	Unlikely	An area of 'important habitat' for a migratory species is: • Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or • Habitat that is of critical importance to the species at particular life-cycle stages, and/or • Habitat utilised by a migratory species which is at the limit of the species range, and/or • Habitat within an area where the species is declining. The study area is unlikely to support an ecologically significant proportion of any population of migratory species. • White-throated Needletail, Fork-tailed Swift are almost exclusively aerial species. Individuals may fly over or occasionally roost within the study area, however potential impacts are restricted to minor loss of potential roosting habitat and are unlikely to substantially modify any area of important habitat. • Black-faced Monarch are associated typically with rainforest ecosystems, occasionally occurring in coastal scrub dominated by Coast Banksia. Impacts to banksia-dominated Heathy Woodland are minimal, with the majority of vegetation loss limited to the existing cleared easement. • Rufous Fantail and Satin Flycatcher may also occasionally forage or nest within forest and woodland vegetation within the study area. Modification to potential habitat for these species is relatively minor, as most impacts have been limited to the existing cleared easement. • Latham's Snipe and Glossy Ibis are typically associated with permanent and ephemeral wetlands and waterbodies. The study area supports minimal suitable foraging habitat for

Significant impact criteria	Likelihood of significant impact	Justification
		these species, as the majority of DEECA mapped wetlands were not observed to hold water throughout the site investigation and targeted surveys (October 2022 – February 2023), despite the higher than average rainfall for the period. Such areas may provide occasional foraging habitat during periods of inundation, particularly as Latham's Snipe and Glossy Ibis have been previously recorded at nearby suitable habitat such as Lake Wellington, Lake Coleman and Heart Morass wetlands, however works are planned during summer time when habitats are likely to be dry and species are unlikely to forage at those locations.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	Unlikely	The project does not include any known mechanism that would result in establishment of invasive species that are not already present in the relevant environment. To prevent further spread or establishment of new weed species a detailed Construction Environmental Management Plan (CEMP) should include weed management strategies and a site induction should highlight the conservation value of native vegetation.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	Unlikely	As described above, the study area is unlikely to support an ecologically significant proportion of any population of migratory species. While some areas of potential foraging, roosting or nesting habitat will be temporarily impacted by the proposed project, it is unlikely to seriously disrupt the lifecycle of a significant proportion of a population of any migratory species.

Conclusion for migratory species

With implementation of the proposed impact mitigation measures, it is unlikely that the proposed action will have a significant impact on any migratory species.

Appendix D. Photos of the study area

Photo 11 **Heathy Woodland EVC 48 - Habitat zone 60 (intact) and 61 (derived state -existing easement); looking approximately west, 10 October 2022, no impacts proposed (Figure 5).**

Photo 12 **Heathy Woodland EVC 48 -Habitat zone 52, low quality, looking approximately south - west, 10 October 2022, impacts to native vegetation proposed (Figure 5).**

Photo 13 Heathy Woodland EVC 48 – Habitat Zone 52; looking approximately north-east, 12 October 2022 impacts to native vegetation proposed within the existing easement (Figure 5).

Photo 14 Heathy Woodland EVC 48 – Habitat Zone 52; looking approximately north-east, impacts to native vegetation proposed within the existing easement (Figure 5)

Photo 15 **Heathy Woodland EVC 48 – Habitat Zone 55; looking approximately south-west, 12 October 2022, no impacts proposed to native vegetation (Figure 5).**

Photo 16 **Heathy Woodland EVC 48 - Habitat zone 80; looking approximately west, 13 October 2022, impacts to native vegetation minimal (see Figure 5).**

Photo 17 Heathy Woodland EVC 48 - Habitat zone 80; looking approximately south-east, 13 October 2022 impacts to native vegetation minimal (see Figure 5).

Photo 18 Heathy Woodland EVC 48 - Habitat zone 82; looking approximately south-east, 12 October 2022, no impacts to native vegetation minimal (see Figure 5).

Photo 19 **Derived heathy Woodland EVC 48 - Habitat zone 81; looking approximately east, 11 October 2022, impacts to native vegetation within existing easement (see Figure 5).**

Photo 20 **Derived heathy Woodland EVC 48 - Habitat zone 81; looking approximately west 11 October 2022, impacts to native vegetation within existing easement (see Figure 5).**

Photo 21 **Damp Sands Herb Rich Woodland EVC 3– Habitat Zone 11; looking approximately north-east, 18 October 2022, no impacts to native vegetation (Figure 5)**

Photo 22 **Damp Sands Herb Rich Woodland EVC 3– Habitat Zone 75; looking approximately east, 18 October 2022, no impacts to native vegetation (Figure 5)**

Photo 23 Derived Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 24, driven by Bracken; looking approximately south, 19 October 2022, impacts to native vegetation (Figure 5).

Photo 24 Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 8; looking approximately south-west, 18 October 2022, impacts to native vegetation (Figure 5).

Photo 25 **Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 8; looking approximately south-west, 18 October 2022, impacts to native vegetation along easement. Minimal impacts within in-tact vegetation (Figure 5)**

Photo 26 **Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 8; looking approximately south-west, 18 October 2022, impacts to native vegetation along easement. Minimal impacts within in-tact vegetation (Figure 5)**

Photo 27 Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 50; looking approximately south-east, 18 October 2022, impacts to native vegetation (Figure 5).

Photo 28 Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 50; looking approximately south, 18 October 2022, impacts to native vegetation (Figure 5).

Photo 29 **Damp Sands Herb Rich Woodland EVC 3 – Habitat Zone 1; looking approximately west, 18 October 2022, no impacts to native vegetation (Figure 5)**

Photo 30 **Derived Lowland Forest in the existing easement (HZ 34) and EVC 16 Lowland Forest (HZ 35) within the intact vegetation in the forefront, changing to Derived (HZ 38) and intact (HZ 39) Heathy Woodland travelling east; looking approximately south-east ,13 October 2022. No impacts to native vegetation (Figure 5)**

Photo 31 **Lowland Forest (derived) -Habitat zone 34; looking approximately south-west, 18 October 2022, No impacts to native vegetation (Figure 5)**

Photo 32 **Sand Heathland EVC 6 -Habitat zone 67 (intact) and 68 derived state (on the existing easement); looking approximately south-west, 14 October 2022, impacts to native vegetation (Figure 5)**

Photo 33 Sand Heathland EVC 6 -Habitat zone 67; looking approximately south, 14 October 2022, impacts to native vegetation (Figure 5)

Photo 34 Sand Heathland EVC 6 -Habitat zone 67; looking approximately southwest, 14 October 2022, impacts to native vegetation (Figure 5)

Photo 35 **Sand Heathland EVC 6 -Habitat zone 68 (derived); looking approximately west, 14 October 2022, impacts to native vegetation (Figure 5)**

Photo 36 **Swamp Scrub EVC 53 – Habitat zones 72 (intact vegetation) and 73 (derived existing easement vegetation); looking approximately north-east, 14 October 2022. Impacts to vegetation on the existing easement (HZ 73) (Figure 5).**

Photo 37 **Swamp Scrub EVC 53 – Habitat zones 72 (intact vegetation) and 73 (derived existing easement vegetation); looking approximately east, 14 October 2022, Impacts to vegetation on the existing easement (HZ 73) (Figure 5).**

Photo 38 **Creekline Herb Rich Woodland EVC 164-Habitat zone 43; looking approximately south-east, 18 October 2022, no impacts to native vegetation (Figure 5).**

Photo 39 Creekline Herb Rich Woodland EVC 164-Habitat zone 43; looking approximately east, 18 October 2022, no impacts to native vegetation (Figure 5).

Photo 40 DEECA mapped wetland, Habitat zone 83 (wetland number 91201), looking approximately south, 14 October 2022, no impacts to native vegetation proposed (Figure 5).

Photo 41 **DEECA modelled wetland - Habitat zone 56 (wetland number 91181); looking approximately north-east, 13 October 2022, impacts to wetland (Figure 5)**

Photo 42 **DEECA modelled wetland - Habitat zone 56 (wetland number 91181); looking approximately east, 13 October 2022, impacts to wetland (Figure 5)**

Photo 43 **Predominantly introduced vegetation, looking approximately south-east, 20 October 2022 (Figure 3)**

Photo 44 **Large tree in habitat zone 1; looking approximately south-east, 20 October 2022, no impact to tree (Figure 5).**

Photo 45 Scattered tree number 14; looking approximately north, 13 October 2022, no impacts to tree (Figure 5).

Appendix E. Vegetation Quality Assessment

A continuous area of the same EVC is termed a 'habitat zone'. Different habitat zones exists where there are different EVCs present and/or discrete (non-continuous) patches of the same EVC. A separate vegetation quality assessment was conducted for each habitat zone.

Seventy-seven habitat zones were identified (Table 49 and Table 50). The results of the vegetation quality assessment are provided in Table 49 and Table 50.

Table 46 Vegetation Quality Assessment results for habitat zones 1-53

Site and Habitat Zone ID			1, 2	3, 4, 5, 6, 47	7	8, 12	13, 11, 9, 14	10	15-29	30-33	34, 36	35	38	39	40	41	42	43	44	45	48	50	51	52, 53, 55
EVC #: Name			DSHRW 3	DSHRW 3	DSHRW 3	DSHRW 3	DSHRW 3	DSHRW 3	DSHRW 3	DSHRW 3	LF 16	LF 16	HW 48	HW 48	HW 48	HW 48	CHRW	CHRW 164	HW 48	HW 48	DSHRW 3	DSHRW 3	DSHRW	HW 48
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Trees	10	9	0	0	0	4	0	0	8	0	4	0	0	9	0	0	9	0	9	0	0	0	0
	Tree Canopy Cover	5	5	0	0	0	5	0	0	5	0	3	0	5	4	0	0	5	0	4	0	0	0	4
	Lack of Weeds	15	0	0	0	13	15	15	0	7	9	15	15	15	13	13	15	15	13	13	0	4	0	0
	Understorey	25	15	5	5	15	15	5	5	10	5	10	5	20	20	5	5	20	5	20	5	15	10	15
	Recruitment	10	10	0	5	10	10	0	0	5	0	5	0	10	10	0	0	10	0	10	0	6	5	3
	Organic Matter	5	5	2	2	0	5	5	2	3	3	3	3	3	5	5	3	3	5	5	2	2	2	2
	Logs	5	2	0	0	0	5	0	0	0	0	5	0	0	5	0	0	5	0	5	0	4	0	5
	Total Site Score		46	7	12	38	59	25	7	38	17	45	23	53	66	23	23	67	23	66	7	31	17	29
	EVC standardiser (x 75/55)		1	1	1	1.36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Adjusted Site Score		46	7	12	51.68	59	25	7	38	17	45	23	53	66	23	23	67	23	66	7	31	17	29
Landscape Value	Patch Size	10	1	1	1	8	8	8	1	4	8	8	8	8	8	8	8	8	8	8	8	8	1	6
	Neighbourhood	10	1	1	1	5	5	5	1	3	5	5	5	5	5	5	5	5	5	5	3	4	1	4
	Distance to Core Area	5	3	3	3	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	3	3	3
	Total Landscape Score		5	5	5	17	17	17	5	10	17	17	17	17	17	17	17	17	17	17	15	15	5	13
Habitat points = #/100		100	51	12	17	68.68	76	42	12	48	34	62	40	70	83	40	40	84	40	83	22	46	22	42
CONDITION SCORE		1	0.51	0.12	0.17	0.6868	0.76	0.42	0.12	0.48	0.34	0.62	0.40	0.70	0.83	0.40	0.40	0.84	0.40	0.83	0.22	0.46	0.22	0.42

Table 47 Vegetation Quality Assessment results for habitat zones 57-84

Site and Habitat Zone ID			57	58	59	60	61	62	63	64	65	67	68	69	70	71	72, 74	73	75, 77	76	78, 79, 80, 82	81	84
EVC #: Name			DSHRW 3	DSHRW 3	HW 48	HW 48	HW 48	SH 6	SH 6	SH 6	SS 53	SH 6	SH 6	SS 53	SS 53	SH 6	SS 53	SS 53	DSHRW 3	DSHRW 3	HW 48	HW 48	DSHRW
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Trees	10	0	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	5	0	0
	Tree Canopy Cover	5	4	3	0	5	0	NA	NA	NA	0	NA	NA	0	0	NA	0	0	3	0	3	0	0
	Lack of Weeds	15	0	0	0	9	9	4	4	4	13	4	0	6	13	0	13	13	11	11	13	13	0
	Understorey	25	15	5	5	20	15	15	15	5	15	10	5	5	15	10	15	5	15	5	20	5	5
	Recruitment	10	3	6	5	10	0	10	10	6	10	6	0	6	10	6	10	6	10	3	10	6	0
	Organic Matter	5	2	4	0	5	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	2
	Logs	5	0	5	0	3	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	2	0	0
	Total Site Score		24	23	10	52	29	34	34	20	43	25	10	20	43	21	43	29	44	24	58	29	7
	EVC standardiser (x 75/55)		1	1	1	1	1	1.36	1.36	1.36	1.25	1.36	1.36	1.25	1.25	1.36	1.25	1.25	1	2	1	1	1
	Adjusted Site Score		24	23	10	52	29	46.24	46.24	27.2	53.75	34	13.6	25	53.75	28.56	53.75	36.25	44	48	58	29	7
Landscape Value	Patch Size	10	1	1	1	6	6	1	8	8	8	8	8	8	8	8	8	8	8	8	8	8	1
	Neighbourhood	10	1	1	3	5	5	3	5	5	5	6	6	7	7	7	7	7	7	7	7	7	1
	Distance to Core Area	5	1	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	1
	Total Landscape Score		3	5	7	14	14	7	17	17	17	18	18	19	19	19	19	19	19	19	19	19	3
Habitat points = #/100		100	27	28	17	66	43	53.24	63.24	44.2	70.75	52	31.6	44	72.75	47.56	72.75	55.25	63	67	77	48	10
CONDITION SCORE		1	0.27	0.28	0.17	0.66	0.43	0.53	0.63	0.44	0.71	0.52	0.32	0.44	0.73	0.48	0.73	0.55	0.63	0.67	0.77	0.48	0.10

Habitat zones 37, 46, 49, 54, 56, 66 and 83 are modelled wetlands. The modelled wetland score has been applied to these habitat zones. These habitat zones are not included in the above VQA scores.

Appendix E.1. Tree data

Table 51 Scattered trees within the study area

Tree #	Scientific name	Common name	DBH	Size
1	Dead	N/A	50	Small
2	Dead	N/A	59	Small
3	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	148	Large
4	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	88	Large
5	Dead	Coast Manna-gum	24	Large
6	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80	Large
7	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	122	Large
8	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90	Large
9	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	100	Large
10	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	65	Small
11	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	110	Large
12	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90	Large
13	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90	Large
14	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90	Large
15	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	87	Large
16	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	94	Large
17	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	55	Small
18	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	55	Small
19	Dead	Manna-gum	70	Large
20	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	100	Large
21	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	105	Large
22	Dead	N/A	70	Large
23	Dead	N/A	70	Large

Tree #	Scientific name	Common name	DBH	Size
24	*Eucalyptus viminalis subsp. viminalis*	Manna-gum	30	Small
100	Dead	N/A	62	Small
101	Dead	N/A	64	Small
102	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	89	Large
103	Dead	N/A	75	Large

Table 52 Large trees within patches within the study area

Tree #	Scientific name	Common name	DBH
1	*Banksia serrata*	Saw Banksia	40
2	*Banksia serrata*	Saw Banksia	60
3	*Eucalyptus arenicola*	Gippsland Lakes Peppermint	52
4	*Banksia serrata*	Saw Banksia	46
5	*Banksia serrata*	Saw Banksia	65
6	*Eucalyptus arenicola*	Gippsland Lakes Peppermint	55
7	*Banksia serrata*	Saw Banksia	46
8	*Banksia serrata*	Saw Banksia	50
9	*Banksia serrata*	Saw Banksia	50
10	*Banksia serrata*	Saw Banksia	60
11	*Banksia serrata*	Saw Banksia	40
12	*Banksia serrata*	Saw Banksia	40
13	*Banksia serrata*	Saw Banksia	48
14	*Banksia serrata*	Saw Banksia	42
15	*Eucalyptus arenicola*	Gippsland Lakes Peppermint	58
16	*Banksia serrata*	Saw Banksia	42
17	*Banksia serrata*	Saw Banksia	42
18	*Banksia serrata*	Saw Banksia	55

Tree #	Scientific name	Common name	DBH
19	*Eucalyptus arenicola*	Gippsland Lakes Peppermint	52
20	*Eucalyptus viminalis*	Manna Gum	54
21	*Eucalyptus viminalis* subsp. *pryoriana*	Coast Manna-gum	100
22	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	100
23	*Banksia serrata*	Saw Banksia	55
24	*Eucalyptus consideniana*	Yertchuck	80
25	*Eucalyptus consideniana*	Yertchuck	110
26	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
27	*Banksia serrata*	Saw Banksia	40
28	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
29	*Banksia serrata*	Saw Banksia	55
30	*Eucalyptus consideniana*	Yertchuck	72
31	*Banksia serrata*	Saw Banksia	50
32	*Eucalyptus consideniana*	Yertchuck	100
33	*Eucalyptus consideniana*	Yertchuck	114
34	*Eucalyptus consideniana*	Yertchuck	80
35	*Banksia serrata*	Saw Banksia	50
36	*Eucalyptus consideniana*	Yertchuck	70
37	*Eucalyptus consideniana*	Yertchuck	85
38	*Banksia serrata*	Saw Banksia	50
39	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	75
40	*Banksia serrata*	Saw Banksia	60
41	*Banksia serrata*	Saw Banksia	50
42	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
43	*Banksia serrata*	Saw Banksia	40
44	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	100
45	*Eucalyptus consideniana*	Yertchuck	80

Tree #	Scientific name	Common name	DBH
46	*Banksia serrata*	Saw Banksia	50
47	*Eucalyptus consideniana*	Yertchuck	93
48	*Eucalyptus consideniana*	Yertchuck	70
49	*Eucalyptus consideniana*	Yertchuck	100
50	*Eucalyptus consideniana*	Yertchuck	80
51	*Banksia serrata*	Saw Banksia	50
52	*Banksia serrata*	Saw Banksia	65
53	*Banksia serrata*	Saw Banksia	83
54	*Banksia serrata*	Saw Banksia	55
55	*Banksia serrata*	Saw Banksia	60
56	*Eucalyptus consideniana*	Yertchuck	90
57	*Eucalyptus consideniana*	Yertchuck	90
58	*Banksia serrata*	Saw Banksia	55
59	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	95
60	*Banksia serrata*	Saw Banksia	50
61	*Eucalyptus consideniana*	Yertchuck	120
62	*Banksia serrata*	Saw Banksia	56
63	*Eucalyptus consideniana*	Yertchuck	100
64	*Eucalyptus consideniana*	Yertchuck	80
65	*Banksia serrata*	Saw Banksia	65
66	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
67	*Banksia serrata*	Saw Banksia	40
68	*Eucalyptus arenicola*	Gippsland Lakes Peppermint	75
69	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
70	*Eucalyptus consideniana*	Yertchuck	80
71	*Dead*	Dead	110
72	*Eucalyptus consideniana*	Yertchuck	95

Tree #	Scientific name	Common name	DBH
73	*Eucalyptus ovata*	Swamp Gum	95
74	*Eucalyptus consideniana*	Yertchuck	80
75	*Eucalyptus consideniana*	Yertchuck	107
76	*Eucalyptus consideniana*	Yertchuck	70
77	*Eucalyptus consideniana*	Yertchuck	73
78	*Eucalyptus consideniana*	Yertchuck	71
79	*Eucalyptus ovata*	Swamp Gum	90
80	*Eucalyptus consideniana*	Yertchuck	82
81	*Eucalyptus consideniana*	Yertchuck	71
82	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	80
83	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	76
84	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	75
85	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
86	*Eucalyptus radiata subsp. radiata*	Narrow-leaf Peppermint	70
87	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	102
88	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	75
89	*Dead*	Dead	85
90	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	87
91	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	72
92	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90
93	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	78
94	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	116
95	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
96	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	85
97	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
98	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	130
99	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	82

