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# Abbreviations

AADT	annual average daily traffic
CGS	Centre for Groundwater Studies
EMIP	Environmental Management Implementation Plan
EPA	Environmental Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
HGV	heavy goods vehicles
km	kilometre
LMC	Land Management Corporation
m	metre
MFP	Multi-function Polis
O–D	origin–destination
PIRSA	Primary Industries & Resources SA
TDS	total dissolved solids
VHT	vehicle-hours of travel
VKT	vehicle-kilometres of travel

# 1 Introduction

## 1.1 Purpose of this Supplement

An Environmental Report for the Port River Expressway was available for public comment between 30 November 2000 and 12 January 2001. During this period comments and submissions were received from four State Government agencies, four councils and thirty-six other organisations, groups and individuals.

The purpose of this Supplement is to provide the response from Transport SA to these comments and submissions. This Supplement, together with the Environmental Report, forms part of the Final Environmental Report which will guide the design, construction and operation of the Port River Expressway project.

The Environmental Report examined the likely impacts of the project on the biological, physical and social environments of the area. It also recommended environmental management practices to be used during both construction and operation of the new road and rail connections.

## 1.2 Public display period

The Environmental Report was released for public comment at two information seminars held at the Douglas Mawson Institute of TAFE, Port Adelaide, on Thursday 30 November 2000.

The report was put on public display for five weeks at a range of community locations to ensure that it was available to as many members of the community as possible. Ten information panels were produced summarising the key findings from the report. Response sheets were available at the display to enable interested members of the community to record their comments. The display was set up at:

Douglas Mawson Institute of TAFE  
Wednesday 29 November – Wednesday 6 December

Westfield Arndale Shopping Centre  
Thursday 7 December – Saturday 9 December

Semaphore Library  
Sunday 10 December – Sunday 17 December

The Parks Library  
Monday 18 December – Saturday 30 December

Project representatives staffed these displays on eight occasions. A separate display, which provided an overview of the project, was set up at the Salisbury Council offices.

### 1.3 Distribution of information

The Environmental Report and an Executive Summary were distributed to key stakeholders, with copies also available for purchase. The report was also available for viewing at the offices and libraries of Adelaide City Council, Charles Sturt Council, Salisbury Council and Port Adelaide Enfield Council.

Throughout the display period, numerous meetings and/or presentations were undertaken with community groups, businesses, other Government agencies, Council members and professional associations to discuss issues relating to the Environmental Report. Two workshops were held with the City of Port Adelaide Enfield Council to discuss the Council's response to the Environmental Report. Discussions with stakeholders will continue as the project develops and an increasing number of unconfirmed elements are finalised.

To encourage community awareness of the Environmental Report, details of the display period were publicised by:

- a media release announcing the release of the report;
- distribution of a poster to community centres throughout the Port Adelaide area;
- advertisements placed in *The Advertiser* and local Messenger newspapers throughout the display period.

Copies of the Executive Summary, project brochure and project newsletter, *Express news*, were available at the public display. The Port River Expressway telephone information line was monitored throughout the display period and the web address, [www.transport.sa.gov.au/portriverexpressway](http://www.transport.sa.gov.au/portriverexpressway), promoted in publicity materials.

Letters were sent to approximately 1,500 members of the community three weeks before the close of the display period, reminding them that the comment period would end on Friday 12 January 2001. At the request of several respondents who required additional time to complete their submissions, this deadline was extended until 30 January.

### 1.4 Consultations

#### 1.4.1 Consultation prior to release of the Environmental Report

The community consultation program undertaken for the Environmental Report was designed with the objectives of identifying key stakeholders, raising awareness of the consultation process and communicating how people could be involved by contributing to the development of the project. Consultations were held during July and August 2000.

To facilitate the consultation process, discussions focused on those project elements open to community influence, such as:

- the bridge design
- junction and intersection details
- operation of Birkenhead Bridge and St Vincent Street/Commercial Street
- landscape form and treatment
- urban design

- details of the project schedule and construction program that may impact on local business conditions.

These are some of the key issues addressed in this Supplement.

Significant elements of the project have been confirmed by Cabinet and therefore could not be changed by consultation, such as the location of the bridge. Other project elements are unknown, such as the operation of tolls, and for these elements Transport SA will continue to update stakeholders and the broader community on developments as the project progresses.

Submissions raising matters that were outside the scope of the Environmental Report were also received, as were comments on matters that became relevant just as the Environmental Report was being completed and could not be addressed in the report. In relation to the broader issue of industrial development taking place on the Lefevre Peninsula, Transport SA is undertaking separate studies to examine these potential impacts on traffic flow and volumes on the peninsula.

#### 1.4.2 **Comments on report**

Forty-four submissions were received in response to the call for comments during the public display period. These submissions included a total of 175 specific comments. Table 1.1 summarises the categories of issues raised.

**Table 1.1** Summary of issues raised

Category	Number of comments <sup>1</sup>
Traffic flows and mix	48
Position, height, appearance and design of the bridges	25
Future developments in the area	15
Surface water and wetlands	15
Native vegetation	14
Geotechnical conditions and groundwater	10
Rail	7
Air quality	6
Bicycle paths	6
Road traffic noise	6
Landscaping	4
Artists	3
Contaminated land	3
Staging of the construction	3
Economics	2
Consultation	2
Fauna	2
Heritage	2
Induction of the construction workforce	2
Environmental Management Plan	1
<b>Total (= total no. of comments)</b>	<b>175</b>

<sup>1</sup> Includes multiple submissions on the same subject.

11 responses, from telephone calls, facsimiles, e-mails, letters and response sheets, were entered into a database that recorded the name, address, organisation and comment. These responses were analysed to determine specific questions, comments or concerns. A code was assigned to each comment and the comments were grouped by their code. The results of this initial analysis are shown in Table A.1 in Appendix A, which also provides a cross-reference for each comment to the relevant section in this Supplement.

The analysis shows that many people commented on the same issues, albeit with different emphases and opinions. This report is therefore organised in chapters that address categories of issues rather than in a series of questions and answers, which would in many cases have involved repeating both the question and the answer. Individuals who submitted comments can find responses to their concerns by using the cross-references in the last column of Table A.1.

While the greater part of this Supplement provides answers to criticisms and questions it is noted that statements endorsing the need for a Port River Expressway were received from several respondents.

## 2 Traffic flows and mix

A key objective of the Port River Expressway is to improve transport efficiency through better access to Outer Harbor for both road and rail traffic. The current road links west of the Salisbury Highway – South Road Connector to Port Adelaide are relatively indirect and congested. Heavy traffic passes through the historic Port Adelaide Centre to access the container terminal at Outer Harbor and other industry on the Lefevre Peninsula.

The improved freight access provided by the Port River Expressway will also assist the Port Adelaide area to further develop its unique character by reducing the impact of heavy road transport on the amenity of the central business district of Port Adelaide. Several respondents expressed the view that the expressway would reduce heavy goods vehicle traffic on Grand Junction, Causeway, Cormack and Semaphore Roads, producing benefits in terms of improved air quality, reduced noise and increased safety. Appreciation of the Federal Government's funding of the expressway under the Roads of National Importance scheme was also expressed.

Questions were submitted concerning traffic predictions. Some respondents expressed concern that the volume of traffic on Victoria Road would increase, particularly as a result of a proposal for a new grain handling facility at Outer Harbor. Some respondents suggested that the Mersey Road/Elder Road corridor should be upgraded to cater for a greater number of commercial vehicle movements. Among other matters raised were junctions on the expressway, the upgrading of Hanson Road, an eastern bypass of Port Adelaide, and potential impacts on the wider traffic network.

### 2.1 Potential to use Mersey/Elder Road as a designated heavy vehicle route

Several respondents suggested that Mersey/Elder Roads be upgraded to provide an alternative to Victoria Road for heavy goods vehicles travelling between Outer Harbor and the Port River Expressway.

Victoria Road is the major arterial road providing access to Lefevre Peninsula, and has sufficient traffic capacity to cater for current and predicted future traffic. Victoria Road is under the care and control of Transport SA.

Mersey Road and Elder Road are both local roads under the care and control of Port Adelaide Enfield Council, and primarily provide access for abutting properties (both residential and industrial/commercial). This route is currently discontinuous with its extension to the north of Strathfield Terrace.

Considerable upgrading would be needed before the Mersey Road/Elder Road route would become an attractive alternative route for commercial vehicles.

Transport SA is investigating this suggestion—examining the need for an alternative commercial vehicle route, likely issues and environmental effects, and possible costs. The results of this investigation will be discussed with Port Adelaide Enfield Council and other stakeholders once it has been completed.

In any case, the need for an alternative route would appear to be closely linked to the pattern, nature and timing of future development of the Lefevre Peninsula. For this issue to be effectively managed there will need to be cooperation and coordination between Council, other Government authorities (including Transport SA), property owners and developers and service authorities/providers.

## **2.2 Road layout and junctions**

One respondent expressed concern that the junction between the Port River Expressway and Elder Road on the peninsula would constitute a major impediment to the flow of traffic onto and off the road bridge and would be likely to cause delays, particularly when the bridge was open.

Transport SA considers that it is essential for traffic to be able to access Elder Road from the Port River Expressway, since many heavy vehicles start and terminate their journeys at the industries immediately north of the bridge. The area of land available for the construction of the junction allows for some flexibility and the possible solutions considered are shown in Figure 6.1 of the Environmental Report. The final decision on which of the solutions will be chosen will depend partially on the detailed design of the road bridge (e.g. its height). The respondent's concern regarding delays will be addressed during the design phase, which will investigate technical aspects of the proposed treatment such as traffic storage and slip lanes, traffic movement and priority and the phasing of traffic signals.

## **2.3 Traffic data**

Several submissions queried the basis of the traffic predictions presented in the Environmental Report.

Traffic modelling is of necessity based on a range of assumptions and/or expectations. The predictions of future traffic used for the Environmental Report were based on future land use scenarios applying at the time the modelling was done. This modelling suggested that the Port River Expressway will not attract additional traffic to Lefevre Peninsula, but will result in a significant redistribution of traffic patterns within the Port Adelaide Enfield Council area. It is acknowledged that the volume of traffic accessing the peninsula in the future will be linked to the pattern, nature and timing of future developments.

A range of traffic studies were undertaken to determine the impacts of the Port River Expressway project. These included a broad assessment of likely changes in emissions levels in the Port Adelaide Enfield Council area.

Further information on the studies used in the Environmental Report is provided in the following.

### 2.3.1 Traffic counts

Estimates of annual average daily traffic (AADT) volumes on each major road link within the Port River Expressway corridor were provided by Transport SA for the year 2000. These data were derived from an analysis of traffic counts from six permanent counting stations within the region, supplemented with data from a series of 11-hour traffic counts at a further twenty-four locations. This represents a reliable source of information on daily traffic movements within the study area.

Transport SA also undertook additional analysis of the counts to derive estimated proportions of light and heavy trucks using the major roads within the study area. Light trucks comprise all rigid trucks and buses, while heavy trucks comprise all articulated vehicles—semi-trailers, B-Doubles and road trains. These data form a key input for assessing the potential diversion of trucks from the road network within and around the Port Adelaide Centre area to the Port River Expressway.

### 2.3.2 Origin–destination survey

An origin–destination (O–D) survey of traffic using Victoria Road was undertaken by Transport SA in early 2000 to provide improved information on the movement of traffic between Lefevre Peninsula and other parts of Adelaide. Analysis of the data has provided an up-to-date basis for confirming the high proportion of commercial vehicle traffic, in particular, likely to use the Port River Expressway.

### 2.3.3 Traffic predictions

Transport SA provided the following predictions of traffic flows within the Port River Expressway corridor in the future:

- 1996: Assignments of modelled 1996 traffic volumes (based on Census population and employment information) to the existing 1996 road network, and to a 1996 network upgraded to include the Port River Expressway.
- 2011: Assignments of modelled 2011 traffic demand (based on predicted population and employment information) to a:
  - ‘Base Case’ 2011 road network that included road network improvements either implemented or committed but excluded the Port River Expressway;
  - ‘Project Case’ network which comprised the Base Case network upgraded to include the Port River Expressway.
- 2020: Estimates of 2020 traffic volumes on road links in the Port River Expressway corridor, derived from the estimated 2000 AADT volumes and the 2011 predictions.

Data provided for each scenario comprised estimated AADT on each major road link within the study area. For the modelled 1996 and 2011 predictions, Transport SA also provided estimates of vehicle-kilometres (VKT) and vehicle-hours (VHT) of travel derived from the traffic assignment process.

This represented the most up-to-date set of future traffic predictions available for the Environmental Report study.

#### 2.3.4 Commercial vehicle traffic

Transport SA also provided estimates of light and heavy commercial vehicle proportions on major roads within the study area for the year 2000. These were derived from existing traffic count data, and provide a reasonable basis for estimating the future movement of trucks within the study area for the existing Base Case scenario. For the Project Case scenario (with the Port River Expressway in operation), these estimates were updated using output from the O–D survey to take account of the rerouting potential of the Port River Expressway. (It is noted that the Transport SA modelling process did not provide explicit estimates of truck movements on individual road links.)

#### 2.3.5 Tabulated traffic data

Several submissions asked that the traffic data be presented in tabular form. Data on both total traffic and truck volumes are provided in Table 2.1. The figures following present a diagrammatic representation of the locations 1–19 identified in Table 2.1, as well as the same data for total traffic volumes (Figure 2.1) and for truck volumes (Figure 2.2).

### 2.4 Hanson Road

The section of Hanson Road between the Port River Expressway and Cormack Road will be developed as part of the expressway project.

Some respondents called for the upgrading of Hanson Road between Cormack Road and Grand Junction Road. Hanson Road to the north of Grand Junction Road is currently under the care and control of Port Adelaide Enfield Council. Once the proposed works between the Port River Expressway and Cormack Road are completed it is likely that all of this part of Hanson Road will become part of the arterial road system under the care and control of Transport SA.

Transport SA has developed a Strategic Road Network as part of its *Adelaide Metropolitan Transport Directions* document. Hanson Road has been identified as a primary freight route and a formal Planning Study has been initiated to define in more detail the role and operating characteristics of this road, and the processes to advance the planning, design and scheduling of funding if works are proposed.

Upgrading beyond Cormack Road will not, however, be part of the Port River Expressway project, and no commitment has been given to the time frame of any future upgrading of Hanson Road to Grand Junction Road.

One respondent submitted that grade separation of the junction of Hanson Road and the Port River Expressway should be considered either now or in the future.

Transport SA has examined grade separation at this junction. While the expense cannot be justified at this time, the design of the junction and land acquisition will be such that future grade separation will be possible.

### 2.5 Eastern bypass of Port Adelaide

Some respondents have expressed concern that large numbers of commercial vehicles will use the Commercial Road/St Vincent Street (East) route to access the Port River Expressway.

Access between Port Adelaide Centre and the Port River Expressway will be provided by extending St Vincent Street (East) to the disused rail corridor and the provision of a new connection to Francis Street.

Transport SA, in conjunction with Port Adelaide Enfield Council, is investigating the possibility of extending this new connection to the south to connect to Commercial Road, possibly in the vicinity of Russell Street. Figure 2.3 shows the conceptual alignment of this extension.

