



Port Pirie Regional Council

NATIONAL WATER SECURITY PLAN FOR CITIES AND TOWNS PROJECT

FINAL REPORT



October 2012

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Front Page Photo: Pictured at an inspection at the Nyrstar plant were from left, Elyse Herrald-Woods, Acting Assistant Director, National Water Security Plan for Cities and Towns; Dr Andrew Johnson, CEO, Port Pirie Regional Council; Mayor Brenton Vanstone; Brian Stanton, Project Manager, Nyrstar and Brian Kretschmer, Manager, Projects and Technology, Nyrstar.

1. EXECUTIVE SUMMARY

1.1. Project Overview

Port Pirie Regional Council and Nyrstar (Port Pirie), together with funding provided by the Australian Government via its *National Water Security Plan for Cities and Towns* have collaborated to complete a major strategic water reuse project for the City of Port Pirie (South Australia).

The project involved reusing 350ML of water per year (with the potential over time to reach 500ML/yr) from Nyrstar's waste water system (PET plant), treat the water by way of a reverse osmosis plant, and make the water available for community municipal greening (100ML), with the balance being reused by industry (Nyrstar). Previously Nyrstar's waste water was released into the ocean after treatment via its PET plant.

This recycled water will directly replace mains water supplied via the River Murray; assist with improving children's health under the community's *Ten for Them* project; help facilitate economic and industry growth; as well as assist Council to provide higher quality playing surfaces on its major ovals.

The total cost of this project was \$5 million and was funded via the Australian Government (\$2.5 million); Port Pirie Regional Council (\$1 million) and Nyrstar (\$1.5 million).

The project has received overwhelming public support and Council is already in the process of identifying additional water sources (predominantly storm water) that can be reused and then be reticulated using the infrastructure created via this *National Water Security Plan for Cities and Towns* grant.

1.2. Project Results and Outcome Realisation

The project has generated an estimated 350ML per year of water savings, at this early stage of operations. It is estimated that this figure can be increased, over time, as use of the RO plant are refined and becomes more efficient at treating the water for reuse.

1.3. Major Project Issues

The major issue with this project has been under estimating the time and complexity of the project. This has resulted in a number of delays which were outside of the control of Council and Nyrstar.

2. PROJECT OVERVIEW

2.1. Project Background

Electorate: Grey

Location: Port Pirie (South Australia)

Port Pirie is one of the South Australia's major regional centres with a population of over 13,000 residents. The City is located approximately 220km north of Adelaide in the Upper Spencer Gulf region.

Port Pirie is South Australia's second largest port and is the site of what is still the world's largest lead smelter, operated by Nyrstar; which is also a major multi-metal smelter producing refined silver, zinc, copper and gold. Nyrstar is the City's largest individual employer.

The City of Port Pirie is located in a relatively dry climatic region with approximately 344 mm of rainfall in an average year.

Like almost all urban centres, the City of Port Pirie has a requirement for significant volumes of water, beyond that required as a potable supply for domestic and other purposes. The City also requires non-potable water for such things as the irrigation of public and school sports fields, for public open space and for other amenity purposes; as well as for industry use.

The City of Port Pirie has historically drawn some 4.3 Gl of water per annum from the River Murray via the Morgan-Whyalla pipeline. The major applications of this water has been for the Port Pirie township (2.1Gl pa) and for the Port Pirie smelter (2.2Gl pa). The recent drought conditions experienced across southern Australia and affecting the River Murray in particular have however highlighted the vulnerability of this resource.

Port Pirie also has another very unique problem. The many years of lead smelting operations in the City have created a lead-dust contamination problem that represents a significant risk to human and environmental health. The City (Community, Council & Nyrstar) is committed to addressing this risk through the *Ten for Them Project (formerly Tenby10)*, which is about reducing lead contamination in Port Pirie, in particular to reduce the blood lead levels in Port Pirie's children. A significant aspect of the *Ten for Them Project* is a Dust Management Plan for the City which aims to encourage the Port Pirie community to implement broad-based dust suppression measures, including: watering of public open spaces, sports fields and private lawns and gardens; regularly washing down external surfaces (as opposed to sweeping); and maintaining dust suppression programs on selected roads.