Tree #	Scientific name	Common name	DBH
100	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	86
101	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	102
102	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	90
103	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
104	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
105	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	125
106	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	110
107	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	100
108	*Eucalyptus consideniana*	Yertchuck	60
109	*Eucalyptus consideniana*	Yertchuck	55
110	*Eucalyptus consideniana*	Yertchuck	55
111	*Eucalyptus consideniana*	Yertchuck	65
112	*Eucalyptus consideniana*	Yertchuck	50
113	*Eucalyptus consideniana*	Yertchuck	60
114	*Eucalyptus consideniana*	Yertchuck	80
115	*Eucalyptus consideniana*	Yertchuck	55
116	*Eucalyptus consideniana*	Yertchuck	65
117	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	70
118	*Eucalyptus consideniana*	Yertchuck	55
119	*Eucalyptus consideniana*	Yertchuck	55
120	*Eucalyptus consideniana*	Yertchuck	65
121	*Eucalyptus consideniana*	Yertchuck	70
122	*Eucalyptus consideniana*	Yertchuck	70
123	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	55
124	*Eucalyptus consideniana*	Yertchuck	60
125	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	80
126	*Eucalyptus consideniana*	Yertchuck	75

Tree #	Scientific name	Common name	DBH
127	*Eucalyptus consideniana*	Yertchuck	65
128	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
129	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	80
130	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	70
131	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	70
132	*Eucalyptus consideniana*	Yertchuck	70
133	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	55
134	*Eucalyptus consideniana*	Yertchuck	50
135	*Eucalyptus consideniana*	Yertchuck	50
136	*Eucalyptus consideniana*	Yertchuck	50
137	*Eucalyptus consideniana*	Yertchuck	60
138	*Eucalyptus consideniana*	Yertchuck	70
139	*Eucalyptus consideniana*	Yertchuck	70
140	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	50
141	*Eucalyptus viminalis subsp. pryoriana*	Coast Manna-gum	50
142	*Eucalyptus consideniana*	Yertchuck	50
143	*Eucalyptus consideniana*	Yertchuck	55
144	*Eucalyptus ovata - Swamp Gum*	Swamp Gum	52
145	*Eucalyptus consideniana*	Yertchuck	55
146	*Eucalyptus consideniana*	Yertchuck	65
147	*Eucalyptus consideniana*	Yertchuck	60
148	*Eucalyptus consideniana*	Yertchuck	50
149	*Eucalyptus consideniana*	Yertchuck	50
150	*Eucalyptus consideniana*	Yertchuck	55
151	*Eucalyptus viminalis subsp. viminalis*	Manna Gum	100
152	*Banksia serrata*	Saw Banksia	45
153	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	50

Tree #	Scientific name	Common name	DBH
154	*Eucalyptus consideniana*	Yertchuck	50
155	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	50
156	*Dead*	Dead	50
157	*Dead*	Dead	65
158	*Banksia serrata*	Saw Banksia	40
159	*Eucalyptus consideniana*	Yertchuck	60
160	*Eucalyptus consideniana*	Yertchuck	50
161	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	55
162	*Eucalyptus consideniana*	Yertchuck	55
163	*Eucalyptus consideniana*	Yertchuck	80
164	*Eucalyptus conspicua subsp. conspicua*	Silver Swamp Stringybark	55

Appendix F. Native vegetation removal report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: **27/06/2023**
Time of issue: **2:42 pm**

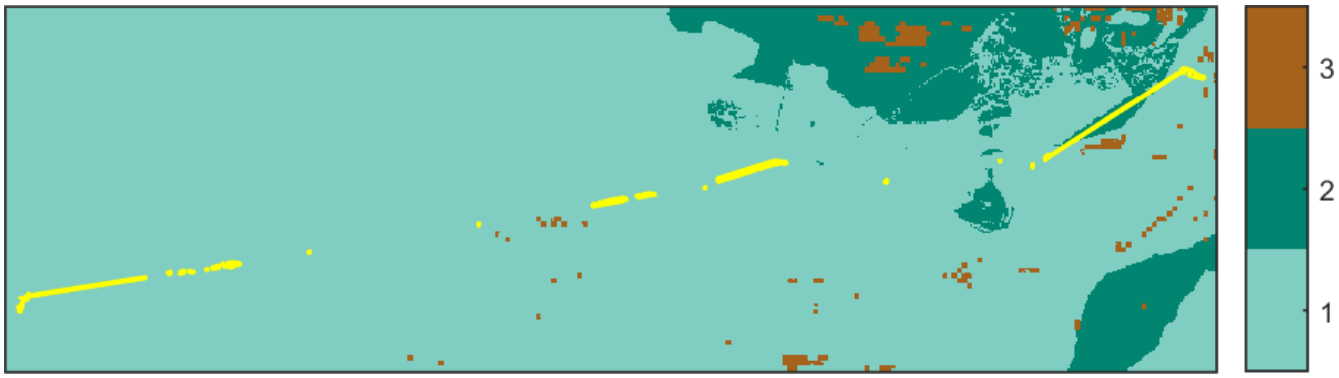
Report ID: BIO_2023_184

Project ID	ENSYM_230605

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	13.632 ha
Extent of past removal	0.000 ha
Extent of proposed removal	13.632 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	5.909 general habitat units
Vicinity	West Gippsland Catchment Management Authority (CMA) or Wellington Shire Council
Minimum strategic biodiversity value score[2]	0.569
Large trees	0 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-A	Patch	gipp0136	Vulnerable	0	no	0.220	1.352	1.352	0.624		0.362	General
2-A	Patch	gipp0136	Vulnerable	0	no	0.300	4.600	4.600	0.566		1.621	General
3-A	Patch	gipp0136	Vulnerable	0	no	0.290	0.027	0.027	0.450		0.008	General
4-A	Patch	gipp0048	Vulnerable	0	no	0.170	0.006	0.006	0.680		0.001	General
5-A	Patch	gipp0006	Rare	0	no	0.480	0.085	0.085	0.998		0.061	General
6-A	Patch	gipp0006	Rare	0	no	0.520	0.387	0.387	0.910		0.288	General
7-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.123	0.123	0.430		0.016	General
8-A	Patch	gipp0003	Vulnerable	0	no	0.460	0.069	0.069	0.460		0.035	General
9-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.040	0.040	0.458		0.005	General
10-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.007	0.007	0.450		0.001	General
11-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.039	0.039	0.458		0.005	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
12-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.249	0.249	0.530		0.034	General
13-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.045	0.045	0.920		0.008	General
14-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.003	0.003	0.460		0.000	General
15-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.001	0.001	0.920		0.000	General
16-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.015	0.015	0.920		0.003	General
17-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.004	0.004	0.450		0.001	General
18-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.025	0.025	0.460		0.003	General
19-A	Patch	gipp0048	Least Concern	0	no	0.770	0.001	0.001	0.808		0.001	General
20-A	Patch	gipp0003	Vulnerable	0	no	0.280	0.047	0.047	0.440		0.014	General
21-A	Patch	gipp0003	Vulnerable	0	no	0.220	0.030	0.030	0.460		0.007	General
22-A	Patch	gipp0003	Vulnerable	0	no	0.100	0.274	0.274	0.450		0.030	General
23-A	Patch	gipp0003	Vulnerable	0	no	0.220	0.360	0.360	0.511		0.090	General
24-A	Patch	gipp0003	Vulnerable	0	no	0.170	0.262	0.262	0.460		0.049	General
25-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.012	0.012	0.460		0.002	General
26-A	Patch	gipp0003	Vulnerable	0	no	0.760	0.026	0.026	0.870		0.027	General
27-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.011	0.011	0.460		0.001	General
28-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.797	0.797	0.939		0.139	General
29-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.043	0.043	0.460		0.006	General
30-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.054	0.054	0.790		0.009	General
31-A	Patch	gipp0003	Vulnerable	0	no	0.120	0.104	0.104	0.790		0.017	General
32-A	Patch	gipp0003	Vulnerable	0	no	0.760	0.029	0.029	0.900		0.031	General
33-A	Patch	gipp0003	Vulnerable	0	no	0.170	0.027	0.027	0.450		0.005	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
34-A	Patch	gipp0006	Rare	0	no	0.630	0.086	0.086	0.743		0.071	General
35-A	Patch	gipp0053	Endangered	0	no	0.550	0.564	0.564	0.980		0.461	General
36-A	Patch	gipp0003	Vulnerable	0	no	0.670	0.253	0.253	0.829		0.233	General
37-A	Patch	gipp0048	Least Concern	0	no	0.770	0.006	0.006	0.801		0.006	General
38-A	Patch	gipp0048	Least Concern	0	no	0.480	0.348	0.348	0.803		0.226	General
39-A	Patch	gipp0048	Least Concern	0	no	0.660	0.001	0.001	0.710		0.001	General
40-A	Patch	gipp0016	Vulnerable	0	no	0.340	0.000	0.000	0.460		0.000	General
41-A	Patch	gipp0003	Vulnerable	0	no	0.690	0.250	0.250	0.768		0.228	General
42-A	Patch	gipp0048	Least Concern	0	no	0.430	0.002	0.002	0.740		0.001	General
43-A	Patch	gipp0016	Vulnerable	0	no	0.620	0.010	0.010	0.460		0.007	General
44-A	Patch	gipp0003	Vulnerable	0	no	0.690	0.003	0.003	0.990		0.003	General
45-A	Patch	gipp0003	Vulnerable	0	no	0.760	0.025	0.025	0.907		0.028	General
46-A	Patch	gipp0006	Rare	0	no	0.440	0.197	0.197	0.733		0.112	General
47-A	Patch	gipp0053	Endangered	0	no	0.710	0.108	0.108	0.759		0.101	General
48-A	Patch	gipp0006	Rare	0	no	0.320	0.586	0.586	0.976		0.278	General
49-A	Patch	gipp0053	Endangered	0	no	0.440	0.119	0.119	0.981		0.078	General
50-A	Patch	gipp0003	Vulnerable	0	no	0.630	0.012	0.012	0.835		0.011	General
51-A	Patch	gipp0003	Vulnerable	0	no	0.420	1.740	1.740	0.967		1.078	General
52-A	Patch	gipp0048	Least Concern	0	no	0.770	0.025	0.025	0.930		0.028	General
53-A	Patch	gipp0048	Least Concern	0	no	0.770	0.000	0.000	0.930		0.000	General
54-A	Patch	gipp0048	Least Concern	0	no	0.770	0.001	0.001	0.800		0.001	General
55-A	Patch	gipp0048	Least Concern	0	no	0.770	0.000	0.000	0.800		0.000	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
56-A	Patch	gipp0048	Least Concern	0	no	0.770	0.010	0.010	0.800		0.010	General
57-A	Patch	gipp0048	Least Concern	0	no	0.770	0.001	0.001	0.800		0.001	General
58-A	Patch	gipp0048	Least Concern	0	no	0.770	0.003	0.003	0.800		0.003	General
59-A	Patch	gipp0048	Least Concern	0	no	0.420	0.051	0.051	0.472		0.024	General
60-A	Patch	gipp0048	Least Concern	0	no	0.420	0.005	0.005	0.900		0.003	General
61-A	Patch	gipp0048	Least Concern	0	no	0.420	0.008	0.008	0.900		0.005	General
62-A	Patch	gipp0048	Least Concern	0	no	0.420	0.002	0.002	0.900		0.001	General
63-A	Patch	gipp0048	Least Concern	0	no	0.420	0.002	0.002	0.900		0.001	General
64-A	Patch	gipp0048	Least Concern	0	no	0.420	0.006	0.006	0.531		0.003	General
65-A	Patch	gipp0048	Least Concern	0	no	0.420	0.001	0.001	0.450		0.000	General
66-A	Patch	gipp0048	Least Concern	0	no	0.420	0.013	0.013	0.473		0.006	General
67-A	Patch	gipp0048	Least Concern	0	no	0.420	0.018	0.018	0.502		0.009	General
68-A	Patch	gipp0048	Least Concern	0	no	0.420	0.013	0.013	0.460		0.006	General
69-A	Patch	gipp0048	Least Concern	0	no	0.420	0.003	0.003	0.460		0.002	General
70-A	Patch	gipp0048	Least Concern	0	no	0.420	0.003	0.003	0.460		0.001	General
71-A	Patch	gipp0048	Least Concern	0	no	0.420	0.000	0.000	0.460		0.000	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Dwarf Kerrawang	*Commersonia prostrata*	502965	Endangered	Dispersed	Habitat importance map	0.0039
Ribbed Thryptomene	*Thryptomene micrantha*	503396	Rare	Dispersed	Habitat importance map	0.0032
Woolly Waterlily	*Philydrum lanuginosum*	502494	Vulnerable	Dispersed	Habitat importance map	0.0026
Beardless Bog-sedge	*Schoenus imberbis*	503046	Rare	Dispersed	Habitat importance map	0.0020
Robust Spider-orchid	*Caladenia valida*	501022	Endangered	Dispersed	Habitat importance map	0.0019
Gippsland Lakes Peppermint	*Eucalyptus arenicola*	504479	Rare	Dispersed	Habitat importance map	0.0019
Creeping Rush	*Juncus revolutus*	501839	Rare	Dispersed	Habitat importance map	0.0018
Grey Billy-buttons	*Craspedia canens*	504643	Endangered	Dispersed	Habitat importance map	0.0018
Rough-grain Love-grass	*Eragrostis trachycarpa*	501197	Rare	Dispersed	Habitat importance map	0.0017
Annual Fireweed	*Senecio glomeratus subsp. longifructus*	507144	Rare	Dispersed	Habitat importance map	0.0014
Veined Spear-grass	*Austrostipa rudis subsp. australis*	504940	Rare	Dispersed	Habitat importance map	0.0013
Marsh Saltbush	*Atriplex paludosa subsp. paludosa*	500326	Rare	Dispersed	Habitat importance map	0.0011
Metallic Sun-orchid	*Thelymitra epipactoides*	503367	Endangered	Dispersed	Habitat importance map	0.0009
Golden Grevillea	*Grevillea chrysophaea*	501530	Rare	Dispersed	Habitat importance map	0.0009
Spurred Helmet-orchid	*Corybas aconitiflorus*	500835	Rare	Dispersed	Habitat importance map	0.0009
Terek Sandpiper	*Xenus cinereus*	10160	Endangered	Dispersed	Habitat importance map	0.0008
Pacific Golden Plover	*Pluvialis fulva*	10137	Vulnerable	Dispersed	Habitat importance map	0.0008
King Quail	*Coturnix chinensis victoriae*	10012	Endangered	Dispersed	Habitat importance map	0.0008
Dune Wood-sorrel	*Oxalis rubens*	502390	Rare	Dispersed	Habitat importance map	0.0008

Pink Zieria	*Zieria veronicea subsp. veronicea*	503607	Rare	Dispersed	Habitat importance map	0.0008
Swamp Everlasting	*Xerochrysum palustre*	503763	Vulnerable	Dispersed	Habitat importance map	0.0007
Maroon Leek-orchid	*Prasophyllum frenchii*	502709	Endangered	Dispersed	Habitat importance map	0.0007
Forest Bitter-cress	*Cardamine papillata*	505034	Vulnerable	Dispersed	Habitat importance map	0.0006
Veiled Fringe-sedge	*Fimbristylis velata*	501369	Rare	Dispersed	Habitat importance map	0.0006
Salt Lawrencia	*Lawrencia spicata*	501888	Rare	Dispersed	Habitat importance map	0.0006
Lacey River Buttercup	*Ranunculus amplus*	505019	Rare	Dispersed	Habitat importance map	0.0006
New Holland Mouse	*Pseudomys novaehollandiae*	11455	Vulnerable	Dispersed	Habitat importance map ; special site	0.0006
Wavy Swamp Wallaby-grass	*Amphibromus sinuatus*	503625	Vulnerable	Dispersed	Habitat importance map	0.0006
Lesser Sand Plover	*Charadrius mongolus*	10139	Critically endangered	Dispersed	Habitat importance map	0.0006
Matted Flax-lily	*Dianella amoena*	505084	Endangered	Dispersed	Habitat importance map	0.0005
Grey Mangrove	*Avicennia marina subsp. australasica*	500345	Rare	Dispersed	Habitat importance map	0.0005
Glossy Grass Skink	*Pseudemoia rawlinsoni*	12683	Vulnerable	Dispersed	Habitat importance map	0.0005
Leafy Twig-sedge	*Cladium procerum*	500786	Rare	Dispersed	Habitat importance map	0.0005
Martin's Toadlet	*Uperoleia martini*	13930	Critically endangered	Dispersed	Habitat importance map	0.0005
Purple Blown-grass	*Lachnagrostis punicea subsp. punicea*	504206	Rare	Dispersed	Habitat importance map	0.0005
Thick-lip Spider-orchid	*Caladenia tessellata*	500547	Vulnerable	Dispersed	Habitat importance map	0.0005
Trailing Hop-bush	*Dodonaea procumbens*	501090	Vulnerable	Dispersed	Habitat importance map	0.0004
Fringed Helmet-orchid	*Corybas fimbriatus*	500839	Rare	Dispersed	Habitat importance map	0.0004
Wellington Mint-bush	*Prostanthera galbraithiae*	503928	Vulnerable	Dispersed	Habitat importance map	0.0004
Tall Vanilla-lily	*Arthropodium sp. 1 (robust glaucous)*	503699	Rare	Dispersed	Habitat importance map	0.0004
Pale Swamp Everlasting	*Coronidium gunnianum*	504655	Vulnerable	Dispersed	Habitat importance map	0.0004

Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*	504222	Rare	Dispersed	Habitat importance map	0.0004
Purple Diuris	*Diuris punctata*	501084	Vulnerable	Dispersed	Habitat importance map	0.0004
Austral Crane's-bill	*Geranium solanderi var. solanderi s.s.*	505337	Vulnerable	Dispersed	Habitat importance map	0.0004
Yarra Gum	*Eucalyptus yarraensis*	501326	Rare	Dispersed	Habitat importance map	0.0004
Bushy Hedgehog-grass	*Echinopogon caespitosus var. caespitosus*	501120	Endangered	Dispersed	Habitat importance map	0.0004
Marsh Sandpiper	*Tringa stagnatilis*	10159	Vulnerable	Dispersed	Habitat importance map	0.0004
Variable Bossiaea	*Bossiaea heterophylla*	500438	Rare	Dispersed	Habitat importance map	0.0003
Slender Wire-lily	*Laxmannia gracilis*	501889	Rare	Dispersed	Habitat importance map	0.0003
Lewin's Rail	*Lewinia pectoralis pectoralis*	10045	Vulnerable	Dispersed	Habitat importance map	0.0003
Rough Blown-grass	*Lachnagrostis rudis subsp. rudis*	500159	Endangered	Dispersed	Habitat importance map	0.0003
Silky Kidney-weed	*Dichondra sp. 1*	505786	Rare	Dispersed	Habitat importance map	0.0002
Dwarf Milkwort	*Polygala japonica*	502623	Vulnerable	Dispersed	Habitat importance map	0.0002
One-flower Early Nancy	*Wurmbea uniflora*	503583	Rare	Dispersed	Habitat importance map	0.0002
Lanky Buttons	*Leptorhynchos elongatus*	501941	Endangered	Dispersed	Habitat importance map	0.0002
Small Scurf-pea	*Cullen parvum*	502773	Endangered	Dispersed	Habitat importance map	0.0002
Heath Platysace	*Platysace ericoides*	502571	Rare	Dispersed	Habitat importance map	0.0002
Little Tern	*Sterna albifrons sinensis*	10117	Vulnerable	Dispersed	Habitat importance map	0.0001
Slender Pink-fingers	*Caladenia vulgaris*	504449	Rare	Dispersed	Habitat importance map	0.0001
Fisch's Greenhood	*Pterostylis fischii*	502795	Rare	Dispersed	Habitat importance map	0.0001
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0001
Australasian Bittern	*Botaurus poiciloptilus*	10197	Endangered	Dispersed	Habitat importance map	0.0001
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*	10498	Vulnerable	Dispersed	Habitat importance map	0.0001

