

Water Efficiency Grant Report The City of Brighton

March 2011



Introduction

This Report summarizes the implementation of the Water Efficiency Grant provided to the City of Brighton (hereafter the "City") by the Office of Water Conservation and Drought Planning (hereafter the "Office") of the Colorado Water Conservation Board (CWCB) in 2010. The Grant was provided to the City for the specific purpose of supporting local efforts to implement the City's Water Conservation Plan, updated in 2008 and reviewed and approved by the Office in early 2009. For this particular project, the Grant funding was used to support the following local efforts:

- Focused Community Outreach
- Selected Commercial and Residential Facility Audits
- Replacement of Inefficient Fixtures in City and Commercial Facilities
- Data Collection and Reporting

Each of these specific activities is discussed in the report; as is a presentation of key findings and recommendations.

Please note that it is the intention of both the City and the CWCB to support the implementation of meaningful water conservation in the City of Brighton service area. To this point, the project was focused on creating sustainable water demand reductions in those City and commercial facilities targeted by the project. Fixture replacements and data collection tasks were therefore executed to achieve and verify permanent water savings in the five facilities that were targeted for retrofits. Audits were conducted for the targeted commercial, residential and irrigation customers to collect data that will be used to identify potential water demand reductions in future retrofit and/or rebate programs that the City may pursue.

Given that the conditions for some portion of the City's customer base changed between the time that the grant application was submitted to the Office for consideration and the time that grant funding was awarded to the City, some modifications to the scope of work were needed to complete implementation efforts. All modifications to the scope that occurred as a result of changing conditions in the City are identified and discussed in the report. Noteworthy is that none of the changes in the conditions encountered during execution of the grant funded project compromised the ability of the City to stimulate improved water use efficiency within the City facilities and its targeted customer base.

Acknowledgements

The City and the project team wish to acknowledge the contributions of the owners and staff of all the businesses and institutions that allowed the audit and fixture replacement teams to visit, collect data and install new fixtures in each of the targeted buildings. Without the support and cooperation of these individuals, none of the permanent water savings associated with this project could be realized. Those organizations and institutions that supported this project include the following:

• City of Brighton – City Hall, Police Station, Recreation Center, Senior Center

- Commercial Facility- Inglenook Senior Living Facility, Brighton Care Center, Brighton Terrace, Colorado Cinema, Cottonwood Care Center, Eastgate, VFW, Walmart
- Restaurants Billie's Café, Brighton Bar, Bubba Chino's, Chili's, Jerry's Bar and Restaurant, Jordinalli's Bar, La Estrellita's, Lone Star, Mojo's, Taco Bell
- Home Owner Associations (with irrigation only uses)- Brighton Crossing, Crescent Village, Indigo Trails, Platte River Ranch
- Residential Customers Gossert, Morales, and Hansen Families

Specific Tasks Performed

Each of the tasks identified in the grant application are discussed below. The tasks include:

- Community Outreach
- Conducting Audits
- Implementing Retrofits
- Reporting

Community Outreach

The community outreach efforts conducted as a portion of this project utilized about 6.5% of the total grant funding; however this task was vital in communicating with the actions of the City to the City's customers. Funding from the grant, supplemented by matching funds from the City, was utilized to do the following:

- Upgrade and expand the scope of the District's website;
- Prepare and publish two different service announcements publicizing and promoting the project;
- Develop public television content to promote business and residential requests for audits; and
- Design, print and install signage (for those locations that received retrofit fixtures) providing information regarding the benefits of the City's implementation efforts supported by the CWCB.

In the performance of the project, the following metrics were achieved.

Table 1 – Summary of Community Outreach Efforts

Task	Metric	Number
Update and Expand Website	Number of Visits	Positive trend*
Public service announcements		
Water Schedule KBRI- 8 Boards	2010 Run-time (hours)	128
Residential Audits KBRI- 8 Boards	2010 Run-time (hours)	152
Print and install signage		
Tent Cards	Number	50
Saving Water and Energy	Number	18

^{*}The City of Brighton does not currently have the statistical reporting capabilities required to track the number of visits to each page on the City's main website; however, an analysis of the total number of visits to the entire site shows an upward trend in the number of City webpage visits indicative of an increased interest in the City's website as more content. It can be inferred that the expansion of the water conservation page contributed to the increasing interest in the City's website in 2010 (Appendix A).

The City's website was expanded to include the new water conservation efforts resulting from the Grant. This website is used to promote local water conservation measures and programs, provide information regarding other City conservation programs (e.g., rebates), and generally provide information to interested individuals. The City tracks the number of unique visitors, the total number of

site visits per month, the number of pages and total number of hits per month for the entire City website (Appendix A).

Two public service announcements were televised on the City's Public, Educational and Government access (PEG) television channel providing information on Brighton's watering calendar, toilet and washing machine rebates and the commercial and residential audits that were made available through the Grant.

Another printed messaging campaign that was funded by or in association with this project included creating, producing, distributing and installing signage in every room in each facility that received replacement fixtures. These signs (which are provided in Appendix B) were developed to educate and inform facility users about the water-saving fixtures and their benefits in reducing water use and creating energy savings, specific to each facility.

Audits

The City conducted a commercial, residential and home owner association (HOA) water audit program from March to August 2010 in an effort to further support customer wise water use and water use efficiency. Included in this audit program were ten local restaurants, four large HOAs (with irrigation use only), three volunteer residences, and eight other commercial businesses. These audits were used to characterize both indoor and outdoor water uses, when appropriate, to identify cost-beneficial water saving opportunities within each facility/location.

These audits were combined with the audits conducted prior to the grant funded project, to identify potential water and related energy savings for each location. Table 2 summarizes the audits conducted prior to and during execution of this project.

The audit involved reviewing past and current water use data for each audited facility, and collecting site-specific data characterizing facility-specific water use. Data that was collected during the audits included:

- Number, use and flow rate from each sink faucet
- Number and flow rate from each showerhead
- Number and estimated flush volume for each toilet and urinal
- Number and serial number of all kitchen and laundry facility appliances that use water (e.g., washing machines, laundry extractors, ice machines, steam tables, dish washing machines, etc.)
- Swimming pool, hot tub and Jacuzzi use and water replacement rates
- Outdoor irrigation uses (e.g., irrigated area, sprinkler system timing)
- Other water uses

For indoor water uses, data collected from each facility was compared and contrasted with monthly, seasonal and annual water rates to configure and calibrate a facility-specific water model which was used to estimate water use for each subject fixture that may be a candidate for replacement. In this way, an estimate of water savings and costs for each candidate fixture could be developed to support decision-making by the City in the allocation of potential future Grant supported replacement fixtures.