With these factors in mind Port Pirie Regional Council, Nyrstar and Regional Development Australia Yorke and Mid North (formerly the Southern Flinders Ranges Development Board) have been working together for some time to secure an additional water supply for Port Pirie which would reduce its reliance on the River Murray; assist with improving children's health under the community's *Ten for Them* project; help facilitate economic and industry growth; as well as assist Council to provide higher quality playing surfaces on its major ovals.

2. PROJECT OVERVIEW

2.1 Project Background (Cont'd)

As a result, various studies have been conducted exploring potential sources of water other than the River Murray including:

- Reusing wastewater from the City's sewerage treatment plant
- Reusing wastewater from the (Nyrstar) smelter
- Sewer mining
- Stormwater reuse options.

The most significant of these studies undertaken was a report prepared by Worley Parsons in May 2008. This report sought to combine and reuse Nyrstar's waste water together with SA Water's municipal waste water, for use by the community and industry. The Worley Parsons report indicated that 1,349ML/yr of River Murray water could be reduced by recycling these two waste water streams. This represents a 30% reduction in current demand for Port Pirie (City & Nyrstar). The Worley Parson report proved the viability of this concept.

Since this time, Port Pirie Regional Council, Nyrstar and the Southern Flinders Ranges Development Board (now RDAYMN) have sought to identify funding opportunities for the implementation of the Worley Parsons proposal.

After further research, a much more price competitive option was identified which involved reusing Nyrstar's waste water (and deferring reusing SA Water municipal waste water). It is this option that was pursued and subsequently funded by the Australian Government via its *National Water Security Plan for Cities and Towns* program and the subject of this report.

This project is also consistent with a number of water saving initiatives being implemented by Council including the installation of water efficient sub-surface irrigation systems on playing fields and the replacement of grass with water sensitive landscaping. In addition, Council has participated in a number of community programs aimed at reducing water consumption in households throughout the region.

2.2. Project Objectives and Goals

The objective for the funding from the Australian Government via *its National Water Security Plan for Cities and Towns* program for this project, was to recycle Nyrstar's waste water for community and industry use.

More specifically, the project aimed to further treat some of the 830ML/yr of production waste water from Nyrstar which previously was discharged into the sea. This waste water was intended to be further treated via micro filtration and reverse osmosis to generate around 350ML/yr of A class recycled water which could be reused. The project partners are also now considering other potential water sources (ie stormwater) that may also be able to be treated via this plant in order to maximise its capacity of 500ML/yr.

As a result of this project, Nyrstar now redirects 250ML of this treated water back into its mineral processes, while 100ML is made available for greening Council's parks, gardens and sports fields. More specifically, Council provided a reticulation system from Nyrstar's boundary, through almost the entire length of the City.

2. PROJECT OVERVIEW

2.2. Project Objectives and Goals (Cont'd)

This aims to provide recycled water to replace River Murray water at Memorial Park (30ML/yr), Memorial Oval (14ML/yr), Woodward Park (5ML/yr), Frank Green Park (5ML/yr), Senate Road Sporting Complex (30ML/yr); the Port Pirie Cemetery (14ML/yr) and 2ML/yr for greening, wash down, cleaning, and dust suppression, which are critical activities to reduce lead exposure in the community.

The goals of this project were to secure an additional water supply for Port Pirie which would reduce its reliance on the River Murray; assist with improving children's health under the community's *Ten for Them* project; help facilitate economic and industry growth; as well as assist Council to provide higher quality playing surfaces on its major ovals. More specifically, the primary benefits associated with this proposal are summarised by the following:

- 350 ML direct net reduction in demand for River Murray potable water.
- Contribute to the *Ten for Them* target of reducing blood lead levels in Port Pirie children via additional greening, cleaning of public spaces and dust suppression.
- Deferral of public sector cost to upgrade water supply infrastructure on the Morgan Whyalla pipeline.
- Improved water security capacity in Port Pirie with plant design accommodating potential to provide salt water desalination in response to failure of existing mains water supply.
- Free up existing SA Water supplies to be available for future industry and community growth
- Allow for the improvement of outdoor playing surfaces on Council sports fields

This project will recycle 350ML of water annually which will be used to directly replace potable mains water from the River Murray. Port Pirie Regional Council will use the recycled water for community greening; wash down facilities and road works. Nyrstar will use the water for its internal mineral processing, wash down facilities and for (lead) dust suppression onsite.

