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Submission title: **Environmental Infrastructure – Water Management, Adelaide City Council**

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No. of pages: 5

Date: 15 October, 2008

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**Adelaide City Council Response to
Infrastructure Australia request for Project
Ideas for evaluation and possible inclusion
on the National Infrastructure Priority List.**

15 October 2008

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Background

To bring to the attention of the expert panel the importance of Environmental Infrastructure to the City of Adelaide, and indeed the whole of South Australia given the unsustainable reliance of the River Murray system to supply water needs in the 21st century.

For the purpose of this submission, Environmental Infrastructure (water) relates to the following:-

- Temporary / permanent water storages for flood management, environmental, and recreational uses.
- Creeks & open channel drain management and upgrades.
- Underground aquifer storage and recovery / reuse.
- Water quality / treatment initiatives including reforestation, revegetation, carp management, wetlands, water treatment equipment.
- Wastewater storage, treatment and reuse reticulation systems.
- Water Sensitive Urban Design.

Best practice management of water within the Adelaide metropolitan area has become critical over the last few years as result of the current drought in south-east Australia, stress on Murray Darling River system, and land use practices over the preceding 50 years. The SA State Government and inner Adelaide metropolitan Councils have invested resources wisely over the last few years to identify a series of economic and environmental issues facing the region with respect to water management and associated infrastructure.

Planning and development of environmental water infrastructure in key areas will provide the tools for the Adelaide Metropolitan Area to meet the current and future water management requirements of the community. These requirements are critical to the economic, environmental, social, recreational, and cultural of the regions communities, particularly in the City of Adelaide.

Identification of Water Management Issues

The ongoing growth and urbanisation of the Adelaide metropolitan area over the last 50 years has resulted in the emergence of significant water environmental issues. Many of the inner Local Government areas are now faced with water shortages to sustain community open space, significant flood mitigation risk to public and private property, loss of recreational and cultural opportunities due to water quality issues, and loss of economic opportunities due to all of the above. The region is facing a period of significant demand for the planning and implementation of new water environmental infrastructure to meet these challenges.

The following causes have been identified as having an impact on the current water management issues facing the inner Adelaide metropolitan region:-

- Lack of acceptable levels of risk management by successive Local and State Governments over the last 50 years resulting in adverse environmental impacts on water courses and open spaces within the Adelaide inner metropolitan area.
- Loss of environmental flows in all watercourses, water supply catchments, and river systems due to drought, climate change, and over allocation of water resources within the catchments.

- Cyclical climate change where water resource management decisions have been based on above normal rainfall patterns experienced over the latter half of the 20th century.
- Future climate change due to the impacts of global warming.
- The issue of aging infrastructure management, the removal or renewal of obsolete and inappropriate infrastructure, and development of new technologies in the area of water quality and quantity management.
- Increased population growth & density of the Adelaide metropolitan area, and associated impact on water quality and quantity, demand on water resources and related infrastructure.

Identification of Environment and Community Impacts

The following environmental and community impacts have been identified as a result of abovementioned water quantity and quality management issues.

Economic

Water resources in sufficient quantity and quality are critical in supporting South Australia's ongoing economic prosperity. A lack of 'big picture' planning at Local, State, and Federal Government levels have resulted in the current water quality and quantity issues, particularly the Constitutional Rights of the States to manage water resources in each State.

It is clear that the Murray-Darling River system will be unable to supply water to meet the needs of Australia's future. Infrastructure to deliver alternative water supplies such as stormwater / waste water reuse, aquifer storage and recovery, and sea water desalination have large demands on resources and funding, and will be unable to meet community demand in the short term due to the long planning and implementation lead times.

Environmental

Water resources in sufficient quantity and quality are also critical in supporting water course and community open space environments within the Adelaide metropolitan area. Environmental water inputs are critical in sustaining aquatic and open space habitats and ecosystems. Poor environmental flows and water quality issues in the River Torrens system have created a biomass imbalance in Torrens Lake that has resulted in the destruction of macrophytes and the prevalence of exotic fish species. This imbalance, together with high nutrient loads from the catchments results in regular toxic blue green algae outbreaks on Torrens Lake.

The lack of available irrigation water for Adelaide's Park Lands has resulted in the loss of biodiversity and habitats putting delicate ecosystems at risk.

