

ATTACHMENT C

Lake Powell Pipeline Project No. P-12966

Water Needs Assessment:

Water Use and Conservation Update, Response to Comments

Utah Board of Water Resources

Lake Powell Pipeline Project No. P-12966
Water Needs Assessment: Water Use and Conservation Update
Response to Comments

1. Introduction

Water conservation is an essential component of water resource planning for the Washington County Water Conservancy District (WCWCD) and the Kane County Water Conservancy District (together “Districts”). Since the Federal Energy Regulatory Commission (FERC) Application was filed in 2016, the State of Utah has published more current water use data, including updated gallons per capita per day (gpcd) numbers. In addition, WCWCD is incorporating into its water resource planning more aggressive water conservation goals as it continues evaluating and enhancing its various water saving programs. The State of Utah and Districts, as LPP proponents, submit this updated information on water use and conservation to ensure that FERC has the most current and accurate data available as it reviews the Application and completes the NEPA process.

2. The “Big Picture”

To deny the need for a second water source for Washington County and place a singular focus on the reduction of water demands, i.e., conservation, is to ignore the “big picture” issues associated with the development of a comprehensive, long-term water supply plan. In reality, water conservation is a large element of southwest Utah’s comprehensive long-term water supply plan. Other key elements include water reuse, projects to maximize use of local water supplies, agricultural water conversions and the Lake Powell Pipeline. See Figure 1. This diverse portfolio is technically, environmentally and socially feasible and responsible solution to southwest Utah’s complex water supply challenge. The portfolio takes into consideration critical factors that must be examined to meet, on a consistently reliable basis, the future water needs of a growing community, and does so in a way that respects local social and environmental values, while recognizing affordability constraints. To eliminate any of these elements of the portfolio adds risk and vulnerability of shortage or simply not being able to meet future water needs.

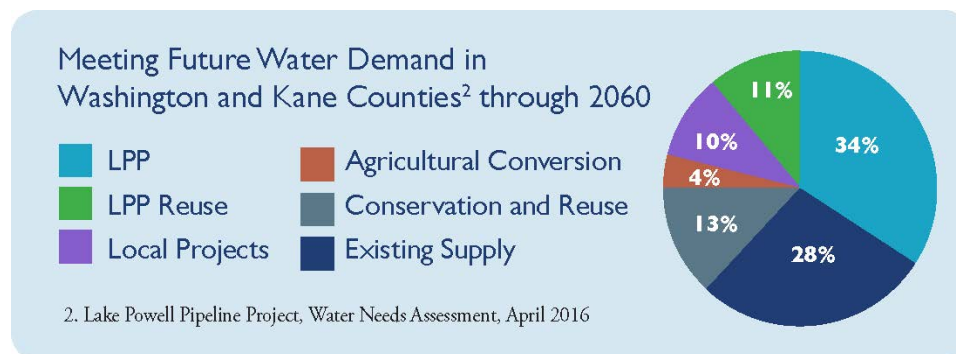


Figure 1. Meeting Future Water Demand in Washington and Kane Counties through 2060

The LPP, as proposed, is necessary not only to meet the identified future water needs of Washington and Kane counties, but to achieve other prudent planning objectives:

- Provide for System Diversity/Reliability: Washington County is currently wholly dependent upon the Virgin River basin as a source of water supply. That supply has associated water quality problems¹, and is vulnerable to natural events such as forest fires that will exacerbate water supply issues in the future. In addition, water supply models designed to project future flow scenarios in the Virgin River under differing climate regimes call into question the annual reliability of the quantity of water available from this source, particularly in the crucial summer months. Water delivered from the Colorado River via the LPP would alleviate these concerns.
- Provide for System Redundancy: Pumps, pipelines, storage and treatment facilities are all essential components of a reliable water supply system. Over time, both system failure, e.g., due to aging infrastructure and natural or human-induced disasters, e.g., earthquakes, rockfalls, or operational errors, may interrupt essential water deliveries. To the extent there exists only one water source and one water delivery system, the community remains at risk. LPP provides needed system redundancy.
- Account for Climate Variability: Climate projections show a potentially warmer and drier future, with more intense and/or prolonged droughts and more intense rainfall events when storms do occur. Prudent planning demands both the incorporation of additional sources of supply to meet demands in times of drought, as well as access to storage facilities that will capture water when it's available for use when water isn't obtainable. LPP provides this buffer.
- Account for Long-Term Uncertainty: Given the number of variables associated with both water supply and demand from climate change, to rates of growth, to the use of emerging water saving technologies, it is not possible to pinpoint the exact amount of water supply that will be necessary at a specific point in time. That said, water supply cannot be treated as a commodity, like factory-produced widgets that can be "manufactured" or delivered on a real time basis.² Water supply projects take years, if not decades, to plan, permit and construct. Responsible public water suppliers must assess long-term water availability and demands based on best available data and information. They must also assess the risks associated with a failure to act. Those who would have the Districts forego development of LPP and instead rely primarily on conservation in combination with agricultural water transfers fail to acknowledge the immense risk associated with a failure to timely utilize available Colorado River supplies. That analysis³, even if assumed correct, would have the Districts depending upon a potable water supply which merely matches estimated potable water demands. Responsible public water supply systems simply cannot "live on the edge" as such a proposal would suggest. If growth were to accelerate beyond estimates, if existing supplies were to shrink due to climate

¹ 2016. Utah Board of Water Resources. 2016 Lake Powell Pipeline Water Needs Assessment. April.

² WCWCD has prudently adopted a policy of providing for a 15 year planning reserve.

³ Western Resource Advocates, Local Waters Alternative to the Like Powell Pipeline, March 13, 2013; see also: Western Resource Advocates, Motion to Intervene and Comments, November 16, 2018

variability, if more stringent regulatory requirements, e.g., water quality, were to further impinge source supplies, or if existing systems were to experience infrastructure disruptions or failures, an entire community would be placed in peril. This is unacceptable. System customers require a clean, reliable supply of water each day, including peak demand days, under a host of potential environmental and socio-economic conditions. Water shortage, much less unavailability, is not an option. Should demand not develop as quickly as originally estimated, that is acceptable, for the community will continue to grow as time passes. Those who have implemented a long-term vision, including the implementation of conservation measures, will be well situated to meet an essential community need.

- Protect the Environment: Another compelling reason for the development of a small portion of Utah's Colorado River allocation through withdrawals at Lake Powell is the avoidance of environmental degradation associated with the alternatives. As evidenced by the terms of an Exchange Contract recently negotiated between the state of Utah and the Bureau of Reclamation, leaving water in the Colorado River system as it flows down to Lake Powell, rather than diverting it immediately below Flaming Gorge Reservoir as legally allowed, is a true win/win situation. Potential detriments to endangered fish species, which are subject to the existing Recovery Program and reside in the reaches of the 400-plus mile riparian zone between these two storage facilities, will be avoided by maintaining flows. Of equal importance, should WCWCD find itself in a position of having to rely in the future on the Virgin River as its sole source of surface water supply, additional adverse environmental impacts may occur. For example, greater diversions from the Virgin River system may result in the loss of valuable riparian zone vegetated areas that were previously inundated, while existing pollutant loadings would be concentrated due to the loss of dilution flows. On a similar note, greater reliance upon re-use and other conservation practices in order to meet water demands could result in the diminishment of beneficial in-stream flows, a shrinkage of wetland buffer areas, and the introduction of greater levels of pollutants due to run-off from increased impervious surface areas." This is not a responsible path to follow.
- Ensure Regulatory Compliance: Completely overlooked by those who would severely restrict the amount of water to be utilized by the Districts' residents and businesses as the preferred solution to the impending water supply shortage are state regulatory requirements established by the state Drinking Water Board pursuant to the state Safe Drinking Water Act. Utah Administrative Code Rule 309-510 establishes "minimum sizing requirements", with specific reference to "minimum quantities and flow rates that shall be used in the design of new systems and in the evaluation of water source, storage facility, and pipeline capacities" absent the approval of alternate sizing requirements. See: Sections 510-4(1) and 510-6. The purpose of these sizing requirements is to ensure that water providers plan and design facilities that are "reliably capable of supplying adequate quantities of water which consistently meet applicable drinking water quality requirements and do not pose a threat to general public health." Section 510-1. Local authorities may impose even more stringent requirements.

3. Accomplishments to Date and Beyond

The Districts have aggressively, and successfully, pursued conservation objectives for many years. WCWCD and its municipal partners (who are provided wholesale water by WCWCD) have invested over \$60 million in recent conservation efforts, resulting in significant water savings. Washington County was the first Utah county to meet the statewide water conservation goal of reducing per capita water use 25 percent by 2025. WCWCD's service area is leading the state of Utah in terms of water use reductions, having achieved a savings of more than 30 percent in a recent span of 15 years.

As noted in the 2016 LPP Water Needs Assessment, in 2015, WCWCD and the State of Utah engaged Maddaus Water Management ("Maddaus"), an internationally recognized expert in conservation program evaluation, to prepare a report evaluating 80 water conservation management protocols to achieve further water use reductions in Washington County. The recommended water conservation measures are being implemented by WCWCD. For example, WCWCD recently incorporated advancements in meter design (installing meters that can measure secondary water) and new technology (smart meters) to better track water use in its secondary irrigation system.

A copy of WCWCD's most recent Water Conservation Plan (December 2015)⁴ is in Attachment A hereto. A list summarizing its conservation program initiatives can also be found in Attachment B hereto. Logically, WCWCD initially implemented the conservation measures that were most easily accomplished and most cost effective. Going forward, additional use reductions will be more difficult and costly to achieve.

In June of 2018, the State of Utah published the 2015 Municipal and Industrial Water Use Data, which has become the baseline for new water supply planning and conservation goal setting. This report employed a revised methodology for examining residential, commercial, industrial and institutional uses as compared to the prior reports that were relied upon in the 2016 LPP Water Needs Assessment. As compared to methods previously utilized, the report differed in its approaches to determining service area populations, residential lot sizes, and estimates of secondary or nonpotable use. Per capita usage in Washington and Kane Counties, as extracted from this report, can be found in Table 1.

⁴ The Washington County water conservation plan will be periodically reviewed and updated, incorporating appropriate additional advances in conservation BMPs as they become available.

Table 1. 2015 Per Capita Per Day Water Use

Year ³	Water Use (GPCD)	Washington County ¹			Kane County ¹		
		Culinary (potable)	Secondary (untreated)	Total ²	Culinary (potable)	Secondary (untreated)	Total ²
2015	Residential	177	16	193	129	58	187
	Commercial, Industrial, Institutional ⁴	52	57	108	81	15	97
	Total System Water Use	229	73	302	210	73	283

Source: UDWRe. 2015 Municipal and Industrial Water Use Data. June 12, 2018

Note:

¹ Kanab-Virgin River Basin water use

² Differences between base values and totals due to rounding.

³ The State of Utah has recently published 2016 and 2017 water use numbers, but these numbers do not affect the revised WCWCD conservation goal.

⁴ The Division of Water Resources included second home water use (e.g., vacation or seasonal homes) in commercial, industrial, and institutional quantities in the 2010 M&I Water Use report. Second home water use is now included in residential quantities in the 2015 M&I Water Use report.

Key:

GPCD = gallons per capita per day

Following the recent completion of a Legislative Water Audit, the State of Utah is developing updated regional water conservation goals. According to the state, “the purpose of [a] regional goal setting process is to combine scientific/engineering analysis with regional input to develop goals appropriate for different areas of the state.” It is anticipated that the updated water conservation goals will be made public in coming months. The Districts, in coordination with area retail water providers, will consider the results of this initiative in updating their programs and establishing their future goals. In the interim WCWCD, in conjunction with its water resource planning efforts, has assumed that there will be an additional 20% reduction by 2060 from the reported 2015 per capita use.

The above notwithstanding, two other factors that bear upon the efficacy of WCWCD’s conservation efforts must be kept in mind. As noted, WCWCD is primarily a wholesale water provider. It therefore does not generally control water use at the retail or individual tap level. Nevertheless, WCWCD actively promotes, in coordination with the retail providers, the conservation measures referenced above, and has achieved significant water use reductions. WCWCD includes in its water supply contracts with retail entities the requirement that an “increasing block” or conservation-oriented pricing structure be utilized in customer billing⁵. This sends an appropriate price signal. Second, as alluded to above, the exact nature and pace of implementation of conservation practices is rightfully dictated by local governing bodies who are

⁵See: Washington County Water Conservancy District. 2006. Washington County Water Conservancy District April 2006 Regional Water Supply Agreement. Available at: <https://www.wcwcd.org/wp-content/themes/wcwcd/pdf/municipal/RWSA.pdf>.

familiar with the socio-economic fabric of the community. Local ratepayers' input and participation are essential if any conservation program is to be successful.

4. Comparisons to Other Communities

WCWCD has a strong water conservation program in place and has achieved remarkable per capita water use reductions. An examination of the WCWCD program in comparison to the programs of other similarly situated communities' water use readily demonstrates the county's commitment to water conservation.

There are a number of critical factors that must be examined in any community to community water use comparison, a fact acknowledged by EPA⁶ and even some LPP opponents⁷. These include:

- Differences in both daily and seasonal temperatures (especially during growing season)
- Differences in seasonal precipitation patterns and total annual precipitation (e.g., greater growing season precipitation, as found in Tucson, AZ, lowers gpcd demand)
- Population density (greater density, e.g., Phoenix, AZ and Las Vegas, NV, lowers gpcd demand)
- Local soils, geology and geography/elevation
- Socio-economic make-up of the community including:
 - income levels, nature of businesses, second home ownership (which is 20 percent to 25 percent in Washington County)
 - abundance of recreational amenities per capita such as golf courses (15 in Washington County) and playing fields as well as large public institutions with open space increase water demand (Washington County is a hub for educational institutions, hospitals, outdoor recreation, and tourism with over 6 million visitors a year, increasing gpcd demand; Kane County hosts more than 4 million visitors a year)
- Differences in data collection times and methods, e.g., data from varying temporal periods; varying definitions of use categories; inconsistent treatment of system losses; a variety of calculation protocols, such as calculations based on permanent resident population versus number of system connections; treatment of return flows, secondary water use and private water sources. See Attachment C for complete listing of factors that influence usage numbers and make a direct comparison between communities nearly impossible.

Keeping in mind that the above factors impact water usage patterns, communities within the Districts compare favorably with other similarly situated communities throughout the arid

⁶ See: U.S. Environmental Protection Agency (EPA). 2016. "Best Practices to Consider When Evaluating Water Conservation and Efficiency as an Alternative for Water Supply Expansion". December.

⁷ Conservation strategies must reflect "each regions capacity to conserve"; "every municipality has a different mix [of commercial, industrial, and institutional users] which exhibit different water use patterns". See: Western Resource Advocates. 2016. Comments on LPP Preliminary Licensing Proposal. February.

western United States. When examining segments of water use with the greatest commonality i.e., indoor residential use^{8,9}. Washington County falls within the middle of the range of gpcd, St. George (58 gpcd), Phoenix (56 gpcd), Tucson (61 gpcd) and Denver (54 gpcd). As anticipated, residential outdoor water use is generally higher in Washington County than other western communities that experience greater summer precipitation. Overall, Washington County total residential use, including indoor and outdoor use is comparable to other western communities when the above factors, such as precipitation, temperature, and housing density are considered.

In November, 2018, Maddaus completed a study¹⁰ that compared the WCWCD conservation program to that of 10 other western communities with top-tier programs. Having observed that water conservation has been a hallmark of WCWCD's focus since 1993, Maddaus concluded that WCWCD has an established, effective water conservation program that compares favorably with those of its peers. In particular, its program budget, spending and staffing efforts equaled or exceeded those of other similarly situated communities (see Table 2).

Maddaus also took note of WCWCD's current utilization of the four most common efficiency programs, i.e., leakage management, toilet rebates, free irrigation system evaluations, and free showerhead and faucet aerator dissemination. In fact, Maddaus found that WCWCD employs two-thirds of the thirty-six most common practices among study participants. Four additional conservation measures were recommended by Maddaus that WCWCD could implement to allow WCWCD's strong program to become more cost effective, sustainable and robust. WCWCD management has endorsed the immediate implementation of these measures, as follows:

- Work with municipal retail providers¹¹ to reduce system water loss by implementing additional water loss control measures.
- Enhance existing water-efficient fixture giveaway program.
- Enhance use of outdoor efficiency incentive measures through rebates and coupons.
- Explore opportunities to partner with energy utilities to offer water and energy incentives, including incentives for efficient clothes washers and hot water on demand systems.

⁸ See: New Mexico. 2013. New Mexico Water Conservation Planning Guide for Water Suppliers. Technical Report 53. ("reproducible metrics" need a comprehensive understanding of local demographic and environmental conditions).

⁹ See: EPA 2016 Best Practices, *supra*. at p. 46 (using gpcd in the context of overall system use is "not helpful for goal setting nor is it appropriate for comparing utilities to each other because of the variations in customer make-up").

¹⁰ See: Maddaus. 2018. Water Conservation Programs: A Comparative Evaluation.

¹¹ Washington County is primarily a wholesale water supplier and cannot directly control the systems of municipalities who are the area retail water providers. Accordingly, Washington County is dependent upon retail water providers to implement many conservation measures.