**Table 2.1** Tabulated traffic data

No. <sup>1</sup> Location	2000				2011				2020			
	Total traffic volume <sup>2</sup>		Truck volume <sup>3</sup>		Total traffic volume		Truck volume		Total traffic volume		Truck volume	
	Base Case	Project Case	Base Case	Project Case	Base Case	Project Case	Base Case	Project Case	Base Case	Project Case	Base Case	Project Case
1. Victoria Road	19,000	n/a	650/900	n/a	20,500	20,500	700/960	700/960	21,100	21,100	720/990	720/990
2. Bridge crossing	n/a	n/a	n/a	n/a	n/a	23,500	n/a	800/940	n/a	25,300	n/a	860/1,010
3. Francis Street (east of Ocean Steamers Road)	7,100	n/a	860/500	n/a	12,000	28,800	1,440/840	1,500/1,440	14,800	31,200	1,800/1,050	1,620/1,560
4. Port River Expressway (east of Eastern Parade)	n/a	n/a	n/a	n/a	n/a	25,900	n/a	1,760/1,630	n/a	28,200	n/a	1,920/1,780
5. Port River Expressway (east of Hanson Road)	n/a	n/a	n/a	n/a	n/a	43,800	n/a	3,060/2,850	n/a	55,100	n/a	3,750/3,470
6. Salisbury Highway (east of South Road)	35,500	n/a	2,130/1,420	n/a	63,100	76,200	3,790/2,520	4,950/4,040	80,100	89,600	4,810/3,200	5,820/4,750
7. Cormack Road (west of South Road)	15,000	n/a	1,500/650	n/a	17,700	3,000	1,770/760	220/120	19,300	3,500	1,930/830	250/170
8. South Road Connector (north of Cormack Road)	35,500	n/a	2,130/1,420	n/a	63,100	33,600	3,790/2,520	2,020/1,340	80,100	34,900	4,810/3,200	2,090/1,400
9. Birkenhead Bridge	24,800	n/a	920/620	n/a	26,800	10,000	990/670	430/150	27,700	10,800	1,020/690	460/150
10. Causeway Road	12,700	n/a	270/510	n/a	14,300	12,500	280/520	220/250	15,000	12,900	320/600	230/260
11. St Vincent Street (east of Commercial Road)	15,800	n/a	1,140/670	n/a	22,700	10,900	1,760/1,030	500/200	26,400	11,200	2,000/1,180	520/210
12. St Vincent Street (west of Commercial Road)	24,800	n/a	940/660	n/a	27,200	11,500	1,000/680	490/170	28,200	12,300	1,040/710	530/180
13. Commercial Road (north of Grand Junction Road)	28,700	n/a	1,435/1,000	n/a	29,600	28,500	1,480/1,035	860/710	30,000	30,000	1,500/1,050	900/750
14. Gray Terrace (north of Grand Junction Road)	3,600	n/a	180/90	n/a	3,900	3,200	200/100	130/60	4,000	3,500	210/105	140/70
15. Grand Junction Road (west of Gray Terrace)	29,200	n/a	1,140/570	n/a	32,200	23,100	1,280/640	670/340	33,500	24,600	1,320/660	720/360
16. Grand Junction Road (west of Hanson Road)	35,700	n/a	2,300/1,640	n/a	44,200	30,100	2,960/2,030	2,290/1,000	48,300	32,600	3,230/2,220	2,480/1,090
17. Grand Junction Road (east of South Road)	37,100	n/a	2,500/1,750	n/a	48,300	28,600	3,220/2,210	2,150/940	53,800	30,200	3,550/2,440	2,270/1,000
18. Eastern Parade (north of Grand Junction Road)	8,000	n/a	950/830	n/a	10,600	13,200	1,270/1,110	1,320/1,120	11,900	14,000	1,430/1,250	1,400/1,190
19. Hanson Road (north of Grand Junction Road)	11,600	n/a	810/520	n/a	13,100	17,400	920/590	1,480/1,390	13,800	24,800	970/620	2,110/1,980

<sup>1</sup> Numbers correspond to numbers in Figures 2.1 and 2.2.

<sup>2</sup> Traffic volumes are AADTs.

<sup>3</sup> Truck volumes are average daily volumes (the first number is the number of light trucks; the second number is the number of heavy goods trucks).

n/a Expressway not in existence.

Note: Base Case (no Port River Expressway); Project Case (with Port River Expressway)

**Figure 2.1**

Figure 2.1

Figure 2.2

Figure 2.2

Figure 2.3

Figure 2.3

Figure 2.3



The results of Transport SA's investigation have been discussed with Council and other stakeholders and further work is in progress. This work includes an assessment of costs and benefits. At this stage no decisions have been made about the need for this bypass, the preferred alignment, design standards, measures to mitigate any adverse environmental effects or responsibility for funding of construction and maintenance.

One submission reiterated the concerns held by some that the provision of a bypass would further reduce the number of visitors to Port Adelaide. However, the respondent considered that the provision of a safe, free, reliable and efficient network of roads should be the Government's and Council's prime consideration.

### **Causeway Road**

One respondent considered that the predicted reduction in truck traffic on Causeway Road was disappointing and that more of this traffic should be directed to use the Port River Expressway.

Table 2.2 shows current traffic data, and predictions for the year 2020, for Causeway Road. (The Base Case is what would happen if the Port River Expressway were not built, while the Project Case shows what would happen if the Port River Expressway were built.)

It can be seen that there will be a significant reduction in truck traffic using Causeway Road as a result of the Port River Expressway. Nevertheless, Causeway Road will continue to provide for commercial vehicle movements between Lefevre Peninsula and the industrial areas to the west and south of the City.

**Table 2.2** Traffic data and predictions for Causeway Road (currently and in 2020)

Traffic	Currently	In the year 2020	
	Base Case	Base Case	Project Case
Total traffic	12,700	15,000	12,900
Total light trucks <sup>1</sup>	270	320	230
Total heavy goods vehicles <sup>2</sup>	510	600	260

<sup>1</sup> Rigid trucks and buses

<sup>2</sup> Articulated vehicles, semi-trailers, B-Doubles and road trains

It is noted that the predictions in Table 2.2 were made before the proposal to provide a bypass from Commercial Road to the Port River Expressway was put forward.

## **2.6 Grade separation of expressway junction**

One respondent considered that in order to achieve the full benefit of the Port River Expressway, Transport SA should consider full grade separation at the junction of the expressway with the Salisbury Highway – South Road Connector.

Transport SA is reviewing options for managing traffic at this junction. Several proposals have been developed in the concept design work undertaken to date.

These options will be included in the tender call for the Stage 1 roadworks. Decisions will then be made on the most cost-effective solution, drawing on tendered cost information and updated traffic predictions.

## **2.7 Influences on the wider traffic network**

Several comments were received questioning the impact of the Port River Expressway on traffic volumes and composition on the arterial road system outside of the Port Adelaide Enfield Council area. Traffic modelling undertaken for the Port River Expressway project has considered several possible road network improvements both within and outside the Port Adelaide Enfield Council area. These include an Eastern Bypass of the Port Adelaide Centre, implementation of a local area traffic management scheme, future grade separation of the Gepps Cross intersection, and construction of the Montague Road extension between Port Wakefield Road and the Salisbury Highway – South Road Connector.

This traffic modelling suggests that the expressway will have a minor effect on traffic volumes on the key arterial roads passing through the Salisbury Council and Charles Sturt Council areas. However, as the Salisbury City Council has identified in their submission, local changes to land use and development patterns (such as development of the Defence Science Technology Organisation land and Mawson Lakes) will influence traffic demands to a much greater extent than the Port River Expressway.

Traffic volume changes on the Salisbury Highway – South Road Connector to the west of Port Wakefield Road will essentially result from a transfer of traffic from Grand Junction Road and Cormack Road. As indicated above, traffic volume changes on Salisbury Highway north-east of Port Wakefield Road are more likely to be due to local factors, including industrial developments in the Salisbury area that rely on Port Adelaide/Outer Harbor to meet transportation needs.

One respondent commented that the junction of Eastern Parade and Grand Junction Road should be provided with duplicated right hand lanes to reduce congestion.

It is expected that there will be an increase in traffic turning right from Grand Junction Road into Eastern Parade (as indicated in Figure 6.1 of the Environmental Report). Traffic conditions will also be reviewed as part of a Traffic Management Study that is presently underway.

### **2.7.1 Traffic predictions in the Birkenhead, Ethelton and Semaphore areas**

Traffic modelling undertaken for the Port River Expressway project suggests that there will be minimal changes in traffic volumes in these areas as a result of the expressway, although there is some potential for an increase in east/west traffic moving between Military Road and Victoria Road. The modelling suggests that the Hanson Road/Marion Road corridor will provide a much more suitable route for traffic moving between the northern and western suburbs.

### **2.7.2 Connection from the Port River Expressway onto Victoria Road**

One respondent commented that the merging of two streams of traffic at the junction of the Port River Expressway and Victoria Road would present a safety issue.

The alternative road junctions shown in Figure 2.2 of the Environmental Report were designed to provide a direct connection between the Port River Expressway and Victoria Road. While the actual layout will depend partially on final negotiations between Transport SA and the private sector consortium invited to build the road and bridges, all potential layouts will provide for a seamless transition.

### **2.7.3 Residential streets joining Victoria Road**

Residents of streets that join Victoria Road between Semaphore Road and Heath Street expressed concern that access to and from the Port River Expressway will be hazardous.

The alternative layouts of roads presented in Figure 2.2 of the Environmental Report show a service road that replaces the southern end of Victoria Road. The reasons for considering this option include the need to address the safety of vehicles entering or exiting the Port River Expressway. All three alternative layouts provide for a junction between the service road and the Port River Expressway on the extension of Semaphore Road. Additional advantages of this arrangement include the increased distance of through-traffic from residential streets such as Walker, Gunn and Martin.

The junction of Heath Street with Victoria Road is the cause of some concern to residents of that street. The street is currently blocked off at its southern end (Fletcher Road). The suggestion has been made that this street could be blocked off at the Victoria Road end and opened at Fletcher Road, thus avoiding the need for residents of this street to enter and exit Victoria Road.

Details of the road layout on the Lefevre Peninsula will be finalised with the private sector consortium responsible for final design and construction. The concerns of residents are noted by Transport SA and further discussion will take place with Port Adelaide Enfield Council once these detailed designs have been prepared. The residents of Gunn Street have indicated their intention to organise a 'street meeting' and Transport SA would be happy to attend such a meeting to hear residents' concerns.

### **2.7.4 Savings in network kilometres and fuel**

One respondent submitted that savings in the number of kilometres travelled and thus in the number of litres of fuel used would not justify the cost and upheaval that will be caused by the Port River Expressway.

Transport SA has undertaken an assessment of the direct economic benefits of developing this project. It is estimated that total direct benefits to road users (made up of savings of both travel time and vehicle operating costs, and reduced road crashes) during the first 20 years of operation will be greater than \$400 million; this figure greatly exceeds the estimated construction cost of \$130 million (including the rail component of the project).

These estimated benefits exclude the indirect benefits of the project which include significantly improved amenity, and enhanced development opportunities.

There can be little doubt that the Port River Expressway will result in significant benefits to both users and the local community.

#### **2.7.5 Impact on the Birkenhead Bridge**

Concern was expressed that land redevelopment in the Inner Harbour may require the Birkenhead Bridge to open more often, thus placing additional restraints on the traffic that will still use Nelson and St Vincent Streets after the Port River Expressway opens. The potential extension of the life of the Birkenhead Bridge was also questioned; and the respondent commented that if tolls were charged, Birkenhead Bridge would remain the preferred route to the peninsula.

Land redevelopment in the Inner Harbour is not addressed in the Environmental Report as it will be the subject of a separate planning process. Construction of the Port River Expressway has the potential to extend the life of Birkenhead Bridge because there will be a reduction in both the total amount of traffic using it and the number of heavy goods vehicles. Birkenhead Bridge will be an essential and continuing part of the metropolitan road network. 'Leakage' of traffic from the Port River Expressway is addressed in Section 3.7 of this Supplement.

#### **2.8 Access to and from the expressway, particularly for industry**

Three submissions were received expressing concern that the Port River Expressway would restrict access to and from industrial sites, particularly those in the Elder Road, Ocean Steamers Road and Francis Street areas.

Transport SA recognises that a key issue for the Port River Expressway design team has been to develop efficient access and exit points to the expressway with the aim of minimising disruption to local traffic and encouraging heavy vehicle traffic to use the expressway whenever possible. The Port River Expressway Road Freight Industry Consultation Study (Kristine Peters Project Management May 2001) commissioned by Transport SA found that design plans for access to and exit from the expressway for road trains and other heavy vehicles were generally considered suitable.

Access to Elder Road will be via an intersection on the western approach to the river crossing. This junction will be designed with appropriate turning lanes and storage lengths for heavy vehicles, and traffic signal sequences that cater for the predicted traffic volumes.

In relation to access to particular industrial sites, once the detailed designs are complete, Transport SA will consult with affected property owners to discuss how any issues can be resolved. These negotiations with property owners in Francis Street have already commenced and consultants undertaking the Road Freight Industry Consultation Study have included these concerns in their report.

One industry on the peninsula requires the new road system (i.e. the Port River Expressway and the associated connections) to be capable of accommodating B-Double vehicles. The Port River Expressway will be a designated road train route according to Transport SA's standards for this type of road. The proposed expressway has as its principal objective the provision of a bypass for heavy

vehicles around Port Adelaide, and will be built to a standard that can accommodate road trains and B-Doubles. In addition, the above study has recommended a network of road train and B-Double routes on to adjacent roads.

One respondent is aware that Transport SA is investigating the use of Elder Road as an alternative route to Outer Harbor. Concern has been expressed relating to the fact that Adelaide Brighton Cement straddles this road, and employees and vehicles cross it frequently. There are some four access roads and twelve gates into the cement work property.

In relation to Transport SA's investigation into the future use of Elder Road, safety and access issues have been researched and stakeholders consulted, prior to the final analysis of the route being conducted. The potential use of Elder/Mersey Roads was also discussed in Section 2.1.

Francis Street will be upgraded and widened to improve the definition of lanes and to maintain access to and from businesses. Following discussions with the main industries using Francis Street, the median will be a painted rather than raised strip, allowing vehicles to turn into and out of properties in much the same manner as currently occurs.

While Ocean Steamers Road will not extend north to south across the Port River Expressway, businesses located on either Francis Street or Ocean Steamers Road will continue to have access to their properties.

One submission suggested that the full benefits of the Port River Expressway would not be realised unless Hanson Road was upgraded and widened along its full length between the expressway and Grand Junction Road. This matter is discussed in Section 2.4.

One respondent submitted that the Environmental Report does not address site access requirements for the Wingfield Waste Management Centre or potential development of the Dean Rifle Range overshoot area. At the time of the release of the Environmental Report little was known about these developments and these details are still being discussed. Access to these areas will be via the existing entrance to the Wingfield Waste Management Centre and via North Arm Road, which is currently an unmade road running north-west between the Rifle Range and overshoot areas.

These access arrangements are being examined by Transport SA as part of a separate investigation into freight industry access requirements, and will be resolved as development plans for this land become clearer. Transport SA acknowledges that the issues raised require further discussion with the respondent and other stakeholders.

One submission suggested that although the Port River Expressway is a good idea, consideration should be given to upgrading South Road to freeway status to provide a better north/south corridor through the greater metropolitan area.

The need for any future upgrading of South Road will be monitored as part of Transport SA's routine road network management processes. Any future proposals to upgrade South Road will be subject to Transport SA's planning processes, which involve consultation with stakeholders and the local community.

## **2.9 Miscellaneous traffic and network issues**

### **2.9.1 Port Adelaide to St Kilda Expressway**

One respondent asked if an expressway would be built between Port Adelaide and St Kilda. Transport SA does not have plans for an expressway in this location.

### **2.9.2 Safety issues**

One respondent pointed out that the Port River Expressway would allow a higher traffic speed and that drivers joining Victoria Road should be warned to slow down once they reach the speed-restricted area of the peninsula. Speed cameras were recommended. The enforcement of speed limits is a matter for the SA Police.

The only section of the Port River Expressway that would enable drivers to travel at high speeds is the section between the Salisbury Highway – South Road Connector and Eastern Parade. From Eastern Parade, through Francis Street and across the river, a 60 kph speed limit will apply due to the potential for vehicle accidents along this section of the project. Traffic may also be slowed by queues during bridge opening times.

