



AN ENVIRONMENTAL  
REMEDICATION COMPANY

# Multi Stage Vacuum Flashed Desalination System

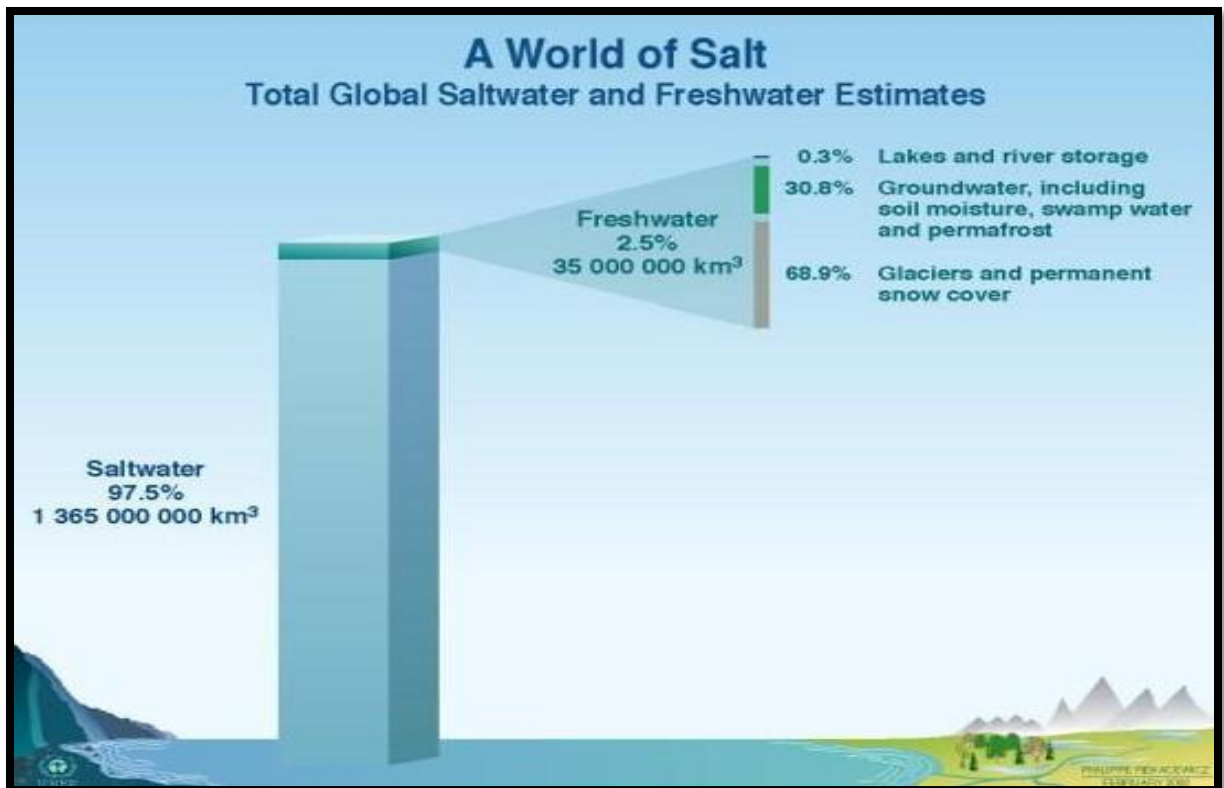
A dynamic splash of clear water with numerous bubbles, set against a light blue background that transitions from white at the top to a soft blue at the bottom.

*“Water will be more important than oil this century”  
Boutros Ghali Former U.N. Secretary General*

## **The Problem:**

Global water shortages are becoming common and growing more acute. Experts estimate that by 2030 nearly one-half of the world's population will be experiencing water shortages. Water is not a renewable resource, as many people assume. Most fresh water is drawn from underground aquifers and not returned. As a result, reserves of fresh water continue to drop at alarming rates. Fresh water supplies in the United States and worldwide have all been tapped. No new major sources of fresh water remain undiscovered.

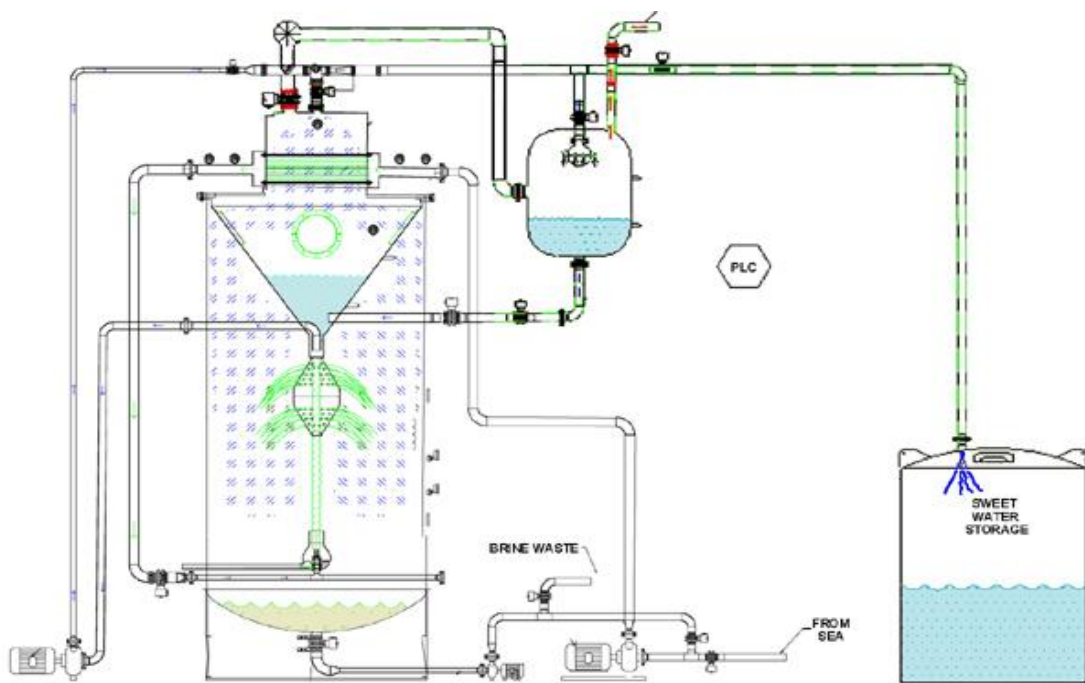
Several methods exist to desalinate water. The two primary methods are reverse osmosis and multi stage flash distillation. Reverse osmosis for municipal or commercial production requires a large capital investment, continuous maintenance and large amounts of energy, which translates to high per gallon water costs and limited affordability. Most of the areas in the world that need alternative water supplies do not have the financial means to acquire such systems. Standard thermal distillation systems have their own set of problems. In a standard thermal distillation system only a small percentage of the water is actually converted to steam. Unless a multi stage process is employed it is not possible to efficiently produce commercially viable amounts of water. Standard thermal desalination systems can work on a small scale where there is an abundance of waste heat, such as in cogeneration plants, but on a large scale the case for standard thermal distillation becomes unaffordable because of the inherently inefficient energy requirements.