Table 2 – Summary of Water Audits Conducted by the City

Prior to the Grant	Town Facilities	
	City Hall	
	 Inglenook 	
	 Police Station 	
	Recreation Center	
	Senior Center	
During Execution of the Grant	<u>Restaurants</u>	<u>HOAs</u>
	 Billie's Café 	 Brighton Crossing
	Brighton Bar	 Crescent Village
	 Bubba Chino's 	 Indigo Trails
	• Chili's	 Platte River Ranch
	 Jerry's Bar and Restaurant 	
	 Jordinalli's Bar 	<u>Other</u>
	 La Estrellita's 	 Brighton Care Center
	Lone Star	Brighton Terrace
	Mojo's	 Bromley Lane Car Wash
	Taco Bell	 Colorado Cinema
		 Cottonwood Care Center
	Residence	 Eastgate
	 Gossert 	• VFW
	 Hansen 	 Walmart
	 Morales 	

For the commercial facilities with outdoor water uses and the HOAs, monthly irrigation use was compared and contrasted with expected summertime evapotranspiration (ET) to determine if seasonal irrigation occurred at an appropriate level. The summertime ET for each facility was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program and site specific data that characterized the irrigation area.

Appendix C contains the results of the individual residential, commercial facility and HOA audits conducted as part of the grant funding, including the location, the data collected, and the water model developed to evaluate site-specific water use and identify candidates for fixture replacement.

Fixture Replacements

Based on the observed need, facility manager participation, the availability of fixtures, and the coordination of facility needs with local installation teams, replacement fixtures were installed in a total of five City facilities. A summary of the installed fixtures by facility is provided in Table 3.

The specific fixtures that were used to replace the inefficient old fixtures are as follows:

• Showerheads- A total of 46 Caroma 1.5 gallons per minute (gpm) stainless steel, vacuum assisted low-flow showerhead fixtures were installed. An extra 15 showerheads were provided to the facility manager at Inglenook for additional replacement efforts.

- Shower timers- a total of 3 EDU/ FAC Model Shower Managers were installed. This model runs
 for seven minutes in full-flow mode, which delivers up to 2.2 gpm, before switching to a 60second reset interval which restricts flow to 0.7 gpm.
- Faucet aerators- A total of 131 USA Landlords dual-threaded 0.5 gallon per minute (gpm) stainless steel, low-flow faucet aerator were installed in bathroom and kitchen hand-wash sinks. These faucet aerators were not deemed suitable for other applications (e.g., pot and pan sinks, kitchen gallery sinks, etc.). An extra 30 aerators were provided to the facility manager at Inglenook for additional replacement efforts.
- Toilets- A total of 55 Caroma SyndeySmart dual-flush, EPA WaterSense approved 1.28/0.7 gallon
 per flush (gpf) toilets were installed. It is estimated from experience that these toilets would
 average about 0.9 gpf accounting for the mixture of 0.7 and 1.28 flushes.

Table 3 - Water Fixture Retrofits per Facility

Location	Fixture Type	Installed Retrofits
City Hall	Sink Faucet Aerator	13
	Toilet	14
	Urinal	0
Inglenook	Sink Faucet Aerator	87
	Showerhead	30
	Toilet	36
Police Station	Sink Faucet Aerator	15
	Showerhead	2
	Urinal	0
Recreation Center	Sink Faucet Aerator	13
	Showerhead	14
	Shower Timer	3*
	Urinal	0
Senior Center	Sink Faucet Aerator	3
	Toilet	5
	Urinal	0

^{*} The showertimers which were installed in the Recreation Center were vandalized and were therefore removed after three months

Water Savings

The installation of the high-efficiency fixtures in the five City facilities listed in Table 3 have unquestionably reduced current water use demand for those uses impacted by the retrofitting. In other words, every new dual-flush toilet uses less water per flush than its predecessor. Similarly, all new showerheads allow less water to flow in a minute than the older, less efficient showerhead. Therefore, real savings are occurring assuming that the same water use behaviors are taking place.

Unfortunately, measuring the actual water use reduction is not as simple as might otherwise be expected, for at each facility the replacement fixtures represent only a fraction of current water use. In addition, there may be other water uses at each facility that were not reported or captured within the audit framework. In addition, water use behaviors may not be truly constant, therefore, a comparison

of expected water saved (based on the facility-specific water models developed) and the actual measured water savings is not necessarily congruent. Nonetheless, it is clear that water use reductions have occurred at every facility with installed retrofits. It is also clear that the water savings are generally consistent with those predicted.

Table 4 presents the water-model based estimated water savings for each of the facilities that received replacement fixtures and the actual change in monthly water use prior to and after the fixtures were replaced (based on the water model presented in Appendix C). The estimated water savings for the Recreation Center and Inglenook are based on winter month water uses for 2008; and the estimated water savings for all other audited City facilities are based on winter month water uses for 2009. The actual water savings realized in the Recreation Center is based on a comparison of monthly indoor water use for the years 2008 and 2010; all other actual water savings calculations are based on a comparison of monthly indoor water use for the years 2009 and 2010. The data used to calculate the estimated and actual water savings is presented in Appendix D.

Table 4 - Estimated and Measured Average Monthly Water Savings per Facility

Facility	Estimated Average Indoor Monthly Water Savings (gallons)	Observed Average Indoor Monthly Water Savings (gallons)
City Hall	10,179	13,000
Inglenook	25,346	24,250
Police Station	3,376	4,952
Recreation Center	52,158	52,280
Senior Center	1,641	1,875

The expected water savings, based on the results of the audits and the related water models, were about 3.41 acre-feet; whereas the actual savings measured were about 3.55 acre-feet¹.

The reasons for the differences between the estimated and measured water savings may be influenced by many different factors including:

- Differences in the number of facility users.
- Differences in the normal uses of water within a facility.²

¹ The replacement value of 3.55 acre-feet of water for the City of Brighton is about \$106,500 (at \$30,000 per acrefoot). The cost of the water demand reduction was about \$13,000 per acre-foot using the combination of the Water Efficiency Grant and City funds and resources. See conclusions section for more information regarding the cost and benefit of the project on reducing water demand.

² Based on the monthly wintertime water use data provided for 2008 (about 633,000 gallons per month), one or multiple water leaks were suspected at the Recreation Center. No work was done to remedy the leak(s) during the audit; however, based on the monthly wintertime water use data provided by the City for 2010 (about 152,000 gallons per month), it appears that some work was done to fix the suspected the leak (or leaks). The water demand model for the Recreation Center assumes an initial leak of approximately 10.6 gpm. It is estimated that this leak (or leaks) was reduced to about 0.75 gpm in 2010, which in conjunction with the water savings produced as a result of the fixture retrofits, produce a total water demand reduction of about 480,000 gallons per month.

• Differences in the estimated and actual number of uses and/or length of use of each replaced fixture in the facility.

The City does not maintain records regarding facility visits for most of its buildings (with the exception of the Recreation Center). It is not anticipated that this data can be easily collected by the City in the future, except at the Recreation Center, where site visitors check in when they visit the facility. Conversely, occupancy rates at the Inglenook Senior Living Facility can be readily obtained.

Modifications to the Scope

As previously indicated, the scope of work contained in the grant application included estimates on the number of audits, and the number of replacement fixtures that would be installed. However, conditions predicted at the time of the application were not entirely consistent with the conditions found during project execution. For these reasons, some of the original scope was revised to account for conditions encountered during execution of the project.

