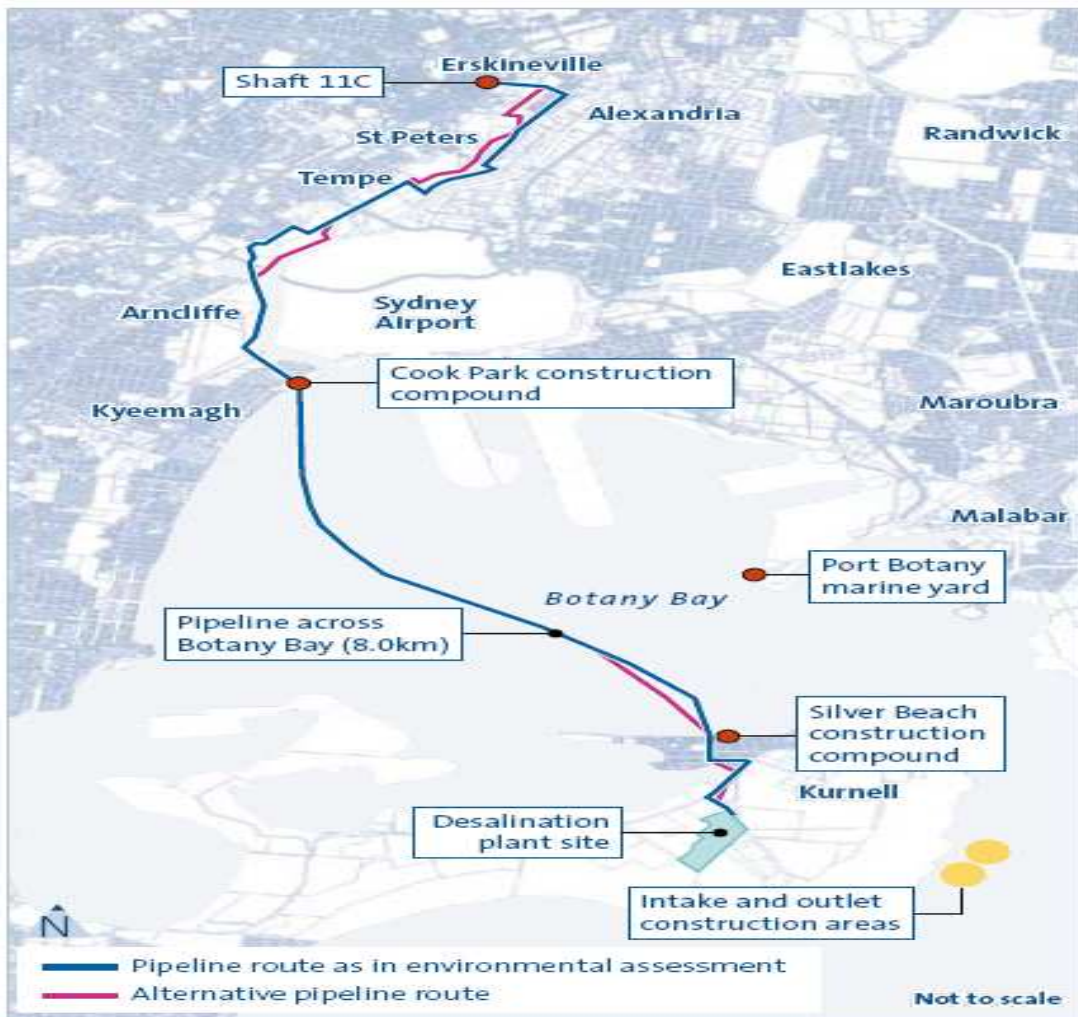


Sydney's Desalination Plant

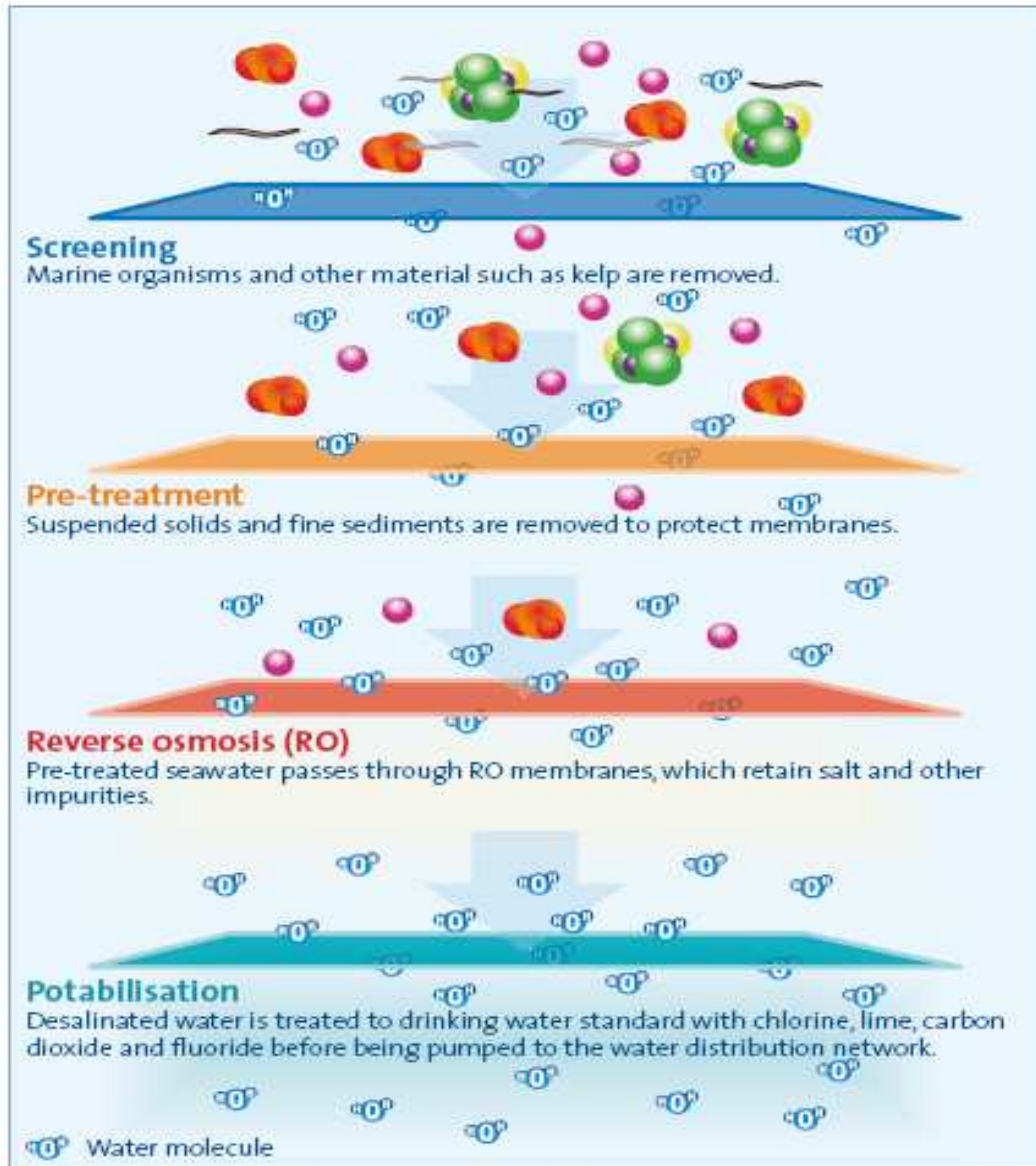
The Desalination Plant will be built on 45 hectares of industrial land, and will be powered by 100% renewable energy. It can produce 250 million litres a day, which can be increased to 500 million litres a day in the future if needed. A new pipeline will carry the water from Kurnell across Botany Bay to the city's main water supply. The pipeline will connect with the City Water tunnel at Erskineville, and will pass through Kurnell, across Botany Bay to Kyeemagh and then through Tempe, St Peters, Alexandria and Erskineville.



The Kurnell to Erskineville pipeline

The desalination technology

The plant will use a process called reverse osmosis to remove salt and other solids from seawater to produce drinking water. Seawater will be forced through a membrane under high pressure, the membrane acts like a strainer to separate the drinking water from salt and other solids in the seawater.



Desalination using reverse osmosis

Turning seawater into drinking water

Step 1. Seawater enters the desalination plant through an intake system about 300 meters offshore. Water enters at a low speed to avoid impacts on marine life.

Step 2. Seawater passes through an initial screening to remove any debris.

Step 3. Seawater is filtered to remove any fine particles.

