

## **A Summary of Lake Havasu City's Water Conservation Measures**

Every five years, the City must submit an updated water conservation plan to the U. S. Bureau of Reclamation (Reclamation) as part of its contract obligation for a Colorado River entitlement. The 2010 Water Conservation Plan details conservation measures that the City has in place and those that are proposed (on this website). This discussion briefly highlights water conservation efforts the City government has taken to date and those in the planning stages.

### 1) Supply effluent to golf courses in place of using treated drinking water.

The City has been supplying treated wastewater effluent to three of the four area golf courses, two for decades. Today, about 50% of the generated effluent is reused or between 2,000 and 2,400 ac-ft. The rest is percolated and lost back into the Colorado River system. The main issue is storage of the effluent when it is not needed for irrigation (please see further below and the Water Resources discussion). This water for many years was extremely cheap, but adjusted rates were established in 2009 to reflect this water as a commodity and today its cost is comparable to other effluent providers in the state.

### 2) Water Rate Structure Changes

Past water rate structure changes (1980's-1990's) helped to drive down water consumption within the City from over 450 gallons/person/day to less than 260 gallons/person/day (please see Water Service Area and Consumption discussion). Note: the current consumption rate is just under 200 gallons/person/day.

### 3) Water Conservation Officer

The City established a Water Conservation Officer position in 2000 through a Water Conservation Field Services (WCFS) Grant offered by the Bureau of Reclamation, which paid for half of this position's salary. Federal funding for this situation ended in 2012; however, the City deems this as a valuable position. Why? The Water Conservation Officer conducts many free home water audits (up to 1,000 per year) to help residents and businesses save on water consumption as well as money, particularly when related to the winter water averaging period (please see further below and the Water Consumption discussion). This position investigates high water usage and water wasting issues that a customer may not know they even have. During home water audits, the Water Conservation Officer has been distributing an irrigation water stop valve when the situation fits. This simple device connects to a bubbler riser and head, which keeps an irrigation system from wasting large amounts of water if the bubbler ever breaks.

### 4) Water Conservation Education

Communicating the importance of water conservation on a conceptual level as well as on a practical basis is key to increasing water use efficiency throughout the city. Water conservation education is emphasized through public presentations at trade shows, special events and at the schools. Over 1,500 school children per year receive a lesson in water conservation. In addition, the City's Slow the Flow campaign through newspaper, white sheet, cinema slide

show, pamphlet, cable channel 4, this website and even calendar public service advertising has offered tips throughout the seasons on smart irrigation practices, preparation for winter water averaging, water softener and evaporative cooler maintenance, and home inspection of water systems, including water fixtures.

#### 5) Water Conservation rebate programs

The WCFS grant has also helped the City to run water conservation rebate programs (2008, 2010 and 2011). Rebated items included low flow toilets, swimming pool solar covers, hot water recirculation pumps, and water pressure regulators. 1548 toilets, 311 pool covers, 320 hot water recirculation pumps, and 85 pressure regulators were replaced or added over the three years. Estimated water savings from these improvements is over 7 million gallons per year. Unfortunately, there is no available funding to continue this program at this time.

#### 6) The City's Parks Division

The Parks Division updated irrigation systems to increase water use efficiencies using WCFS funding in the past. They also adjusted watering times at different sites to minimize overwatering, adjusted sprinkler and bubblers so they do not waste water off the area of intended purpose. The Parks Division has also helped to revise the City recommended landscape plant list (on this website) by eliminating water thirsty plants and focusing on drought tolerant species, including as much native vegetation as possible.

#### 7) The City's Water Division

The Water Division is charged with drinking water production, treatment and distribution, and with over 480 hundred miles of water lines and 7000 valves, water leaks and under measured water can be a major source of unaccounted water waste. Water system maintenance and upgrades are a priority to minimize these issues. The Water Division took advantage of the sewer expansion construction by replacing inferior PVC water service lines to homes with more rugged wrapped copper lines at the same time those homes were connected to the sewer system. This has drastically reduced water leak problems in these areas. The City even received an \$8 million forgivable WIFA loan for this work.

Construction upgrades to the City's water booster stations and water tanks have also taken place to make them run more energy efficient with less water loss.

The Water Division is also upgrading old water service meters for both residential and non-residential customers. Water meters have a general useful life of ~20 years, but they tend to lose water flow count accuracy with time. Usually, more water moves through an older meter than is measured on the meter dial, especially if the water flow is low. Although this may be seemingly good for the customer, this is a source of unaccounted water that has an associated expense of treatment and transportation. The new water meters are not only more accurate, but can also be retrofitted with radio transmitters to automatically read water volumes on an almost continuous basis. While this technology would help with water accounting and help the customer to easily track their water use, it is expensive so the City will have to examine its options before moving ahead with this type of meter reading.

#### 8) Waterless Urinals

With the help of the WCFS grant, the City replaced 49 conventional urinals with no flush urinals throughout city owned structures, including park restrooms.