Social

The Adelaide Park Lands and River Torrens precinct are key assets managed by Adelaide City Council in the provision and support of open space and recreational services within Adelaide. The social and recreational opportunities within Adelaide are greatly impacted by the quality of these key open space environments.

Opportunities for social & organised sport facility use, recreational open space use, and water activities on Torrens Lake are either degraded or eliminated due to poor water quality or lack of water to sustain environments.

Cultural

The Adelaide Park Lands support many of the recreational and cultural activities held within the Adelaide City Council area. These activities are affected by inappropriate

open space environments due to lack of environmental infrastructure or irrigation water to sustain critical environments.

The Adelaide Festival of Arts is a national event staged during the summer months. This event, and several other recreational and cultural events staged along the Torrens Lake precinct are subject to the inconvenience of regular closures of Torrens Lake due to poor water quality. Cultural events within the Torrens Lake precinct also support tourism and commercial operations associated with the lake.

Casues

There are many reasons why South Australia, and the Adelaide metropolitan area now face the water management issues identified above.

In hindsight, the accumulated decisions / experiences over the last 50 years have all contributed to water quality and quantity issues now facing the State.

These include:-

- Water quality and quantity was not a high priority for state and Federal Governments after the implementation of the Snowy Mountains Hydro Electricity Scheme in the 1950's.
- Lack of strategic thinking at all levels of Government in areas of water management (capture / treatment / reuse), catchment management, open space management and development controls.
- Fifty years of above average rainfall through the latter half of the 20th century saw complacency in the management of future water resource needs.
- Social and scientific research into the long term affects of Australia's water management practices were undervalued.
- Population growth and lack of strategic planning of regional(excessive water allocations) and urban (high density urbanisation) development and management of natural water courses and river systems have resulted in the water quantity and quality issues the Adelaide metropolitan area now faces.
- Due to Constitutional constraints, there was no cooperation between the three tiers of Government with respect to water resource management.

Measures to address Water Management Issues

Adelaide City Council has been working over the last 5 years cooperatively with Local, State, and Federal Governments to investigate shortfalls in environmental infrastructure in delivering key environmental outcomes for the Adelaide metropolitan area. A vast amount of recent research has been undertaken by the three tiers of Government over the last decade to investigate and address the water management issues now facing the State.

These investigations include the following:-

- Brown Hill & Keswick Creeks catchments stormwater floodplain mapping
- First to Fifth Creeks catchments stormwater floodplain mapping
- Brown Hill & Keswick Creeks Flood Management Master Plan
- Eastern Region Urban Stormwater Master Plan
- River Torrens Taskforce Outcomes
- Glenelg to Adelaide Wastewater Reuse Project
- Torrens Lake Environmental Initiatives
- Waterproofing Adelaide
- Adelaide & Mount Lofty Ranges Natural Resources Management Plan

- South Australia State Infrastructure Plan

As the capital city of South Australia, Adelaide City Council plays a central role in the numerous water environmental issues facing the Adelaide metropolitan area. Water management in the Adelaide metropolitan area has potential to significantly impact the environmental, social, economic, and cultural attributes of the State.

Ongoing urbanisation and development pressures on natural watercourses within the Adelaide metropolitan area have contributed to significantly increased flood risk and degradation of water quality in existing receiving waters including St Vincent Gulf. Over the past 5 years, Adelaide City Council has worked in partnership with six other Councils, SA Department of Water, Land & Biodiversity Conservation, Planning SA, SA Department of Environment & Heritage, AS Environment Protection Authority, SA Premier & Cabinet, SA Department of Transport, Energy, & Infrastructure, and the Adelaide & Mount Lofty Ranges Natural Resources Management Board in investigating stormwater flood mitigation, stormwater / wastewater conservation / reuse, and water quality improvements in water courses and associated catchments.

The 2006 Brown Hill & Keswick Creeks Flood Management Master Plan is a \$105mil joint Local, State and Federal Government project to protect more than 5,000 properties and avert more than \$200mil of property damages in the inner Adelaide metropolitan area as a result of the 1 in 100 year storm event.