In addition to reducing water use from the River Murray, the water reuse proposal will significantly assist with improving children's health by supporting the community's *Ten for Them* project. *Ten for Them* is an Australian first program which has seen Council, the community, the SA Government (Department of Health and EPA) and industry (Nyrstar) come together to address Port Pirie's historically high lead in blood issue. The aim is to have 95% of children under four in Port Pirie below the World Health Organisation's lead in blood levels. This program which has been hugely successful to date, requires significant amounts of water for dust suppression. This water reuse project will allow non-mains water to be used to contain lead dust onsite at Nyrstar, in the community via cleaning and wash down processes implemented by Council, and through community greening (which is seen as the best way to place a barrier between children and lead dust contained in soil).

Finally, this project will also reduce the demand on the Morgan-Whyalla pipeline. Council has previously been advised that if a major water-intense industry was to come to Port Pirie, that SA Water could not be able to guarantee water supply for the months of February and March due to capacity issues within the pipeline. This project would reduce the pressure on the pipeline and allow for the future growth of the City.

2. PROJECT OVERVIEW

2.2. Project Objectives and Goals (Cont'd)

The project design includes a reverse osmosis desalination element in response to the elevated salinity within existing waste water streams. Plant location and design allows for the system to be rapidly altered to treat sea water from the adjacent Pirie River, thus allowing the project to play a disaster risk management role. In the event of a catastrophic failure of the existing mains water supply, this proposed plant is capable of producing an emergency potable water supply for the City.

2.3. Project Conditions (eg requirements, expectations, assumptions, constraints etc)

Nil.

2.4. Project commencement and completion dates, project duration

Key Activities	2010				2011				2012			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preliminaries												
Funding Approved			■									
Consultant Engineers Tender			■	■								
Detailed Design of Project					■	■	■	■				
Treatment Plant												
Tender Process					■	■						
Offsite- Construction							■	■	■			
Onsite Works									■	■	■	
Commissioning											■	
Reticulation												
Tender Process									■			
Works Undertaken										■	■	
Commissioning											■	

2.5. Project scope/deliverables and high level milestones

Key aspects of this project included:

- The provision of a reverse osmosis treatment plant capable of treating 500ML per year.
- Over 5 kilometres of pipe network was installed & connected throughout various areas in Port Pirie.
- Upgrades to the existing irrigation network in a number of parks
- Provision of a connection point (stand pipe) and hard stand area to enable the recycled water to be used for road sweeping, water cart operations for dust suppression, road building purposes, tree watering, and playground cleaning.

2. PROJECT OVERVIEW

2.5. Project scope/deliverables and high level milestones (Cont'd)

- The construction of a mega litre storage tank, complete with associated pipework, pumps and electrical infrastructure to enable three days water supply to be held. This included installation of instrumentation such as the level sensor actuator & tank control panel; and an enclosed shed constructed to house the pumps.

As a result of this project, Nyrstar's waste water is further treated, via micro filtration and reverse osmosis, to generate around 350ML/yr of A class recycled water which can be reused. The project partners are also considering other potential water sources (other waste water streams and stormwater) that may also be able to be treated via this plant in order to maximise its capacity of 500ML/yr.

Nyrstar now redirects 250ML of this treated water back into its mineral processes, while 100ML is made available for greening Council's parks, gardens and sports fields. In particular, Council provided a reticulation system from Nyrstar's boundary, through almost the entire length of the City. This aimed to and successfully provided, recycled water to replace River Murray water to Memorial Park (30ML/yr), Memorial Oval (14ML/yr), Woodward Park (5ML/yr), Frank Green Park (5ML/yr), Senate Road Sporting Complex (30ML/yr); the Port Pirie Cemetery (14ML/yr) and 2ML/yr for greening, wash down, cleaning, dust suppression, which are critical activities to reduce lead exposure in the community.

