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EA RWCP Universal City Assessment Report and Proposed Plan

Executive Summary

The total cost of the proposed three-year Universal City Regional Water Conservation Program (RWCP) is \$454,087, at a total cost of \$587 per acre-foot. The program is expected to save an estimated 774 acre-feet of water over ten years, which is expected to provide 387 acre-feet to the Edwards Aquifer (EA) reserve (39 acre-feet on a one-year basis). Based on the needs, concerns, and past, current, and planned water conservation activities specific to Universal City, the proposed RWCP elements are as follows.

1. RWCP funds of \$14,000 in 2013 and \$42,000 per year in 2014 and 2015 used in conjunction with Universal City funds of \$10,000 in 2013 and \$30,000 per year in 2014 and 2015 for a **High-Efficiency Plumbing Program**. The RWCP cost is estimated to be \$207 per acre-foot (the total cost is estimated to be \$355 per acre-foot) of projected water savings over ten years. Local non-profit entities will participate in the program as a community service project and fundraiser where they are rewarded with \$25 for each household they recruit for plumbing conversion. The costs cited above include the non-profit entities' rewards, plumbing fixtures, and installation of 700 high-efficiency showerheads, faucet aerators, and Caroma toilets during the three-year program.
2. \$125,370 of RWCP funds in 2013 to purchase 126 water leak noise loggers to complete an **Advanced Leak Detection System** two years earlier than the City currently has planned. The cost of projected water savings in these two years is \$2,365 per acre-foot. This cost per unit appears high because per unit water conservation costs are typically calculated over a ten-year period, rather than a two-year period.
3. \$190,717 of RWCP funds in 2013 to purchase 1,038 radio-read meters to complete a **Meter Replacement Program** two years earlier than the City currently has planned. The cost of projected water savings in these two years is \$3,201 per acre-foot. Again, this unit cost is high because water conservation unit costs are typically calculated over a ten-year period, rather than a two-year period.
4. \$40,000 of RWCP funds used in conjunction with \$18,500 of Universal City funds in 2014 to implement a **Large-Scale Commercial Retrofit Program** targeted at Multi-Family Residential Complexes. Replacement of existing high-water use toilets, showerheads, faucet aerators, and centrally located washing machines with high-efficiency equipment is estimated to cost the RWCP \$212 per acre-foot (total cost of \$310 per acre-foot) of projected water savings over ten years.

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Introduction

The primary goal of the Edwards Aquifer (EA) Regional Water Conservation Program (RWCP) is to provide 10,000 acre-feet of water as a reserve in the EA to benefit spring flow levels. The purpose of this Assessment Report and Proposed Plan (hereafter referred to as Report or Plan) is to identify the Universal City baseline condition and mix of the four RWCP elements – High-Efficiency Plumbing Fixtures & Toilet Distribution, Lost Water & Leak Detection, Commercial/Industrial Retrofit Rebates, and Water Reclamation for Efficient Water Use – that can best take advantage of the water conservation opportunities that exist in Universal City. Once approved by the Universal City Council and the Edwards Aquifer Authority (EAA), this Plan will be structured into a contract that will serve as the funding mechanism for EAA to implement the RWCP elements specific to Universal City and its needs. In this contract between the EAA and Universal City, the projected water savings and associated EA reserve fifteen-year commitment (i.e., 50% of water conserved is to remain in the EA for fifteen years) in return for the RWCP funds will be delineated. The City of Universal City, as well the City of Uvalde, volunteered to be the pilot cities for the RWCP.

Water Uses and Demand

Universal City is located in Bexar County with a current population of 18,987. The City water system currently has 5,249 single-family residential connections, 112 multi-family connections, and 411 commercial connections for a total of 5,772 connections. The 112 multi-family connections reflect approximately 3,045 living units, for an approximate 8,294 living units in the City. The Universal City water system does not have any wholesale customers.