Grey-tailed Tattler	*Tringa brevipes*	10155	Critically endangered	Dispersed	Habitat importance map	0.0001
Eastern Water-ribbons	*Cycnogeton microtuberosum*	504537	Rare	Dispersed	Habitat importance map	0.0001
Elegant Parrot	*Neophema elegans*	10307	Vulnerable	Dispersed	Habitat importance map	0.0001
Forest Red-box	*Eucalyptus polyanthemos subsp. longior*	504754	Rare	Dispersed	Habitat importance map	0.0001
Black Falcon	*Falco subniger*	10238	Vulnerable	Dispersed	Habitat importance map	0.0001
Coastal Greenhood	*Pterostylis alveata*	503956	Vulnerable	Dispersed	Habitat importance map	0.0000
Australasian Shoveler	*Anas rhynchotis*	10212	Vulnerable	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000
Golden Pomaderris	*Pomaderris aurea*	502651	Rare	Dispersed	Habitat importance map	0.0000
Southern Toadlet	*Pseudophryne semimarmorata*	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Common Pipewort	*Eriocaulon scariosum*	501218	Rare	Dispersed	Habitat importance map	0.0000
Australian Little Bittern	*Ixobrychus dubius*	10195	Endangered	Dispersed	Habitat importance map	0.0000
Masked Owl	*Tyto novaehollandiae novaehollandiae*	10250	Endangered	Dispersed	Habitat importance map	0.0000
Intermediate Egret	*Ardea intermedia*	10186	Endangered	Dispersed	Habitat importance map	0.0000
Eastern Great Egret	*Ardea modesta*	10187	Vulnerable	Dispersed	Habitat importance map	0.0000
Freckled Duck	*Stictonetta naevosa*	10214	Endangered	Dispersed	Habitat importance map	0.0000
Musk Duck	*Biziura lobata*	10217	Vulnerable	Dispersed	Habitat importance map	0.0000
Baillon's Crake	*Porzana pusilla palustris*	10050	Vulnerable	Dispersed	Habitat importance map	0.0000
Hardhead	*Aythya australis*	10215	Vulnerable	Dispersed	Habitat importance map	0.0000
Blue-billed Duck	*Oxyura australis*	10216	Endangered	Dispersed	Habitat importance map	0.0000
Little Egret	*Egretta garzetta nigripes*	10185	Endangered	Dispersed	Habitat importance map	0.0000
Fairy Tern	*Sterna nereis nereis*	10118	Endangered	Dispersed	Habitat importance map	0.0000
Common Bent-wing Bat (eastern ssp.)	*Miniopterus schreibersii oceanensis*	61342	Vulnerable	Dispersed	Habitat importance map	0.0000

Black-tailed Godwit	*Limosa limosa*	528553	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

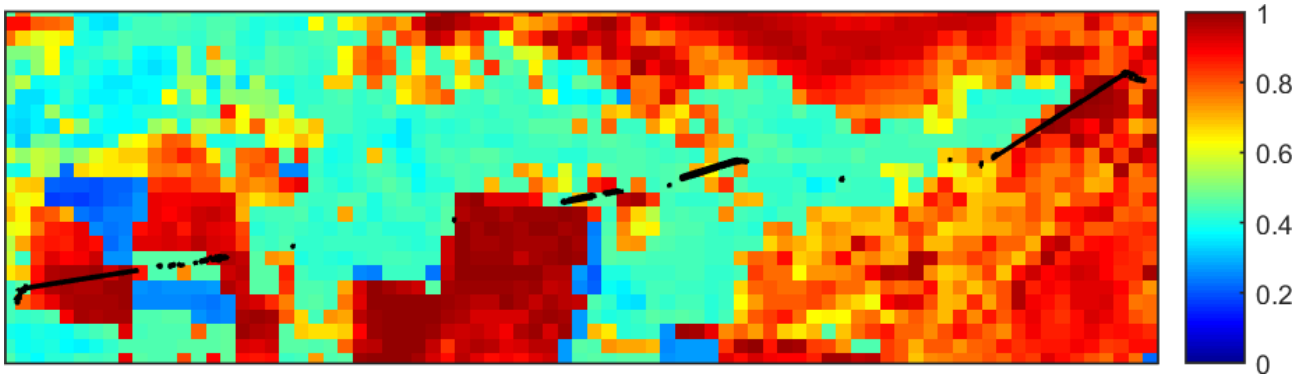
- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

Habitat impacted

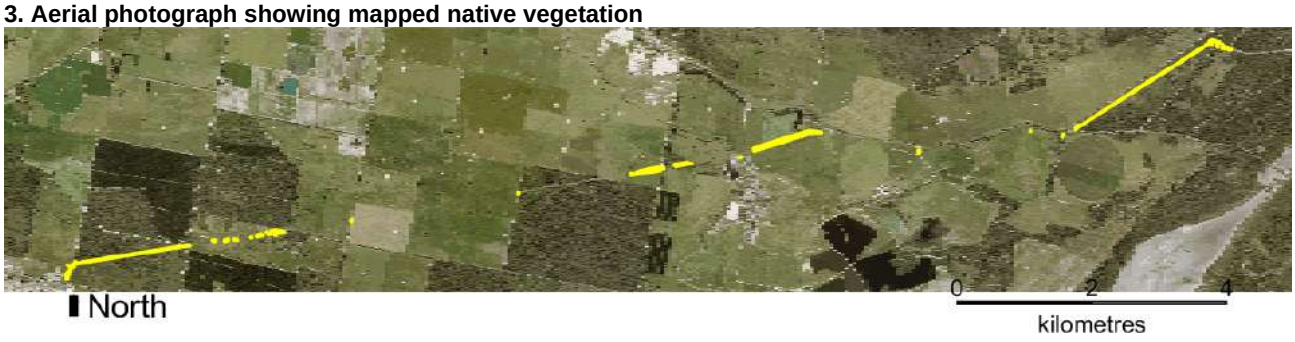
- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species
- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

Appendix G. Native vegetation offset credit availability

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 20/11/2023 01:51 **Report ID: 21848**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
5.909	0.569	0	CMA	West Gippsland
			or LGA	Wellington Shire

Details of available native vegetation credits on 20 November 2023 01:51

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0138	24.007	1605	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric
BBA-0759	18.868	659	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR
BBA-2623	15.348	638	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2751	10.307	0	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR
BBA-2810	7.758	613	West Gippsland	Latrobe City	Yes	Yes	No	VegLink
BBA-2845	20.143	642	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2875	32.836	1037	West Gippsland	Wellington Shire	Yes	Yes	No	Abezco
VC_CFL-3717_01	35.916	0	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

For more information contact the DEECA Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au

Appendix H. Arboriculture assessment report

OLDMEADOW
ARBORICULTURE
TREE CARE SPECIALISTS

Project SEA CCS

Arboricultural impact assessment

Prepared for:

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Prepared by:

Rhys Oldmeadow
Oldmeadow Arboriculture
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Report code:

22019 esso0323_AIA_V4

Site assessment:

19-20 April 2023

Report date:

19 June 2023

Stage	Title	Type	Date	Version	Author
	22019 esso0323_AIA	Arboricultural impact assessment	01 June 2023	1	Rhys Oldmeadow
	22019 esso0323_AIA_V2	Arboricultural impact assessment	13 June 2023	2	Rhys Oldmeadow
	22019 esso0323_AIA_V3	Arboricultural impact assessment	19 June 2023	3	Rhys Oldmeadow
>	22019 esso0323_AIA_V4	Arboricultural impact assessment	20 July 2023	4	Rhys Oldmeadow

Table of Contents

1. Introduction

1.1 Purpose

Oldmeadow Arboriculture has been engaged to undertake an assessment of all large or scattered trees identified by Biosis Pty Ltd within the vicinity of the proposed construction of a new CO_2 pipeline for the Gippsland Basin Joint Venture's South East Australia Carbon Capture and Storage (SEA CCS) Project. The participants in the Gippsland Basin Joint Ventures are Esso Australia Resources Pty Ltd (Esso) and Woodside Energy (Bass Strait) Pty Ltd. Esso is the operator of the Gippsland Basin Joint Venture.

Background

This version 4 report has been prepared to correct some errors in tree species identification as well as some terminology.

1.2 Scope

Large or scattered trees:

- Review native vegetation mapping, and construction proposal for the onshore pipeline.
- Undertake an assessment of **identified large/scattered trees** considered lost.
- Determine a lost or retain status for **identified large/scattered trees**.
- Provide a report detailing the assessed impact from the proposed construction works on **identified large/scattered trees** and provide recommendations to minimise the impact to retained trees.

1.3 Method

- A site visit was undertaken by Rhys Oldmeadow 19-20 April 2023.
- All observations were taken at ground level, using stage 1 of the Visual Tree Assessment (VTA) method (Mattheck and Breloer 1994).
- A representative of Esso Australia Resources Pty Ltd also attended site on 19 April to provide access and explain the likely construction methodology in field.

Documents viewed for the preparation of this report

- Advisian provided shape files illustrating the proposed *disturbance area, project area* and *avoidance area* (influenced by sensitivities identified by Biosis Pty Ltd), on Wednesday 29 April.
    - These documents were updated on 31/05/2023 to reflect changes to the construction methodology to reduce impacts.

1.4 Limitations

- The assessment was undertaken from ground and did not involve excavation; root condition was not investigated unless above ground signs were observed such as surface roots or cracking/heaving of the soil
- No instruments were used to record internal tree structure
- No aerial examination (climbing) was undertaken of the upper canopy
- Tree locations were provided by Biosis Pty Ltd and were only updated if they appeared to significantly deviate from aerial imagery.

2. Observations

2.1 Site summary

The proposed pipeline extends through a total of 40 cadastral parcels, however, only 18 of these contained large or scattered trees as identified by Biosis Pty Ltd.

A large cluster of trees is located near Valve Site 3 at the eastern end of the pipeline construction. These were predominantly of the genus *Banksia* and were situated in sandy soils.

The new pipeline also passes through agricultural land owned by Gippsland Water and some private landowners. Trees within these parcels were primarily scattered with ample room for avoidance.

There were two sections of land approximately 1400m and 1700m respectively, which contained significant numbers of identified large and scattered trees. The 1400m section in particular contained a very large number of trees in relatively close proximity to the proposed new pipeline. The proposed construction method through this area was altered to trenchless construction to avoid environmental sensitivities.

Plate 1 - Dense vegetation to the south (left) of the existing easement through crown land.

Plate 2 Patch Trees 99, 101, 128. Trenchless construction now proposed for this section of the pipeline.

2.2 Proposed new CO_2 pipeline

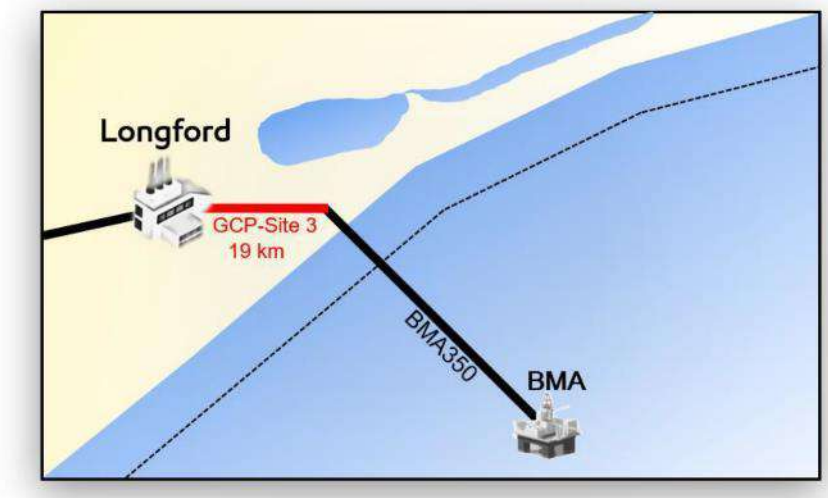


Plate 3 - Indicative route of new pipeline as provided by Advisian during the kick off meeting.

3. Discussion

3.1 Construction methodology

Where significant encroachment into tree protection zones cannot be avoided, impact mitigation measures will be required to ensure that the retained tree remains viable.

Given the nature of the proposed construction methods, impacts can be minimised using the following methods.

3.1.1 Excavation

Open-cut trenching where it occurs within tree protection zones has the potential to have the most significant detrimental impact on tree health, and potentially stability, as it severs roots. Large tree roots can branch prolifically and support a significant number of smaller and fibrous roots which ultimately source water and oxygen enabling trees to function. Severing large roots can thus have a very significant impact on tree health as it may remove a large proportion of total root mass.

Mitigation options

Utilise trenchless construction at a depth below 1000mm. This technique will bore below most tree roots and have a negligible impact on tree health.

3.1.2 Compaction and site scraping

Compaction and site scraping may not have the immediate impact that removing large woody roots can have, however, most tree roots are in the top 600mm of the soil profile. Site scraping of even 100-200mm to achieve a level grade for access roads can therefore remove a significant portion of fibrous roots; the function of which is to absorb water. Additionally, movement of heavy vehicles across tree protection zones can cause compaction, which reduces the permeability of water, and can ultimately cause root death.

Mitigation options

Operate machinery within existing cleared easement minimising any encroachment into tree protection zones or lay down compaction matting such as HDPE mats, steel plates or rumble boards where vehicles must traverse the tree protection zones.

Ensure site scraping is not greater than 100mm or utilise geotextile fabric and use fill to achieve grade for vehicle access tracks.

4. Conclusion

A total of 192 trees (28 scattered and 164 patch) were identified by Biosis Pty Ltd which may be impacted by the proposed construction of an additional pipeline adjacent to existing pipelines.

Careful construction methodology which considers (among other things) the size and proximity of adjacent trees, has all but eliminated any expected impacts to identified large and scattered trees. Individual recommendations for trees can be found in Appendix 1: Tree data, but generally involve either:

- Trenchless construction at a depth >1000mm
- Installing star pickets (or similar) and flagged bunting at the edge of the easement to prevent machinery access into uncleared land will assist in protecting trees proposed for retention
- Utilising ground protection techniques inside Tree Protection Zones (TPZ) such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.

If the above measures are undertaken (as prescribed in Appendix 1: Tree Data), none of the 192 assessed trees will require removal or are expected to be impacted to such an extent so as to be considered lost.

5. References

Standards Australia, AS 4373-2007 Pruning of amenity trees

Standards Australia, AS 4970-2009 Protection of trees on development sites

6. Appendix 1: Tree Data

- DBH: Diameter at breast height
- TPZ: Tree protection Zone
- SRZ: Structural root zone
- ULE: Useful life expectancy

Scattered

ID	Species	DBH	TPZ	Comments	Impact	Recommend
1	Dead	50	6	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Do not trench within 2m to maintain stability.
2	Dead	59	7.1	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Do not trench within 2m to maintain stability.
3	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	148	15	Abundant space to keep clear of TPZ.	Low.	Ensure all works are outside of TPZ.
4	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	88	10.6	Abundant space to keep clear of TPZ.	Low.	Ensure all works are outside of TPZ.
5	Dead	24	2.9	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Do not trench within 2m to maintain stability.
6	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Tree well removed from proposed trench.	Low	Ensure all works are outside of TPZ.
7	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	122	14.6	GPS point was inaccurate and has been adjusted. Tree well removed from proposed trench.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
8	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	Tree well removed from proposed trench.	Low	Ensure all works are outside of TPZ.
9	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	100	12	<1% encroachment from proposed trench. Tree will tolerate.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
10	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	65	7.8	Tree well removed from proposed trench.	Low.	Ensure all works are outside of TPZ.

ID	Species	DBH	TPZ	Comments	Impact	Recommend
11	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	110	13.2	Tree well removed from proposed trench.	Low.	Ensure all works are outside of TPZ.
12	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	Tree well removed from proposed trench.	Low.	Ensure all works are outside of TPZ.
13	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	Tree located far side of existing pipelines, well removed from trench.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
14	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	Tree located far side of existing pipelines, well removed from trench.	Low.	Ensure all works are outside of TPZ.
15	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	87	10.4	Proposed trenchless construction.	Low	Ensure trenchless construction is at >1000mm depth.
16	Eucalyptus viminalis subsp. viminalis - Manna Gum	94	11.3	Tree well removed from proposed trench.	Low.	Ensure all works are outside of TPZ.
17	Eucalyptus viminalis subsp. viminalis - Manna Gum	55	6.6	Abundant space to avoid the TPZ.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
18	Eucalyptus viminalis subsp. viminalis - Manna Gum	55	6.6	Abundant space to avoid the TPZ.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
19	Dead	70	8.4	Abundant space to avoid the TPZ.	Low.	Do not trench within 2m to maintain stability.
20	Eucalyptus viminalis subsp. viminalis - Manna Gum	100	12	Abundant space to avoid the TPZ.	Low.	Ensure all works are outside of TPZ.
21	Eucalyptus viminalis subsp. viminalis - Manna Gum	105	12.6	Abundant space to avoid the TPZ.	Low.	Ensure all works are outside of TPZ.
22	Dead	70	8.4	Abundant space to keep clear of TPZ.	Low.	Do not trench within 2m to maintain stability.
23	Dead	70	8.4	Abundant space to keep clear of TPZ.	Low.	Do not trench within 2m to maintain stability.
24	Eucalyptus viminalis subsp. viminalis - Manna Gum	30	3.6	Abundant space to keep clear of TPZ.	Low.	Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.

ID	Species	DBH	TPZ	Comments	Impact	Recommend
100	Dead	62	7.4	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Do not trench within 2m to maintain stability.
101	Dead	64	7.7	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Ensure all works are outside of TPZ.
102	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	89	10.7	Abundant space to keep clear of TPZ.	Low.	Ensure all works are outside of TPZ.
103	Dead	75	9	Dead tree, trunk well outside construction footprint. TPZ not applicable.	Low.	Ensure all works are outside of TPZ.

Patch

ID	Species	DBH	TPZ	Comments	Impact	Recommend
1	Banksia serrata	40	4.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
2	Banksia serrata	60	7.2	Pipeline proposed to be installed utilising trenchless construction.	Low.	Ensure all works are outside TPZ.
3	Eucalyptus arenicola - Gippsland Lakes Peppermint	52	6.2	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
4	Banksia serrata	46	5.5	Pipeline proposed to be installed utilising trenchless construction.	Low.	Ensure all works are outside TPZ.
5	Banksia serrata	65	7.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
6	Eucalyptus arenicola - Gippsland Lakes Peppermint	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
7	Banksia serrata	46	5.5	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
8	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
9	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
10	Banksia serrata	60	7.2	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
11	Banksia serrata	40	4.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
12	Banksia serrata	40	4.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
13	Banksia serrata	48	5.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
14	Banksia serrata	42	5	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.

