

INDEPENDENT MARINE SCIENCE REVIEW PANEL (MSRP)

Report of the 6th meeting of the Marine Scientific Review Panel (MSRP) held on 9th December 2022.

The Panel considered the final reports in the key areas relating to the location of the EP desalination plant. Most of these reports, in a draft format, had been reviewed by the Panel previously, with this meeting considering advice provided to the authors on previous drafts. The Panel was unanimous in its view that the technical content and recommendations of the reports were accurate and suitable for decision-making in regard to the location of the plant. Input from the Panel was primarily about improving the ease of reading and clarity of the reports, particularly the inclusion of executive summaries for several reports.

Oceanographic modelling report

The key purpose of this work was to build upon the existing model the water movements (in terms of direction and current speed) within Boston and Proper Bays. The work included collection of a year of new water quality data to validate the model. This model was then used to examine the potential impacts on salinity within the Inner Bays from the ultimate capacity an 8 GL/Yr desalination plant. The model was run for a 5-year period under all conditions (i.e., all seasons, dodge tides etc) and at a number of potential outfall locations.

Modelling of the brine discharged from the outfall structure resulted in salinity levels within the natural variability of salinity in the bays and well within the levels recommended by the Australian and New Zealand Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ) as well as the agreed design criteria set for the plant.

Modelling also confirmed that the discharge of brine into the deeper and more rapidly moving water increased the dispersion of brine.

A sensitivity analysis modelling exercise was also undertaken to understand the impacts of discharge of the brine into the bottom three horizontal layers in the model compared with only the 'worst-case' discharge into the bottom horizontal layer of the model. While the operation of a plant would mix the brine as much throughout the water column, the early modelling was a worst case one where the brine was discharged into one layer only. As expected, the impact was a more effective dispersal of the brine which outlines how conservative the initial base-case modelling was.

The model was also used to examine particle tracking through 'releasing' particles around reef areas around the Inner Bays area to determine the entrainment of particles in the inlet pipe and dispersion of brine released from the outfall.

Modelling of the movement of released particles has indicated that less than 0.1% of spawned biomass is likely to be at risk of entrainment by the intake pipe of the proposed plant.

Ecotoxicity Data Review

This report reviews the performance of operating desalination plants, primarily around Australia, and also where relevant overseas.

The review supports the recommendation of the 40:1 dilution of discharge from the plant, although the information presented in the report indicates 40:1 is a conservative dilution requirement.

The report covers two main areas, the impact of the discharge of brine to the marine environment (which has shown to be the main driver in toxicity relating to desalination plants) and the chemicals that may be used in the desalination process. The reports indicates that the brine discharge requirements will be met within the engineering performance guidelines agreed for the operation of the plant. Each specific chemical tested previously for existing plants have their own dilution criteria which must be adhered to in order for their release within the brine discharge.

It should be noted that information in the report will form a large part of the marine impact assessment within the Development Assessment process, required to be completed before construction begins.

Habitat Mapping report

This report contains a comprehensive overview of the habitats within the bays based upon analysis of drop-down video footage taken at a large number of 'drop' location within the Proper, Boston and Louth Bays. It essentially provides a map of the abundance of seagrasses, macroalgae, turf and bare seafloor. It also examined the epiphyte growth on seagrass which can be an indicator of seagrass health.

The information mapped will allow optimisation of the location of the intake and outfall pipes to minimise environmental impact as well as the baseline for the longer-term monitoring program once the plant is constructed and operational.

Water Quality report

This is a report details nearly 12 months of both water column profiling (i.e., water quality parameters from the top to the bottom of the water column) at set locations and individual water sampling at a large number of locations within the bays by SA Water.

The Panel noted several elevated levels of copper, lead and zinc in a small number of samples and the occasional detection of elevated ammonia.

Advice was provided on the presentation of results and noted that other sources of data would be incorporated into future reports.