The key differences between the proposed scope and the executed scope are listed below:

- The original scope called for a total of 35 audits, including 15 residential and 10 each for commercial and HOA water users. Due to the lack of interest in the local community for audits, the number of residential and HOA audits was less than expected; however the number and complexity of the commercial audits was greater than expected. Therefore, the cost of doing the additional commercial audits offset any cost savings associated with doing fewer residential and HOA audits. For this reason, there are no budget implications associated with the revised number of audits. A total of 25 audits resulted from the Grant; including 10 restaurants, three residential, four HOA and eight other commercial customers.
- Changes also occurred with regard to the number of fixtures that were replaced due to site
 access and customer interest (as described below). Table 5 summarizes the changes to the
 number of retrofit fixtures.

Table 5 – Summary of Modifications to the Number of Replacement Fixtures Installed

Fixture	Original Scope	Modified Due to Field Conditions
Showerhead	129	46
Showertimers	4	3
Sink Faucet Aerators	160	131
Toilets	51	55
Urinals	15	0

There were a number of issues that arose during the installation phase of the project that hampered efforts to install the number of fixtures envisioned during preparation of the grant application.

The issues encountered during project execution included:

- A majority of the showers in Inglenook were found to contain hand held showerheads, which
 were not allow for retrofitting using the Caroma showerhead. Surplus showerheads are being
 used by the City in other programs.
- The showertimers which were installed in the Recreation Center were vandalized and as such were removed after three months of use. Water savings after this time were only associated with the low flow showerheads.
- A number of bathroom sinks in Inglenook did not have detachable faucet aerators, such that
 only a percentage of the sinks could be retrofit. Surplus faucet aerators are being used by the
 City in other programs.
- At City Hall, two toilets were not replaced given that the existing toilets are connected directly
 to lateral metal pipes, creating plumbing challenges that were cost prohibitive to remedy during
 the retrofit process. The surplus toilets were moved to Inglenook.
- At all the facilities, the waterless urinals were found to be cost prohibitive to install due to the
 location of the existing drain pipe (which was typically too low to be accommodated by the new
 waterless urinal porcelain configuration). Four additional toilets were purchased and installed
 at Inglenook using the funding that was original earmarked for the urinals.

Conclusions and Recommendations

The Water Efficiency Grant awarded to The City of Brighton was put to use to implement components of the City's approved Water Conservation Plan. As a result of the grant funded project, the City was able to increase outreach to the community that it serves and measurably decrease water use in various City facilities and open senior living facility.

Total measured water savings over a single year associated with the installed replacement fixtures are expected to be about 3.55 acre-feet, with a replacement value of about \$106,500 to the City (based on a replacement water cost of \$30,000 per acre foot including water acquisition, transportation, treatment and distribution).

The cost of the water savings varied in each retrofit facility dependant on a number of factors, including the number and type of fixtures replaced, the number of times each fixture was used, and the number of facility visits. In particular, those facilities that received showerhead and faucet aerators were typically the most cost effective retrofits, especially in those facilities with shared use showers and sinks (i.e., the Rec Center and Police Station). Toilets, which save significant amounts of water, are the least cost effective because of the capital cost and, for the Inglenook facility, the limited use per toilet.

Table 6 – Estimated Cost per Acre-Foot to Replace Inefficient Fixtures by Facility			
Location	Cost per AF		
City Hall	\$ 14,310		
Inglenook	16,539		
Police Station	1,489		
Recreation Center	358		
Senior Center	31,527		

Based on the results of this project, there are a number of possible improvements that may be valuable to other organizations working to install water efficient fixtures into public and/or commercial facilities. In general, those facilities with high use, shared shower facilities achieve the most cost-effective benefits as illustrated by the cost per AF observed at the Recreation Center and the Police Station. Conversely, the costs of replacing personal use toilets such as in the Senior Center are the most expensive water use reductions. For this reason, future retrofits conducted by the City (and for that matter by the State) should focus on high-use, shared bathroom facilities such as those found in bars, restaurants, institutional facilities, etc.

The audits conducted as part of this project were found to be useful in helping to identify City-based customers that would benefit from future retrofits in a cost-effective manner.

Based on the cost-benefit analyses conducted for each individual facility, recommended retrofits and upgrades have been identified for nearly all of the audited commercial facilities – with the exception of the Bromley Lane Car Wash (where upgrades and improvements require a substantial cost without the

desired rate of return related to water savings).³ As can be seen in Table 7, the majority of the recommendations relate to retrofitting faucet aerators in restaurants and other commercial facility bathrooms.

Toilets and urinal replacements were found to be cost-effective for high water use bars and restaurants (e.g., Billie's Café, Jerry's, Lonestar, Taco Bell, and Walmart). Replacement of toilets and urinals in other locations would reduce customer water demand; however the water savings did not justify the expense of the installation. Also note that at some of the facilities toilets are configured as flushing values and not tank toilets. Toilets configured as flushing values are more expensive to replace and therefore were not found to be cost effective.

Table 7: Summary of Recommendations by Fixture/Appliance Type

Fixture Type	Number	Annual Water Savings (AF)	Cost to Implement (\$)	Cost of Water Savings to the City (\$/AF)
Faucet Aerators	214	5.6	1,500	250
Toilets and Urinals	17	1.0	6,600	6,600
Showerheads	36	1.0	1,550	1,550
Washing Machines	5	0.4	4,625	11,500
Leaks	2	0.9	1,600	1,850

Table 7 also indicates that the following improvement may be worth considering:

- Washing machines which are located in high use areas (Brighton Terrace Apartments and the Beauty Shop at Walmart) are worth replacing with high-efficiency Energy Star appliances since these machines are used multiple times on a daily basis.
- Leaks at the VFW Hall and Walmart should be evaluated, located, and where possible, repaired.

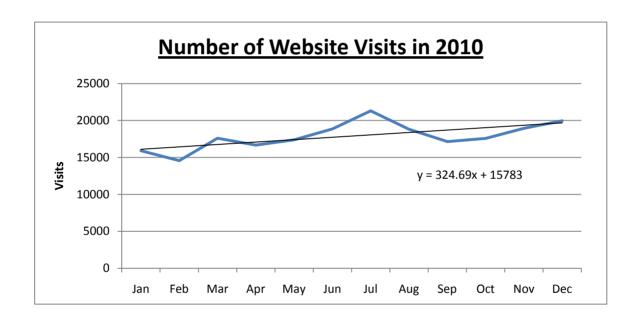
Implementation of these recommendations could be completed for about \$5,000 for the showerheads and faucet aerators (including data collection and reporting) saving up to 7 AF. Toilet replacements at a cost of about \$8,000 (including data collection and reporting) would save an additional 1 AF.

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³ Additional details regarding the recommendations for individual facilities can be found in Appendix C.