15	Eucalyptus Arenicola - Gippsland Lakes Peppermint	58	7	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
16	Banksia serrata	42	5	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
17	Banksia serrata	42	5	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
18	Banksia serrata	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
19	Eucalyptus Arenicola - Gippsland Lakes Peppermint	52	6.2	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
20	Eucalyptus viminalis - Manna Gum	54	6.5	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
21	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
22	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
23	Banksia serrata	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
24	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
25	Eucalyptus consideniana - Yertchuk	110	13.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
26	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
27	Banksia serrata	40	4.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure all works are outside TPZ.
28	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
29	Banksia serrata	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
30	Eucalyptus consideniana - Yertchuk	72	8.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
31	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
32	Eucalyptus consideniana - Yertchuk	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

33	Eucalyptus consideniana - Yertchuk	114	13.7	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
34	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
35	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
36	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
37	Eucalyptus consideniana - Yertchuk	85	10.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
38	Banksia serrata	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
39	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	75	9	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
40	Banksia serrata	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
41	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
42	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
43	Banksia serrata	40	4.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
44	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
45	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
46	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
47	Eucalyptus consideniana - Yertchuk	93	11.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
48	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
49	Eucalyptus consideniana - Yertchuk	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

50	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
51	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
52	Banksia serrata	65	7.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
53	Banksia serrata	83	10	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
54	Banksia serrata	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
55	Banksia serrata	60	7.2	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
56	Eucalyptus consideniana - Yertchuk	90	10.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
57	Eucalyptus consideniana - Yertchuk	90	10.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
58	Banksia serrata	55	6.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
59	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	95	11.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
60	Banksia serrata	50	6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
61	Eucalyptus consideniana - Yertchuk	120	14.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
62	Banksia serrata	56	6.7	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
63	Eucalyptus consideniana - Yertchuk	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
64	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
65	Banksia serrata	65	7.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
66	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
67	Banksia serrata	40	4.8	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
68	Eucalyptus arenicola - Gippsland Lakes Peppermint	75	9	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.

69	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
70	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
71	Dead	110	13.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
72	Eucalyptus consideniana - Yertchuk	95	11.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
73	Eucalyptus ovata - Swamp Gum	95	11.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
74	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
75	Eucalyptus consideniana - Yertchuk	107	12.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
76	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
77	Eucalyptus consideniana - Yertchuk	73	8.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
78	Eucalyptus consideniana - Yertchuk	71	8.5	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
79	Eucalyptus ovata - Swamp Gum	90	10.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
80	Eucalyptus consideniana - Yertchuk	82	9.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
81	Eucalyptus consideniana - Yertchuk	71	8.5	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
82	Eucalyptus viminalis subsp. viminalis - Manna Gum	80	9.6	4 large trees in road reserve. Proposed trenchless construction.	Low.	Ensure trenchless construction is at >1000mm depth.
83	Eucalyptus viminalis subsp. viminalis - Manna Gum	76	9.1	4 large trees in road reserve. Proposed trenchless construction.	Low.	Ensure trenchless construction is at >1000mm depth.

84	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	75	9	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
85	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
86	Eucalyptus radiata subsp. radiata - Narrow-leaf Peppermint	70	8.4	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
87	Eucalyptus viminalis subsp. viminalis - Manna Gum	102	12.2	Trunk ~10m from proposed open trench.	Low.	Utilise TPZ fence, star pickets with flag bunting, at edge current cleared zone. Utilise ground protection.
88	Eucalyptus viminalis subsp. viminalis - Manna Gum	75	9	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
89	Dead	85	10.2	4 large trees in road reserve. Dead tree. Proposed trenchless construction.	Low.	Ensure trenchless construction is at >1000mm depth.
90	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	87	10.4	Trunk ~10m from open trench.	Low.	Clear self-seeded trees from beneath. Utilise ground protection inside TPZ such as steel plates, HDPE matting or rumble boards in accordance with AS4970 Protection of trees on development sites.
91	Eucalyptus viminalis subsp. viminalis - Manna Gum	72	8.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
92	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	4 large trees in road reserve. Proposed trenchless construction.	Low.	Ensure trenchless construction is at >1000mm depth.
93	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	78	9.4	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
94	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	116	13.9	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
95	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
96	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	85	10.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
97	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
98	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	130	15	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure all works are outside TPZ.

99	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	82	9.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
100	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	86	10.3	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
101	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	102	12.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
102	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	90	10.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
103	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
104	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
105	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	125	15	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
106	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	110	13.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
107	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	100	12	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
108	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
109	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
110	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
111	Eucalyptus consideniana - Yertchuk	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
112	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
113	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

114	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
115	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
116	Eucalyptus consideniana - Yertchuk	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
117	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
118	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
119	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
120	Eucalyptus consideniana - Yertchuk	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
121	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
122	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
123	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
124	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
125	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
126	Eucalyptus consideniana - Yertchuk	75	9	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
127	Eucalyptus consideniana - Yertchuk	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

128	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Moderate.	Ensure trenchless construction is at >1000mm depth.
129	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
130	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
131	Eucalyptus viminalis subsp. viminalis - Manna Gum	70	8.4	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
132	Eucalyptus consideniana - Yertchuk	70	8.4	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
133	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
134	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
135	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
136	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
137	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
138	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
139	Eucalyptus consideniana - Yertchuk	70	8.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
140	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
141	Eucalyptus viminalis subsp. pryoriana - Coast Manna-gum	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
142	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

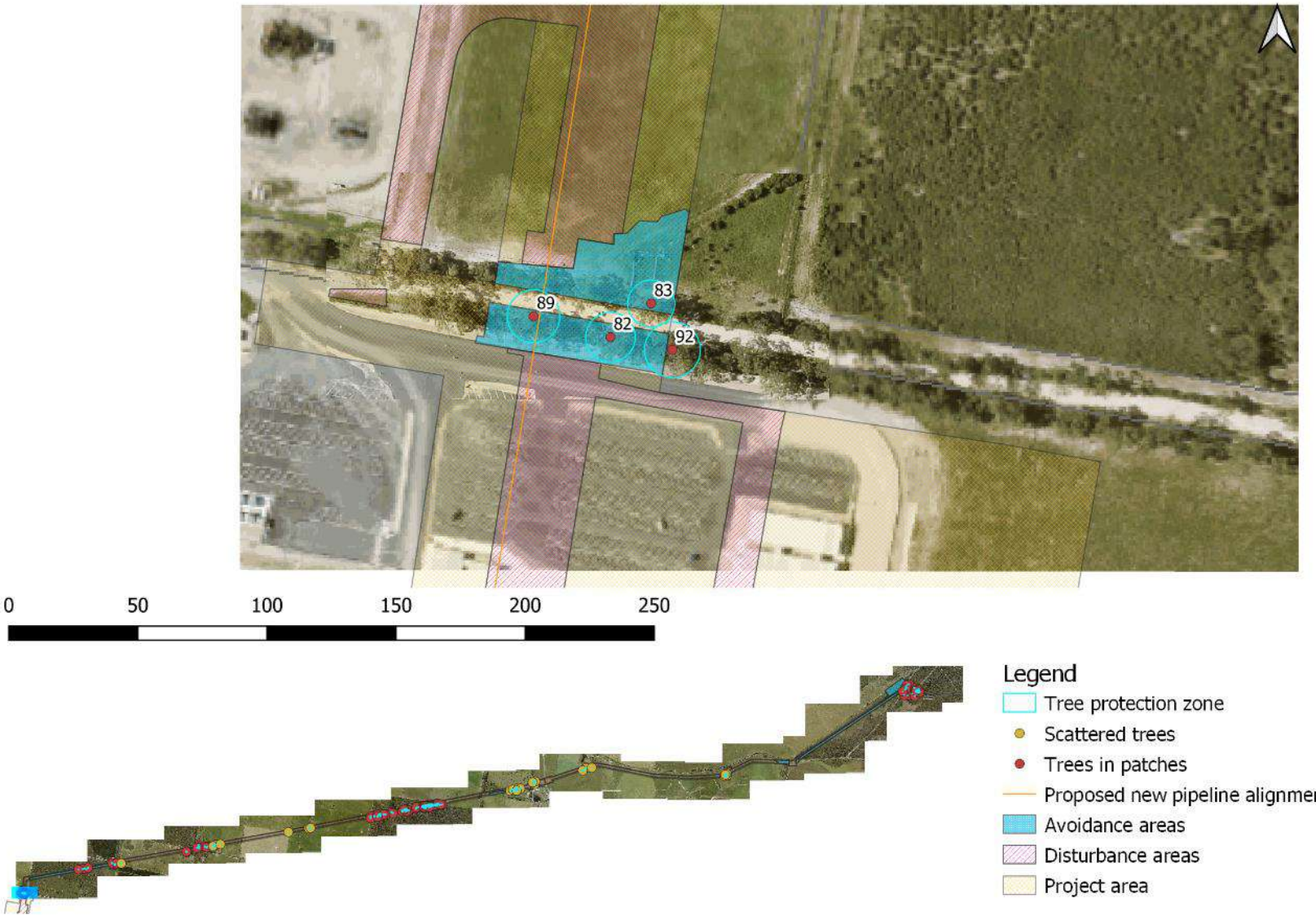
143	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
144	Eucalyptus ovata - Swamp Gum	52	6.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
145	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
146	Eucalyptus consideniana - Yertchuk	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
147	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
148	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
149	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
150	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
151	Eucalyptus viminalis subsp. viminalis - Manna Gum	100	12	Well removed from proposed works.	Low.	Ensure all works are outside TPZ.
152	Banksia serrata	45	5.4	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
153	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
154	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
155	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
156	Dead	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
157	Dead	65	7.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

158	Banksia serrata	40	4.8	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
159	Eucalyptus consideniana - Yertchuk	60	7.2	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
160	Eucalyptus consideniana - Yertchuk	50	6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
161	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
162	Eucalyptus consideniana - Yertchuk	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
163	Eucalyptus consideniana - Yertchuk	80	9.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.
164	Eucalyptus conspicua subsp. conspicua - Silver Swamp Stringybark	55	6.6	Pipeline proposed to be installed utilising trenchless construction. No impact to trees.	Low.	Ensure trenchless construction is at >1000mm depth.

7. Appendix 2: Aerial maps

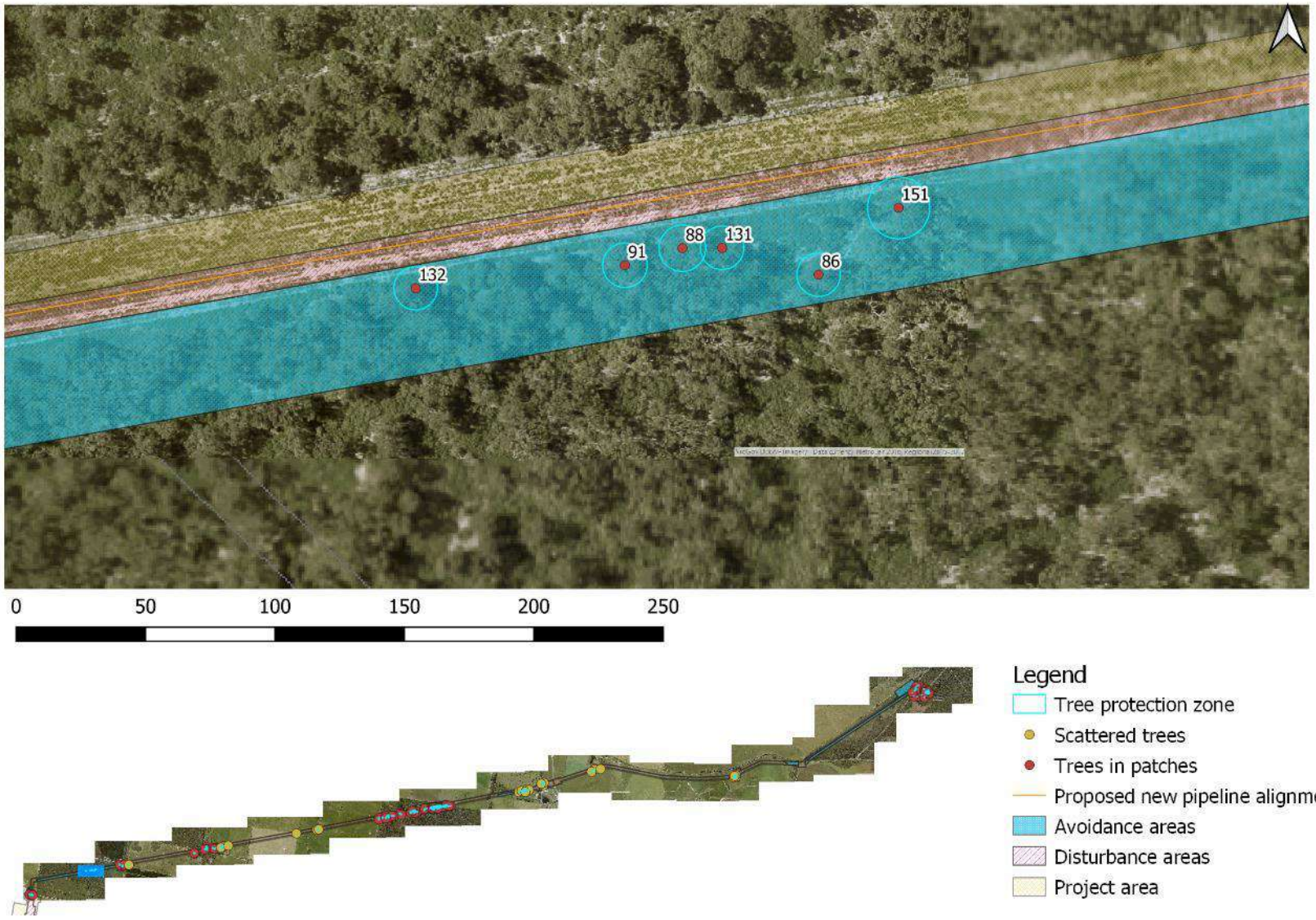
SEA-CSS

Map 1 of 16



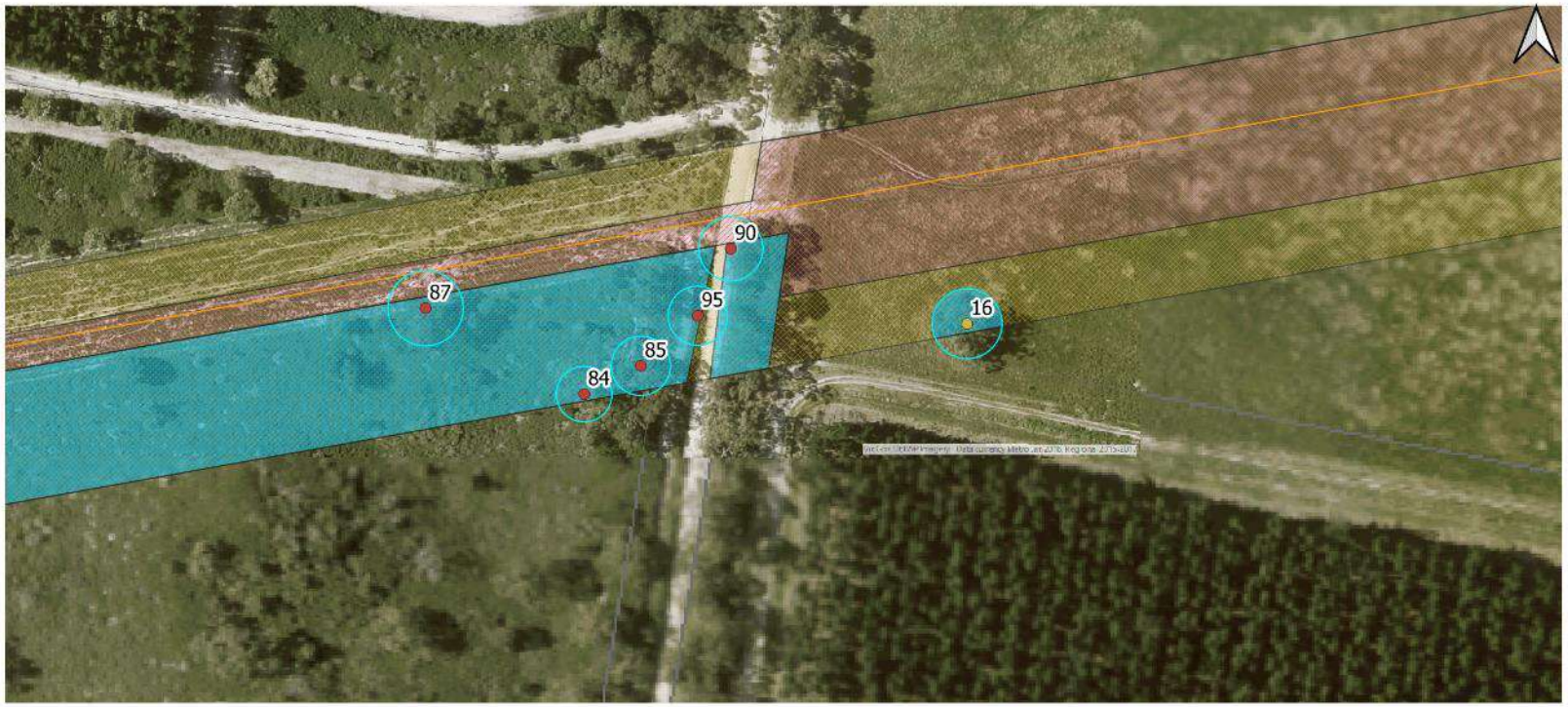
SEA-CSS

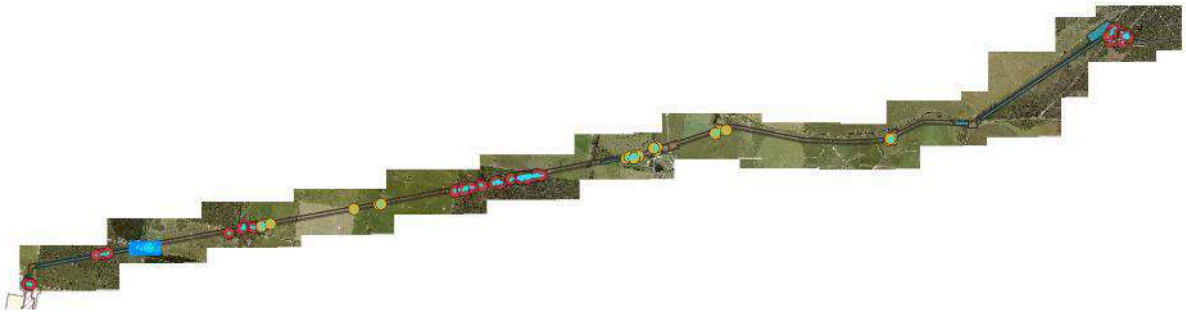
Map 2 of 16



SEA-CSS

Map 3 of 16



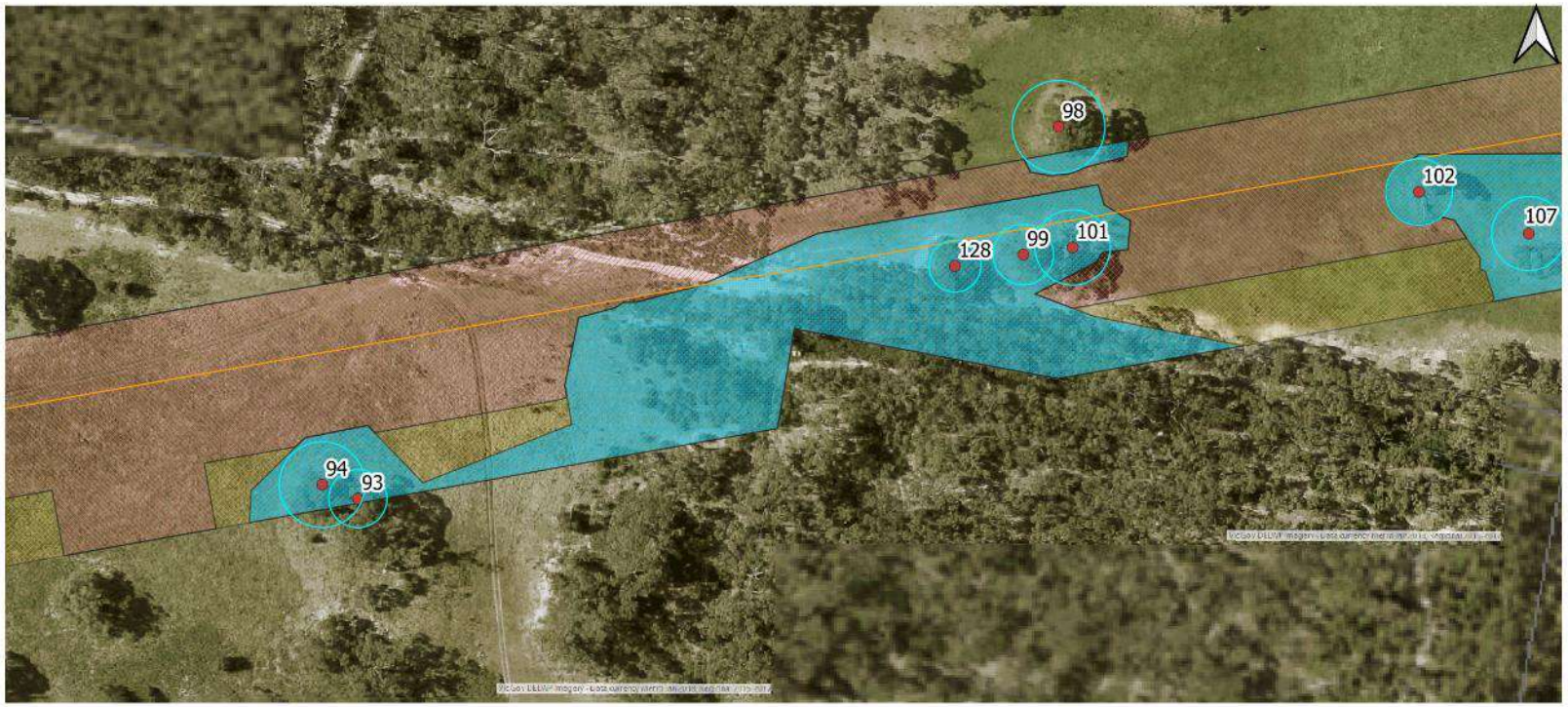


Legend

- Tree protection zone
- Scattered trees
- Trees in patches
- Proposed new pipeline alignment
- Avoidance areas
- Disturbance areas
- Project area

