Sustainability in Action

Water Recycling at Australia Trade Coast – Brisbane Water

✓ made to last
✓ economically sustainable
✓ environmentally friendly
✓ positive impact on quality of life for this and future generations

Summary

Water Recycling at the Australia Trade Coast (ATC) industrial precinct is a complex project that displays long-term strategic planning for Brisbane’s future water needs.

The project aims to avoid wasting high-quality treated water on industrial activities that could use water of a lower grade and unnecessary discharge of industrial waste water into Moreton Bay. The ultimate goal is for a well-planned district, where land-use and the water needs of the occupier will be matched most efficiently with the type of water quality available at the site.

Brisbane Water, as members of a multi-agency Infrastructure Working Group for the ATC area, were commissioned to develop a Master Plan for the area and a feasibility study for a water recycling scheme.

The Brisbane Water Team worked hard to build a business case for water recycling, which would involve the construction of three reverse-osmosis treatment plants (to remove Nitrogen and Phosphorus) and a network of supply pipelines.

By presenting the environmental and long-term strategic and economic benefits, the team was able to persuade decision-makers to opt for a scheme that costs significantly more in the shorter term than business as usual.

This success was largely down to gathering sound scientific data and financial analysis to justify the case, having committed people to champion the idea and persistent lobbying of decision-makers from an early stage. Competing priorities had to be considered carefully with the long-term view always in mind.

The project will save Brisbane 18 000 Megalitres of potable water each year, will create a secure and economic water supply for the ATC industries and make a major contribution to protecting the future water supply of the whole city.

Project description

The Water Recycling Scheme at Australia Trade Coast is a complex, multi-agency exercise in integrated water management. The Australia Trade Coast (ATC) is a large industrial area incorporating the Port of Brisbane, Brisbane Airport, BP and a variety of other large industries, with some proposed residential development.
In response to projections that Brisbane’s water supply would run dry by 2025, and that industry uses of the city’s potable water, Brisbane Water (BW) saw the opportunity to re-use industrial waste water in the ATC area. This was supported by Council’s WaterSense 2010 ‘Target 18’ policy, which identifies water re-use schemes as a major strategy for conserving the water supply.

The ATC Infrastructure Working Group commissioned BW to develop a Master Plan to set a clear direction for the project. The BW staff gathered a team of technical and financial experts to decide the feasibility of such a scheme. Using triple-bottom-line analysis of 14 water management options, the re-use scheme was chosen.

This option entails building three reverse-osmosis water treatment plants, the pipelines to deliver the water to where it is needed and thorough exploration of the potential uses for recycled water of different grades.

To achieve the best outcome, the team is investigating ways of ensuring that future development in the area matches the right industry to the right zone to be able to make use of the water quality available. Working closely with City Planning and the Department of State Development and Innovation is key.

The scheme is expected to deliver 18 000 Megalitres of potable water savings and improved water quality in Moreton Bay by reducing discharges of nitrogen and phosphorus by 18%.

The team grappled with competing priorities, for example, the reverse osmosis plants are very energy-intensive, contributing large amounts of greenhouse gas to the environment. However, the benefits of the project were seen to outweigh this drawback.

The team succeeded in challenging accepted views and gaining support for an option that costs substantially more than the alternative over the medium term (30 years) by arguing the long-term benefits to the community. Crucial to this success was having sound scientific and financial data and building support from decision-makers from an early stage.

**Sustainability strong points**

*Economic sustainability:*

- This is a complex situation, where the cost of water re-use actually exceeds that of business as usual in the financial analysis. The business as usual cost is $87.6 million at net present value and including the operational costs over the next 30 years, whereas the water re-use option comes to $116 million.

  The true value of the project, however, needs to be evaluated over the longer term. The financial benefits of the project will be apparent in the avoided costs of future dam construction, which would be highly likely in the future if Brisbane’s water consumption is not managed well now.

  Putting in the best possible infrastructure now will also be more economic in the long run than replacing existing systems only to have to upgrade them with a completely different system later on.

- Businesses receive economic benefit by having a secure, reliable water supply at a predictable price.
Community sustainability:
• Better water quality allows residents to enjoy the bay more, eg swimming
• Avoided social impact of building new dams, such as reclamation of land from residents, loss of farms and green space

Environmental sustainability:
• Saves the city’s precious water resources through water re-use strategies
• Protects waterway health by reducing discharges of industrial waste water to the bay
• From a greenhouse gas perspective there is a down side, as the technology for treating the re-used water is energy-intensive, thereby increasing greenhouse emissions. In order for the project to go ahead, the issues of water conservation and greenhouse emissions had to be weighed up and prioritised.

Long term thinking:
• Ensuring the security of the community’s long-term water supply in response to the projection that Brisbane’s water storage would dry up by 2025 if we carry on as usual.

Target areas:
This project responds to Council’s Sustainability Target Areas:
• **Resource efficiency through conserving water and aiming for an integrated area where the right land is used for the right purpose**
• **Biodiversity conservation** by protecting waterway health and avoiding dam construction that would destroy habitat
• **Sustainable places and urban form** by creating a well planned industrial area that serves community needs well into the future

Project history
• Prior to project inception, Brisbane Water had already established a water reuse scheme in the ATC area with BP, supplying them 10 Megalitres/day
• BW made projections of the water demands in the ATC area if there were no water reuse
• BW consulted with other industries about the possibility of reusing waste water
• ATC Infrastructure Working Group was set up in 2003 to plan long term infrastructure needs, of which water supply is just one part. BW saw the opportunity to develop a water reuse plan for the area
• The project was supported by Council’s “Target 18” Demand Management Strategy, which identifies water reuse strategies and water efficiency measures as priorities for Brisbane
• ATC Infrastructure Working Group commissioned BW to develop the Master Plan for ATC Water Reuse in late 2004
• This Master Plan was approved by Council in early 2005
• A Project Team was established at BW and work is underway

Project partners
The Australia Trade Coast Infrastructure Working Group is made up of members from:
Brisbane Water
Department of State Development and Innovation
Port of Brisbane Corporation
Brisbane Airport
Outcomes

• three reverse osmosis water treatment plants and associated supply pipelines
• 18 000 Megalitres of potable water saved per year
• 18% reduction in discharges of nitrogen and phosphorus to the bay
• secure supply of water for industry
• a well planned, integrated area where each industry is located to make best use of the type of water available

Project Strengths

• Long-term strategic thinking
• Good cross-agency partnering
• Rigorous scientific and economic analysis
• Skilled project management of a complex problem with complex solutions
• Balances competing priorities
• Strong environmental benefits with long-term economic benefits
• Effective internal education and lobbying of decision-makers

Project Challenges

• Convincing people to accept what is the more expensive option in the short term
• Knowing who is going to use the water. When deciding what facilities and infrastructure to place in the area, the team has to make assumptions about the types of land use and industries that are likely to be there in the future and what their water needs might be.
• A future challenge is how to ensure that remnant greenfield sites within the ATC area are developed in a way that complements the project aims – matching the right industry to the right zone in order to make the most of the water sources available.