

Marginal Cost of New Water Supply

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Communities require new water supply sources for various reasons. Those in the Southwest are experiencing unprecedented drought conditions and must increase the available supply to meet current demand. Groundwater levels are being depleted in some areas, and basins are being adjudicated which further exacerbates the problem. Some areas are experiencing growth and need to find new sources of water to meet the new demand. In some areas existing groundwater or surface water quality is deteriorating and becoming unusable as a drinking water source. New regulations are also impacting the use of some sources of raw water requiring additional treatment processes at increased costs.

When utilities consider new supply sources several options come to mind. If they are near the coast, seawater desalination always seems to be the first choice analyzed. This continues to be one of the most expensive supply options even though prices have been coming down. Not only is reverse osmosis expensive due to the power requirements, but land is expensive on the coast and there are extensive environmental issues with the intake structures. Additionally, the produced water must be transported into the large diameter distribution pipe system. All of this equates to a marginal cost of this new supply being \$9.00 per 1000 gallons.

The option many are considering now is indirect, or direct, potable reuse. The technology for recycling wastewater is proven as there are many projects around the world, successfully employing this method. The TDS is lower than seawater or brackish water and thus the cost to treat is lower. The location of these plants is also closer to the distribution system pipes and thus the transmission costs are lower. The cost of this supply option is \$5.00 per 1000 gallons.

The next option considered is brackish, or off spec, water being developed. This usually entails some type of groundwater extraction and some type of treatment. The treatment could be as simple as salt removal which is less expensive than seawater due to the lower TDS, or as complicated as arsenic removal through ion exchange systems. The average cost of this supply option is \$2.50 per 1000 gallons.

All of these are viable options, but one simple idea is often left out of the mix. Finding and repairing leaks in the existing system. It is estimated that 25% of the water produced and delivered into a potable water distribution system is lost to leaking pipes. This is a significant new beneficial water supply source that could be tapped by finding and fixing these leaks. It is estimated that the cost to find and fix leaks is \$1.30 per 1000 gallons, the lowest of all the options. Not only that, but the time it takes to perform this task is much shorter than any of the capital improvement projects needed for seawater desalination, brackish water development or wastewater recycling.

The last option for generating new supplies is demand management. Water conservation is essentially a no cost solution where consumers or industry voluntarily use less water. Most customers are already demand hardened after years of being told to conserve water. Another issue with demand management is that it reduces revenue for the utility and makes it more difficult for the utility to pay its fixed costs. Alternatively, real water loss reduction through fixing leaking pipes improves the fiscal position of the utility by reducing production costs, energy, and chemicals, keeping revenues steady and requiring no capital investment.

The water supply solution is under our nose, or actually, under our feet, hidden from sight, just waiting to be discovered.