

## Demand - Supply Analysis for Conservation

The City of Tulare is a municipal water supplier that relies exclusively on groundwater supplies. The scope and requirements of the Stress Test Self Certification (three additional years of precipitation and potable demand equal to the last three years) provide a spotlight on the importance of Tulare's sole potable water source to its community. The following is an analysis of demand and supply within those parameters.

### Demand

Over the years 2013 through 2016 potable demand has steadily decreased year after year: 18,877.6 AF in 2013, 17,311.9 AF in 2014 and 15,165.8 AF in 2015. This coincides with calls for conservation both as voluntary and mandated during that period. This trend will continue into the foreseeable future as the City and residents of Tulare continue to make changes to consumption practices that promote sustainable demand.

### Supply

The difficulty in providing an analysis of groundwater supply volumes is that these measurements are very infrequent and imprecise (as compared to surface water volumes for example). The implementation of adopted groundwater sustainability plans in the future will alleviate much of these difficulties. Until then, Kaweah Delta Water Conservation District (KDWACD) has only very recently released an update to the Water Resource Investigation document that identifies an estimated volume in the aquifer that Tulare utilizes, Hydrologic Unit V of the aquifer beneath KDWCD. (See these locations in the WRI update document located at [www.kdwcd.com/kdwcdweb\\_005.htm](http://www.kdwcd.com/kdwcdweb_005.htm) ) Hydrologic Unit V also includes the City of Visalia, another significant municipal groundwater customer, supplied by California Water Service Company.

This document has identified estimated aquifer volumes for the entire district as well as each of the six hydrologic units within the district through 2012. This document identifies volume estimates for specific yield methods of 6%, 8% and 10% from 1952 through 2012. For conservative analysis purposes Tulare has utilized 6% yield for aquifer volume estimates. Over four year intervals the specific yield volumes show a decrease of -0.3% through the historical data. Utilizing this consistent rate of volume decrease, staff has extrapolated changes in aquifer volumes in hydrologic unit V from 2012 through 2019. This is an additionally conservative view of volume change because the historical data is collected in four year increments, so the degree of volume change may be greater or lesser from year to year. Additional conservative analysis measures have been taken by looking strictly at aquifer volume estimates not accounting for annual precipitation inflows to the aquifer that may become available or the anticipated future effects of conservation as the community improves conservation and water efficiency efforts. Strictly speaking, staff has reviewed supply data strictly as though no additional supplies will be added to the aquifers, the existing supplies are conservatively estimated, and residents do not improve or regress in terms of conservation efficacy. *(See table below, also attached spreadsheet 'WRI GW Storage Projection')*

Total Groundwater in Storage (AF)		
	Entire District	V
<b>2012</b>	<b>15,933,509</b>	<b>4,316,539</b>
2013	15,790,107	4,187,043
2014	15,647,996	4,061,432
2015	15,507,164	3,939,589
2016	15,367,600	3,821,401
2017	15,229,292	3,706,759
2018	15,092,228	3,595,556
2019	14,956,398	3,487,689
avg % Change	-0.9%	-0.3%

### Standing Water Levels

Staff reviewed the current and historical standing water levels because they represent the immediate local access to groundwater supply for the City. The City of Tulare currently maintains 24 potable production wells in the system. The representative well identified in the Groundwater tab of Worksheet 1 is Well 27. (See attached spreadsheet 'Standing Water Levels') Currently it is estimated to have an additional 90 feet available between the water level and the existing bowl depth. The current overall standing water level in Tulare's wells is estimated to be 200 feet. Historically, the City has seen an estimated average drop in standing water levels of 4.5 feet per year over since 2009. In the period since 2013, the average annual drop is estimated to be 9.6 feet per year, demonstrating an increase in the rate of lowering of the standing water levels in recent year as compared to historical data. If Well 27 is to be taken as representative of all the wells in the system, by 2019, if current rate of drops in the standing water depths continue, Well 27 will have an estimated 51 feet of water available even if the city were to make no additional modifications to the depth of the bowls on this well. Any outlying older wells that the city currently has that may be negatively affected by the end of 2019, such as if they become non-productive, will be replaced with addition of at least two new wells and several storage tanks that are currently in the City's Capital Improvement Plan for completion prior to the end of 2019.

### Conclusion

The City of Tulare acknowledges the importance of conservation, water efficiency and mindful resource management. Although the City's sole source of potable water is through groundwater supplies, which does not yet have highly accurate and regularly updated aquifer volume estimates and is shared with other sizeable municipal suppliers, the information that is available in no way indicates a dire shortage or threat of shortage to the City of Tulare within the three year stress test parameters set forth by the State. What staff identifies, even with additionally conservative controls beyond what has been requested by the State, is that the stress test does not identify a supply shortage or conservation target. However, the current drought context, coupled with the upcoming policy environment created by the

Sustainable Groundwater Management Act requires that Tulare continue conservation efforts and be an active steward of our groundwater resources.

On June 2, 2016 the City of Tulare Board of Public Utilities approved the adoption of a 20% conservation target standard based on 2013 production. Doing so retained the existing water conservation stage and related prohibitions and requirements that have been adopted to meet the state mandated 30% standard. This adopted standard will be based on potable water production regardless of customer class and will continue to move the City of Tulare closer to its SB X7-7 conservation goals for 2020.