2.6. Funding sources

The total cost of this project is \$5 million and was funded via the Australian Government \$2.5 million; Port Pirie Regional Council \$1 million and Nyrstar \$1.5 million.

3. PROCESS AND METHODS

3.1. Project Governance

Council set up a Steering Committee for this project that involved members from Council (PPRC), Nyrstar and the Australian Government. More specifically, the Steering Committee consisted of:

Jeannine Lisle:	Department of Sustainability, Environment, Water, Population and Communities
Brian Kretschmer:	Manager, Projects and Technology, Nyrstar
Brian Stanton:	Project Manager, Nyrstar
Andrew Johnson:	Chief Executive Officer, PPRC
Len Wilton:	Manager Technical Services, PPRC
Sal Lucivero:	Project Manager, PPRC

The Steering Committee met regularly during the project duration, and more frequently during the later stages of the project. Minutes and agendas were prepared for all meetings, together with any action lists stemming from these meetings.

Consulting engineers and other project specific experts also attended Steering Committee meetings as required.

Regular briefings were also provided to the Elected Members of Council and the community on the status of this project.

3.2. Project activities and conduct

The project was predominately implemented by private sector contractors, which were procured via a competitive process. The main contractors used for this project include:

- Worley Parsons (Design and Consultant Engineers)
- OsmoFlo (design, installation of Reverse Osmosis Plant)
- Total Electrical (storage tank and associated electrical)
- P A and C I Martin (reticulation system)

3.3. Greenhouse Gas emission offset

Port Pirie Regional Council has ensured that 20 percent of its total electricity needs for its entire operations is sourced from renewable energy sources. This is expected to offset its greenhouse gas emission from this project.

3.4. Water quality management

As part of the contract (between Nyrstar and Osmoflo) for the operations and ongoing maintenance of the reverse osmosis plant, Osmoflo are required to ensure the quality of the water their plant produces. Council and Nyrstar also have protocols in place in the event that the water quality drops to an unacceptable level, for any reason.

3. PROCESS AND METHODS

3.5. Stakeholder consultation, community engagement, information community and key promotional/public activities

Council and Nyrstar undertook numerous activities to keep the community informed of this project. These include:

- Holding an official launch on the signing of the agreement with Osmoflo for the supply of the RO plant.
- Council provided regular updates via social media (Facebook and Twitter)
- Council, via its quarterly newsletter, the Pirie-odical, also provided updates on the project.
- Media (TV, print, and radio) were also in regular contact with Council seeking updates on the project.
- Press Releases were also prepared at key milestones of the project.

3.6. Project issues/risks and measures/management

Risks associated with the project were managed by the individual members of the Steering Committee and reviewed by the Steering Committee itself.

Key risks of the project included the project exceeding its budget, not being able to deliver required water savings, and not being able to meet timelines. These issues were determined early on in the project and were addressed during the detailed design phase of the project.

4. PROJECT ASSESSMENT

4.1. Achievement of project deliverables and outcome realisation

Council has achieved its objectives for this project and has successfully reduced mains (River Murray) water consumption by 350ML pa by further treating Nyrstar's waste water, via micro filtration and reverse osmosis and subsequently generate A class recycled water which can be reused.

Nyrstar now redirects 250ML of this treated water back into its mineral processes while 100ML is made available for greening Council's parks, gardens and sports fields. In particular, Council provided a reticulation system from Nyrstar's boundary, through almost the entire length of the City. This aimed to and successfully provided recycled water to replace River Murray water to Memorial Park (30ML/yr), Memorial Oval (14ML/yr), Woodward Park (5ML/yr), Frank Green Park (5ML/yr), Senate Road Sporting Complex (30ML/yr); the Port Pirie Cemetery (14ML/yr) and 2ML/yr for greening, wash down, cleaning, dust suppression, which are critical activities to reduce lead exposure in the community.

