

**From:** Joseph\_Rizzi [Joseph\_Rizzi@sbcglobal.net]

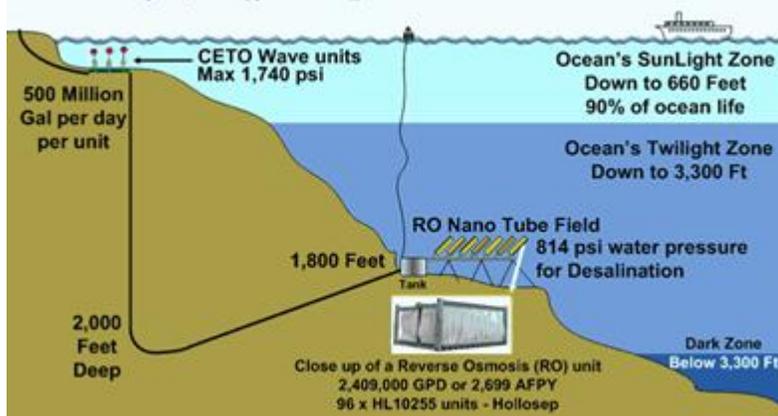
**Sent:** Monday, May 11, 2015 5:07 PM

**To:** Satkowski, Rich@Waterboards; Mizell, James@DWR; [Amy.Aufdemberge@sol.doi.gov](mailto:Amy.Aufdemberge@sol.doi.gov)

**Subject:** 5 Alternate solutions to fix our water shortage Naturally!!!

5 solutions that truly have Co-Equal goals in supplying more water and saving the Delta at the same time:

- 1. Natural Desalination** – Trillions of gallons of **NEW** water for the Central Valley and LA area at roughly \$20 an acre foot operational cost. All 100% powered by nature with no adverse environmental issues. This would eliminate the need to take water out of the Delta, so we could STOP the pumping delta water and get the water from the sea at a low cost.
  - Locating the Desalination field off the coast about 3 miles and down 1,800 feet allows for the weight of water to supply all the pressure needed to use Reverse Osmosis hollow fibers to constantly desalinate a limit less amount of water.
  - Locating the RO field down at 1,800 feet allows the RO Hollow Fiber membranes to capture only fresh water and all salt and other particles would naturally flow down the valley or the ocean current would sweep the particles away. Being located far below the sun light zone allows for little interaction with sea life (90% of sea life lives in sun light zone down to ocean deep of 660 feet). So no Brine, no impaling life, no growth on RO units.
  - Using gravity conveyance from 1,800 feet at the RO field for the 3 miles back to shore where the depth would be 2,000 feet allows the flow of water to naturally take the longest journey, which is achieved by a horizontal drilling.
  - Wave power, like in CETO Wave operating off coast of Australia, is used to lift the water to the surface and used to put the water up the side of a mountain or water tower to then utilize gravity once more to convey it for use, in aqueducts or reservoir.
  - Replace Delta water from the sea. LA can get 100% or more from the sea. Central Valley would need a pipeline from sea to inland aqueducts conveyed using wave power and then gravity. Thus no water needed from Delta for export. **NO** Environmental issues, because only clean fresh water is taken from the sea.



- 2. CETO Wave Desalination** -- Using only the power of the waves to power a Desalination plant using Nature. Currently in operations off the coast of Australia. <http://www.carnegiwave.com/ceto-technology/what-is-ceto.html>. A concept that CETO people have missed is that the Ocean is made up of 3 zones (Sunlight, Twilight and Dark zones) for which the intake and out flows should be located in at least the Twilight zone, so as to not disturb the sunlight zone which has 90% of all ocean life living in it. In fact if an ultra filter like ZeeWeed is also placed on the intake it would eliminate the pre-filter requirements that most on-shore desalination plants need to minimize

clogging. Getting the water from the Twilight zone will eliminate the need for chemicals to kill life growing on the RO membranes because this water does not have the life, nutrients and other ingredients needed for life to grow. The pipes going down to the depths would not have to be strong to with stand great pressures, because the pressures inside and outside the pipes will be about the same, since water will be filled inside the pipe, just moving which will give it less of a pressure inside. Special desalination tanks can be built so that cleaning of the RO membranes are automatically and constantly being cleaned, thus eliminating 95% of maintenance cost. CETO wave can be used around Monterey Bay area, Santa Barbra, Carlsbad and may others. Can replace Delta water with water from the sea just like Natural Desalination above.

