NORTH EAST LINK PROJECT

EPBC Referral Attachment B - Hydrology Report

Revision 0

12 January 2018

Document prepared by:

Document Control Page

Release

Revision	Date Released	Release Status	Comment
0	12.01.2017	**For use**	FOR USE

Issue

Draft	☐	Final	☒

Abbreviations

Abbreviation	Definition
CMAs	Catchment Management Authorities
EPA	Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
IRC	Index of River Condition
ISC	Index of Stream Condition
NEL	North East Link
SEPP	State Environment Protection Policy
WQMP	Water Quality Monitoring Program

Executive Summary

North East Link ('the project') is a proposed new freeway standard road connection that would complete the missing link in Melbourne's metropolitan ring road, giving the city a fully completed orbital connection for the first time. North East Link would connect the Western Ring Road (M80) to the Eastern Freeway, and include works along the Eastern Freeway.

The project is being referred to the Australian Government Environment Minister in accordance with the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

This report was prepared in order to support the EPBC referral being prepared for the project. It aims to provide a summary of the existing conditions of the main waterways within the referred project area in relation to the catchment, flows and water quality of the waterways which interact with the referred project area, being Plenty River, Banyule Creek, Yarra River, Merri Creek and Koonung Creek.

In order to determine the existing conditions for the waterways within the referred project area, a desktop and field assessment process was used. The catchment type, waterway conditions, water flows and water quality were all a focus for Plenty River, Banyule Creek, Yarra River, Merri Creek and Koonung Creek.

The waterway conditions for the five key waterways have been determined as:

- Plenty River: very poor
- Banyule Creek: moderate
- Yarra River: moderate
- Merri Creek: very poor
- Koonung Creek: very poor

An important part of the surface water design and management of the project will be to include measures in the design that control the potential impacts on rivers and creeks, to prevent impacts on surface water quality and flow.

Water sensitive urban and road design will be adopted to control potential impacts to receiving waters such as rivers and creeks from additional runoff volume, alteration of the timing of flows, and contamination from increased pollutants. Additional pavement area that is created by building new roads or adding additional lanes or interchanges to existing roads creates additional stormwater runoff that may not have occurred in pre-developed conditions. Any road works that create additional pavement area will be required to meet water sensitive road design criteria and provide additional water treatment and flow retention as necessary. Water sensitive urban and road design will be included as a part of a drainage strategy for the project.

The drainage strategy for the project will include the specifications for water quality treatment of stormwater runoff in accordance with VicRoads Integrated Water Management Guidelines and the Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG). These objectives assist in determining the level of stormwater management necessary to meet the State Environment Protection Policies (SEPP) Waters of Victoria.

Table of Contents

Table Index

Figure Index

Appendices

1. Introduction

North East Link ('the project') is a proposed new freeway standard road connection that would complete the missing link in Melbourne's metropolitan ring road, giving the city a fully completed orbital connection for the first time. North East Link would connect the M80 Ring Road (M80) to the Eastern Freeway, and include upgrade works to the Eastern Freeway.

The project is being referred to the Australian Government Environment Minister in accordance with the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act).

1.1 Purpose of this report

This report was prepared in order to support the EPBC referral being prepared for the project. It aims to provide a summary of the existing conditions of the main waterways within the referred project area in relation to the catchment, flows and water quality of the waterways which interact with the referred project area, being Plenty River, Banyule Creek, Yarra River, Merri Creek and Koonung Creek.

2. Description of proposed action and referred project area

2.1 Description of proposed action

North East Link ('the project') is a proposed new freeway standard road connection that would complete the missing link in Melbourne's metropolitan ring road, giving the city a fully completed orbital connection for the first time. North East Link would connect the Western Ring Road (M80) to the Eastern Freeway, and include works along the Eastern Freeway.

The following section describes the North East Link alignment and the key elements, noting that developmentof the concept design is ongoing.

- **Western Ring Road to Lower Plenty Road** – from the M80 and Greensborough Bypass to the northern tunnel portal, this section would include a mixture of above, below and at surface road sections, with new road interchanges at M80, Grimshaw Street and Lower Plenty Road.
- **Tunnels** – from the northern tunnel portal located just north of Lower Plenty Road to south of Manningham Road, twin tunnels would travel under residential areas, Banyule Flats and the Yarra River. Near each tunnel portal, supporting tunnel infrastructure would be required, including ventilation structures, substations and associated infrastructure. This section would include a new interchange at Manningham Road.
- **Bridge Street to Eastern Freeway** –this section would include open cut and bored or mined tunnel with the southern tunnel portal located south of the Veneto Club. Further south, surface road and viaduct structures would connect to the Eastern Freeway via a new interchange.
- **Eastern Freeway upgrades** – from around Hoddle Street in the west through to Springvale Road in the east, modifications to the Eastern Freeway would include widening to accommodate future traffic volumes, provision of new dedicated bus lanes for rapid bus services (Doncaster Busway) and associated works.