### **2.9.3 Long-term traffic issues**

One respondent commented that if more use were made of the rail network, there would be less need for additional road infrastructure such as the Port River Expressway. Further, the respondent considered that the Environmental Report did not examine the long-term consequences of the Port River Expressway, particularly in terms of increased traffic on Victoria Road.

The route of the Port River Expressway is largely east/west through an industrial area where there are very few residential properties. The area contains many freight forwarding and freight consolidation industries, all of which rely on road freight. The area is also the site of significant road/rail freight interfaces. The Port River Expressway is designed to enhance both the road freight and rail freight networks, thus largely relieving Port Adelaide of its current truck traffic and freight trains. The removal of the rail freight loop through Rosewater and around the western bank of the Port River will further enhance the amenity of Port Adelaide and the residential zones in these areas.

The provision of additional passenger train infrastructure would not remove the need for both road and rail freight infrastructure.

The question of additional future traffic on Victoria Road has been addressed in Section 2.3 of this document as well as in the Environmental Report. It is not the Port River Expressway itself that will cause an increase in traffic on Victoria Road, but developments that are taking place on Lefevre Peninsula. A comprehensive land use study that examines various land uses scenarios for the Lefevre Peninsula has been prepared by Jensen Planning & Design (2001) for Port Adelaide Enfield Council, Planning SA and the Department of Industry and Trade. This report was released after the completion of the Environmental Report. Also announced at the time of the Environmental Report's completion was the proposal for a grain handling terminal at Outer Harbor. In the light of these two developments, Transport SA has reviewed its traffic estimates and commissioned

a study to investigate the potential of Mersey/Elder Roads as an alternative to Victoria Road and to analyse the impact of a range of development options.

#### **2.9.4 Comments on scope of the Environmental Report**

A respondent commented that 'a wider range of issues should have been taken into account' in the Environmental Report. The report considered a broad range of relevant environmental issues and Transport SA considers that all relevant environmental effects have been appropriately covered.

Another respondent submitted that the Environmental Report was of a 'low standard when compared to industrial development applications'. It is noted that the Environmental Report covers the same scope and range of issues covered by Environmental Assessment reports undertaken for major construction projects, such as the Southern Expressway and the Adelaide–Crafers Highway projects.

# 3 Bridge issues

Several respondents questioned the proposed location of the bridges between No. 1 and No. 2 Docks. Most of these submissions suggested that locations further downstream would be preferable because of:

- loss of visual amenity in Inner Harbour;
- proximity of the bridges (and the Port River Expressway) to historic Port Adelaide and sites potentially suitable for residential development;
- the height of the bridges and therefore the opening frequency;
- the possible need to move a range of recreational, commercial and charter vessels downstream of the new bridges, leading to a decrease in the 'life' of Inner Harbour.

Additional issues concerning the road bridge were its visual appearance and the potential impact of a toll.

## 3.1 Location of the bridges

The location of the bridges was examined in a series of studies from 1991 to 1997, with the rationale for the preferred location summarised in the Environmental Report and again in this section (Table 3.1).

**Table 3.1** Summary of advantages/disadvantages of alternative bridge locations

Southern route (between Docks 1 & 2)	Central (Eastern Parade extension)	Northern (Willochra Street)	High-level bridge or tunnel
Shorter river crossing and narrower opening span – 30 m	Wider river crossing and 70 m opening span needed for larger ships moving upstream—adds extra costs	Need 70 m wide river opening span for larger ships moving upstream	Long approaches and overpass over Elder Road
Least impact on the built environment, in terms of land acquisition, traffic and noise in urban areas	Direct impact on Adelaide Brighton Cement and fuel storage depots—significant land acquisition of expensive property	Approach roadworks longer than with other options Amenity impact on Willochra Street and adjacent residents	Has biggest impact on built environment

Southern route (between Docks 1 & 2)	Central (Eastern Parade extension)	Northern (Willochra Street)	High-level bridge or tunnel
Low number of bridge openings given commercial operations mostly sited downstream	More frequent bridge openings—approximately  5 million tonnes pass upstream	More frequent bridge openings	No bridge openings
Least disruptive during construction	Access to and from peninsula less than with southern route	Level of access to and from peninsula less than with other schemes	More expensive road connections, particularly Elder Road, and hence costs significantly higher
Lower cost (\$120 million) and greater benefits. Benefit–cost ratio = 4.3 road, 1.3 rail and 4.9 total project	Higher cost option because of land acquisition and longer river crossing. Cost approximately \$160 million	Higher cost (\$180 million) and lower benefits. Benefit–cost ratio = 3.1 road, 0.5 rail and 2.5 total project	Higher cost (\$220 million) and lower benefits for high-level bridge. Benefit–cost ratio = 1.9 road, 0.5 rail and 2.5 total project
Best location for rail access given lowest costs (\$15 million vs \$44 million to the north)	Alienation of existing grain and industrial facilities	Alienation of existing grain and industrial facilities	Higher cost (\$270 million) and lower benefits for tunnel option. Benefit–cost ratio = 1.5 road, 1.0 rail and 1.5 total project
Most diversion of traffic from St Vincent Street	Less likely to attract private sector investment given higher cost and less traffic—road bridge \$70 million vs. \$45 million to the south		High-level bridge needs 50 m clearance—approaches 1,000 m long

It can be seen from the summary in Table 3.1 that locating the bridge at the preferred site between No. 1 and No. 2 Docks would result in:

- least disruption to shipping;
- least impact on industry through the need to acquire business properties, and the greatest potential for diversion of traffic out of the Port Adelaide Centre;
- least cost.

A principal objective of the Port River Expressway is to capture as large a proportion as possible of the commuter and heavy goods vehicle traffic that

currently uses either the Grand Junction/Causeway/Semaphore/Victoria Road route or the Francis Street/Ocean Steamers Road/St Vincent Street/Birkenhead Bridge/Victoria Road route to Outer Harbor. Analysis shows that the further north the location of the road bridges, the less freight traffic would be captured, thus partially defeating the principal objective of the project. Lower traffic volumes would result in less income from any toll. As well, the significantly increased project costs would make alternative crossing locations unlikely to attract private sector investment.

### **3.2 Height of the bridges**

One respondent queried the cost–benefit ratios that have been used to determine the optimum height of the bridges. It was noted that while a higher opening bridge would make the connection to Elder Road difficult, it would also ease the flow of traffic and may therefore increase the benefit in the cost–benefit equation.

The South Australian Government has endorsed a ‘low-level’ opening bridge with a nominal 6 m clearance. Transport SA commissioned the Environmental consultant to examine the environmental effects of the endorsed low-level option, and also the effects of a higher level opening option at the same site. The Environmental Report provides an envelope within which the private sector can conduct its analyses of the two options.

Cost–benefit analysis of the height of the bridges was documented in earlier reports referenced in the Environmental Report. However, the issue of traffic delays due to the height, and resulting opening frequency, of the bridges was not investigated in detail in previous analysis of the two options.

### **3.3 Appearance and design of the bridges**

One respondent considered that an aesthetically pleasing bridge design could enhance the vista from Lipson Street Wharf by partially masking the view of the cement works, and providing a visual delineation between industrial and other zones.

Transport SA will include in its tender documents the specific requirement for interested private sector consortia to consider the aesthetics of the bridges during the design stages.

Reduction in the barrier effect, if wanted, can be achieved by designing bridges with slim profiles, supported by slim piers that are aligned with each other.

One respondent suggested that a swing bridge be considered. Engineering considerations mitigate against swing bridges, since this type of bridge has an opening span that rotates about a central pier, producing two open sections. An additional constraint is the need to position the road and rail bridges close together, which would be impossible if swinging sections of road and rail bridges had to be accommodated. This form of bridge is also likely to be more costly.

The opening sections of the bridges and their support piers will need to be protected against accidental collisions from shipping. Bridges that open vertically can be provided with rolling fenders placed between the shipping lane and the support pier. Ships passing through the opening that are misaligned or that drift in lateral winds will be guided by the rolling fenders, without damaging the support piers. This arrangement is not as easily achieved in the case of swing bridges.

### **3.4 Bridge opening regime and effects on river traffic**

To assist with the development of a bridge opening time regime, Transport SA surveyed vessel types and movements in Inner Harbour in February 2000, as summarised in Table 3.2. Transport SA is continuing its discussion with marine operators to develop an opening regime that addresses the needs of both marine operators and road and rail users.

The opening regime will be included in the tender documents calling for Expressions of Interest from private sector developers wishing to submit proposals for the design, construction and operation of the bridges.

In addition to the number of vessel movements, the height of the bridges will also influence the frequency of opening. Several height options have been examined in studies during the past ten years, but the low-level opening option has been selected as the preferred one. Ultimately, the design and height of the road and rail bridges will be a matter for the private sector consortia to consider during the feasibility phase of delivering the river crossing, and will be subject to endorsement by Transport SA.

### **3.5 Effects of the bridges on the life of Inner Harbour**

The Port River Expressway project will not, of itself, require the relocation of vessels and boating facilities downstream of the new bridges. The bridges will have opening spans that will accommodate all sizes of vessel currently accessing Inner Harbour.

The commercial operations in Inner Harbour are decreasing and, in time, some operators may relocate downstream of the bridges for reasons other than the existence of the bridges. One respondent suggested that the Sailing Club be moved to the eastern side of Birkenhead Bridge. Issues associated with the Sailing Club are being discussed with Council, the club and other Government agencies. No firm commitment can be made in relation to the club's future until all issues are addressed.

River traffic information (shown in Table 3.2) will be used to develop a regime that provides flexibility to accommodate current vessel movements into and out of Inner Harbour and to balance the needs of road and rail users, especially during peak periods.

### **3.6 Effects of the bridges on tourism and heritage**

Concern has been expressed that the siting of the bridges between No. 1 and No. 2 Docks will adversely affect both tourism and the heritage values of Port Adelaide. Concerns ranged from general comments on the physical and social fabric of the wharf area to specific concern regarding the following matters:

- the consequences for Shed 8, which houses a collection of National and State heritage belonging to the Maritime Museum;
- the future of the SA Aviation Museum;
- the aesthetic impact of a bridge design that may contrast with the present architectural style of the wharf area.

Since one of the objectives of the Port River Expressway (and hence the bridges) is to remove as much heavy vehicle traffic from historic Port Adelaide as possible,

**Table 3.2** Preliminary river traffic summary as at February 2000

Vessel height (m)	Vessel	Description	Movements
0–6 m	<i>Archie Badenoch</i>	Restored water police launch	Charter—averages two trips per day, sometimes up to five trips per day, also special events and weekends.
5 m	Fisheries inspection boat		As required.
5 m	Pilot boats		As required.
6–12 m	<i>MV Port Princess</i>	Cruise boat	Daily lunchtime cruises, occasional twilight. Friday/weekends—late evening. School holidays—two trips per day, and public holidays, weekends, New Year's Eve.
Approx. 11 m	<i>Celtic Rose</i>	Fishing boat	Variable.
12–20 m	<i>MV Queen Adelaide</i>	Cruise boat	Daily lunchtime cruises. Weekends and school holidays, including twilight/evening. Frequency increases depending on demand.
18 m	<i>MV Gallantry</i>	MFS fire boat	Berthed at Outer Harbor.
15 m	<i>Yelta</i>	Restored tug	Pre-booked charter during school holidays between 12:00 noon and 2:00 pm.
3 yachts @ 20 m, others @ 8–17 m	Pt Adelaide Sailing Club yachts (about 60 yachts berthed)		Races every weekend (about 20 participate). Twilight race once per month during summer. Typical weekday 4–5 boats in use.
17.4 m	Navy patrol boats		Infrequent visits.
2 @ 18 m, 2 @ 12 m	4 tugs		Generally operate in teams of two. Require unrestricted access.
12–15 m	Fishing fleet		10 boats, average four trips per year.
16 m	Andrew Wilson	Dredging boat	Operates on average once a fortnight.
25 m	<i>Obsidienne</i>	Charter yacht	Approximately 14 trips per week, usually early morning and evening times.
Approx. 28 m	<i>One &amp; All</i>	Charter ship	Pre-booked charters. Three cruises per day, 9:00 am–12:00 noon, 1:00 pm–4:00 pm, twilight at 6:00 pm (return 10:00 pm). Extended trips in school holidays.
32 m	<i>Falie</i>	Charter ship	Pre-booked day cruises between 10:00 am and 4:00 pm subject to demand. Afternoon or half-day cruises throughout the year. Twilight cruises during daylight saving months starting 5:30 pm–6:30 pm. Late October–December is the peak operating time. School holidays—extended trips. Requires 24-hour access including very early morning access.
30 m	<i>Stolt Australia</i>	Chemical carrier	
More than 32 m	HMAS <i>Hobart</i> HMAS <i>Brisbane</i>	Destroyers	Up to 16 visits per year.
35 m	Navy frigates		Infrequent.
40 m	Merchant ships		8 ships that service grain terminals, BP.
46 m	<i>Crystal Symphony</i>	Luxury cruise ship	Infrequent.

the project will create an environment in which Port Adelaide can capitalise on its heritage and enhance its attractiveness to tourists. Possible future locations for the Aviation Museum are being considered by Transport SA.

### **3.7 Potential impact of a toll**

Several respondents expressed the view that a toll would be counter-productive in that it may discourage vehicles from using the bridge, thus placing additional traffic burdens on the current network of arterial roads.

One respondent suggested that a shadow toll should be imposed and not a direct toll on bridge users. Other respondents stated that any toll charged on commercial vehicles should take account of the economic viability of the enterprise.

Transport SA is aware that people may try to avoid the road bridge if a toll is charged; such avoidance is commonly known as 'leakage' or diversion. Leakage can be addressed by instituting a traffic management scheme on roads that lead to and from the Port River Expressway. For example, it may be appropriate to place weight restrictions on Birkenhead Bridge, thus preventing heavy vehicles from avoiding the expressway.

The South Australian Parliament has passed legislation that allows the collection of a toll. That legislation precludes the use of a shadow toll, i.e. a toll paid by the Government based on traffic volumes, rather than one paid directly by the users. The ability to charge a toll was considered necessary in order to provide the private sector developer of the bridge with the greatest flexibility in recouping its investment in this major infrastructure project.

When Transport SA calls for Expressions of Interest from private sector consortia, interested parties will be asked to submit proposals that address such issues as tolling and leakage. As the process of identifying the preferred private sector consortium progresses, Transport SA will undertake negotiations concerning the approach to tolling, seeking to ensure that maximum traffic volumes utilise the river bridge. Issues of tolling will also be addressed during the feasibility stage of the bridge construction project once the preferred private sector consortium has been identified and appointed.

One respondent requested that tolls not be charged on cyclists. Tolls will not be levied on bicycles.

### **3.8 Ceremony to mark the opening of the bridges**

An official opening ceremony is the traditional means by which the Government marks completion of major road construction projects. Options to mark completion of the Port River Expressway that involve the local community, and that also acknowledge the Federal and State Governments' roles in funding the project, will be developed closer to the project's completion date.

### **3.9 Advantage of the proposed road bridge**

One organisational respondent submitted that the chosen location of the road bridge would materially assist its operation on the peninsula, allowing it to service bulk and bag customers and to receive minor raw materials onto the site.

# 4 Flora, fauna and landscaping

Although land along the proposed alignment of the Port River Expressway has generally been degraded by past industrial and fill activities, in some areas native vegetation, including samphire, still remains. Several submissions highlighted the importance of preserving native vegetation wherever possible and of using native species in plantings adjacent to the new expressway.

The species lists provided in the Environmental Report were said to be incorrect in some cases, and incomplete in others.

An additional field survey has been conducted to address the issues raised in the submissions and the findings have been used in this response.

This section discusses these issues and provides a greater level of detail than was included in the Environmental Report.

