









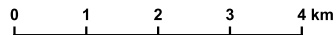
Legend

-  Site boundary
-  Wind turbines
-  Access tracks

Flood depth (m)

	< 0.1		0.5 - 1.0
	0.1 - 0.2		1.0 - 1.5
	0.2 - 0.5		> 1.5

Scale



Data: State of Victoria (DECCA/Land Use Victoria), Commonwealth of Australia, Wind Prospect, and specialist studies/reports. Data is indicative only; accuracy and completeness are not guaranteed.
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Figure 12.11 1% AEP flood depth – Existing conditions

Smaller drainage systems and dams

There are small ephemeral drainage lines located within the project site that flow intermittently following rainfall (Figure 12.3). Surface water flows at proposed infrastructure crossing locations were modelled for the 1% and 10% AEP. Peak flows ranged from 0.8 to 22.9 cubic metres per second for the 1% AEP event, and between 0.4 and 7.5 cubic metres per second for the 10% AEP event (Appendix B – **Surface Water and Groundwater Impact Assessment**).

Several dams are present on private properties across the project site, which supply water for stock and agricultural purposes. Based on the **Flora and Fauna Assessment** by Nature Advisory (Appendix D), the dams associated with Wetland 29405 may form part of a habitat corridor for Growling Grass Frog however, many of these dams lack vegetation and connectivity with other habitats. As such, they would provide low-quality habitat for Growling Grass Frog and other native fauna.

12.6.3 Wetlands

Wetlands of international importance, or 'Ramsar' wetlands, are those that contain rare or unique wetland types, or are important for conserving biological diversity. There are no Ramsar listed wetlands located within the project site, with the closest being the Western District Lakes Wetlands approximately 40 kilometres east of the project site.

The Directory of Important Wetlands in Australia, managed by the Commonwealth Department of Climate Change, Energy, the Environment and Water, identifies wetlands of national importance. There are no wetlands listed on this directory within the project site.

Due to the relative flat topography, most depressions within the project site are inundated during winter and spring (during some years) but largely dry-out during summer. The larger swampy areas are known to hold water for approximately three to four months, then dry (through both natural flow paths and artificial drains) and form modified grasslands, which are grazed by sheep and cattle. During drier years, these wetlands do not fill and remain modified grasslands.