2.2 Referred project area

The project involves the augmentation of existing operating freeways and arterial roads, as well as construction of new surface roads, tunnels and elevated structures. The surface road connections and elevated structures would be located in urbanised areas of Melbourne, largely within (or adjacent to) existing road reserves. The underground tunnels would travel beneath the most ecologically sensitive portion of the referred project area, including the Yarra River, avoiding surface impacts through this area.

The referred project area is shown in Figure 1 of the covering referral document and includes all of the areas that works would be proposed at surface level or where investigations would be undertaken for development of the project, as well as a wider area within which the tunnels would be constructed below the surface. The precise location of the roads and tunnels is subject to further design work, but they would be located within the referred project area indicated.

The referred project area is wider than the actual footprint of the concept design, allowing for potential variations to the project as the design progresses. Accordingly, the referred project

area has assumed the worst case scenario in terms of potential surface impacts. The environmental performance requirements will apply to the final design of the project within the referred project area. These requirements will ensure that the environmental outcomes and performance standards set for the project will be met irrespective of the project's ultimate design.

Impacts at a number of sensitive areas near to the project have been avoided through the designation of no go zones where surface works are not permitted as part of the project. No go zones have been designated for the following sensitive areas:

- A vegetated patch near to the intersection of M80 and Plenty Road. This was observed to contain a community of Grassy Eucalypt Woodland of the Victorian Volcanic Plain (EPBC Act-listed as critically endangered), which may have originated as a Plains Grassy Woodland (EVC 55) offset site
- Bolin Bolin Billabong, located between Bulleen Road and the Yarra River. This is a known site of cultural significance and ecological value (non EPBC related)
- A portion of Yarra Bend Park, south of the Eastern Freeway. This area is home to the Grey-headed Flying-fox (EPBC Act-listed as vulnerable) and is protected under the Flying-Fox Campsite Management Plan.

A tunnel has been proposed beneath the Banyule Flats, the Warringal Parklands, and the Yarra River, as well as the Heide Museum of Modern Art and sculpture park, to avoid surface impacts at these locations. This area has been included within a designated ‘conditional no go area’ where surface works would not be permitted as part of the project with the possible exception of activities relating to site investigations, relocation of minor utilities and ground improvement. No go zones are shown in Figure 2 of the covering referral document.

3. Methodology

3.1 Desktop assessment

3.1.1 Waterway Condition

Existing conditions within the waterways intersected by the project can be determined by a variety of factors including the Index of River Condition (IRC), water flows and water quality.

The IRC ranking system was developed by Melbourne Water to assess the condition and health of the rivers and creeks within their operating area (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007). The IRC ranking system is intended to provide an overall integrated measure of the environmental condition of rivers. It has been developed based upon the Index of Stream Condition (ISC) developed by Department of Sustainability and Environment (Department of Environment and Primary Industries, 2013). The IRC rankings differ from the ISC rankings in that they've been modified to account for the urban rivers and creeks within Melbourne Water's operating area.

The IRC ranking system is intended to provide an overall integrated measure of the environmental condition of rivers. The index is broken into five parts. It provides a summary of the extent of change from natural or ideal conditions for each part as shown in Table 1

Table 1 Description of environmental river condition measures

Index Part	Description
Water Quality	Key water quality indicators compared against Victorian Government environment protection policy water quality objectives
Aquatic Life	Diversity of macro invertebrates
Habitat and Stability	River bank and bed condition, presence of and access to physical habitat, artificial barriers
Vegetation	Quality and quantity of streamside vegetation
Hydrology	Flow volume and seasonality of flow (how close to natural they are in terms of quantities and timing)

Each part is scored out of a maximum of ten so that the overall score for the index will vary between a minimum of zero and a maximum of 50. The final score determines the allocation of the river into one of five classifications: very poor, poor, moderate, good or excellent.

The latest IRC available data for the referred project area is for six years from 2004 to 2007 and was compiled by Melbourne Water.

