

Waterworld  
By Doug Fredericksen



*“Water, water, everywhere, nor any drop to drink” Coleridge*

Seventy percent of the planet we live on is composed of water. Of that, less than one percent is fit to drink. While pale blue cliffs of coastal glaciers calve into the sea, the delicate balance of life on our world is changing faster than we ever imagined.

Eight of the hottest years in recorded history have occurred in the last ten years. Since the turn of the century the average global temperature has risen by 1.3 Fahrenheit. It may not sound like much, but it has been enough to spur the likes of Hurricanes Andrew and Katrina, inundate most of Europe in a flood of near Biblical proportions, and create a drought across Africa that has spurred the first genocidal conflict of the new millennium in Darfur.

Water is the key to life. We can go without food for weeks, but for less than three days without water. Our bodies are composed of 65 percent water. Yet throughout the world, we seem to take it for granted and refuse to conserve this precious resource.

Most of the people in Africa and Asia live on about two and a half gallons of water a day. Here in America, we each use on an average, over two hundred gallons of water a day. More than fifty percent of all the water we use is for irrigation and landscaping.

Along with the huge amount of water we waste with over-irrigation, municipalities seem to “lose” an immense amount of fresh water. New York City’s oldest operating water main, the Croton system, was built in 1893, partially out of wood. The three major water mains that feed the city of New York bring billions of gallons of potable water a day to a thirsty city. Of that, there are estimates that as much as thirty percent of the water in some mains is lost through leakage. One small section of the New York system, the Rondout-West Basin alone leaks up to 35 million gallons of fresh water a day according to the New York State Comptroller’s office.

The California Aqueduct has been called a wonder of the modern world. It snakes across the state for over 444 miles, moving water at a gradual pace through carefully engineered canals. At strategic points, such as the Edmonston Pumping Plant near Los Angeles, some of the largest pumps on the planet pump billions of gallons of water up

over 2,000 feet to the crest of mountains and hills that block the waterway's path. Yet most of the aqueduct flows through the desert. The concrete canal is open to the sky and loses massive amounts of the water that flows through it due to evaporation.

While our engineers and water supplier's work long and hard to provide a seemingly unending quantity of water to thirsty American cities that are growing dramatically in dry areas like Las Vegas and Phoenix, many people in the world are forced to walk miles to obtain the most minimal and possibly contaminated supplies of water to sustain life.

There have been simple and effective solutions applied to the problems of providing water in third world situations. One such solution is the foot powered pumps provided in southern Africa by Pump Aid. The pumps are simple, cheap, and are based on a two-thousand-year-old Chinese design. Another simple innovation is the use of rolling water barrels designed to carry up to twenty times what one person could normally carry from a water source. The barrels have a handle and are designed to roll over rough type terrain and can be re-used for years. In Peru farmers have worked with local anthropologists to revitalize a thousand-year-old irrigation network that would alleviate drought problems and enable the local populace to farm in dry seasons.

While simple designs and procedures have worked wonders to save lives around the globe, it is amazing that we haven't turned our own technological prowess upon the problems of waste and overuse. The technology exists to preserve and protect the resources we have, and it is our duty as plumbers and mechanical contractors to push the envelope with implementation of this technology.

Many jurisdictions in the western half of the nation have adopted municipal codes that require small, solar-powered rain gauges on residences that measures rainfall and shut down the irrigation system during rainy times. Nothing is more infuriating than seeing a sprinkler system operating at full bore during a rainstorm. Dual flush toilets are now on the market and could save huge quantities of water.

Many cities have their own desalter facilities which can supply clean (but non-potable) water to major industrial users such as golf courses, parks, and stadiums. There is no reason why we couldn't extend this use of non-potable water to flush toilets and urinals as well.

Private gray water systems have been addressed in Chapter 16 of the 2006 Uniform Plumbing Code. Innovative use of these systems could save and reuse large amounts of water. Flow restricting aerators on faucets and showers could also help in conservation. There are so many things we could, and should do to play our part in this stressed environment.

After all, the answers aren't that difficult. Common sense dictates that we should be at least as efficient as people were two thousand years ago. Before the time of Christ, Greek and Roman architects designed their aqueducts so that 95% of the system was covered or underground. Some of the Greek aqueducts are as much as sixty-five feet beneath the ground. From all existing records, their leakage rates for municipal water mains were less than those of municipal systems today, with much of that having being water "stolen" by illegal taps into the ancient water mains.

There is no reason we can't provide better services than engineers two thousand years ago. Huge losses in our municipal water systems through evaporation or leakage

are both unreasonable and unforgivable. It's time our elected officials got involved in the plumbing industry and made our water supplies a priority.

As plumbers we've always fought against leaking pipes and wasted resources. It's time the common sense of the working man be put to the forefront of this battle. Our experts need to step up to the plate, modify our codes, stop the foolish waste of resources, and save the world through better plumbing practices. We have the technology, the skills, and the manpower. Let's get on with it.