

## Let's Talk Water – Water Use

By Dr. Mike Strobel

How people use water really depends on where one lives. In many parts of the world, societies are not strongly industrialized and most water use goes towards human consumption and crop irrigation. In the United States, the largest water withdrawals were for thermoelectric power generation and irrigation. A USGS report on water use in the United States (<http://water.usgs.gov/pubs/circ/2004/circ1268/>) describes that 408 billion gallons of water per day were used in the U.S. in 2000. Of this total amount of water, about 195 billion gallons per day were used for thermoelectric power. But much of this was saline surface water and represents water used for once-through cooling at power plants. About 52 percent of fresh surface-water withdrawals and about 96 percent of saline-water withdrawals went towards thermoelectric power generation. One could argue that because saline water is not available for other uses, such as drinking or irrigation, without expensive treatment, it shouldn't count when considering how water is used in the U.S.

With that thought in mind, let's look at how freshwater was used in 2000. Irrigation accounts for most freshwater use, at about 137 billion gallons per day in the U.S. in 2000, or about 40 percent of all freshwater withdrawn. California used the most irrigation water, about 30.5 billion gallons per day, or about one-quarter of the total irrigation withdrawals for the U.S. The next biggest user of irrigation water is Idaho at about 17 billion gallons per day in 2000. Nevada only used about 2 billion gallons per day in 2000. Public water supplies (water for communities) were the second biggest use of freshwater in the U.S., with about 43 billion gallons per day used in 2000. The big users were California, Texas, Florida and New York, where there are large populations living in urban areas. For comparison, California used about 6.1 billion gallons per day in 2000 for public water supply, whereas Nevada used about 629 million gallons per day for the same period.

Other water use categories are industrial, mining, domestic, livestock, and aquaculture. Of these, industrial is the largest at about 5 percent of all water use for the U.S. in 2000. Mining accounts for less than 1 percent of all water use. If you look at the water use report cited above, it doesn't list Nevada in the category of water use for mining. This is because water pumped for dewatering mines, which can be huge quantities in areas such as in northern Eureka County, are not heavily used for processing ores. Much of this water pumped from the ground either is applied as irrigation (and accounted for in this category) or put into streams. So the water isn't actually used for mining, but rather is transported from one place to another. Domestic water use is less than 1 percent of the total water use for the U.S. and includes water used inside and outside of homes that is supplied from private sources (non-public water supplies). Uses include washing dishes, bathing, flushing toilets, consumption, and watering lawns. The biggest users of domestic water are California, Michigan, and Florida. Livestock and aquaculture (farm-raised finfish and shellfish) both account for less than 1 percent of total water use for the country.

It is interesting to look at water use in terms of surface water and ground water. Surface water is used more than ground water for thermoelectric power, public water supplies, irrigation, industrial, and aquaculture. Ground water is used more than surface water for domestic supplies, livestock, and mining. If we consider only freshwater and ignore saline-water withdrawals, 40 percent of the total water used was for irrigation and of this, about 58 percent of the water came from surface-water sources. About 63 percent of public water supplies come from surface water (cities rely heavily on lakes, streams, and reservoirs for their water). In stark contrast, about 98 percent of domestic water supplies come from ground water.

So how does Nevada use its water? In 2000, Nevada used about 2.8 billion gallons of water per day. Of this amount, about 2.1 billion gallons per day are used for irrigation, or about 75 percent of total water use. Sounds like a lot of water, but Nevada ranks 16<sup>th</sup> in the nation for water use for irrigation, so by comparison, this number isn't so surprising. This makes even more sense when you consider that Nevada only receives about 9 inches of precipitation per year for much of the State, and that irrigation is essential for most vegetation to survive in this environment. About 629 million gallons per day go to public water supply, or about 22.4 percent of the annual water use. Thermoelectric power accounted for 36.7 million gallons per day, or about 1.3 percent. Other categories, such as domestic and industrial, were less than 1 percent of total water used in Nevada for 2000.

As one would imagine, when looking at public supply for water use in Nevada, the larger urban areas are the big users. Preliminary estimates for Nevada counties in 2002 show that Clark County uses about 73 percent of the total public supply and Washoe County uses about 14.5 percent. Together these two counties account for about 87.5 percent of the public supply water use for the entire state. The next biggest users are Carson City, about 2.7 percent, Elko County, about 1.8 percent, and Douglas County, about 1.6 percent. The rest of the 12 counties in Nevada combined make up about 6 percent of the total annual water supply use. Of course, this is entirely reasonable when you look at the population distribution for Nevada and the fact that most rural users are on domestic water supplies. Keep in mind that these numbers are just estimates, but they do provide a good representation of how public water is used in Nevada.

How an individual house uses water really depends on many factors, such as how many people occupy the home (in my case, how many kids you have and how long do they spend in the shower each day), the size of your lot, and where you live (desert verses the wet northeast U.S.). The Southern Nevada Water Authority has a website that shows total residential water use in the Las Vegas area ([http://www.snwa.com/html/ws\\_water\\_use\\_facts.html](http://www.snwa.com/html/ws_water_use_facts.html)). According to this website, residential use accounts for 65 percent of Southern Nevada's water use, and residents use about 70 percent of their drinking water outdoors (90 percent in the summer). The breakdown is given as 47 percent of the water goes to effective landscape outdoor use, 23 percent as wasted landscape water, 8 percent for toilets, 6 percent for laundry, 5 percent for showers, 5 percent for faucets, 4 percent for leaks, and 2 percent for baths, dishwashers, and other uses. SNWA points out that between 20 to 30 percent of

residential water is lost to leaks and waste water. I feel that these figures can be applied for much of Nevada, not just Las Vegas, and it shows not only how we can avoid wasting water, but also the importance to Nevadans to have lawns, trees, and gardens. SNWA has been making a strong effort to educate the public and to help residents conserve this valuable resource.

If you have any questions about water use or any other water topic, please contact me in care of the Ely Times or email me at [mstrobel@usgs.gov](mailto:mstrobel@usgs.gov). Next week, we will discuss the geology of eastern Nevada and how this affects water resources.