In 1970, the Universal City population was just over 7,500 and those people used about 1,200 acre-feet of water. The population grew steadily through the years while the City's water use has gone up and down, rising to about 2,000 acre-feet by 1980 with spikes to around 2,500 acre-feet in 1995-99 and 2005-06, around 2,700 acre-feet in 1984 and 1988-89, and around 2,800 in 2008-09 and 2011-12. The per capita municipal water use has correspondingly fluctuated over the years, ranging from 123 gallons per capita per day (GPCD) in 2010 to 206 GPCD in 1984, and averaging 147 GPCD. Universal City's 2012 water use was approximately 2,718 acre-feet and 125 GPCD. In comparison, projected water demand for Universal City in the 2011 South Central Texas Regional Water Plan was 2,608 acre-feet for 2010, rising to 2,916 acre-feet for 2020, and a high of 3,175 acre-feet by 2030.¹ Refer to the Appendix for additional municipal water use and GPCD data.

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Universal City currently owns 3,670 acre-feet of Edwards Aquifer water and 800 acre-feet of Carrizo Aquifer water, for a total of 4,470 acre-feet. This compares favorably to the 2012 usage of approximately 2,718 acre-feet. Furthermore, the City has not ever had a pumping limit violation. This is in part due to Universal City's purchase of additional EA water rights as their water right leases expired. This practice has been ongoing since 2006 and Universal City has purchased approximately 600-700 acre-feet in the last couple of years. While Universal City has not experienced an actual water shortage, the EAA has imposed pumping restrictions on the City, as well as San Antonio and other area cities, for the past two years due to drought conditions.

The City primarily utilizes Edwards Aquifer water as its potable water source, as noted above, and has been pro-active in its attempts to prepare itself for a drought of record and expected growth. Universal City's growth rate from 2010 to 2012 was 4.4 percent. The projected growth rate between 2012 and 2016 is 14.2 percent. City officials estimate that 16.7 percent of development land is still available. It is believed that the available space will be filled out by 2025 and the population at that time will be approximately 26,055. To reduce their dependence on the EA, the City arranged to obtain Carrizo Aquifer water, as it is needed, through partnership with the Schertz-Seguin Local Government Corporation. Due to the cost of the Carrizo water, however, it is typically only used during years with prolonged periods of drought conditions. Universal City is also constructing a new reclaimed water line and storage tank so that treated effluent from a nearby San Antonio River Authority (SARA) wastewater treatment plant can be used for irrigation in the future.

Since about 1997, Universal City has used a tiered rate structure where the rates are higher as the volume of water consumed increases for all customers other than commercial accounts and separate commercial irrigation reuse water accounts. Separate commercial irrigation potable water rates are also tiered. Tiered rate structures are thought to increase water conservation by providing extra financial disincentive when higher volumes of water are consumed. The Universal City data supports this positive correlation between tiered rates and water consumption; the average per capita daily use was 155 GPCD for 1970-1996, while the average per capita daily use dropped to 134 GPCD for 1997-2012. This decrease in water consumption is admirable and due at least in part to the water conservation initiatives the City has implemented to date.

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Baseline Condition and Future Opportunities for Conservation – RWCP Elements

High-Efficiency Plumbing Fixtures

Universal City currently has a toilet voucher program that provides its citizens with a \$75 rebate when they replace a high-flow toilet manufactured in or before 1992 with a new high-efficiency toilet. Residents complete a rebate application form, attach the original sales receipt, and schedule an inspection of their removed and newly installed toilets; there is a limit of two toilet rebates per household. City Water Department technicians inspect the removed and installed toilets and collect the application form and sales receipt, and then the rebate is processed.

The City has spent \$68,325 and processed 911 toilet rebates since inception of their toilet voucher program in 1991. The industry standard estimated water savings for replacement of a high-water use toilet with a high-efficiency model is 12,000 gallons per year. Universal City did not track whether the replaced toilets were standard or ADA-compliant toilets, but want to include both types of toilets in their future program. Universal City has also distributed 624 plumbing retrofit kits (i.e., showerheads and sink aerators) since 1993 at a total cost of \$2,246. The industry standard estimated water savings is 10,000 gallons per year per showerhead/aerator retrofit. The past Universal City toilet replacements will therefore save an estimated 340 acre-feet of water and the plumbing kit retrofits another 190 acre-feet over ten years.