Key infrastructure constructed as part of the project included:

- The provision of a reverse osmosis treatment plant capable of treating 500ML per year.
- Over 5 kilometres of pipe network was installed and connected throughout various areas in Port Pirie.
- Upgrades to the existing irrigation network in a number of parks.
- Provision of a connection point (stand pipe) and hard stand area to enable the recycled water to be used for road sweeping, water cart operations for dust suppression, road building purposes, tree watering, and playground cleaning.
- The construction of a megalitre storage tank complete with associated pipework, pumps and electrical infrastructure, to enable three days water supply to be held. This included installation of instrumentation such as the level sensor actuator and tank control panel; and an enclosed shed constructed to house the pumps.

4. PROJECT ASSESSMENT (Cont'd)

4.2. Project Finance

The project was delivered close to budget with the slight overrun being funded by Nyrstar. A summary of the project budget is provided below. A copy of the audited financial statements for the project are included in Attachment B. The following provides a summary of the project income and expenditure.

	Budget	Actuals	Variance
INCOME			
Commonwealth	\$2,500,000	\$2,500,000	\$0
Council	\$1,000,000	\$1,000,000	\$0
Nyrstar	\$1,500,000	\$1,500,000	\$0
TOTAL INCOME	\$5,000,000	\$5,000,000	\$0
EXPENDITURE			
Council			
Preliminaries, Design & project Management	\$200,000	\$370,506	-\$170,506
Storage Tank, Electrical & Pumps	\$720,000	\$584,949	\$135,051
Rising Main and Distribution Pipe-work	\$780,000	\$1,013,910	-\$233,910
Contingencies	\$300,000	\$0	\$300,00
Council Total	\$2,000,000	\$1,969,365	\$30,635
Nyrstar			
RO Treatment Plant	\$2,600,000	\$2,599,580	\$420
GPA Power Supply	\$400,000	\$491,145	-\$91,145
Other Works	\$0	\$377,338	-\$377,338
Contingencies	\$0	\$0	\$0
Nyrstar Total	\$3,000,000	\$3,468,063	-\$468,063
Total Expenditure	\$5,000,000	\$5, 437,428	-\$437,428
Net Surplus / (Deficit)	\$0	-\$437,428	\$437,428

4.3. The volume of stormwater harvested/supplied or potable water savings achieved by the project; where the treated stormwater from the project is being used and for what purposes

The project involved reusing 350ML per year of water (with the potential over time to reach 500ML/yr) from the Nyrstar’s waste water system (PET plant), treat the water by way of a reverse osmosis plant, and make the water available for community municipal greening (100ML), with the balance being reused by industry (Nyrstar). Previously Nyrstar’s waste water was released into the ocean after treatment via its PET plant.

4. PROJECT ASSESSMENT

4.3 The volume of stormwater harvested/supplied or potable water savings achieved by the project; where the treated stormwater from the project is being used and for what purposes (Cont'd)

Previously Nyrstar treated and discharged 830ML/yr of production waste water into the sea. As a result of this project this waste water is further treated, via micro filtration and reverse osmosis, to generate around 350ML/yr of A class recycled water which can be reused. The project partners are also considering other potential water sources (other waste water streams and stormwater) that may also be able to be treated via this plant in order to maximise its capacity of 500ML/yr.

Nyrstar now redirects 250ML of this treated water back into its mineral processes while 100ML is made available for greening Council's parks, gardens and sports fields. In particular, Council provided a reticulation system from Nyrstar's boundary, through almost the entire length of the City. This aimed to and successfully provided recycled water to replace River Murray water to Memorial Park (30ML/yr), Memorial Oval (14ML/yr), Woodward Park (5ML/yr), Frank Green Park (5ML/yr), Senate Road Sporting Complex (30ML/yr); the Port Pirie Cemetery (14ML/yr) and 2ML/yr for greening, wash down, cleaning, dust suppression, which are critical activities to reduce lead exposure in the community.

