

APPENDIX B - TYPICAL FLOOD PEAK TRAVEL TIMES

In using the information contained in this Appendix, consideration needs to be given to the time of travel of the flood peak. A flood on a 'dry' waterway will generally travel more slowly than a flood on a 'wet' waterway (e.g. The first flood after a dry period will travel more slowly than the second flood in a series of floods). Hence, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities.

Note that flooding will start some time ahead of the time indicated by the following travel times – these are the time between the flood peaks at respective sites.

Only waterways that contain telemetered stream level and flow gauges are included in table B1. Reliable flow travel time information is not presently available for other waterways within Cardinia Shire.

Downstream gauges may experience a flood peak prior to that occurring at an upstream gauge. This phenomenon may be due to the location of the thunderstorm passing through the catchment between the two gauges, or because of the urban environment found downstream causing floodwaters to enter the waterway quicker than those in a more rural setting upstream. Lastly this may be because of the existence of a retarding basin between the two gauges.

Typical Travel Times

Location From (gauge)	Location To (gauge)	Typical Travel Time	Comments
CARDINIA CREEK			
Officer South	Cardinia	Between 1 min to 2 hours	
BUNYIP & TARAGO RIVERS			
Headworks	Iona	Between 4 & 18 hours	Inflows from Tarago River likely to impact on travel time.
Tonimbuk		Iona may peak up to 16 hours before Tonimbuk or 8 hours after	Tonimbuk is just as likely to peak after Iona as before even though it is located upstream. Therefore, flood peak travel times between these gauges should be used with caution. Inflows from Tarago River likely to impact on travel time.
Longwarry North		Iona may peak up to 6 hours before Longwarry North or 6 hours after	Longwarry North may peak after Iona even though it is located upstream. Therefore, flood peak travel times between these gauges should be used with caution. Inflows from Tarago River likely to impact on travel time.
Neerim South		Between 8 & 20 hours	Inflows from Bunyip River likely to impact on travel time.
Drouin West		Iona may peak up to 2 hours before Drouin West or 10 hours after	Drouin West may peak after Iona even though it is located upstream. Therefore, flood peak travel times between these gauges should be used with caution. Inflows from Bunyip River likely to impact on travel time.
Iona	Cora Lynn Ford	Between 1 min to 2 hours	
	Koo Wee Rup	Between 4 & 7 hours	

Table B1 – Typical Flood Travel Times between gauges on Cardinia Creek & Bunyip River

Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
CARDINIA CREEK				CARDINIA
16 th September 1993	Officer South	Cardinia	Cardinia peaked 1 hour before Officer South	Minor
30 th July 1996	Officer South	Cardinia	1 hour	Major
13 th November 2004	Officer South	Cardinia	1 hour	Moderate
3 rd February 2005	Officer South	Cardinia	1 hour	Moderate
31 st October 2010	Officer South	Cardinia	2 hours	Below Minor
5 th February 2011	Officer South	Cardinia	2 hours	Major
22 nd June 2012	Officer South	Cardinia	1 hour	Minor
BUNYIP & TARAGO RIVERS				IONA
29 th July 1977	Tonimbuk	Iona	Iona peaked 4 hours before Tonimbuk	Minor
	Neerim South		18 hours	
	Drouin West		10 hours	
10 th August 1978	Tonimbuk	Iona	10 hours	Minor
	Neerim South		21 hours	
	Drouin West		8 hours	
20 th November 1978	Tonimbuk	Iona	Iona peaked 8 hours before Tonimbuk	Minor
	Neerim South		12 hours	
	Drouin West		Iona peaked 2 hours before Drouin West	
22 nd August 1981	Headworks	Iona	4 hours	Minor
	Tonimbuk		Iona peaked 17 hours before Tonimbuk	
	Neerim South		10 hours	
	Drouin West		1 hour	
14 th September 1983	Headworks	Iona	11 hours	Minor
	Tonimbuk		Iona peaked 2 hours before Tonimbuk	
	Neerim South		8 hours	
	Drouin West		4 hours	
17 th October 1983	Headworks	Iona	9 hours	Minor
	Tonimbuk		Iona peaked 10 hours before Tonimbuk	
	Neerim South		15 hours	
	Drouin West		Iona peaked 2 hours before Drouin West	
19 th September 1984	Headworks	Iona	3 hours	Moderate
	Tonimbuk		1 hour	
	Neerim South		8 hours	
	Drouin West		3 hours	
7 th November 1985	Headworks	Iona	5 hours	Minor
	Tonimbuk		Iona peaked 6 hours before Tonimbuk	
	Neerim South		11 hours	
	Drouin West		1 hour	
29 th July 1987	Headworks	Iona	4 hours	Minor
	Tonimbuk		Iona peaked 16 hours before Tonimbuk	
	Neerim South		13 hours	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
11 th June 1989	Drouin West	Iona	8 hours	Minor
	Headworks		11 hours	
	Tonimbuk		Iona peaked 4 hours before Tonimbuk	
	Neerim South		18 hours	
	Drouin West		3 hours	
28 th October 1989	Headworks	Iona	11 hours	Minor
	Tonimbuk		Iona peaked 3 hours before Tonimbuk	
	Neerim South		15 hours	
	Drouin West		4 hours	
31 st October 1989	Headworks	Iona	12 hours	Minor
	Tonimbuk		Iona peaked 3 hours before Tonimbuk	
	Neerim South		18 hours	
	Drouin West		7 hours	
12 th October 1990	Headworks	Iona	4 hours	Major
	Tonimbuk		Iona peaked 4 hours before Tonimbuk	
	Neerim South		10 hours	
	Drouin West		6 hours	
18 th September 1991	Headworks	Iona	7 hours	Minor
	Tonimbuk		Iona peaked 11 hours before Tonimbuk	
	Neerim South		14 hours	
	Drouin West		3 hours	
11 th October 1992	Headworks	Iona	6 hours	Minor
	Tonimbuk		4 hours	
	Neerim South		13 hours	
	Drouin West		4 hours	
16 th September 1993	Headworks	Iona	16 hours	Moderate
	Tonimbuk		4 hours	
	Neerim South		20 hours	
	Drouin West		9 hours	
12 th June 1995	Headworks	Iona	11 hours	Minor
	Tonimbuk		7 hours	
	Neerim South		10 hours	
	Drouin West		4 hours	
23 rd October 1995	Headworks	Iona	4 hours	Minor
	Tonimbuk		Less than 1 hour	
	Neerim South		15 hours	
	Drouin West		Iona peaked 3 hours before Drouin West	
6 th November 1995	Headworks	Iona	11 hours	Minor
	Tonimbuk		6 hours	
	Neerim South		15 hours	
	Drouin West		Less than 1 hour	
30 th July 1996	Headworks	Iona	4 hours	Moderate
	Tonimbuk		Iona peaked 13 hours before Tonimbuk	
	Neerim South		9 hours	
	Drouin West		7 hours	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
	Iona	Cora Lynn Ford	1 hour	
8 th August 1996	Headworks	Iona	6 hours	Minor
	Tonimbuk		2 hours	
	Neerim South		13 hours	
	Drouin West		3 hours	
	Iona		Cora Lynn Ford	
1 st October 1996	Headworks	Iona	9 hours	Minor
	Tonimbuk		3 hours	
	Neerim South		12 hours	
	Drouin West		1 hour	
	Iona		Cora Lynn Ford	
13 th November 2004	Headworks	Iona	8 hours	Moderate
	Tonimbuk		7 hours	
	Longwarry North		3 hours	
	Neerim South		13 hours	
	Drouin West		6 hours	
	Iona	Cora Lynn Ford	2 hours	
		Koo Wee Rup	5 hours	
3 rd February 2005	Headworks	Iona	17 hours	Minor
	Tonimbuk		5 hours	
	Longwarry North		Less than 1 hour	
	Neerim South		19 hours	
	Iona	Koo Wee Rup	6 hours	
13 th September 2005	Headworks	Iona	Less than 1 hour	Minor
	Tonimbuk		Iona peaked 8 hours before Tonimbuk	
	Longwarry North		Less than 1 hour	
	Neerim South		19 hours	
	Drouin West		5 hours	
	Iona	Cora Lynn Ford	Less than 1 hour	
		Koo Wee Rup	4 hours	
