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TONTO HILLS WATER SUPPLY AND DEMAND

BACKGROUND AND SAFETY OF WATER SUPPLY

Tonto Hills Utility Company (THUC) acquired a water allocation of 71 acre-feet per year (AF/yr) from the Central Arizona Water Conservation District (CAWCD) via the Central Arizona Project (CAP) canal and brought it online in March 2004. Under an intergovernmental agreement, City of Scottsdale draws our water allocation from the CAP canal, treats it with its own CAP allocation, and delivers it to us via the Desert Mountain water distribution system. Therefore, our water is effectively Scottsdale water and includes Scottsdale well water. The water is then stored in our hillside water tank from which it is distributed by gravity to our customers via more than 6 miles of pipeline within Tonto Hills. This “surface water” supply replaced a groundwater supply that was provided by two aging THUC water wells that were located on nearby U.S. Forest Service property, had quality and quantity issues, and could not keep pace with the water demand. The Tonto Hills Domestic Water Improvement District (THDWID) acquired THUC’s assets in December 2010, but the federal leases for the THUC well sites were not transferred to THDWID and, due to quality issues and low production from the granite aquifer, local wells are no longer a practical option for Tonto Hills. Currently, the limited CAP supply is the only feasible long-term source of water for Tonto Hills.

Our CAP water allocation is classified as Municipal and Industrial, which means that we hold a significant priority over other major users of CAP water, such as all agricultural and excess water contracts and recharge projects. In fact, only the Indian long-term contract entitlements have a higher priority on the CAP system. Arizona Department of Water Resources (ADWR) reports that the risk of our allocation being reduced due to prolonged drought conditions is low. If cuts to the CAP system occur, they are borne by lower priority water users first. If a prolonged drought condition eventually requires any reductions in allocations at our priority level, they would be shared equally on a percentage basis among all the other municipalities and industries in our classification and that reduction would likely be small. These factors indicate that our water supply will last for the foreseeable future (our renewable CAP contract term is 100 years) and that any interruptions of the CAP system will be temporary in nature and will be due chiefly to operation and maintenance issues. In addition, none of these projections of drought risk take into account implementation of effective water conservation measures that would surely occur and reduce water demand across the CAP-supplied system.



The THDWID Board is committed to providing sufficient potable water for its members within the limits of the available resource. We are preparing for unforeseen interruptions in CAP water supply by banking our unused CAP allocation at a Groundwater Savings Facility. By banking, we obtain long-term storage credits against which Scottsdale can pump groundwater in lieu of CAP water to continue meeting our needs, if necessary. In addition, we have identified water-trucking companies that could help us through short-term local interruptions in the Scottsdale water system or in our own distribution system. Other ongoing efforts include potential acquisition of additional CAP water supply through the phased ADWR reallocation of Non-Indian Agriculture water. The THDWID New Build/Remodel Policy was first developed in 2014 to encourage design of new homes and renovation of existing homes to be consistent with our long-term water management goals and to discourage designs that could put new members at risk of having insufficient water for full enjoyment of their homes when we approach full build-out.

SUSTAINABILITY AND WATER DEMAND

The Board has also analyzed our potential water demand at full build-out of the Tonto Hills community to determine the sustainability of our current rates of use and to plan ways to keep our supply sustainable in the coming decades. It is difficult to predict exactly how many homes will be built in our subdivision because there are some parcels that may not be buildable due to the terrain.

Based on our useable CAP allocation and the current maximum number of parcels that could potentially be developed at “full build-out” (225), the Board projects that there will be sufficient water to supply about 87,000 gallons per year (gal/yr) to each residential/commercial customer at full build-out if everyone used the same amount of water. This amount is equal to an average monthly supply of about 7,250 gallons per lot. This amount is consistent with the per capita usage assumed by the ADWR for communities like ours. The bases for these projections include:

1. Only **60 AF/yr** (or 84.5%) of our 71-AF/yr allocation is estimated to be useable based on the following assumptions:
 - a. Pipeline and storage losses of **5%**, which are claimed by Scottsdale for delivering the water to us (per our Scottsdale contract for treatment and delivery of our CAP allocation).
 - b. Pipeline losses up to about **10%**, which occur within Tonto Hills before water reaches the customers. During 2011-2017, average annual internal losses ranged from 13.1% in 2013 to 8.3% in 2016; overall average was 10.8%. Losses have been reduced to less than 10% in 2015-2017 through



management practices (meter replacement, improvement in meter accuracy and leak detection, etc.). Standard loss rate in the industry is 10% to 15%.

- c. The landscaping at the front entrance of Tonto Hills is assumed to use an average of about 10,000 gallons per month (0.4 AF/yr), or about **0.5%** of our total allocation.
2. There are 203 residential and 22 commercial parcels that have or could have water service at full build-out; total is **225**.
3. No long-term reductions in our allocation due to drought or other causes are assumed to occur (external factors that may decrease our useable allocation include: cut backs to Municipal and Industrial CAP allocations due to drought; interruption of CAP supply due to terrorist attacks or canal maintenance/repairs; ADWR actions taken due to unsustainable population growth; etc.).