3.1.2 Flow Assessment

Utilising gauge data provided by Melbourne Water across the Melbourne region, existing flow duration curves have been developed using a histogram analysis. In Table 2below is a summary of the gauges utilised in this analysis. The locations of these gauges are shown graphically in Figure 1

Table 2 Gauge data summary

Gauge No.	Waterway	Location	Date from	Date to	Interval
229615A	Plenty River	Greensborough	1980	2017	6 minute
229135A	Yarra River	Banksia Street Heidelberg	1975	2017	1 hour
229149A	Merri Creek	St Georges Road Northcote	1975	2017	6 minute
229229A	Koonung Creek	Bulleen Road	1996	2017	6 minute

Figure 1 Melbourne Water Gauge Locations

3.1.3 Water Quality Assessment

Utilising the Environmental Protection Agency (EPA) of Victoria series of Information Bulletins to support and guide the State Environment Protection Policy (SEPP) (EPA Victoria, 2003b). A series of water quality and nutrient objectives could be determined for the rivers/creeks in the referred project area. All of which fall within the category 'urban waterways of the Yarra catchment'. Two of the Information Bulletins relevant to this study include:

- Water Quality Objectives for Rivers and Streams – Ecosystem Protection (EPA Victoria, 2003c)
- Nutrient Objectives for Rivers and Streams - Ecosystem Protection (EPA Victoria, 2003a)

The objectives set out in these publications are outlined in Appendix A.

These objectives were then compared to data from the Water Quality Monitoring Program (WQMP) conducted by Melbourne Water throughout 136 sites around Greater Melbourne. Each site is sampled monthly and tested for a variety of indicators. The most recent published water quality data from the WQMP is for the twelve months during 2015 (Melbourne Water, 2015). The sites used in this assessment are shown spatially in Figure 2.

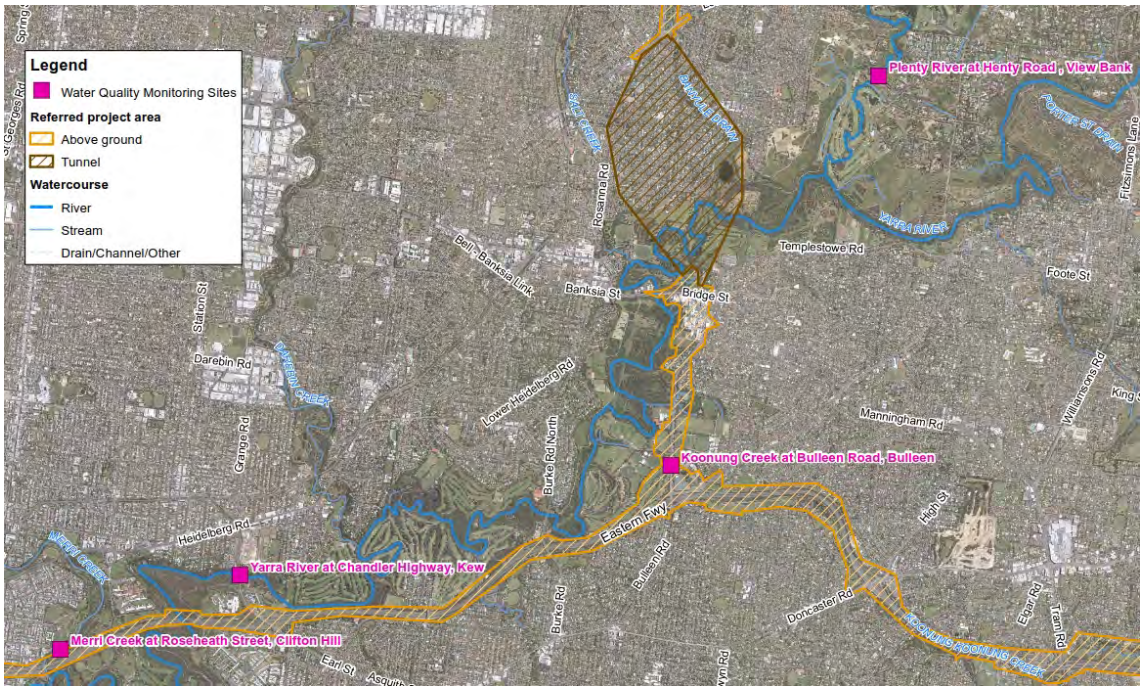

Figure 2 Water Quality Monitoring Sites

3.2 Field assessments

On the 17th July 2017 a site walkover was conducted at key locations within the referred project area. This scope of the site walkover was focused on the Yarra River, Banyule Creek and Koonung Creek. The aim of the site walkover was to inform the existing conditions assessment by observing overland flow paths, waterway and creek characteristics.