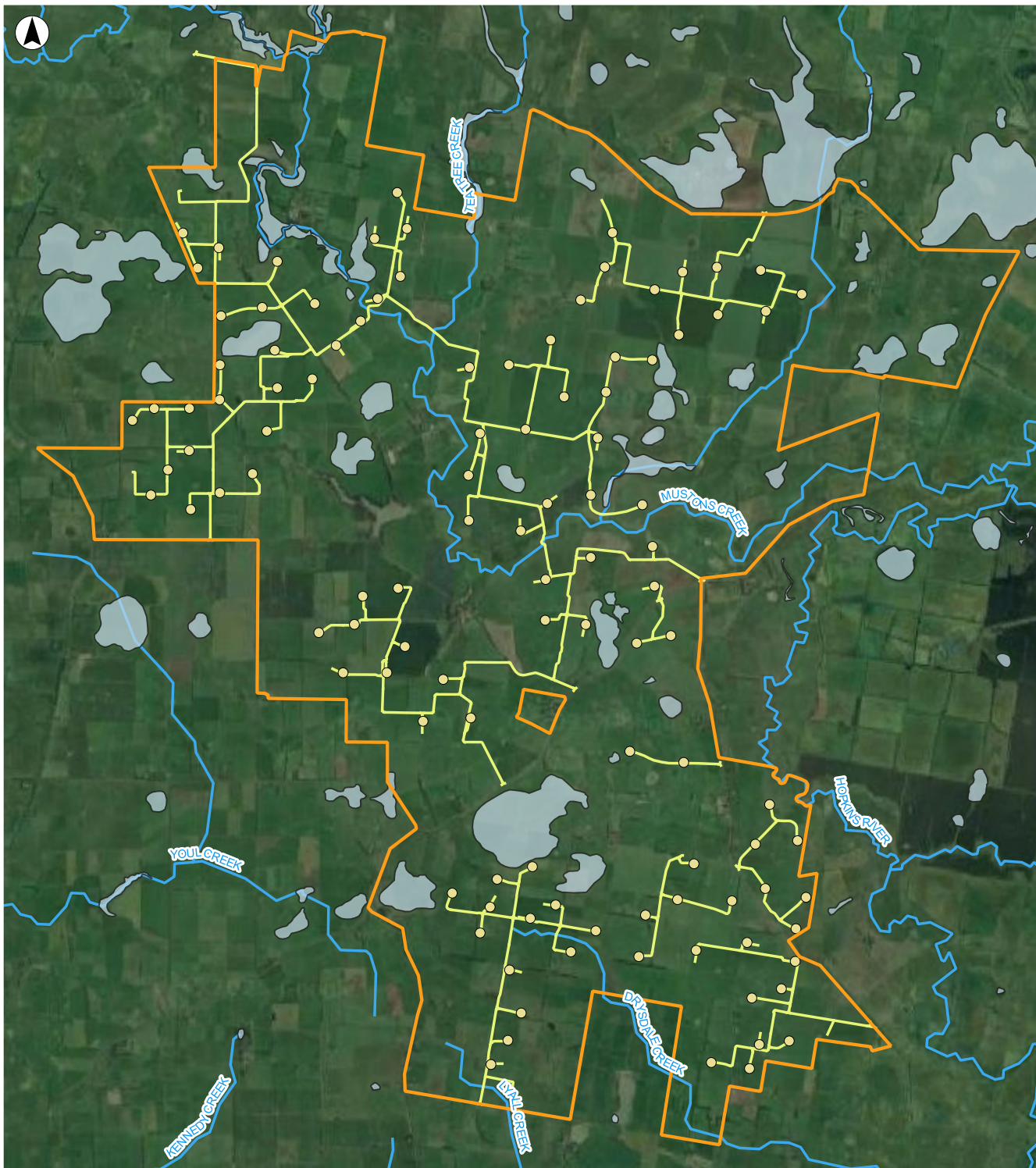
Wetlands identified within the DEECA Victorian Wetland Inventory ('current wetlands') database within and surrounding the project site are shown in Figure 12.12. Wetlands within the project site primarily capture localised runoff from isolated catchment areas, however there are some that receive flood overflows from Mustons Creek or its tributaries. The wetlands are mainly linked through natural channels, with some wetlands connected by constructed channels or drained to increase the area of land available for agricultural production.

Hydraulic and hydrological water balance modelling was also completed for the project site to determine the spatial extent of wetlands suitable for Brolga breeding (i.e., if the wetlands were able to hold water for more than 120 consecutive days, based on data from 2009 to 2019). Results of this modelling are presented in Chapter 10 – **Brolga**.





The DEECA **Victorian Wetland Inventory** ('**Current wetlands**') database shows the extent and types of wetlands in Victoria, incorporating local and regional wetland datasets. Wetlands in the DEECA database are categorised based on:

- wetland system type (lake, marsh/swamp, marine, estuarine)
- salinity regime (e.g., fresh, saline)
- water regime (permanent or periodically inundated)
- water source (e.g., groundwater, river)
- dominant vegetation
- wetland origin (naturally occurring or human-made).