Table 2. Comparison of Water Conservation Programs

Program Component	Albuquerque Bernalillo County Water Utility Authority	Colorado Springs Utilities	El Paso Water	City of Grand Junction	City of Phoenix Water Services Department	Salt Lake City Department of Public Utilities	City of Santa Fe	Southern Nevada Water Authority	City of Tucson	Washington County Water Conservancy District¹
State	New Mexico	Colorado	Texas	Colorado	Arizona	Utah	New Mexico	Nevada	Arizona	Utah
Approx. Population Served	658,238 (2015)	470,513 (2015)	787,208 (2013)	28,125 (2018)	1,648,611 (2017)	316,402 (2016)	83,878 (2017)	2,262,962 (2017)	750,000 (2017)	153,300 (2015)
Major Metro Region(s)	Albuquerque	Colorado Springs	El Paso	Grand Junction	Phoenix	Salt Lake City	Santa Fe	Las Vegas	Tucson	St. George
Number of Agencies Served	1	1	1	1	1	1	1	7	1	7
Service Area (square miles)	190 sq mi	195 sq mi	250 sq mi	9 sq mi	661 sq mi	136 sq mi	53 sq mi	822 sq mi	390 sq mi	200 sq mi
Average System Demand (MGD)	87.5 MGD (2015)	78.6 MGD (2016)	102.3 MGD (2013)	5.3 MGD (2017)	276.0 MGD (2017)	61.1 MGD (2017)	N/A ¹	455.0 MGD (2017)	89.3 MGD (2017)	43.8 MGD (2017)
Annual Conservation Budget^{2,3}	\$1,615,000	\$850,000	\$1,188,600	\$13,500	\$915,533	\$346,700	N/A ¹	\$15,831,200	\$4,000,000	\$643,543
Conservation Spending (\$/capita)	\$2.45	\$1.81	\$1.51	\$0.48	\$0.56	\$0.62	N/A ¹	\$7.00	\$5.33	\$3.88
Full Time Equivalent Conservation Staff	8.5	6.25	10	0.5	5	1	N/A ¹	20	4	5.75

Notes

¹ N/A indicates that data was not available from the agency at the time this document was published.

² Conservation program and budget anticipated to vary based on type of service provided (e.g., wholesale providers may not have authority to set or enforce ordinances). Project costs included in conservation budget may vary by agency and are listed as reported.

³ City of Phoenix annual budget is based on the year 2017.

5. Costs Associated with Extreme Conservation Measures

If the Districts were to pursue unrealistic conservation goals as the only strategy to address growing water demand, it would fail in its social responsibility of securing a firm and reliable future water supply. Costs of implementing extreme conservation measures are also higher than more balanced approaches to meeting water demand. Those costs include the direct costs paid by customers on an individual basis, the costs reflected in higher rates and fees, and the environmental and socio-economic costs that are a direct consequence of making such a choice.

By way of example, adoption of an extremely limited (or prohibited) outdoor watering regime would require:

- The elimination of, or severe restrictions upon, the growing of grass, trees, ornamental shrubs and plants that currently comprise much of the landscaping in the area and which cool areas around residential, commercial, institutional and industrial properties
- The removal and prohibition of shade trees or plants
- The prohibition of home vegetable gardening
- The hardscaping of existing landscapes in the form of rock cover, concrete or other surface nonvegetative cover
- The prohibition of, or severe limitations upon, the use of residential swimming pools
- Additional limitations upon the installation and watering of parks, golf courses, medians and other outdoor recreational amenities
- The need to enforce, through inspections, audits, fines, etc. all such restrictions.

Significant environmental impacts would accompany such severe conservation measures including: (i) a rise in ambient community temperatures due to the heat island effect resulting from the loss of vegetation; (ii) water quality degradation due to increased run-off during storm events and a loss of in-stream dilution flows; (iii) increased flooding or extreme run-off events due to loss of water retention and percolation areas; and (iii) adverse impacts upon wildlife associated with the loss of a vegetative canopy.

Socio-economic impacts can also be anticipated. These include:

- Diminishment of park lands and recreational areas, including ball fields and backyards
- An increase in energy (cooling) costs and associated water demand at power plants
- An increase in water bills (to assist in meeting high costs of conservation initiatives)
- A potential decrease in overall community attractiveness due to loss of green spaces and vegetative cover, with concomitant loss of businesses as they seek a more conducive environment
- A potential loss of tourism and tourism dollars.

The Districts have attempted to estimate the “hard” costs associated with such an extreme conservation initiative (see Table 3). This includes the cost of: (i) lawn and landscape removal; (ii) the installation of replacement hardscapes; (iii) ordinance enforcement; and (iv) the acquisition of alternate supplies and construction of associated infrastructure.

Table 3. Costs of Extreme Conservation Proposal

Components	Cost (2015 dollars)
Permanent Outdoor Water Restrictions Costs¹	\$1,281,000,000
WCWCD Costs	\$328,000,000
<i>Turf Removal Rebates²</i>	<i>\$315,000,000</i>
<i>Water Restriction 2025 Households³</i>	<i>\$13,000,000</i>
Household Costs	\$953,000,000
<i>Landscape Replacement - 2025 Households⁴</i>	<i>\$644,000,000</i>
<i>Increased Landscape Costs for New Households - post-2025⁵</i>	<i>\$237,000,000</i>
<i>Increase Electricity Use Due to Urban Heat Island Effect⁶</i>	<i>\$72,000,000</i>
Water Supplies and Related Infrastructure (Capital)^{7,8}	\$274,000,000
Existing/Planned Supplies	⁹
Reuse	⁹
Additional Agricultural Water Transfers ¹⁰	\$21,000,000
Apple Valley Pipeline ¹¹	\$163,000,000
Agricultural Water Pump Station/Distribution	\$35,000,000
Water Supply Storage (22,000 acre-feet)	\$55,000,000
Total Costs	\$1,555,000,000

Notes:

¹ Assumes WCWCD would need to impose permanent water restrictions starting in 2025 to achieve the necessary GPCD reductions required under the extreme conservation proposal.

² Turf rebate of \$1.5/square foot of irrigated landscape per 2025 household with a \$5,000 cap (Maddaus 2015); households would be restricted to 600 square feet of irrigated landscape.

³ Six full time equivalents necessary to manage mandatory water use restrictions with associated penalties for non-compliance.

⁴ Average \$10,000 per household for landscape replacement cost (based on cost quotes from St. George landscape professionals); average cost accounts for varying parcel sizes and levels of landscaping.

⁵ Standard landscaping costs equal \$5,700, and low-irrigation landscaping costs equal \$10,000 (based on cost quotes from St. George landscape professionals); cost differential applied to new households each year; average costs account for varying parcel sizes and levels of landscaping.

⁶ Assumes Utah and St. George averages of 8,785 kWh per year per household and 8.132 cents/kWh, respectively; 62 percent of household electricity used during peak air conditioning period (May-October); conservatively assumes energy use increases 7.5 percent due to removal of landscaping (U.S. Environmental Protection Agency. 2008. Reducing Urban Heat Islands: Compendium of Strategies Trees and Vegetation; Akbari, H. 2005. Energy Saving Potentials and Air Quality Benefits of Urban Heat Island Mitigation (PDF) (19 pp, 251K). Lawrence Berkeley National Laboratory.).

⁷ Capital costs are developed at a conceptual level.

⁸ Potable water supply under the extreme conservation proposal would meet reduced demand but would not provide a planning reserve to address future risks and unknown conditions. If additional potable water is needed in the future under this proposal, then WCWCD would need to construct a reverse osmosis facility to treat additional Virgin River water. Costs for a reverse osmosis facility to address future risk in this proposal are not included in this table.

⁹ Costs would be similar to LPP Proposed Action.

¹⁰ Costs are for 25,120 acre-feet of agricultural water right transfers beyond the LPP Proposed Action; \$843/acre-foot for St. George and Washington Canal Company shares (Utah Division of Finance 2016). Proponents of this proposal have not demonstrated that this quantity and quality of agricultural water is feasible.

¹¹ Without the LPP Proposed Action, a pipeline would need to be built from St. George to Apple Valley to provide water supply.

6. Alternative Sources of Supply

A number of LPP critics have asserted, under the conservation umbrella, potentially available alternate sources of supply. In short, they have acknowledged that the Districts cannot simply “conserve their way out” of a future shortage, a point upon which the Districts and LPP detractors agree. However, turning to alternate supply sources simply shifts the supply burden away from the water available to the State under its Colorado River Compact allocation and onto the other sources which, for a variety of reasons, are not suitable substitutes. Furthermore, the following options do not diversify Washington County’s water supply or provide the same quantity or quality of water as LPP.

- Agricultural Conversion: One such alternative is the conversion of water from agriculture use to municipal use. This can be accomplished in three ways, i.e., (1) the “buy and dry” of agricultural lands, (2) municipal growth onto agricultural lands with the acquisition of accompanying water rights, or (3) the use of various lease or other interruptible supply arrangements with owners of agricultural water rights. LPP previously analyzed this option and reasonably concluded that approximately 10,080 a/f would be readily available from agricultural conversion due to anticipated urban expansion.¹² Recent, more detailed analysis, has demonstrated that a total of approximately 23,000 acre-feet of additional agricultural acquisitions may be reliably available for municipal use,¹³ far lower than the 35,000 to 40,000 acre-feet assumed by the Project opponents to be available. Proponents of agricultural conversion have ignored numerous limitations on such water transfers, including:
 - The quality of agricultural water, which in Washington County is largely unsuitable for domestic supply purposes absent costly advanced treatment with accompanying environmental concerns, which makes interruptible supply arrangements infeasible.
 - The negative environmental and socio-economic consequences associated with the: (i) loss of green space; (ii) loss of return flow to the river; (iii) loss or impairment of the agricultural economy, including hay production, and local custom and culture; and (iv) loss of locally grown foods.
 - The need for the installation of costly pumps, pipes and storage to effectively and efficiently capture, control and use agricultural water, as found in a variety of locations, for municipal purposes.
 - Existing water company bylaws and other legal limitations on irrigation company water transfers.
 - The potential uncertainty that may come from interruptible water supply arrangements where water ownership remains in agriculture, e.g., future sale and transfer of the rights or the creation of conservation easements.
 - A State and local desire to maintain a healthy agricultural economy and associated open spaces.

¹² 2016. Utah Board of Water Resources. 2016 Lake Powell Pipeline Water Needs Assessment. April.

¹³ 2019. Olds, J. Evaluation of the Potential Conversion of Irrigation Water to Municipal use in the Virgin River Basin, Washington County, Utah. January.

- Reuse: There is no significant disagreement between the Districts and other interested parties regarding the value of reuse supplies and the efficacy of current reuse efforts. In fact, the Districts have noted that significantly more reuse water may be available in the future if LPP is built, as LPP supplies will be fully re-useable. However, without LPP deliveries in the portfolio, this enhanced efficiency opportunity is lost. That said, it bears noting that growth in reuse supplies may come at a high cost, especially if the original source is not LPP water, but instead brackish groundwater or contaminated agricultural water. Such costs are associated with expensive and energy intensive treatment, e.g., reverse osmosis, as well as the construction of expensive storage and delivery systems needed to provide the water at the time and place of need.
- Groundwater: There has also been a suggestion that the Districts can place greater future reliance on groundwater supplies. Virtually all of the groundwater supply in Washington County has been appropriated and new groundwater development is thus prohibited pursuant to state water law. This limitation results from the conclusion by Utah's state engineer that significant new groundwater development is likely to result in groundwater mining or withdrawals in excess of the aquifer's safe yield. The Districts cannot allow community growth dependent upon a non-renewable groundwater supply. In addition, some of the available groundwater supply in the area is of a very poor quality, and would require expensive advanced treatment if it were to be used in the potable system. Finally, the available groundwater supply is not necessarily situated so as to be readily incorporated into the existing water delivery system. Once again, costly storage, pipes and pumps would have to be constructed and maintained in order to place further reliance on this source.

7. Conclusion

Conservation is an important component of the Districts' and the state's water resource plan. As demonstrated above, significant strides in water conservation have been made in the past and greater water savings will be realized in the years ahead. The Districts and the state are committed to establishing aggressive, but realistic, conservation goals. Nevertheless, detailed engineering analysis, based on available facts clearly demonstrates that conservation alone is not a practical way to meet future water demands in the Districts' service areas. New water supplies are essential. Moreover, a second source of water supply is required to ensure future system reliability and redundancy.

Attachment A – 2015 Water Conservation Plan: Washington County Water
Conservancy District



Water Conservation Plan

WASHINGTON COUNTY WATER CONSERVANCY DISTRICT

Updated December 2015

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Chapter I: Introduction

Washington County Area

Washington is one of the fastest growing and arid counties in Utah, the second-driest state in the nation. The county's largest population center resides in St. George, one of the top 10 fastest growing cities in America. St. George receives an average of only 8 inches of rain per year.

Despite its arid climate, Washington County is considered one of the most desirable places to live, work and play. The warm temperatures and 300 days of sunshine accompanied with the abundant social, cultural and educational amenities has attracted more than 150,000 residents, nearly 5,000 businesses, 60,000 employees, more than 11,000 second homeowners and an average of five million annual tourists.

Rapid population and economic growth accompanied with an unreliable, single-source water supply prone to prolonged drought conditions necessitates an aggressive conservation approach, development of additional water supplies and free-market transfer of agricultural water. A multi-pronged approach is essential.

2015 Conservation Plan Update

In August of 1993, facing rapid population growth and a limited water supply, the district approved a Water Resource Management, Development and Protection Plan, which states, "The District shall develop a water conservation plan which promotes public education and information dissemination concerning water conservation; and promotes the adoption of technologies, practices, and devices which will yield improvements in the efficiency and management of water use." That same month, the district board called on community citizens to form a Water Conservation and Drought Management Committee. Their efforts resulted in the 1996 Water Conservation Plan, the first of its kind in Utah, followed by updates in 2005, 2010 and now, in 2015.

The district will continue updating its conservation plan every five years to incorporate new advancements and technology to increase water reduction goals.

State Legislature

This 2015 Water Conservation Plan ("WCP"),



like its predecessors, addresses the key role that water conservation programs and practices play in meeting future water needs, taking into account the need for water supply diversity, reliability, and conservation expressed by leaders and citizens of both Washington County and the state.

Utah State Code Section 73-10-32 (2004) sets forth the requirements for water conservation plans to be prepared by culinary water providers and

conservancy districts and submitted to the Utah Division of Water Resources (DWR). The appendix to this plan contains a copy of the advertisement posting the date and time for the public hearing, minutes of the public hearing where public comment was received, posting of board meeting for adoption of the plan, minutes of that meeting, and a copy of all written comments mailed and e-mailed by the comment deadline.



Chapter 2: Water Resources:

Current Water Supply

About the District

Washington County Water Conservancy District (district) was established in 1962 to manage Washington County's water needs. During its 50-plus year history, the district has significantly expanded infrastructure, services and capabilities in an ongoing effort to serve the county's growing population.

Today, the district provides water for more than 85 percent of the county's population and manages reservoirs, pipelines, wells, water storage tanks, treatment plants, hydropower plants, diversion dams and more. The facilities are currently capable of producing more than 65 million gallons of culinary water a day.

The majority of the district's water is sold wholesale to its municipal partners including the cities of St. George, Washington, Hurricane, Santa Clara, Ivins, Toquerville, La Verkin and the town of Virgin. While providing wholesale water to municipalities is the district's central operation, the district also manages small retail, secondary and wastewater systems.

Authorization of Operating Agency

The district, a not-for-profit public agency and a political subdivision of the State of Utah, was created through petitions signed by a majority of property owners to authorize taxation of real property for the development, sharing, and management of water supplies. Its seven-member board of trustees, appointed by the Washington County Commission, is primarily responsible for permanent long-term water resource planning, development, management, control, delivery, use, and wholesale water distribution to municipalities in Washington County.

District Responsibilities

The district works to ensure that the regional water quality meets or exceeds state and federal standards. An essential component of the district's management of water resources includes creating and implementing conservation programs including Governor Gary Herbert's directive to reduce daily per capita water use 25 percent from 2000 to 2025. Washington County



Quail Creek Reservoir

has already accomplished that goal.

While the district performs a critical role in managing water, it does not have the authority to regulate growth or to control the water management actions of its municipal partners or water use by end users. Policies, codes, and regulations that directly affect water use are implemented through the respective municipality.

The district does have an active role in the facilitation and collaboration of many successful, community-wide, water-efficient policies such as watering restrictions and conservation-related requirements in new construction. Education, community outreach, and incentive programs are largely coordinated by the district with support and involvement from its municipal partners, community stakeholders, key government agencies and the general public.

The district has developed a portfolio of existing and future water resource options available to meet demands over time, including water conservation, reclaimed or reuse water, groundwater, groundwater storage, Virgin River basin surface water and a small percent of Utah's Colorado River allocation. Data gathering and planning allows the district to assess overall water supply and make informed decisions

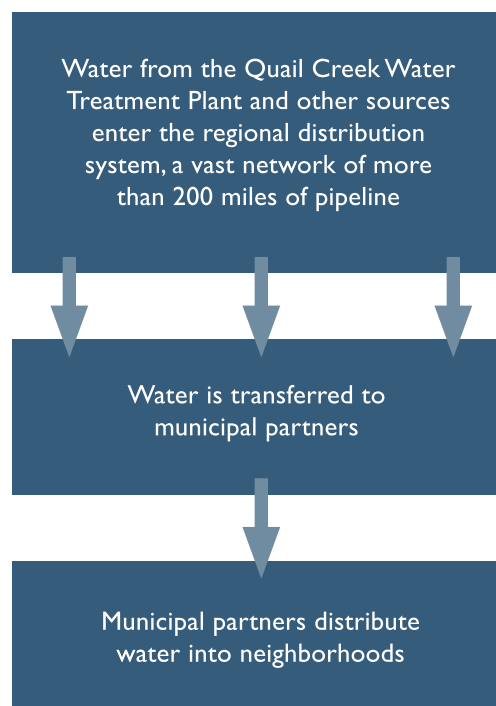
regarding what resources to bring online when necessary. The map of **Figure 2-2** shows the service area of the district.