City officials estimate that 7,500 high-water use toilets are still in use based on an analysis of pre-1992 housing building data. Replacement of 700 toilets, showerheads, and sink aerators during the three-year Universal City RWCP will save a projected 473 acre-feet of water over ten years (using the industry standard estimated water savings of 22,000 gallons per year per toilet/showerhead/aerator, as noted above), which is expected to provide 236 acre-feet to the EA reserve (23.6 acre-feet on a one-year basis).

Universal City Public Works currently budgets \$28,500 per year for toilet rebates. This funding will instead be used in conjunction with RWCP funding to revamp and expand the City's toilet program. Utilizing the San Antonio Water System (SAWS) contract, RWCP funds will be used to purchase plumbing equipment. The Universal City funds will be used to pay local plumbers to install the new equipment. Incorporating equipment installation could be especially effective in generating public participation, in addition to eliminating the need for separate equipment distribution and follow-up inspection activities.

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Universal City staff, with the assistance of Texas A&M Water Conservation & Technology Center (WCTC) staff, will implement a program similar to the SAWS *Season to Save* Program. The *Season to Save* model utilizes non-profit entities (e.g., Universal City churches, City schools, and school bands) whose members provide outreach to their family, friends, and neighbors who are City residents to encourage plumbing conversions. The *Season to Save* program is a fundraiser and community service project for participating entities, who are rewarded with \$25 for each toilet/showerhead/aerator installed in a household they recruited for plumbing conversion. City staff may also use regularly scheduled clean-up events and the annual Snow Fest to solicit participation of City residents in the High-Efficiency Plumbing Program.

An additional component of Universal City's current High-Efficiency Plumbing Program is a voucher program for replacement of high-water use washing machines with high-efficiency washing machines. The City has processed 160 rebates at \$75 each for a total of \$12,000 spent on this voucher program since its 2009 inception. Universal City Public Works currently budgets \$3,300 per year for washing machine rebates under this program; that equates to 44 washing machine rebates per year. Universal City plans to continue this voucher program.

Universal City RWCP: \$14,000 RWCP funds in 2013 for 100 high-efficiency Caroma toilets, showerhead/aerator kits, and the non-profit entities' rewards
\$42,000 RWCP funds per year in 2014 and 2015 for 300 Caroma toilets, showerhead/aerator kits, and non-profit entities' rewards per year
Universal City will pay local plumbers \$10,000 in 2013 and \$30,000 per year in 2014 and 2015 to install the new plumbing equipment
Total three-year cost to RWCP is \$98,000 and to Universal City \$70,000 for a combined three-year cost of \$168,000 to achieve projected water savings of 473 acre-feet over ten years

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Table 1 - High-Efficiency Plumbing Program Budget and Projected Savings

Year	# of Toilets & Plumbing Kits	Cost for Toilets	Cost for Plumbing Kits	Non-Profit Reward	Plumber Installation Fee	Total RWCP Cost	Total Universal City Cost
2013	100	\$10,000	\$1,500	\$2,500	\$10,000	\$14,000	\$10,000
2014	300	\$30,000	\$4,500	\$7,500	\$30,000	\$42,000	\$30,000
2015	300	\$30,000	\$4,500	\$7,500	\$30,000	\$42,000	\$30,000
Totals for 3-Year Program						\$98,000	\$70,000
						\$168,000	

Year	# of Toilets & Plumbing Kits	10-Yr Water Conserved (Ac-Ft)	10-Yr Aquifer Reserves (Ac-Ft)	1-Yr Aquifer Reserves (Ac-Ft)
2013	100	68	34	3
2014	300	203	101	10
2015	300	203	101	10
Totals for 3-Yr Program		473	236	24
RWCP Cost Per Ac-Ft		\$207	\$415	\$4,147
Total Cost Per Ac-Ft		\$355	\$711	\$7,109

Lost Water and Leak Detection

Universal City has been aggressive in its attempts to eliminate water waste and began implementation of an Advanced Leak Detection Program in 2010. The first component of the Universal City Advanced Leak Detection Program is an Advanced Leak Detection System consisting of 375 Permalog+ multifunction leak noise loggers and advanced meter reading transmitters. The loggers “listen” to detect possible leaks that are transmitted to a database and City Water Department technicians are dispatched to pinpoint leak locations and make necessary repairs. When installation is completed, this monitoring system will cover the entire distribution system to metered end-users and will be the first monitoring system of its kind in Texas.