Appendix A City of Brighton Website Traffic Information

Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2010	9780	15917	98740	192038	11.94 GB
Feb 2010	9048	14573	89566	166076	10.45 GB
Mar 2010	10588	17594	123199	214658	13.56 GB
Apr 2010	10149	16662	138467	229381	12.50 GB
May 2010	10799	17383	133248	218207	12.55 GB
Jun 2010	11683	18851	136367	235619	13.69 GB
Jul 2010	13526	21301	146985	252093	17.43 GB
Aug 2010	11260	18805	139581	228410	18.25 GB
Sep 2010	10252	17152	129420	205980	15.65 GB
Oct 2010	9806	17571	121726	196123	14.06 GB
Nov 2010	10126	18938	131402	213284	15.02 GB
Dec 2010	10723	19969	128669	210139	15.01 GB
Total	127740	214716	1517370	2562008	170.11 GB



Appendix B

Example Signage Used to Highlight Fixture Replacements

THIS FACILITY, TOGETHER WE ARE HELPING OUR COMMUNITY. BY USING THE HIGH-EFFICIENCY WATER FIXTURES IN

OF WATER (Per Month) Helping to Save 110,000 GALLONS

And to reduce Carbon Emissions associated with reduced hot water use by 10 TONS OF CO, (Per Month)

- Thank You!



Brought to this facility through a partnership between the City of Brighton and the Colorado Water Conservation Board

THIS FACILITY, TOGETHER WE ARE HELPING OUR COMMUNITY. BY USING THE HIGH-EFFICIENCY WATER FIXTURES IN

OF WATER (Per Month) Helping to Save 80,000 GALLONS

And to reduce Carbon Emissions associated with reduced hot water use by 9 TONS OF CO, (Per Month)

- Thank You!





THIS FACILITY, TOGETHER WE ARE HELPING OUR COMMUNITY. BY USING THE HIGH-EFFICIENCY WATER FIXTURES IN

OF WATER (Per Month) Helping to Save 6,000 GALLONS

And to reduce Carbon Emissions associated with reduced hot water use by 1.2 TONS OF CO, (Per Month)

- Thank You!



Brought to this facility through a partnership between the City of Brighton and the Colorado Water Conservation Board

THIS FACILITY, TOGETHER WE ARE HELPING OUR COMMUNITY. BY USING THE HIGH-EFFICIENCY WATER FIXTURES IN

OF WATER (Per Month) Helping to Save 4,000 GALLONS

And to reduce Carbon Emissions associated with reduced hot water use by 1/3 TONS OF CO, (Per Month)

- Thank You!





THIS FACILITY, TOGETHER WE ARE HELPING OUR COMMUNITY. BY USING THE HIGH-EFFICIENCY WATER FIXTURES IN

OF WATER (Per Year) Helping to Save 50,000 GALLONS

And to reduce Carbon Emissions associated with reduced hot water use by 1 TON OF CO, (Per Year)

- Thank You!



Brought to this facility through a partnership between the City of Brighton and the Colorado Water Conservation Board

Appendix C Commercial and Residential Water Audit Program



Commercial and Residential Water Audit Program September 2010







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Introduction

Great Western Institute was retained by The City of Brighton to conduct SMART WATER Audits in order to help local businesses and residential customers better understand their water use, and to support evaluations that will be used to improve customer water use efficiency, as appropriate. The audits, conducted from March to August 2010, were performed as part of the grant awarded by the Colorado Water Conservation Board (CWCB) to the City and focused on characterizing water use for individual customers within the following three categories of customer type:

- Residential:
- Commercial; and
- Irrigators (i.e., Home Owner Associations (HOAs) that manage the irrigation of outdoor turf areas in residential developments).

Note that the water audits were conducted as part of the implementation of the City's recently updated, and CWCB approved, Water Conservation Plan. The water conservation measures and programs selected by the City to implement in its Water Conservation Plan include a wide range of technical and educational activities - one of which includes the water audits.

Audits were conducted at those facilities listed in Tables 1, 2 and 3. Specifically water audits were performed at ten restaurants and eight other commercial facilities, five HOAs and three residences. A brief "SMART WATER Audit Report" for each of the audited customers is attached to this report for distribution to each customer.

This report contains an overview of the methodology used to conduct the audits and a summary of the overall findings. Recommendations related to future implementation efforts on the City's part are also included.

Methodology

The SMART WATER Audit Program was initiated in February 2010. The locations for these audits were selected based on a review of water use data for the period January 2008 to December 2009. Locations were selected based on three key criteria: observed high water use, age of the facility (audits were preferentially conducted in the City's oldest restaurants and bars), and customer interest in having the audits performed. Once the list of customers was developed using these criteria, contact was made to characterize customer interest and, when possible, the site visit for the audit was scheduled.

A summary of the customers that were audited, the date of the audit and other relevant information related to the audit is provided in Tables 1, 2 and 3, for commercial facilities, HOAs and residences, respectively. The methodology for auditing each of these facility types is provided below.

Table 1: Commercial Facility Audits

Facility Name	Address	Account Number	Date Audited	Average Winter Time Water Use (gallons)	Outdoor Irrigation Y or N		
Restaurants							
Billie's Cafe	1830 E. Bridge St.	31.0150.0.2	3/17/2010	31,267	N		
Brighton Bar	245 S. Main St.	26.0440.0.2, 26.0435.0.4	3/17/2010	6,714	N		
Bubba Chinos	201 S. Main St.	26.0410.0.2	3/172010	7,087	N		
Chili's	2211 Prairie Ctr. Pkwy	15.5002.0.1	2/24/2010	127,500	N		
Jerry's Bar and Restaurant	130 N. Main St.	47.515.0.2	3/17/2010	15,400	N		
Jordinalli's Bar	25 N. Main St.	47.0395.0.1, 47.0400.0.1	3/17/2010	30, 875	N		
La Estrellita's	45 N. Main St.	47.0370.0.1	3/17/2010	76,250	N		
Lone Star	305 Pavilion Pl.	26.0538.0.1	2/24/2010	90,571	N		
Mojo's	174 S. Main St.	47.0591.0.1	3/17/2010	45,909	N		
Taco Bell	2121 Prairie Center Pkwy	18.2001.3.1	4/2/2010	44,571	Υ		
	C	Other					
Brighton Care Center	2025 Egbert St.	51.0260.0.1	4/2/2010	386,636	Y		
Brighton Terrace	101 W. Egbert St.	27.0015.0.5*.4.3; 27.0020.0.5*.4.3; 27.0025.0.5*.4.3	4/2/2010	180,000	N		
Colorado Cinema	250 Pavilion Pl.	26.0536.0.1	2/24/2010	65,929	N		
Cottonwood Care Center	2311 E. Bridge St.	33.0065.1.1	4/2/2010	380,071	N		
Eastgate	3030 E. Bridge St.	31.0005.1.1	2/24/2010	2,053,773	Y		
VFW	161 N. Main St.	47.0285.0.1, 47.0280.0.1	3/17/2010	16,667	Y		
Walmart	60 W. Bromley Ln.	26.0010.0.1	2/24/2010	221,250	N		

Commercial Facilities

Commercial facilities that exhibit high water use in the City include:

- Selected restaurants and bars;
- A Car wash:
- A big-box retail store;
- Two extended care facilities (for handicapped and/or elderly citizens);
- A movie house;
- The VFW facility;
- An apartment building; and
- A mobile home park.