#### 9) City Property Conversion from Turf to Xeriscape

The City has reduced the area of turf landscaping at some its facilities. One notable place is the north side of the Police Station where grass was removed in favor of xeriscape consisting of drought tolerant plants, boulders representing local geology, park benches consisting of London Bridge granite, and metal artwork from local artists, including an interactive sundial. This park is called Heart of Havasu for the three heart-shaped areas that blend the above facets. The heart area furthest down slope is topographically inverted so it can collect rain runoff from the rest of the park for the plants in that area. This is known as green infrastructure landscaping (more on that below). A second xeriscape demonstration project was established at the Transit transfer station just north of Mesquite Avenue at Capri Lane.

#### 10) Water Conservation Citizen Volunteer Group

A water conservation citizen volunteer group was established in 2010 to help with various water conservation projects and help the Water Conservation Officer. The group has helped with developing water conservation presentations, developing this website, installing green infrastructure, running the rebate program, and generating water conservation tips and water harvesting techniques. The group continues to work on efforts for water conservation education.

#### 11) Green Infrastructure

The City received a small grant from the Watershed Management Group, a non-profit from Tucson, to install Green Infrastructure demonstration sites. Green Infrastructure allows runoff to be directed to where it can be put to beneficial use, such as watering plants rather than running off property down a street or wash. The west Aquatic Center parking lot was the focus of the first workshop in which a 114-foot strip of asphalt was removed in favor of plantings and gravel landscaping where rain runoff would flow into. The west corner of the parking lot was also restructured as a slight depression with plants to collect runoff from the rest of the parking lot. This area filters the water before some of it passes through to a drain into Pima Wash. Pervious concrete installation at the City Hall parking lot was the focus of a second workshop. This work mitigated a problem of rain water collecting in shallow ponds in the parking lot. The water is redirected to plantings at adjacent parking islands.

#### 12) No Water Waste Ordinance

A Water Waste ordinance that goes into effect during declared Colorado River water shortages was created in 2010 (Title 7 – Chapter 7.20 of the City Code). The ordinance was created to prepare in the event that real water supply shortages are realized. The ordinance gives

City Council the discretion to pick what provisions to enact that are appropriate to the given situation.

### 13) Colorado River Shortage Strategy Planning

Similarly, the 2010 Water Conservation Plan includes a section outlining a tool box of flexible action strategies for City Council to use during shortages. These include voluntary and involuntary water restrictions, purchasing water already banked with the Arizona Water Banking Authority, changing water rates, and water rationing. A newer alternative that should be in place by 2013 is the potential purchase of water from agricultural concerns in Mohave Valley that would fallow fields for the duration of a shortage period. Use of any combination of these strategies would again be at the discretion of the City Council.

### 14) Wastewater Sewer Expansion Program

This measure is quite controversial, yet the 2002 to 2011 sewer expansion program that effectively connected 85% of the City to sewer had an unintended water conservation consequence due to the way the City is currently financing the debt. Winter water averaging strongly incentivizes water customers to use the least amount of water as possible from November through the middle of April as the monthly sewer charge for the rest of the year is determined through this use (and the as the customers all know, it is not trivial). This has, along with many other measures mentioned above, helped to lower the average amount of water used by each person from 260 to just under 200 gallons/person/day.

### 15) City Hall Monitoring Well Conversion

The City is taking advantage of any way to decrease potable water irrigation and as mentioned in the beginning of this summary, is using treated wastewater effluent on golf courses. Expanding on this, the city has a monitoring well at City Hall that has the right set of conditions to be converted to a small-scale irrigation well. Landscaping at City Hall and the Police station will be irrigated from this well, saving about 10 acre-feet/year of potable water. The water level in this well is about 50 feet above the Colorado River accounting surface (please see Water Resources section), so the groundwater is not considered Colorado River water. This means that the water is not under federal control and any water diverted from the well will not count against our annual Colorado River water allocation. This project will be completed in the first half of 2013 and is funded through the current WCFS grant. The conversion is projected to save the City money each year in water treatment and energy cost expenses. A successful conclusion to this work will be used as a basis for other possible small-scale irrigation projects in the city.

### 16) Wastewater Effluent Reuse Program

Lastly for now, the City is involved in a long-term study to store and recover excess treated wastewater effluent so that more potable drinking water used for irrigation can be replaced. Today, about 50% of the effluent generated is used for irrigation. The other 50% is lost to the lake/river system. To change this situation we must overcome the problem of storing winter excess effluent that would be available for recovery during the warmer months.

Currently, some excess effluent is sent down wells at the North Regional Wastewater Treatment Plant south of the airport. This water percolates through the sediments and has formed a water mound, which ideally should be retrievable through recovery wells. One test recovery well drilled to this point though, did not have the sufficient yield to make recovery feasible. City staff is further evaluating options as the potential reward is significant. Up to 2,000 acre-feet of potable drinking water could be replaced with effluent if all parks, schools and other landscaping are converted. Why is this significant? Again it goes back to potential Colorado River shortages that would reduce the amount of water we could divert from the river. The less dependent we are on the river water, the better off we will be during those periods.