This initiative includes a suite of projects within the Brown Hill & Keswick Creek catchments including temporary flood storages, flood mitigation dams, and water course improvements and diversions. These projects will also incorporate numerous community and environmental benefits such as development of recreational areas, aquifer storage and recovery, and biodiversity enhancements. A key project within the Adelaide City Council area is the proposed establishment of a series of temporary flood storages in the Adelaide Park Lands. These storages are likely to include water quality enhancement (wetlands or water quality treatment plant) and aquifer storage and recovery.

The most significant watercourse in the inner metropolitan area, the River Torrens, is a key recreational, social, cultural, and environmental asset of metropolitan Adelaide. The River Torrens forms a recreational lake through the centre of Adelaide which supports key recreational, social, and cultural activities within the city. Over the past decade, this key amenity asset for Adelaide City Council has been subject to numerous closures due to water quality issues as a result of low environmental flows, biomass imbalance (reduction in macrophytes / prevalence of carp) and polluted catchments. In response to these issues, the SA State Government formed the Torrens Taskforce, responsible for developing short term and long term solutions to the water quality issues within the River Torrens catchment. In 2007, the Torrens Taskforce outlined a \$65mil suite of initiatives to restore the River Torrens watercourse environment. These initiatives range from physical pollution interception, environmental flow security, water sensitive urban design, land use management (water course fencing and farm land management), biological filtration, construction of wetlands, re-establishment of macrophytes, removal of carp, interception / prevention / removal of nutrients, and watercourse revegetation.

Adelaide City Council is a key customer of the State Government's Glenelg to Adelaide Pipeline wastewater reuse project, providing treated sewage effluent for irrigation of the Adelaide Park Lands. This joint State and Federal Government \$75mil project will replace more than 1.3Giga Litres of irrigation water currently sourced from the potable water supply and River Torrens water body.

The project will require significant alteration to existing Adelaide City Council irrigation and water supply reticulation systems throughout the extent of the Adelaide Park Lands. This project will deliver significant environmental, social, recreational, cultural, and economic benefits to the people of South Australia, most notably, the reduction of the discharge of treated effluent to the marine environment in St Vincent Gulf.

Project Priorities

From a Local Government perspective, it is suggested that the order of importance of water environmental infrastructure development be determined by the common areas of infrastructure across Local Government in South Australia.

The two critical areas of water management are therefore:-

Stormwater / Waste Water Reuse

Salisbury, Tea Tree Gully and Playford Councils in the northern suburbs of Adelaide and Onkaparinga Council in the southern suburbs have pioneered the capture, treatment, and reuse of collected stormwater and common effluent drainage scheme effluent water. While the majority of this water is used for either irrigation or underground aquifer replenishment, a significant proportion is reused by industry for use in industrial processes. Other Councils in the Adelaide metropolitan area are also planning future stormwater reuse initiatives, particularly the five Councils associated with the Brown Hill & Keswick Creek Flood Management Master Plan project where temporary storage facilities are likely to incorporate water quality treatment options (wetlands) and aquifer storage and recovery at suitable locations.

State and Local Government will also be looking to achieve an expansion of the Glenelg to Adelaide Pipeline Effluent Reuse scheme to include the further irrigation of open spaces in adjacent Council areas, and effluent reuse in buildings and water features such as toilet flushing, air conditioning cooling towers, and recreational lakes.

Flood Mitigation

Development of critical infrastructure associated with the Brown Hill & Keswick Creek Flood Management Master Plan project in the Cities of Adelaide, Burnside, Mitcham, Unley, and West Torrens in inner metropolitan Adelaide is clearly a high priority in mitigating personal injury and property damage risks within the Brown Hill & Keswick Creeks Catchments. With more than 5,000 properties at risk of damage and an overall damage bill of more than \$200mil, this project is clearly high of state and Local Government agendas. The social, cultural, and environmental benefits associated with this project through the development of stormwater reuse infrastructure, habitat and biodiversity creation / restoration, and creation of recreational facilities provide additional support for all parties to implement this project.

Bibliography

The following reports are recommended for review by the expert panel:-

1. Brown Hill & Keswick Creeks Flood Management Master Plan
2. Eastern Region Urban Stormwater Master Plan
3. River Torrens Taskforce Outcomes
4. Waterproofing Adelaide
5. Adelaide & Mount Lofty Ranges Natural Resources Management Plan
6. South Australia State Strategic Plan
7. South Australia State Infrastructure Plan