Site visits were used to collect relevant information regarding water use practices and characteristics at each individual facility. For example, at restaurants, information regarding the number and flush volumes of all toilets and urinals were collected, along with the flow rates of all sinks in both the bathroom and kitchen. Information characterizing water use in the dishwashing and food preparation area were also collected. For those facilities with a single tap that provides water for both indoor and outdoor use, data was collect to evaluate outdoor irrigation efficiency, as well (i.e., irrigated area in square feet). Similar data was collected at each of the other commercial facilities to characterize both indoor and outdoor water use.

Indoor Water Use

An inventory of water using fixtures and appliances was developed for each audited facility and is included in the brief report for each facility provided as attachments to this report. The inventories included any special water uses that each facility had including, but not limited to, hot tubs and pools, laundry facilitates, air cooling devices, etc.

Once the water use data was collected, a water use "model" was developed for each of the subject facilities. The water use model was utilized to estimate facility-specific water use based on the observed average and maximum monthly wintertime water use for the period January 2008 to December 2009. The model was developed using the water use inventory and was calibrated to reproduce observed average and maximum daily water use based on the number of uses for each fixture and appliance, as well as the typical owner-reported water use for items such as hot tubs, pools, etc. Ice machine water use was estimated using the certified product directory maintained by the Air-Conditioning, Heating and Refrigeration Institute (AHRA). Water use for the laundry facilities was estimated using the manufacturers' specification sheets available based on internet research and/or information available from the EPA Energy Star program. Other water uses (e.g., kitchen sinks, in-line dishwashers, etc.) were estimated based on engineering experience and/or discussions with facility staff. Both hot and cold water use was also estimated for each facility using the water model.

Once the water use model was calibrated to the average and maximum day wintertime water use, it was used to estimate potential future water savings associated with installing the following water saving fixtures and/or appliances, customized based on facility type and water use:

High Efficiency Toilet – 1.28 gallons per flush High Efficiency Urinal – 0 gallons per flush Low Flow Showerhead - 1.5 gallons per minutes Low Flow Sink Aerator – 0.5 gallons per minute High Efficiency Washing Machine (to replace top loading machines) - 18 gallons per load

No estimates were made to upgrade commercial washing machines or commercial car wash facilities.

The calibrated water use model with the appropriate number and type of water saving fixtures and appliances was then employed to estimate future water and energy savings for each audited facility. Total water and energy savings per facility were then calculated, along with an estimate of the average payback period for each type of water saving device. The cost of the replacement water and the avoided treatment and distribution costs to the City (based on the water saved for each facility) were also calculated.

The calibrated water use model and the cost benefit analysis developed for each audited facility is included in each of the Commercial Facility SMART WATER Audit Reports attached to this report.

Outdoor Water Use

For those commercial facilities that had outdoor water use, an evaluation was performed to determine if seasonal irrigation occurred at an appropriate level based on a comparison of applied irrigation to estimated evapotranspiration (ET) over an irrigated area. Irrigated area for each facility that performed outdoor irrigation was collected during the audit process by measuring the turf area and verifying irrigated area using aerial photography. summertime ET was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation for a given location and weather condition (i.e., based on daily temperature and precipitation data). Daily weather data for the summers of 2008 and 2009 were obtained from the National Oceanic and Atmospheric Administration (NOAA).

The comparison of outdoor irrigation to estimated ET is included in each of the Commercial Facility SMART WATER Audit Reports attached to this report, as appropriate.

Table 2: Summary of HOA Audits

HOA Name	Address of Tap	Account Number	2009 Total Summertime Water Use (gallons)	Irrigated Acres (sq. ft.)
Brighton Crossing- Water Tower Park	145S 45 th Avenue	37.2039.6.1	58,000	76,962.5
	4502 E. Bridge St.	37.2039.4.1	3,159,000	76,962.5
Total			3,217,000	153,925
Brighton Crossing- Fountain Park	21 N. Prairie Falcon Parkway	37.0012.0.1	1,817,000	193,200
	5225 Longs Peak St.	37.0509.0.1	2,079,000	193,200
Total			3,896,000	386,400
Crescent Village	2608-2610 Egbert St.	31.0031.0.1	192,000	27,250
	2502-2506 Egbert St.	31.0038.0.1	522,000	27,250
	2518-2520 Egbert St.	31.0039.0.1	877,000	27,250
	2521-2523 Egbert St.	31.0044.0.1	463,000	27,250
Total			2,054,000	109,000
Indigo Trails	1411 Red Poppy Way	29.4811.0.1	582,000	126,669
	1529 Wildflower Dr.	29.4575.0.1	1,260,000	126,669
Total			1,842,000	253,338
Platte River Ranch	863 Mockingbird St.	29.0187.0.1	90,000	35,333
	986 Canary Ct.	29.2248.0.1	360,000	35,333
	901 Mockingbird St.	29.0547.0.1	608,000	35,333
Total			1,058,000	106,000

HOAs

Audits for the five HOAs were conducted to determine whether or not irrigation was applied at a rate consistent with estimated ET for the 2008 and 2009 summer seasons. Irrigated area for each HOA was estimated based on conversations with the HOA property managers, maps and other information that was provided by the property managers; which was then verified using aerial photography. Actual summertime ET was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation for a given location and weather condition (i.e., based on daily temperature and precipitation data). Daily weather data for the summers of 2008 and 2009 were obtained from the National Oceanic and Atmospheric Administration (NOAA).

The comparison of outdoor irrigation to estimated ET is included in each of the HOA SMART WATER Audit Reports attached to this report.

Table 3: Summary of Residential Audits

Residential Property	Address	Account Number	Date Audited	Average Monthly Wintertime Use (gallons)	Peak Summertime Monthly Use (gallons)*
Gossert	279 Birch Ave	27.0745.0.1	4/2/2010	5,167	28,000
Morales	209 S. 13th Ave	13.0525.0.3	8/25/2010	4,909	88,000
Hansen	283 N. 9th Ave	45.0430.0.4	8/25/2010	1,308	16,000

^{*}Based on water use in the summertime of 2008

Residential

Residential audits were conducted to characterize both indoor and outdoor water use. During the site visit, information was collected to characterize residential water use, including the number and flush volume of all toilets, flow rate of all showers and faucets, make and model of all washing machines and dishwashers, and a listing of any other water uses on the premises (e.g., swamp cooler, etc.).

Outdoor watering practices were also characterized, including the make and model of the irrigation controller, the number of zones, and the duration and timing of set irrigation intervals, if available. The data collected during the site visit was organized into a water use inventory for each home.

