APRIL 2022

Desalination plant site selection summary

Desalination is one of the options in the Lower Hunter Water Security Plan (LHWSP).

A desalination plant uses membrane filter technology to remove salts from saline or brackish water to produce water suitable for drinking. Desalination is a drinking water supply option that does not rely on rainfall.

This factsheet sets out the process used to select the preferred desalination plant locations for consideration in the development of a new LHWSP.

Background

The 2014 Lower Hunter Water Plan recommended small temporary desalination plants to supply drinking water that would only be built and operated in times of extreme drought.

In 2016 a site next to the Belmont Wastewater Treatment Works (WWTW) was selected for a drought response desalination plant. This site was cost effective, had sufficient cleared land owned by Hunter Water, and brine discharges could be put back in the ocean via the existing infrastructure.

Why assess more sites

A major review of the LHWSP commenced in 2017. The principle of "All options on the table" has underpinned the review to ensure a transparent, evidence-based process that is supported by our community.

This process considered the role desalination could play in our water supply as either an ongoing supply or drought response plant.

What we considered

In 2019, Hunter Water started detailed investigations into possible locations for desalination plants.

Consideration was given to the benefits of different sized plants ranging in capacity from 30 million litres per day to 155 million litres per day. A wide range of sites on the Central Coast and Lower Hunter region were considered.

A range of studies were undertaken that assessed the technical, regulatory and approval, and environmental requirements for a desalination plant. The studies considered:

- plant size, technology options, volume of water produced and modes of operation
- site locations, land ownership, power and utility services
- geotechnical and geological features, particularly for intake and outlet pipelines
- intake water quality and brine management and disposal
- coastal and geotechnical hazards including erosion, flooding, storm risks, and mine subsidence
- community and environmental impacts and risks.

How we worked through the site selection process

A three phased decision support framework was developed to identify and assess locations suitable for desalination plants.

Phase 1: Constraints and opportunities mapping. This phase identified 'no go' areas that were eliminated from the assessment process. 'No-go' areas were areas identified to have environmental, social or engineering risk limitations.

Phase 2: Site shortlisting. The long list of sites identified in Phase 1 were evaluated based on a range of criteria including environmental, social, and technical aspects. This process identified a shortlist of 17 sites.

The shortlisted sites were grouped into five geographical clusters for further evaluation. Assessing clusters rather than individual sites was preferred so as to not rule out sites based on individual lot areas and boundaries, and allow for adaptability with plant layout.

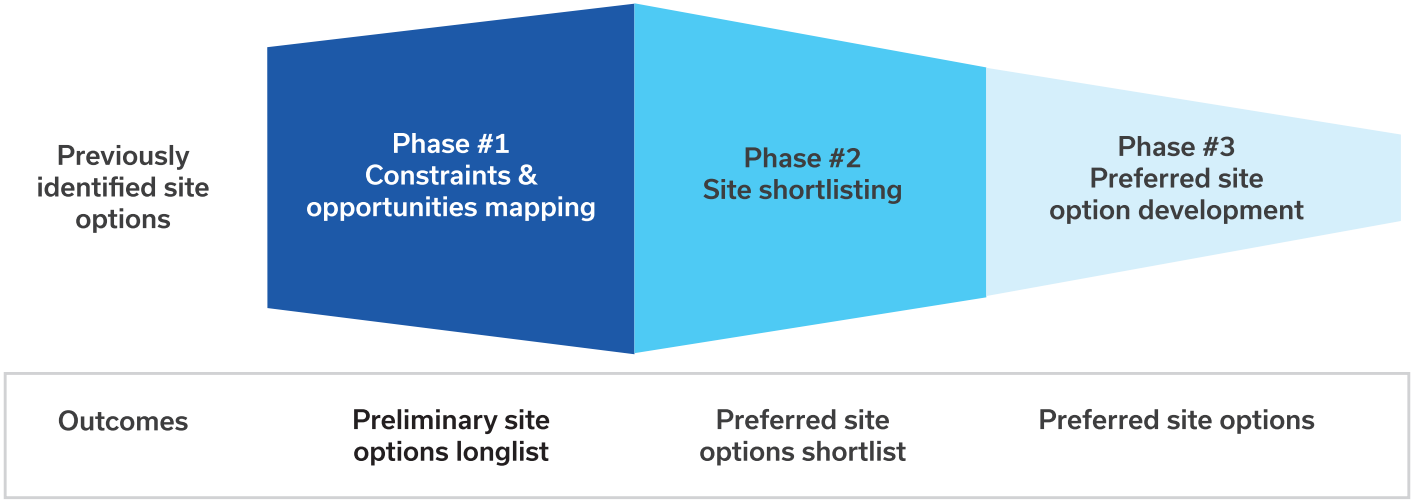

Figure 1: Desalination Feasibility Study flow diagram

A spatial analysis tool was used along with expert workshops to identify additional constraints, risks and data gaps, and identify the best ranking cluster of sites.

Four sites were identified for further assessment. These were:

- Walsh Point, at the eastern end of Kooragang Island
- Belmont
- Dora Creek
- Stockton.

Phase 3: Preferred site option development. Feasibility studies were conducted for the four sites including an assessment of engineering and environmental constraints, risks and opportunities, and limitations of each site as both small and large drought response and ongoing supply plants.

Preferred sites

The findings of the feasibility study found both Belmont and Walsh Point as suitable sites for either drought response or as an ongoing supply desalination plant for the Lower Hunter.