SEA-CSS

Map 4 of 16



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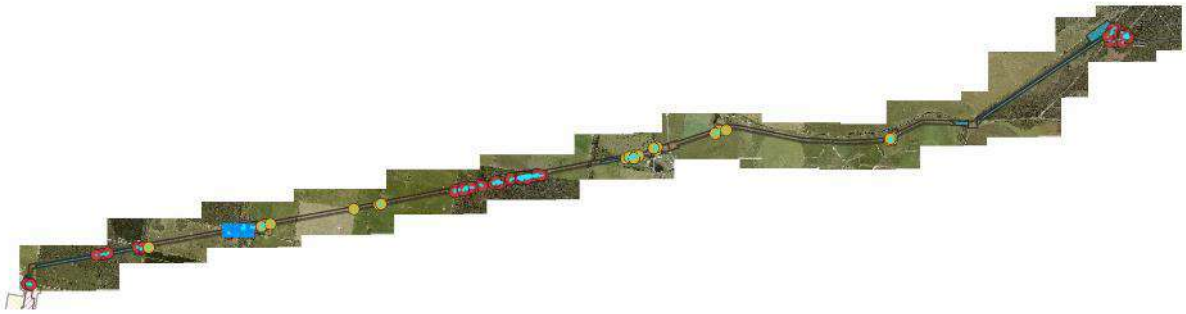
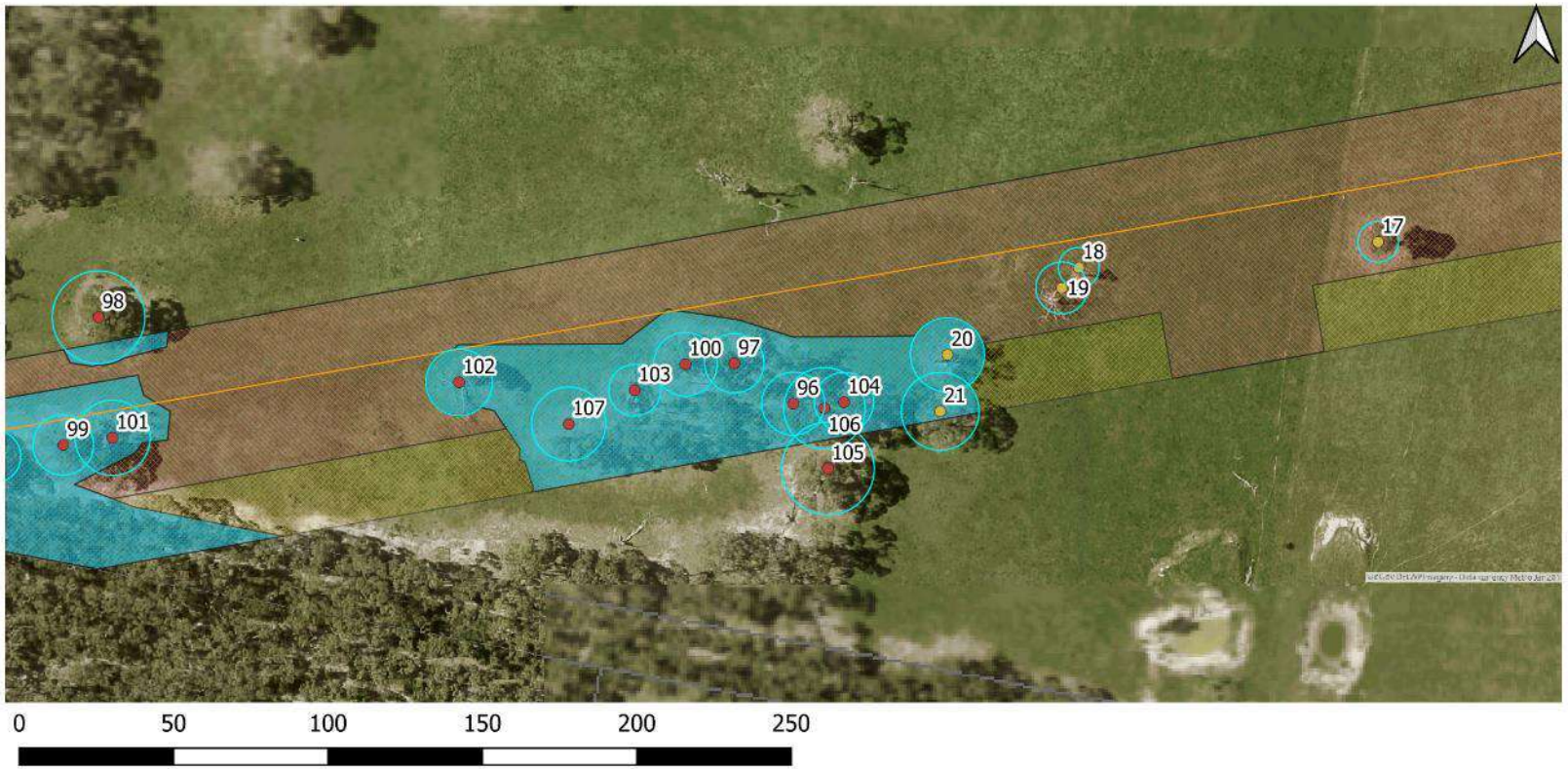


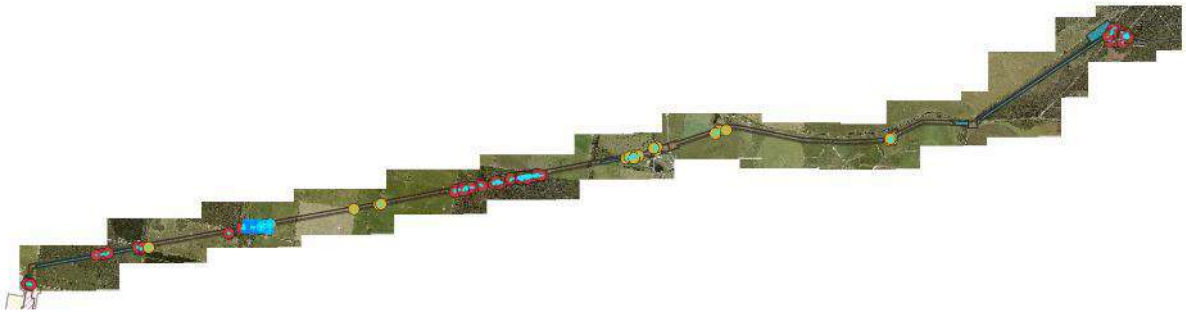
Legend

- Tree protection zone
- Scattered trees
- Trees in patches
- Proposed new pipeline alignment
- Avoidance areas
- Disturbance areas
- Project area

SEA-CSS

Map 5 of 16



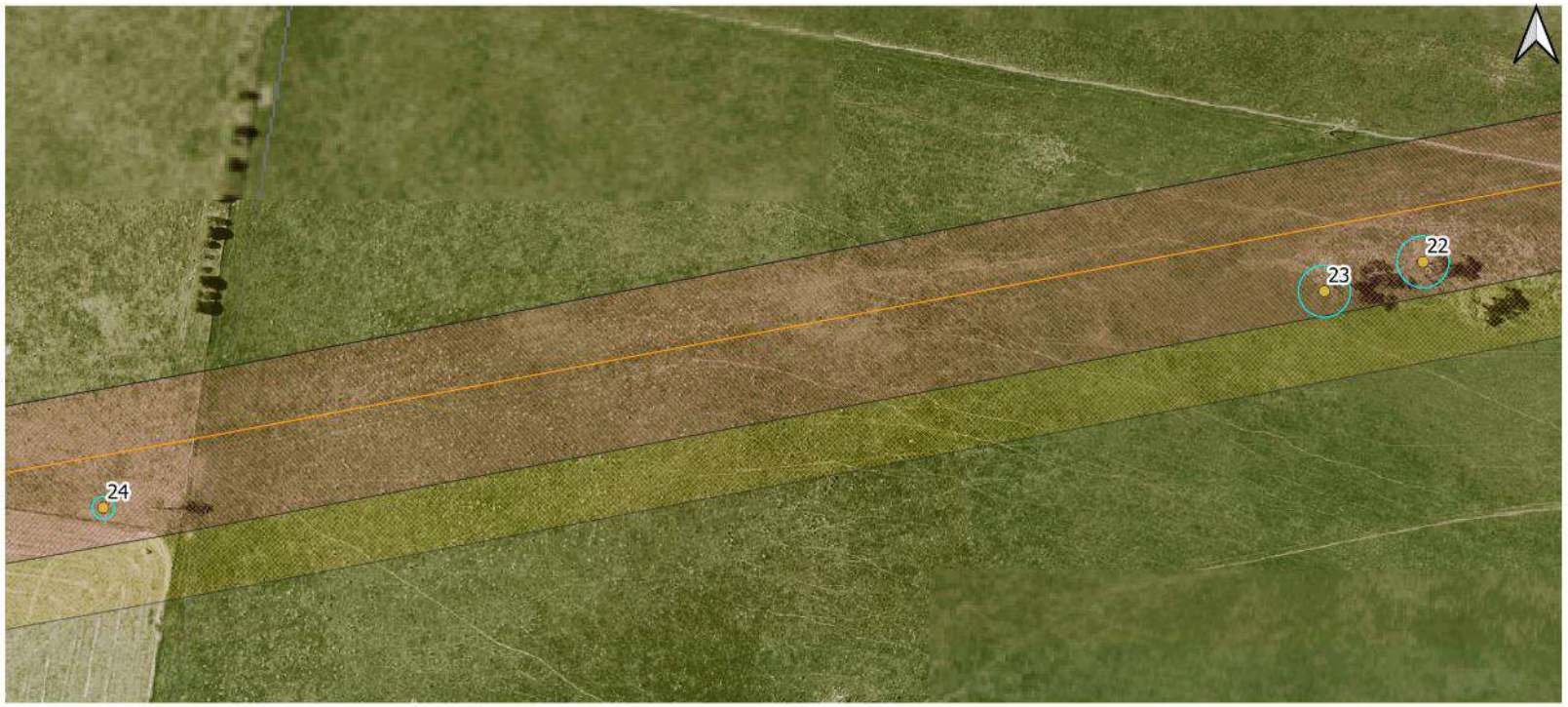


Legend

- Tree protection zone
- Scattered trees
- Trees in patches
- Proposed new pipeline alignment
- Avoidance areas
- Disturbance areas
- Project area

SEA-CSS

Map 6 of 16



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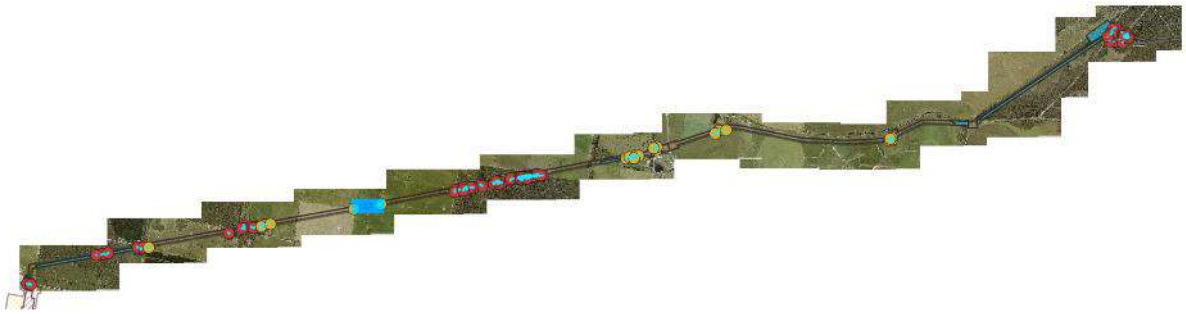
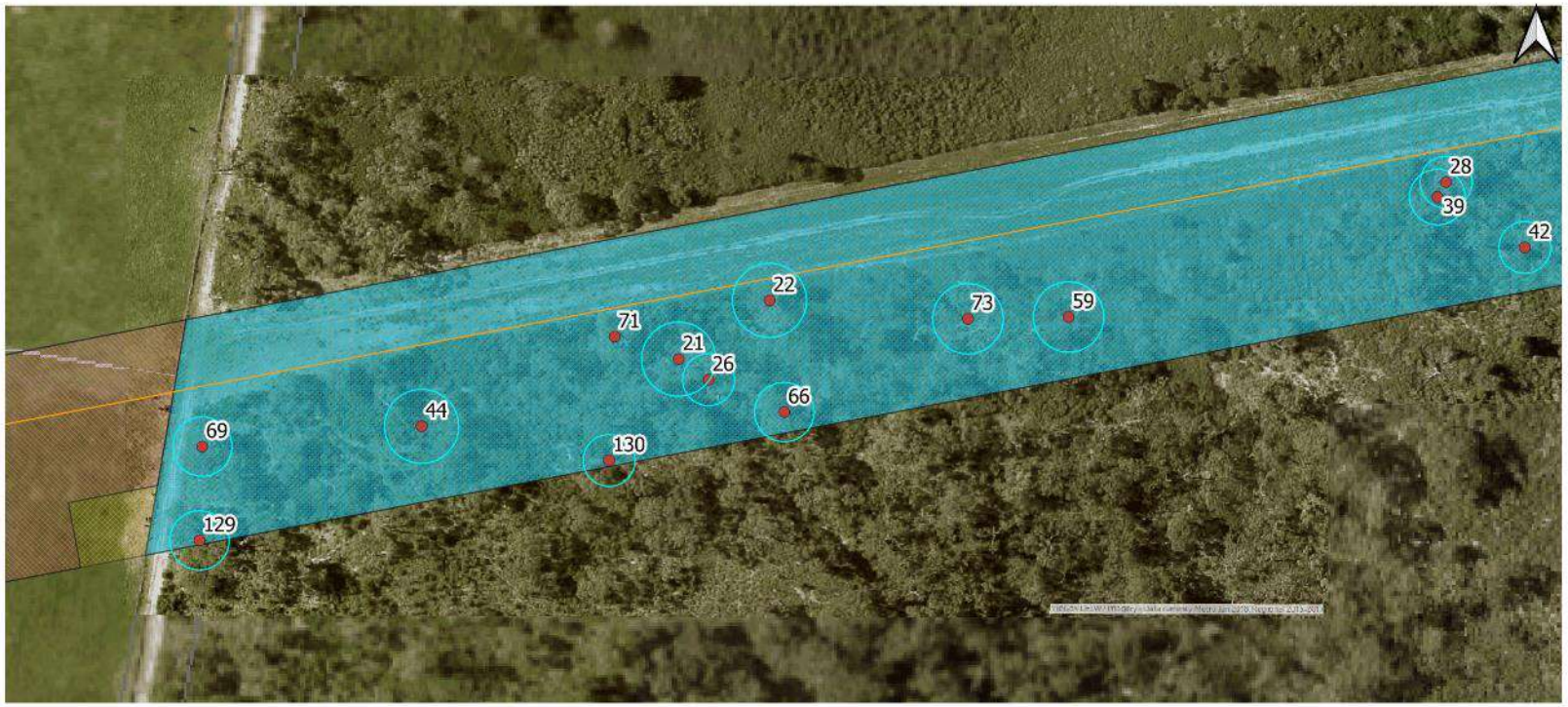


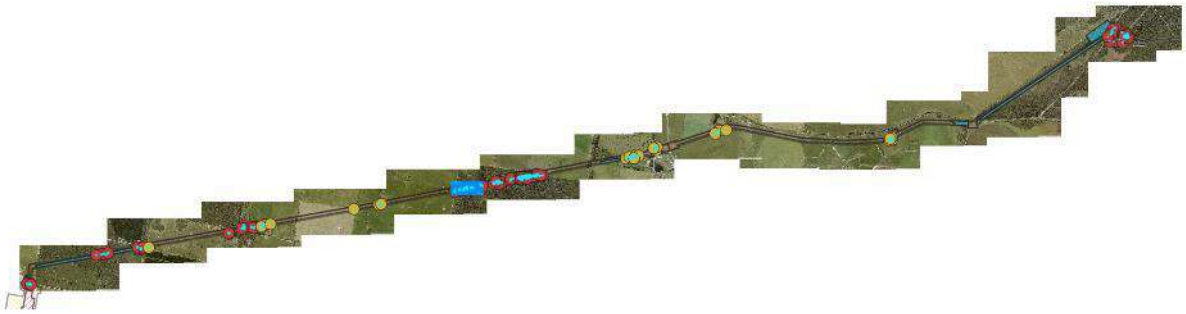
Legend

- Tree protection zone
- Scattered trees
- Trees in patches
- Proposed new pipeline alignment
- Avoidance areas
- Disturbance areas
- Project area