Integrated Water Resource Planning – Citizen Involvement

In 2012, the district appointed a Citizens Integrated Resource Planning Advisory Committee (CIRPAC), made up of 28 citizens representing a broad spectrum of community interests. CIRPAC reviewed Washington County's complex water-related issues and challenges in 14 meetings conducted between September 2012 and May 2014.

A 16-member conservation workgroup subcommittee of CIRPAC was organized in 2014 to assist with the development of this update to the district's water conservation plan. Committee members included district staff, municipal representatives, a landscape architect and community leaders. The committee researched conservation options, costs, implementation and potential returns in a series of meetings that are summarized in the appendix. Their efforts formed the foundation for recommendations and goals that were presented to the district's board for consideration.

Figure 2-1. Water Supply and Distribution



Inventory of Present District Water Resources

The information contained in this plan pertaining to existing and future water supply and demand is derived from the Water Needs Assessment (WNA) (MWH 2015).

Washington County's current water supplies come from a combination of groundwater (springs and wells) and surface water (direct diversions and reservoirs). The Navajo Sandstone Aquifer and shallow alluvial aquifers provide groundwater resources. Surface water sources consist of the Virgin River and its tributaries. In 2010, approximately 20 percent of the developed culinary water supplies for public community water systems in Washington County were from groundwater sources and 80 percent were from surface water sources. Groundwater supplies developed by public drinking water systems are generally of high quality and can be used directly for culinary uses after disinfection. Surface water supplies are used directly to meet secondary water demands or are treated to meet

Figure 2-2

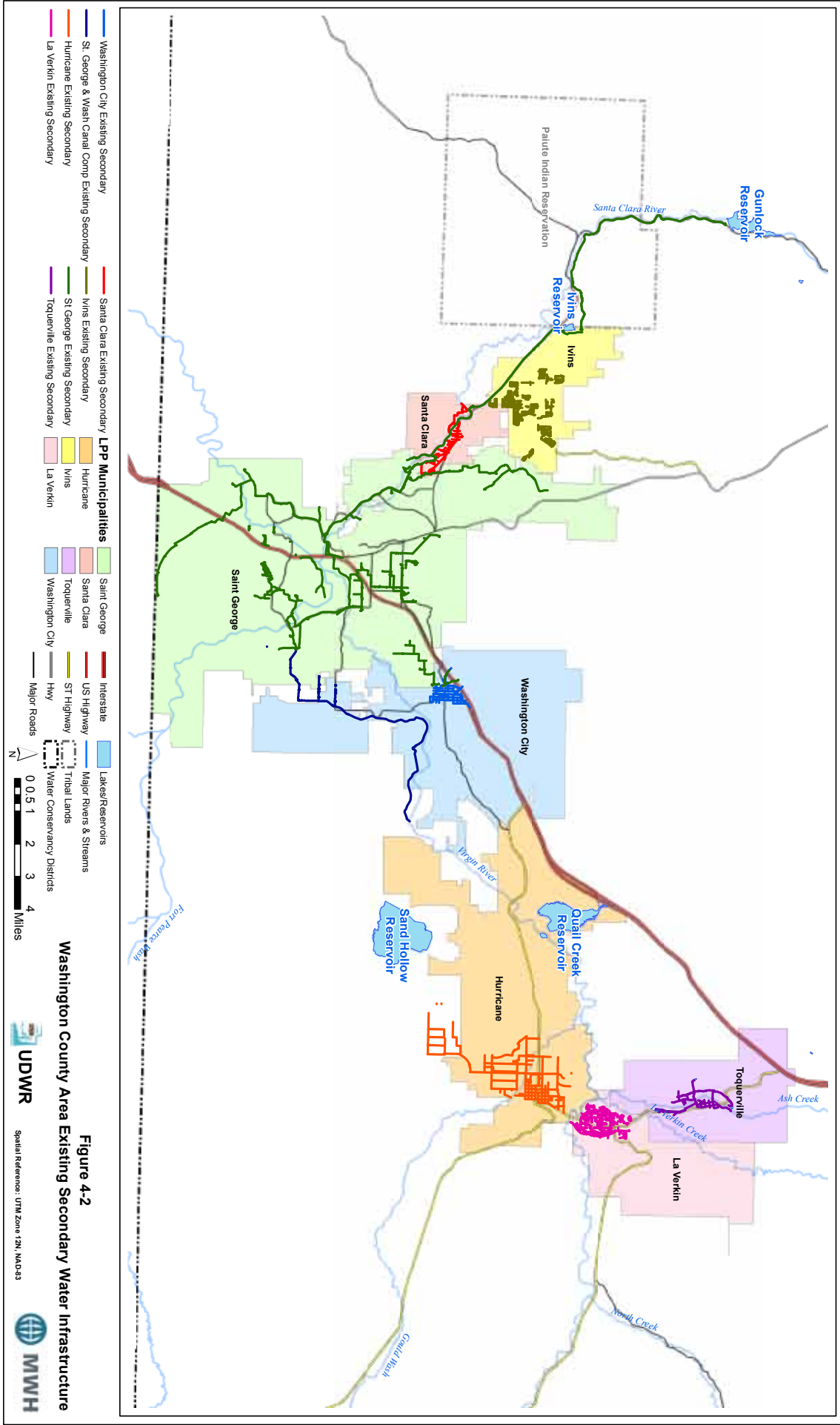


Table 2-1. WCWCD Existing Culinary Projects and Water Uses

Project	Reliable Culinary Quality Water Yield (ac-ft/yr)
Quail Creek and Sand Hollow Reservoirs ⁽¹⁾	24,922
Sand Hollow Non-Recharge Groundwater ^(v2)	4,000
Cottam Well Field	875
Kayenta Water System (Ence Wells)	250
Crystal Creek Pipeline	2,000
Total	32,047

Notes:

⁽¹⁾ Reliable yield for Quail and Sand Hollow Reservoirs includes yields from Kolob and Meadow Hollow Reservoirs.

⁽²⁾ Supply utilizes water rights and natural basin recharge.
Source of data: WNA 2015

culinary demands. The cities and towns in Washington County developed independent water collection and treatment systems over the years. Since the district's first project in the mid-1980s, the major municipal water systems have become increasingly integrated.

Groundwater sources within the district service area are closed to further appropriations by the Utah state engineer, with the exception of the Canaan Gap drainage east of the Hurricane Cliffs and the Beaver Dam Wash drainage, which are open to small groundwater appropriations for domestic filings. New diversions and uses must be accomplished by change applications filed on previously approved water rights.

Existing Supplies

Because most of the readily available water in the county has been developed and virtually no new water rights are available, the larger municipalities are generally relying upon the district for future water supplies, most of which will be provided through large water projects that require a regional funding base.



Quail Creek Reservoir

The information in Table 2-1 lists district culinary water supplies. Operational flexibility is continually being enhanced in order to avert water supply shortages. The table summarizes the reliable yield for district projects for culinary purposes. Culinary supplies can also be used to meet secondary water demands if necessary.

The following map, Figure 2-3 indicates where the projects and water sources in Washington County.

Intersystem Agreements – Regional Water Supply Agreement

On April 23, 2006, the district implemented a cooperative Regional Water Supply Agreement (RWSA) that currently includes eight municipal partners. Collectively, these municipalities provide water and wastewater services to more than 150,000 southern Utah residents and five million annual visitors. The RWSA municipal partners are listed below with the date the agreement was executed.

The RWSA implemented a new pricing mechanisms to encourage water conservation by eliminating take-or-pay contracts that require blocks of water to be paid for whether or not they are used. In addition, the agreement encourages better partnerships

in resource sharing. The RWSA also imposes conservation and water quality requirements on municipal partners through uniform stipulations on water use, landscape ordinances and water reuse. Impact fees are charged on new residential and commercial development to cover the costs of water development to meet the needs of growth. Impact fees, paid by new development for capital costs of facilities necessary to supply water, are increased with increasing irrigated area, thus encouraging new development to minimize outdoor use of water. Lots in excess of 10,000 square feet pay for the additional area unless a water conservation agreement is recorded to limit irrigated landscape.

RWSA Key in Additional Conservation Strategies.

Under the RWSA, municipal partners retain their existing water resources, rights and facilities, except to the extent that they choose to integrate them with the district's system. As municipalities grow and their respective water resources are fully developed, the RWSA will become the mechanism by which they will meet future demand. Table 2-2 lists the water resources of current RWSA municipal partners.



Figure 2-3

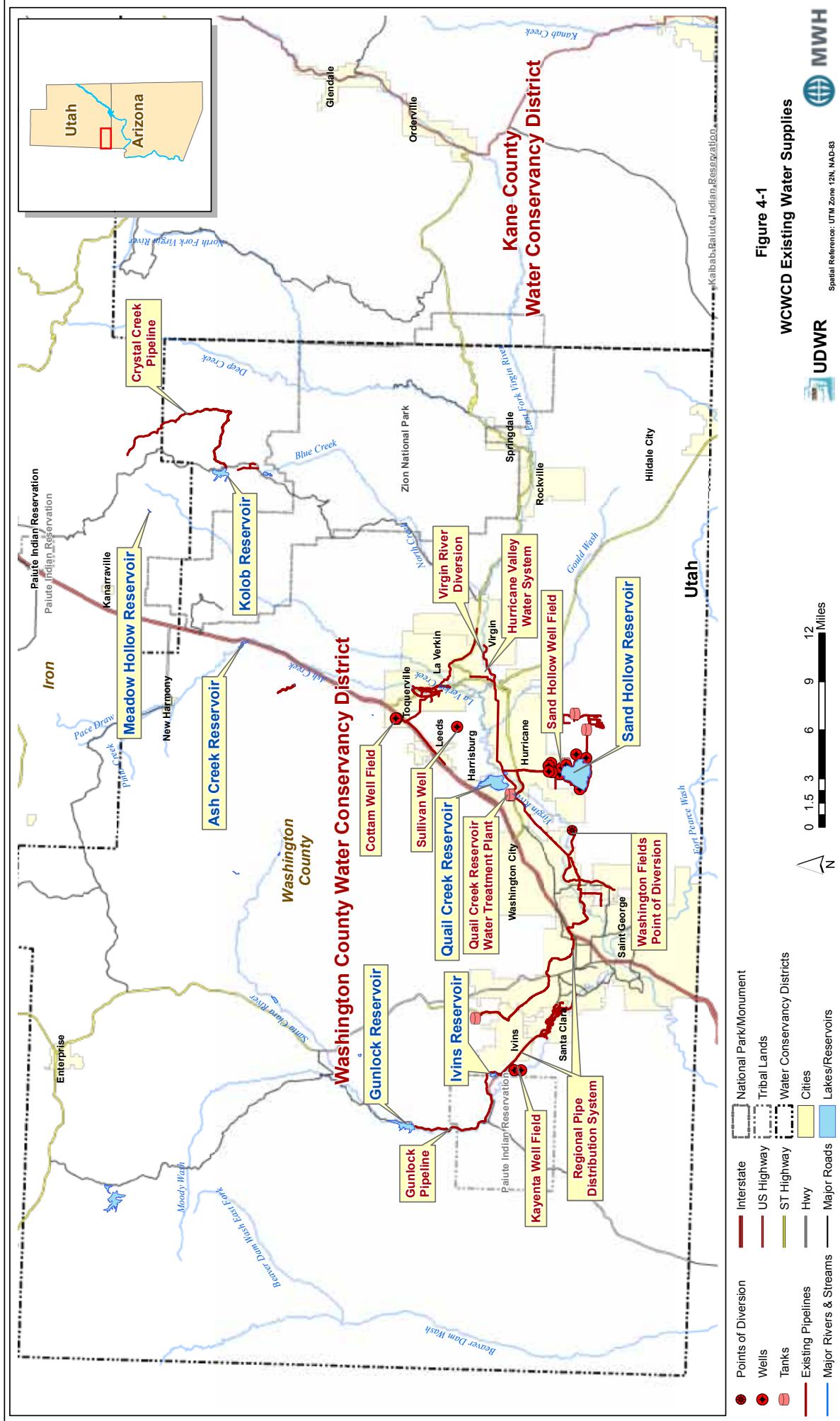


Figure 4-1

WCWCD Existing Water Supplies



UDWR
Spatial Reference: UTM Zone 12N, NAD-83



Table 2-2. Inventory of District Municipal Partner Additional Resources

Water Supplier	Reliable Culinary Quality Water Yield (ac-ft/yr)		
	Springs	Wells ⁽¹⁾	Total ⁽¹⁾
Hurricane City Water System ⁽³⁾	1,614	1,854	3,468
Ivins City ⁽³⁾	48	177	226
LaVerkin City ⁽³⁾	661	0	661
Leeds Domestic Water Users Assoc.	80	339	418
Santa Clara Municipal Water System ^(3,4)	97	1,274	1,371
St. George, City of ^(3,5)	1,200	11,113	12,313
Toquerville Water Dept. ⁽³⁾	363	0	363
Washington Municipal Water System ⁽³⁾	0	1,904	1,904
Total	4,063	16,661	20,724

Notes:

⁽¹⁾ Wells are limited to 50% of their maximum capacity for reliable supply when well/pump capacity is the limiting factor. Springs and surface water supplies are equal to their respective maximum capacities.

⁽²⁾ Reliable water supply is considered to be equal to calculated water use.

⁽³⁾ Has contract with the WCVCD for additional water supply.

⁽⁴⁾ Reliable well supply is calculated based on Santa Clara's 24.7% ownership of wells in Snow Canyon Compact yield.

⁽⁵⁾ Reliable well supply is calculated based on St. George's 63.3% ownership of wells in Snow Canyon Compact yield. However, St. George has more well water rights available for additional supply, if needed.

Source WNA 2015



Taking time to smell the flowers at Red Hills Desert Garden

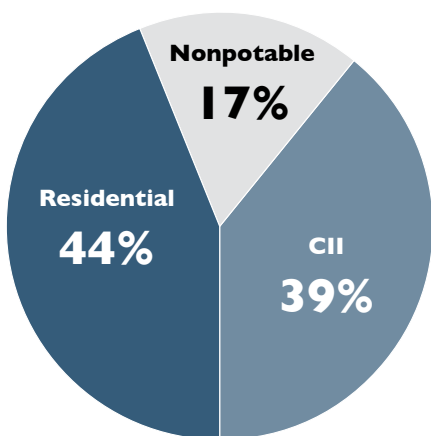
Chapter 3: Current Water Demands

Table 3-1. Population for Washington County's Major Cities

City/District	2010 Population
Hurricane	13,300
Ivins	6,410
LaVerkin	4,060
Santa Clara	6,500
St. George	72,750
Washington	18,760
WCWCD	138,530

Source: WNA 2015

Figure 3-2: 2010 Water Consumption by user group



Notes:

1. Figure is based on 2010 water use data.
2. Secondary use includes untreated water for outdoor irrigation use for residential single family, multifamily, second-home, commercial, industrial, and institutional customer categories.
3. Non-revenue water is not included in this figure.

When planning for the future needs of a community, water managers calculate current demand and look at growth projections. The most common metric to measure water use is gallons per capita per day (GPCD). Utah's population projections are prepared by the Governor's Office of Management and Budget (GOMB). All utilities in Utah use the GOMB's numbers for consistency. 2010 historical population for major cities in Washington County is listed in **Table 3-1**.

Measuring GPCD

Utah DWRe calculates GPCD based on total gallons of water used (treated and untreated water diverted or withdrawn for residential, commercial, institutional, and industrial customers) divided by the permanent population. The water industry has not established a standard for calculating GPCD. The DWRe has researched the many factors and variables for calculating GPCD used by other western states and/or cities and found many inconsistencies. Therefore while Utah uses GPCD numbers for planning purposes, GPCD numbers are not suitable for comparing water use efficiencies with other states and/or cities.

2010 Water Use – Residential, Commercial, Institutional and Industrial

Residential water use in Washington County in 2010 was 155 GPCD. CII use contributed 169 GPCD. Culinary water use was 270 GPCD, secondary was 55 GPCD, and the total was 325 GPCD.

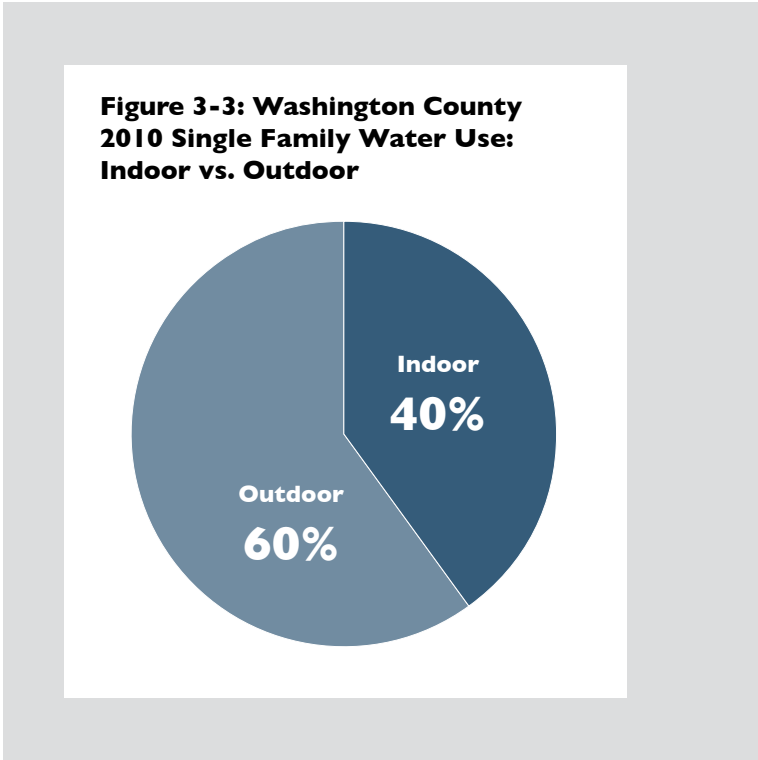
Figure 3-1, provides a breakdown of residential water use for both outdoor and indoor use and Commercial, Industrial and Institutional (CII) water use (based on 2010 data). Looking at total water use, **Figure 3-2** shows the breakdown of water use by group in percentages.