28 th September 2009	Headworks	Iona	20 hours	Minor
	Tonimbuk		Iona peaked 3 hours before Tonimbuk	
	Longwarry North		2 hours	
	Neerim South		15 hours	
	Drouin West		2 hours	
	Iona	Cora Lynn Ford	5 hours	
		Koo Wee Rup	6 hours	
31 st October 2010	Headworks	Iona	12 hours	Minor
	Tonimbuk		3 hours	
	Longwarry North		Iona peaked 1 hour before Longwarry North	
	Neerim South		15 hours	
	Drouin West		Iona peaked 5 hours before Drouin West	
	Iona	Cora Lynn Ford	1 hour	
		Koo Wee Rup	4 hours	
21 st December 2010	Headworks	Iona	18 hours	Minor
	Tonimbuk		3 hours	
	Longwarry North		3 hours	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at	
	Neerim South		12 hours		
	Drouin West		12 hours		
	Iona		Cora Lynn Ford		1 hour
			Koo Wee Rup		5 hours
5 th February 2011	Headworks	Iona	9 hours	Major	
	Tonimbuk		8 hours		
	Longwarry North		6 hours		
	Neerim South		13 hours		
	Drouin West		8 hours		
	Iona	Cora Lynn Ford	2 hours		
		Koo Wee Rup	Less than 1 hour		
12 th April 2011	Headworks	Iona	7 hours	Minor	
	Tonimbuk		Iona peaked 2 hours before Tonimbuk		
	Longwarry North		Iona peaked 7 hours before Longwarry North		
	Neerim South		11 hours		
	Drouin West		1 hours		
	Iona	Cora Lynn Ford	2 hours		
		Koo Wee Rup	7 hours		
11 th August 2011	Headworks	Iona	7 hours	Minor	
	Tonimbuk		3 hours		
	Longwarry North		2 hours		
	Neerim South		13 hours		
	Drouin West		4 hours		
	Iona	Cora Lynn Ford	Less than 1 hour		
		Koo Wee Rup	7 hours		
30 th September 2011	Headworks	Iona	9 hours	Minor	
	Tonimbuk		3 hours		
	Longwarry North		2 hours		
	Neerim South		13 hours		
	Drouin West		2 hours		
	Iona	Cora Lynn Ford	Cora Lynn Ford peaked 1 hour before Iona		
		Koo Wee Rup	5 hours		
10 th November 2011	Headworks	Iona	13 hours	Minor	
	Tonimbuk		6 hours		
	Longwarry North		4 hours		
	Neerim South		20 hours		
	Drouin West		10 hours		
	Iona	Cora Lynn Ford	1 hour		
		Koo Wee Rup	4 hours		
27 th November 2011	Headworks	Iona	10 hours	Minor	
	Tonimbuk		1 hour		
	Longwarry North		2 hours		
	Neerim South		16 hours		
	Drouin West		Less than 1 hour		
	Iona	Cora Lynn Ford	1 hour		
		Koo Wee Rup	6 hours		
26 th May 2012	Headworks	Iona	11 hours	Minor	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at	
	Tonimbuk		Iona peaked 17 hours before Tonimbuk		
	Longwarry North		Iona peaked 6 hours before Tonimbuk		
	Neerim South		3 hours		
	Drouin West		2 hours		
	Iona		Cora Lynn Ford		2 hours
			Koo Wee Rup		6 hours
5 th June 2012	Headworks	Iona	5 hours	Minor	
	Tonimbuk		18 hours		
	Longwarry North		9 hours		
	Neerim South		9 hours		
	Drouin West		3 hours		
	Iona		Cora Lynn Ford		1 hour
Koo Wee Rup		7 hours			
22 nd June 2012	Headworks	Iona	7 hours	Minor	
	Tonimbuk		4 hours		
	Longwarry North		2 hours		
	Neerim South		11 hours		
	Drouin West		7 hours		
	Iona		Cora Lynn Ford		1 hour
Koo Wee Rup		5 hours			
3 rd July 2012	Headworks	Iona	4 hours	Minor	
	Tonimbuk		Iona peaked 4 hours before Tonimbuk		
	Longwarry North		Iona peaked 6 hours before Longwarry North		
	Neerim South		7 hours		
	Drouin West		Iona peaked 1 hour before Drouin West		
	Iona		Cora Lynn Ford		5 hours
Koo Wee Rup		6 hours			
28 th August 2015	Headworks	Iona	6 hours	Minor	
	Tonimbuk		1 hour		
	Longwarry North		1 hour		
	Neerim South		14 hours		
	Drouin West		7 hours		
	Iona		Cora Lynn Ford		1 hour
Koo Wee Rup		5 hours			
22 nd July 2016	Headworks	Iona	6 hours	Minor	
	Tonimbuk		1 hour		
	Longwarry North		3 hours		
	Neerim South		9 hours		
	Drouin West		2 hours		
	Iona		Cora Lynn Ford		2 hours
Koo Wee Rup		7 hours			
2 nd May 2020	Headworks	Iona	3 hours	Minor	
	Tonimbuk		2 hours		
	Longwarry North		Less than 1 hour		
	Neerim South		13 hours		
	Drouin West		10 hours		

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
	Iona	Cora Lynn Ford	Less than 1 hour	
		Koo Wee Rup	3 hours	
23 rd August 2020	Headworks	Iona	15 hours	Minor
	Tonimbuk		4 hours	
	Longwarry North		1 hour	
	Neerim South		9 hours	
	Drouin West		6 hours	
	Iona		Cora Lynn Ford	
	Koo Wee Rup	5 hours		
25 th October 2020	Headworks	Iona	7 hours	Minor
	Tonimbuk		Iona peaked 1 hours before Tonimbuk	
	Longwarry North		Iona peaked 3 hours before Longwarry North	
	Neerim South		9 hours	
	Drouin West		6 hours	
	Iona		Cora Lynn Ford	
	Koo Wee Rup	8 hours		

Table B2 – Historical Flood Travel Times between gauges on Cardinia Creek and the Bunyip River