



Town of Clarkdale



Background

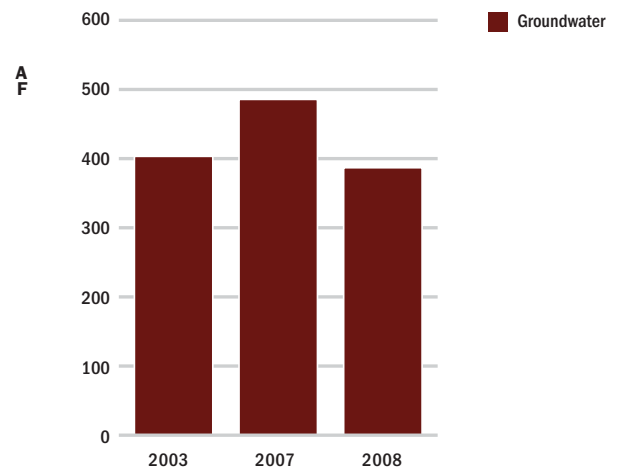
The town of Clarkdale—population 4,030—is part of Yavapai County in north-central Arizona.* The town is located on the banks of the Verde River, as it cuts through red rock canyon country and the northeastern part of the Mingus Mountain Range.

Clarkdale lies within the northern edge of the Central Highlands Transition Zone, just south of the Colorado Plateau. The average precipitation is 12.7 inches, with rainfall evenly distributed throughout the year. Average high temperatures in the summer are approximately 99.6 degrees (°F), and the lowest average temperature in winter is 30.6 degrees (°F).†

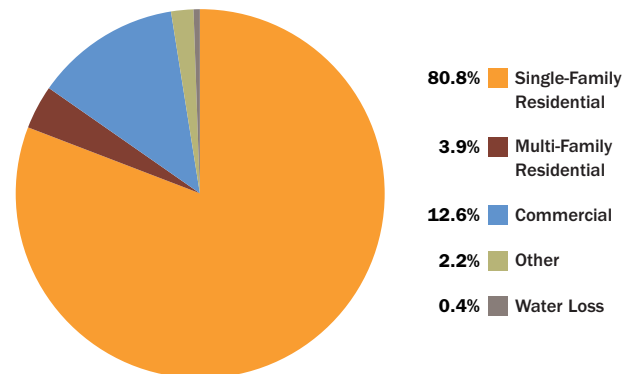
Water Supply and Deliveries

The town of Clarkdale purchased a private water utility in 2006 and consequently assumed all operations and maintenance of the town's water supply system. Water supply in Clarkdale is sourced entirely from groundwater, and the overwhelming majority of treated water is delivered for single-family residential use (81%).

SOURCES OF WATER FOR CLARKDALE



2008 WATER USE IN CLARKDALE



* Arizona Department of Commerce. 2009. *Arizona population estimates, 2009*. Available at: <http://www.azcommerce.com/econinfo/demographics/Population+Estimates.html> (accessed May 5, 2010).

† IDcide Local Information Data Server. Clarkdale, AZ weather. <http://www.idcide.com/weather/az/clarkdale.htm> (accessed July 5, 2010).



Per Capita

The town of Clarkdale has achieved a reduction in gallons per capita per day (GPCD) water use since assuming control of the water supply system. From 2006-2008, the town reduced residential use by 11%, system-wide potable use by 6.5%, and system-wide total use by 10%.

Clarkdale GPCD			
Per Capita Water Use	2006	2007	2008
Residential ^a	82	81	73
System-Wide Potable ^b	92	97	86
System-Wide Total ^c	97	109	86

^a Treated water deliveries to residential accounts ÷ service area population
^b Total treated water delivered ÷ service area population
^c Total raw water from all supply sources + direct effluent use ÷ service area population

Rate Structure

The town currently uses a three-tier inclining block rate for residential water accounts, and includes the first 1,000 gallons of water within the base service fee.

Usage Per Dwelling Unit	Cost
1,001–10,000 gallons	\$4.00 per 1,000 gallons
10,001–20,000 gallons	\$5.60 per 1,000 gallons
Over 20,000 gallons	\$7.84 per 1,000 gallons

Residential accounts have a base service fee of \$23.50, which represents 36% of an average customer’s monthly bill for 10,000 gallons. Customers are also charged several additional fees each month, including \$4.00 for Water Resource Development, \$0.32 for Yavapai County Water Advisory Committee, \$0.41 for Gila River Adjudication, and \$0.25 for Water Conservation Program. The slope of Clarkdale’s average price curve is 0.0247, indicating that the average price of water increases as consumption volume increases.

