

## VAPOR COMPRESSION DISTILLATION

### Forever Water 1,000 gal./hr. Cost/Benefit Analysis

**Initial Cost of Forever Water 1,000 gallon per hour unit: \$90,000**

**Value of Annual Pure Water Production:**

1,000 gal. per hr. X 24 hrs. X .85 availability X .90 recovery = 18,360 gal. pure water per day  
 18,360 gal. pure water per day X 365 days = 6,701,400 gal. pure water per year  
 6,701,400 gal. per year/325,850 gal. per acrefoot = 20.6 acrefeet of pure water per year  
 20.6 acrefeet of pure water per year @ \$500 per acrefoot = **\$10,300** per year

**Dilution Value of Pure Water:**

Example #1: 9 AcFt of well water @ \$100 per AcFt diluted with 1 AcFt of pure water @ \$500 per AcFt  
 \$1,400/10 AcFt = \$140 per AcFt for 10% pure water dilution  
 Example #2: 8 AcFt of well water @ \$100 per AcFt diluted with 2 AcFt of pure water @ \$500 per AcFt  
 \$1,800/10 AcFt = \$180 per AcFt for 20% pure water dilution

**Energy Cost**

Electric input (Watt-h/gal)	Electric input (kWh/AcFt)	\$0.08/kWh	\$0.10/kWh	\$0.12/kWh
15 Watt-hours/gal	4,888 kWh/AcFt	\$391/AcFt	\$489/AcFt	\$587/AcFt
20 Watt-hours/gal	6,517 kWh/AcFt	\$521/AcFt	\$652/AcFt	\$782/AcFt
25 Watt-hours/gal	8,146 kWh/AcFt	\$652/AcFt	\$815/AcFt	\$978/AcFt

Note: More plates can be added to reduce electricity input. This is a capital cost versus operating cost decision. Adopting solar photovoltaic power, wind energy, or some other renewable source of electricity will be evaluated as a means of stabilizing long-term energy costs of this distillation process.

Calcium reduction is an additional cost. Ion exchange will be used to reduce calcium from 600 mg/L to 150 mg/L.