Source: The Victorian wetland classification framework 2014 (DELWP, 2016)



Legend

-  Site boundary
-  Wind turbines
-  Access tracks
-  Wetlands
-  Major watercourse



Data: State of Victoria (DECCA/Land Use Victoria), Commonwealth of Australia, Wind Prospect, and specialist studies/reports. Data is indicative only; accuracy and completeness are not guaranteed.
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Figure 12.12 DEECA mapped wetlands in relation to the project site

Nine ecological vegetation communities (EVCs) that rely on the surface water have been mapped within the investigation area (as described in Chapter 8 – **Biodiversity and habitat**). Details of these EVCs and their relevance are described more fully in Appendix D – **Flora and Fauna Assessment**. Their location comparative to surface water sources are described below:

- Plains Grassy Wetland (EVC 125), Plains Sedgy Wetland (EVC 647), and Brackish Wetland (EVC 656) – these communities mostly occur in wet depressions away from watercourses, where water levels fluctuate seasonally according to rainfall.
- Creekline Tussock Grassland (EVC 654) and Aquatic Herbland (EVC 653) – these communities are supported by unnamed tributaries.
- Tall Marsh (EVC 821) – this community was recorded in one farm dam.
- Riparian Woodland (EVC 641) and Creekline Grassy Woodland (EVC 68) – these communities occur adjacent to Mustons Creek, with Riparian Woodland also supported by unnamed tributaries.
- Floodplain Riparian Woodland (EVC 56) – this community occurs adjacent to the Hopkins River.

Summary

A summary of the surface water features applicable to the project within and downstream of the project site is provided in Table 12.10.

Table 12.10 Surface water features applicable to the project and the values they support

Surface water features	Description	Features	Values
Hopkins River	<ul style="list-style-type: none"> • Designated waterway by Glenelg Hopkins Catchment Management Authority (Waterway 36/1). • Catchment covers approximately 10,000 square kilometres. • Large waterway with a defined floodplain. • Flows through a small portion of the eastern boundary of the project site. 	<ul style="list-style-type: none"> • Catchment largely comprised of agricultural land. • Water quality samples, collected by Water Technology, exceeded the 75th percentile trigger values for electrical conductivity and Total Phosphorus (for the upstream sample location). 	<ul style="list-style-type: none"> • Cultural heritage significance (Appendix J – Aboriginal Cultural Heritage Impact Assessment).
Mustons Creek and its tributaries (Burchett Creek and Tea Tree Creek)	<ul style="list-style-type: none"> • Designated waterway by Glenelg Hopkins Catchment Management Authority (Waterway 36/1-29). • Covers approximately 510 square kilometres. • Major tributary of Hopkins River. • Narrower than Hopkins River, but has well-defined banks. • Fed by tributaries including Burchett Creek (Waterway 36/1-29-10) and Tea Tree Creek (Waterway 36/1-29-5). 	<ul style="list-style-type: none"> • Catchment largely comprised of agricultural land. • Water quality samples, collected by undertaken by Water Technology, found that water quality samples exceeded the 75th percentile trigger values for electrical conductivity, pH, Total Phosphorus and/or turbidity. • Index of Stream Condition rating for Mustons Creek and Burchett Creek of poor or very poor. 	<ul style="list-style-type: none"> • Growling Grass Frog may use Mustons Creek for most of the year in sections that retain water pools, and smaller tributaries of Mustons Creek during the wet season (Appendix D – Flora and Fauna Assessment). • Cultural heritage significance (Appendix J – Aboriginal Cultural Heritage Impact Assessment).

Surface water features	Description	Features	Values
Drysdale Creek and its tributaries (Lyall Creek)	<ul style="list-style-type: none"> Designated waterway by Glenelg Hopkins Catchment Management Authority (Waterway 36/2-14). Covers approximately 200 square kilometres Tributary of Merri River. Main tributary of Drysdale Creek is Lyall Creek (Waterway 36/2-14-4). 	<ul style="list-style-type: none"> Catchment largely comprised of agricultural land. Index of Stream Condition rating of very poor. 	<ul style="list-style-type: none"> Cultural heritage significance (Appendix J – <i>Aboriginal Cultural Heritage Impact Assessment</i>).

12.6.4 Climate change

Based on the existing project site topography, the increased rainfall under the climate change scenario would result in greater flooding depths and a slightly greater inundation extent for the 1% AEP (Figure 12.13) and 10% AEP events. However, there would be no overall change to inundation patterns or runoff pathways.