

## **Victorian Desalination Project – Frequently Asked Questions**

### **PROJECT OVERVIEW**

#### **What does the project involve?**

The desalination project includes the design, finance, construction and operation of the desalination plant, marine structures, an 84 kilometre transfer pipeline, delivery of an 87 kilometre underground power supply for the project and the purchase of renewable energy.

It is the largest seawater desalination plant currently being developed in Australia, and one of the largest reverse osmosis plants being developed in the world. It will supply up to 150 billion litres of water a year to Melbourne, Geelong and, via other connections, South Gippsland and Westernport towns.

The project's production capacity represents approximately one third of Melbourne's annual water needs from a source that is entirely independent of rainfall. It will be constructed in three 50 gegalitre (GL) modules, which will provide significant flexibility for the state's supply needs.

#### **Why does Victoria need a desalination plant?**

Population growth, climate change and the drought of recent years means Victoria needs to plan carefully to manage its future water requirements. The desalination plant is just one of a number of measures being put in place to guarantee the reliability of our future water supply.

The major benefit of desalination is that it can continue to deliver high quality drinking water even if there is no rain.

#### **Where will the plant be located?**

The plant is being constructed just outside of the town of Wonthaggi on the Bass Coast.

#### **Why was that site chosen?**

A Seawater Desalination Feasibility Study (<http://www.ourwater.vic.gov.au/programs/desalination/background/feasibility-study>) prepared by Melbourne Water – and one of several investigations into ways to address shortfalls in Melbourne's water supply - examined a range of possible options in terms of plant size, location and project timing.

Four locations were short listed in the study – the Surf Coast, Port Phillip Bay, Western Port and Bass Coast.

Wonthaggi was chosen because of its ready access to high quality, high activity ocean water for the supply of seawater and rapid dispersal of the saline concentrate, a suitable site terrain, and the suitability to link into Melbourne's existing water supply.

#### **How much will it cost?**

The capital cost of the project is \$3.5 billion dollars.

On a megalitre per day output capacity basis, the capital cost of the desalination plant itself is comparable to that of the Sydney desalination plant, and less than that of the Brisbane and Adelaide plants. The Victorian desalination plant also has a greater investment in architecture and landscaping than any other Australian desalination plant.

The total maximum net present cost to the State over the 30 year contract term of the project is \$5.7 billion. This includes construction, financing and operating costs, and using 150 billion litres of water every year for the next 27.75 years (the full contract operation period).

### **Who is building the desalination plant?**

The Victorian Desalination Project is being delivered as a Public Private Partnership (PPP). The Victorian Government, through the Department of Sustainability and Environment Capital Projects Division, has entered into an agreement with AquaSure who will finance, design, build, operate and maintain the desalination plant.

AquaSure brings together three companies, all leaders in their fields:

- Degrémont - a SUEZ ENVIRONNEMENT company and world leader in reverse-osmosis desalination technology
- Thiess - one of Australia's largest and most trusted construction and services companies, and
- Macquarie Capital - the world's strongest and most experienced infrastructure advisor.

Thiess Degrémont has been contracted to design and build the plant for AquaSure.

### **When will the plant be completed?**

AquaSure has committed to delivering water by the end of 2011.

### **How has the project evolved?**

- 19 June 2007: Victorian government released its Water Plan, a suite of strategic projects designed to secure Victoria's water future. The Plan included the development of a seawater reverse osmosis desalination plant on the coast near Wonthaggi.
- In September 2007, Premier John Brumby and Water Minister Tim Holding announced that the Desalination Project would be delivered as a Public Private Partnership (PPP) under the government's *Partnerships Victoria* (PV) framework. The PPP process enables the Government to tap into private sector expertise in designing, building, financing, operating and maintaining the Project (in this case for 30 years) before handing it back to the Government.
- December 2007 – January 2009: The Minister for Planning decided that an Environment Effects Statement (EES) was needed for the project (this was a 12-month public process, assessing the potential environmental and social impacts of project). As part of the process an Independent Expert Group (IEG) was appointed to provide advice on the design and soundness of key studies.
- March 2009: The Federal Minister for Environment, Heritage and the Arts approved by the project under the *Environment Protection and Biodiversity Conservation Act*, and the Environment Protection Authority issued a Works Approval.
- 4 June 2008: the Victorian government called for Expressions of Interest (eight submissions were received).
- 30 September 2008: Two bidders shortlisted to tender (AquaSure and Basswater).
- October 2008: Tender documents released (6 month tender period).
- 30 July 2009: The Government announced AquaSure as the winning bidder.
- 28 September 2009: Thiess Degrémont commenced earthworks on site

## **PLANT DESIGN**

### **What will the desalination plant look like?**

Visual amenity has always been an active concern of the community. AquaSure and its contractors have endeavoured to bring together architecture, ecology, the landscape and world-class technology to create one of the most significant and large scale environmental design projects in Australia.