4.4. Levelised cost of water supplied as a result of the project

The cost of treating the water via the reverse osmosis plant is estimated by Osmoflow to cost \$0.70 per kilo litre (OPEX only). Amortising the \$5 million infrastructure costs over 10 years and 350ML pa adds a further \$1.40 per kilo litre. These estimates are considered conservative given that most of the infrastructure should last longer than ten years and it is anticipated that further water may be able to be treated to reach the plants capacity of 500ML per year; both of which will significantly reduce the initial estimated cost of \$2.10 per kilo litre.

4.5. Amount of GHG emission offset and/or energy saving achieved as a result of the project (if available)

Not Available.

4.6. Other environmental benefits if any (e.g. mitigation of the risks/impact of localised flooding, improvement of the water quality in receiving waters, generation of environmental flows etc)

Nil.

4.7. Social Benefits

This water reuse initiative was a result of Port Pirie Regional Council, Nyrstar and Regional Development Australia Yorke and Mid North (formerly the Southern Flinders Ranges Development Board) working together to secure an additional water supply for Port Pirie which would :

4. PROJECT ASSESSMENT

4.7. Social Benefits (Cont'd)

- reduce Council and Nyrstar's reliance on the River Murray by 350 ML per year;
- assist with improving children's health under the community's *Ten for Them* project by reducing blood lead levels in Port Pirie children via additional greening, cleaning of public spaces and dust suppression;
- Deferral of public sector cost to upgrade water supply infrastructure on the Morgan Whyalla pipeline;
- Improved water security capacity in Port Pirie with plant design accommodating potential to provide salt water desalination in response to failure of existing mains water supply;
- help facilitate economic growth by freeing up existing SA Water supplies to be available for future industry and community growth;
- Allow for the improvement of outdoor playing surfaces on Council sports fields.

Reduction in River Murray Water

This proposal will provide a direct substitution of 350ML (to a maximum potential of 500ML) of mains (River Murray) potable water. This will relieve the pressure of the ailing river system and enable either other organisations to use this water, or provide additional environmental flows for the river.

Ten for Them (formally Tenby10) (www.tenby10.com)

Port Pirie is home to the world's largest lead smelter, currently operated by Nyrstar; which is also a major multi-metal smelter producing refined silver, zinc, copper and gold. Nyrstar is the City's largest individual employer and contributes significantly to the gross State product of South Australia.

The lead smelter has operated from the late 1800's. Unfortunately, for over 100 years the smelter operated in what would be considered unacceptable by today's environmental standards. For many years there have been enormous concerns over atmospheric lead pollution at Port Pirie. In particular, the adverse effect that this can have on developing children.

Lead can enter the body through ingestion of lead contaminated food, water, soil, dust or paint chips and through inhalation of lead dust particles. Whereas adults absorb about 10% of ingested lead, children's less mature digestive systems can absorb 50%. Blood lead levels above 10 µg/dL can interfere with the development of organ systems, in particular the central nervous system, which affects babies and young children more than adults.

Concerns about blood lead levels have existed for decades and much work was done to alleviate the problem. In the 1980s and 1990s, major decontamination and environmental projects were undertaken and screening of children in Port Pirie began.

Nyrstar has implemented many initiatives that contribute to reducing emissions, including major capital works projects (such as enclosing the Blast Furnace), constant monitoring of air quality both within and outside the site, as well as many changes to site operating policies that are minimising emissions and dust movement on site. Many other complimentary initiatives have been also been developed in the community.

By 2005 however, it was clear that although significant progress had been made, it was simply not enough and elevated blood levels in the community's children was still of great concern.

4. PROJECT ASSESSMENT

4.7. Social Benefits

Ten for Them (formally Tenby10) (www.tenby10.com) (Cont'd)

In a unique, world leading partnership, the Port Pirie Regional Council, Department of Health, Environment Protection Authority, Nyrstar Smelter and the community got together to find a solution to the lead issue. Thus the tenby10 (since renamed *Ten for Them*) project was born.

Our goal (of *Ten for Them*) is to lower children's blood lead levels to below the World Health Organisation standard of 10 micrograms per decilitre of blood, because what was acceptable in the past is no longer acceptable.

