

**Report on Water Use Efficiency and
Conservation in the Las Vegas Valley”**

June 29, 2011

**Prepared for the Office of the Nevada State Engineer
on behalf of
Great Basin Water Network**

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A handwritten signature in black ink that reads "Peter Gleick". The signature is written in a cursive style with a large initial "P" and a long, sweeping underline.

Introduction

The Las Vegas Valley has grown rapidly over the past several decades, bringing new people and new opportunities. While this growth has benefited the region and its residents, it also presents new challenges. One of the most significant challenges is satisfying the water needs of the Valley in an equitable and sustainable way.

This report summarizes and updates the November 2007 report of the Pacific Institute and Western Resource Advocates, titled “Hidden Oasis,” which reviewed Las Vegas’ water conservation and efficiency efforts and potential, and offered an analysis of that potential.¹ That assessment commends local water agencies for implementing a number of innovative programs but concludes that considerably more could be done to capture existing inefficient and wasteful water uses, both indoors and outdoors. Indoor water conservation, especially, has been largely ignored in areal efforts. Our review of single-family residential customers, hotels, and casinos indicates that installing water-efficient fixtures and appliances could reduce current *indoor* water demand by 40% in single-family homes and nearly 30% in hotels and casinos. Installing water-efficient landscapes more widely and more aggressively could further reduce current *outdoor* water demand by up to 40% in single-family homes. Many of these efficiency improvements can be implemented at a lower cost and with fewer social and environmental impacts than developing new water supplies, including proposed efforts to tap groundwater systems in eastern Nevada (shared, some hydrologists believe, with western Utah) via new pipeline infrastructure.

Key Findings

Las Vegas Valley agencies have developed and implemented some innovative conservation and efficiency programs in the past. Nevertheless, the Las Vegas area remains significantly behind other Western U.S. cities in its efforts to cut wasteful, inefficient uses of water.

Las Vegas has implemented only a small fraction of the various water-efficiency programs being used successfully throughout the western U.S. This is one reason Las Vegas residents continue to

¹ Report of the Pacific Institute and Western Resource Advocates, “Hidden Oasis,” November 2007, http://www.pacinst.org/reports/las_vegas/index.htm.

use significantly more water per person, both indoors and outdoors, than residents of Tucson, Albuquerque, Los Angeles, and other arid and semi-arid U.S. cities. In 2008, for example, the most recent year for which consistent data are available, per-capita water use in the Southern Nevada Water Authority (SNWA) area was 241 gallons per person per day, better than the area's rate of over 348 gallons per person per day in 1990, but still far above most southwestern cities.²

Water conservation and efficiency improvements in the Las Vegas area can defer or eliminate the need for new water-supply facilities.

Efficiency improvements identified in our 2007 "Hidden Oasis" report would be far less costly to consumers and avoid the social and environmental impacts associated with building new supply and treatment infrastructure, such as SNWA's proposed groundwater development and pipeline project in eastern Nevada (SNWA Pipeline Project). Developing new supply, conveyance, and treatment facilities should not be pursued until more cost-effective options have been implemented and explicit comparisons between new supply and demand-reduction programs are an essential component of any sound planning or permitting effort.

While Las Vegas area residents have reduced outdoor demand in recent years, outdoor use is still higher than other arid and semi-arid U.S. cities.

One of the most innovative and well publicized conservation programs in the Las Vegas Valley promotes the removal of turf. Despite the initial success of this program, Las Vegas homeowners continue to use a large proportion of their water outdoors, where it evaporates and is lost from the system. Water utilities can and should expand incentives and education efforts to further reduce outdoor water use. These savings are especially important because of the consumptive use aspects of outdoor water use, and are especially valuable for reducing the need for new sources of supply.

Water conservation efforts in the Las Vegas Valley largely ignore the potential for indoor efficiency improvements, particularly for single-family homes. Those measures targeting indoor water waste have been poorly implemented.

² M.J. Cohen. 2011. "Municipal Deliveries of Colorado River Water." Report of the Pacific Institute, Boulder, Colorado. http://www.pacinst.org/reports/co_river_municipal_deliveries/.