SEA-CSS

Map 7 of 16



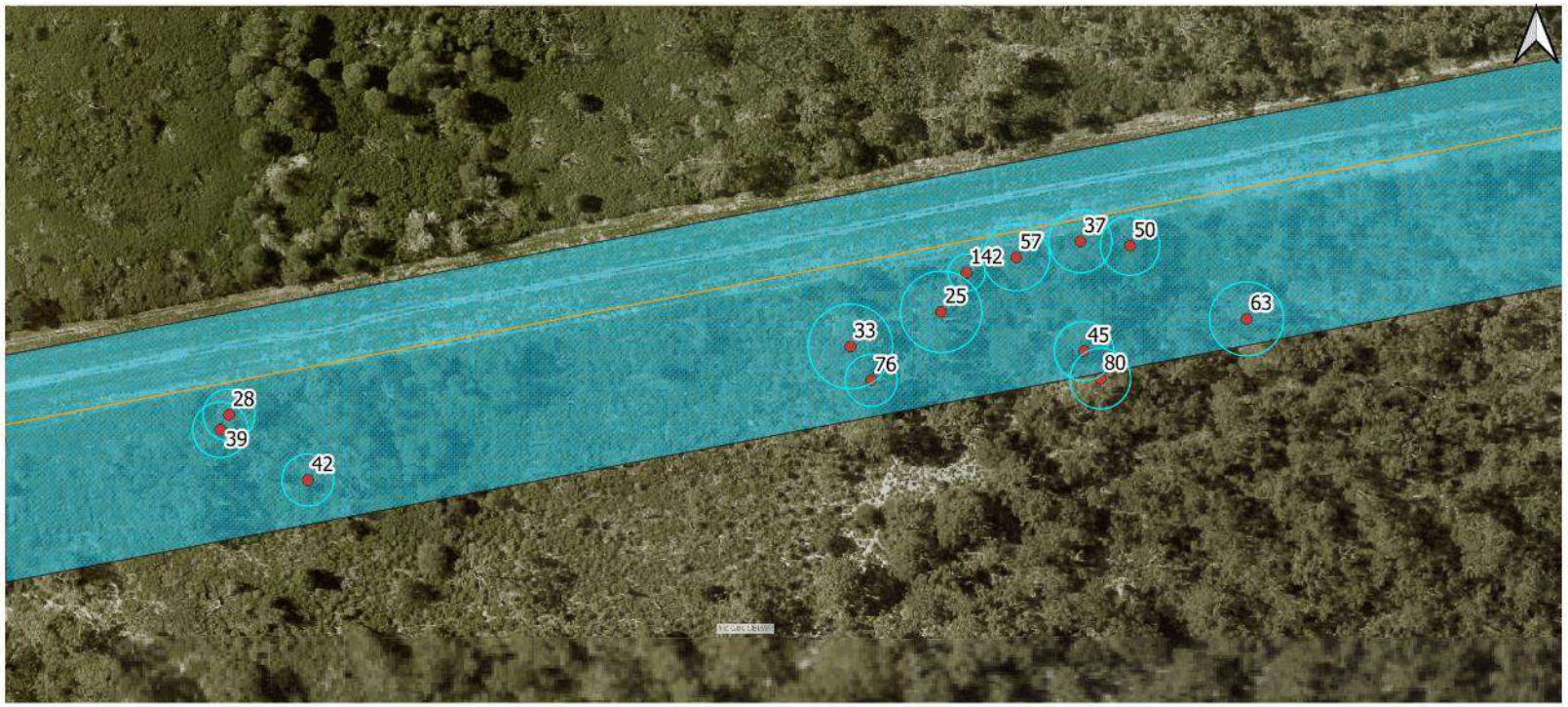


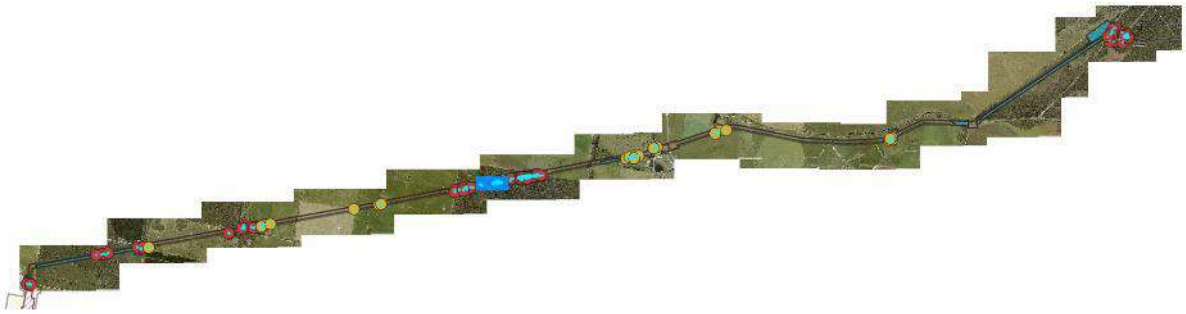
Legend

- Tree protection zone
- Scattered trees
- Trees in patches
- Proposed new pipeline alignment
- Avoidance areas
- Disturbance areas
- Project area

SEA-CSS

Map 8 of 16





Legend
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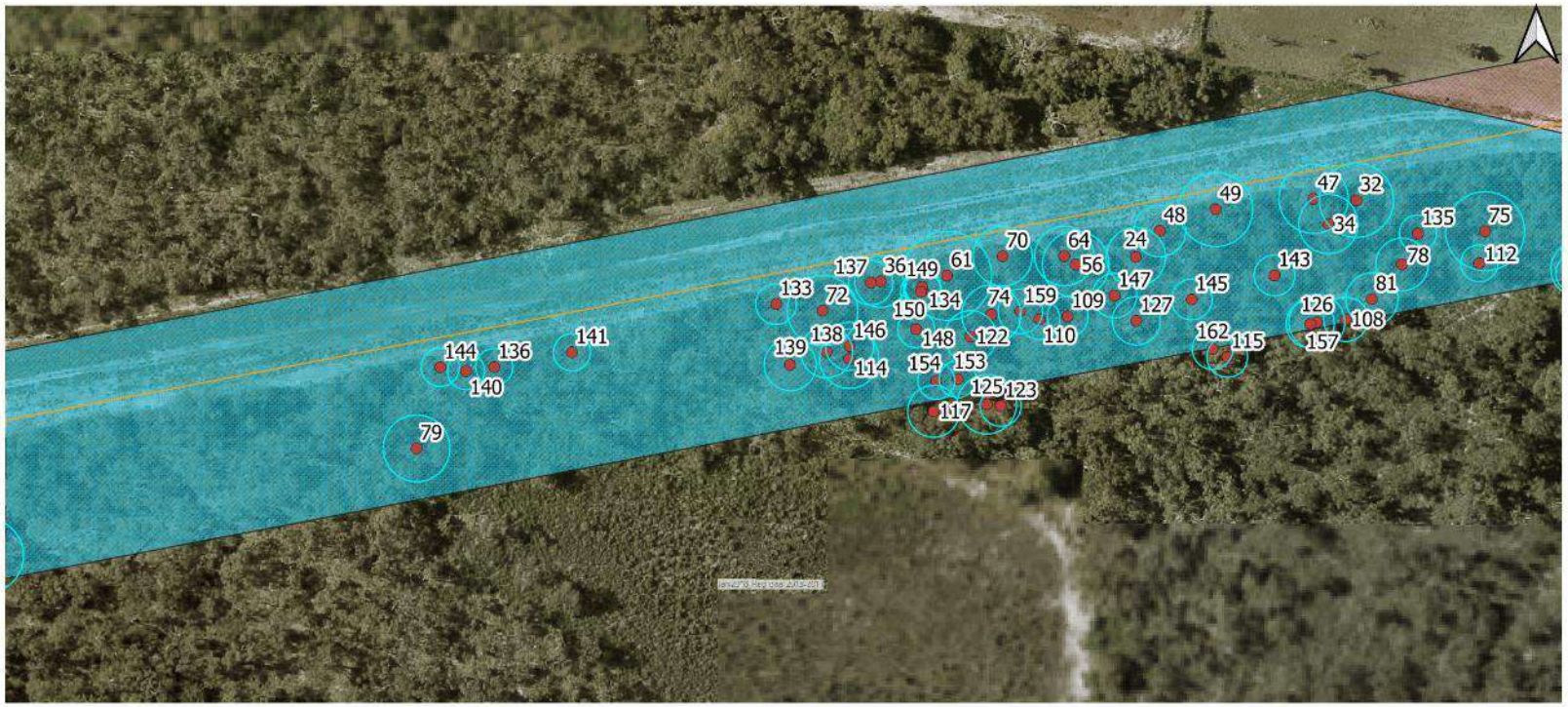
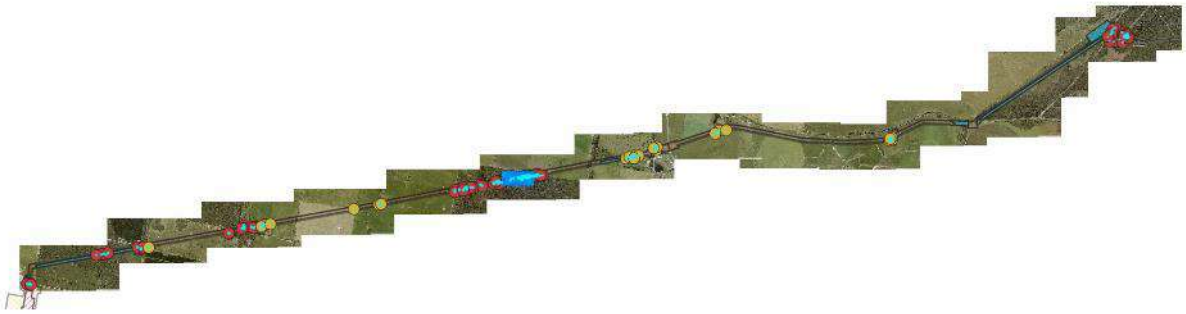
Map 9 of 16





Legend

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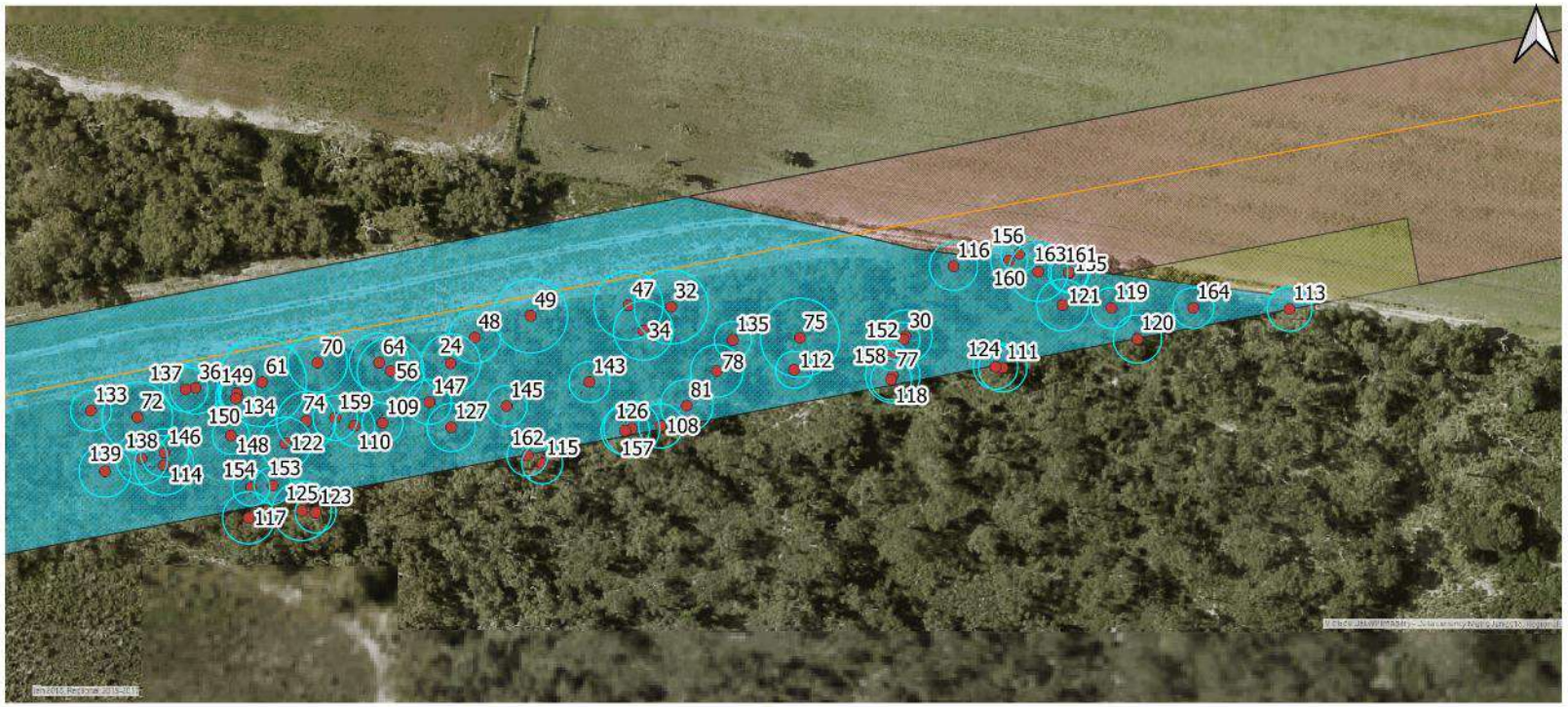
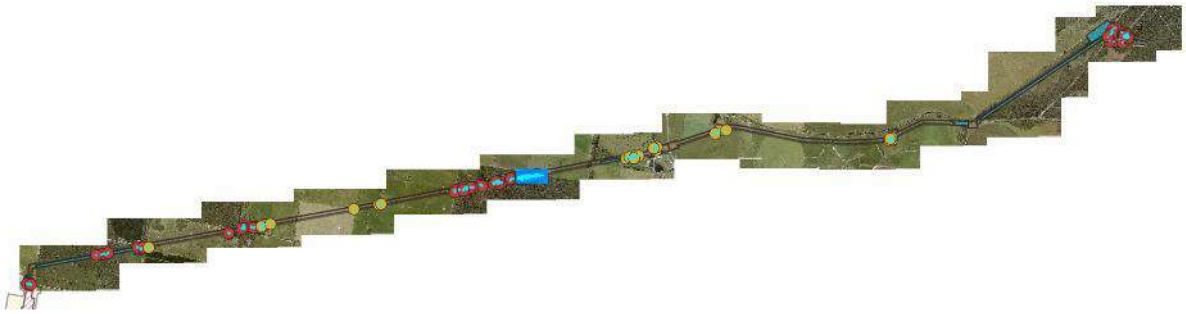
SEA-CSS

Map 10 of 16





Legend

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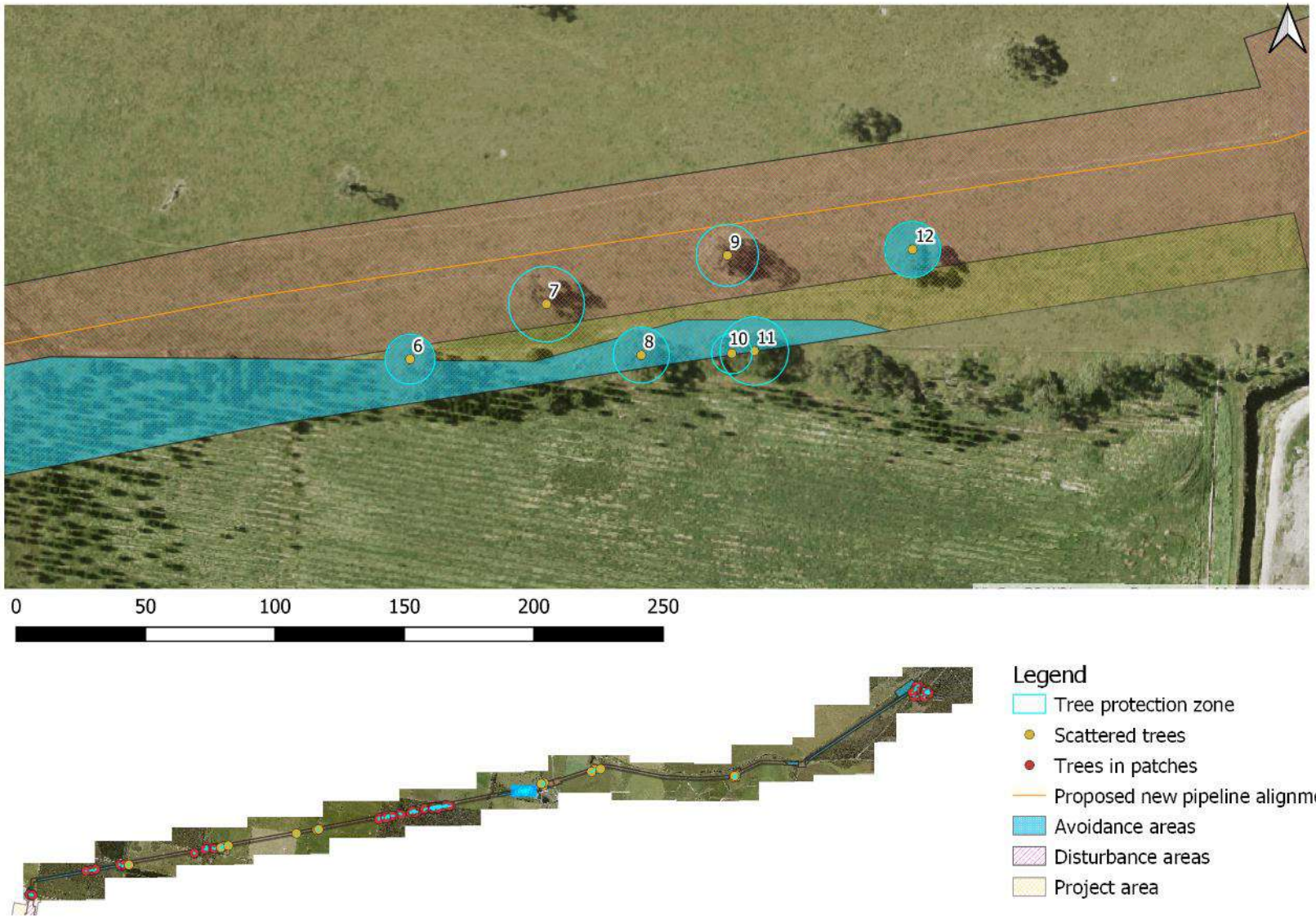
Map 11 of 16



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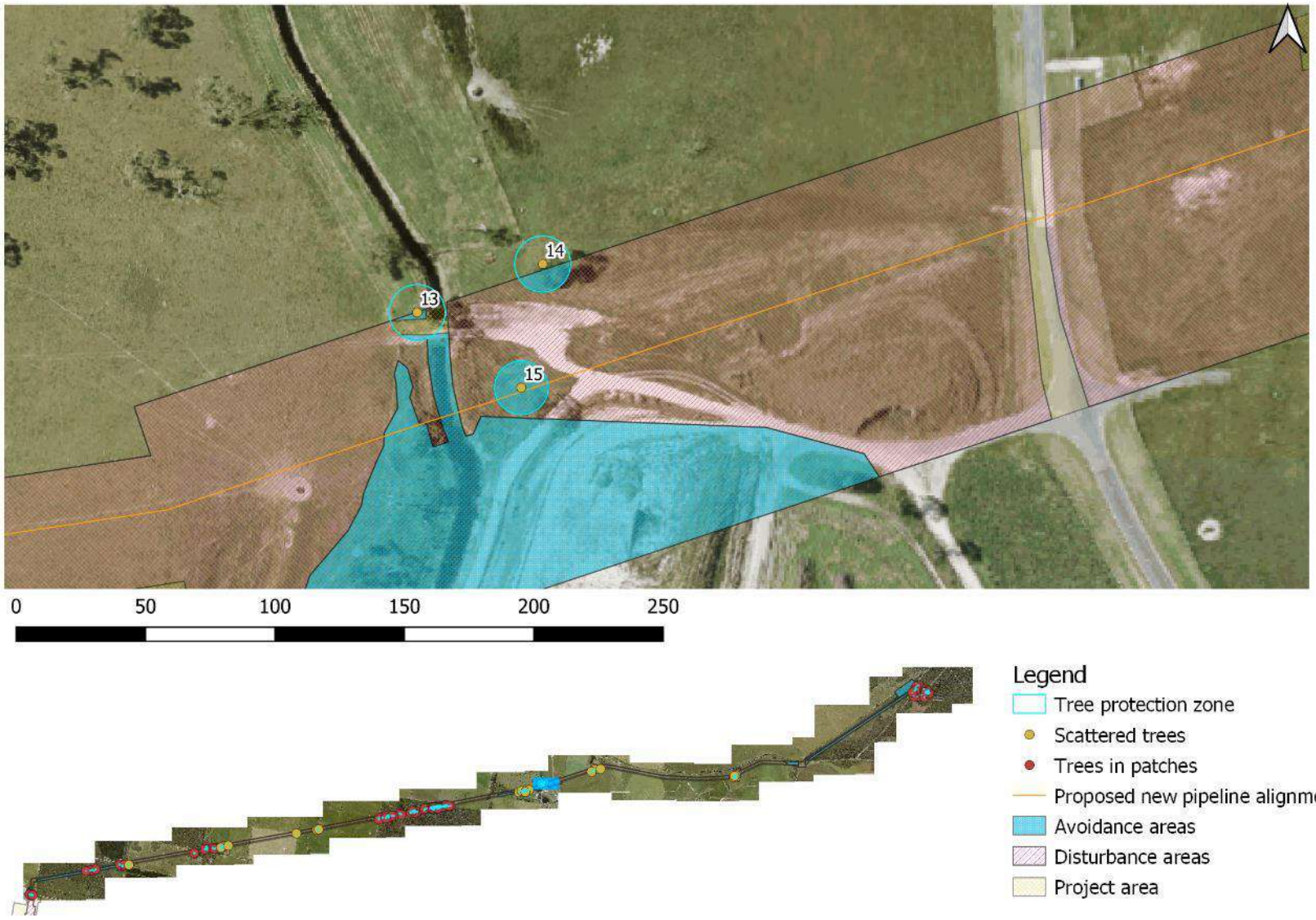