Conservation Measures

As a Community Water System in the Verde River Basin, Clarkdale has prepared a water conservation plan as part of its system water plan.

Customer Rebates

The town of Clarkdale does not currently offer any financial rebate programs.

Ordinances/Rules

Landscape Design Standards* – The plant materials used for landscaping shall be primarily native or drought-tolerant and conform to the city’s official plant list. The majority of each design plan must utilize Xeriscape concepts and incorporate energy and water conservation practices. Use of gray water is encouraged.

Standards for Golf Course Developments[†] – Applicant must submit a water management and monitoring plan demonstrating a project meets ADWR’s standards for golf courses within AMAs. The development must be able to generate a sufficient amount of effluent to meet the entire irrigation needs of the golf course. Golf course water use is limited to no more than five irrigated acres per hole.

Demand Reduction Strategies[‡] – Strategy Level I (“Water Alert”) is automatically in effect from May 1 through September 30, and is strongly encouraged on a daily basis at all other times of the year. Some mandatory measures include:

- Residential landscaping shall be accomplished with plant materials that require little or no supplemental irrigation water.
- Outdoor water use is prohibited between the hours of 9:00 a.m. and 5:00 p.m., and watering days are coordinated with a resident’s address.
- Cooling of outdoor areas with water or misting devices is prohibited.
- Restaurants shall serve water to customers upon request only.
- Hotels shall wash a customer’s linens if a stay is in excess of one night on request only.
- Automobile washing shall only be undertaken with a bucket and hose with shut-off nozzle, using other water-saving devices, such as a pressure washer, or at carwashes that recycle or recirculate water.

* CLARKDALE, ARIZ., CODE § 9-1 TO -9 (2010).

† *Id.* § 12-8-01.

‡ *Id.* § 19-11-4 to -6.



- Construction projects are required to use reclaimed water or effluent for construction and dust control purposes.

Water Conservation Code^{*} – Article 19-12 has been reserved for the town’s Water Conservation Code, which is currently under development.

Evaporative Coolers[†] – Evaporative coolers shall not be installed in new buildings or additions. Evaporative coolers are permitted only as a replacement for coolers and must have a water recirculating device.

Water Heating Systems[‡] – All water heating systems shall be equipped with a recirculating pump, manifold, or similar approved device, unless the farthest fixture using hot water is 10 feet or less from the water heater. All hot water piping shall be insulated.

Permitted Lawn Irrigation Systems[§] – Low-water-use drip systems are permitted for new and replacement lawn irrigation systems. Sprinkler systems may be repaired only and not expanded or installed except for permitted new or expanded turf.

Water System Damage[¶] – No person shall maliciously, willfully, or negligently, break, damage, uncover, deface, or tamper with any structure or equipment that is a part of the municipal water system.

Water Waste^{**} – It is unlawful for any person to willfully or negligently permit or cause the escape or flow of water or irrigation water in such quantity as to cause flooding, impede traffic, create a hazardous condition, or cause damage to the public streets of the town.

Education

Website – The Water Division of the town of Clarkdale hosts a webpage that provides educational information and materials to customers. The webpage details water quality and conservation information, including a link to the town’s Drought and Water Shortage Preparedness

^{*} *Id.* § 19-12.

[†] *Id.* § 7-2-1(AB) (amending Residential Code for One and Two Family Dwellings of the Town of Clarkdale).

[‡] *Id.* §§ 7-3-1(L),(M) (amending Plumbing Code of the Town of Clarkdale). See also *Id.* § 7-2-1(AI) (amending Residential Code for One and Two Family Dwellings of the Town of Clarkdale).

[§] *Id.* § 7-3-1(N) (amending Plumbing Code of the Town of Clarkdale).

[¶] *Id.* § 19-7-2(H).

^{**} *Id.* § 10-1-20.

Plan, and Conservation Tips. It also offers information on the town’s watering schedule and historical water use.