Indoor Water Use

As with the commercial audits, a water use model was configured and calibrated against observed average and maximum wintertime use to identify how and where water uses occur in each residence. The calibrated model was then adjusted to incorporate potential water saving fixtures and appliances in a manner consistent with the commercial audit discussion. The calibrated water use model with the appropriate number and type of water saving fixtures and appliances was then employed to estimate future water and energy savings for each audited home. Total water and energy savings per home were then calculated, along with an estimate of the average payback period for each type of water saving device. The cost of the replacement water and the avoided treatment and distribution costs to the City (based on the water saved for each facility) were also calculated.

The calibrated water use model and the cost benefit analysis developed for each audited residence is included in each of the Residential SMART WATER Audit Reports attached to this report.

Outdoor Water Use

Outdoor water use at each residence was performed to determine if seasonal irrigation occurred at an appropriate level based on a comparison of applied irrigation to estimated evapotranspiration (ET) over an irrigated area. Irrigated area for each home was collected during the audit process by measuring the turf area and verifying irrigated area using aerial photography. Actual summertime ET was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation for a given location and weather condition (i.e., based on daily temperature and precipitation data). Daily weather data for the summers of 2008 and 2009 were obtained from the National Oceanic and Atmospheric Administration (NOAA).

The comparison of outdoor irrigation to estimated ET for each audited home is included in each of the Residential SMART WATER Audit Reports attached to this report.

Reporting

A SMART WATER Report was developed for each audited property presenting the following:

- An inventory of facility/residence water uses;
- The site specific indoor water use model;
- Cost/benefit analysis for potential future water savings;
- Time history of customer monthly water use in 2008 and 2009; and
- For those properties with outdoor water use, a comparison of irrigation water application rate to estimated summertime ET for 2008 and 2009.

A SMART WATER Report for each audited property is attached. Each report is suitable for delivery to each individual property owner or manager for their consideration and use.

Summary of Results and Recommendations

Based on the SMART WATER audit data collection and subsequent analyses, various types of fixture and appliance retrofits and replacement opportunities were identified that would improve customer water use efficiency. The facility-specific improvements are detailed in the reports prepared for each individual customer that was audited (see attachments). The facility-specific improvements included a wide range of fixture and appliance upgrades such as:

- Installing high-efficiency toilets and urinals;
- Replacing faucet aerators and showerheads with low flow equivalents; and
- Replacing clothes washing machines with Energy Star washing machines.

In addition, numerous ongoing leaks and outdoor irrigation inefficiencies were identified that may require additional characterization and repair.

Noteworthy is that not all the identified upgrades and repair opportunities are worthy of implementing, depending on facility-specific water use characteristics, and the nature and quality of the existing fixtures. For this reason, the water models that were developed to characterize individual customer water use practices included cost-benefit assessments that were used to estimate the rate of future water savings, and whenever appropriate, energy savings, such that cost benefit analyses could be prepared from the perspective of both the customer (through reduced operating costs) and the City (through reduced replacement water costs, and treatment and delivery costs).

The resulting cost benefit analyses were used to identify the most cost-effective retrofit and replacement opportunities associated with the audited commercial facilities, as presented in Table 4. The listings of recommendations include any retrofit or replacement that would have a payback period of less than 6 years for the customer. Leaks that were identified during performance of the audits are also included in the recommendations.

Note that the audits did not identify any specific upgrades or improvements for the residential customers beyond the replacement of showerheads and faucet aerators in homes (which was known before the audits were conducted). This was due the fact that for residential settings, the replacement of toilets and/or washing machines are not as cost-effective as in commercial settings where fixture and appliance use is substantially higher.

With respect to outdoor irrigation practices at the audited commercial facilities, homes and HOAs, it appear that irrigation is occurring at an application rate that is consistent with the estimated ET for each of the years evaluated (i.e., 2008 and 2009).¹

¹ The exception is the irrigation at the Gossert's home, which appears to be high, but since they self-adjust their irrigation controller clock, the over application of irrigation water can be adjusted by the homeowner without cost to either the customer or the City.

Table 4: Summary of Recommended Retrofits and Replacements in **Commercial Facilities**

Location	Improvements	# of Fixtures	Estimated (Improven		Estimated Water Savings (gpy)	Cost of Saving Acre-I	s Per
Restaurants							
Billie Cafe	Toilets	3		1,131	32,940		
	Urinal	1		396	21,600		
	Bathroom Faucets	2		13	9,180		
	Kitchen/ Bar Faucets	2		13	5,400		
				1,553	69,120	\$	7,300
Brighton Bar	Bathroom Faucets	3		20	4,320		
	Kitchen/ Bar Faucets	5		33	5,850		
			\$	53	10,170	\$	1,700
Bubba Chino's	Bathroom Faucets	2		13	17,424		
	Kitchen/ Bar Faucets	2		13	2,178		
			\$	26	19,602	\$	400
Chili's	Urinals	2		792	43,800		
	Bathroom Faucets	2		13	63,291		
	Kitchen/ Bar Faucets	6		40	167,170		
	-		\$	845	274,261	\$	1,000
Jerry's	Toilets	3		1,131	32,688		
	Urinal	1		396	9,000		
	Bathroom Faucets	2		13	21,060		
	Kitchen/ Bar Faucets	1		7	5,400		
			\$	547	68,148	\$	7,400
Jordinalli's	Bathroom Faucets	5		32	50,808		
	Kitchen/ Bar Faucets	2		13	4,015		
	-		\$	45	54,823	\$	250
La Estrellita's	Bathroom Faucets	2		13	17,820		
	Kitchen/ Bar Faucets	3		20	12,600		
	-		\$	33	30,420	\$	350
Lonestar	Urinals	2		792	25,200		
	Kitchen/ Bar Faucets	5		33	15,480		
	-		\$	825	40,680	\$	6,600
Mojo's	Bathroom Faucets	6		40	25,272		
	Kitchen/ Bar Faucets	5		33	10,260		
			\$	73	35,532	\$	700
Taco Bell	Urinal	1		396	25,550		
	Bathroom Faucets	4		26	129,600		
\$ 422 155,150						\$	2,300

Table 4 (continued): Summary of Recommended Retrofits and **Replacements in Commercial Facilities**

Location	Improvements	# of Fixtures	Estimated Cost of Improvements	Estimated Water Savings (gpy)	Savings Per	
Other						
Brighton Care Center	Bathroom Faucets	34	225	466,000		
	Kitchen Faucets	1	7	7,000		
	Other Faucets	1	7	6,000		
			\$ 239	479,000	\$	163
Brighton Terrace	Bathroom Faucets	36	238	378,000		
	Showerheads	36	1,548	328,500		
	Washing Machines	4	3,700	87,600		
			\$ 5,486	794,100	\$	2,250
Bromley Lane Car Wash	None recommended					
Colorado Cinema	Kitchen Faucets	2	13	3,650		
			\$ 13	3650	\$	1,160
Cottonwood Care Center	Bathroom Faucets	58	380	327,000		
	Kitchen Faucets	3	20	13,700		
	<u> </u>		\$ 400	340,700	\$	390
Eastgate	Bathroom Faucets	646	4,200	4,398,000		
	Showerheads	428	18,400	2,343,000		
			\$ 22,600	6,741,000	\$	1,100
VFW	Bathroom Faucets	8	53	10,000		
	Kitchen Faucets	2	13	2,000		
	Leak	1	800	105,000		
			\$ 866	117,000	\$	2,400
Walmart	Urinals	4	1,600	132,000		
	Bathroom Faucets	1	7	11,500		
	Kitchen Faucets	6	40	21,900		
	Other Faucets	3	20	5,700		
	Washing Machine	1	925	35,000		
	Leak	1	800	180,000		
			\$ 3,400	386,100	\$	2,800

Recommendations

Based on the cost-benefit analyses conducted for each individual facility, recommended retrofits and upgrades have been identified for nearly all of the audited commercial facilities – with the exception of the Bromley Lane Car Wash (where upgrades and improvements require a substantial cost without the desired rate of return related to water savings). As can be seen in Table 5, the majority of the recommendations relate to retrofitting faucet aerators in restaurants and other commercial facility bathrooms.