## 4.1 Extent of native vegetation species in the corridor

### 4.1.1 Dean Rifle Range

The vegetation in the north-eastern corner of the intersection of Eastern Parade with the proposed expressway (adjacent to Dean Rifle Range) has several remnant native species in a matrix of introduced species. The weeds *Ammophila arenaria* (Marram grass) and *Galenia secunda* (Blanket weed) dominate the area.

This area is raised 1–2 m above the adjoining land and has a coarse sandy substrate. A large area of the land at Gillman has previously been reclaimed using a range of materials. While it is possible that the substrate at this location is imported fill, it is more likely that the site represents a remnant recent dune (a dune left after the last geological tidal recession), as occurs on Torrens Island and Lefevre Peninsula.

The area has several native plant species and a much greater diversity and abundance of introduced plants (Table 4.1). One individual male plant of *Lomandra collina* was recorded at the site. This species is considered to be rare within the Southern Lofty (SL) bioregion (Lang & Kraehenbuehl 2000).

The block of land is approximately 270 m x 60 m (at its widest point) and comprises three vegetation zones. The southern section, approximately 100 m long, has a very open overstorey of *Acacia ligulata* and a number of large, adult shrubs of *Adriana klotzschii*. The shrubstorey consists primarily of *Nitraria*

*billardierei* and a small number of *Lotus australis*. The groundstorey contains a small diversity of native grasses and introduced grasses, herbs and forbs.

**Table 4.1** Summary of species identified in the Dean Rifle Range area

Native/Exotic <sup>1</sup>	Species	Common Name	Conservation Status (Southern Lofty)
N	<i>Acacia ligulata</i>	Umbrella bush	Uncertain
*	<i>Acacia</i> sp.		
N	<i>Adriana klotzschii</i>	Coast bitter-bush	Uncommon
*	<i>Ammophila arenaria</i>	Marram grass	
*	<i>Avena fatua</i>	Wild oat	
*	<i>Bromus diandrus</i>	Great brome grass	
*	<i>Bromus sterilis</i>	Sterile brome grass	
*	<i>Carpobrotus edulis</i>	Hottentot fig	
*	<i>Centaurea calcitrapa</i>	Star thistle	
N	<i>Chloris truncata</i>	Windmill grass	
*	<i>Critesion marinum</i>	Sea barley-grass	
N	<i>Danthonia setacea</i> var. <i>setacea</i>	Small-flower wallaby-grass	
N	<i>Dianella brevicaulis</i>	Short-stem flax-lily	
**	<i>Euphorbia terracina</i>	False caper	
*	<i>Galenia secunda</i>	Galenia	
N	<i>Lomandra collina</i>	Sand mat-rush	Rare
N	<i>Lotus australis</i>	Australian trefoil	Uncommon
**	<i>Lycium feroicissimum</i>	African boxthorn	
N	<i>Maireana brevifolia</i>	Short-leaf blue-bush	
N	<i>Nitraria billardierei</i>	Nitre bush	
N	<i>Pelargonium australe</i>	Australian pelargonium	Uncommon
N	<i>Stipa curticola?</i>	Short-crest spear-grass	Of possible significance (SA); Uncommon (SL)
N	<i>Stipa scabra</i> ssp. <i>falcata</i>	Slender spear-grass	

<sup>1</sup> \*Introduced species; \*\* Proclaimed species; N Native species.

This zone contains the greatest percentage and diversity of native species.

The central zone is approximately 100 m long. The overstorey comprises a few individuals of *Acacia ligulata* and African boxthorn. The groundstorey is

predominantly Marram grass, with False caper and Blanket weed. One male *Lomandra collina* and a small population of *Dianella brevicaulis* are present in the groundstorey. Native species are of low abundance and diversity.

The northern zone, approximately 70 m long, is degraded, with few native species and a high diversity and abundance of exotic species. African boxthorn is present in greater numbers than in the central zone. Marram grass, two species of Brome grass and Sea barley-grass dominate the groundstorey.

Material from a smelter works (furnace lining, slag and matte) is present on the surface in one area of the northern zone. The distribution and amount of this material is unknown and may require sampling at depth. African boxthorn is present in the area. Some of the individuals have been treated with herbicide; however, some are still living.

The *Stipa* species and many of the native species would be useful as a source of revegetation material.

Fauna noted for the area included *Vulpes vulpes* (Red fox) and a juvenile *Lerista dorsalis* (lizard).

Transport SA has re-examined the alignment and adjusted it so that the loss of remnant vegetation is minimised within practical limits.

Two small areas of samphire close to the road alignment were examined. One is in a fair condition while the other is badly degraded. Dominant species in these areas are *Halosarcia pergranulata* and *Atriplex paludosa* ssp. *cordata*. Changes in the alignment (mentioned above) may mean that these small areas of samphire will be avoided.

#### 4.1.2 Dean Rifle Range to Barker Inlet Wetlands

A number of native chenopod and samphire species are present along the proposed expressway route. Many species are potentially valuable as a source of revegetation material. Species include *Atriplex paludosa* ssp. *cordata*, *Atriplex semibaccata*, *Carpobrotus rossii*, *Enchylaena tomentosa*, *Halosarcia pergranulata*, *Isolepis nodosa*, *Maireana brevifolia*, *Sarcocornia quinqueflora* and *Suaeda* sp.

The introduced species *Lycium ferocissimum*, *Myrtus communis* (one plant) and *Juncus acutus* (Spiny rush, two clumps) were recorded along this section. Populations of Capeweed, Wild turnip, Wild mustard and Salvation Jane are also present.

At the end of the Rifle Range and on the south side of the surveyed centreline is a small patch of good quality samphire. *Stipa* sp., probably *Stipa scabra*, is also present on the adjacent dune (near the fence line) and possibly dredge fill.

Rabbits (*Oryctolagus cuniculus*) were present along the proposed route.

## 4.2 Habitat and biodiversity

### 4.2.1 Bird species

One respondent expressed concern that rare species of birds, including the Slender thornbill and the Rock parrot, will be affected by the removal of samphire. During extensive surveys conducted for the MFP neither species was recorded or observed along the southern edge of the MFP Gillman site (i.e. the proposed corridor for the expressway). It is believed that the two bird species usually avoid disturbance edges and prefer areas of less disturbed samphire along the embankment inland of the mangrove fringe.

More recently, the Rock parrot has been observed on the grassy edges of the Dean Rifle Range. This area contains a mixture of introduced grasses, saltbush and samphire.

#### 4.2.2 **Habitat re-creation**

Comment was made that consideration should be given to recreating habitat lost during construction of the Port River Expressway.

Transport SA is aware of this important aspect of environmental management, which assists conservation and biodiversity. However, landscaping must also take account of road safety requirements and amenity considerations, and perform additional functions such as screening adjacent roads and properties.

The Coast bitter-bush (*Adriana klotzschii*) plants in the corridor are large and relatively old and constitute an important biodiversity resource. Both male and female plants are present. The species is suitable for transplantation, as a source of propagating material and for use in landscaping. One respondent considered that loss of this species would reduce habitat for the butterfly *Theclinesthes albocincta*. Replacement of bitter-bush will be considered in the detailed landscaping plans. Transport SA will undertake remediation work to ensure that species indigenous to the area are used.

The scope for recreating the original habitat components in the area is partially dictated by the land available. The corridor is relatively narrow, providing linear stretches of limited width. While habitat restoration will play a part in the landscape design, Transport SA may also enhance existing areas of native vegetation through weed control and supplementary planting in a triangular area near the Dean Rifle Range and Boral. However, it should be noted that this is subject to acquisition decisions outside the scope of this project. Further discussion between Transport SA and the City of Port Adelaide Enfield will take place and will include assessment of the use of *Callitris preissii* and *Allocasuarina verticillata* for street trees.

#### 4.2.3 **Environment Protection Biodiversity Conservation Act**

One respondent commented that *Halosarcia flabelliformis* was present in the Gillman area and that its presence may trigger the need for environmental assessment under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In this case the EPBC Act will not come into play because while *Halosarcia flabelliformis* is known to have existed on Garden Island in the past, the species no longer exists in the area. The species was not recorded in the Gillman area during the many surveys conducted for the MFP proposal, the recent wetlands development or the current Port River Expressway assessment. The nearest extant population is believed to be in the Penrice saltfields north of Gillman. The EPBC Act would only be triggered if listed species were threatened by the proposal. This samphire species will not be threatened by the Port River Expressway.

#### 4.2.4 Plant lists

Concern was expressed that the species list was incomplete and not site-specific. That is, some species listed are not found in the region, while a number of other species were missing from the list. It was also suggested that the site be surveyed for significant plant individuals that might be rescued.

The plant lists provided in the Environmental Report have been supplemented by the list presented in Table 4.1 of this document, which shows species observed in an additional field survey of the corridor conducted after the Environmental Report was published.

While the timing of flora surveys was dictated by the project timing, the surveys were supplemented by previous extensive surveys conducted for the MFP and stormwater wetlands projects.

#### 4.3 Native versus exotic species in landscape design

One respondent considered that it was preferable to use native rather than exotic species in the landscape design. Particular attention was drawn to the use of Native pine in preference to Norfolk Island pine and concern was expressed that the planting of *Callistemon* sp. may reduce biodiversity.

The suggested use of Norfolk Island pine along Victoria Road and the approach to the road bridge was based on providing continuity between the new elements of the project and the existing rows of Norfolk Island pine on Victoria Road. It is important to the integration of the Port River Expressway with the existing landscape that abrupt changes or disjunctions in landscape be avoided.

A balance needs to be struck between the aesthetics of the project and the acknowledged need to preserve as much as possible of the habitat. Developments such as the Port River Expressway inevitably cause some loss of habitat and it may not be possible to restore or preserve habitats in their entirety. Habitats for native fauna exist north of the corridor and will be unaffected by the Port River Expressway.

In urban areas emphasis must also be placed on the use of attractive plantings to enhance urban amenity, provide shade, screen unattractive development and complement adjoining areas. Transport SA will liaise closely with Council in the selection of species in the urban areas and along the corridor.

A more detailed landscape plan is being developed as part of the detailed road design. This final landscape design may differ in some details from the conceptual design shown in the Environmental Report. However, the final design will still consider the principles outlined in the report.

Native species will be used to the greatest extent possible, within the boundaries of aesthetics, safety and screening of adjacent properties.

#### 4.4 Impact on Barker Inlet Wetlands flora

One submission considered that the benefits of the Port River Expressway, particularly the relief of congestion on Grand Junction Road, would be significant. It was stated that these benefits should not be at the expense of vegetation and fauna in the constructed wetlands.

The wetlands will not be significantly affected by the Port River Expressway. The current design impinges slightly on the Barker Inlet Wetlands at the junction of the Port River Expressway and the Salisbury Highway – South Road Connector. However, any disturbed areas will be rehabilitated as part of the project.

# 5 Future developments in the area

Several respondents commented on industrial developments taking place on the Lefevre Peninsula. The principal concern was that these developments would increase traffic using the Port River Expressway to access Victoria Road.

Other respondents commented on the proposed route of the Port River Expressway and suggested alterations to the route that would reduce impacts on existing industry and potential residential developments.

## 5.1 Route selection

One respondent commented that if the Port River Expressway route were located to the north of the Pivot site, the old (filled-in) South Australian Company Dock, south-east of No. 1 Dock, could be re-excavated and restored. Similarly, a move to the north of the Pivot site would increase the distance between the expressway and the Woolstores' precinct, thus enhancing the potential for this area to be redeveloped for residential purposes.

Another respondent submitted that use of the land immediately north of the Pivot site would adversely affect existing industries by reducing access.

The rationale for the choice of the preferred river crossing location has been addressed in Section 3.1 of this Supplement. The crossing point partially dictates the approach routes.

When the route options were assessed in earlier studies it was decided that it was not feasible to move the Port River Expressway to the north of the Pivot site because there would be a major conflict between the road and rail networks. In addition, there would be a significant impact on the built environment, requiring major land acquisition and costly dislocation and relocation of industries such as Adelaide Brighton Cement and the fuel depots on Victoria Road.

### 5.1.1 Land acquisition resulting from route selected

Land needed for the Port River Expressway would be acquired under the provisions of the *Land Acquisition Act 1969*. The Act considers both the acquisition of land and compensation for loss of the land or other effects on a business or individual property owner.

Transport SA has consulted with landowners that are likely to be affected by the acquisition of land. Most of the land required is held by Government agencies or Adelaide City Council. Additional consultation has recently started as detailed design has reached the point at which the location and area of land to be acquired is known.

### **5.1.2 Land Development Committee**

The City of Port Adelaide Enfield requested that the Council be a member of the South Australian Government's Land Development Committee. This committee was established to identify Government-held land assets in the Port area that could provide a development opportunity for the private sector. It concluded its investigations in September 2000. The Port River Expressway Project Steering Committee is overseeing private sector involvement in the project, and land earmarked for development will be subject to planning processes that include Council.

## **5.2 Residential development**

Developments occurring adjacent to the Port River Expressway will be subject to the usual planning process. If a proposal to develop sites such as No. 1 Dock for residential purposes (currently zoned as General Industrial (2)) were put forward, issues such as the proximity of the Port River Expressway, access to the site and the Environment Protection Agency's (EPA) draft buffer zone guidelines would all be taken into account. Note that the buffer zone distances set out by the EPA are guidelines. If an application was made to construct residences within the guideline distances, adjacent industries would have an opportunity to lodge objections during the planning process. The residential development at Lipson Street Wharf is within one kilometre of the Pivot and Adelaide Brighton Cement sites, as is much of the area of Port Adelaide itself.

It is acknowledged that waterfront land in Port Adelaide is at a premium. Transport SA will include specific requirements in its call for Expressions of Interest that address the need for the private sector consortia to take into account such issues as the design aesthetics of the bridge and approaches, noise and access. Any developer wishing to maximise its return on capital invested would actively seek to ensure that prime land is protected from adverse effects of the road, rail and bridges.

One respondent considered that redevelopment of Shed 5 on the southern side of No. 1 Dock into a mixed use property featuring a museum would be inappropriate, since this land is potentially valuable as a site for future residential development. Decisions regarding Shed 5 are subject to discussions between the Land Management Corporation, the City of Port Adelaide Enfield and other Government agencies, including Planning SA.

## **5.3 Industrial developments on the Lefevre Peninsula**

Comments were received regarding the increasing volume of traffic accessing industrial sites on Lefevre Peninsula. Concern was also expressed that industrial developments proposed for the Lefevre Peninsula brought into question the research underlying the choice of the route of the Port River Expressway.

The Port River Expressway itself will not affect the volume of traffic on Victoria Road. While significant proposals relating to the peninsula have been put forward during planning for the expressway, these do not affect the principle behind the proposal; that is, to relieve traffic congestion in Gillman and the Port Adelaide Centre, and improve access to rail and freight handling locations in the area.

The Gillman and Lefevre Peninsula Land Capability Study Report, prepared by Jensen Planning & Design (2001) for the City of Port Adelaide Enfield Council, has recommended that an 'industry focus scenario' be adopted for the area. At the time of preparing this response document, this option was yet to be accepted by Council.

The Environmental Report considered the traffic as it now stands and used predictive techniques to model traffic growth into the future (until 2020). The basis for the traffic predictions was the natural growth in traffic and the anticipated industrial and residential development on the Lefevre Peninsula.

Transport SA is now examining the implications of rezoning, which may result in more intense development and urban regeneration, and is revising its traffic predictions for the area. Development applications lodged by new or expanding industries should contain predictions of the effects that the proposed developments would have, not only in terms of traffic volumes but also in terms of other potential environmental impacts.

#### **5.4 Movement of the container terminal to Gillman**

One respondent asked whether a feasibility study had been undertaken in relation to relocating the container terminal to Gillman.

Earlier studies, carried out for Transport SA throughout the 1990s, considered a range of options for commercial shipping in Port Adelaide. One option was to move commercial shipping activities to the eastern bank of the Port River and consolidate related industries in this area.