The *Ten for Them* project has had significant success in reducing the blood lead levels of Port Pirie's children, with the latest results showing that 72% of children tested recorded a level below 10 µg/dL. This is dramatic improvement since the project commenced in 2006 and the best ever results since testing commenced in the 1980's.

The key to this success has been the many *Ten for Them* initiatives undertaken both at the Smelter and within the community, such as onsite facility upgrades and policy improvements, increased monitoring of air quality, a vibrant communications program and improved and more accessible educational and nutritional programs at schools and community centres. However the most significant reduction in children's blood lead levels has been achieved by reducing exposure to lead dust through greening and wetting down projects.

Water is seen as an essential element in achieving the objectives of the *Ten for Them* program. This water reuse project will allow non-mains water to be used to contain lead dust on site at Nyrstar, in the community via cleaning and wash down processes (roads, footpaths, machinery, playgrounds and onsite at Nyrstar), and through community greening (which is seen as the best way to place a barrier between lead dust within soil and children). The effectiveness of these efforts to reduced lead dust has been enhanced by Council providing a connection point (stand pipe) and hard stand area at its storage tank.

Previously (to this project) these activities are undertaken by use of mains water from the River Murray. This project offers an alternative to mains water and the opportunity to expand areas that can be greened.

All of these disciplines share a fundamental requirement for water, in a way that can perhaps be viewed as contrary to evolving water conservation philosophy, but which is crucial to the health and well-being of the people of Port Pirie...particularly its future generations.

Economic Growth and Population Expansion

Council and RDAYMN have been advised by SA Water that if a large water intense industry was to consider relocating to Port Pirie, that it could not guarantee water supplies during the months of February and March. This project would take some pressure of the Morgan-Whyalla pipeline and thus provide opportunities for Growth.

4. PROJECT ASSESSMENT

4.7. Social Benefits

Economic Growth and Population Expansion (Cont'd)

Port Pirie has committed significant resources to attracting growth, investment and business expansion in the City and is aiming to maximise the opportunities that may be present as a result of the mining activity in the north of South Australia. A lack of available water for residential, industrial and commercial growth would have a significant detrimental effect on the future sustainability of the community.

Reliability of Water Supply

Nyrstar Port Pirie is an integrated multi-metal smelter and refinery, with flexibility to process a wide range of lead-containing feedstocks to produce refined lead, silver, zinc, copper and gold. The site capacity is approximately 235,000 tonnes of refined lead and lead alloys, 16 million troy ounces (500 tonnes) of refined silver and approximately 45,000 tonnes of zinc. Other by-products include copper, gold and sulphuric acid. The site processes feedstock from a variety of locations, including lead concentrates from Zinifex Rosebery and Century mine. Port Pirie also processes a large amount of secondary materials and by-products, sourced from the Hobart smelter, existing site stockpiles and other external materials. The smelter directly employs 670 staff and a further 110 contractors. Nyrstar is a critical part of the Port Pirie economy and integral to its survival.

Nyrstar is reliant on the continual availability of water to its operations. Even a short term disruption of supply has the potential to see the plant closed down for an extended period of time, which would not only affect Nyrstar financially, but also have a profound effect on the residents and the economy of the City. This project would provide an additional water supply that would reduce the Company's and the City's reliance on mains water, for the continuity of Nyrstar's operations and protect the economy of the City.

Quality of Playing Surfaces

Due to a combination of Port Pirie's relatively dry climate and the water restrictions that exist for irrigating open spaces, Council has struggled to maintain the quality of playing surfaces on its sports fields. With the completion of this water reuse project, Council can now provide additional water to some of its prime sports fields.

4.8. Summary of outcome realisation and its extent

The objective of this funding project was to recycle Nyrstar's waste water for community and industry reuse.

More specifically, the project aimed to further treat some of the 830ML/yr of production waste water from Nyrstar which previously was discharged into the sea. This waste water was intended to be further treated via micro filtration and reverse osmosis to generate around 350ML/yr of A class recycled water which could be reused. The project partners are also now considering other potential water sources (ie stormwater) that may also be able to be treated via this plant in order to maximise its capacity of 500ML/yr.