4. Existing conditions

4.1 Plenty River

Plenty River is approximately 50 kilometres in length beginning in the Great Dividing Range and flows in a generally south direction to its confluence with the Yarra River near the Rosanna Golf Course. In the section to the north of the Greensborough Bypass Plenty River flows through forested, rural and open space land use and to the south through residential and urban areas, but the River itself is mainly contained within parkland. (Melbourne Water, 2016a).

The Plenty River catchment is a water supply catchment that contains two water supply reservoirs; Yan Yean Reservoir and Toorourong Reservoir. These water supply reservoirs have altered the natural flow regime of the river and subsequently could alter flood flows through the catchment (Melbourne Water, 2016a).

The major existing road crossings of Plenty River are Greensborough Bypass, Main Street, Para Road and Lower Plenty Road. At Greensborough Bypass this includes some piers near the river banks.

Plenty River in the vicinity of the referred project area is a naturalised river which was rated as very poor according to the IRC ratings. Changes from natural stream flow conditions, is one of the contributing factors to this rating. Rural frontages to the river allow extraction, therefore reducing the stream flow.

Plenty River is an ephemeral stream and ceases flowing regularly for a couple for months over the summer period (Melbourne Water, 2016a). Shown in Figure 3 is the existing conditions flow duration curve, which highlights the ephemeral nature of Plenty River. As 17% of the time the flow is less than 0.01m^3/s.

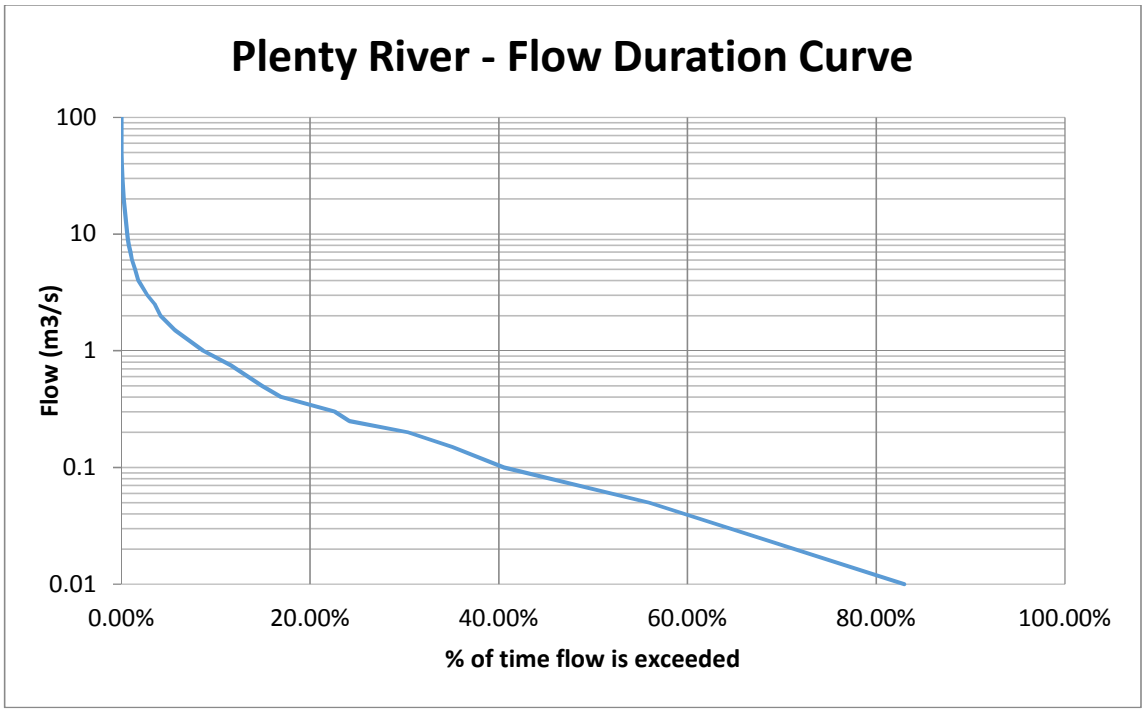

Figure 3 Plenty River Flow Duration Curve

Analysis of the WQMP data (Melbourne Water, 2015), for the 12 months of 2015 resulted in Plenty River only meeting five out of ten SEPP objectives. The result of this analysis can be seen in Appendix B Table 4.