The Port River is not deep enough to accommodate the Panamax-size vessels that are now needed in order to be competitive in world markets. Major dredging of the river would be needed to overcome this limitation. There are significant environmental effects to be considered in relation to the deepening of the Port River up to the AusBulk terminal or beyond. Current indications are that the river will only be deepened near Outer Harbor. It is thus highly unlikely that the container terminal would be shifted to Gillman and further investigation of this matter is beyond the scope of this report.

# 6 Surface water and groundwater

Issues raised by respondents centred mainly on the effects of the Port River Expressway on the constructed stormwater wetlands that collect runoff water from several catchments prior to discharging surface water into Barker Inlet, North Arm and the Port River. The principal concern expressed was that water from the expressway would be contaminated and would have an adverse effect on the quality of the water entering the wetlands and hence the river and estuarine systems.

Comment was also made on the need to take into account the shallow nature of groundwater in the area, given that it could adversely affect the freeway and that rising sea levels may compound future impacts on expressway infrastructure.

## 6.1 Constructed wetlands

The main purpose of the constructed stormwater wetlands in the area is to treat and improve the quality of the surface water runoff from various catchments prior to its being discharged into the marine and estuarine environments of the Port River, Barker Inlet and North Arm Creek. By delaying the flow, suspended solids and various pollutants are largely removed from the water column. This 'cleaner' water is then allowed to flow into the receiving waters. Artificial constructed wetlands have proved successful in improving water quality in receiving waters, as evidenced by the reduction in pollutants measured by the EPA at several points in the estuarine and river environments.

The catchments that drain into the existing wetlands comprise both residential and industrial areas and, taken together, are quite large. The Gillman catchment area is approximately 66 square kilometres. The surface area of the Port River Expressway is very small in comparison with the total catchment area and will not lead to a significant increase in the total quantity of runoff entering the wetlands.

Table 6.11 in the Environmental Report presents data that show the water quality of runoff entering the Barker Inlet Wetlands from the Dunstan Road drain. This is contrasted with the quality of runoff from the Leach Highway. It is evident that the water quality of road runoff is significantly better than the quality of water currently entering the Barker Inlet Wetlands. The effect of the Port River Expressway runoff is likely to be a small improvement in the existing water quality.

Preliminary discussion has taken place on the possibility of enlarging an existing constructed wetland in Schroder Park at the southern end of the Adelaide Brighton Cement site to accommodate runoff from the bridges and their approaches.

Transport SA intends that all stormwater runoff from the Port River Expressway will be directed to either existing constructed wetlands or newly built ones.

## **6.2 Management of spills**

The existing constructed wetlands have been designed so that, in the event of an accidental discharge from road or rail containers, polluted liquids can be confined to the first of several ponds in the wetlands that operate in series. A temporary barrier can be erected that prevents water from the first pond entering the second and subsequent ponds. This arrangement offers clean-up crews an opportunity to pump out contaminated water from the first pond and to dispose of it appropriately without water in the other ponds being contaminated.

Transport SA will discuss arrangements for spill response with Council and incorporate the actions in the project Environmental Management Plan (EMP).

One respondent considered that while the Port River Expressway would lead to a reduction in accidents, and therefore accidental spills of chemicals and fuels, spills would still occur. The respondent suggested that traffic management and signage should be provided to warn drivers of delays and alternative routes in the case of accidents.

Transport SA has commissioned a study into the use of Intelligent Transport Systems including variable message signs.

The respondent also wanted to know how spills would be contained on the western side of the river. It was acknowledged that spills on the eastern side would be contained in the first pond of each of the constructed wetlands.

As noted, discussions have taken place with Adelaide Brighton Cement on the feasibility of extending the small wetland installed by the company in Schroder Park at the southern end of its premises on the peninsula. (A respondent's concerns in relation to this wetland are noted below.) While final design of the road layout has not taken place, Transport SA recognises the need for responsible stormwater and spill management in this area. The extended wetland proposed, like those on the eastern section, would be used to contain spills for appropriate clean-up and disposal of contaminants.

## **6.3 Protection of Schroder Park**

One respondent commented that the wetland pond in Schroder Park contains water of sufficiently high quality to support tadpoles, frogs and a variety of aquatic life. The respondent considered it necessary to protect water quality in this pond. As noted above, this pond was constructed to treat stormwater from Adelaide Brighton Cement.

Construction of an extension to the wetland to deal with runoff from the expressway would be dependent on there being enough space on the site. Further discussion with Adelaide Brighton Cement will be required to clarify the function of the existing pond.

## **6.4 Construction management**

Several issues relating to pollution control during the construction phase were raised. The principal concern was that mud and soil is usually mobilised by

earthworks during construction, and that these can find their way into stormwater systems including wetlands.

Construction management is governed by a set of contract documents, one of which will contain the EMP. The construction contractors will be required to develop and implement an Environmental Management Implementation Plan (EMIP). The EMIP is a document that shows how the contractor intends to manage the environmental issues, identified in the EMP, during construction. The contractor's environmental performance will be monitored and audited during construction to ensure that EMIP commitments are adhered to.

The EMP/EMIP form part of the contract documentation, and it is not possible to include Council in the management of the contract. However, Transport SA has undertaken to continue to liaise with Council during the construction and operational phases of the project.

## **6.5 Groundwater movement**

One respondent commented that there should be a plan for the appropriate treatment and disposal of hypersaline groundwater pumped from the area during construction, and that groundwater flow should be modelled, then monitored into the future to detect any effects of the project on existing groundwater flow regimes. There was also a comment on the need to ensure that saline groundwater did not adversely affect the environment. Additional information on these matters is presented in this section.

The EMP/EMIP will contain provision for the disposal of all materials (solid and liquid) generated as a consequence of construction. At this time it is not known what, if any, groundwater pumping may be necessary. Groundwater pumping would only be necessary if excavations were deep enough and penetrated a lens of hypersaline water.

The St Kilda Formation aquifer is hydraulically connected to the North Arm and the Port River; therefore its watertable approximates mean sea level and is affected by tidal and seasonal variation. Groundwater measurements from a number of studies (CGS 1993; Belperio & Rice 1989; PIRSA bore data, PPK unpublished data) indicate that the depth to watertable varies from 0.2–4.0 m in the Gillman – Port Adelaide area. It should also be noted that the greater depths to watertable apparent in the area of the Wingfield dump are probably related to the man-made topographic feature of the dump itself. Groundwater recharge resulting from rainfall can cause rapid changes to groundwater levels due to the shallow groundwater and low permeabilities resulting in slow lateral flow.

In the Gillman area groundwater flow is predominantly northward toward the North Arm and the low-lying marshlands. Hydraulic gradients are considered low. Lateral groundwater flow velocities have been calculated as being less than 1 m/yr (CGS 1993). Upward vertical groundwater flow occurs throughout the area owing to the evaporation of shallow groundwater. CGS (1993) has estimated that 0.8–1.0 m is the usual maximum depth of watertable for which upward vertical groundwater movement is significant.

The salinity of shallow groundwater varies significantly. Throughout the Gillman – Port Adelaide area, potentially potable water quality groundwater, with salinity less than 1,000 mg/L, is recorded on the western side of the Port River. Salinities

increase towards the east, with measured salinity values of shallow groundwater in the vicinity of the proposed expressway varying from 18,000 mg/L in the vicinity of the Wingfield Dump, to 130,000 mg/L in the vicinity of the saltfields. Lower salinities are associated with the landfills owing to enhanced rates of recharge.

### **Summary**

In summary, lateral groundwater flow is very much less than vertical groundwater movement. Under this regime the Port River Expressway, which will be built largely on imported fill, will not change the lateral flow and will have little influence on the vertical movement of groundwater, which is controlled principally by evaporative influences and localised recharge.

Given that the Port River Expressway is unlikely to impact groundwater significantly, no ongoing monitoring is proposed, although bores operated by PIRSA may continue to be monitored as part of a wider program.

As detailed design progresses, Transport SA will examine components of the infrastructure to identify any influences on groundwater, and any influences that groundwater may have on the infrastructure. Design and management measures can then be devised to protect both groundwater and the infrastructure.

## **6.6 Pre-treatment of runoff from the Pivot site**

One respondent commented that surface water runoff from the Pivot site should be treated prior to discharge from the site into the local drainage system and the constructed wetlands.

The Pivot operation is subject to a Licence to Discharge issued by the EPA. Under the terms of that licence, the EPA can negotiate a suitable stormwater management protocol with the company. Transport SA, Pivot and Council are addressing stormwater issues so that, where possible, the drainage scheme prepared for the expressway is compatible with Pivot's plans to discharge runoff. Any solutions have to be approved by the EPA. Pivot has installed monitoring systems inside its property to ensure that EPA requirements are met.

Pivot has indicated a preference to disperse water to the north. The feasibility of this is being assessed as part of the preliminary design for the railway line.

## **6.7 Sea level rise**

There was some concern expressed that superior engineering may be required due to rising sea levels. Section 4.5.1 of the Environmental Report has a brief discussion on the predicted rate of sea level rise. According to information presented in that section, expected land subsidence rates and sea level rise, combined with 100-year average recurrence interval (ARI) storm events, mean that the Port River Expressway should be constructed with a view to protecting it from sea level changes in excess of 3 m Australian Height Datum. This is consistent with the recommendations of the Coastal Protection Board.

The predictions were based on land subsidence and sea level rise analyses over a 100-year interval. The rise is considered to be negligible over the 100 years and is not expected to affect the project.

Transport SA will continue to liaise with the inter-agency group examining the implications of climate change on rises in sea level.

## **6.8 River water quality**

Two respondents commented that the quality of water in the Port River should be improved to enable dolphins and other marine life to enjoy the Inner Harbour area.

The EMP for the bridge construction will contain detailed commitments to ensure that construction does not adversely affect water quality. In addition, preliminary discussions have taken place in which the question of providing an additional artificial stormwater wetland on the western side of the river has been raised. This wetland would assist in removing some of the suspended solids and compounds in the stormwater runoff from the bridges and their approaches, and go some way to improving water quality in the river.

Significant measures have been undertaken in the past to improve the Port River water quality, and stormwater wetlands have been established to treat stormwater. Industries have also reduced their waste disposal into the river, and as recently as late 2000 Penrice Soda Products commissioned a discharge clean-up plant. The Water Catchment Boards are putting plans into place to ensure continuing improvement of the water quality and the EPA has a regular monitoring program. Presently, the Port Adelaide Waste Water Treatment Plant discharges water into the river, but this plant will eventually be decommissioned and the waste diverted to Bolivar.

One respondent submitted that if livestock trucks were queued while waiting for the road bridge to open, significant amounts of faecal matter would accumulate on the roadside. If this material were not managed in an appropriate manner, the river waters could be polluted.

Runoff from the road and rail bridges will be directed to stormwater channels and thence to constructed wetlands. This is no different from the current situation where pollutants that collect on road pavements are periodically washed into the stormwater system during rain. Transport SA will monitor the situation; however, the intention is to provide a 'design solution' that will overcome the need for active measures such as street sweeping after livestock vehicles.

## **6.9 Acid sulphate soils**

The principal issue of concern to respondents on the subject of the geotechnical conditions and groundwater was the possibility that acid sulphate soils would be encountered or caused by the project.

As documented in the Environmental Report, preliminary investigations indicated that the area most vulnerable to acid sulphate soils was to the north of the proposed Port River Expressway corridor. They also indicated that it was unlikely that the expressway would encounter existing acid sulphate conditions or that the excavations necessary for culverts and other infrastructure would produce acid-sulphate-forming conditions.

All of the expressway will be constructed on filling that will form an embankment above the natural ground surface. Testing will be undertaken for potential acid sulphate conditions where any temporary excavation is required.

Transport SA will undertake additional investigations during the detailed design phase. It is developing appropriate management measures to address both acid sulphate soils and other physical factors that will influence the infrastructure

associated with the expressway. It should be noted that the corridor remains largely free of areas where acid sulphate conditions occur.

### **6.10 Innovative foundation systems**

One respondent submitted an engineering technique for the building of roads and bridges where poor foundations exist. Discussions have been held with the respondent who has since contacted several large consultancy firms to discuss the innovation.

# 7 Rail issues

**Rail-related issues raised by respondents included potential safety concerns, impacts on access to industrial sites, the removal of the 'Rosewater Loop' and the environmental advantages of rail over road.**

## 7.1 Proximity of rail lines to existing industrial activities

One respondent considered that the proximity of the rail lines to sulphuric acid storage tanks on the northern side of the Pivot site would constitute a safety concern because of vibration caused by trains. The respondent acknowledged that this issue was not discussed in the Environmental Report as it was then under discussion between Transport SA and Pivot, and detailed design of the rail tracks in this area was yet to be undertaken.

Transport SA will continue to keep Pivot informed of developments in regard to the rail arrangements and will undertake a safety case analysis if the final design indicates that vibration could be a concern.

The same respondent considered that the proximity of rail tracks to the dock area where fertiliser is loaded onto ships could constitute a hazard to workers.

The rail tracks would be separated from pedestrian access and work areas as far as possible by barriers and warning signs. Road crossings would be accompanied by audible warning signals. A safety audit has not been undertaken for the rail arrangements, since detailed design is yet to take place. When Transport SA is finalising the design, the safety of both people and infrastructure will form a major part of the considerations.

## 7.2 Road access to properties

One respondent considered that a change to the rail arrangements north of the Pivot site would adversely impact on road access to the industrial sites in the area, partly because of the trains 'parked' while waiting on bridge closures and partly because road access would have to be across rail tracks.

The problem of trains parked across roads has long been recognised in this area and is being examined by a working party that includes the operators of the Intermodal Freight yard. Potential solutions include:

- scheduling train movements outside of peak hours;
- providing a parking loop that can accommodate an entire train so that it does not have to park across roads as is the case at the moment;
- scheduling rail bridge closing times to coincide with quiet road traffic times.

The objective of the rail component of the project is to reduce the interference between the road and rail networks, particularly in the area from the Causeway to

Elder Road but also in the area of Francis Street/Eastern Parade and Rosewater. Reaching this objective will necessarily entail analysing access and parking issues, including those raised by the respondent.

### **7.3 Rosewater Loop**

Two respondents considered that the removal of the rail line in Rosewater (the 'Rosewater Loop') would provide significant opportunities for alternative use of the linear strip of rail corridor. However, while one submission raised the possibility of additional bicycle tracks, the other warned that the corridor may be contaminated and that the costs of remediation may prevent its public use.

If the corridor were to be converted into residential land use, and investigations revealed a problem, the EPA would require significant remediation work to be carried out. However, if the use were to be passive recreation, such as open space and bicycle paths, the degree of remediation required may not be as extensive as for residential land.

Further investigations would need to take place to measure the extent and type of any contamination, examine alternative land uses and cost any consequent remediation.

### **7.4 Rail as a mode of transport**

One respondent considered that greater use of both passenger and freight trains would be more environmentally beneficial than the provision of additional road facilities. The Port River Expressway project's objectives in regard to this comment are addressed in Chapter 2 of this document.

# 8 Air quality

Several questions were raised regarding potential changes in air quality brought about by the Port River Expressway. There was also a question about the method used to estimate these changes.

## 8.1 Effects of air pollution on flora and fauna

A question was raised about whether or not air pollution, particularly in high-speed traffic zones, would affect either flora or fauna. Existing air quality levels, and predicted future levels both with and without the expressway, are presented in Table 8.1. It shows the results of the regional analysis that was presented graphically in the Environmental Report.