Outreach – The town provides water conservation methods and tips in monthly billing statements. Conservation information and articles are also featured in the town-wide newsletter.

School Programs – Water conservation staff provides education to the local elementary school.

Implementation of Conservation Measures

Clarkdale has not levied any fines due to ordinance violations; rather, warnings and additional water conservation literature is provided to first-time violators. The town provides water conservation education to approximately 80 elementary students each year.

Funding for Conservation

In 2008, the town of Clarkdale had a conservation budget of \$4,305, approximately 0.3% of the total water utility’s budget. All seven of the water utility’s employees participate in conservation programming and efforts at some level. Each year the town spends about \$1.07 per customer on conservation programs.

Goals for Conservation Savings

Clarkdale’s goal is to reduce GPCD water use across its system. The town started tracking GPCD in 2007 and has a goal to reduce use 6% between 2007 and 2009, from 82 GPCD to 77 GPCD, respectively.

Water Loss

In 2008, Clarkdale recorded 2 AF (652,000 gallons) of water loss, representing 0.4% of total supplies. This is substantially lower than water loss reported for 2007 at 52 AF (11%). For the period of data collection, Clarkdale and Cottonwood (a neighboring community) had an unmetered inter-municipal connection that made determining exchange water difficult, which may play into the low-water-loss number for 2008.

Supply-Side Efficiency Measures

Clarkdale recently contracted a study to determine leaks in the town’s infrastructure. In response to the study,

Clarkdale anticipates it will change out 135 water meters within the next year.

Effluent Use

Clarkdale captures and reuses all the effluent it generates. In 2008, the town generated 126 AF, and delivered 125 AF for recharge. The town is working on upgrading the quality of its effluent, so more reuse options will be available in the future.

Additional Information

The town has submitted grant applications to generate solar electricity for operating the water system.

Lake Havasu City 

Background

Lake Havasu City is located along the Colorado River on the eastern shore of Lake Havasu. The city is the largest municipality in Mohave County, with an estimated population of 55,502 residents.*

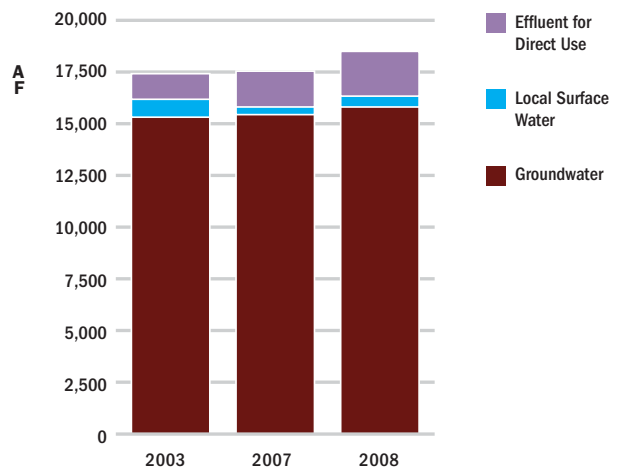
Lying in the Basin and Range physiographic province, Lake Havasu City has a low-elevation, desert climate, with average maximum and minimum temperatures of 86.6 and 63.9 degrees (°F), respectively. Average annual precipitation is 4.2 inches.†

Water Supply and Deliveries

In 2008, 86% of the water supplied to Lake Havasu City was sourced from groundwater wells, with a small amount directly diverted from Lake Havasu. Legally, most groundwater within the Lake Havasu service area is considered Colorado River water and is tracked according to Lower Colorado River decree accounting. Over the time period of 2003-2008, the city’s system-wide potable treated deliveries remained relatively flat, even while population increased 10%. The city attributes

this response to a progressive sewer rate structure based on water consumption (enacted to fund the transition of Lake Havasu City from a septic to a sewer system) and the general economic downturn of the past several years. Approximately half of all deliveries in 2008 went to single-family residential accounts and 10% was delivered for turf management.

SOURCES OF WATER FOR LAKE HAVASU CITY



* Arizona Department of Commerce. 2009. *Arizona population estimates, 2009*. Available at: <http://www.azcommerce.com/econinfo/demographics/Population+Estimates.html> (accessed May 5, 2010).

† Personal communication between Doyle Wilson, Water Resource Coordinator, Lake Havasu City Public Works, and Drew Beckwith, July 20, 2010.