Toilets and urinal replacements were found to be cost-effective for high water use bars and restaurants (e.g., Billie's Café, Jerry's, Lonestar, Taco Bell, and Walmart). Replacement of toilets and urinals in other locations would reduce customer water demand; however the water savings did not justify the expense of the installation. Also note that at some of the facilities toilets are configured as flushing values and not tank toilets. Toilets configured as flushing values are more expensive to replace and therefore were not found to be cost effective.

Table 5: Summary of Recommendations by Fixture/Appliance Type

Fixture Type	Number	Annual Water Savings (AF)	Cost to Implement (\$)	Cost of Water Savings to the City (\$/AF)
Faucet Aerators	214	5.6	1,500	250
Toilets and Urinals	17	1.0	6,600	6,600
Showerheads	36	1.0	1,550	1,550
Washing Machines	5	0.4	4,625	11,500
Leaks	2	0.9	1,600	1,850

There are a few other noteworthy recommendations, as follows:

- Washing machines which are located in high use areas (Brighton Terrace Apartments and the Beauty Shop at Walmart) are worth replacing with high-efficiency Energy Star appliances.
- Leaks at the VFW Hall and Walmart should be evaluated, located, and where possible, repaired.

There are a number of key observations that should be highlighted:

• The water savings potential at the Eastgate Mobile Home Park are substantial since this location houses over 400 individual homes. Estimates indicate that perhaps 6.7 million gallons of water could be saved a year at this location. This represents the single largest potential water savings in the City, based on the audits conducted.

- Potential water savings are possible for less than \$1,000 per acre-feet at numerous locations in the City including restaurants (Bubba Chino's, Jordinalli's, La Estrellita's, and Mojo's) and elder care facilities (Brighton Care and Cottonwood Care). These savings are associated entirely with the replacement of faucet aerators in bathrooms and in kitchen and bar hand wash areas.
- If all the **faucet aerators** listed in the recommendations (Table 5) are replaced, the City would potentially save around 5.5 acre-feet of water per year at a cost of about \$1,500 or at about \$250 per acre-foot of reduced annual water demand (not including the potential savings at Eastgate). This recommendation can be implemented using faucet aerators that are currently on hand at the City (although funding for tracking the water savings associated with this retrofit, and reporting to the State are not currently available).

It should also be noted that the City has at least one other important opportunity to reduce future customer water demand. Current City requirements for new developments do not promote Xeriscape and native plantings in conjunction with green spaces (parks, storm water detention facilities, etc.). Changes to planning and land use polices at the City could substantially reduce future water demand. Some of the HOAs audited were less than 5 years old. More HOAs will be developed in the coming years. Having ordinances that require native plantings and no turf areas, especially in areas without foot traffic or within storm water quality facilitates could substantially reduce future water demand expected by the City. Noteworthy is the many commercial customers within the City's service area are installing native plants and xeric landscapes to reduce outdoor watering requirements. It is expected that more xeric landscapes will be constructed in the City as landscapes mature and water rates increase.

SMART WATER Audit Reports

Commercial Facilities

Restaurants

BRIGHTON

SMART WATER Audit Report



Billie's Café

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 1830 E. Bridge Street in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Billie's Café water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Billie's Café in 2008 and 2009.

Water Use Summary

Billie's Café was built in the 1970's. Similar to many restaurants built before 1994, Billie's Café has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The sink faucets in the men's and women's bathrooms use about 1 gallon per minute. Changing these aerators would cost about \$6 per sink and could result in a water and energy savings of approximately \$76 dollars per year per sink.

The three toilets at Billie's Café use about 2.5 gallons per flush. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend \$1,131 with a total water savings of approximately \$270 per year resulting in a payback period of about 4 years. In addition, replacing the current 1 gallon per flush urinal with a Water Sense approved high efficiency waterless urinal, with an initial cost of about \$396; the restaurant could see a cost savings of approximately \$177 per year, resulting in a payback period of about 2 years.

Billie's Café does utilize a pre-rinse spray nozzle that helps to reduce kitchen water use. They also utilize air cooled ice makers which also help to reduce water use. Billie's Café has two kitchen hand wash sinks that use approximately 2 gallons per minute. Replacing the aerators in these sinks with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and could save a combined water and energy savings of about \$45 per sink per year.

Billie's Café indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

The water saving measures described above are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$1,553 and may bring a reduction of about \$690 in annual water and energy costs.

Table 1 - Inventory of Billie's Cafe Water Using Fixtures and Appliances

Location	Billie's Café	Café						
Address	1830 E. Bridge St	e St						
Contact	Lisa/Liz; Spoke with Ling	te with Ling						
Date	3/17/2010							
Type of Business	Restaurant							
Account Number	31.0150.0.2							
Notes								
Built Date 1970's	1970's							
# of Employees Approximately 12	Approximate	ly 12						
# of Customers Weekends 350; weekdays 180	Weekends 35	50; weekday	s 180					
Toilets	1.28 gpf	1.6 gpf	2.5 gpf	3.5 gpf				Comment
Mens			T					
Womens			7					
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens			T					Old fixture
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	6 gpm	
Pots and Pans	9					8		1 - never used, 1 - used to soak
Kitchen Handwash			7					
Bathroom Mens		1						
Bathroom Womens		1						
Mop Sink	J					1		used 2-4 times per day
Pre Risnse Spray						1		
Other Uses	Use	Make		Model		Capacity		
Ice machines								
		Manitowac						air cooled, smaller size
Steam Table								
						2'x10'		
Hot Water Heater	•							
		Rhem Rudo	Rhem Rudd Universal	G91-200		91 gallons		
Dish Washer	•							
		Energy Mizer	er	CB-2		Ser: 143640	(Busy; runs 7am-2pm
Refrigeration								
								Walk in - large
Freezer								
								Walk in - large
Cooling Towers								
								Make up unit; swamp cooler
Outdoor Irrigation	None							

Table 2 - Summary of Current Water Use and Potential Water Savings Billie's Cafe Audit Summary