Universal City received a 50/50 matching funds Conservation Grant from the EAA in 2011 to purchase and install 125 noise loggers. At \$995 per logger, the total cost for Phase I was \$124,375. The City purchased another 62 loggers in 2012 for \$61,690. Phase II was completed when these loggers were installed in January 2013.

Universal City has determined that Phase III, purchase and installation of the final 188 loggers, will cost \$187,060. Universal City Public Works currently has budgeted \$61,690

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for 62 loggers in 2013, and will have to delay completion of this project until 2015, spending another \$62,685 per year in 2014 and 2015 for the remaining 126 loggers.

Universal City had estimated water losses of 15.41 acre-feet in 2011 and 22.33 acre-feet in 2012 due to main breaks in areas of the City that were not yet being monitored by the noise loggers. Because Universal City staff have not yet prioritized the areas where the remaining 126 loggers would be installed in 2014 and 2015, an assumption was made that 63 loggers would be installed in 2014 in those areas where the 2012 main breaks resulted in 22.33 acre-feet of lost water, while the remaining 63 loggers would be installed in 2015 in those areas where 2011 main breaks resulted in a smaller volume of lost water of 15.41 acre-feet. Installation of these 126 loggers in 2013 will therefore result in projected water savings of 53 acre-feet, as captured by the following equation.

$$22.33 + 2 * 15.41 = 53.15 \text{ acre-feet}$$

In 2010, eight percent of the water the City pumped from the Edwards and Carrizo Aquifers was unaccounted for, amounting to 192.846 acre-feet. The amount of unaccounted for water was even better in 2011 at six percent, equaling 182.871 acre-feet. A little higher in 2012, 238.839 acre-feet, or nine percent, of the Edwards water was “lost.” The average annual unaccounted for water from 2010 to 2012 was 204.852 acre-feet, so projected water savings of 53 acre-feet during 2014 and 2015 seem reasonable. The cost of the additional projected water savings in 2014 and 2015 is \$2,365 per acre-foot. This cost per unit appears high because per unit water conservation costs are typically calculated over a ten-year period, rather than a two-year period.

Universal City RWCP: \$125,370 RWCP funds in 2013 for 126 leak noise loggers to complete the Advanced Leak Detection System two years earlier than the City currently has planned and conserve a projected 53 acre-feet of water during those two years

The second component of Universal City’s Advanced Leak Detection Program is replacement of their traditional meters with an Advanced Meter Reading (AMR) System, begun in 2010. In 2010 to 2012, the City replaced 4,403 traditional meters with radio-read meters at a cost of approximately \$512,429.

Universal City has determined that it will cost \$311,615 to replace the remaining 1,408 meters. Universal City Public Works currently has budgeted \$120,898 for meter replacement in 2013, and will have to delay completion of this project until 2015, spending another \$190,717 in 2014 and 2015. The water meters are over 20 years old and meter accuracy testing on some of the remaining meters scheduled to be replaced resulted in a

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24.7 percent average accuracy rate at a flow rate of 0.25 gallons per minute. Based on the average age of the meters remaining to be replaced, water savings are estimated to be ten percent of the water pumped through these meters. Replacement of 802 meters in 2013 that would have been replaced in 2014 will save a projected 38 acre-feet of water, and replacement of 236 meters in 2013 that would have been replaced in 2015 will save a projected 11 acre-feet per year, so 22 acre-feet in two years, for a total projected water savings of 60 acre-feet during 2014 and 2015. As stated above, the average annual lost water from 2010 to 2012 was 204.852 acre-feet, so total projected water savings of 113 acre-feet from leak detection during 2014 and 2015 also seem reasonable. The cost of the additional projected water savings in 2014 and 2015 due to meters is \$3,201 per acre-foot, and due to both loggers and meters combined is \$2,783 per acre-foot. Again, these unit costs are high because water conservation unit costs are typically calculated over a ten-year period, rather than a two-year period.