Based on the concept of a 'green line' running throughout the site and featuring an innovative living roof, the design fully integrates the built form with the landscape, making the plant barely visible from all public viewing points.

The living roof, the largest of its kind in Australia, will be completely covered with living indigenous vegetation to camouflage the plant, provide acoustic protection, corrosion resistance and thermal control, and reduce maintenance needs. A prototype roof has been growing successfully in Gippsland since February 2009, using many regional and indigenous plants.

Excavated soil will be kept on site and used to construct a series of dunes that will integrate the plant with the landscape and minimise visual and noise impacts for neighbouring areas.

### **How big will the plant be?**

The plant will comprise 29 buildings that take up just 38 of the total 263 hectare site. It will be set at a reduced ground level, enabling it to be integrated into the landscape and reducing the amount of energy needed to lift seawater to the plant. The highest point of the main buildings is 20 metres above sea level, but will be barely visible from surrounding areas.

The remainder of the area will see one of the largest single ecological restoration projects of its kind ever undertaken in Victoria – restoring and enhancing the natural habitat and creating a new coastal park for future generations to enjoy.

## **ENERGY**

### **How much energy will the plant need to operate?**

About 90MW a year will be required to power the plant and pipeline when it is operating at 150GL a year. This will be 100 per cent offset by renewable energy.

Quick facts:

- A standard 4-star fridge would use about the same energy as the desalination plant per household per day.
- A standard hot water service uses almost eight times as much energy as the desalination plant per household per day.
- A recent CSIRO report found that if Victorian homes used 15 per cent less hot water each day, the energy savings would offset all the power used to produce and deliver our water for a year.

AGL will supply Renewable Energy Certificates (RECs) from its overall portfolio of renewable energy generation assets now and in the future, including from a new wind farm being built near Glenthompson in Western Victoria.

### **How do the Renewable Energy Certificates work?**

It would be impractical to power the plant directly with wind, solar, tidal or other green energy, so Renewable Energy Certificates (RECs) from generation commissioned after 1 July 2007 will be purchased to offset the electricity that the plant and the transfer pipeline will use.

This will mean that the same amount of renewable energy will be injected into the electricity grid, as will be taken by the plant and transfer pipeline during operations.

### **What measures have been put in place to increase the plant's energy efficiency?**

AquaSure has introduced a number of innovative systems to minimise power consumption within the plant including world-leading energy recovery and re-use devices that significantly reduce power consumption in the reverse osmosis process.

The plant's compact, modular design reduces pipe work and eliminates inefficient energy use. Energy is further saved by constructing the plant at a low level relative to sea level. This reduces the amount of energy needed to lift seawater into the plant.

Other energy reducing features such as variable speed drives, high efficiency motors and low energy use membranes have also all been adopted.

## **ENVIRONMENT**

### **What sort of environmental management practices are being put in place for the project?**

Minimising the impact on the environment is a key aim of the Victorian Desalination Project and this has been built into the contract between AquaSure and the Government through the inclusion of 221 environmental performance requirements across 38 areas.

The key tool for environmental management is the Environmental Management Plan (EMP). The EMP is a publicly available document and can be found on the AquaSure website (<http://www.aquasure.com.au/index.htm>). It identifies key environmental issues, management strategies and controls and provides a reference point for direction on day-to-day works.

The project team is working closely with a range of government stakeholders - including Department of Environment and Sustainability (DSE), the Environment Protection Authority (EPA), the Department of Primary Industries (DPI), Melbourne Water, South Gippsland Water, South East Water, local councils and Catchment Management Authorities - to ensure that environmental management controls and the EMP is implemented in an effective manner.

Environmental issues with specific management plans include:

- Soil management
- Hazardous materials
- Air quality
- Noise and vibration
- Archaeology and cultural heritage
- Flora and fauna
- Water and wetlands
- Resource efficiency
- Water quality and erosion control
- Marine

### **What is being done to protect the marine environment?**

Extensive marine surveys were carried out as part of the Environment Effects Statement.

A marine monitoring program for the design and construction phase has been developed in accordance with the requirements set out by the Minister for Environment and Climate Change, including habitat and ecosystem mapping, flora and fauna surveys and water quality monitoring.

Marine monitoring work is being undertaken to help confirm the location of the intake and outlet structures and provide further confirmation of the baseline marine conditions.

A marine monitoring program for the operation and management phase of the project (post commissioning in December 2011) is currently being developed.