Figure 3-3 shows the breakdown of residential water use into indoor and outdoor components. This breakdown is based on the assumption that water use during the months of December and January represent indoor water use since outdoor water use is at a minimum. Water providers look at historical use patterns and focus water conservation planning in categories with the highest historical use. Indoor use is approximately 40% of water consumption.

Factors Influencing Per Capita Use

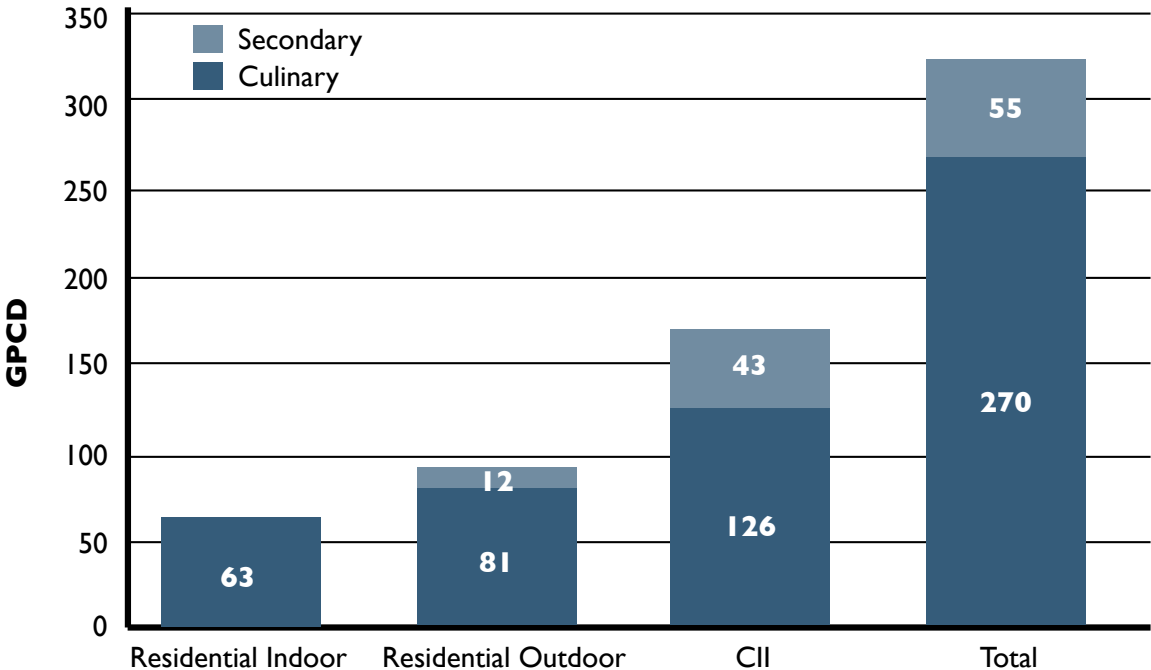
Local climate, culture and economic factors influence water consumption. The pioneer culture of home gardening has persevered over time. The warm climate in southwest Utah provides a long growing season for shade trees, home vegetable gardens and other landscaping. Precipitation is concentrated outside the summer growing season. System demands in southwest Utah are increased by the growing season coupled with a high evapotranspiration rate and minimal offsetting precipitation.

The pleasant climate, plentiful recreational opportunities, and the scenic beauty of southwest Utah attract five million tourists each year. During their stays, visitors consume water and contribute to



the district’s calculated per capita use. Washington County has a large tourism population associated with conventions, golfing, athletic events and visits to nearby national parks and recreation areas. The

Figure 3-1. 2010 Gallons Per Capita Per Day (GPCD) Water Use*



*Due to rounding, numbers may not add up to numbers cited in text.

world renowned Zion National Park is located in the county and the area is a gateway to Lake Powell, Bryce Canyon, and the Grand Staircase-Escalante National Monument.

Dixie State University (DSU) and Dixie Applied Technology College (DXATC) are within the district's service area. Some students at these two institutions are permanent residents of Washington County, and consequently are included in the population data for the county, but many are not. In 2014, 36 percent of DSU's 8,000-plus students were not residents of

Washington County. The net non-permanent student population for Washington County will inflate CII per capita water use compared to locations without student populations.

Nearly 27 percent of Washington County's homes are secondary residential properties. While inside water use would be relatively minimal for these nonpermanent residents, their landscape water use would be the same as permanent residents. DWRe estimates that water use by second homes contributes 36.4 GPCD in Washington County.



Chapter 4: Water Conservation: Achievements and Current Programs

Conservation History

Water conservation has been a hallmark of the district's focus since 1993 when it approved the Long Term Framework for Water Resources Management, Development, and Protection Plan. In 1996, the district published its first water conservation plan and currently updates the plan every five years to incorporate new technology and concepts. The district coordinates with its municipal partners, the State of Utah and other agencies to maximize and expand conservation efforts.

In 2010 and again in 2015, a detailed water

conservation evaluation was conducted by Maddaus Water Management (MWM). The analysis reviewed the following:

- most recent water use data available at the customer level (billing data)
- existing water conservation measures
- potential future water conservation measures based on experience in other parts of the country
- alternative conservation programs
- programs likely to be implemented in the future

MWM uses a proprietary conservation model that analyses water use at the end-use level and includes



Annual events, such as Fall Festival and Water Fair, help educate residents about water conserving practices.

information on individual unit water savings, year of implementation, unit costs to customers and the utility, market penetration and other factors. The evaluation table is included in the appendix.

The conservation workgroup, described on page 6, vetted MWM's model and MWM completed a technical analysis of potential conservation measures to:

1. Identify and evaluate current and new conservation measures that may be continued or implemented by the district to reduce future water demand
2. Estimate the water savings of each potential measure and the costs to the district, member agencies and public, if applicable
3. Combine the conservation measures into increasingly more aggressive programs and evaluate the water savings and financial impacts of each alternative measure or program.
4. Continue building and expanding demand-management practices to promote conservation and reduce overall water use.

Figure 4-1 identifies key water conservation components that are recommended to be implemented in combination of each other.

- Water Pricing – Tiered-rate structures charge higher rates as water use increases. These rate structures encourage efficiency, while ensuring the affordability of water for essential uses.
- Incentives – Incentives are tools that invite and

encourage the community to participate in the conservation programs. The district has a number of incentive programs critical to reaching our goals.

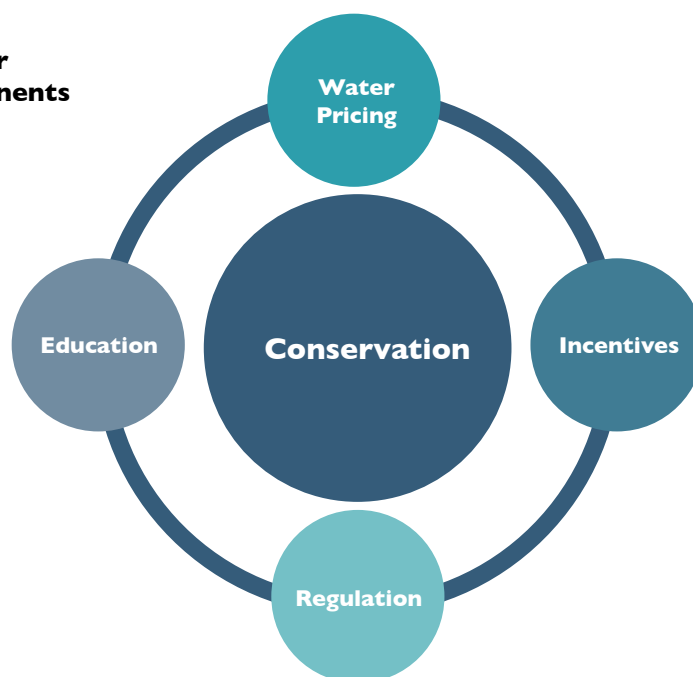
- Regulations – City and county governments have adopted a variety of land-use codes and water-use ordinances to promote the efficient and wise use of Washington County's water resources.
- Education – The district's public-education programs are designed to invite buy-in from the community and help residents understand that responsible water use is a critical choice when living in a desert environment.

These measures work with one another in a synergistic fashion to promote wise water use. The complex interrelated nature of these conservation programs makes it difficult to attribute specific GPCD reductions to any single measure, but the overall success demonstrates the cumulative result of efforts on every front.

Conservation Achievements

The district's ongoing commitment to water conservation is evident in the reduction of Washington County GPCD by 114 gallons (26 percent) between 2000 and 2010, compared to a state average reduction of 18 percent. The district is committed to further reductions through the programs outlined in this plan and aims to exceed the current goal in future updates.

Figure 4-1. Key Water Conservation Components



Achievements Based On Best Management Practices

The DWRe provides water districts and agencies a list of recommended water conservation practices referred to as Best Management Practices (BMPs), which are listed in **Table 4-1**. These 14 BMPs guide water agencies in conservation planning and success evaluation.

The following sections describe how the district followed the DWRe's BMP outline to achieve our present conservation success and explains how the BMPs support our objectives for the coming years. These practices are outlined with a brief overview of how the district has cooperated with and/or expanded on its programs since the initial plan was submitted in 1996.

BMP 1: Comprehensive Water Conservation Plans. All water conservation plans prepared by the district, dating back to its first plan in 1996, have involved extensive analysis and stakeholder input.

In addition, the district coordinates with its municipal partners, DWRe and other state water conservancy districts to maximize and expand all conservation efforts. The overall campaign is designed to educate the public on how to individually and collectively achieve local and statewide conservation goals.

BMP 2: Universal Metering (Excessive Water Use Notification). Metering is the foundation of accurate measurement of demand-management programs. The district's municipal partners are working to fully meter all customer connections for each class of water in accordance with American Water Works Association

Table 4-1. Utah DWRe Best Management Practices (BMP)

- **BMP 1** - Comprehensive Water Conservation Plans
- **BMP 2** - Universal Metering
- **BMP 3** - Incentive Water Conservation Pricing
- **BMP 4** - Water Conservation Ordinances
- **BMP 5** - Water Conservation Coordinator
- **BMP 6** - Public Information Program
- **BMP 7** - System Water Audits, Leak Detection and Repair
- **BMP 8** - Large Landscape Conservation Programs and Incentives
- **BMP 9** - Water Survey Programs for Residential Customers
- **BMP 10** - Plumbing Standards
- **BMP 11** - School Education Programs
- **BMP 12** - Conservation Programs for Commercial, Industrial and Institutional Customers
- **BMP 13** - Reclaimed Water
- **BMP 14** - "Smart Controller" Technology

(AWWA) standards. Municipalities operate ongoing meter maintenance and replacement programs. Meters are read monthly and data is recorded on the basis of customer class, meter size, land use and



Hundreds attend the annual Fall Festival at The Garden.

Table 4-2. Washington County Municipal Water Rates

Cities	Price* (per 1,000 gallons)
Hurricane	\$2.19
Ivins	\$2.45
LaVerkin	\$2.08
Santa Clara	\$2.07
St. George	\$1.72
Washington	\$1.92
Toquerville	\$3.93

* Based on 30,000 gallons use in a 30-day period

other pertinent variables. Most utilities monitor customer use to identify unusual water use, such as spikes in consumption due to leaks, and notify customers of unusual water use activity. The district hopes this practice will expand throughout the county.

BMP 3: Incentive Water Conservation Pricing. The district and its municipal partners have tiered water rate schedules to encourage conservation, as required by the RWSA. In addition, the district prepares a water budget for each of its golf course customers and charges a 50 percent surcharge for use in excess of the budgeted amount.

Table 4-2 lists the basic water rates of the RWSA municipal partners. Conservation pricing (embedded in the numbers in table 4-2) provides incentives to customers to reduce average use and water used during peak demand, high temperatures or both. Such pricing includes:

Basic Rate. A monthly charge based on meter size and designed to recover the fixed cost of providing service. This includes the cost of meter reading, billing, accounting, collecting, debt service on bonds, depreciation, insurance and other costs that do not vary with the amount of water delivered by the system. Although not all local municipalities include fixed costs in base rates, doing so assures that conservation successes do not create revenue deficiencies. This rate does not include any water.

Tiered Usage Rate. The water customer is charged a unit price according to water usage for the month. Unit prices increase in tiers as water use increases to encourage the user to reduce inefficient use. Fees collected from excess water usage could be allocated to conservation programs.

Base Sewer Charge According to Water Used. A volume charge for water and sewer service is based on metered water use only on commercial accounts. The volume charge is designed to recover all variable costs including energy for pumping, chemicals required for treatment, staff and laboratory fees and any other costs that vary with the amount of water delivered to the wastewater treatment plant.



Scenery at Red Hills Desert Garden

Other optional rates may include:

- **Seasonal rates.** These rates are based on seasonal water use such as summer versus winter or excess-use surcharges to reduce peak demands during summer months. The district works with its municipal partners to educate water users on peak demand periods to reduce use during this timeframe.
- **Billing usage information.** Many of our municipal partners include an annual overview of monthly water use in the billing statement. This provides a tool for residents to better understand and manage their water use as well as detect leaks and test system efficiencies. The district is encouraging all cities update their billing software to provide this information to the retail water user.

BMP 4: Water Conservation Ordinances and Easements. The success of the district's conservation accomplishments is partly dependent upon the water management and business practices of its individual municipal partners. There are five key areas related to demand management that are the responsibility of the municipalities: metering, tiered water rates, landscape ordinances, time of day watering and managing non-revenue water.

In addition to the ordinances listed above, the district imposes impact fees on all new development within the service areas of municipal partners. The fee is based on the size of the lot, with a pro rata increase for irrigated areas over a certain size to encourage efficient landscape design and reduced outdoor

watering. Any resident desiring to minimize the cost of the impact fee may sign a water conservation easement limiting the irrigated landscape to 5,000 square feet or less.

BMP 5: Water Conservation Manager. The district employs a full-time conservation manager with two decades of industry experience. This position coordinates with other agencies and conducts a multitude of conservation programs and activities including serving as a member of the Governor's Water Conservation Team, which oversees the statewide "Slow the Flow" media campaign. Tasks also include coordination with the district's public information manager on local conservation-related campaigns. Through interfacing with a large number of citizens, local boards, and public entities, the water conservation manager creates awareness of incentive and/or volunteer water saving programs that benefit their financial bottom line. In addition, this position chairs conservation plan workgroups, including the 16-citizen conservation workgroup, and coordinates annual educational programs, activities and events at the district's conservation gardens and throughout the community.

BMP 6: Public Information Programs.

Water Conservation Demonstration Gardens

The district manages two water conservation demonstration gardens in St. George: The Garden and Red Hills Desert Garden. Each garden is designed to inspire and educate home- and business-owners on water efficient landscape principals and is maintained



by a full-time district employee. Educational resources, including signs and brochures covering a variety of topics, are available at the gardens. Thousands of residents visit the gardens annually.

The Garden, 1851 S. Dixie Dr. was completed in 2002 and was a joint partnership with the district, St. George City, Utah State University (USU) Extension and Costanza & Associates, a Utah-based landscape architect firm. The Garden has been an educational resource to the community in the art and experience of water-efficient landscaping. The disciplines demonstrated at The Garden include proper soil composition and fertilization; understanding weather and climate; proven irrigation practices and technologies; plant design; and plant selection. There are four landscape themes demonstrated at The Garden: Desert Highlands, Urban Desert, Native Desert Shrublands and Desert Oasis.

The district and city of St. George host several annual community events at The Garden, including two large community events Fall Festival and Garden Fair, and monthly landscape workshops taught by certified local experts. All events are free and open to the public.

The Garden also provides assistance to organizations such as USU Extension's Master Gardeners, Utah Nursery and Landscape Association, and local schools and garden clubs. This venue is also popular for weddings and other private events.

Red Hills Desert Garden. Located at 375 N. Red Hills

Parkway, is the first desert conservation garden in the state of Utah. This garden features more than 5,000 water efficient plants, a replica slot canyon and a 1,150-foot stream stocked with native and endangered fish. The garden was built as a social, recreational and education facility. It opened in 2015 as a collaborative project of district, City of St. George and Virgin River Program.

The garden is organized in three ecosystems: Great Basin, Colorado Plateau and the Mojave Desert, all of which come together in Washington County. The garden will serve as an educational resource to increase public awareness of the benefits and beauty of our natural environment through ongoing activities, programs and events for teachers, students, visitors and the general public for years to come.

Utah Water-Wise Plant Tagging. The district contributed to Utah's Water-Wise Plant Tagging program, which consisted of representatives from government and local organizations working together to organize a list of ornamental trees, shrubs, herbaceous perennials, ornamental grasses, and ground covers that would meet the criteria listed below:

- water-wise
- adaptable to Utah's arid climate and cold winters
- available in the industry
- relatively easy to maintain in the landscape
- desirable landscape characteristics which remain desirable under limited water availability



Monthly workshops teach on water efficient landscape principles.

A tagged plant requires water at most once every two weeks after establishment in order to maintain its aesthetic characteristics. The plant is identified with a generic, bright yellow tag indicating to the consumer that the plant is a water-wise plant. Participating nurseries and garden centers throughout the state will have these tagged plants available.

The program goals of this state-developed program are to assist Utah citizens in identifying water-wise plants for use in their region. An evaluation was not performed for this plan update.