4.2 Banyule Creek

Banyule Creek originates at Simpson Barracks and flows south into the Yarra River. The creek is approximately 4 kilometres in length. The catchment consists of urban development and includes part of the Simpson Barracks and also some open space areas. North of Lower Plenty Road Banyule Creek runs parallel to Greensborough Road through Simpsons Barracks and an open reserve. Sections of the creek through this reserve are vegetated (Figure 4 and Figure 5). South of Lower Plenty Road the creek flows through an open reserve adjacent to residential properties until it meets the Yarra River. At Drysdale Road the creek passes under the road in a single 0.61 metre diameter culvert. At Lower Plenty Road the creek passes under the road in two 1575 mm diameter culverts.

Figure 4 Banyule Creek between Lower Plenty Road and Drysdale Road

Banyule Creek is a minor tributary to Lower Yarra River. The major existing road crossings of Banyule Creek are at Drysdale Street, Lower Plenty Road and Banyule Road.

Banyule Creek is a naturalised creek within an urban catchment and according to the IRC rating is combined in the Middle and Lower Yarra River catchment conditions, which are currently considered moderate. Key risks include changes in hydrology, water quality reduced due to stormwater inflow, partial barriers to fish migration and the existence of exotic weeds and pests (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007).

Banyule Creek is a minor urban tributary of the Yarra River and is not gauged.

Banyule Creek is does not have a water quality monitoring station along its reach length, therefore no water quality data is available.

Figure 5 Banyule Creek reserve upstream of Drysdale Road, right bank looking upstream

4.3 Yarra River

Melbourne Water describes the Yarra River catchment as follows (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007):

"The Yarra catchment lies north and east of Melbourne, beginning on the southern slopes of the Great Dividing Range in the forested Yarra Ranges National Park. Around two million people, over one-third of Victoria's population, live in the catchment, which has an area approximately 4000 square kilometres.

The upper reaches of the Yarra River and its major tributaries flow through forested, mountainous areas, which have been reserved for water supply purposes for more than 100

years. Around 70% of Melbourne's drinking water comes from these pristine upper reaches. Most of the land along rivers and creeks in the middle and lower sections has been cleared for agriculture or urban development."

Much of the floodplain is protected in public open space and includes various wetlands such as the Bolin Bolin Billabong and Yarra Flats Billabong (Melbourne Water, 2016b).

Yarra River in the vicinity of the project is a naturalised river (Figure 6 and Figure 8). Vegetation includes native trees which grow along the banks of the river. According to the IRC rating, the area of interest is combined in the Middle and Lower Yarra River catchment conditions, which are currently considered moderate. Key risks include changes in hydrology, water quality reduced due to stormwater inflow, partial barriers to fish migration and the existence of exotic weeds and pests (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007).

Figure 6 Yarra River downstream from Burke Road

Flows in the Yarra River are significantly altered from its natural condition due to the existence of water storages along its length. Based on the gauge data provided by Melbourne Water at Banksia Street in Heidelberg, the flow duration curves shown below in Figure 7 were developed. Significant variability can be seen between a wet year and dry year. In a dry year only 20% of the time was the flow greater than 4 m^3/s, whereas in typical wet year the flow was greater than 55 m^3/s 20% of the time. Across the total period 18 m^3/s was exceeded 20% of the time.

