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Phoenix (AZ) Water Enterprise

# Water System Prepared to Manage Current Drought With Diverse Sources and Substantial Volume

## Summary

Despite Arizona's nearly 15-year drought, the [City of Phoenix Water Enterprise](#) (Aa2 stable) is well positioned to handle any future imbalance between water supply and user demand. The [City of Phoenix](#) (Aa1 stable) has managed through every drought in its nearly 100-year history, never declaring a drought emergency. The city's municipal water system benefits from a diverse and substantial range of sources, and when combined with a record of aggressive management, is prepared to meet demand across its service area. Key factors in our analysis are:

- » **Supply is strong due to a combination of diverse sources, substantial volume of available water and prudent long-term planning and creative storage solutions.** Phoenix Water Enterprise customers only use about 40% of supply provided by the Salt, Verde and Colorado rivers and other sources. The water system also participates in a state effort to store unused Colorado River water underground, while last month it reached an agreement to use some of [Tucson's](#) (Aa3 stable) storage space.
- » **Phoenix Water Enterprise's infrastructure allows ample flexibility and capacity for future growth.** The system will maintain solid financial flexibility as Phoenix's population grows and the economy recovers. The city has shown a willingness to raise rates, though they have remained flat since 2012. Projections call for modest 3% annual rate increases between 2016 and 2020.
- » **The Phoenix system has a comprehensive strategy to meet demand in an extreme scenario such as the Secretary of the Interior reducing Arizona's access to Colorado River supply.** The system's demand management approach calls for multiple stages of usage reduction, including implementation of a surcharge. On the supply side, the city has priority rights on water from the Salt and Verde rivers, which could offset Colorado River reductions. Backup options also include increasing groundwater and reclaimed water.

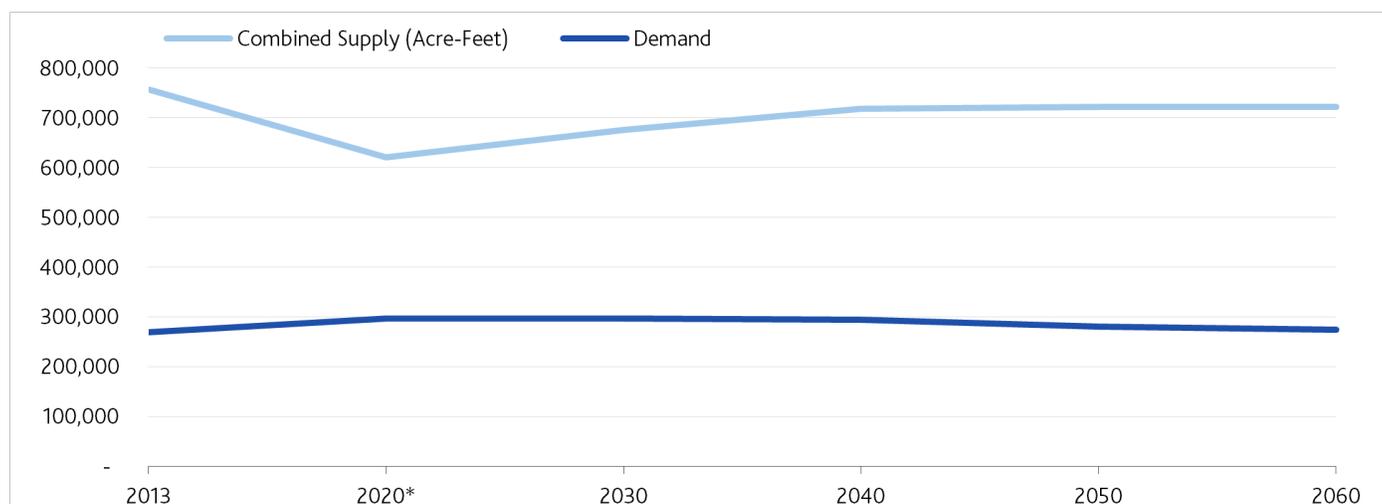
## Supply is strong with diverse sources, substantial volume and creative storage solutions

Phoenix Water Enterprise sources are very diverse, providing highly reliable supply. The system gets 95% of customer drinking water in roughly equal shares from two surface water sources. The Salt River Project (SRP) delivers water from the Salt River and Verde River, and the Central Arizona Project (CAP) provides supply from the Colorado River. In addition, the Phoenix system has access to groundwater resources as well as flexibility in the use of reclaimed water.

