

Appendix K

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**Glossary of Terms**

## Contents

K1 Glossary of Terms

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<b>Acid sulphate soils</b>	Name given to soils containing iron sulphides, most commonly pyrite. These release toxic levels of iron, aluminium and heavy metals when exposed to air and water.
<b>Bathymetry</b>	The measurement of the depth of the ocean floor from the water surface
<b>Bed rock</b>	The solid unweathered and consolidated rock that lies beneath loose surface deposits.
<b>Bio-fouling</b>	Degradation of the Reverse Osmosis (RO) membranes due to the presence of organic compounds or biological matter.
<b>Bottom Water Level</b>	The lowest height at which water can be pumped from a reservoir/tank/storage area.
<b>Brine</b>	See RO concentrate.
<b>Capital Expenses (CAPEX)</b>	The cost associated with bringing the plant into operation and includes design, approvals and construction.
<b>Carbon neutrality</b>	The achievement of zero net carbon emissions from a site/plant.
<b>Co-location</b>	Co-locating with existing industry potentially negating the need for a new intake / outfall structure.
<b>Desalination</b>	The process of separating salt from seawater or brackish water to form a concentrated brine solution (waste) and a purified water stream (product).
<b>Diffuser</b>	End of outfall device used to encourage initial rapid mixing of the effluent with sea water
<b>Directional drilling</b>	A steered drilling method employing intentional guiding of the bore at a specified angle from the vertical by deflection of the drill bit.
<b>Discount Rate</b>	A specific interest rate used to determine the Net Present Cost (NPC) of a project.
<b>Entrainment</b>	The process by which discharged brine waste is carried by ocean currents into the intake zone and thus contaminating feed water quality.
<b>Effluent</b>	See RO concentrate.
<b>Extreme Water Level</b>	The sea level created by the additive effect of a storm surge and high tide.
<b>Feed water</b>	The supply of water into the plant from the original source (sea, bore well, river, etc).
<b>Filtration</b>	A process that forms part of pre-treatment and removes debris, pathogens, organic matter and divalent ions from feed water before it enters the RO membranes.
<b>Groundwater</b>	Water that occupies pores and crevices (known as aquifers) in rock and soil, below the surface of the Earth. The upper limit of the groundwater is the water table.
<b>HDPE (High Density PolyEthylene)</b>	A tough linear crystalline polymer used as the material for the intake and outfall pipes.
<b>Hydraulic Grade Line</b>	The potential energy of water as it is pumped from the intake to the

	plant and then to the connection node.
<b>Initial dilution</b>	The dilution received by a discharge plume as it exits the outfall and experiences initial mixing.
<b>Intake</b>	The intake pipe which draws feed water from the sea.
<b>Levelised costs</b>	A relative cost used as a comparative tool to evaluate the different plants (i.e. cost per megalitre).
<b>Mean Sea Water Level</b>	A calculated average sea level considering high and low tides over a period of time.
<b>Microtunnelling</b>	A process that uses a remotely controlled Tunnel Boring Machine combined with pipe jacking to directly install pipelines underground. This avoids the need for long stretches of open trench and is used mainly for applications where the tunnel diameter is too small for human entry.
<b>Nano-technology</b>	Development of devices at the atomic, molecular, or macromolecular range of approximately 1-100 nm.
<b>Net Present Cost (NPC)</b>	The total cost of the project over its lifetime discounted to the present day using a specified discount rate. It is used as a comparative tool between the plants to evaluate their costs in present terms.
<b>Network</b>	The existing water infrastructure and pipeline systems of an area for which the desalination plant will feed into.
<b>Network integration</b>	The process of introducing the treated product water into the existing water network through connection nodes.
<b>Obstacle limitation surface</b>	A series of surfaces in the airspace surrounding an airport. It defines the airspace to be protected for aircraft operating visually during the initial and final stages of flight, or manoeuvring in the vicinity of the airport.
<b>Operating Expenses (OPEX)</b>	The cost associated with the actual running of the plant and includes electricity, maintenance, etc.
<b>Outfall</b>	The pipe used to discharge waste including RO concentrate, pre-treatment filter and RO membrane backwash to the environment
<b>Pilot Bore</b>	The initial stretch of tunnel created by a thrust bore after which further tunnel works can begin.
<b>Point Source</b>	A single identifiable point of waste discharge.
<b>Post treatment</b>	Chemical treatment of desalinated water to ensure hardness and pH are balanced and may include chlorination (disinfection) and fluoridation.
<b>Potable</b>	A grading given to water that is considered suitable for consumption.
<b>Pre-treatment</b>	Usually involving a filtration step, this ensures that the feed water is pH balanced and free from any debris, pathogens and divalent ions before it proceeds to the RO membranes.
<b>Product Water</b>	The post treated water that is pumped into reservoirs ready for network integration.
<b>RO (Reverse Osmosis)</b>	Process which uses high pressure vessels to force saltwater (seawater or brackish water) through a water permeable membrane, producing a desalinated product water stream and a concentrated

	salty waste stream.
<b>RO concentrate</b>	The concentrated salty waste stream that is produced as a result of a reverse osmosis system.
<b>Rock armour</b>	A shielding layer of rock used to protect and support pipelines both trenched and sea bed laid.
<b>Salinity</b>	A measure of salt levels in aqueous solutions.
<b>Sea bed laid</b>	Type of intake configuration in which a pipe is embedded into the sea floor and supported by rock armour. Trenching may be needed and involves embedding of the pipe into the ground above the sea level (on land).
<b>Sensitivity</b>	The extent to which a certain cost will fluctuate due to the influence of external factors.
<b>Storm surge</b>	Rise in the water surface above normal seawater levels as a result of wind stress and atmospheric pressure.
<b>SWRO (Sea Water Reverse Osmosis)</b>	Specific type of RO system designed to desalinate seawater (having a TDS of over 15 000 mg/L).
<b>TDS (Total Dissolved Solids)</b>	Concentration figure used to measure the total inorganic and organic content in an aqueous solution.
<b>Thrust boring</b>	A soil displacement boring method where a closed pipe (head) is driven into the ground from a thrust pit creating a pilot bore.
<b>Top Water Level</b>	The greatest height at which water can be stored in a tank/reservoir/storage area before overflow occurs.
<b>Topographic</b>	The relief features or surface configuration of an area more specifically relating to elevation data/contours.
<b>Tunnel Boring Machine</b>	An implement used to drill circular bores, usually to allow human entry, employing a circular rotary cutting face that feeds waste material through the rear.
<b>Tunnelled</b>	The process by which a pipe is placed underground and led from the desalination plant to be exposed at a suitable depth at sea.
<b>Turbidity</b>	A measure of the opacity of water based on the presence of suspended particles, quantified using light scattering experiments.
<b>Whole of life cost</b>	An all encompassing estimate of cost projected over the expected operational duration of the plant.