Governor's Water Conservation Team – Slow the Flow Media Campaign. The state-sponsored public education “Slow the Flow” campaign, now in its 15th year, is supported and funded, in part, by the district. Many of the district’s conservation programs, incentives, and public education initiatives synergize with the state campaign to increase wise water use and achieve the Governor’s water conservation target of reducing per capita daily use 25 percent by 2025. The combination of water diversity and comprehensive conservation measures are both necessary to meet the demands of expanding population and visitor volume in Southern Utah.

As a member of the Governor’s Water Conservation Team, the district coordinates with DWR and other districts throughout the state to carry the “Slow the Flow” campaign into respective service areas. The campaign educates the public to understand what they can do individually to help achieve conservation



goals across the state, thus encouraging a long-term water conservation ethic among Utah residents and visitors. The annual cost share of the program is \$12,500 for the district, which is pooled with monies from the other members of the team. The district will continue supporting and assisting the Governor’s Water Conservation Team to increase conservation attitudes throughout the state through a unified conservation message.

Booths and Public Events. The district hosts and participates in several community events annually to distribute educational resources to the public. In addition, the district frequently coordinates tours of district facilities to students, elected officials, service organizations, landscape professionals, nurseries, homebuilders, business groups and the general public.

Local Media Campaign. The district currently invests approximately \$25,000 annually on an extensive local advertising campaign that includes print, broadcast, radio, online and social media placements. In addition, the district secures more than a million dollars in



Red Hills Desert Garden



earned (non-paid) media coverage annually.

Public Outreach. The district participates in a variety of public outreach initiatives including hosting/participating in community events, media outreach, speaking opportunities and advertising placements.

EPA WaterSense Partner. In 2007, the district began partnering with the EPA's WaterSense program, which allows the district to implement established and branded national programs in our local community. These events include "Fix a Leak Week," "Shower Better" and "We're For Water."

BMP 7: System Water Audits, Leak Detection and Repair. Prior to the district's launch of its System Audit and Loss Control program in 2011, the district reported up to 35 percent loss in some systems. Today, the district's average system loss is 9 percent – well under AWWA's 15 percent acceptable standard for unaccounted water in utilities. This program has minimized wasteful source water withdrawals, financially optimized revenue recovery, minimized distribution system disruptions, optimized supply efficiency, generated reliable performance data and reduced potential for contamination. In addition, the program has established a protocol to improve water measurement accuracies and balance system water production and sales.

BMP 8: Large Landscape Conservation Programs and Incentives.

Horticulture Classes, Training, and Awards

The district currently supports USU Extension in promoting and offering education through Qualified Water Efficient Landscapers (QWEL) certification,

an EPA WaterSense recognized program that allows certified landscapers to partner with the federal agency. In addition, certified landscapers qualify to participate in the district's irrigation rebate programs.

Prior to offering the QWEL training, the district hosted Irrigation Association certification testing. In 2003, the district partnered with Dixie Applied Technology College ("DXATC"), USU Extension and St. George City to create a program to educate the landscape professional in water-efficient landscape management.

All classes, trainings and awards coordinated by the district encourage professionalism and promote best management practices for water-efficient landscapes. A five percent drop in water demand is anticipated to be achieved through proper landscape management practices.

BMP 9: Water Survey Programs for Residential Customers. Water survey programs, known as Water Checks, offer a free sprinkler system evaluation and educational materials to homeowners and multi-family developments. Since 2005, the district has conducted more than a thousand water checks, giving property owners a customized recommended watering schedule and tips to reduce use based on their system's efficiency and performance.

BMP 10: Plumbing Standards. The district offers rebates for WaterSense labeled toilets in homes built in 2000 or prior and for installation of any WaterSense Labeled plumbing fixture to Commercial, Industrial and Institutional customers. In addition, a contribution is given to the City of St. George to run its toilet rebate program.

BMP 11: School Education Programs. The district participates in several school outreach and educational programs to promote conservation and wise water use. In addition, district staff members serve as a resource for educators in elementary, secondary and higher education.

The district's largest annual undertaking is the Water Fair. This fair, in support of the state's core water curriculum, is for all fourth graders in Washington



An ad created as part of the district's public outreach efforts.

County. Nearly 40,000 students have participated in the program since its inception in 1995. More than 30 presentations are available at the fair, which is held at Dixie State University free of charge. Topics range from water treatment, properties, infrastructure, conservation and source protection. The average cost to the district for this fair is \$2,000. Local municipalities and merchants donate items for the fair, including prizes in the entertaining Water Jeopardy game.

BMP 12: Conservation Programs for CII Customers. CII water users account for 51 percent of the county's use making them a primary target for rebate and incentive programs. Rebates offered as part of the district's Water Efficient Technology Assistance Program include replacing water-cooled machines with air-cooled machines, retrofitting plumbing with WaterSense labeled fixtures and installation of pre-rinse spray valves. The district also hosts free programs and provides creative materials to local hotels willing to participate in the "Save the Towel" campaign and/or restaurants participating in the "Water Upon Request" program.

BMP 13: Secondary and/or Reclaimed Water.

Secondary Water Systems. The district and its RWSA municipal partners are maximizing the use of secondary water systems to serve new development, thus offsetting demands on culinary water sources. The conversion of open canals and flood irrigation to pipelines and pressurized systems reduces irrigation water use as well as water losses from seepage and evaporation in secondary systems. The district has been involved in the following key conversions:

Toquerville Secondary Water System, the first open ditch system to be converted to a pressurized piped system after the district purchased water rights from the Toquerville Irrigation Company's shareholders, distributes irrigation water from Toquerville Springs to Toquerville residents. The Gunlock to Santa Clara pipeline replaced four diversions and converted flood irrigation to a pressurized system. The pipeline delivers irrigation water to Ivins, Santa Clara and the Shivwits Band of Paiute Indian Reservation. St. George and Washington Canal System converted the largest and longest open canal system in the county, approximately 9 miles, to enclosed pipeline.



Nathan Moses, Utah Division of Water Rights, talks to students about water rights in Utah at an annual Water Fair.

Telemetry Project. The district implemented a telemetry project that monitors diversions along the Santa Clara and Virgin rivers in an effort to minimize water loss, aid in water management and enhance the accuracy of measuring water right allocations.

Study on High Salinity in Water. Working with retired Brigham Young University professor and researcher Dr. Frank Williams, a research was conducted identifying plants and irrigation practices of landscape plants tolerant of high-salinity water. The purpose was to evaluate the use of Virgin River water in the establishment and management of grasses, trees, shrubs and other landscape plants commonly used in this area and thought to be salt tolerant. The study has:

- Evaluated the plant's establishment using high-salinity water
- Considered the plants' ability to survive on minimal water use
- Established best management practices for landscapes using river water
- Evaluated growth characteristics
- Monitored soil for accumulation of salts and determine best management practices
- Created a ranking for plants adaptability to high salt content water
- Produced a recommended plant list specific to Washington County

- Guided municipal landscape plant selection and maintenance

The study continues to monitor landscape plants to establish best management practices long after the establishment of the plants using high salinity water. The publication of this research is periodically updated as new information is collected.

BMP 14: "Smart Controller" Technology.

Smart Water Application Technology (SWAT) Controller Rebates. Since 2002, the district has offered rebates to large water users and homeowners who install smart controllers. Municipalities, schools, churches, planned community developers and homeowners have participated in this educational program designed to mitigate overwatering.

Weather Station Link and Website. The district, USU and St. George City have worked with Irrisoft to link existing weather stations in the county to one computer terminal. The weather station collects data and produces an evapotranspiration value known as ET. This ET value is then used by large water users, landscape professionals and homeowners to gauge landscape irrigation needs. The website www.dixiegardener.org has been created to disseminate the ET value county-wide. This website is hosted and updated weekly by the USU Extension.



Produce grown in the community garden, which uses reuse water, is frequently donated to the local soup kitchen.

Chapter 5: Future Water Demand and Water Supplies

The GOMB is projecting Washington County will more than quadruple its population by 2060, necessitating a proactive and aggressive approach to conservation and new resource development. **Table 5-1** shows the projected growth of the district's six largest municipal partners.

The district uses GOMB population calculations, per capita water use and estimated conservation savings to determine future water needs. Increased conservation efforts are expected to reduce daily per capita usage, but the district must be capable of supplying enough water to meet Utah design standards for source sizing.

Plumbing code measures account for 32 percent of the future conservation potential achieved and are independent of any program; they are based on customers following applicable current local, state and federal laws, building codes and ordinances. **Table 5-2** shows population water demand projections out to 2060.

Table 5-2. Forecasted Total Demand for Future District M&I Water Use

Year	Population	Per Capita use with Plumbing Code Only (GPCD)	Per Capita Use with Conservation (GPCD)	Total Projected Water Demand with Conservation (ac-ft/yr)
2010	138,530	325	325	50,380
2020	196,480	316	311	68,450
2030	279,270	315	295	92,220
2040	369,370	310	295	122,010
2050	468,990	309	295	154,940
2060	576,850	307	285	184,250

Source: WNA 2015

Table 5-1. GOMB Population Projections by Major City

City	Population					
	2010	2020	2030	2040	2050	2060
Hurricane	13,300	18,950	27,020	35,800	45,510	56,020
Ivins	6,410	9,130	13,020	17,250	21,930	27,000
LaVerkin	4,060	5,780	8,250	10,930	13,890	17,100
Santa Clara	6,500	9,260	13,200	17,500	22,240	27,380
St. George	72,750	103,640	147,780	195,810	248,920	306,420
Washington	18,760	26,730	38,110	50,490	64,190	79,020
Total	138,530	196,480	279,270	369,370	468,990	576,850
Annual Growth Rate	-	3.6%	3.6%	2.8%	2.4%	2.1%

Source: WNA 2015

Table 5-3. Current and Future Projects Reliable Yields

Supply Source	Average Annual Yield in 2060 (ac-ft/yr)
Existing Supplies	67,676 ⁽¹⁾
Agricultural Conversions from Development	10,080 ⁽²⁾
Ash Creek Pipeline and Well Improvements	13,670 ⁽⁴⁾
Lake Powell Pipeline	82,249
Maximize Existing Wastewater Reuse Capacity of 10 mgd	7,300 ⁽³⁾
Warner Valley Reservoir	-
Future LPP Reuse	27,120 ⁽³⁾

Notes:

⁽¹⁾Includes WCWCD reliable water supply which includes WCWCD existing projects and water uses.

⁽²⁾The estimated supply is 12,880 ac-ft/yr with 90% reliability (WNA 2015). However, it was estimated that approximately 2,800 ac-ft/yr of this supply is currently in use and has been accounted for in the reliable secondary supply. It was assumed that agricultural conversions from development would be developed moderately until Warner Valley Reservoir is available for storage.

⁽³⁾ See WNA 2015.

Washington County's water demand is expected to increase to approximately 184,245 acre feet per year by 2060 (WNA 2015). The demand projections reflect average water use under average weather conditions and do not reflect climate change/altered weather patterns, varied temperatures, increased or decreased snow and/or rainfall, prolonged drought, changes in environmental or water quality regulation or other factors that may significantly impact water demand.

Figure 5-1 shows existing and proposed water projects to meet projected demand with conservation. The numbers shown incorporate the existing total Washington County supply of 67,670 (WNA)

The yields of these supplies are summarized in **Table 5-3**. Washington County needs an additional 116,569 ac-ft per year to meet estimated 2060 demand. **Figure 5-2** is a map of the district's future proposed projects.

Figure 5-1. Summary of Water Supply and Demand Total with Conservation

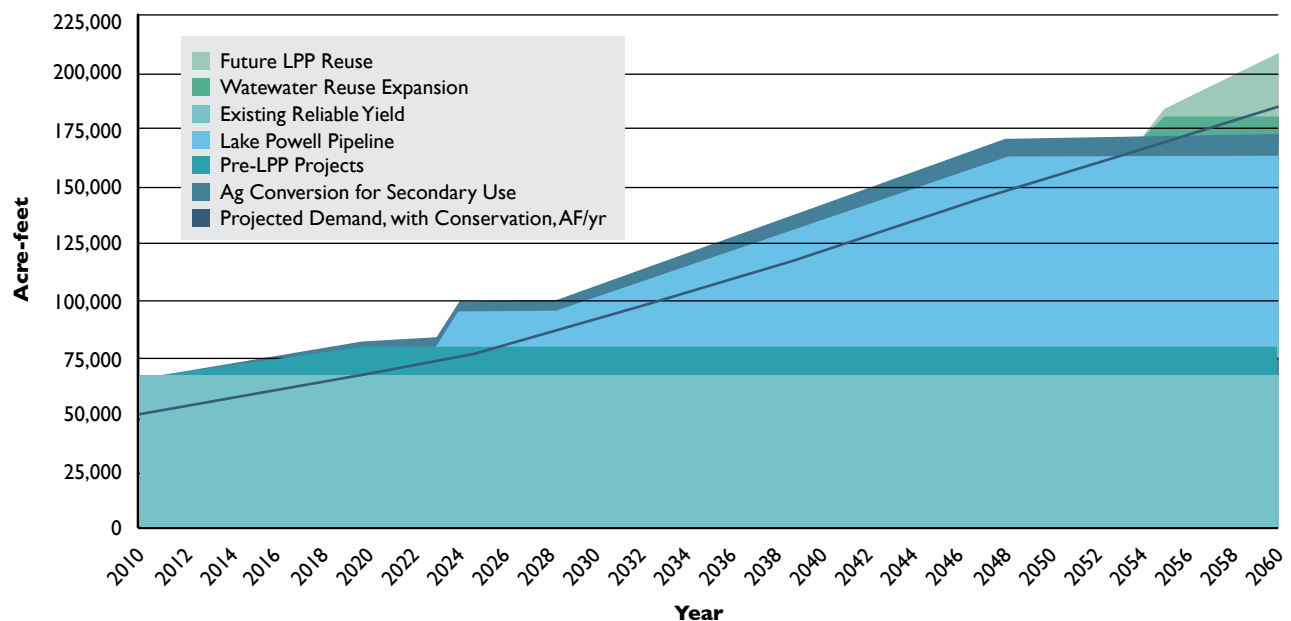


Figure 5-2. Map of Existing and Future Water Projects

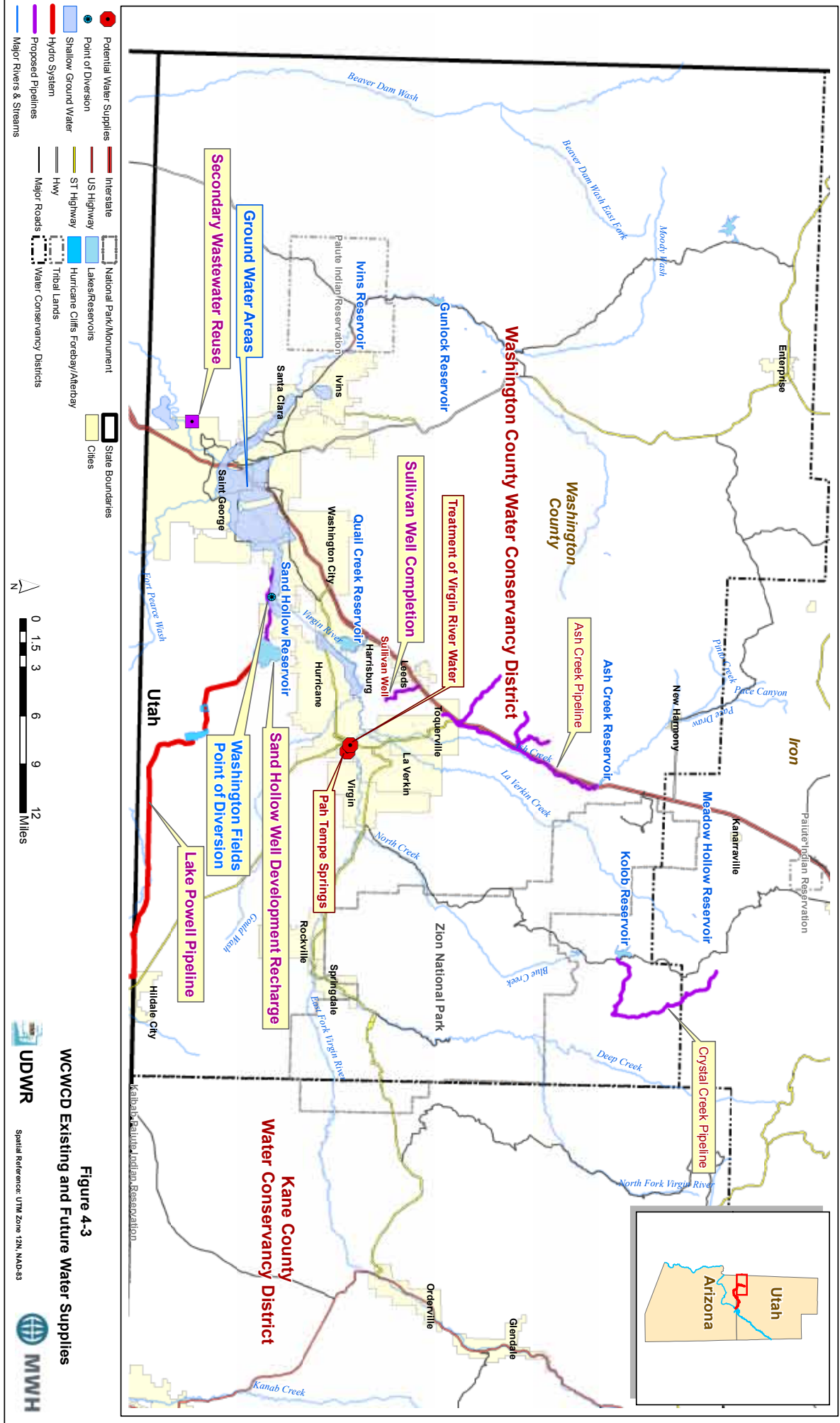


Figure 4-3
WCWCD Existing and Future Water Supplies

Chapter 6: Water Conservation: Recommendations and Goals

Table 6-1. Future Reduction Goals for GPCD*

Year	Percent of Water Saved	GPCD Saved
2010	26%	114
2060	35%	154

*Based on water use from 2000.