The multiple sources help the enterprise maintain supply that far outstrips demand. The city's annual water demand of 302,087 acre-feet accounts for 40% of its combined supply of 757,025 acre-feet (see Exhibit 1).

Exhibit 1

### Multiple Water Sources to Provide Ample Supply For Decades



\*Roosevelt Dam was modified in 1990's to increase storage in wetter years. This additional storage is not included for planning purposes

Source: City of Phoenix, AZ

With the enduring California drought, the Secretary of the Interior could declare a reduction in Colorado River water deliveries below the Hoover Dam. In that type of extreme low-supply/high-demand scenario, Arizona's junior water right priority as a state means cities like Phoenix could see a reduction in supply from the Central Arizona Project (CAP), which relies on the Colorado River. However, we believe that the Phoenix system has enough other substantial resources at its disposal to mitigate any potential shortfalls.

Under the current "Law of the River," the Colorado River's flow is allocated according to a compact between upper basin and lower basin states. The lower basin states – [California](#) (Aa3 stable), [Nevada](#) (Aa2 stable) and [Arizona](#) (Aa3 positive) – share 7.5 million acre-feet per year from the Colorado River. Arizona is entitled to 2.8 million acre-feet. Of that 2.8 million acre-feet, about 1.7 million has a junior standing to California and would be cut back in the event the Secretary of the Interior declares a shortage.

Still, even in the most severe Tier 3 shortage, over a million acre-feet of Colorado River supply would still be available to Arizona entities. The Phoenix water system holds rights to 186,557 acre-feet of CAP water, and nearly 149,227 acre-feet would be available in nearly all shortage scenarios. Typically, the Phoenix water system's dependence on Colorado River does not exceed 130,000 acre-feet annually. Even under high-growth projections, Phoenix's need for Colorado River water does not exceed 149,227 acre-feet to meet annual demand until at least 2023. <sup>1</sup>

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Also in preparation for shortfalls, Arizona as a state and Phoenix in particular have been leaders in creative water storage solutions. In 1996, the state established the Arizona Water Banking Authority to store or “bank” unused Colorado River water underground for drought protection. That supply is available to water departments in the Phoenix region on a pro-rata basis. Currently, the banking authority has 1.6 million acre-feet stored underground for the region, roughly equivalent to the amount delivered to the state in one year.

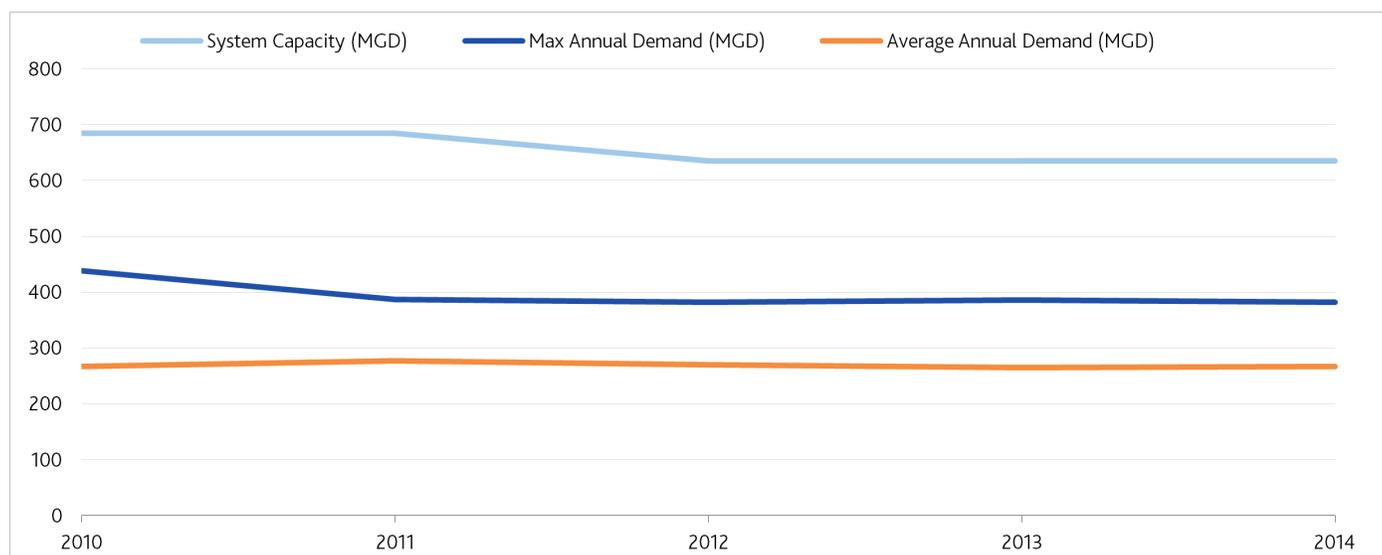
In October, the city entered into an agreement with the [City of Tucson Water Enterprise](#) (Aa2 stable), where the Phoenix Water Enterprise can expand its supply by accessing Tucson’s substantial underground storage space. The agreement allows the Phoenix system to increase its typical annual use of 130,000 acre-feet of CAP water up to the 149,227 acre-feet high-priority maximum, with the difference stored underground for later use. Per the agreement, Tucson Water can use the CAP water sent by Phoenix Water while Phoenix Water will receive an equivalent amount of Tucson Water’s CAP supply. Also, the agreement will result in long-term savings for both cities, with reduced pumping costs for the City of Tucson as increased underground recharge raises the water table, while Phoenix avoids having to build additional wells and storage capacity.