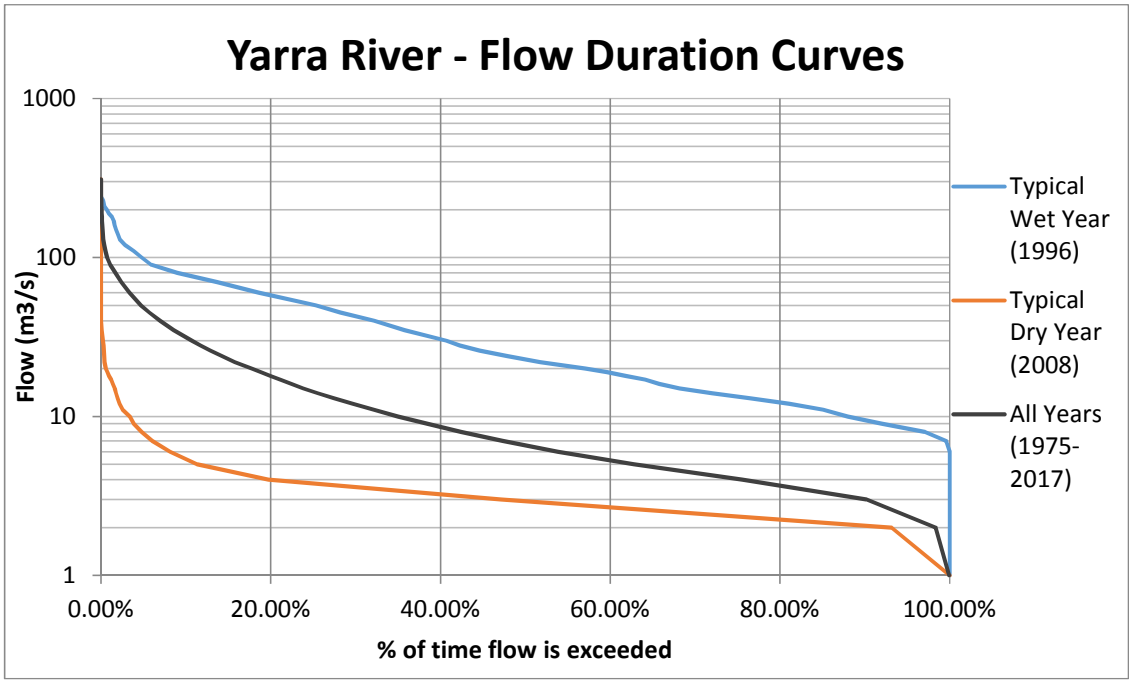

Figure 7 Yarra River Flow Duration Curves

Analysis of the WQMP data (Melbourne Water, 2015), for the 12 months of 2015, at the station situated near the Chandler Highway crossing, resulted in the Yarra River meeting seven out of ten SEPP objectives. The result of this analysis can be seen in Appendix B, Table 5.

Figure 8 Yarra River downstream of Chandler Highway

4.4 Merri Creek

Melbourne Water describes Merri Creek as follows (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007):

"Merri Creek flows from the foothills of the Great Dividing Range north of Wallan on the Hume Highway. It is a major tributary of the Yarra River flow over basalt plains to meet the Yarra ay Fairfield. Tributaries include Edgars and Central creeks. Merri Creek has high Aboriginal heritage value, as the creek and surrounding lands were important for food, shelter and travel."

Merri Creek in the vicinity of the project is surrounded by urban suburbs. This naturalised system is considered very poor according to the IRC rating of waterways. Risks to the lower reaches include the quality and quantity of stormwater, poor quality streamside vegetation and fish barriers (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007).

Merri Creek as a waterway has a flow greater than 0.1 m^3/s 80% of the time, as can be seen in Figure 9 below.

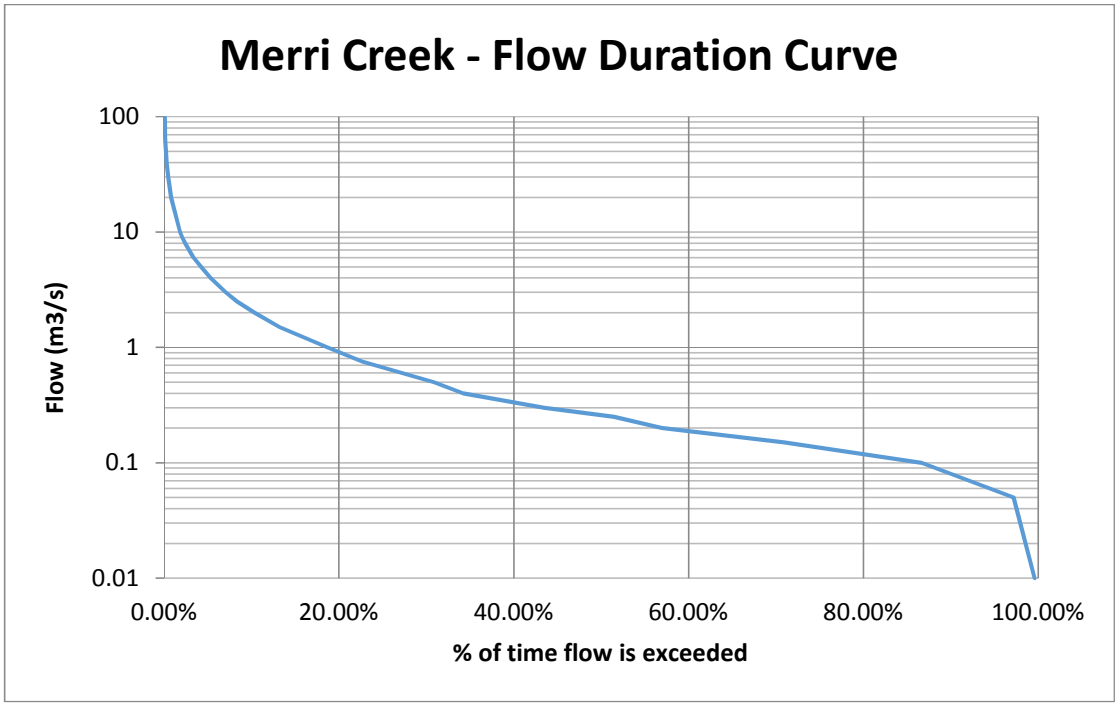

Figure 9 Merri Creek Flow Duration Curve

Analysis of the WQMP data (Melbourne Water, 2015), for the 12 months of 2015, at the station on Merri Creek near Roseneath Street, resulted in Merri Creek meeting five out of ten SEPP objectives. The result of this analysis can be seen in Appendix B, Table 6.