Unlike large municipalities in the valley, THDWID has a finite source of CAP water that cannot be augmented by pumping groundwater from our own wells. Therefore, the Board believes it is fair and reasonable for both current residents and unbuilt parcel owners to expect an equal share of the limited water resource if they need it, regardless of their current water demand. Otherwise, some THDWID members might not have sufficient water if others use excessive amounts of water. Using the 60 AF/yr of useable allocation described above and assuming the THDWID will have to supply water to 225 parcels at full build-out, the equal per-lot-share would be about **87,000 gal/yr**, which is equal to an average use of **7,250 gallons per month**.

More than 76% of the customers (104 of 136) used *less than* 87,000 gallons in 2016 and most of these customers used far less than this amount. Nearly 24% of the customers (32 of 136) used *more than* this “equal share” amount; the top 10 users used more than twice this amount (185,000 to 346,000 gallons).

Future Boards should change this “equal share” threshold accordingly if the useable allocation changes or better information becomes available over time for the assumptions used in the calculations. The threshold is intended to be the demarcation on which the Board can base high-use tiers in the rate schedule and, further, can consider restrictions and levying of fines for overuse when water resource conditions are critical.

The THDWID is far from needing to institute substantive restrictions, unless external factors threaten our water supply, because:



1. As of December 2017, THDWID was only 60% of projected full build-out.
2. In 2016, the median and mean customer metered water use in the THDWID was only 63% and 80%, respectively, of the estimated 87,000 gal/yr "equal share".
3. As a community, metered water use in 2016 was only 48% of the estimated 60 AF/yr useable allocation.

However, in the long term, the concern is that the percentage of use by each customer could change to a point that it is not sustainable for the community as we approach build-out. At that point, substantive measures will be necessary to bring excessive water users in line with the rest of the community. The responsible approach is to inform THDWID members of the limitations of our water supply so that customers can monitor their use and work to bring it down to a sustainable level and so that new home builders can design features compatible with the equal share threshold of sustainable water use.

ACTIONS TAKEN TO ASSURE SUSTAINABILITY

To address these issues and to provide a sustainable water supply for all THDWID members, the Board believed it was prudent to establish a new commodity rate schedule on January 1, 2014 that can be used in conjunction with THDWID's Conservation Plan, which is required by the State of Arizona. The Board considered the pre-2014 usage characteristics and commodity rates for our community, rate structures for nearby towns and communities, and the potential impacts to water bills of current and future THDWID residents. Design of the 2014 rate schedules included numerous iterations of alternative rates using 2012 actual meter readings to arrive at a structure that:

1. Has no impact on existing/future customers that use no more than 13,000 gallons per month.
2. Has no significant impact on even the highest users until Conservation Stages 3 or 4 are reached (expected to be decades into the future at current home building rates, unless external factors threaten our water supply).
3. Provides future Boards with the tools to incentivize users to conserve when required.

The 2014 conservation water rate schedules retain Tiers 1 and 2 of the previous 3-tier schedule, but add three new tiers for high water use. This structure is consistent with rate schedules for many nearby municipalities, including Cave Creek, Carefree, and Scottsdale. The Conservation Plan includes restrictions on certain types of water use at various stages of threat to our water



supply, as well as consumer education and counseling on water conservation. In addition to the 2014 rate schedule, the THDWID Board will be able to levy fines and impose other restrictions when necessary during Conservation Stages 3 and 4 to provide further incentives to reduce water usage to sustainable levels.

PRIOR WATER RATE SCHEDULES vs. 2014 CONSERVATION RATE SCHEDULES					
COMMODITY RATES PER 1,000 GALLONS PER MONTH					
(Zero Gallons Included in \$40 base rate)		2013 and prior	2014 (Stages 1 & 2)	2014 Stage 3	2014 Stage 4
1st Tier: 0 – 4,000 Gallons	\$	6.80	6.80	6.80	6.80
2nd Tier: 4,001 – 13,000 Gallons	\$	10.20	10.20	10.20	10.20
3rd Tier: 13,001 – 20,000 Gallons	\$	12.30	12.30	15.00	20.00
4th Tier: 20,001 – 30,000 Gallons	\$	12.30	12.42	20.00	40.00
5th Tier: 30,001 – total usage	\$	12.30	12.55	30.00	70.00

The THDWID Conservation Plan gives detailed descriptions of the conservation measures to be taken in four stages, based on water supply conditions. The Conservation Rate Schedules for Stages 3 and 4 would become effective when the following conditions occur:

Stage 3: Any combination of build-out, water use, and adjustments to useable allocation causes **80% or more of the total useable allocation** to be used

Stage 4: Any combination of build-out, water use, and adjustments to useable allocation causes **90% or more of the total useable allocation** to be used

Note that adjustments to useable allocation could be caused by internal factors (differences in the assumed 10% unmetered water loss) or external factors (reduction in CAP or local water supply).

The Board makes decisions annually regarding implementation of the Conservation Rate Schedules at the February THDWID Board meeting so that an announcement can be made at the Annual General Meeting in late March. Decisions are based on the usage data for the previous year. If implemented, the Stage 3 or 4 Conservation Rate Schedules would be applied beginning with the water invoices for April of that year and would continue until a different conservation stage is declared. The Board may implement Stage 3 or 4 rates at other times based on the then-current water supply conditions and it intends to provide ample advance notice to the THDWID customers to allow them to alter their use patterns to avoid the high-use rates and potential fines.