While many water agencies in the western United States offer homeowners rebates and other incentives to replace wasteful fixtures and appliances with more efficient models, these incentives are not available to many Las Vegas area residents. Expanding indoor efficiency efforts and improving implementation of water treatment and recycling would provide substantial water savings by providing water that can be reused for a wide range of uses, without finding new supply.

Water agencies in the Las Vegas Valley have failed to prioritize measures that improve indoor water-use efficiency, because these agencies earn return flow credits for wastewater returned to the Colorado River. By putting more emphasis on return flow credits than indoor efficiency, water agencies miss opportunities to:

- Delay or eliminate the need for significant capital investment to expand conveyance and treatment infrastructure, such as the SNWA Pipeline Project.
- Permit more people to be served with the same volume of water, without affecting return flows.
- Reduce dependence on water sources vulnerable to drought and political conflict.
- Save the customer money over the life of those improvements through reductions in energy, water, and wastewater bills.
- Reduce energy and chemical costs associated with pumping, treating, and transporting water and wastewater.
- Reduce energy-related greenhouse gas emissions.

Water rate structures in the Las Vegas Valley fail to encourage water conservation and efficiency improvements.

People respond to price signals. Yet SNWA and its member water agencies in the Las Vegas Valley underestimate the importance of proper water pricing. Water rates in the SNWA service area, while higher now than several years ago, are still generally lower, per unit of water, than other arid and semi-arid cities in the West. Coupled with disproportionately high fixed rates, the rate structures of SNWA and its member agencies do not adequately encourage efficient water use. By adopting rate structures more in line with those that have become common among other arid and semi-arid cities in the West, SNWA and its member agencies could achieve

substantially greater water conservation and efficiency within SNWA's service area, eliminating or postponing the need for more costly and controversial new water supply infrastructure.

SNWA's long-term planning efforts fail to include conservation improvements and overestimate development and population expansion and thus may overestimate future demand.

While progress has been made in recent years, water demand projections for the Las Vegas Valley suggest that only small efficiency improvements will be sought or achieved in the future. Per capita water demand is projected to decline only modestly (less than 10%) over 30 years, despite evidence that other cities and water agencies have managed to sustain an average of 1% per year reductions in demand.³ This modest projected improvement suggests that cost-effective, technically achievable efficiency improvements, including those required in new construction by existing ordinances, are not adequately integrated into future demand projections. Moreover, future demand projections have typically been based on assumptions of future population and housing expansions that may not materialize and are well above rates for the past few years.

Las Vegas could significantly expand efforts to reduce inefficient and wasteful water use.

Water use in the Las Vegas area remains higher than it could be, and substantially higher than in many other Western communities. While data limitations prevent a full end-use analysis of all water users in the Las Vegas Valley, our assessment of water use by single-family residential customers, hotels, and casinos indicates that installing water-efficient fixtures and appliances could reduce current *indoor* water demand by 40% in single-family homes and nearly 30% in hotels and casinos. Expanding water-efficient landscape programs could further reduce current *outdoor* demand by as much as 40% in single-family homes. In our initial November 2007 assessment we estimated that water conservation and efficiency improvements for just these three sectors could reduce current water diversions by more than 86,000 acre-feet per year. While behavioral changes and efforts in other water-using sectors can produce even greater reductions, we did not address them in the 2007 report.

³ M.J. Cohen. 2011. "Municipal Deliveries of Colorado River Water." Report of the Pacific Institute, Boulder, Colorado. http://www.pacinst.org/reports/co_river_municipal_deliveries/.

Combining the conservation and efficiency strategies with programs and policies the Southern Nevada Water Authority (SNWA) has already implemented would further reduce vulnerability to future drought and increase overall system reliability.

The SNWA has developed and promoted some innovative policies and programs that have helped make the Las Vegas Valley's supply more reliable and drought-tolerant. Reducing demand through water conservation and efficiency improvements would improve system reliability further.

Recommendations

SNWA water planners, managers, and residents should fully pursue the steps laid out in the 2007 "Hidden Oasis" report to reduce water and related energy waste in Southern Nevada. These measures could be readily implemented at less cost and risk, more speed, and with greater reliability than the SNWA Pipeline Project.