### Phoenix Water Enterprise's infrastructure system maintains ample flexibility and capacity for future growth

As the economic recovery continues, the Phoenix system's current infrastructure is well positioned to handle growth. The city has historically benefited from strong population growth and the system has ample treatment capacity and supply to ensure appropriate demand management (see Exhibit 2).

Exhibit 2

Treatment Capacity Well Above Demand Even On Heavy Usage Days MGD, million gallons per day



Source: City of Phoenix, AZ

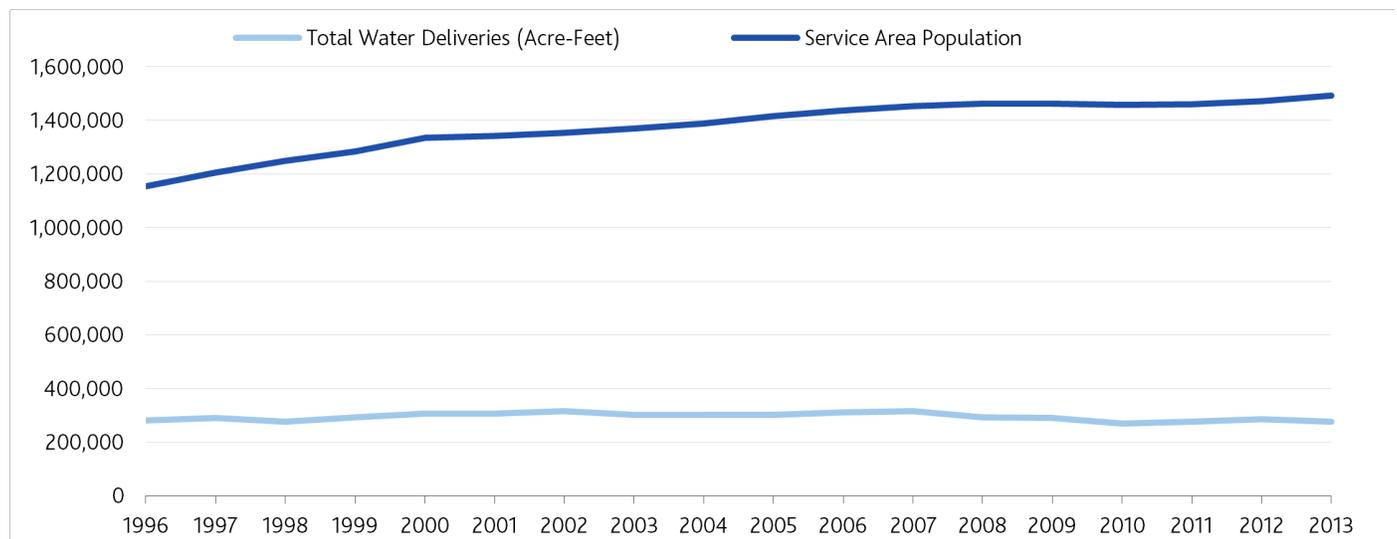
In 1980, the Arizona Groundwater Act was enacted by the state legislature. Regulations under the legislation require a reduction in per-capita water consumption in phases, while also requiring a gradual elimination of groundwater use in excess of that recharged by 2025. Phoenix remains in compliance with these requirements. Importantly, the legislation also requires the Arizona Department of Water Resources (ADWR) to determine the adequacy of each municipality's water supply to support proposed development. In September 2010, ADWR approved the Phoenix's application for a Designation of Assured Water Supply for the next 100 years.