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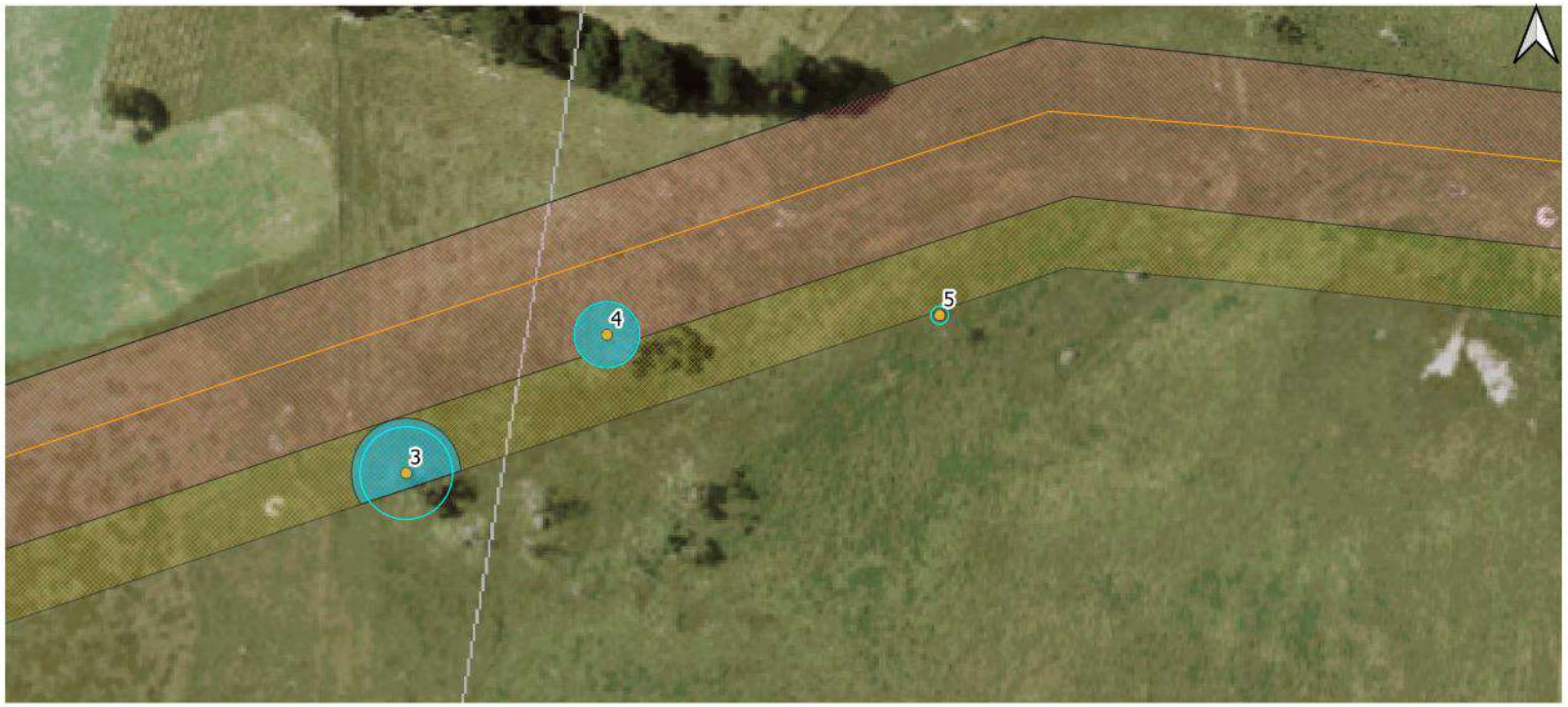

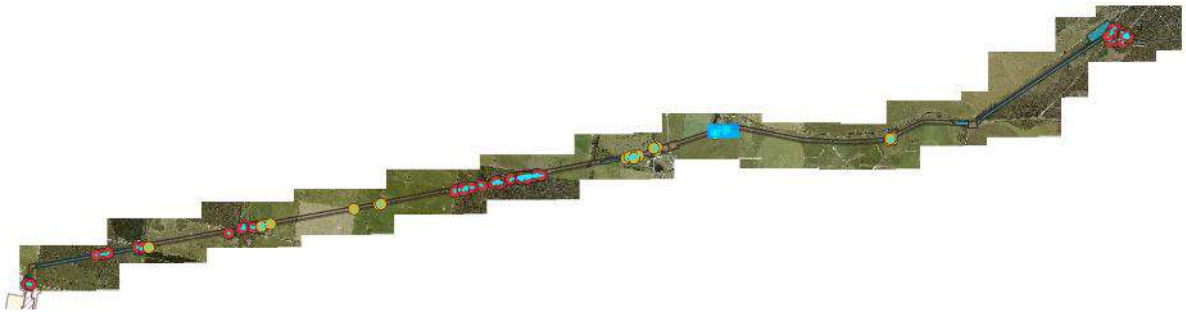

Legend

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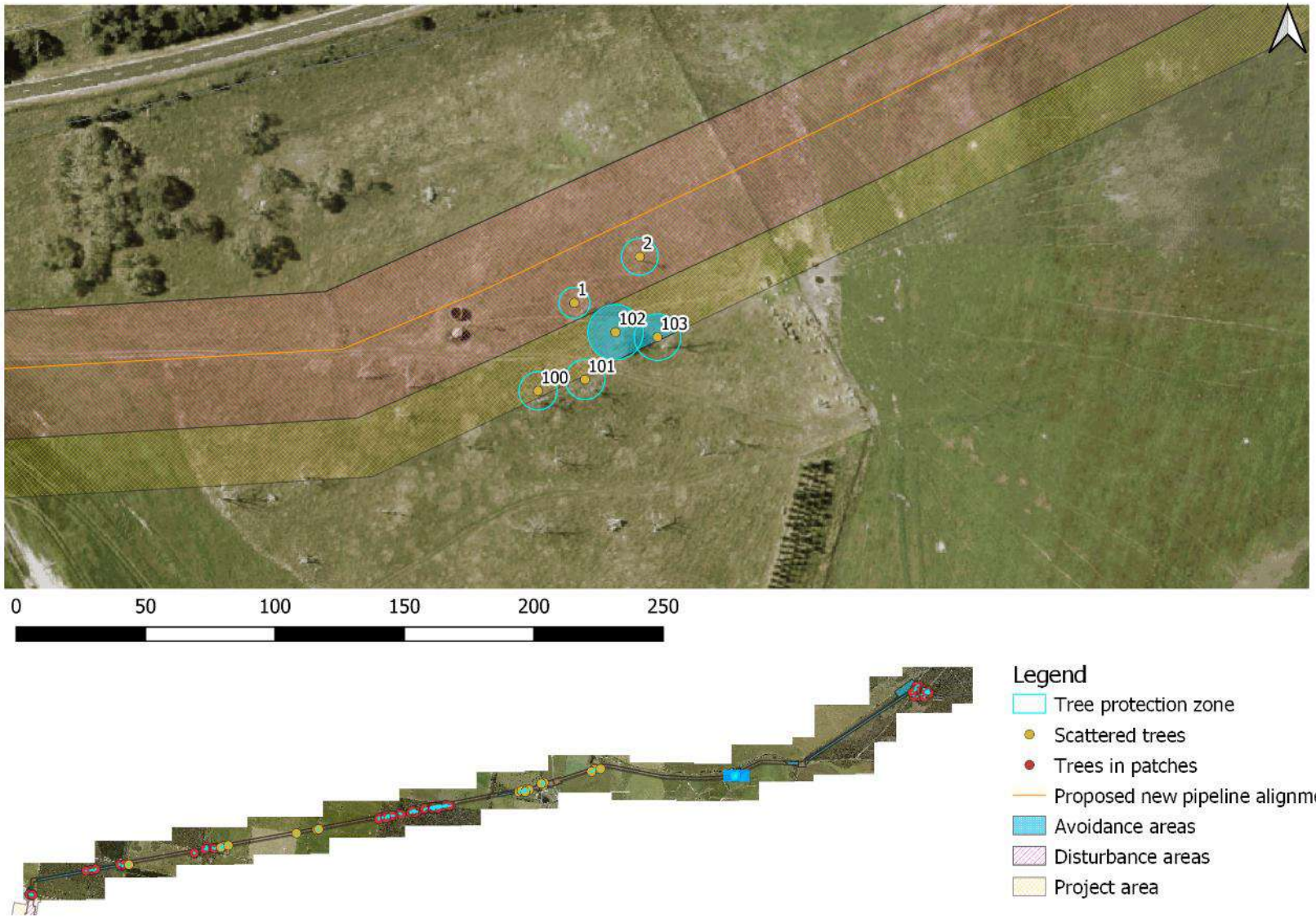
Map 14 of 16



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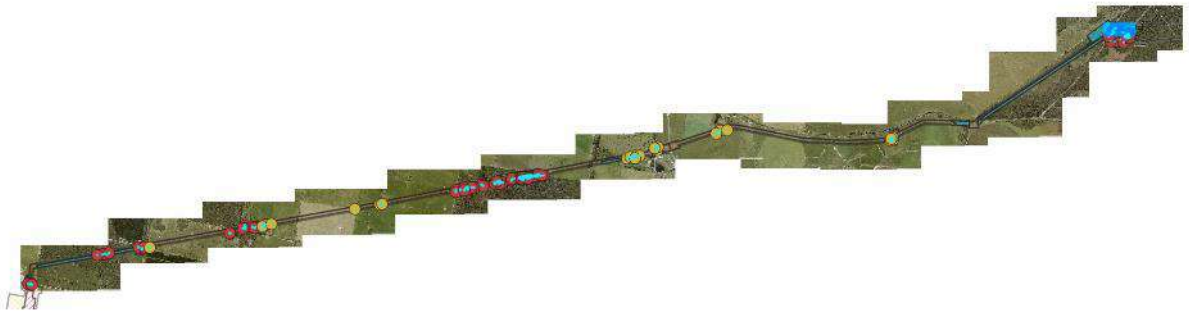

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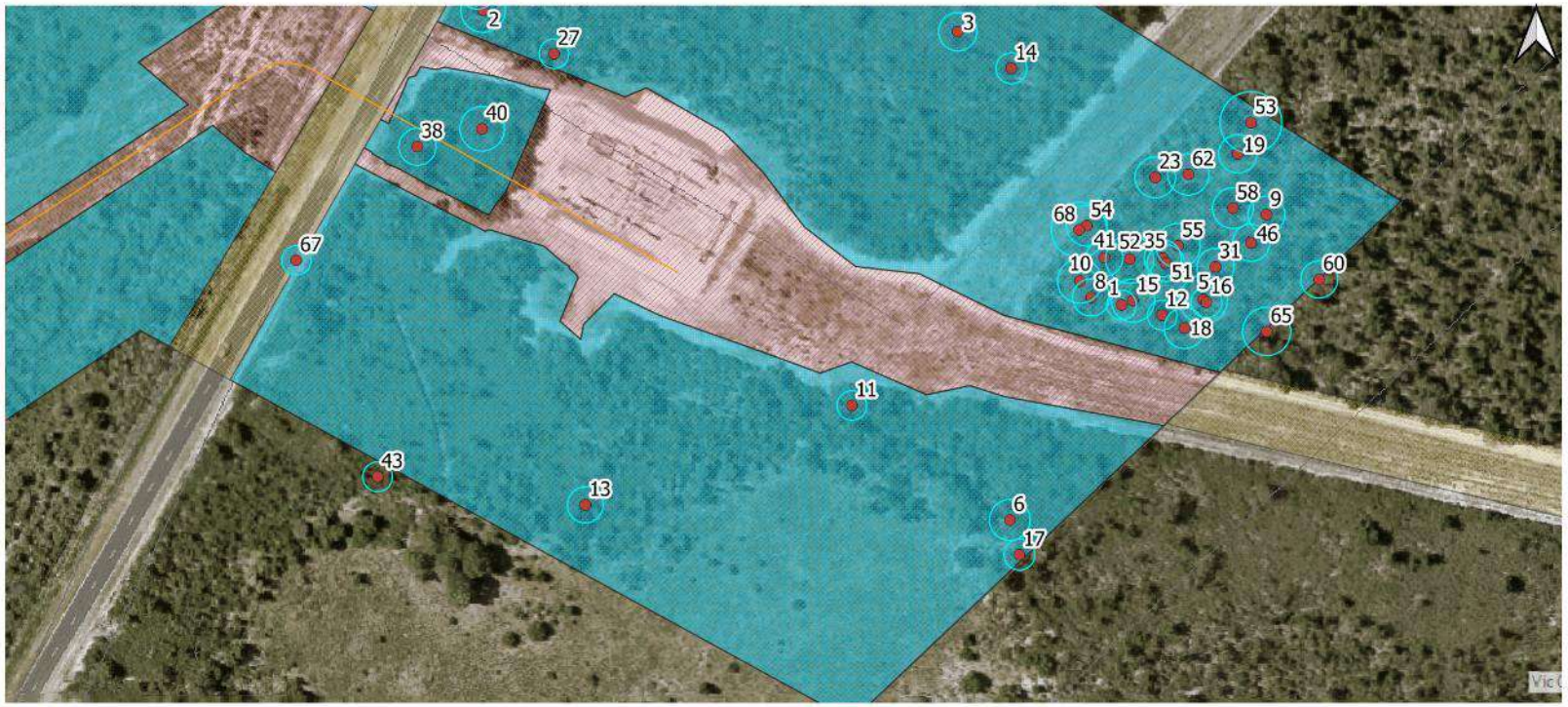
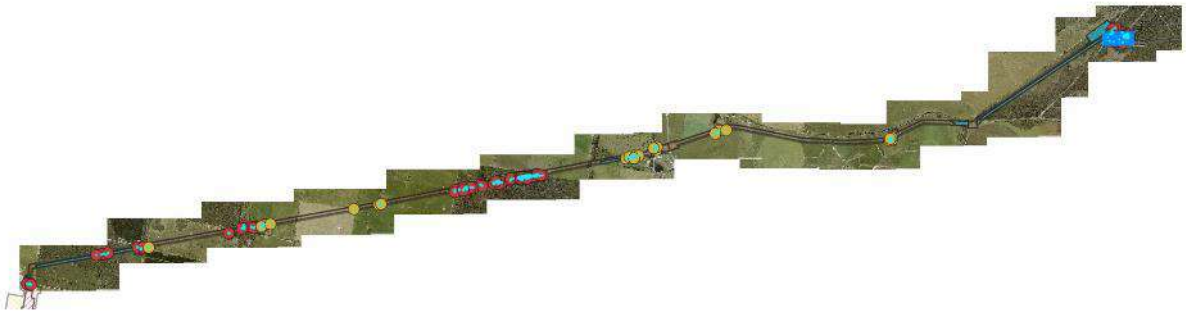
Map 16 of 16





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8. Appendix 3: Arboricultural descriptors

Age

Relates to the physiological stage of the tree's life cycle.

Category	Description
Juvenile	A young tree, given normal environmental conditions for that tree it will not yet flower or fruit.
Semi-mature	Able to reproduce yet still to achieve expected size in situation
Maturing	Specimen approaching expected size in situation, with reduced incremental growth
Over-mature	Tree is senescent and in decline

Arboricultural Rating/Amenity value

Arboricultural rating relates to a combination of tree condition factors, including health and structure (arboricultural merit), and also conveys an amenity value. Amenity relates to the trees biological, functional and aesthetic characteristics (Hitchmough 1994) within an urban landscape context. The presence of any serious disease or tree-related hazards that would impact risk potential are taken into account.

Category	Description
High	Tree of high quality in good to fair condition. Generally a prominent arboricultural/landscape feature. These trees have the potential to be a medium – to long-term component of the landscape if managed appropriately. Retention of these trees is highly desirable.
Medium	Tree of moderate quality, in fair or better condition. Tree may have a condition, and or structural problem that will respond with arboricultural treatment. Often the majority of a mature tree population will fit into this category. It is therefore often further divided into classes A, B and C with A being the more desirable for retention. These trees have the potential to be a medium – to long-term component of the landscape if managed appropriately. Retention of these trees is generally desirable.
Low	Unremarkable tree of low quality or little amenity value. Tree in either poor health or with poor structure or a combination. Tree is not significant because of either its size or age, such as young trees with a stem diameter below 15cm. These trees are easily replaceable. Tree (species) is functionally inappropriate to specific location and would be expected to be problematic if retained. Retention of such trees may be considered if not requiring a disproportionate expenditure of resources for a tree in its condition and location.
None	Trees of low quality with an estimated remaining life expectancy of less that 5 years. Tree has either a severe structural defect or health problem or combination that cannot be sustained with practical arboricultural techniques and the loss of the tree would be expected in the short term. Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. Tree infected with pathogens of significance to either the health or safety of the tree or other adjacent trees. Trees whose retention would not be viable after the removal of adjacent trees (including trees that have developed in close spaced groups and would not be expected to acclimatise to severe alterations to surrounding environment – removal of adjacent shelter trees). Tree has a detrimental effect on the environment, for example, the tree is recognised environmental woody weed with potential to spread into waterways or natural areas. Unremarkable tree of no material landscape, conservation or other cultural value.

Trees have many values, not all of which are considered when an arboricultural assessment is undertaken. However, individual trees or tree group features may be considered important community resources because of unique or noteworthy characteristics or values other than their age, dimensions, health or structural condition. Recognition of one or more of the following criteria is designed to highlight other considerations that may influence the future management of such trees.

Significant	Description
Horticultural Value/Rarity	Outstanding horticultural or genetic value; could be an important for propagating stock, including specimens that are particularly resistance to disease or exposure. Any tree of a species or variety that is rare.
Historic, Aboriginal Cultural or Heritage Value.	Tree could have value as a remnant of a particular important historical period or a remnant of a site or activity no longer in action. Tree has a recognised association with historic Aboriginal activities, including scar trees. Tree commemorates a particular occasion, including plantings by notable people, or having association with an important event in local history.
Ecological Value	Tree could have value as habitat for indigenous wildlife, including providing breeding, foraging or roosting habitat, or is a component of a wildlife reserve. Remnant indigenous vegetation that contributes to biological diversity.

Condition

The assessment of tree condition evaluates factors of health and structure. The descriptors of health and structure attributed to a tree evaluate the individual specimen to what could be considered typical for that species growing in its location. For example, some species can display inherently poor branching architecture, such as multiple acute branch attachments with included bark. Whilst these structural defects may technically be considered arboriculturally poor, they are typical for the species and may not constitute an increased risk of failure. These trees may be assigned a structural rating of fair-poor (rather than poor) at the discretion of the author.

Diagram 1, provides an indicative distribution curve for tree condition to illustrate that within a normal tree population the majority of specimens are centrally located within the condition range (normal distribution curve). Furthermore, that those individual trees with an assessed condition approaching the outer ends of the spectrum occur less often.