4.5 Koonung Creek

Melbourne Water describes Koonung Creek as follows (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007):

"Koonung Creek is a small tributary of the Yarra that arises in Blackburn North and Doncaster. Its catchment is almost entirely urban, however the creek contains major parklands in some of its reaches that have high recreational value. The creek has been heavily modified by

realignment and erosion control works, particularly those associated with the Eastern Freeway, however it has retained native fish species, listed water birds, the growling grass frog and the floodplain contains sites of significant Aboriginal heritage.

Koonung Creek is a heavily modified waterway due to the construction of the Eastern Freeway and is considered very poor according to the IRC rating of waterways. Following waterway modification vegetation was re-stablished along sections of the waterway (Figure 10 and Figure 11). The most significant risks for the Creek include the significantly altered hydrology, loss of vegetation, poor water quality and barriers to fish movement (Melbourne Water and Port Phillip Westernport Catchment Management Authority, 2007).

Flow data is available for Koonung Creek but was not used due to the limited recording period of 1996 to 2017 and poor data quality due to the gauge location and rating curve reliability.

Analysis of the WQMP data (Melbourne Water, 2015), for the 12 months of 2015, at the station on Koonung Creek near Bulleen Road, resulted in Koonung Creek meeting six out of ten SEPP objectives. The result of this analysis can be seen in Appendix B, Table 7.

A large concentration of E. Coli was reported to be 16 times greater than the target. E. Coli is an indicator of human faecal matter contamination (Wangersky, 2006). Potential sources for this contamination include sewer blockage, seepage from the sewerage system and cross-connections between sewer and stormwater pipes (EPA Victoria, 2007).

Figure 10 Vegetation along Koonung Creek upstream of Doncaster Road

Figure 11 Vegetation at Koonung Creek wetlands

5. Management

An important requirement of the surface water design and management of the project will be to include measures that control the potential impacts on rivers and creeks. Water management principals are to be applied to the design to maintain the existing conditions of the rivers and creeks, including flow and water quality.

Water sensitive urban and road design will be adopted to control potential impacts to receiving waters such as rivers and creeks from additional runoff volume, alteration of the timing of flows, and contamination from increased pollutants. Additional pavement area that is created by building new roads or adding additional lanes or interchanges to existing roads creates additional stormwater runoff that may not have occurred in pre-developed conditions. Any road works that create additional pavement area will be required to meet water sensitive road design criteria and provide additional water treatment and flow retention as necessary. Water sensitive urban and road design will be included as a part of a drainage strategy for the project.

The drainage strategy for the project will include the specifications for water quality treatment of stormwater runoff in accordance with VicRoads Integrated Water Management Guidelines (VicRoads, 2013) and the Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG) (CSIRO, 1999). The BPEMG establish best practice performance objectives for urban stormwater (for urban development). These objectives assist in determining the level of stormwater management necessary to meet the State Environment Protection Policies (SEPP) Waters of Victoria.

In some locations the treatment may be unable to be contained within the project boundary. Offsite treatment locations may be investigated. If treatment is not an option an offset payment may be considered for water quality works to be conducted elsewhere in the catchment.

6. Conclusions

In order to determine the existing conditions for the waterways within the referred project area, a desktop and field assessment process was used. The catchment type, waterway conditions, water flows and water quality were all a focus for Plenty River, Banyule Creek, Yarra River, Merri Creek and Koonung Creek.

The waterway conditions for the five key waterways have been determined as:

- Plenty River: very poor
- Banyule Creek: moderate
- Yarra River: moderate
- Merri Creek: very poor
- Koonung Creek: very poor

An important part of the surface water design and management of the project will be to include measures in the design that control the potential impacts on rivers and creeks, to prevent impacts on surface water quality and flow.

