

Desalination Plant



Jersey Water commissioned the first desalination plant in the British Isles in 1970. The plant was built in an abandoned quarry close to the sea at La Rosière, Corbiere, at the south-west corner of the Island. Sea water was pumped into a deep pond (quarry pool) within the old quarry before being abstracted for desalination.

The original desalination plant used a multi-stage flash (MSF) distillation process, whereby the sea water was boiled under vacuum, evaporated and condensed into a fresh water distillate.

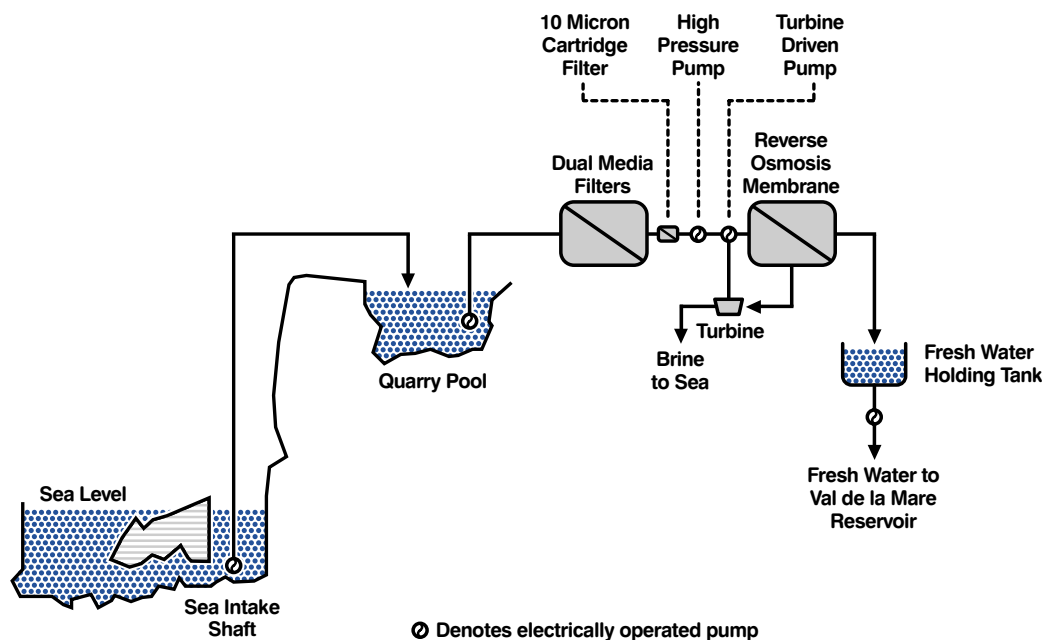
By 1997 the MSF plant had reached the end of its operational life and it was decided to replace this important standby water resource with a modern plant using the Reverse Osmosis (RO) process, giving a number of significant operational benefits.

On Friday 9th July 1999, General Sir Michael Wilkes KCB CBE, Her Majesty's Lieutenant Governor of Jersey, officially opened the new RO desalination plant at La Rosière.

The RO desalination plant plays a vital role in providing an alternative water source for the Island and when necessary augmenting natural water resources which are predominantly surface derived.

Technical Facts

	Plant output capacity	Sea water conversion	Sea water feed quality	Fresh water output quality	Specific energy usage	Maximum electrical power demand
La Rosière	6,000m ³ per day	45%	37,000mg/l (total dissolved solids)	≤ 400mg/l (total dissolved solids)	6.8kWh per m ³ water produced	1,750kW

La Rosière Reverse Osmosis Plant Maximum Capacity 6MI/day


A deep sea water intake shaft and tunnel constructed below the mean low tide level on the foreshore allows sea water to be pumped at all states of the tide, which can vary by as much as 12m. A macerator device in the sea water intake shaft removes seaweed and other large matter. The sea water is discharged and stored into the quarry pool, which allows settlement of particulate matter.

The sea water is then transferred from the quarry pool into the primary treatment filters, which are downward flow type pressure filters. There are four such filters that use a combination of sand and anthracite to filter the sea water, removing small particulate matter. The filters are automatically back-washed on a time-interval basis, which is set to give optimum quality of the filtered water.

On leaving the filters, the sea water is passed through cartridge type filters, with a pore size of 10 microns, to prevent any remaining particulate matter fouling the RO membranes.

The filtered sea water then passes to the Reverse Osmosis (RO) plant, which comprises of four equal sized units, each having 156 spiral-wound type membranes and capable of producing 1,500 m³ of fresh water (permeate) per day. 45% of the filtered sea water is converted into fresh water, the remaining reject water (Brine) is returned to the sea. Water is supplied to each RO unit by a multi-stage centrifugal pump at a pressure of 65 bar (gauge). The sea water rejected from the membranes is under high pressure and operates turbine-driven pumps, positioned in series with the electrically driven high pressure pumps, allowing recovery of energy which would otherwise be lost.

The plant layout and control system allows each of the four RO units to be operated independently or as a whole unit. The plant uses the mains electricity supply with a dedicated 11,000V, 4 MW feeder cable. At full capacity the plant produces 6,000m³ of fresh water and consumes 1,750kW of electrical power.

The RO plant produces ultra high quality fresh water, removing dissolved solids, salt, bacteria, viruses and other particles greater than 0.001 microns. This water is then pumped to Val de la Mare Reservoir for blending with natural waters and eventually forwarded for treatment and distribution to our customers.