## ***The Solution:***

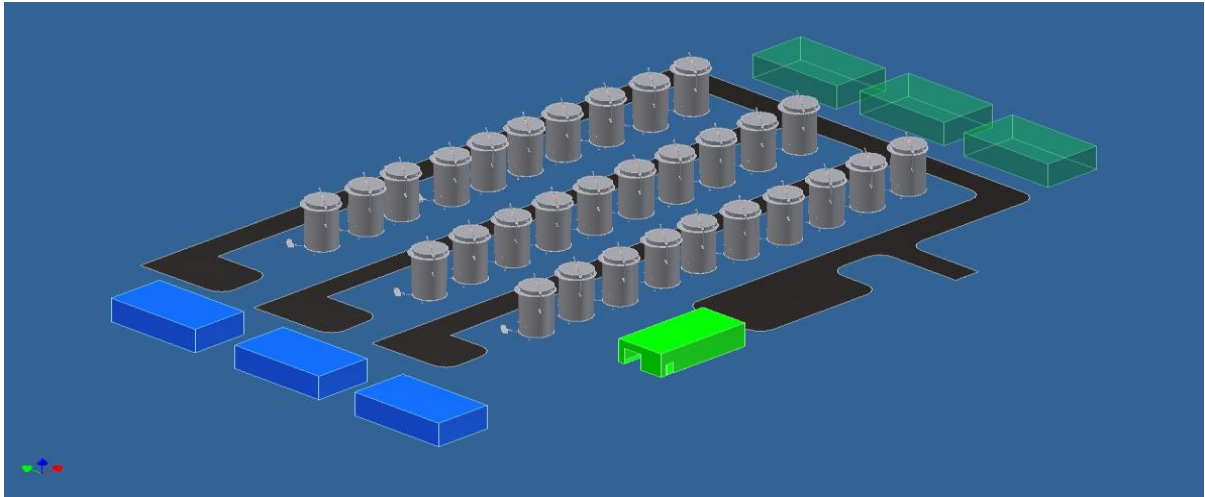
Our company has developed the Superflash Eductor which enables a series of flashing stages, each possessing a lower ambient pressure than the previous, within a single vessel. It is well known that most thermal desalination systems are designed to maintain water temperature to achieve vaporization. Our design relies on a constant vacuum/temperature ratio in the lower portion of the flash chamber. Interfacial contact within the Superflash eductor vaporizes an initial amount of water then the remaining water, in a high velocity stream is propelled into a perforated double cone to produce appropriately sized water droplets to induce additional vaporization. Further flashing occurs in the upper portion of the vessel. Steam vapors are drawn up through a demister arrangement. As the vapor passes through the demisters the solid salt particles cause a liquid drop to form at the demister surface. When it becomes large enough it falls into the brine collector. Condensed sweet water is collected in a conical storage tank that houses the condenser unit.

The system operates efficiently and can be scaled to produce millions of gallons per day. By operating the multi stage system within a single vessel less BTUs are required. Adequate heat for the Superflash Eductor can be provided by a solar array that easily produces 100° C. Additionally, much of the heat is preserved in the brine and supplemental energy can be obtained from other nearby sources including bio-mass combustion or natural gas fired heaters.



**Patent Pending Superflash Eductor Economically Flashes Seawater to Steam to Produce Ultra Pure Water**

# Multiple Systems for Water Plant Production and Mobile Systems for Greater Accessibility



## Advantages

- Lower Energy Requirements than Reverse Osmosis
- Lower Capital Costs
- No Membrane Maintenance
- Seawater or Brackish Water as Source
- Reduced Need for Pre or Post Chemical Treatment
- Modular Design
- Self Cleaning
- Smaller Plant Footprint

## Applications

- Municipal Water Supply
- Offshore Vessels

## Features

- Solar Collectors for Supplemental BTU Needs
- Automated Controls
- Scalable to Millions of Gallons
- Wide Range of Feed-water or Salinity Levels
- Consistent Quality of Pure Water - Very Low TDS