7. References

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Appendices

Appendix A – Water Quality and Nutrients Objectives for the Yarra Catchment

Table 3 SEPP Water Quality and Nutrients Objectives for Yarra Catchment

Parameter	Objective
Dissolved Oxygen (% Saturation)	>60% (Minimum)
Dissolved Oxygen (Concentration)	>6 mg/l (Minimum)
Electrical Conductivity	<900 µS/cm (Maximum) – Yarra River <1,800 µS/cm (Maximum) – Koonung/Banyule
pH	>6 (Minimum)
pH	<8.5 (Maximum)
Turbidity	<25 NTU (50th Percentile)
Suspended Solids	<50 mg/l (50th Percentile) – Yarra River <25 mg/l (50th Percentile) – Koonung/Banyule
Total Nitrogen	<1,000 µg/l (Maximum)
Total Phosphorous	<80 µg/l (Maximum) – Yarra River <100 µg/l (Maximum) – Koonung/Banyule
E. Coli	200 orgs/100mL (50th Percentile) – Yarra 1,000 orgs/100mL (50th Percentile) - Koonung/Banyule

Appendix B – Water Quality Monitoring Results

Table 4 Water Quality Monitoring Results for Plenty River

Parameter	Units	Statistic	SEPP Objective	Plenty River at Kurrak Road, South Morang	Plenty River at Viewbank
Dissolved Oxygen	% saturation	minimum	>60	17	48
Dissolved Oxygen	Concentration (mg/l)	minimum	>6	2	4
Electrical Conductivity	µS/cm	maximum	<1,800	960	720
pH		minimum	>6	7.6	7.4
pH		maximum	<8.5	8.1	7.9
Turbidity	NTU	50th Percentile	<25	11	14
Suspended solids	mg/L	50th Percentile	<25	9	14
Total Nitrogen	µg/L	maximum	<1,000	2,300	1,000
Total Phosphorous	µg/L	maximum	<80	190	290
E. coli	orgs/100mL	50th Percentile	<200	101	565

Table Notes: Does not meet SEPP objective

Table 5 Water Quality Monitoring Results for Yarra River

Parameter	Units	Statistic	SEPP Objective	Yarra River at Kangaroo Ground-Warrandyte Road, Warrandyte	Yarra River at Chandler Highway, Kew	Yarra River at Princes Bridge, Melbourne
Dissolved Oxygen	% saturation	minimum	>60	89	67	81
Dissolved Oxygen	Concentration (mg/l)	minimum	>6	8	6	7
Electrical Conductivity	µS/cm	maximum	<900	160	210	20,000

pH		minimum	>6	7.4	6.9	7.4
pH		maximum	<8.5	7.7	7.8	8.0
Turbidity	NTU	50th Percentile	<25	9	24	9
Suspended solids	mg/L	50th Percentile	<50	9	21	13
Total Nitrogen	µg/L	maximum	<1,000	900	1,100	1,300
Total Phosphorous	µg/L	maximum	<80	40	70	160
E. coli	orgs/100mL	50th Percentile	<200	91	203	280

Table Notes: Does not meet SEPP objective

Table 6 Water Quality Monitoring Results for Merri Creek

Parameter	Units	Statistic	SEPP Objective	Merri Creek at Roseneath Street, Yarra Bend	Merri Creek at Summerhill Road, Craigeburn
Dissolved Oxygen	% saturation	minimum	>60	22	33
Dissolved Oxygen	Concentration (mg/l)	minimum	>6	7	3
Electrical Conductivity	µS/cm	maximum	<1,800	1,600	6,100
pH		minimum	>6	8	8
pH		maximum	<8.5	9	8
Turbidity	NTU	50th Percentile	<25	7	5
Suspended solids	mg/L	50th Percentile	<25	5	6
Total Nitrogen	µg/L	maximum	<1,000	1,700	3,500
Total Phosphorous	µg/L	maximum	<80	180	450
E. coli	orgs/100mL	50th Percentile	<200	220	210

Table Notes: Does not meet SEPP objective

Table 7 Water Quality Monitoring Results for Koonung Creek

Parameter	Units	Statistic	SEPP Objective	Koonung Creek at Bulleen Road, Bulleen
Dissolved Oxygen	% saturation	minimum	>60	44
Dissolved Oxygen	Concentration (mg/l)	minimum	>6	4
Electrical Conductivity	µS/cm	maximum	<1,800	1,200
pH		minimum	>6	7.2
pH		maximum	<8.5	7.9
Turbidity	NTU	50th Percentile	<25	32
Suspended solids	mg/L	50th Percentile	<25	16
Total Nitrogen	µg/L	maximum	<1,000	2,200
Total Phosphorous	µg/L	maximum	<80	130
E. coli	orgs/100mL	50th Percentile	<200	3,250

Table Notes: Does not meet SEPP objective