**Table 8.1** Regional scale air quality analysis results

	Existing			Year 2020 (without expressway)			Year 2020 (with expressway)		
	CO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub>	CO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub>	CO <sub>2</sub>	NO <sub>x</sub>	PM <sub>10</sub>
Grand Junction Road	873.8	100.9	6.3	1,295.0	121.3	6.5	763.6	88.2	5.5
Causeway Road	69.4	8.0	0.5	97.6	9.1	0.5	71.8	8.3	0.5
Semaphore Road	34.1	3.9	0.2	47.8	4.5	0.2	38.4	4.4	0.3
Birkenhead Bridge	73.6	8.5	0.5	95.5	8.9	0.5	32.0	3.7	0.2
St Vincent Street	98.1	11.3	0.7	171.3	16.0	0.9	61.1	7.1	0.4
Commercial Road	118.8	13.7	0.9	145.4	13.6	0.7	125.5	14.5	0.9
Ocean Steamers Road	12.4	1.4	0.1	26.8	2.5	0.1	10.8	1.3	0.1
Francis Street	32.3	3.7	0.2	77.7	7.3	0.4	n/a	n/a	n/a
Eastern Parade	80.8	9.3	0.6	145.5	13.6	0.7	122.5	14.1	0.9
Cormack Road	212.0	24.5	1.5	319.0	29.9	1.6	58.7	6.8	0.4
Hanson Road	70.7	8.2	0.5	100.9	9.5	0.5	227.4	26.3	1.6
South Road	301.4	34.8	2.2	707.4	66.3	3.5	347.7	40.2	2.5
Port River Expressway	n/a	n/a	n/a	n/a	n/a	n/a	365.5	121.1	8.2
<b>Total</b>	<b>1,977.4</b>	<b>228.2</b>	<b>14.2</b>	<b>3,229.9</b>	<b>302.5</b>	<b>16.1</b>	<b>2,225.0</b>	<b>336.0</b>	<b>21.5</b>
<b>Residential areas</b>	<b>1,279.2</b>	<b>147.8</b>	<b>9.2</b>	<b>1,900.5</b>	<b>178.1</b>	<b>9.5</b>	<b>1,143.1</b>	<b>132.1</b>	<b>8.2</b>

*n/a* These roads do/will not exist under the selected option.

Without the Port River Expressway air quality will continue to decline in all parts of the arterial and local road networks in the study area. While it is true that the emission of small particles (particles less than ten micrometres in diameter, or PM<sub>10</sub>) will increase in areas where speeds are greater, PM<sub>10</sub> will decrease in other areas. Other emissions to atmosphere will decrease because of reduced

congestion (engines at idle or that are continuously accelerating and decelerating emit more air pollution). At the regional scale there will be an improvement in air quality brought about by the expressway.

Parts of the Port River Expressway will run through a new corridor that borders the industrial zones of Wingfield and Gillman. In this area and in the Hanson Road area, air quality will decrease only marginally. This decrease will be brought about by the shift of traffic towards the Port River Expressway and away from Grand Junction Road, Cormack Road and St Vincent Street, and an increase in the average speed of traffic.

From Table 8.1 it can be seen that air quality changes in the vicinity of the Port River Expressway are small. Under these circumstances, it is unlikely that flora or fauna will be affected by air pollution from the project.

## **8.2 Method of estimation of changes in vehicle emissions**

One respondent asked what method had been used to calculate air quality and another asked if the calculations took account of natural increases in traffic volumes.

Table 8.1 estimates are based on the modelled traffic flows and current composition. The model used is based on a computer model developed for Transport SA by an atmospheric scientist (Holmes Air Science Pty Ltd), and examines the numbers, average speed and types of vehicles passing a given point in the road network. Using standard emission data for a variety of engine types and fuels, the model calculates a total emission to atmosphere at the point under consideration. Table 8.1 shows the estimated vehicle emissions currently, and in 2020 with and without the Port River Expressway. These estimates are based on existing traffic data or predicted future traffic flows and composition, and typical emission rate data for a variety of fuel and engine types.

Vehicle emissions data are based on international and interstate databases, which contain information about emissions rates, vehicle type and operating conditions. These rates have been modified to reflect local vehicle fleet characteristics where possible. Given the nature of the project and its effect on traffic movements through the Port Adelaide/Enfield area, this analysis has been undertaken at the regional level, rather than the local level.

Further modelling of local air quality effects of the project in the vicinity of Victoria Road, Semaphore Road and Nelson Street could be undertaken as part of the resolution of project details in this vicinity. Local air quality in this vicinity is heavily influenced by proximity to the existing intersection and the level of traffic congestion at the intersection. Indications are that local air quality will not be adversely affected as the proposed junction/intersection is likely to be located further away from existing housing, and traffic congestion levels are likely to be reduced.

## **8.3 Vehicle emissions at the western end of the Port River Expressway**

One submission queried the statement that the Port River Expressway will reduce levels of emissions at the western end of the expressway.

Whatever the future level of traffic demand, vehicle emissions will be lower with the expressway than without. While it is true that there will be a significant redistribution of traffic as a result of the expressway, the extent of this effect in the vicinity of Victoria Road is predicted to be small.

Additional considerations to be noted are:

- a rearrangement of the road and rail junctions and conflicts in the vicinity of Semaphore and Elder Roads will considerably reduce congestion and therefore engine idling time;
- the realignment of Victoria Road further away from houses on Victoria Road will improve the air quality in this immediate area.

# 9 Bicycle paths

Several comments were received endorsing Transport SA's provision of bicycle facilities as part of the design of the Port River Expressway. However, the figure showing the proposed paths in the Environmental Report does not show additional connections between the Port River Expressway bicycle paths and several existing bicycle paths in the Port Adelaide, Enfield and Gillman areas.

Two submissions were received that commented on cycle safety issues.

## 9.1 Additional bicycle paths and connections

The bicycle path network in the Port Adelaide, Enfield and Gillman areas serves two purposes: recreational cycling and commuting. Recreational cycling patterns are more diffuse than commuting patterns, where cyclists tend to travel by the shortest route between home and work. The Port River Expressway lies in a corridor that links predominantly industrial areas to industries in the Outer Harbor area (its principal purpose being to link national roads with the industrial areas of Wingfield, Enfield and Gillman). This means that bicycle paths provided in the shoulders of the Port River Expressway are not likely to be used primarily for commuting.

The suggested additional links (one at the corner of Bedford and Wilkins Streets and one linking the existing Rosewater railyards to the Port River Expressway via the disused rail easement from Bedford Street) are worthy of further discussion between Bike SA, Council and the Port River Expressway team at Transport SA. Transport SA is currently investigating a bypass through the disused rail corridor at Bedford Street and the suggestion of additional bicycle path connections in the area will be considered by the investigation team.

Roads that are not under the control of Transport SA are administered by the councils in the area. The suggestions regarding additional bicycle routes on these roads will be brought to the attention of the relevant councils.

## 9.2 Safety issues

Three comments were made on the issue of safety for cyclists:

- safe detours should be provided for cyclists during construction
- bicycle paths should be constructed to the appropriate standard
- the paths constructed should be safe for cyclists.

The question of cyclists' safety during construction will be addressed in the EMP and EMIP for the project. These will require construction contractors to provide safe passage, not only for vehicles but also for pedestrians and cyclists.

All cyclist facilities will meet appropriate standards, including Part 14 of the AUSTRROADS Traffic Engineering Guide, which covers cycling facilities.

# 10 Road traffic noise measurements and predictions

Questions were raised about how the noise predictions were made and the areas in which data were gathered and for which predictions were made. Additional questions concerned the existing noise levels, particularly along Victoria Road.

## 10.1 Baseline noise data

Baseline noise measurements were made at several points to assess:

- existing noise levels at strategic points along the proposed corridor;
- existing noise levels in areas from which traffic will be diverted by the new expressway and bridges;
- noise levels that may be expected to be associated with the audible signalling devices associated with the proposed bridges;
- noise and vibration levels that may be expected to be associated with mechanisms for the opening and closure of the proposed bridges.

The objective of these measurements was to provide data that facilitate an analysis of the expected change in the noise environment near the project.

Measurements were taken at:

- commercial premises situated on the section of St Vincent Road between the Birkenhead Bridge and Commercial Road, where traffic demand is expected to decrease;
- residential premises along the section of Victoria Road between Swigg Street and Hilton Street, where conditions are also expected to change;
- residential premises situated on Martin Street, Elder Road and Wilson Street that, if they were to remain, would be close to the Port River Expressway;
- the site of the Lipson Street Wharf residential development.

To obtain the required data associated with the bridges, noise and vibration were measured at the Birkenhead Bridge.

## 10.2 Predicted road traffic noise levels

### 10.2.1 Lipson Street Wharf development

One respondent asked if the predictive model, when applied to the Lipson Street Wharf development, took account of a reduction in traffic on St Vincent Street.

Traffic data (shown in Table 2.1) were used to analyse changes in traffic volumes, vehicle mix and traffic patterns (changes in the routes travelled).

Where traffic would be reduced on certain streets, the noise predictions showed a reduction in average noise. Where traffic increased on certain streets, the predictions showed an increase in noise. Thus the model does take account of the reduction in traffic on streets near the Lipson Street Wharf development.

### 10.2.2 Victoria Road

One respondent considered that noise monitoring and modelling should take place on the western side of the river as well as the eastern side.

Noise monitoring was conducted in several locations on the western side, as indicated in Section 10.1.

### 10.2.3 Hanson Road extension

Transport SA's Road Traffic Noise Guidelines only apply to noise sensitive land uses within the scope of the project. Residential uses are the primary noise sensitive land uses. As all of Hanson Road within the scope of the project is zoned for industrial/commercial development, no noise mitigation measures would be required.

## 10.3 Areas where noise levels are high

One respondent commented that the noise levels along Victoria Road exceed 'design criteria', and will be made worse by heavy vehicles negotiating grades.

Table 10.1 shows the noise levels measured during the baseline survey at Victoria Road and the predicted noise levels at the same location. It should be noted that 2.5 dB(A) has been added to the measured noise levels to take account of noise reflected by building facades.

The existing noise level at Victoria Road exceeds the guideline value. Based on that and the predicted future noise levels, some mitigation treatment(s) will need to be considered as part of the detailed scheme definition work for proposed road works in this vicinity.

**Table 10.1** Existing and predicted noise at Victoria Road

Basis of measurement or prediction	Day time L <sub>eq</sub> 15 hours <sup>1</sup>	Night time L <sub>eq</sub> 9 hours
Baseline plus 2.5 dB(A)	73	66
Predicted (2011)	73	65
Predicted (2020)	73	65

<sup>1</sup> L<sub>eq</sub> 15 hours is the 'equivalent noise level' over a fifteen-hour period.

The developer of the river crossings and associated road and rail approaches will be required to develop an appropriate noise mitigation approach based on Transport SA's guidelines. Possible mitigation measures include noise mounding or barriers, and 'quiet' road surfaces. The extent to which these measures can be accommodated will depend partially on the final road layout choice (see Figure 3.1 of the Environmental Report).

In each option, the Port River Expressway is further away from the houses on Victoria Road between Swigg Street and Semaphore Road, which will tend to reduce traffic noise for residents of these houses. The road layouts also offer the opportunity to incorporate earth mounds into the landscape plan, which would deflect noise away from these houses.

'Quiet' road surfaces are achieved by 'open graded' pavements that have air spaces helping to absorb vehicle noise, since the noise created by vehicles is largely a result of tyre friction.

# 11 Miscellaneous issues

This section addresses responses covering a variety of issues not discussed in the previous sections. These include issues related to contaminated land, project staging, economics, consultation, invertebrate fauna, heritage (Aboriginal and European), construction workforce induction, the EMP, pest species, the Dean Rifle Range, inclusion of artists on the design team, renewable energy and use of recycled materials.

## 11.1 Request for information on contaminated land

The City of Port Adelaide Enfield requested that information regarding the location and nature of any contaminated sites in the Port River Expressway corridor be copied to the Council.

Similarly, Council requested that it be informed of any remediation that may take place in association with the Port River Expressway project.

Transport SA will discuss Council's needs in more detail with the aim of providing this information as requested.

## 11.2 Staging of the project

Three respondents commented on the staging of construction of the Port River Expressway. All considered that it was important that the project be staged so that the road component (Stage 1) was closely followed by the road bridge component (Stage 2). One respondent commented that:

The TSA pamphlet 'Better Access across the Port River—August 1999' states that construction of the bridge will commence 18 months after the project starts (i.e. mid to late 2003). Any changes to that schedule and any delays will lead to traffic problems. These should be identified and solutions found.

Transport SA is aware of the issues that may result from the completion of Stage 1 Roadworks in advance of the river crossings and contract documents will address this matter. Discussions will be undertaken with Council to minimise impacts and to address traffic management issues.

## 11.3 Economics

### 11.3.1 Local labour/service supply

One respondent asked if there was a mechanism for ensuring that local businesses and local people would be employed on the project to enhance training and employment opportunities.

The Port River Expressway project team maintains a register of individuals and suppliers that have expressed interest in the project. This register will be forwarded to the construction contractors during the tender process. Transport SA, in conjunction with Council, will provide an information session for local business to explain the Government's procurement processes for the project. It will not be possible to specify where contractors source their resources for the project. A list of project activities has been supplied to Council at their request. This list includes the following:

- Road construction equipment:
  - plant (and possibly operators)
  - backhoes
  - tippers
  - graders
  - water-carts
  - tractors
  - compaction equipment.
- Materials (and possibly supply and placing) and services
  - sand, gravels, spalls
  - recycled and quarry products
  - bituminous/asphaltic supply/placing
  - cement (for use in pavement)
  - concrete supply/placing
  - materials/contamination testing
  - kerbing (gutter and median)
  - guardrail/wire rope components and installation
  - geotextiles/geogrids/geofabrics/stabilisation materials/gabion mattress
  - roadside furniture—guideposts, delineators, pavement bars
  - linemarking
  - signs (supply and install), gantries
  - construction pegs, stakes, strings
  - handrails (e.g. for cyclists at intersection points)
  - environmental infrastructure specified by the Environmental Report and Guidelines for Construction, e.g. for dust suppression, stormwater litter catchment racks and filters, and other filtration devices such as hay-bales
  - traffic signal infrastructure.
- Other services
  - service items, for example relocations, ducting, cable, conduits
  - construction surveyors
  - streetlighting—luminaires, footings, electricians

- specialist metal fabrication workshops
- work-site traffic management and equipment
- traffic barriers
- bollards
- bunting
- cones
- road-works signs
- delineation
- drilling/sawcutting/auger contractors
- demolition contractors
- trench reinstatement contractors
- leasing—site offices, temporary store sheds.
- Structures/drainage (in addition to those above):
  - plant (and possibly operators)
  - cranes
  - excavators
  - dozers
  - materials (and possibly supply and placing)
  - formwork and shoring contractors
  - concrete supply and placing (pumping, vibrate, screed, trowel)
  - steel reinforcement and fixing
  - precast pipes, units, boxes, crowns and bases
  - bunding pipes, e.g. Ribloc
  - water pumps
  - sandbags
  - earth retaining walls
  - bolts, curing compounds (e.g. Hilti)
  - specialist bridge equipment—bearings, joint compounds
  - stakes, pegs
  - wire, rope
  - general construction materials, e.g. plastic sheet (Fortecon)
  - services
  - plumbers
  - construction surveyors.

### **11.3.2 Disruption to industry during construction**

One respondent commented that care must be taken during the construction phase to minimise financial losses to businesses resulting from restricted access to industrial sites.

The construction contractor will develop a traffic management plan for use during the construction period. This plan will be discussed with Port Adelaide Enfield Council and other key stakeholders to ensure that access is maintained as far as possible and that should access be temporarily blocked, industry will receive notification in advance so that alternative access arrangements can be made.

### **11.4 Consultation**

One respondent submitted that little consultation had taken place with boatyard owners located in Jenkins Street and that the Environmental Report was incorrect when it stated that widespread consultation had taken place with the groups shown in Appendix B of the Environmental Report.