Universal City RWCP: \$190,717 RWCP funds in 2013 for 1,038 radio-read meters to complete the Advanced Meter Reading System two years earlier than the City currently has planned and conserve a projected 60 acre-feet of water during those two years

Table 2 – Advanced Leak Detection Program Budget and Projected Savings

Year	Cost for 125 Leak Noise Loggers	Cost for 1,038 Radio-Read Meters	2-Yr Water Conserved (Ac-Ft)	10-Yr Aquifer Reserves (Ac-Ft)	1-Yr Aquifer Reserves (Ac-Ft)
2013	\$125,370		53	26.5	2.65
2013		\$190,717	60	29.8	2.98
		Logger Cost Per Ac-Ft	\$2,365	\$4,731	\$47,309
		Meter Cost Per Ac-Ft	\$3,201	\$6,401	\$64,011
		Leak Detection Cost Per Ac-Ft	\$2,783	\$5,566	\$55,660

Commercial/Industrial Retrofits

There are no industrial enterprises in Universal City. Commercial water connections in Universal City generally include laundromats, shopping centers, and restaurants. The following list of the top ten commercial water accounts in Universal City, by average annual volume of water used in the past five years, indicate potential targets for the Large-Scale Retrofit Program.

1. Northeast Lakeview Campus = 56 acre-feet
2. Kitty Hawk Middle School = 16 acre-feet

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3. Super 8 Motel = 9 acre-feet
4. Triangle Shopping Center = 9 acre-feet
5. Kwik Wash Laundries = 7 acre-feet
6. HEB Grocery Store = 7 acre-feet
7. Golden Corral Rest.= 6 acre-feet
8. Coronado Shopping Center = 6 acre-feet
9. Judson Pool = 5 acre-feet
10. First Baptist Church and School = 5 acre-feet

Northeast Lakeview Campus' average annual water usage indicates it might be an ideal target for this Program, but the buildings on the campus actually lie in Live Oak, while the entrance and parking lots are in Universal City. Additionally, almost 40 percent of water used on the Campus in the last five years goes to irrigation, which will be replaced with reclaimed water as discussed later in this Report.

Schools are another potential target for this Program. Universal City has four elementary schools and one middle school, and all but one of the elementary schools were built in or before 1992. The cafeteria rinsers, toilets, and faucets have not been retrofitted in these older Universal City schools. The middle school, however, is the only public school whose water use made the top ten list and that usage is likely due in large part to irrigation of athletic fields.

Universal City Public Works staff is most interested, however, in targeting multi-family residential complexes with their Large-Scale Retrofit Program. Average annual water usage over the past five years at the twelve multi-family complexes built prior to 1992 ranges from about two acre-feet to approximately 44 acre-feet. There are six complexes that used an average of over 20 acre-feet of water per year during the past five years, including two that used 40 acre-feet or more, one of which is located a couple of blocks from another 20+ acre-feet complex. In the past five years, the total average annual water use of these six complexes is 197 acre-feet. This volume of water usage, and therefore potential water savings, is higher than all but the top commercial water user and is comparable to Northeast Lakeview Campus' non-irrigation water usage.

One large multi-family complex and some duplexes and four-plexes participated in a Multi-Family Plumbing Retrofit Program Universal City implemented several years ago, but there were issues with the length of time property owners took to get the provided plumbing equipment installed and the amount of staff time required to implement the program. The City has therefore not funded this Program in recent years. To remedy the problems

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previously encountered, the Commercial Retrofit Program will provide replacement high-efficiency equipment and installation for the high-water use toilets, showerheads, faucets, and washing machines at the identified multi-family residential complex(es).

Costs to implement this Commercial Retrofit Program will be provided by the RWCP and Universal City. The \$18,500 of Universal City Public Works funding currently budgeted for toilet rebates and not allocated in 2013 under the expanded toilet program will instead be used in 2014 in conjunction with \$40,000 of RWCP funding. The SAWS contract will be utilized to purchase toilets and plumbing kits that will be provided free of charge to the multi-family complex(es). A \$200 rebate will be provided for each commercial high-water use washing machine that is replaced. Local plumbers will be paid to install the new plumbing equipment and washing machines.

