

# Brackish "Salty" Water

Brackish water falls between seawater and fresh water. Brackish water is similar to seawater except the salt content is less, as are the TDS (total dissolved solids).

One authority states that brackish water begins at about 1000 ppm TDS and runs upward to around 10,000 or 12,000 ppm TDS.

The basic process of treating brackish water in desalination applications is to pass pressurized water through a membrane. As fresh water passes through, brine or wastewater is rejected. The percentage rejection or pure water yield will again depend on the TDS – total dissolved solids.

Seawater applications differ from brackish mainly in the level of osmotic pressure required to achieve fresh water.

Typically, the pressure needed ranges in brackish water treatment from 5 psi to 75 psi, although the majority of brackish applications fall in the 145 psi to 290 psi range.

Brackish water is generally a surface-type water and as such can be influenced by such environmental factors as rainfall and humidity.

Ion levels and bacteria could be higher in the summer months compared to winter months, and salinity, nitrates, iron, silica and bacteria are a few examples of what is common in untreated brackish water.

(The above is based on a [Water Technology](#) "Technical Feature" (March 2010) by Rich DiPaolo.

According to the [Wikipedia](#):

**Brackish water** is water that has more salinity than fresh water, but not as much as seawater. It may result from mixing of seawater with fresh water, as in estuaries, or it may occur in brackish fossil aquifers. The word comes from the Middle Dutch root "brak," meaning "salten" or "salty". Certain human activities can produce brackish water, in particular certain civil engineering projects such as dikes and the flooding of coastal marshland to produce brackish water pools for freshwater prawn farming. Brackish water is also the primary waste product of the salinity gradient power process. Because brackish water is hostile to the growth of most

terrestrial plant species, without appropriate management it is damaging to the environment (see article on shrimp farms).

Technically, brackish water contains between 0.5 and 30 grams of [salt](#) per [litre](#)—more often expressed as 0.5 to 30 parts per thousand (ppt or ‰). Thus, *brackish* covers a range of [salinity regimes](#) and is not considered a precisely defined condition. It is characteristic of many brackish surface waters that their salinity can vary considerably over space and/or time.

### Water salinity based on dissolved salts in parts per thousand (ppt)

<a href="#">Fresh water</a>	Brackish water	<a href="#">Saline water</a>	<a href="#">Brine</a>
< 0.5	0.5 – 30	30 – 50	> 50

In summary, brackish water lies in definition somewhere between fresh water and sea water and is defined mainly by its salt content.

### TREATMENT OF BRACKISH/SALTY WATER

Treatment of brackish water and not to be confused with sea water treatment, is almost exclusively by membrane technology (reverse osmosis or Nono Filtration) or by distillation.

Both of above treatment technologies is “slow” ito processed water per hour, reverse osmosis faster than distillation and both classed as “expensive technology”, capital cost and operating cost.

Therefor the cost per litre of treated water is high in relation to current authority water charges.

Treating brackish water is not “cheap” and no single filter will remove the dissolved salts, only membrane technology. Below picture of a typical RO Membrane.