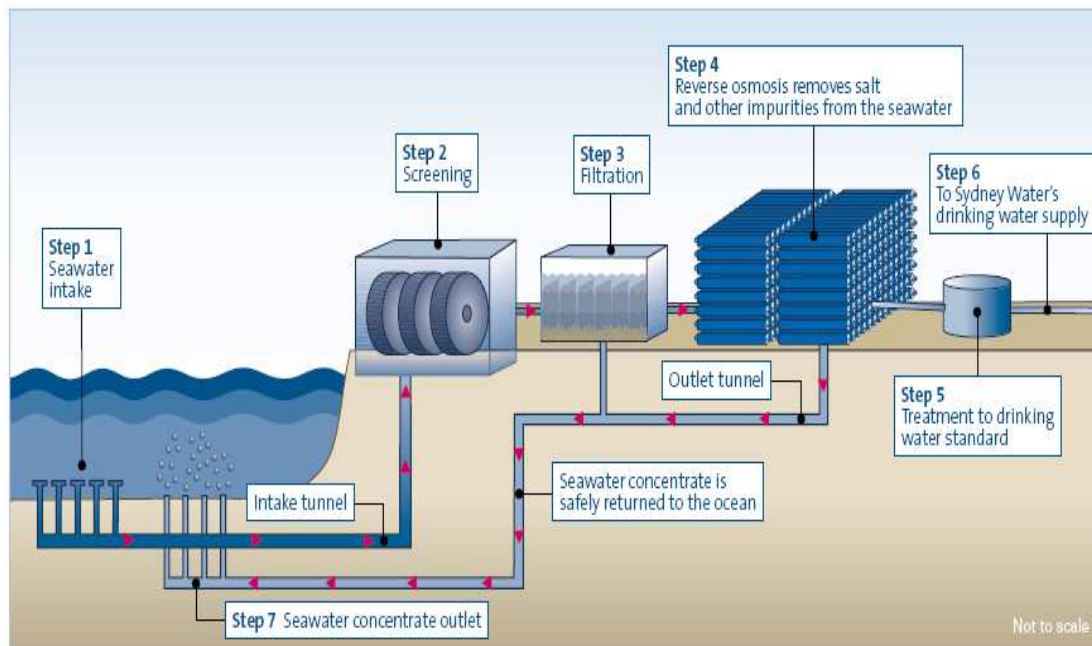
Step 4. Filtered seawater passes through the reverse osmosis membranes

Step 5. Desalinated water is treated to meet strict Australian Water Guidelines.

Step 6. Drinking water is pumped into the water distribution network.

Step 7. Seawater concentrate is safely discharged to the ocean and dispersed through outlet diffusers about 300 metres offshore.

The seawater concentrate will be about twice as salty and one to two degrees warmer than the water drawn into the plant. The salt content and temperature will return to normal seawater salinity and temperature at about 50 to 75 metres from the discharge point.



The desalination process

Two major contracts have been awarded for the desalination plant. Blue Water joint venture will design, build, operate, and maintain the ocean intake and outlet structures. The joint venture consists of Veolia Water and John Holland Group. The water delivery alliance will design and build the pipelines from Kurnell to Erskineville. These pipelines will carry desalinated water over 17 kilometers. These include 7.5 kilometers of twin 1400 diameter steel pipelines across Botany bay, 6.4 kilometers of 1800 diameter pipes in concrete pipes installed by micro tunneling . The balance of approximately 3 kilometers 1800 diameter steel pipeline will be installed by dig and lay conventional trenching methods. This alliance is made up of Bovis Lend Lease, McConnel Dowell, Kellogg Brown and Root, Worley Parsons and Environment Recourses Management.

One critical path undertaken by the designers was the design of the concrete for the structure, the inlet and outlet areas, and also the design of the pipelines. The supply of the concrete was awarded to Readymix, which will supply a specialist mix from their Caringbah Plant. Readymix have been involved in many difficult and challenging projects in the past, and their experience and expertise was called on once again by John Holland Group. Many months of trials were performed, in consultation with Mc Connel Dowell. A high performance concrete had to be designed and implemented so as to accommodate the stringent requirements. These include a 100 year design life, a concrete that would meet the stringent durability parameters set by the designers. Chlorides penetrating the concrete was also a major issue.

Peter Ney Technical Manger of Readymix says “we had to come up with a High Performance Concrete that was going to meet all the strict measures put in place by the consulting engineers. The answer was relatively simple. We used cement blends utilizing the Ecocem. These special blends were fine tuned by our laboratory staff doing many months of trials mixes. We are using up to 60% of Ecocem in our high performance concrete, in a project that will use more than 50,000 m³ over a period of 12 months. We have no doubt we will not only meet the expectations of our clients, but exceed them”.