3. **Benicia Flow Management Gates** – ***Not*** a dam, barrier or locks stopping all flow of water. Always an open section to allow boats and aquatic life to **FREELY** travel in and out of each zone. Gates would keep the **Fresh Delta** water separated from the **Salty Bay** water and stop salt water incursion by limiting the flow of fresh water out of the area. 1.3 MAF is needed to naturally keep the salt water out of the Delta and in the Bay, which in dry years 7 MAF goes to the bay and 5 MAF is exported south. This is much better than simply releasing more water from the reservoirs in the north to keep the salinity back and help the aquatic life. This would keep the Delta at closer to the high tide water level constantly with slower moving flows which will help the levies last longer. ***Most important*** benefits would be that more water can flow from the north Sacramento River naturally through the Delta to the pumps in Tracy for more usable water availability.

**Benicia Bridge** - added gates to the base of bridge supports. Most of the work has already been done! Wow! This turns the Suisun Marsh and Delta is to Fresh water reservoirs, but more importantly it makes the Delta healthier for fish and other aquatic life while allowing more water to flow south. The Co-Equal goal: →

<http://tinyurl.com/kno3ugg>

<http://tinyurl.com/punsotf> ← 1931 DWR study of Barriers in bay. (pg. 39 states 1.3 MAF needed to hold back salt waters naturally without locks. Dry years have 7 MAF going to bay and 43.4 MAF in wet years.

<http://tinyurl.com/l3npwmg> )



4. **WaterFX** Solar distillation of **Salty Bay** or Ocean water. Locating Solar FX modules on the hundreds of miles of aqueducts creates an ideal environment for SolarFX modules to desalinate all the water that can be feed to it. The Ocean and the salty Bay water are ideal sources of water because of the endless supply of water, even waste treatment plant water can be used. WaterFX received prop 1b funding earlier, but has only been looked at in a small way. This would add **NEW** water to the aqueducts, which would allow for less pumping of water from the Delta.

<http://waterfx.co/aqua4/>

- Pipeline from Bay to Tracy to bring the Salty bay water that the Delta and environmentalist are concerned with. Using wind power to lift the water to the top of the Tracy pump area where the Aqueducts start. Put in a pipeline that follows the Aqueducts and at points along the way turns the water into fresh clean water by WaterFX's solar distillation process and put into the aqueducts for distribution.
- Use CETO Wave pumps to pump water up a mountain south of Monterey bay and into Pipeline for a 66 mile gravity conveyance to the aqueducts inland. The pipeline would follow the Aqueducts and at points along the way turns the water into fresh clean water by WaterFX's solar distillation process and put into the aqueducts for distribution.
- Pipelines from Water treatment plants could be lifted locally and directed to Tracy to be processed by WaterFX's solar distillation process and put into the aqueducts for distribution.

5. **Toilet to Farm** – Much easier for public to stomach than **Toilet to Tap**. Dedicate one of the Aqueducts to directly use the Water treatment plant output water mixed with Delta water for Farming only. This would involve Pipelines for carrying the water from the treatment plants to the Aqueduct plus water towers at plants for pressurize the water to be used and some pipelines to make sure that the reuse water is not used for anything other than faming. This is less processing than utilizing the WaterFX process to clean up the water further, but would require more pipelines to keep the water separated or adding pipelines for human consumption. Since 80% of the aqueduct water is used for agriculture it is best when we can reuse water instead of dumping in the bay or tributaries to go out to sea.

Please contact me for comments or more details on these ideas,

Joseph Rizzi -- Cel: 707-208-4508 -- Email: [Joseph\\_Rizzi@sbcglobal.net](mailto:Joseph_Rizzi@sbcglobal.net)