Boatyards in Jenkins Street will not be directly affected by the Port River Expressway proposal other than in relation to opening times of the bridges and the re-routing of trains away from Semaphore. Nevertheless, the respondent has been involved in consultation processes that preceded the Environmental Report and has been included on the mailing list of both Transport SA's Port River Expressway team and the community consultation team. The respondent has received letters of invitation to seminars and information sessions, newsletters and community consultation updates. Boatyards in the precinct have received personal visits from both Transport SA and the environmental assessment team. Other groups and individuals listed in Appendix B of the Environmental Report have been consulted in a similar manner.

### **11.5 Invertebrate fauna**

One respondent commented that there was little information given in the Environmental Report on invertebrate fauna in the corridor.

No invertebrate fauna surveys were carried out for the Environmental Report; however, invertebrate fauna studies conducted for the development of the adjacent wetlands were referenced.

### **11.6 Aboriginal and European heritage**

#### **11.6.1 Aboriginal heritage**

One respondent submitted that the Environmental Management Plan (EMP) and the Environmental Management Information Plan (EMIP) needed to include procedures related to the discovery of Aboriginal artefacts. This is a standard requirement on all Transport SA projects. The EMP shown in Chapter 8 of the Environmental Report includes the instruction that should any material suspected to be of Aboriginal origin be discovered during construction, all work is to cease and representatives of the Kurna people and the Department of State Aboriginal Affairs are to be informed.

It should be noted that the survey conducted by the assessment team together with representatives of the Kurna people did not identify sites likely to hold

artefacts. This is because the area has been extensively modified by the import of fill materials and the history of dumping in the area.

#### **11.6.2 European heritage and culture**

Concern was expressed that the Environmental Report did not give sufficient recognition to the South Australian Aviation Museum as a major contributor to tourism in the area.

Construction of the road and rail crossings between No. 1 and No. 2 Docks will require the relocation of the Aviation Museum from its Honey Street address. Transport SA acknowledges the importance of the Aviation Museum as a highly regarded volunteer organisation that contributes to the history and tourism of the Port area. Since March 2000 when funding for the Port River Expressway project was announced, Transport SA and the Aviation Museum have worked closely together on the issue of its future location.

#### **11.7 Pre-construction Occupational Health and Safety training of the workforce (induction)**

The City of Port Adelaide Enfield asked that Council be represented at workforce inductions.

This is a matter for discussion between Transport SA, Council and the construction contractors.

#### **11.8 Environmental Management Plan**

One respondent asked what the basis of the EMP was, and for whom and how it was written.

The EMP is a detailed statement of environmental performance criteria specific to the design, construction and operation of the Port River Expressway. It forms the basis of contractual obligations placed upon construction contractors. The contractors are then required to prepare an EMIP that describes how the environmental issues and mitigation measures will be managed on the construction site. Environmental auditing will be undertaken to review the environmental performance of the project and provide feedback on the effectiveness of the environmental management measures.

The preparation of an EMP is a requirement of Transport SA's guidelines for the preparation of an environmental impact assessment. The environmental policy of Transport SA is to develop and manage a transport system that is in harmony with the environment. This can be achieved by:

- minimising pollution
- sustaining ecosystems
- conserving cultural heritage
- enhancing amenity.

The objectives of the EMP are to:

- identify environmental impacts of operation that can be minimised by appropriate design;
- identify and mitigate environmental impacts of construction;

- achieve best practice in environmental management;
- fully comply with statutory and regulatory requirements.

The EMP is written by the Environmental consultant after the consultant has analysed the likely impacts of the proposed project on the existing environment, and prepared mitigation measures designed to reduce adverse impacts.

### **11.9 Pest species**

One respondent commented that pigeons are a major pest in the area of the docks because of the proximity of the grain terminals. The respondent asked what measures would be adopted to control this pest and minimise its impact on infrastructure and bridge operations.

In the event that the grain terminals move to Outer Harbor, the problem may be lessened locally. In any case, measures that can be taken to reduce the effect of pigeons on the infrastructure of the bridges include the use of repellent paints and careful consideration of roosting and nesting potential during bridge design. The operation and maintenance of the bridge will be the responsibility of the private consortium that delivers Stage 2 of the project. The problems associated with pigeons will be brought to its attention.

### **11.10 Disruption to shooting on the Dean Rifle Range**

One respondent asked if shooting would be allowed during construction of Stage 1, the road component of the project.

Negotiations are taking place with the Dean Rifle Range managers and the Office for Recreation & Sport, in relation to the imminent relocation of shooting activities to Lower Light. There may be some overlap between the start of construction and this relocation. The contract documentation for the Stage 1 roadworks will, therefore, include details of any restrictions to accessing this area for construction during this interim period.

### **11.11 Inclusion of artists in the design team**

One respondent asked how artists could be included in the project design team.

The tender documentation that has been prepared by Transport SA for the detailed design of Stage 1 and the Call for Expressions of Interest prepared for Stage 2 contain clauses that directly address the need for design teams to consider the aesthetics of the project and the potential for inclusion of public works of art. By having relevant clauses in tender documents, the inclusion of artists will be made integral to the design, not an afterthought.

### **11.12 Use of renewable energy**

One respondent asked if renewable energy sources would be employed once the expressway was in use.

Transport SA is investigating the use of lighting and signage systems that rely partially or entirely on renewable energy sources. Such systems are already used by Transport SA.

### **11.13 Use of recycled materials**

One respondent requested that specifically designed recycled materials be used in the construction of the road. This would include fill and concrete manufacture ingredients, replacing a percentage of traditionally quarried materials. Another respondent asked if any imported fill material would be 'clean'.

Transport SA, as the largest proponent of new road and highway construction in South Australia, is taking a leading role in promoting resource recovery and reuse in the industry. It is currently developing a Contracting and Procurement Manual that will cover the use of recycled materials and promote environmental issues. The Port River Expressway provides an important opportunity to develop specifications to ensure that recycled and natural quarried materials are assessed equally in the tendering process. Recycled materials have already been used to construct a trial embankment on the project alignment to assess the rate of settlement, as this will impact on the design and construction of the expressway. Transport SA will also undertake a qualitative study on the material it proposes to use for fill. EPA guidelines on acceptable levels of contaminants will be applied to the results of the sampling and testing program, and only material that passes the EPA tests will be used.

## **Appendix B—References**

### **Chapter 2**

Jensen Planning & Design. 2001. Gillman & Lefevre Peninsula land capability study. Prepared for Planning SA, Department of Industry & Trade and Port Adelaide Enfield Council.

Kristine Peters Project Management. May 2001. The Port River Expressway road freight industry consultation report. Commissioned by Transport SA. Adelaide.

### **Chapter 4**

Lang, P.J. & D.N. Kraehenbuehl. 2000. Plants of particular conservation significance in South Australia's agricultural regions. (August 2000 update of unpublished database). Department for Environment & Heritage.

### **Chapter 5**

Jensen Planning & Design. 2001. Gillman & Lefevre Peninsula land capability study. Prepared for Planning SA, Department of Industry & Trade and Port Adelaide Enfield Council.

### **Chapter 6**

Belperio, A.P. & R.L. Rice. 1989. Stratigraphic investigation of the Gillman development site, Port Adelaide estuary. Adelaide: Department of Mines and Energy, Report 89/62.

Centre for Groundwater Studies (CGS). 1993. Dry Creek groundwater study. Final report to MFP Australia. Vols 1 and 2. Adelaide: CGS.

## Appendix A—Respondents’ comments

In Table A.1 every comment received has been summarised and tabulated. The comment or question is addressed in this Supplement in the section indicated in the last column. The names of respondents, abbreviated in this table, are presented in full in Table A.2.

**Table A.1**                      Comments received

Respondent	Issue	Responded to in Section
CL	‘Do it. Expressways are cool.’	(See Note A <sup>1</sup> )
TC	Happy to see reduction in heavy goods vehicles along Grand Junction Road because it will reduce noise and pollution at Tauondi College.	(See Note A <sup>1</sup> )
<b>Chapter 2</b>		
RAA	Supports this project and is pleased to see South Australia receive Federal Government funding under the Roads of National Importance Program (RONI).	2
PAE	Grade separation of Elder Road should allow for future use of Elder Road as alternative route to industries on the Peninsula.	2.2
RAA	Raises concerns that the alternative road layouts for the western end of the bridge approaches entail a major intersection with Elder Road that could cause significant congestion, particularly when the bridge is open. This will also cause concern for residents entering and exiting the road system.	2.2
PAE	Do predictions take into account ‘natural’ increase in traffic volumes?	2.3
PAE	What is the definition of heavy goods vehicles?	2.3
PAE	Percentage reduction in heavy goods traffic over Birkenhead Bridge will depend on definition of heavy goods vehicles.	2.3
PAE	1996 traffic data have been used. Are there more recent data?	2.3
PAREPG	Would prefer to see the traffic forecasts tabulated.	2.3
PAE	Hanson Road should be upgraded through to Grand Junction Road.	2.4

Respondent	Issue	Responded to in Section
PAE	Hanson Road and Grand Junction Road will require upgrading to encourage heavy goods vehicles to access the Port River Expressway.	2.4
RAA	Understands that the safety benefits and efficiency gains of grade separation need to be assessed against the increased cost of providing this infrastructure. But in the case of Hanson Road, if justification can not be found at this time for grade separation then design levels during this current stage of the project should not preclude grade separation at a later date.	2.4
FTPL	The Port River Expressway project will have positive benefits for the Hanson Road area only if Hanson Road is upgraded right through from the Port River Expressway to Grand Junction Road.	2.4
PAE	Heavy goods vehicles should be discouraged from accessing St Vincent Street.	2.5
RAA	Recognises concerns from the Port Adelaide Enfield Council about the displacement of passenger traffic from the mainstreet. The survival of the city centre is obviously important to the retailers and the council; however the provision of a safe, free, reliable, efficient and direct route for drivers should be the Government's major consideration.	2.5
RAA	Questions the limited reduction in heavy goods vehicles on Causeway Road brought about by the Port River Expressway.	2.5
CWSPL	A bypass should be made to connect the Port River Expressway with Commercial Road via Russell Street.	2.5
RAA	In order to achieve the efficiencies of this route it is imperative that the expressway should be grade separated at the South Road/Salisbury Highway junction.	2.6
RAA	Questions the future of the Birkenhead Bridge, particularly in light of possible redevelopment of the area.	2.7
PAE	Option C (connections on the Peninsula) is the preferred option.	2.7
PAE	Eastern Parade and Grand Junction Road should have duplicated right-hand turn lanes to reduce congestion.	2.7
SCC	The arterial road network that delivers traffic to the Port River Expressway is uncoordinated.	2.7

Respondent	Issue	Responded to in Section
SCC	The Port River Expressway will increase traffic along the Salisbury Highway through Parafield Gardens.	2.7
SCC	Developments such as the DSTO site will increase traffic on the Salisbury Highway.	2.7
SCC	The Mawson Lakes bypass will draw more traffic onto the Salisbury Highway and highlights the lack of a link between Montague Road and the Port River Expressway.	2.7
SCC	Signage at the South Road, Port Wakefield Road, Salisbury Highway and South Road Connector should make it clear that the route to National Highway 1 is via Port Wakefield Road not Salisbury Highway.	2.7
PAREPG	The Port River Expressway is likely to increase traffic in the suburbs of Birkenhead, Ethelton and Semaphore.	2.7
PAREPG	The Victoria Road – Port River Expressway junction (a merging of two major traffic streams) is likely to become an area of congestion, particularly during construction. This will lead to greater traffic volumes on Military Road, Fletcher Road and Woolnough Road.	2.7
PAREPG	The vehicle kilometre, fuel and time savings seem low when considered against the cost and upheaval brought about by the Port River Expressway.	2.7
CCS	The traffic analysis does not go far enough; for example, there is a likelihood that the upgrade of Hanson Road will have traffic implications in areas of the City of Charles Sturt.	2.7
JAT&MS	The Port River Expressway will further restrict access to Heath Street. Consideration should be given to either closing off the Victoria Road end of Heath Street and reopening the Fletcher Road end (Heath Street is currently a no-through-road), or extending the indicated service road (the old Victoria Road) as far as Heath Street.	2.7
JAT&MS	A left-hand turn from Heath Street across the Port River Expressway will be hazardous considering the volume of traffic that is city-bound.	2.7
JF	Concern is expressed on the impact of the Port River Expressway on traffic entering and leaving Gunn Street. Gunn Street may have to have a 'no left turn' sign to reduce traffic volumes along this street.	2.7
JM	Traffic flow from Commercial Road onto St Vincent Street should be changed so that there are two right-hand lanes that turn from Commercial Road east onto St Vincent	2.7

Respondent	Issue	Responded to in Section
	Street and one left-hand turn. The building on the south-west corner of the Commercial Road/St Vincent Street junction should be demolished.	
BR	The Port River Expressway is a good idea and South Road should be made into a freeway or a ring road to service the north/south transport traffic.	2.8
LC	Traffic should travel along Elder and Mersey Roads to Outer Harbor and back via Victoria Road.	2.8
DMcG	Elder Road should be developed to allow traffic access to Outer Harbor.	2.8
ACC	Proper access to Wingfield Waste Management Centre must be optimised.	2.8
JM	The Port River Expressway will be a high-speed link to national roads. Care should be taken that drivers do not continue to drive at high speeds once they reach Victoria Road because of safety concerns. Speed cameras should be used.	2.8
PAE	Increased traffic on Victoria Road. What chance of turning Elder Road into primary arterial road?	2.8
ABC	Access to and from the expressway and the heavy vehicle bypass will need to accommodate B-Double trucks in order for ABC traffic to access the road system.	2.8
ABC	There are concerns about increased traffic on Elder Road. This includes the safety of ABC employees and contractors who regularly cross the road to attend plant located on the south-eastern site bounded by Stirling Street and Elder Road. The Elder Road boundary of the Birkenhead site is complicated by regular truck traffic accessing and egressing from both the eastern (four gates/roads) and western (twelve gates) sides of the street to ABC and Fuel Link sites.	2.8
PIVOT	Pivot requires access from Ocean Steamers Road to its employee carpark on Francis Street.	2.8
PIVOT	Access to the Pivot site on Francis Street must be maintained for trucks coming from both Eastern Parade and Ocean Steamers Road.	2.8
AF	Is there going to be an expressway connecting Port Adelaide to St Kilda?	2.9

Respondent	Issue	Responded to in Section
MD	The report should have considered the long-term consequences of the Port River Expressway, for example, the volume of traffic on Victoria Road. A wider range of aspects should also have been taken into account.	2.9
<b>Chapter 3</b>		
PAE Elected	Council wishes to express considerable concern as to the location of the Port River Expressway and the research supporting it.	3.1
FPHA	The position of the bridge and the route seem to have been chosen on economic grounds alone.	3.1
FPHA	The position of the bridge will create a barrier that will leave a lasting legacy on the amenity of the Port and will adversely affect river traffic and tourism.	3.1
LC	Eastern Parade should be extended to the river and the bridge located at that point (between No. 2 and No. 3 Docks).	3.1
RAA	Questions if the cost–benefit analysis on the height of the bridge takes into account the disbenefit of delays and safety in the case of a low-level opening bridge.	3.2
PAE	Bridge design should maintain unobstructed views down river.	3.3
PAE	A horizontal or swing rail bridge would be preferable to a vertical opening span to reduce visibility when open.	3.3
ABC	An aesthetically pleasing bridge design could enhance the outlook from Lipson Wharf and would create delineation between the industrial zone of the Port and the Inner Harbour tourist and recreation area.	3.3
JM	The bridge should use a design from earlier Port Adelaide bridges and if possible, it should be a swing bridge.	3.3
PAE	River traffic data is needed to help determine bridge height and opening frequency.	3.4
KH	A low-level opening option was not discussed earlier.	3.4
PARC	Requests that the bridge be open seven days per week from 8:00 am to midnight.	3.4
PAE	Should not consider moving boating activities downstream of bridges. This would reduce the life of the Inner Harbour.	3.5
PAE	Should pursue moving Sailing Club to eastern side of Birkenhead Bridge.	3.5
ACPL	Understands that the Port River Expressway may require	3.5