Future Goals and Water Conservation Programs

Water conservation will play an increasingly critical role in water resource planning and management, particularly if the historical and projected trends of growth and drought continue. Conservation is a collaborative effort that will require ongoing commitments and financial investments from the district, its municipal partners and water users.

Water conservation programs were analyzed in conjunction with MWM in 2010 and updated in 2015 to ensure that conservation goals could be achieved. MWM reviewed water use data (billing data), evaluated existing water conservation measures, considered potential future water conservation measures and recommended potentially effective programs. The MWM model analyzed water use at the end-use level (e.g., individual appliances and fixtures) and considered factors such as individual unit water savings, year of implementation, unit costs and market penetration. The workgroup then selected preferred conservation measures, outlined in **Table 6-1**.

From 2000-2010, daily per capita water use decreased by 114 gallons in Washington County. Now that the most readily obtainable conservation measures have achieved this reduction, more difficult and expensive future conservation efforts remain, yielding proportionately smaller returns. The analysis discussed in this plan would bring a daily per capita water use reduction of 154 gallons by 2060.



District employees perform a Water Check to help homeowners implement water smart irrigation practices.

This chapter demonstrates how the planned reduction in use is attainable with plumbing codes, current conservation programs and the addition of new programs.

Upon inspection of the list first offered for consideration by MWM, the conservation workgroup evaluated 10 measures in addition to the 18 programs adopted in the 2010 plan. Of those 10, five were included in this plan. Details of the study are included in the appendix. **Table 6-2** lists all program considered for evaluation.

Table 6-3 lists the measures currently offered and measures adopted for this plan. Descriptions of the five new programs follows:

Billing Report Educational Tool. A billing software that educates customers of all classes on actual vs needed water use and compares their use to others in their area, which promotes normative changes in water use. Real-time data is available online

CII Surveys. A free audit to commercial accounts with high water use that will evaluate system performance and suggest options to reduce use

Install High Efficiency Fixtures in Government Buildings. Provides rebates or grants to install high efficiency faucets, toilets, urinals and showerheads in local and state government facilities

School Building Retrofit. A grant program for schools

to replace fixtures and upgrade irrigation systems, modeled after the Eastern Municipal Water District Public School Retrofit Program.

Water Budgeting/ Monitoring. A website that provides large landscape water users feedback on irrigation water use (budget vs. actual) modeled after Municipal Water District of Orange County's Water Smart Landscape Program.

New programs and technological advances will be incorporated into future plan updates.

Conservation Savings

Figure 6-1 shows the projected GPCD reductions and percent conservation anticipated with the selected measures. These estimated water savings include those anticipated from enforcement of current plumbing codes that require use of high-efficiency plumbing fixtures in new homes and remodels. Results show that by implementing the five new measures identified in this plan, GPCD levels would be 40 gallons lower in 2060 than in 2010.

Cost of Conservation

Table 6-4 illustrates the present value of cost savings and the benefit to cost ratio of implementing these programs.

Table 6-2. Conservation Measures Analyzed

General Measures	Residential Measures (Indoor)	Commercial Measures (Indoor)	Irrigation Measures (Outdoor)
Real Water Loss Reduction*	Distribute Retrofit Kits*	CII Surveys*	Irrigation Water Surveys (Water Checks)*
Conservation Pricing*	Single Family (SF) Water Surveys*	CII Rebates to Replace Inefficient Equipment*	Xeriscape Demonstration Gardens*
Public Information Program	Toilet Leak Detection*	Replace Spray Nozzles*	Train Landscape Maintenance Workers*
Water Budgeting/ Monitoring*	Multifamily Washer Rebate*	High Efficiency Urinal Rebate (<0.5 gallon)*	Financial Incentives for Irrigation Upgrades
Billing Report Educational Tool*	Require Efficient Toilets and Urinals	School Building Retrofit*	Smart Irrigation Controller Rebates*
Mobile Home Park Submetering	Washer Rebates for High Efficiency Machines (SF)	Install High Efficiency Fixtures in Government Buildings*	Rotating Sprinkler Nozzle Rebates*
Efficient Outdoor Use Education and Training Program*	High Efficiency Toilet (HET) Rebates*	High Efficiency Toilet (HET) Rebates*	Turf Removal
		Install or Rebate High Efficiency Faucets	
		Require Efficient Toilets and Urinals	

*Current and newly added measures

Figure 6-1. Gallons Per Capita Daily Use Reduction By Scenario

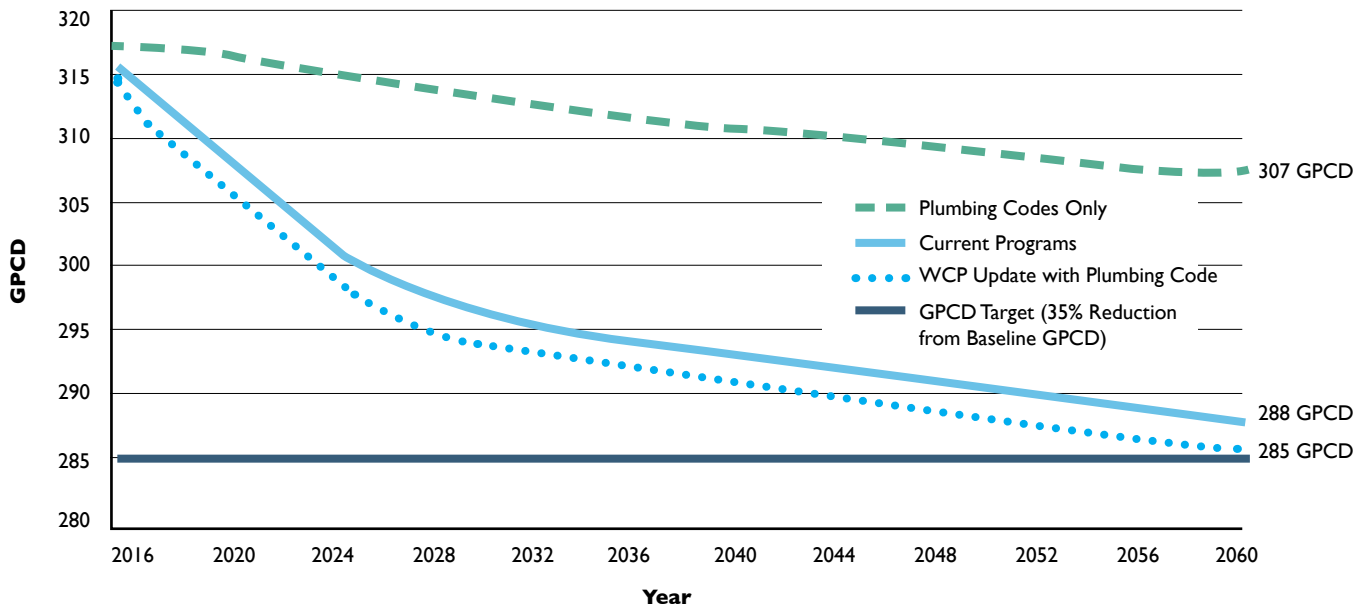


Table 6-3. 2015 District Conservation Programs

Measure Name	Category	Current	2015
CII to Replace Inefficient Equipment	Commercial Measures (Indoor)	X	X
Conservation Pricing	General Measures	X	X
Distribute Retrofit Kits	Residential Measures (Indoor)	X	X
Efficient Outdoor Use Education and Training Program	General Measures	X	X
Financial Incentives for Irrigation Upgrades	Irrigation Measures (Outdoor)	X	X
High Efficiency Toilet (HET) Rebates	Residential Measures (Indoor), Commercial Measures (Indoor)	X	X
High Efficiency Urinal Rebate (<0.5 gallon)	Commercial Measures (Indoor)	X	X
Irrigation Water Surveys (Water Checks)	Irrigation Measures (Outdoor)	X	X
Multifamily Washer Rebate	Residential Measures (Indoor)	X	X
Public Information Program	General Measures	X	X
Real Water Loss Reduction	General Measures	X	X
Replace Spray Nozzles	Commercial Measures (Indoor)	X	X
Rotating Sprinkler Nozzle Rebates	Irrigation Measures (Outdoor)	X	X
Single Family (SF) Water Surveys	Residential Measures (Indoor)	X	X
Smart Irrigation Controller Rebates	Irrigation Measures (Outdoor)	X	X
Toilet Leak Detection	Residential Measures (Indoor)	X	X
Train Landscape Maintenance Workers	Irrigation Measures (Outdoor)	X	X
Xeriscape Demonstraion Gardens	Irrigation Measures (Outdoor)	X	X
Billing Report Educational Tool	General Measures		X
CII Surveys	Commercial Measures (Indoor)		X
Install High Efficiency Fixtures in Government Buildings	Commercial Measures (Indoor)		X
School Building Retrofit	Commercial Measures (Indoor)		X
Water Budgeting Monitoring	General Measures		X

Table 6-4 Conservation Program Cost Benefit Comparison

Conservation Program	Present Value of Water Savings	Present Value of Community Costs	Utility Cost of Water Saved (\$/MG)*	Community Cost of Water Saved (\$/MG)*	Water Utility Benefit to Cost Ratio	Community Benefit to Cost Ratio
2010 Programs with Plumbing Code	\$133,889,976	\$38,589,697	\$270/MG	\$393/MG	5.1	3.7
2015 Programs with Plumbing Code	\$155,723,518	\$44,881,264	\$283/MG	\$397/MG	4.9	4.0

*Cost of water saved per unit volume = present value of costs (utility or community) divided by program water savings. Costs and savings are for the analysis period (years 2016-2060).



A variety of birds enjoy the landscape at Red Hills Desert Garden.

Chapter 7: Conclusion

Funding

Funding will be a major factor in implementing the conservation portion of the plan. The district receives revenues from water rates, property taxes, impact fees and hydroelectric power sales and is committed to funding conservation programs that benefit the community and are fiscally responsible. When possible, the district will pursue funding partnerships with national, state and local organizations to mitigate local costs. Potential partners include:

- Utah Division of Water Resources Conservation and Development Fund

- Permanent Community Impact Fund Board
- Federal and state agencies
- Local cities and towns
- Corporations
- Non-governmental organizations
- Private donors

Monitoring and Updating

The water conservation manager will continue to maintain data on water usage and make regular reports to the board of trustees and municipal partners. This plan will be updated to meet changing conditions and needs and in response to new technologies by 2020.



Red Hills Desert Garden

WASHINGTON COUNTY
WATER CONSERVANCY DISTRICT

WCWCD Board of Trustees Adoption of 2015 WCWCD Conservation Plan Update

Resolution of the Board of Trustees

Whereas pursuant to Section 73-10-32, Utah Code Ann. (1953) (The Act"), Washington County Water Conservancy District prepared a Water Conservation Plan in 1996, prepared updates to the Plan in 2005, 2010 and has now prepared an additional update to its Plan as provided in attached Exhibit 1 (the "Updated Plan"); and,

Whereas Washington County Water Conservancy District has established in its Updated Plan a water conservation goal to reduce water use within its service area by twenty-five percent or more by 2025; and,

Whereas, Washington County Water Conservancy District has determined that achieving this goal will help sustain existing and future water supplies, providing an adequate water supply for future generations; and,

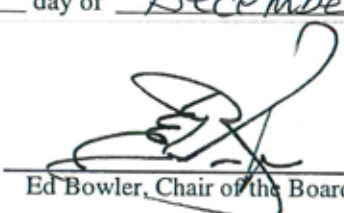
Whereas, the Updated Plan identifies existing and proposed water conservation measures and programs needed to continue making progress toward achieving our goal; and,

Whereas, pursuant to The Act, Washington County Water Conservancy District has held a public hearing, after reasonable and advance notice, for purposes of inviting and encouraging discussion and public comment on the Updated Plan;

NOW, THEREFORE, BE IT RESOLVED by the Board of Trustees of the Washington County Water Conservancy District:

1. Washington County Water Conservancy District has met the requirements of The Act in its preparation of the Updated Plan.
2. The General Manager is authorized and directed, upon completion of final editorial review and such editorial changes as the General Manager deems necessary and appropriate, to cause a copy of the Updated Plan to be filed with the Utah Division of Water Resources and with all other persons or entities deemed appropriate.
3. This Resolution shall take effect immediately upon execution by an authorized member of the Board of Trustees.

PASSED, ADOPTED AND APPROVED this 8 day of December, 2015.



Ed Bowler, Chair of the Board of Trustees

ATTEST:


Secretary/Treasurer

Glossary

Acre-foot – a volumetric unit of water used in water supply planning, which is equivalent to water spread over an acre of area with a depth of 1 foot (325,851 gallons)

Annual Growth Rate – the yearly compounding increase in a value, used in this report to represent the yearly rate of growth for population projections

Aquifer – a groundwater-bearing geologic formation

Buy and Dry – the conversion of agricultural water rights for other uses, typically through purchase by municipal and industrial water providers, with a resulting dry-up of irrigated land

Conservation – reduction in per capita water use typically achieved through water savings measures such as water reuse, efficient lawn watering practices, and low flow water fixtures

Culinary Water – water supply that meets drinking water quality standards and can be used to meet all water demands (synonymous with potable water)

Decision Support System (DSS) – is an interactive software-based system intended to help decision makers compile useful information from a combination of raw data, documents, and personal knowledge to identify and solve problems and make decisions.

Diversion – a diversion changes the natural flow of water to another location by using dams, canals, or pipelines.

Groundwater – water contained in an aquifer, and sometimes extracted for water supply (typically extracted through a groundwater well)

Integrated Water Resources Plan – a balance of forecasted water demands and existing and future water supply projects, typically prepared for planning the timing and volume of future potential water supplies

Maximum Annual Supply – the yearly volume of water that could be delivered at the maximum daily flow rate of a given water supply

Maximum Contaminant Level (MCL) – the greatest level of a particular contaminant within a water source that is considered to be a threshold for making the water source available for beneficial use (e.g., a drinking water MCL for total dissolved solids)

Non-Potable Water – water supply that does not meet drinking water standards, which can be used to meet demands that do not require drinking water quality (e.g., irrigation and lawn watering) (synonymous with secondary water)

Per Capita Water Use – the average rate of water consumption per person, typically calculated in gallons per person per day

Permanent Population – the number of residents living in an area that occupy their residences year-round (i.e., not including tourists or part-time residents)

Potable Water – water supply that meets drinking water standards, which can be used to meet all water demands (synonymous with culinary water)

Prior Appropriation Doctrine – a water administration system typically used in the western United States, which prioritizes water rights by the date that the rights were first administered (i.e., through seniority of the rights)

Reliable Annual Supply – the annual volume of water that is readily available to meet peak demands (in this report, reliable supply is based on the Utah Division of Water Resources definition – the portion of the maximum culinary water supply that can be used to meet annual water demands)

Second homes – owners reside in these homes part time usually during the winter months. These residents are not counted in Washington County's population records but their water use is added to the water use numbers ascribed to permanent residents.

Secondary Water – water supply that does not meet drinking water standards, which can be used to meet demands that do not require drinking water quality (e.g., irrigation and lawn watering) (synonymous with non-potable water)

Surface water – water in rivers, streams, creeks, and lakes is referred to as surface water. The Virgin River provides Washington County with surface water.

Sustainable Yield – the volume of groundwater that can be withdrawn from an aquifer on an average annual basis without depleting the long-term storage of the aquifer, which is generally equal to the amount of recharge to the aquifer

Water Reuse – the use of treated wastewater for a beneficial use, such as lawn and golf course irrigation or industrial water; culinary water reuse refers to the use of treated wastewater to meet culinary demand

Yield – the amount of water can be delivered from a particular supply, typically given in terms of annual supply

Abbreviations and Acronyms

BOD	Biochemical oxygen demand	mgd	Million gallons per day
CFP	Capital Facilities Plan	mg/l	Milligrams per liter
CII	Commercial/Industrial/Institutional	MWM	Maddaus Water Management
DATC	Dixie Applied Technology Courses	NEPA	National Environmental Policy Act
DSS	Decision Support System	RWSA	Regional Water Supply Agreement
DWRe	Utah Division of Water Resources	SITLA	Utah State Institutional Trust Lands Administration
DWRi	Utah Division of Water Rights	SWAT	Smart Water Applied Technology
ET	Evapotranspiration	TDS	Total dissolved solids
GOBPB	Utah Governor's Office of Planning and Budget	TMDL	Total Maximum Daily Load
GPCD	Gallons per capita per day	TSS	Total suspended solids
KCWCD	Kane County Water Conservancy District	USGS	United States Geological Survey
LPP	Lake Powell Pipeline	WCWCD	Washington County Water Conservancy District
M&I	Municipal and Industrial	WCWMC	Washington County Water Management and Conservation Plan
MCL	Maximum contaminant level	WECCO	Western Electrochemical Company
MG	Million gallons		

Appendix

Members of Water Conservation Plan Workgroup
Water Conservation Plan Workgroup Goals and Recommendations
Water Conservation Programs Evaluated by MWM
Notice of Public Hearing Regarding 2015 Conservation Plan Update
Minutes of Public Hearing
Notice of Regular Meeting of WCWCD Board of Trustees Regarding Adoption of 2015
Conservation Plan Update
Written Comments Concerning 2015 WCWCD Water Conservation Plan Update
Utah State Water Conservation Plan Section 73-10-32

Water Conservation Plan Update Workgroup		
Last Name	First Name	Rep
Anderson	Austin	Builders
Bergeson	Larry	WC Schools
Bringhurst	Ty	Toquerville
Butine	Tom	CDF
Fleming	Rene	St. George
Gillette	Chuck	Ivins
Hays	Brad	Santa Clara
Iverson	Victor	County
Kohler	Richard	Green Building
McArthur	Gregg	Chamber
Martin	Connie	Hurricane
Sapp	Carol	Citizen
Warner	Niki	Landscape Nurseries
Winters	Mike	Washington
Wadsworth	Colette	Agriculture
Wilson	Karl	LaVerkin

**INFORMATION TO BE COMPILED THAT REFLECT WCWCD
CONSERVATION PLAN UPDATE GROUP DISCUSSION:**

VISION STATEMENT: Washington County citizens and businesses using water wisely, conserving and working together to sustain our community, preserve our quality of life, fulfill our environmental stewardship, and assure the availability and quality of water in the future.