### **How will the project's environmental management performance be monitored?**

The Environmental Management Plans are implemented by a specialist team of environmental personnel based at the desalination plant and along the pipeline and power alignment. These teams form an important part of the construction team, helping to ensure environmental impacts are minimised during day-to-day construction activities.

AquaSure has also appointed its own Environmental Management Representative, who serves as the environmental leader for the project and ensures that all work is carried out in compliance with the EMS and EMPs.

Supporting this role, for the first time on a major project in Victoria, is an Independent Reviewer and Environmental Auditor (IREA), who has been appointed to review the design, construction and environmental management of the project as it progresses, to seek to ensure safety is maintained and to assist in ensuring compliance with the numerous technical, environmental and social requirements of the contract documents.

The IREA will continue in its role as environmental auditor during the operation and maintenance phase of the project through to the end of the 30 year term of the contract.

Other organisations, such as the Victorian Environment Protection Authority (EPA), are involved in the approval and monitoring of environmental management.

### **What will happen to the waste from the plant?**

During the desalination process, screening and pre-treatment of sea water will result in an amount of pre-treatment waste, including dissolved salts and organics, and small and large solids such as vegetation, sediment and micro-organisms.

Ferric sulfate - a common coagulant used in water treatment facilities around Australia and throughout the world - will be used in the pre-treatment process to make particles in water flock together so that they can be filtered out.

The resulting waste will be a non-toxic substance which, if it weren't for the salt content, could be reused as an additive for soil remediation. However, because of its salt content, it currently has no reuse and will be disposed of at a landfill that is appropriately licensed, based on final classification by the EPA.

## **ROADS AND TRAFFIC MANAGEMENT**

### **What road works will occur?**

The Government has committed up to \$12 million to upgrade key roads and intersections in Wonthaggi. The Project's Environment Effects Statement (EES) identified some sections of road that could be improved to help manage traffic related to the project. These works go beyond that to include Webb Road, West Area Road and Graham Street improvements. Bass Coast Shire Council is carrying out the works.

### **What sort of traffic management strategies are being put in place?**

Managing the impact of traffic is a normal part of managing major projects.

A Traffic Management Liaison Group (TMLG) including representatives from AquaSure, the construction contractors (Thiess Degrémont for the plant site and Thiess Degrémont Nacap for the pipeline), DSE, Bass Coast Shire Council, Cardinia Council, Casey Council, VicRoads and Victoria Police has been established to provide a forum for the exchange of information and discussion of matters associated with construction traffic management plans for the project. The group meets fortnightly.

A Traffic Management Strategy has been developed to address traffic impacts on the project. This strategy has been reviewed and discussed with the relevant councils and VicRoads and modified to suit authority requirements. The strategy is a live document and is periodically reviewed to ensure compliance with authority requirements any change to project works. The strategy also forms the basis of the Traffic Management Plans.

Traffic Management Plans (TMPs) are being created for each area where there is a direct interface between construction traffic and public roads. The TMPs are developed in consultation with the relevant local council and VicRoads (to ensure they fit within the authority's specific requirements). VicRoads provides the approval to proceed.

Traffic management plans are developed for road closures and detours as well as for access ways from the pipeline easement to local roads.

Over-dimensional (OD) loads which are originating from Melbourne Port and other industrial areas around Melbourne and country Victoria are carried on designated OD routes specified by VicRoads. The carriage of all over-dimensional loads follows a stringent approval process and is approved by VicRoads, the large loads being under the direct control of VicRoads escorts. Generally OD loads within urban areas are transported in night time operations, and in rural areas during daylight early morning operations using specialist OD loads haulage contractors.

### *Pipeline*

Strict processes are in place to deal with traffic management associated with the construction of the pipeline, including the implementation of approved Traffic Management Plans for all major transport routes, which are overseen by the TMLG.

In all cases, formal approvals under the Road Management Act must be obtained from VicRoads and/or Councils, for any road works or road closures.

Local communities are informed of road works or road closures that may directly or indirectly impact them as soon as practicable after formal approvals have been obtained from the relevant authorities.

Other initiatives have been established to minimise traffic and parking impacts in local towns while the pipeline is being constructed.

Agreements have been reached with a range of community recreation reserves and showground facilities to supply parking for pipeline construction workers. Workers park at the venues and then travel to work by bus, helping to minimise traffic and parking impacts on the local areas. In return, construction crews undertake a range of upgrade and improvement works – a win/win solution.

### *Wonthaggi*

Traffic studies have forecast traffic volumes for the duration of the construction period and the TMLG continues to work with the Bass Coast Shire Council and VicRoads to monitor traffic matters, and where necessary, put in place additional measures to manage any issues.