4. PROJECT ASSESSMENT (Cont'd)

4.8. Summary of outcome realisation and its extent

As a result of this project, Nyrstar now redirects 250ML of this treated water back into its mineral processes while 100ML is made available for greening Council's parks, gardens and sports fields. In particular, Council provided a reticulation system from Nyrstar's boundary, through almost the entire length of the City. This aims to provide recycled water to replace River Murray water Memorial Park (30ML/yr), Memorial Oval (14ML/yr), Woodward Park (5ML/yr), Frank Green Park (5ML/yr), Senate Road Sporting Complex (30ML/yr); the Port Pirie Cemetery (14ML/yr) and 2ML/yr for greening, wash down, cleaning, dust suppression, which are critical activities to reduce lead exposure in the community.

The goals of this project were to secure an additional water supply for Port Pirie which would reduce its reliance on the River Murray; assist with improving children's health under the community's *Ten for Them* project; help facilitate economic and industry growth; as well as assist Council to provide higher quality playing surfaces on its major ovals. More specifically, the primary benefits associated with this proposal are summarised by the following:

- 350 ML direct net reduction in demand for River Murray potable water.
- Contribute to the *Ten for Them* target of reducing blood lead levels in Port Pirie children via additional greening, cleaning of public spaces and dust suppression.
- Deferral of public sector cost to upgrade water supply infrastructure on the Morgan Whyalla pipeline.
- Improved water security capacity in Port Pirie with plant design accommodating potential to provide salt water desalination in response to failure of existing mains water supply.
- Free up existing SA Water supplies to be available for future industry and community growth

The project has received overwhelming public support and Council is already in the process of identifying additional water sources (predominantly storm water) that can be reused and then be reticulated using the infrastructure created via this *National Water Security Plan for Cities and Towns* grant.

5. EXPERIENCE SHARING AND LESSONS LEARNT

This project has highlighted what can be achieved when Government (Local and Federal), the community and industry, work together for a common purpose. This project would not have been possible without any one of the partners to this project. None could achieve it on their own but collectively we have managed to provide vital community infrastructure which will be valued by generations to come.

6. PROJECT FUTURE

6.1. Proposal for project handover, operation, maintenance and ongoing monitoring and any plans informing this process

Nyrstar has entered into an operational and maintenance agreement with Ozmflo, the suppliers of the reverse osmosis plant, for the plant. Council will maintain the reticulation network as part of its parks operation using a combination of contractors and its own staff.

6.2. Remaining tasks or any outstanding work going past the funding agreement

Nil.

6.3. Future Extension of Project

Council identified, at the time of lodging the original application for this project, that it had the potential in the future to be expanded. The reticulation system constructed as part of this project will be able to be used as part of a future stage 2 community water reuse system that could see storm water or in deed other water sources being treated and used by schools (St Marks College, Risdon Park Primary, John Pirie Secondary), community sporting clubs (Port Sporting and Community Club, Port Pirie Golf Club) and Nyrstar. Investigation work has already commenced to identify these additional water sources, and the determine the technical and economic feasibility of reusing this water.

7. CONCLUSIONS AND RECOMMENDATIONS

This project could potentially be used in the future as a best practice case study on what the Australian Government, Council, the Community and industry can achieve collectively, that each could not achieve on their own. That is, Council and the Australian Government are able to leverage off industry investment, to achieve social and environmental outcomes, while industry can secure a sustainable source of water. Nyrstar's investment in this project will save the community in excess of \$5 million dollars, being the estimated cost to source a suitable water supply, treat the water via a waste water treatment plant, and store the water prior to treating. This would have been cost prohibitive to Council and the community. However, with Nyrstar's involvement, this can now be possible.

ATTACHMENTS

A. Project photos

B. Audited financial statements

PROJECT PHOTOS



Photos :

1-3: Installation of pumping main to irrigation areas.

4: Constructing footing for the storage tank.

5: Storage tank NE corner of The Terrace and George Street.

6: Storage tank showing pumping main to irrigation areas.

7: Painted storage tank.

8: Reverse Osmosis Plant (Nyrstar).