**MISSION: WHAT THEY WANT THE COMMUNITY TO BE IN TERMS OF
WATER WISE STEWARDS**

WISE WATER USE AND CONSERVATION GOALS INCLUDE:

1. Washington County Water Conservancy District and its member agencies are recognized as water efficient and fiscally responsible.
2. Wise water use and conservation guidelines and/or ordinances are well defined and actively practiced county-wide.
3. WCWCD and its member agencies are committed to partnerships and programs that promote water conservation and efficient water management.
4. Washington County is a leader in Utah and the west in effective, fiscally responsible water management where citizens are informed and engaged in conservation with regular evaluations and necessary adjustments to achieve conservation milestones.

GOALS INCLUDE THE FOLLOWING OBJECTIVES:

GOAL 1: Washington County Water Conservancy District and its member agencies are recognized as water efficient and fiscally responsible.

Objective 1: Washington County continues to significantly reduce gallons of water use 25% per person per day from 334 (YEAR 2000) to 251 (YEAR 2025).

Objective 2: Washington County is recognized as a water efficient community and a leader in water conservation and future planning.

Objective 3: Produce presentations or research publications annually that are recognized as important by the industry defining audiences and highlighting wise water management practices, innovation and conservation success.

GOAL #2: Wise water use and conservation guidelines and/or ordinances are well defined and actively practiced county-wide.

Objective 1: WCWCD Water Conservation Plan is updated by 2015 with clearly defined conservation measures including governmental, fiscal and social impacts.

Objective 2: 25% per capita per day water use reduction is reached or surpassed by 2025.

Objective 3: Agricultural water use is maximized for the greatest benefit to those holding water rights, the economy, environment and county citizens.

GOAL 3: WCWCD and its member agencies are committed to partnerships and programs that promote water conservation and efficient water management.

Objective 1: 100% of water-wise, conservation messaging is done through partnership promotion by 2025.

Objective 2: Member agencies, schools, businesses, industry and local service organizations are united participants in WCWCD conservation branding programs by 2025.

Objective 3: Member agencies review, evaluate and coordinate in strategic water conservation plan and programs annually.

GOAL 4: Washington County is a leader in Utah and the west in innovative, fiscally responsible water management and citizen-supported conservation with regular evaluations and necessary adjustments to achieve conservation milestones.

Objective 1: WCWCD supports at least one conservation and water efficient research or pilot project every two years.

Objective 2: Effective water use or wise water management innovations are carefully considered and adopted locally by member agencies and/or by other communities, according to their needs and abilities.

Objective 3: WCWCD awards municipalities and citizens conservation funds, grant education support or scholarships for leadership and/or participation in conservation and/or wise water use.

GOAL 5: Planning for the county's future water needs must include a stronger emphasis on conservation and in addition must incorporate developing new water supplies.

Objective 1: WCWCD supports a comprehensive water management plan.

Objective 2: Actively seek and develop local water resources and regional sources, specifically the Lake Powell Pipeline.

Table B-1 Existing and Potential Measures Assessed in the Measure Screening Process

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
Existing Measures				
Financial Incentives for Irrigation Upgrades	SF, MF, COM, INST Outdoor	For existing SF, MF, and COM customers with landscape. Provide rebates towards the purchase and installation of selected types of irrigation equipment upgrade, including low-volume sprinkler heads, check valves, and rain sensors. Rebate is up to one-half of cost of equipment. Assume average rebate to be \$2,500 for non-residential customers.	YES	
Smart Irrigation Controller Rebates	SF, MF, COM, INST Outdoor	Provide a 50% cost-share for the purchase of a SMART irrigation controller. Require customer to have a "Water Check" and education.	YES	
Distribute Retrofit Kits	SF Indoor	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low-flow showerheads, faucet aerators, and toilet tank retrofit devices. Distribute at community event booths.	YES	
Toilet Leak Detection	SF Indoor	Distribute leak detection tablets for homeowners to test toilets for leaks. Offer advice on toilet leak repair. Continue "Fix the Leak Week" campaign.	YES	
Washer Rebates for High Efficiency Machines	SF Indoor	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology. Can rebate on sliding scale and vary with water efficiency of new machine. Water rebate averages \$200; total rebate higher if local Energy Company participates.	YES	Measure offered previously by St. George City but not currently offered.

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
High Efficiency Toilets (HET) Rebates	SF, MF, COM, INST Indoor	Provide a \$75 rebate or voucher for the installation of a high efficiency toilet (HET). HETs are defined as any toilet that flushes 20% less than an ultra-low flow toilet (ULFT) and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. This program will be eliminated as 1.28 gpf toilets are mandated by state or federal law. This program must be WaterSense labeled.	YES	
Single Family Water Surveys	SF Outdoor	Continue outdoor water surveys (Water Checks) for existing single family residential customers. The participant is provided with a customized report to the homeowner regarding how to save water in their home.	YES	
Multifamily Washer Rebate (Intensive)	MF Indoor	Provide a rebate to apartment complexes (10 or more units) for efficient washing machines in buildings over a certain size that have a common laundry room. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology.	YES	
Public Information Program	SF	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include school programs, poster contests, speakers to community groups, radio and television time, and printed educational material, such as bill inserts, etc. Program would continue indefinitely.	YES	
Conservation Pricing	SF	Existing single family water rates would be changed to create an added price incentive to use less water. Modifications could include adjusting the tiers or rates in the upper tiers to increase the incentives to reduce landscape watering. WCVCD would suggest and support a water rate study to develop specific pricing levels. Rates would be decided by the individual cities.	YES	
Rotating Sprinkler Nozzle Rebates	SF, MF, COM, INST Outdoor	Offer a rebate for upgrading to a rotating nozzle for single family properties. Work with irrigation supply companies to promote.	YES	

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
CII Rebates to Replace Inefficient Equipment	COM, INST	Provide a rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, add conductivity meters on cooling towers, and other equipment. Pattern after San Diego County Water Authority or Seattle Water Department programs. Best if paired with a CII Survey program. Offer to audited sites.	YES	
Replace Spray Nozzles	COM, INST	Provide free installation of 1.14 gpm spray nozzles for the rinse and clean operation in restaurants and other commercial kitchens. Program length 2-5 years.	YES	
High Efficiency Urinal Rebate (<.5 gallon)	COM, INST Indoor	Provide a rebate for High Efficiency Urinals (HEUs) to existing high use CII customers (such as restaurants). Eligible replacements would include urinals flushing with no more than 0.5 gpf and best available technology (1 pint).	YES	
Irrigation Water Surveys (Water Checks)	INST Outdoor	All public and private irrigators of landscapes would be eligible for free landscape water surveys upon request. Normally those with high water use would be targeted and provided a customized report. Assume 5% of large turf areas are surveyed per year. Three-year program, then repeat (3-year measure life).	YES	
Xeriscape Demonstration Gardens	SF Outdoor	Create a demonstration garden displaying living examples of low-water-usage gardens and landscaping. The utility would provide signs and brochures to educate people visiting the garden. Costs to be determined. Possibly combine with Public Information Program.	YES	
Train Landscape Maintenance Workers	MF, COM, INST Outdoor	WCWCD would sponsor training for managers and workers in landscape maintenance methods that will save irrigation water. Work with Dixie State and Utah State University Extension.	YES	

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
Real Water Loss Reduction	System	Implement an Audit and loss control on WCWCD systems. This involves auditing the system to find water loss and apply measures to find and repair leaks in the distribution system and reduce real water loss. A ten year program to reduce unaccounted for water to 10% of production or less is proposed for this measure. Program would follow AWWA established standards.	YES	
New Measures				
New Development Require New Landscape and Irrigation requirements	NEW SF, MF, COM Outdoor	Create a model ordinance that specifies that new single family and non-residential buildings be landscaped according to Xeriscape principals with appropriate plant selection and irrigation systems. Would be up to the cities to adopt and then enforce the ordinance.	NO	Most Workgroup members felt this would be hard to get through city councils and costly to enforce. Also new development is already implementing smaller yards. It was addressed that people need choices.
Turf Removal	SF, MF, COM, INST Outdoor	A \$1.50 per square foot incentive is available for removing existing turf and replacing with desert landscaping or synthetic turf. Maximum rebate of \$5,000. Average rebate of \$1,500 for SF accounts and \$2,500 for non-SF accounts. The replacement of irrigated vegetation with desert landscaping or synthetic turf may significantly reduce outdoor watering needs.	YES	Program gets proposed frequently by new residents. Workgroup felt justified to have the numbers run on this measure even though this program presents many issues, such as being very expensive, health concerns, and urban heat islands effect.

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
New Development Require Multifamily Submetering on New Accounts	New MF	Require the metering of individual units in new multifamily, condos, townhouses, mobile-home parks, and business centers (less than four stories and with water heater in the units). Utility administers meter read and bill program.	NO	Most communities are already doing this. Consider if individual impact fees apply or are waived.
Efficient Outdoor Use Education and Training Programs	SF	WCWCD would offer, organize, and sponsor a series of educational workshops for homeowners in efficient landscaping and irrigation principals. Utilize guest speakers, Xeriscape demonstration gardens, and incentives, such as a nursery plant coupon.	YES	This is already being done.
CII Surveys	CII	High water use accounts would be offered a free water survey that would evaluate ways for the business to save water and money. Assume reach top 5% of high water using accounts by end of program.	YES	
School Building Retrofit	INST	Run a program patterned after Eastern Municipal Water District (EMWD) Public School Retrofit Program wherein the school receives a grant to replace fixtures and upgrade irrigation systems. A description of EMWD's program can be found after this table.	YES	Secondary water is used on most schools.
Billing Report Educational Tool	ALL	Example: Water Smart Software with online access to customer billed consumption and customized suggestions to save water.	YES	This may be done by neighborhood.
Mobile Home Park Submetering	MF Indoor	Require or provide a partial cost rebate to meter all remaining mobile home parks that are currently master metered and not separately metered. Pattern after Santa Clara Valley Water District's (California) program. A description on Santa Clara's program can be found after this table.	YES	
High Efficiency Urinal Rebates	CII Indoor	Provide a rebate or voucher for the installation of a HEU. WaterSense standard is 0.5 gpf or less, though models flushing as low as 0.125 gpf (1 pint) are available and	YES	

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
		function well and so could be specified. Rebate amounts would reflect the incremental purchase cost.		
Install High Efficiency Fixtures in Government Buildings	CII Indoor	Provide rebates or grants to install high efficiency faucets, toilets, urinals, and showerheads in local and state government facilities.	YES	
Install or rebate high efficiency faucets	CII Indoor	Consider direct install program, rebates, or grants for installation of high efficiency sensor faucet fixtures in all or selected high-use commercial and institutional buildings.	YES	
Water Budgeting/ Monitoring	Large Landscape	Website that provides feedback on irrigation water use (budget vs. actual) modeled after Municipal Water District of Orange County's Landscape Certification Program.	YES	
Rebate or Free Rain Sensors	Outdoor ALL or Selected	Provide a rebate or free rain sensor shut-off device for existing irrigation controllers. These cancel scheduled sprinkling when sufficient rain has been received. This measure is most effective in areas with intermittent rain in peak watering seasons and in spring and fall when early or late rains occur.	NO	Not enough rain during the months that it is needed to warrant rebate. Stay with SWAT controllers.
Require Rain Sensors	Outdoor ALL or Selected	Require installation of rain sensor shut-off devices when installing new in-ground irrigation systems.	NO	Not enough rain during the months that it is needed to warrant rebate. Stay with SWAT controllers.
Gray water Retrofit SF	SF Outdoor	Provide a rebate to assist a certain percentage of single family homeowners per year to install gray water systems. Coordinate with county health department.	NO	Workgroup felt there were too many issues with this. The State

Existing or Potential New Measures			Pass?	Comments
Specific Program	Focus of Program	Measure Description		
				legalized it, but gave implementation responsibility to each public health department. No programs are established yet.
Require Plumbing for Gray Water In New SF Development	SF Outdoor	Require builders of single family homes to provide plumbing for and/or install a gray water system in new homes.	NO	Workgroup felt there were too many issues with this. The State legalized it, but gave implementation responsibility to each public health department. No programs are established yet.
Low Impact New and Remodeled Development	ALL	Cities would require developers of new and remodeled sites to follow Low Impact Development concepts/standards/Best Management Practices for storm water and water conservation benefits. Encourage or require use of bio-retention facilities, rain water cisterns, use of recycled water if available, gray water plumbing, etc.	NO	Too early for this program in this area. Could consider in the future.
Require Efficient Toilets and Urinals	ALL	Require all new development to utilize HETs (1.28 gal/flush or less) and HEUs (0.5 gal/flush or less). City and County building departments to implement through normal permitting and inspection process.	YES	
Key to Categories All – All customer categories: SF, MF, and CII System – WCWCD's Distribution System				

Entity: Washington County Water Conservancy District

Body: Washington County Water Conservancy District Board

Subject:	Business
Notice Title:	Notice of a Meeting of the Board of Trustees
Meeting Location:	533 E. Waterworks Drive St. George 84770
Event Date & Time:	November 10, 2015 3:00 PM - 7:00 PM
Description/Agenda:	<p>NOTICE OF A MEETING OF THE BOARD OF TRUSTEES OF THE WASHINGTON COUNTY WATER CONSERVANCY DISTRICT WASHINGTON COUNTY, UTAH</p> <p>NOTICE IS HEREBY GIVEN that the Board of Trustees of the Washington County Water Conservancy District, Washington County, Utah will meet in public session on Tuesday, November 10, 2015, beginning with a work meeting at 3:00 p.m. and the regularly scheduled Board of Trustees Meeting at 6:00 p.m. at 533 East Waterworks Drive, St. George, Utah.</p> <p>3:00 Work Meeting - no formal action to be taken</p> <ol style="list-style-type: none"> 1. Discussion and work on 2016 preliminary budget. 2. Discussion of 2016 Board of Trustee meeting schedule. <p>6:00 p.m. Board of Trustees Meeting</p> <ol style="list-style-type: none"> 1. Ratify the award of grazing and management lease of 80 acres of property near Kolob Reservoir. 2. Public hearing on Washington County Water Conservancy District's Conservation Plan. 3. Approve preliminary 2016 budget. 4. Status reports:

Lake Powell Pipeline project
 Sand Hollow wells
 Water Treatment Plant
 Financial Report

5. Manager's Report

6. Calendar items:

CRWUA - December 16-18
 Utah Water Finance Agency Dinner - December
 17- Las Vegas
 December Board Meeting and public hearing on
 budget - December 8

7. Approval of minutes of October 2015 Board of
 Trustees Meeting.

 Secretary

**Notice of Special
 Accommodations:**

NOTICE OF SPECIAL ACCOMMODATION DURING
 PUBLIC MEETINGS In compliance with the Americans
 with Disabilities Act, individuals needing special
 accommodations (including auxiliary communicative aids
 and services) during this meeting should notify our offices
 (43)673-3617 for any other special accommodations needed.

**Notice of Electronic or
 telephone participation:**

Meetings are recorded. No telephonic participation.

Other information:

Contact Information:

Roberta McMullin
 4356733617
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Posted on:

November 09, 2015 02:15 PM

Last edited on:

November 09, 2015 02:15 PM

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WASHINGTON COUNTY WATER CONSERVANCY

DISTRICT

Minutes of Meeting of Board of Trustees

November 10, 2015

Minutes of a public meeting of the board of trustees of the Washington County Water Conservancy District, held on Tuesday, November 10, 2015, beginning with a work meeting at 3:00 p.m. at 533 East Waterworks Drive, St. George, Utah. Those board members present for the meeting were: Chair Ed Bowler, Jim Ence, Howard Bracken, Ken Neilson, Zachary Renstrom, Tom Hirschi and Jon Pike. Also present were General Manager Ron Thompson, Associate General Manager, Corey Cram, Brie Thompson and Secretary Roberta McMullin. Ed Bowler conducted the meeting and welcomed those present.

The first item on the agenda was a discussion and presentation by General Manager Ron Thompson. Ron told the board he had been working on an analysis of various questions regarding water allocations. He will have more information on another spreadsheet for a future board meeting based on this discussion.

The next item on the work meeting agenda was a discussion on the proposed draft 2016 budget. Copies of the proposed preliminary budget were distributed. A copy of the preliminary 2016 budget is also attached to these minutes. Ron reviewed current cash in the bank as of November 1, 2015, and all the estimated revenues with the total project funds to 12/31/2014 being \$102,178,034. He also reviewed the estimate expenses to year end 2014 and for each fund. The total anticipated expenditures to the end of 2014 are \$3,381,993 leaving net available funds of \$98,796,041. He also reviewed and answered questions on the analysis of the 2016 budget cash flow which shows total available funds of \$135,354,626 and total fund expenditures of \$91,392,761 leaving available funds for reserve funds at \$43,961,865. He went over the reserve fund balances for each of the different funds which totaling \$43,961.