The Universal City apartment complex with the highest average annual water usage has 232 units and most of their floor plans have one bathroom, while two of the seven floor plans have two bathrooms. For planning purposes, an assumption was made that there are an estimated 262 toilets/showerheads/aerators and ten washing machines in the onsite laundry facility to be replaced. Based on a SAWS commercial self-service laundry case study, an estimated 38,000 gallons of water are saved per machine per year.⁶ Replacement of 262 toilets, showerheads, and sink aerators and ten washing machines will save a projected 189 acre-feet of water over ten years (again, using the industry standard estimated water savings of 22,000 per toilet/showerhead/aerator previously noted, as well as the SAWS case study amount of 38,000 gallons per washing machine), which is expected to provide 94 acre-feet to the EA reserve (9.4 acre-feet on a one-year basis).

***Universal City RWCP: \$40,000 RWCP funds and \$18,500 Universal City funds in 2014 for commercial retrofit to multi-family complex high-efficiency plumbing fixtures and washing machines
Total combined cost of \$58,500 to achieve projected water savings of 189 acre-feet over ten years***

Table 3 – Commercial Retrofit Program Budget and Projected Savings

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Year	# of Toilets & Plumbing Kits	Cost for Toilets	Cost for Plumbing Kits	Cost for 10 \$200 Washing Machine Rebates	Plumber Installation Fee	Total RWCP Cost	Total Universal City Cost
2014	262	\$26,200	\$3,930	\$2,000	\$26,370	\$40,000	\$18,500
Total Cost						\$58,500	

Year	# of Toilets & Plumbing Kits	# of Washing Machine Rebates	10-Yr Water Conserved (Ac-Ft)	10-Yr Aquifer Reserves (Ac-Ft)	1-Yr Aquifer Reserves (Ac-Ft)
2014	262	10	189	94	9
RWCP Cost Per Ac-Ft			\$212	\$424	\$4,243
Total Cost Per Ac-Ft			\$310	\$621	\$6,205

Reclaimed Water

Universal City, in cooperation with SARA and the Alamo Community College District (ACCD), has designed a Reuse Water System Project. This regional project will provide non-potable water from SARA's Salatrillo Wastewater Treatment Plant to Universal City and ACCD for irrigation at their facilities.

The initial phase of this project consists of 3.5 miles of transmission main and a 1-million gallon storage tank for a total cost of \$5,016,875. The project will replace approximately 22 acre-feet per year of EA water that Northeast Lakeview College uses for landscape irrigation, based on their annual average use in 2008 to 2012, with reclaimed water. The project will save additional water at the planned Universal City Sports Complex. Universal City leadership envision future phases of this project to increase the City's use of non-potable water for irrigation.

Universal City's remaining cost to implement the initial phase of this project is \$734,580. The City requested \$734,580 in RWCP funding to implement this Reuse Water Supply Project. SARA has agreed, however, to loan the City the \$734,580 for five years at five percent interest and the Universal City Council has already approved borrowing this money from SARA. RWCP funding will be provided to Universal City for other conservation initiatives rather than for this project since the SARA funding has already been set up.

Universal City does not currently have an organized program to encourage residential rainwater, condensate, or graywater collection and reuse. The volume of treated effluent

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used for landscape irrigation at the City golf course, however, rose from 217 acre-feet in 2010 to 364 acre-feet in 2011.

RWCP Participation

The Universal City Public Works Department has sufficient staffing to implement this Universal City RWCP with the assistance and support of WCTC staff. RWCP funding will therefore be used for water conservation programs and not for staff augmentation. There are no additional initiatives or recommendations from Universal City staff that have not been discussed in the preceding sections. Because of the suburban location of Universal City, there are not EA exempt well owners that live in the areas surrounding the City. Universal City staff members provided the requested data and are very enthusiastic and ready to implement their RWCP.

Conclusions and Recommendations

Universal City staff has made great strides in their efforts to eliminate water waste and conserve water to prepare the City for a drought of record and expected growth. The City has been investing in these efforts for the past several years and plans to continue doing so. Following are the water conservation projects that are currently included in the Universal City Public Works Department budget.