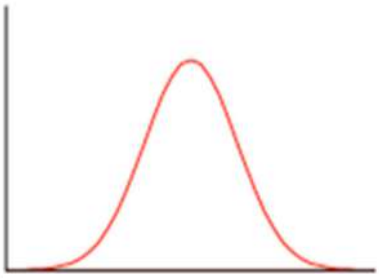


Plate 4 Tree condition\ (Health & Structure)
Indicative normal distribution curve for tree condition

Diameter at Breast Height (DBH)

Indicates the trunk diameter (expressed in centimetres) of an individual tree measured at 1.4m above the existing ground level or where otherwise indicated, multiple leaders are measured individually. Plants with multiple leader habit may be measured at the base. The range of methods to suit particular trunk shapes, configurations and site conditions can be seen in Appendix A of Australian Standard *AS 4970-2009 Protection of trees on development site*s. Measurements undertaken with foresters ø tape or builders tape.

Health

Assesses various attributes to describe the overall health and vigour of the tree.

Category	Vigour/Extension growth	Decline symptoms/Deadwood	Foliage density, colour, size, intactness	Pests and or disease
Good	Above typical	None or minimal	Better than typical	None or minimal
Fair	Typical	Typical or expected	Typical	Typical, within damage thresholds

Fair to Poor	Below typical	More than typical	Exhibiting deficiencies	Exceeds damage thresholds
Poor	Minimal	Excessive and large amount/size	Exhibiting severe deficiencies	Extreme and contributing to decline
Dead	N/A	N/A	N/A	N/A

Height and Width

Indicates height and width of the individual tree; dimensions are expressed in metres. Crown heights are measured with a laser height meter where possible. Due to the topography of some sites and/or the density of vegetation it may not be possible to do this for every tree. Tree heights may be estimated in line with previous height meter readings in conjunction with author's experience. Crown widths are generally paced (estimated) at the widest axis or can be measured on two axes and averaged. In some instances the crown width can be measured on the four cardinal direction points (North, South, East and West).

Name

Provides botanical name, (genus, species, variety and cultivar) according to accepted international code of taxonomic classification, and common name.

Pruning cuts

Type	Description
Reduction cut	A reduction cut reduces the length of a branch or stem back to a live lateral branch of sufficient size. A reduction cut removes a stem that is larger than the retain lateral branch.
Removal cut	A removal cut, sometimes called a collar cut, removes a branch from the trunk or parent branch just outside the collar, if a collar is present. A removal cut removes a branch that is smaller than the parent.
Heading cut	A heading cut reduces the length of a stem or branch without regard to the position or diameter of nearby lateral branches. This is generally not in accordance with AS 4373 Pruning of amenity trees and is only applicable in certain circumstances.

Structure

Assesses principal components of tree structure (Diagram 2).

Descriptor	Zone 1 - Root plate & lower stem	Zone 2 - Trunk	Zone 3 - Primary branch support	Zone 4 - Outer crown and roots
Good	No damage, disease or decay; obvious basal flare / stable in ground	No damage, disease or decay; well tapered	Well formed, attached, spaced and tapered	No damage, disease, decay or structural defect
Fair	Minor damage or decay. Basal flare present.	Minor damage or decay	Typically formed, attached, spaced and tapered	Minor damage, disease or decay; minor branch end-weight or over-extension

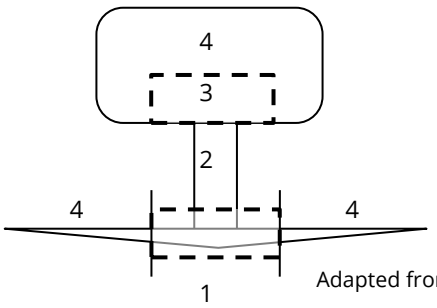
Descriptor	Zone 1 - Root plate & lower stem	Zone 2 - Trunk	Zone 3 - Primary branch support	Zone 4 - Outer crown and roots
Fair to Poor	Moderate damage or decay; minimal basal flare	Moderate damage or decay; approaching recognised thresholds	Weak, decayed or with acute branch attachments; previous branch failure evidence	Moderate damage, disease or decay; moderate branch end-weight or over-extension
Poor	Major damage, disease or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate	Major damage, disease or decay; exceeds recognised thresholds; fungal fruiting bodies present. Acute lean. Stump resprout	Decayed, cavities or has acute branch attachments with included bark; excessive compression flaring; failure likely	Major damage, disease or decay; fungal fruiting bodies present; major branch end-weight or over-extension
Very Poor	Excessive damage, disease or decay; unstable / loose in ground; altered exposure; failure probable	Excessive damage, disease or decay; cavities. Excessive lean. Stump resprout	Decayed, cavities or branch attachments with active split; failure imminent	Excessive damage, disease or decay; excessive branch end-weight or over-extension

Structure ratings will also take into account general tree architecture which considers aspects of stem taper, live crown ratio, branch distribution or bias and crown position such as tree being suppressed amongst more dominant trees.

The lowest or worst descriptor assigned to the tree in any column could generally be the overall rating assigned to the tree. The assessment for structure is limited to observations of external and above ground tree parts. It does not include any exploratory assessment of underground or internal tree parts unless this is requested as part of the investigation. Trees are assessed and the given a rating for a point in time.

Diagram 2: Tree structure zones

1. Root plate & lower stem
2. Trunk
3. Primary branch support
4. Outer crown & roots



Adapted from Coder (1996)

Generally, trees with a poor or very poor structure are beyond the benefit of practical arboricultural treatments.

The management of trees in the urban environment requires appropriate arboricultural input and consideration of risk. Risk potential will take into account the combination of likelihood of failure and impact, including the perceived importance of the target(s).

Type
Describes the general geographic origin of the species and its type e.g. deciduous or evergreen.

Category	Description
Indigenous	Occurs naturally in the area or region of the subject site
Victorian native	Occurs naturally within some part of the State of Victoria (not exclusively) but is not indigenous
Australian native	Occurs naturally within Australia but is not a Victorian native or indigenous
Exotic deciduous	Occurs outside of Australia and typically sheds its leaves during winter
Exotic evergreen	Occurs outside of Australia and typically holds its leaves all year round
Exotic conifer	Occurs outside of Australia and is classified as a gymnosperm
Native conifer	Occurs naturally within Australia and is classified as a gymnosperm
Native Palm	Occurs naturally within Australia. Woody monocotyledon
Exotic Palm	Occurs outside of Australia. Woody monocotyledon

9. Appendix 4. Protection of retained trees

Pruning standards / Lopping

An Australian standard exists to give guidance on pruning of trees.

It is important that all remedial works are carried out by a competent contractor in accordance with the Australian Standard. (AS. 4373 2007 - Pruning of Amenity Trees).

Lopping; as defined within the Standard, is detrimental to trees, often resulting in decay and poorly attached epicormic shoots. Natural Target Pruning methods should be used wherever possible when removing sections from trees.

Establishment of Tree Protection Zones

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. Usually fencing will be used to delineate the Tree Protection Zones (TPZ) as defined by AS 4970-2009 Protection of trees on development sites.

Fencing is installed following permitted vegetation removal and pruning but prior to construction site establishment. Fencing should be retained until completion of all construction related activity.

Activities restricted within the TPZ

A TPZ area may surround a single tree or group or a patch of vegetation, activities that must NOT be carried out within a TPZ include, but are not limited to, the following:

(a) machine excavation including trenching;

(b) excavation for silt fencing;

(c) cultivation;

(d) storage;

(e) preparation of chemicals, including preparation of cement products;

(f) parking of vehicles and plant;

(g) refuelling;

(h) dumping of waste;

(i) wash down and cleaning of equipment;

(j) placement of fill;

(k) lighting of fires;

(l) soil level changes;

(m) vehicle movement – access ways;

(n) changes of grade;

(o) temporary or permanent installation of utilities and signs, and

(p) damage to the tree.

Maintaining Tree Protection Zones (TPZ)

If at any time the TPZ must be infringed upon for works such as excavation for the installation of pipes or drainage or the movement of equipment or any other interference that may cause a change in the availability of water or oxygen to the tree, a suitably qualified arborist should be consulted to supervise the works and permission from the responsible authority may be required.

It may be possible to work or construct within a TPZ without significantly impacting a tree however the size and number of roots in the area would need to be determined and the specifics of the tree and its resilience to impacts would need to be reviewed prior to commencement. Design and construction methods may need alteration to minimise adverse tree impact.

AS 4970-2009 (extract)

Variations to the TPZ

General

It may be possible to encroach into or make variations to the standard TPZ. Encroachment includes excavation, compacted fill and machine trenching.

Minor encroachment

If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

Variations must be made by the project arborist considering relevant factors listed in (see standard) …

Major encroachment

If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable.

The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in (see standard)

Physical / mechanical damage to trees

Physical damage to tree parts, particularly the trunk, provides entry points for pests and diseases such as fungal infections. This may cause long-term decay and can lead to partial or complete tree failure and death.

Alteration of soil levels

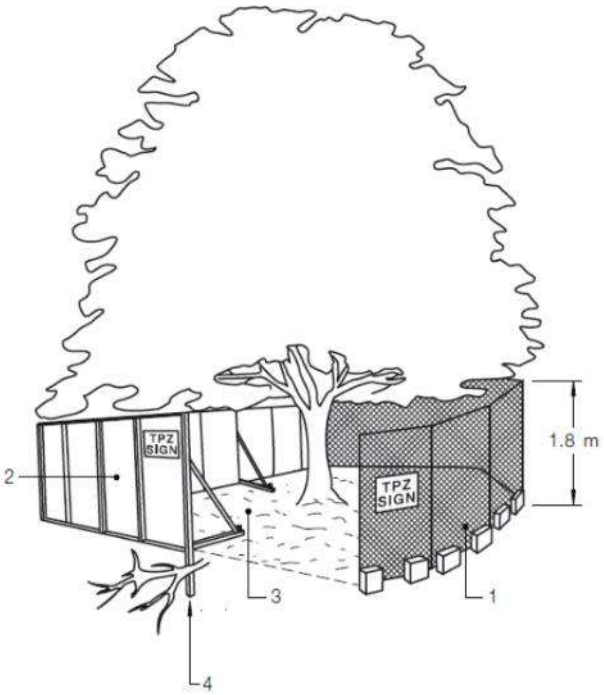
Alteration of soil levels around trees will affect the root zone and stability of a tree as well as tree metabolism. This may result in reduced tree health, excessive deadwood, thinning foliage and poor vigour; it can take some years for the impact to become evident at which time it is normally irreversible.

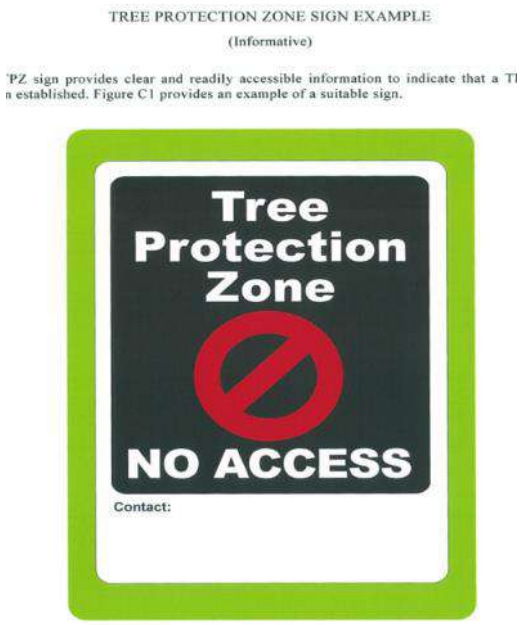
Tree protection zone fencing

Protective fencing is used to delineate the TPZ. The fence must provide high visibility and act as a physical barrier to construction vehicles. No construction activity is to be undertaken within the fenced TPZ. The

fence should be adequately signed, be sturdy and prevent the entry of heavy equipment, vehicles, workers and the public.

Once erected, protective fencing must not be removed or altered without approval by the project arborist or responsible authority. The TPZ should be secured to restrict access. Tree protection fencing will consist of chain wire mesh panels held in place with concrete feet. The tree protection zone shall be clearly signed "Tree Protection Zone – No Access".




TREE PROTECTION ZONE SIGN EXAMPLE

(Informative)

'PZ sign provides clear and readily accessible information to indicate that a TI
n established. Figure C1 provides an example of a suitable sign.

Source – AS 4970-2009 Protection of trees on development sites

Temporary access to the TPZ

When tree protection fencing cannot be installed or requires temporary removal, other tree protection measures should be used.

Where necessary, physical protection for the trunk and branches of trees should be installed. The materials and positioning of protection will be specified by the project arborist. A minimum height of 2m is recommended.

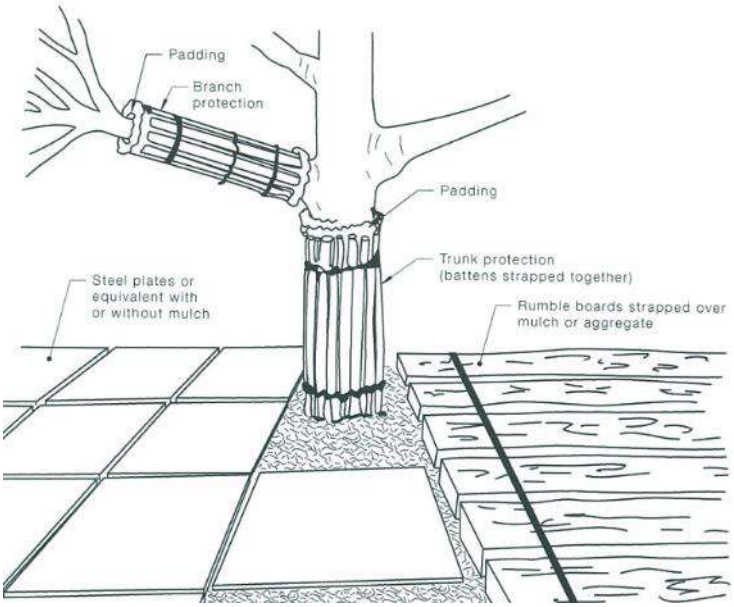
If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards. These measures may also be applied to root zones beyond the TPZ (see image).

Root protection during works within the TPZ

Works that have been approved by the Responsible Authority to occur within the TPZ, such as re-grading, installation of piers or landscaping have the potential to damage roots.

If the grade is to be raised the material should be coarser or more porous than the underlying material.

Depth changes and compaction should be minimized. Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability and health. Relocation or redesign of works may be required.



Source – AS 4970-2009 Protection of trees on development sites

Where the project arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints.

It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators.

Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist during the period that roots are exposed.

Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems, seek advice from the project arborist.

If temporary access is required within a Tree Protection Zone this may be carried out using sheets of heavy plywood or like protection but should not be considered for long term requirements.

Installing underground services within TPZ

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches using non-destructive methods such as Air or hydro excavation.

The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.

Driveways and paving within TPZ's

Works should not encroach into a TPZ. If encroachment is unavoidable any hard surfaces such as paving or driveways should:

1. not require any scraping or excavation – most roots, particularly small absorbing roots, are shallow; within the upper 100mm of soil.

2. be constructed of a permeable material and laid on a base and subbase specifically designed to allow the movement of water through and into the soil below.

If construction is permitted within a TPZ it should be suspended on piers leaving the ground undisturbed other than the careful placement of pier holes. The bottom of supporting beams should be above existing ground level or, if this is not possible beams should run radially away from the tree trunk. There should be NO excavation of any description, including piers, within a Structural Root Zone (SRZ)

10. Arboricultural consultancy: Assumptions

- Any legal description provided to Oldmeadow Arboriculture is assumed to be correct. Any titles and ownerships to any property are assumed to be correct. No responsibility is assumed for matters outside the consultant's control.
- Oldmeadow Arboriculture assumes that any property or project is not in violation of any applicable codes, ordinances, statutes or other local, state or federal government regulations.
- Oldmeadow Arboriculture has taken care to obtain all information from reliable sources. All data has been verified insofar as possible; however Oldmeadow Arboriculture can neither guarantee nor be responsible for the accuracy of the information provided by others not directly under Oldmeadow Arboriculture's control.
- No Oldmeadow Arboriculture employee shall be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.
- Loss of this report or alteration of any part of this report not undertaken by Oldmeadow Arboriculture invalidates the entire report.
- Possession of this report or a copy thereof does not imply right of publication or use for any purpose by anyone but the client or their directed representatives, without the prior consent of Oldmeadow Arboriculture.
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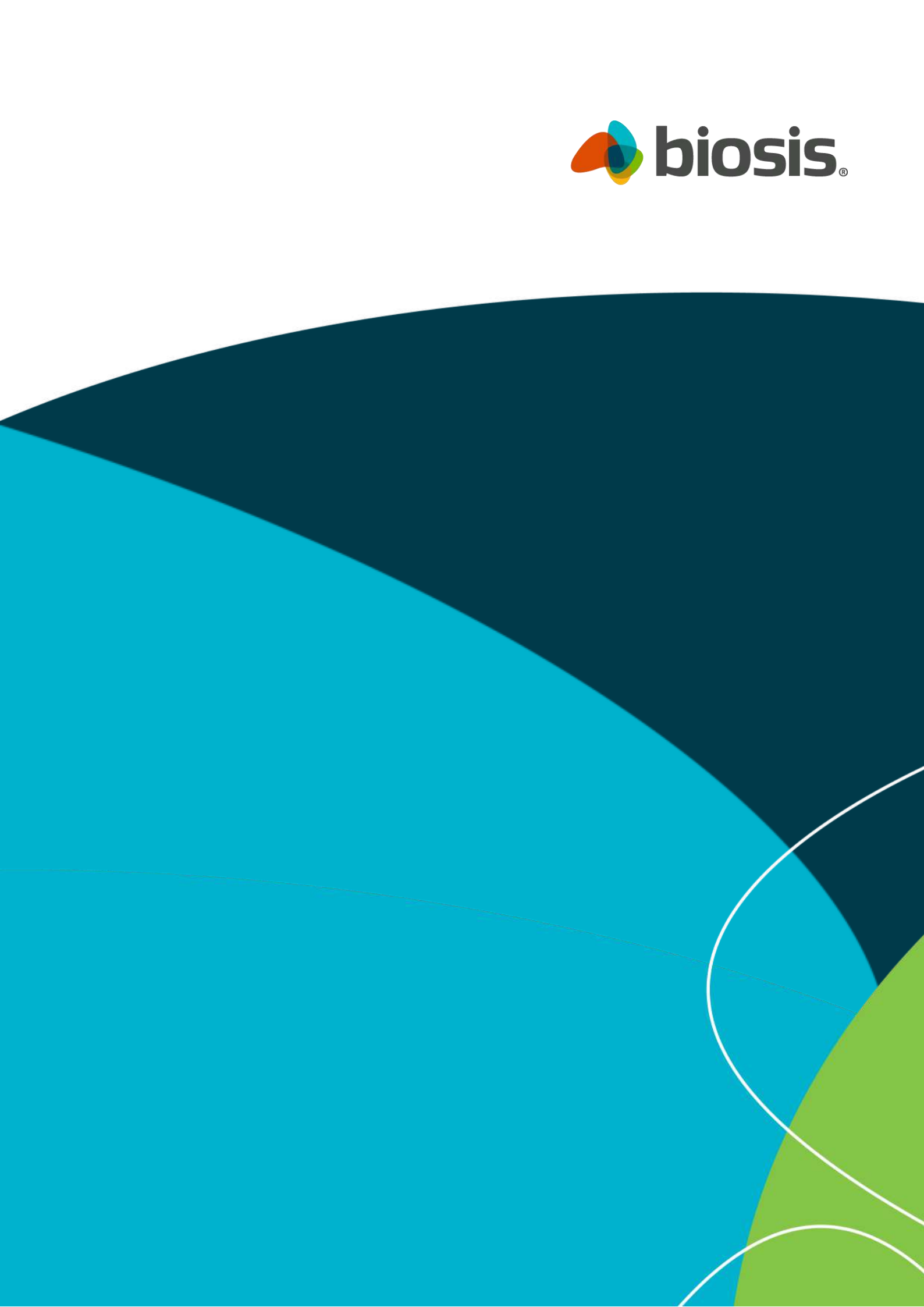
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