Ron next reviewed the 2016 general fund budget and the areas of increase in that fund. He also told the board there are three additional employees he would like to hire under this 2016 budget – an attorney to learn Barbara’s job, the desert garden superintendent who was hired as a temporary employee, and an IT intern who he would like to make a full time employee now.

Ron reviewed the remaining budgets for each fund. There was some discussion after which Ron explained that at the 6 pm meeting tonight the Board can approve the preliminary 2016 budget and then at the December board meeting they will need to approve a final budget.

2016 Board of Trustees Meeting Schedule - The board discussed what night to set the meetings for in 2016. This last year we had the meetings on the 3rd Tuesday except during the interim legislature when we changed to the 2nd Tuesday. After discussion of what would work best for board members, the 1st Wednesday of each month was suggested and discussed. It was decided the 1st Wednesday of each month would be the best date for board meetings in 2016. Ron reviewed other conference dates in 2016 for NWRA Summer Conf. (Aug. 3-5 Sun Valley, ID); Utah Water Users (March 15-17, St. George); NWRA Annual conf. (Nov. 30-Dec. 2, San Diego, CA). Roberta will prepare a schedule of meeting dates and conferences for 2016 for the next meeting.

The board took a break before the 6 PM meeting.

6:00 Meeting: All board was present for this meeting but Jon Pike who was excused for another meeting. Also present were Ron Thompson, Corey Cram, Julie Gillins, Karry Rathje, Judie Brailsford and Roberta McMullin, Secretary. Other guests at the meeting included: Richard Kohler, Nicole Hancock from the water conservation subcommittee, Rick Wheadon (Carollo Engineering) and Dustin Shaffer (Sunrise Engineering.)

Ed welcomed those present and conducted the meeting.

Ratifying the award of a grazing and management lease of 80 acres of property near Kolob Reservoir was the first item on the agenda. Ron asked the board to ratify the award of a grazing and management lease of 80 acres the District owns on property near Kolob Reservoir. They had a Dutch auction or bid and Larry Blake bid the highest at \$10,600. Ron reminded the board that this lease comes up every five years. The District has owned the property for about 20 years and we have been putting it out to bid. This year they did a Dutch auction and Duke Cox and Larry Blake were the last bidders and were bidding against each other but Larry Blake was the high bidder. It went up to almost double of what has been paid before. Larry Blake also had it prior to the last five years. They have to do irrigating and manage the property. Ron said that it is the staff's recommendation to award to the bid to Larry & Kelly Blake, the high bidders.

Jim Ence made a motion to ratify the award of the grazing and management lease for \$10,600 to Larry and Kelly Blake. Howard Bracken seconded the motion and all voted aye.

The next item on the agenda was a public hearing on the district's Water Conservation Plan –

Tom Hirschi made a motion to go into a public hearing on the water conservation plan. Ken Neilson seconded the motion and all voted aye.

Julie Gillins, Water Conservation Coordinator for the district, passed out copies of the draft conservation plan to the board, staff and those present. Julie introduced Nicki Hancock and Richard Kohler who are both members of the workgroup that has been working on this. Julie indicated that each of the cities were represented on the committee along with other community members. Julie showed a list of the 16 workgroup members.

Julie did a PowerPoint presentation highlighting the draft conservation plan. She said the workgroup came up with a list of suggested conservation measures for evaluation. A preliminary evaluation was done by Maddaus Water Management. There are 18 conservation measures currently being offered. Maddaus identified five additional measures that would help us reach a 35% reduction in water use by 2060.

Julie identified the six measures that are the top water savers;

Top Water Savers

Measure Number	Measure Description	Water Savings (MGD)
17	Real Water Loss Reduction*	2.1
9	Conservation Pricing*	2.1
27	Require Efficient Toilets and Urinals	1.6
22	Billing Report Education Tool**	0.8
2	Smart Irrigation Controller Rebates*	0.4
1	Financial Incentives for Irrigation Upgrades*	0.4

*Included in current plan
**Will be included in plan update

The conservation plan is structured as follows:

Plan Structure

CHAPTER 1: Introduction

CHAPTER 2: Water Resources: Current Water
Supply

CHAPTER 3: Water Demand: Current Water Use

CHAPTER 4: Water Conservation: Achievements,
Activities and Current Practices (BMPs)

CHAPTER 5: Future Water Resources and Demand
Projections

CHAPTER 6: Water Conservation Recommendations
and Goals

CHAPTER 7: Conclusion

Julie told the board that they followed the State's template for the conservation plan. She indicated that Table 2.3 in the draft plan needs some correction on the totals.

Julie said she was here to get any input from board members or anyone else present. They hope to get this conservation plan approved next month in December at the Board Meeting.

Ed invited the board members or audience members to make comments on the water conservation plan.

Ron Thompson asked Julie if the cities are going to adopt this as their plan or write their own separate plans. Julie said they can use this plan as a template for their own plans.

Julie told the board about the 2016 workshops that have been created for the Red Hills Desert Garden and The Garden at Tonaquint. There will be one workshop at The Garden at Tonaquint and one at the Red Hills Desert Garden each month throughout the year. Some of the other activities at the gardens will be at the annual garden fair the first week in May during Water Week, a water walk with the Mayor of St. George and a Fall Festival in October. Also they will be doing holiday lighting at the Red Cliffs Desert Garden. The new desert garden is getting a lot of visitation with over 8,000 visitors since a counter was put up after the garden was open to measure visitors.

Ron asked Richard Kohler who was in the audience and has a lot of experience

with water and landscaping, etc. and has been serving on the conservation workgroup, if he felt this conservation plan is moving us in the right direction.

Richard Kohler said yes he believed we were on the right track with this draft water conservation plan. One measure he said he would like to speak about is one conservation program that we should not pursue which is the rebate for removing turf. He described the costs of this program in California. A 2013 study show they only saved about 18.2% more than under traditional landscape. He said that means it cost approximately \$210,000 per a.f., which by comparison for the LPP project, the costs for water is \$11,200 per a.f.

Julie said they would leave this draft open for comments until November 24 and then bring it back to the December board meeting for approval.

There were no more comments offered and the following motion was made.

Tom Hirschi made a motion to close the public hearing. Zach Renstrom seconded the motion and all voted aye.

The next item on the agenda was approval of the preliminary 2016 budget – Ron said he had already walked through the proposed budget in the work meeting. The board has reviewed the proposed preliminary budget and there were no further questions.

Tom Hirschi made a motion to approve the 2016 proposed preliminary budget. Ken Neilson seconded the motion and all voted aye.

Ron Thompson gave status reports on the following projects:

Ron asked Karry Rathje to give a report on the **public outreach efforts** of the district.

Karry said the district is continuing with radio and print ads. They are advertising a variety of things on water conservation, wise use of water and the need for new resource development. The Fall Waterline recently ran. Karry said we are seeing a continued amount of coverage. The district is getting 1.16 mentions in media a day. A lot of that recently has been on city council elections and their feelings on the Lake Powell Pipeline. There has also been a lot of coverage on the economists who claimed that we can't afford to repay the Lake Powell Pipeline debt. We have secured the worksheets for that analysis and have shared that information with

Jeremy Aguero. Karry said we are evaluating those worksheets and hope to set up a meeting with those economists in early 2016 to discuss their model. Karry said it appears that they are misunderstanding the Lake Powell Pipeline financial model and the development act. She said this has given the district a great opportunity to work with local reporters trying to understand the financing.

Karry said she is going to develop a communications strategy plan to stay in front of important messages and key messages. The district is working on this with the state. She said we will be working with community officials to continue to be voices of support.

Karry said there will be a Prepare 60 forum for Cedar City and St. George on December 1. The district will also be hosting a roundtable for newly elected officials.

Ken Neilson said Washington City does a monthly newsletter that is included with the utility bills and it has been very effective. If there is any information that the district would like us to include in their monthly newsletters, let them know.

Lake Powell Pipeline (LPP) - Ron told the board that the preliminary license drafts on the LPP will all go in by December 1 to FERC. The comment period will be 90 days. After comments have been addressed, the final application will go into a two year process to write the final environmental impact statement.

The engineers have been working on a preliminary price estimate. Ron said the engineers estimate is estimating costs four or five times more than on other projects built recently. He said he feels like they are a national firm that doesn't have feeling for local prices. He said it is very frustrating but they will work their way through it.

Ron said the LPP management committee continues to meet monthly and the staff is working daily on different components and issues.

Sand Hollow Wells – Ron said the drillers are working on wells at Sand Hollow right now. They are down about 200' so it isn't going very fast. They hit water at about 18' and have cased the top of it. They will probably go down about 600'. Ron said the district will probably do at least two more wells after this one and with the one they already have that will give four wells to help control the groundwater.

Water treatment plant (WTP) – Ron reported to the board that the WTP is functioning very well. They are starting to wrap up the water season as water demand is going down as usual for this time of year. The upgrade work is about finished and the WTP crew is doing a very good job.

Weather – Ron said that we will be in a fairly significant El Nino year and we need to be prepared to gather as much water as we can. He said he worries about having more rain but less snow. We are dependent on our pipelines with off stream storage. If the runoff is shortened even by six weeks, we will have to manage our way through that with redundant resources.

Approval of minutes of October 2015 Board of Trustees Meeting.

Jim Ence moved to approve the minutes as presented. The motion was seconded by Ken Nielson and all voted aye.

Calendar items – Various upcoming calendar items were reviewed:

December 2 Office Christmas party

December 8 Board meeting and public hearing on budget

December 16-18 Colorado River Water Users Conf. – Las Vegas

Meeting adjourned – There was no further business and upon motion the meeting was adjourned.

**NOTICE OF A MEETING OF THE BOARD OF TRUSTEES
OF THE WASHINGTON COUNTY WATER CONSERVANCY DISTRICT
WASHINGTON COUNTY, UTAH**

NOTICE IS HEREBY GIVEN that the Board of Directors of the Washington County Water Conservancy District, Washington County, Utah will meet in public session with a public hearing and meeting on Tuesday, December 8, 2015 at 6:00 p.m. at 533 East Waterworks Drive, St. George, Utah.

1. Public hearing on 2016 budget.
2. Approval of adjustments to 2015 budget
3. Ratify repair and replacement expenditures for 2015.
4. Approval of 2016 budget.
5. Approval of 2016 meeting schedule.
6. Approval of Retirement Pickup Resolution.
7. Approval of Water Conservation Plan
8. Approval of sale of property in Virgin to Solid Waste Special Service District
9. Ratify contracts with Dixie Deer Special Service District
10. Manager's Report and Status Reports
11. Approval of Minutes of November 2015 board of trustees meeting.

Secretary

**Written Comments
Concerning 2015 Water Conservation Plan Update**

No comments submitted.

1 **WATER CONSERVATION PLAN UPDATES**

2 1999 GENERAL SESSION

3 STATE OF UTAH

4 **Sponsor: Judy Ann Buffmire**

5 AN ACT RELATING TO WATER AND IRRIGATION; REQUIRING WATER
6 CONSERVATION PLANS TO BE UPDATED AT LEAST EVERY FIVE YEARS.

7 This act affects sections of Utah Code Annotated 1953 as follows:

8 AMENDS:

9 **73-10-32**, as enacted by Chapter 305, Laws of Utah 1998

10 *Be it enacted by the Legislature of the state of Utah:*

11 Section 1. Section **73-10-32** is amended to read:

12 **73-10-32. Water conservation plan required.**

13 (1) As used in this section:

14 (a) "Board" means the Board of Water Resources created under Section 73-10-1.5.

15 (b) "Division" means the Division of Water Resources created under Section 73-10-18.

16 (c) "Retail" means the level of distribution of culinary water that supplies culinary water
17 directly to the end user.

18 (d) "Retail water provider" means a supplier of culinary water to the end user.

19 (e) (i) "Water conservation plan" means a written document that contains ideas,
20 suggestions, or recommendations as to what can be done by state and local governments, retail
21 water providers, and the end user of culinary water to help conserve water and limit or reduce its
22 use in the state in terms of per capita consumption so that adequate supplies of water are available
23 for future needs.

24 (ii) Each "water conservation plan" shall contain recommendations for water saving
25 measures that may include:

26 (A) the installation and use of water efficient fixtures and appliances, including toilets,
27 shower fixtures, and faucets;

(B) residential and commercial landscapes and irrigation that require less water to maintain;

(C) more water efficient industrial and commercial processes involving the use of water;

(D) water reuse systems, both potable and not potable;

(E) distribution system leak repair;

(F) dissemination of public information regarding more efficient use of water, including public education programs, customer water use audits, and water saving demonstrations;

(G) water rate structures designed to encourage more efficient use of water;

(H) statutes, ordinances, codes, or regulations designed to encourage more efficient use of water by means such as water efficient fixtures and landscapes;

(I) incentives to implement water efficient techniques, including rebates to water users to encourage the implementation of more water efficient measures; and

(J) other measures designed to conserve water.

(2) (a) Before April 1, 1999, each water conservancy district under Title 17A, Chapter 2, Part 14, Water Conservancy Districts, and each retail water provider shall:

(i) (A) prepare or adopt a water conservation plan if one has not already been adopted; or

(B) if the district or provider has already adopted a water conservation plan, review the existing water conservation plan to determine if it should be amended and, if so, amend the water conservation plan; and

(ii) file a copy of the water conservation plan or amended water conservation plan with the division.

(b) Before adopting or amending a water conservation plan, each water conservancy district or retail water provider shall hold a public hearing with reasonable, advance public notice.

(3) (a) The board shall:

(i) study ways to implement the water conservation plans of the water conservancy districts and the retail water providers;

(ii) develop recommendations on how to implement those plans; and

(iii) report its recommendations to the Natural Resources, Agriculture, and Environment Interim Committee of the Legislature at its meeting in November 1999.

(b) The board's report to the Natural Resources, Agriculture, and Environment Interim Committee may include a recommendation:

(i) that each water conservancy district and retail water provider devote part of at least one regular meeting of its governing body to a discussion of the water conservation plan and allow public comment on it;

(ii) to implement a notification procedure that includes the delivery of the water conservation plan to the media and to the governing body of each municipality and county served by the water conservancy district or retail water provider;

(iii) that certain eligibility requirements, including the adoption of a water conservation plan, be met before a water conservancy district or retail water provider may receive any state funds for water development;

(iv) for the coordination of conservation and drought management plans; and

(v) regarding any other measure designed to conserve water.

(4) Each water conservancy district and retail water provider specified under Subsection (2)(a) shall:

(a) update its water conservation plan no less frequently than every five years; and

(b) follow the procedures required under Subsection (2) when updating the water conservation plan.

[(4)] (5) It is the intent of the Legislature that the water conservation plans, amendments to existing water conservation plans, and the study and recommendations by the board be handled within the existing budgets of the respective entities or agencies.

Legislative Review Note

as of 1-27-99 1:20 PM

A limited legal review of this legislation raises no obvious constitutional or statutory concerns.

Office of Legislative Research and General Counsel

Attachment B – List of Washington County Water Conservancy District Conservation Program Initiatives

Promotion of universal metering
Secondary water metering
Smart controller irrigation technology
Time of day watering ordinances
Requirement of a water conservation plan for municipal customers
Water efficient landscape workshops
Public information programs/school education
Residential and commercial system water audits, leak detection, and repair
Free outdoor irrigation efficiency audits for residences and businesses
Incentive water conservation pricing
Landscape ordinance requirements
Incentives to reduce irrigated landscape area in new development (water conservation easements)
Full-time water conservation manager
Water conservation demonstration gardens with two full-time horticultural educators
Water Smart irrigation rebate program
Water Smart commercial upgrades equipment rebate
Training and certification of landscape training professionals
Financial incentives for irrigation upgrades
Large landscape conservation programs and incentives
EPA WaterSense appliance rebates
Statewide water-wise plant list and tagging program
Public athletic fields conversion to artificial turf grant program
WaterSense toilet/urinal rebates
Multi-family high-efficiency washer rebate program
Funding for local and statewide media campaigns
Horticultural classes, trainings, and awards
Maximize use of secondary water systems including using wastewater reuse
Studying and establishing best management practices for use of high salinity water for landscape

Attachment C – Listing of Factors that Influence Usage Numbers

GPCD Methodology/Calculation

- Demand-side gpcd vs Water resource gpcd (like SNWA and Albuquerque that include return-flow credits/non-consumptive indoor water use)
- Volume:
 - Water produced/diverted/treated (includes system loss) – Gross
 - Water deliveries/billed (not including system loss) – Net
- Population:
 - Latest state/county demographer or census estimate
 - Calculated by using “the housing unit method”: housing units * persons per occupied household * occupancy rate (like Tucson, AZ)
 - Calculated by using the New Mexico Office of the State Engineer (NMOSE) method: Annual Water Production in Gallons / Annual (SFpop [#SFR x Vac x PPH] + MFpop [#MFU x Vac x PPH]) + Institutionalized Populations (IP) / 365 days

Climate Differences:

- Elevation
- Average annual precipitation
- Precipitation during irrigation season
- Average high temperature
- Evapotranspiration rate

Demographics:

- Population
- Population/housing density
- Persons per household
- Vacancy rate
- Second home numbers
- Average residential lot size and landscaped area
- Percent of residences with swimming pools

Water System and Water Accounting:

- Non-potable water
- System loss
- Return-flow credits
- Reuse water
- Indoor/outdoor use
- Residential water use or overall use
- Gallons per person or per household

Economy:

- Amount of commercial, industrial, and institutional usage
- Type of manufacturing
- Number of golf courses
- Number of tourists/visitors