- \$28,500 per year for 380 high-efficiency toilet rebates, at \$75 each
- \$3,300 per year for 44 high-efficiency washing machine rebates, at \$75 each
- \$61,690 in 2013 for 62 water leak noise loggers
- \$120,898 in 2013 for 370 radio-read water meters
- \$734,580 borrowed from SARA for 5 years at 5% for 3.5 miles of transmission main and a 1-million gallon storage tank to allow use of reclaimed water from a nearby wastewater treatment plant for irrigation

Following are the prioritized recommendations for the Universal City RWCP.

1. \$14,000 RWCP funds in 2013 for 100 high-efficiency Caroma toilets and showerhead/aerator sets and the non-profit entities' rewards – *\$207 per acre-foot*
2. \$10,000 Universal City funds in 2013 for installation of the Caroma toilets, showerheads, and sink aerators purchased with RWCP funding (This funding, along with funding for #5 below, will be **instead of** the \$28,500 currently budgeted in 2013)

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3. \$42,000 RWCP funds per year in 2014 and 2015 for 300 Caroma toilets and showerhead/aerator sets and non-profit entities' rewards per year (Total 2013-2015 cost to RWCP is \$98,000 – \$207 per acre-foot)
4. \$30,000 Universal City funds per year in 2014 and 2015 for installation of the Caroma toilets, showerheads, and sink aerators purchased with RWCP funding (This will be **instead of** the \$28,500 currently budgeted annually)
5. \$18,500 Universal City funds in 2014 for commercial retrofit to multi-family complex high-efficiency plumbing fixtures and washing machines (This funding, along with funding for #2 above, will be **instead of** the \$28,500 currently budgeted in 2013)
6. \$40,000 RWCP funds in 2014 for commercial retrofit to multi-family complex high-efficiency plumbing fixtures and washing machines – \$212 per acre-foot
7. \$190,717 RWCP funds in 2013 for 1,038 radio-read meters to complete the Advanced Meter Reading System two years earlier than the City currently has planned – \$3,201 per acre-foot
8. \$125,370 RWCP funds in 2013 for 126 leak noise loggers to complete the Advanced Leak Detection System two years earlier than the City currently has planned – \$2,365 per acre-foot

Refer to Table 4 for the consolidated Universal City RWCP budget and projected water conservation savings. The total cost of the three-year program is \$454,087 and equates to projected water savings of 774 acre-feet over ten years, which is expected to provide 387 acre-feet of water to the EA reserve (39 acre-feet on a one-year basis). The cost per acre-foot over ten years is \$587, while the EA reserve cost is \$1,174 per acre-foot (\$11,737 per acre-foot on a one-year basis).

Table 4 – Universal City RWCP Budget and Projected Savings

Year	Total Cost	Total 10-Yr Water Conserved (Ac-Ft)	Total Cost Per Ac-Ft	Total 10-Yr Aquifer Reserves (Ac-Ft)	Total Cost Per Ac-Ft	Total 1-Yr Aquifer Reserves (Ac-Ft)	Total Cost Per Ac-Ft
2013	\$330,087	180	\$1,833	90	\$3,665	9	\$36,655
2014	\$82,000	391	\$210	196	\$419	20	\$4,193
2015	\$42,000	203	\$207	101	\$415	10	\$4,147
	\$454,087	774	\$587	387	\$1,174	39	\$11,737

References

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1. *2011 Regional Water Plan, South Central Texas Regional Water Planning Area, Volume I*, September 2010, Appendix C, South Central Texas Regional Water Planning Group, San Antonio River Authority, HDR Engineering, Inc., Laura Raun Public Relations, Ximenes & Associates.
2. Universal City staff.
3. Universal City's official website, UniversalCityTexas.com.
4. Universal City's 2010 and 2011 Water Conservation Annual Reports to the TWDB.
5. Universal City's 2010 Water (Loss) Audit Report to the TWDB.
6. SAWS, Commercial WaterSaver Self-Service Laundry Program, Water Conservation Program, Case Study: Coinmach, May 10, 2012.

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