Respondent	Issue	Responded to in Section
	the relocation of the MV <i>Queen Adelaide</i> to No. 1 Dock.	
BW	Concern is expressed that the bridge in its currently proposed location will mean the loss of the tugs and container ships from the area. The preference is for a more northerly location.	3.5
JM	At least one tug should be kept in the Inner Harbour even if the others are moved downstream of the new bridge.	3.5
FPHA	The project will adversely affect the heritage zone of Port Adelaide.	3.6
CAPP	Local people are expressing concern about the location of the bridge and its effects on noise, air quality, impact on development of No. 2 and No. 3 Docks and tourism.	3.6
RAA	Suggests that a shadow toll would provide sufficient finance for the developer and opposes the imposition of a direct toll.	3.7
ABC	ABC is concerned that any toll charge must be economically viable for its operations.	3.7
PABUG	No bridge toll for cyclists.	3.7
AB 1	Totally opposed to any toll on the bridge. Enough is already paid in taxes, car registration and fuel.	3.7
PAE	People may avoid bridge if there is a toll. Transport SA should discuss overall traffic management with Council.	3.7
JM	A parade should be organised for the bridge opening and wharfies invited.	3.8
ABC	ABC would take advantage of the location of the bridge to service bulk and bag customers and truck traffic and to receive minor raw materials to the site on a just-in-time (JIT) program.	3.9
<b>Chapter 4</b>		
PAE	Inconsistencies between text and appendices (plant lists).	4
PAE	More than one area of remnant vegetation, e.g. slightly degraded samphire.	4.1
PAE	Dean Rifle Range remnant patch dominated by <i>Ammophila arenaria</i> not <i>Phragmites australis</i> .	4.1
PAE	Species list in Appendix D is incomplete and should include: <i>Lotus australis</i> , <i>Chloris truncata</i> , <i>Cyperus gymnocaulos</i> , <i>Stipa curticola</i> , <i>Stipa scabra</i> subsp. <i>falcata</i> , <i>Kennedia prostrata</i> and <i>Lomandra collina</i> .	4.1
PAREPG	The Port River Expressway should be re-routed away	4.1

Respondent	Issue	Responded to in Section
	from the patch of remnant vegetation which should remain untouched and protected during construction.	
PAE	Rare species of birds (Slender billed thornbill and Rock parrot) will be affected by removal of samphire.	4.2
PAE	Planting should re-create habitat.	4.2
PAE	Loss of Coast bitter blue bush habitat for butterfly <i>Theclinessthes albocincta</i> , hence reduced biodiversity.	4.2
PAE	<i>Acacia ligulata</i> should not be planted in samphire areas.	4.2
PAE	Scope for adding habitat components that are extinct. PAE can assist with species selection, e.g. <i>Callitris preissii</i> and <i>Allocasuarina verticillata</i> .	4.2
PAE	<i>Halosarcia flabelliformis</i> was known to have existed in Gillman and is listed under the EPBC Act. It should be included in the species list.	4.2
PAE	Significant plants should be rescued before construction.	4.2
PAE	Does the EPBC Act require plant surveys prior to construction and protection of birds and their habitat during construction?	4.2
PAE	If further plant surveys are undertaken they should occur in spring.	4.2
PAE	Prefer use of native species in landscaping not exotics, e.g. Native pine not Norfolk Island pine.	4.3
PAE	Do not use callistemons which reduce biodiversity.	4.3
PAE	Landscape plan should be revised to address habitat restoration issues.	4.3
<b>Chapter 5</b>		
CWS	The Port River Expressway should be routed to the north of or through the Pivot site to increase the distance from potential residential development areas; i.e. Woolstores precinct.	5.1
AB 2	As long as flora and fauna in the wetlands are left alone, the Port River Expressway will cut a lot of traffic from Grand Junction Road and there will be fewer accidents.	4.3
CWS	If the Port River Expressway was re-routed to the north of the Pivot site, the South Australian Company Dock could be restored.	5.1

Respondent	Issue	Responded to in Section
PIVOT	Arrangements related to the rail corridor north of and intruding into the Pivot site will require compensation for loss of land, access and disruption to operations.	5.1
PAE	Council should be member of the Land Management Committee.	5.1
CWS	The report does not consider the potential of No. 1 Dock for residential development.	5.2
CWS	Waterfront development sites are rare in Adelaide and Shed 5 should not be used for museums but the area developed for residences.	5.2
PIVOT	The EPA requires a buffer of 1 km around fertiliser plants which will exclude residential development of the land on No. 1 and No. 2 Docks.	5.3
ABC	ABC maintains a buffer zone between its operations and local residents. It is concerned that any residential development in the area south of its site will violate the buffer zone and lead to future problems.	5.3
ABC	If the land south of the cement works is to be redeveloped, account should be taken of the EPA buffer zone guidelines, the importance of Schroder Park to the community and voluntary organisations (e.g. the 'Our Patch' program).	5.3
SCOTT	Transport SA may wish to acquire the entire site of the NT Freight Services operation because of the decrease in land value brought about by the Port River Expressway.	5.3
PAE	Land at Outer Harbor has been zoned industrial. What future implications does increased industrialisation of the Peninsula have on traffic volumes on the Port River Expressway?	5.3
CAPP	The report does not address the effects of increased traffic on Victoria Road arising from increased industrial development on the Peninsula.	5.3
J COULIE?	Has consideration been given to moving the container terminal to Gillman?	5.4
<b>Chapter 6</b>		
PAE	The Port River Expressway should not add to the already high pollutant load entering wetlands.	6.1

Respondent	Issue	Responded to in Section
RAA	Agrees with the report's assumption that the Port River Expressway should improve safety and reduce crashes hence there should be a reduction in point source or accidental chemical spillage, but other accidents and spills may still occur. This would require adequate traffic management and signage to provide advice to drivers regarding delays and alternate routes.	6.2
	Notes that the wetlands are to be relied upon to contain spills on the eastern side of the bridge but there appears to be no indication of how spills on the western side or across the Port River will be contained.	6.2
PAE	Spill management plans should be developed and implemented jointly with Council.	6.2
ABC	Protection of the Schroder Park pond from contaminants of the expressway run-off and major spill risk needs to be carefully provided for. Currently water quality is able to support tadpoles, frogs and a variety of aquatic plant life.	6.3
PAE	Pollution of the wetlands is most likely to occur during construction. The EMP and EMIP should be agreed by Council and there should be a communications policy to address management during construction.	6.4
PAE	Plans should be made to dispose of hypersaline groundwater released during construction.	6.5
PAE	Modelling should be undertaken to investigate groundwater flow and the impacts of development should be monitored over time.	6.5
PAE	Water from the Pivot site should be treated prior to discharge into the drainage system in accordance with EPA requirements.	6.6
PIVOT	Stormwater management improvements have been deferred until the rail corridor is finalised. They will then be discussed with Transport SA.	6.6
PAE	Account should be taken of sea level rise and land subsidence and should include future sea level rise resulting from climate change.	6.7
PAE	Transport SA should liaise with the Interagency Group (Land Management Corporation and Office of Coastal Management and Council) to keep abreast of strategic initiatives regarding sea level rise and stormwater/high tide coincidence.	6.7

Respondent	Issue	Responded to in Section
PAE	The report does not consider how long-term sea level rise can be accommodated and has taken a 50-year instead of a 100-year horizon for subsidence.	6.7
LTASA	If livestock trucks are required to stop due to bridge opening, effluent from the animals will accumulate on the road.	6.8
AD	The Port River should be cleaned up so that dolphins will use it.	6.8
JQT	How can pollution of the Port River be stopped?	6.8
PAE	How will acid sulphate soils be identified prior to construction?	6.9
PAE	How will acid sulphate soils be managed during construction?	6.9
PAE	What acid sulphate monitoring will occur during construction?	6.9
PAE	How will shallow underground aquifers be protected?	6.9
PAE	What remediation strategies will be adopted for acid sulphate soils?	6.9
PAE	How will infrastructure be protected from the effects of acid sulphate soils?	6.9
PAREPG	Sites at which acid sulphate soils are likely to occur (such as culverts) should be identified and methods for dealing with acid sulphate soils detailed.	6.9
PAREPG	Components of the Port River Expressway that have the potential to impact groundwater should be identified and designs should take account of the need to prevent saline groundwater from affecting the environment.	6.9
DRT	Consider using a novel swamp reclamation technique developed by Mr Turner.	6.10
<b>Chapter 7</b>		
PIVOT	The proximity of the rail to sulphuric acid tanks must be considered in relation to major accidents and potential effects of vibration.	7.1

Respondent	Issue	Responded to in Section
PIVOT	The proximity of the rail corridor to fertiliser loading operations will adversely affect the health and safety of Pivot employees by increasing noise and pollution.	7.1
PIVOT	The impact of the rail corridor on sulphuric acid storage is not discussed because Transport SA has made interim arrangements with WMC.	7.1
PIVOT	Trains held up because of bridge openings will adversely impact access to the Pivot site	7.2
PAE	Rosewater Loop land may be contaminated. The costs of remediation may outweigh benefits of conversion into public use.	7.3
MD	Rail development for both freight and passengers should receive the highest priority because it is more environmentally sound than road transport.	7.4
MD	If more use was made of trains there would be less road traffic and the Port River Expressway could be reassessed on the basis of a lower traffic volumes. The bridge could then be located further north.	7.4
<b>Chapter 8</b>		
PAE	Will increased levels of nitrogen, lead etc. have adverse effects on habitat and species in high speed zones?	8.1
PAREPG	The methodology for calculating air quality is not given.	8.2
PAREPG	The temporal and spatial variation in air quality should be given.	8.2
PAREPG	The air quality in the residential area adjacent to the Port River Expressway at Victoria Road will be significantly adversely impacted.	8.3
PAREPG	It is illogical to assert that the Port River Expressway will reduce levels of emissions at the western end of the expressway.	8.3
<b>Chapter 9</b>		
PABUG	The bike paths proposed would benefit from a further two connections, one at the corner of Bedford and Wilkins Streets and one linking the existing Rosewater railyards to the Port River Expressway via the disused rail easement from Bedford Street. This could also extend northwards to Grand Trunkway.	9.1

Respondent	Issue	Responded to in Section
PABUG	The bike paths should be extended eastwards from the Rosewater railyards to provide an alternative riding experience to the path alongside the Port River Expressway and to be more accessible to residents.	9.1
JM	The proposal to remove the train tracks through Rosewater would provide additional opportunities for bicycle tracks and would enhance opportunities for tourism (e.g. routes to the wetlands, through Port Adelaide Centre, around the Causeway etc.).	9.1
PAE	Bike paths need to be designed carefully to ensure safety.	9.2
PABUG	The bike paths must be designed in accordance with Austroads Part 14.	9.2
PABUG	Construction detours must also be safe for cyclists.	9.2
<b>Chapter 10</b>		
PAE	Does predicted noise level at Lipson Street Wharf take into account reduction in traffic on nearby roads once the Port River Expressway is in operation?	10.2
PAE	Noise modelling should take place on the western side as well as the eastern side.	10.2
PAE	Monitoring and modelling should also take place on the extension to Hanson Road to ensure residential areas are not affected.	10.2
JAT&MS	There will be a large increase in traffic noise at the junction of the Port River Expressway and Heath Street.	10.2
PAREPG	The noise on Victoria Road currently exceeds design criteria and will be made worse by heavy vehicles negotiating grades.	10.3
PAREPG	What are quiet surfaces and acoustic barriers?	10.3
<b>Chapter 11</b>		
PAE	Council wishes to be informed of any remediation.	11.1
PAE	Council should be kept informed of any remediation of acid sulphate soils.	11.1
PAE	Can records of contamination be provided to Council for inclusion on its register?	11.1
CWS	A road without a bridge would exacerbate current traffic problems.	11.2

Respondent	Issue	Responded to in Section
PAREPG	The Transport SA pamphlet 'Better Access across the Port River' (August 1999) states that construction of the bridge will commence 18 months after the project starts (i.e. mid to late 2003). Any changes to that schedule and any delays will lead to traffic problems. These should be identified and solutions found.	11.2
PAE	Transport SA must provide details of staging to Council.	11.2
PAE	Is there a mechanism for requiring the developer to source a percentage of the construction workforce from the north-west Adelaide area and to enhance training opportunities?	11.3
PAE	Care must be taken during construction to minimise financial loss to businesses due to restricted access.	11.3
KH	Very limited consultation has taken place with boatyards in Jenkins Street.	11.4
KH	The report is incorrect in stating that widespread consultation has taken place and there is doubt that other groups have been consulted as indicated in the report.	11.4
PAE	Little information on invertebrates and their importance to biodiversity.	11.5
SAAM	The report does not give sufficient recognition to the Aviation Museum as a major contributor to tourism in the area.	11.6
PAE	Council should be represented at inductions.	11.7
PAE	The EMP and EMIP need to include procedures related to discovery of Aboriginal artefacts.	11.8
PAE	Basis for who, why and how the EMP is done.	11.8
PIVOT	Pigeons are a major pest in the area because of the proximity of the grain terminals. What controls will be put in place to minimise their impact on infrastructure and bridge operations?	11.9
MRCSA	Will activities on Dean Rifle Range be curtailed during construction?	11.10
ARTSSA	How can the inclusion of artists be ensured?	11.11
ARTSSA	How can art be made an essential element and not an afterthought?	11.11
ARTSSA	Tenders should reflect need to include artists.	11.11
PAE	Renewable energy should be used in preference to other power sources.	11.12

Respondent	Issue	Responded to in Section
PAE	Will imported fill be certified 'clean'?	11.13
RC	Recycled material should be used when constructing the expressway.	11.13

\* Note A: These comments do not require a response.

**Table A.2** List of respondents

Abbreviation	Contributor
AB 1	A Bartolo
AB 2	Anthony Busuttill
ABC	Adelaide Brighton Cement
ACC	Adelaide City Council
ACPL	Adelaide Cruises Pty Ltd
AD	Andrew and Luke Daniel
AF	A Franze
ARTSSA	Arts SA
BR	Brenton Rehn
BW	B Winter
CAPP	Community Action for the Port and Peninsula
CCS	City of Charles Sturt
CL	Clint Lambden
CWSPL	Campbell Woolstores Pty Ltd
DMcG	David McGrath
DRT	David R Turner
EPA	Environment Protection Agency
FPHA	Friends of the Port Historic Area
FTPL	Freeman Trucks Pty Ltd
HTSA	History Trust of South Australia
JAT&MS	Jo-Anne Taylor and Mark Seater
JC	John Coulie ? (The hand writing is not clear)
JF	John Fitzpatrick
JM	Jan Mark
JQT	Jia Qusen Troung
KH	Kingsley Hasket—Searles Boatyard
LC	L Crowley
LTASA	Livestock Transport Association of South Australia
MD	Maggie Dittmayer
MRCSA	Metropolitan Rifle Club of South Australia
PABUG	Port Adelaide Bicycle Users Group
PAE	Port Adelaide Enfield Council
PAE Elected	Elected Members of Port Adelaide Enfield Council

Abbreviation	Contributor
PARC	Port Adelaide River Cruises
PAREPG	Port Adelaide Residents Environmental Protection Group
PIVOT	Pivot
RAA	Royal Automobile Association
RB	R Beck
RC	Resourceco
SAAM	South Australian Aviation Museum
SAMM	South Australian Maritime Museum
SCC	Salisbury City Council
SCOTT	Scott Group of Companies (NT Freight Services)
TC	Tauondi College
WGP&Sons	W G Porter & Sons

# Appendix A

## Respondents' Comments

# Appendix **B**

## References