Water demand has been relatively flat recently in Phoenix despite a trend of healthy in-migration and development (see Exhibit 3). Flat and lower demand helps preserve the enterprise's infrastructure. Factors curbing demand include newer technology and

changes in development trends. Back in 1992, the City of Phoenix became one of the first cities to adopt local water efficiency standards for new plumbing fixtures. Another factor in reduced demand is that customers are embracing a desert lifestyle and zeroscaping their yards with no grass and low water plans. Notably, smaller lots can decrease residents' opportunity to install backyard pools. All combined, water demand per capita for Phoenix decreased by 25% from 1994 to 2013.

Exhibit 3

### Steady Water Usage Despite Population Growth



Source: City of Phoenix, AZ

The system's use of rate adjustments not only helped support its infrastructure, but rate increases also curbed customer water demand to some degree. From 1992 through 2012, the city adjusted user rates annually, followed by no rate increases through 2015. Going forward, only modest rate increase of 3% annually are projected between 2016 and 2020. We view the city's demonstrated willingness to raise user rates, combined with still relatively low user rates relative to other large cities, as a credit strength. Looking ahead, the enterprise will retain sound revenue-raising flexibility as currently low rates and ample infrastructure capacity support regional economic growth and new customers.

### Phoenix Water Enterprise has a comprehensive strategy to successfully deal with extreme scenarios

The city's Drought Management Plan and Water Resource Plan outline prudent deficit mitigation strategies to prepare the city for an extended drought/high-demand scenario, including the Secretary of the Interior declaring a reduction in Central Arizona Project (CAP) water supplies.

The city's Drought Management Plan provides for four stages of voluntary and involuntary demand reduction actions. Specifically, one provision in the plan provides the water services director with the power to institute a drought surcharge. The city has never had to take any of these actions since a drought emergency has never been declared.

Supply strategies are also robust and address shortage scenarios for each of the city's major sources. As mentioned above, the city does not fully utilize its CAP allocation and it would take a severe scenario to impact the city's CAP water. Further, the city's water infrastructure is built such that sources from the Salt River Project (SRP) could offset CAP reductions.

Similar to CAP, the city has the highest priority rights for SRP water. If a drought scenario in the watershed causes an extended period of low inflow, the SRP maintains significant well capacity to supplement surface water supplies if a drought persists.

Additional surface water on the SRP system is also available through the Roosevelt/Indian Community exchange water, New Conservation Space water and Verde River gate water sources, providing substantial "backup" water supplies. These supplies are

typically little utilized during normal conditions in order to preserve availability for periods of shortage. Either of these sources could be used to offset a shortage in the CAP systems.

Further supply is provided by groundwater sources and the city's use of reclaimed water, although these two options would be tapped last. Groundwater withdrawals have averaged 9,000 acre-feet annually relative to 15,000 acre-feet of capacity available to the city. However, additional treatment may be necessary to increase the yield on this source. Per an exchange agreement with Roosevelt Irrigation District (the Roosevelt/Indian Community exchange water), the city could increase deliveries of reclaimed water and in exchange the Phoenix system would receive a similar amount of potable groundwater.

## Endnotes

- 1 To read previous Moody's commentary on the impact of Colorado River flows on municipal water enterprises, refer to our Special Comment [Existing Stored Water Buffers Near-Term Drought Risk for Colorado River Municipal Water Enterprises](#) , February 26, 2014.

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