:	L								·		
Maximum Use Calculation	We	ekends 35	50; weekd	ays 180, 12	Weekends 350; weekdays 180, 12 employees	8					
	nnu	number	hot	per use	se total	ĺ	uses/day	hot	subtotal gpd cold	total	
Toilets	Mens Womens	1 2			2.5	2.5 gpf 2.5 gpf	25 flushes 40 flushes			63 200	63 200
Urinals	Mens	-			1.5	1.5 gpf	55 flushes			83	83
Bathroom Sinks	Momens		30	0.5	0.5	1 gpm 1 gpm	12 minutes 6 minutes	24		24 12	48 24
Kitchen Sinks: Pots and Pans		ю		4	-	5 gpm	50 minutes	009		150	750
Kitchen Handwash Sink		2		-	-	2 gpm	8 minutes	16		16	32
Mop Sink		-		0	υ	5 gpm	3 uses	•		15	15
Other Ice Machine (Manitowac) Air Cooled Dishwasher (Energy Mizer) Sream Table				0	17.8	17.8 gp100# 1.2 gpcycle 12.47 gpuse	3 100# Ice 75 cycles 1 daily			53 90 12	53 90 12
						5	Ì	652	observed		1,370 max day 41,000 max month
									observed		30 days at max 1,366.67 max day
Average Use Calculation									1		
	nnu	number	hot	per use	se total	I	uses/day	hot	subtotal gpd cold	total	Ī
lollets	Mens Womens	7 7			2.5	2.5 gpf 2.5 gpf	15 flushes 30 flushes			38 150	38 150
Urinals	Mens	-			1.5	1.5 gpf	40 flushes			09	09
Bathroom Sinks	Mens		55	0.5	0.5	1 gpm 1 gpm	8.25 minutes 4.5 minutes	71		9	33
Kitchen Sinks: Pots and Pans		ю		4	-	5 gpm	40 minutes	480		120	009
Kitchen Handwash Sink		2		-	-	2 gpm	5 minutes	10		10	20
Mop Sink		-		0	2	5 gpm	2 uses	•		10	10
Other Ice Machine (Manitowac) Air Cooled Dishwasher (Energy Mizer) Steam Table				0	17.8 1.2 12.47	17.8 gp100# 1.2 gpcycle 12.47 gpuse	2 100# Ice 60 cycles 1 daily	· · · · · · · · · · · · · · · · · · ·		36 72 12 533	36 72 1049 aver dav
									observed		31,267 aver month 30 days at avg 1,042.22 aver day

Page 1 of 2

Table 2 - Summary of Current Water Use and Potential Water Savings Billie's Cafe Audit Summary

Maximum Use Water Savings	ds											
	number	r	0	nse	total	uses/day	sub hot cold	ototal gpd total		savings hot cold	-	total
Toilets	Mens Womens	7 2		1.28	1.28 gpf 1.28 gpf	25 flushes 40 flushes		32 102	32 102		31	31 98
Urinals	Mens	-		0	0 gpf	55 flushes		•	,		, , 88	, , 88
Bathroom Sinks	Mens Womens		0.25	0.25	0.5 gpm 0.5 gpm	12 minutes 6 minutes	12 6	6	24 12		27 9 .	 24 .
Kitchen Sinks: Pots and Pans		ю	4	-	5 gpm	50 minutes	009	150	750			
Kitchen Handwash Sink		2	0.25	0.25	0.5 gpm	8 minutes	4	4	80	12	12	24
Mop Sink		-	0	S	5 gpm	3 uses	•	15	15			
Other Ics Machine (Manitowac) Air Cooled Dishwasher (Energy Mizer) Steam Table			0	17.8 1.2 12.47	17.8 gp100# 1.2 gpcycle 12.47 gpuse	3 100# loe 75 cycles 1 daily		53 90 12 477	53 90 12 1,099 max day 4,000 max month 3,7 days at max 1,366 F7 max day			
Average Hee Water Savings	,,						Politico.		ייססיסים ווופע מפו			
	number	hot		per use cold to	total	uses/day	sub hot cold	subtotal gpd total		savings hot cold	7	total
Toilets	Mens Womens	7 2		1.28	1.28 gpf 1.28 gpf	15 flushes 30 flushes		19	19 77		18	
Urinals	Mens	-		0	0 gpf	40 flushes			,		09	
Bathroom Sinks	Mens Womens		0.25	0.25	0.5 gpm 0.5 gpm	8.25 minutes 4.5 minutes	യ ഹ	ω ro	71 6	. , . , 		
Kitchen Sinks: Pots and Pans		ю	4	-	5 gpm	40 minutes	480	120	009			
Kitchen Handwash Sink		2	0.25	0.25	0.5 gpm	5 minutes	ဇ	ဇ	Ŋ	. ∞	. 80	15
Mop Sink		-	0	S	5 gpm	2 uses		10	10			
Other Ice Machine (Manitowac) Air Cooled Diswasher (Energy Mizer) Steam Table			0	17.8 1.2 12.47	17.8 gp100# 1.2 gpcycle 12.47 gpuse	2 100# loe 60 cycles 1 daily	495 observed	36 72 12 361	36 72 12 857 aver day 31,267 aver month			
Costs to Implement							оргение		1,042.22 aver day			
COSTS TO IIIIDIGIIIGIII	lmnu	ber H	ardware In	stallation	Pay B		Water Savings (gpy) Energy Si	avings (kWhr)	Total Cost Savings/	/yr Tota	al Cost Savi	ngs/yr/fixture
Tolet Urinal Bathroom Sink Kitchen Handwash Sinks		2 2 4 8 8 8 8	282 \$ 311 \$ 1.61 \$ 1.61 \$	95 85 5 5	\$ 1,131 4.19 \$ 396 2.24 \$ 13 0.09 \$ 1,553	9 yrs 4 yrs 9 yrs 5 yrs	22,940 9,180 5,400	- 1,192 701	တ ဟ ဟ ဟ ဟ	270 \$ 177 \$ 153 \$ 90 \$ 690	90 177 76 45	
	AF Savings:	vings:	0.21	07	\$/AF: \$ 7,323	اء	Replacement Water Cost*: \$	6,364	Avoided Cost**:	\$ 657		
							* Calculation based on \$30,000 per AF		** Calculation base	** Calculation based on \$9.50/ 1000 gal		

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BRIGHTON

SMART WATER Audit Report



Brighton Bar

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your bar and restaurant at 245 S Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Brighton Bar water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Brighton Bar in 2008 and 2009.

Water Use Summary

Brighton Bar was built in the 1960's. Similar to many restaurants built before 1994, Brighton Bar has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The sink faucets in the men's and women's bathrooms use about 2 gallons per minute. Changing these aerators would cost approximately \$6 per sink and could result in a water and energy savings of approximately \$72 per year.

The six toilets at Brighton Bar are 1.6 gallon per flush toilets. However, these toilets are flushing at approximately 2 gallons per flush, noting that customers report having to flush the toilets multiple times for each use. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend \$2,262 saving about \$25 per year.

By replacing the three current 1 gallon per flush urinals with the Water Sense approved high efficiency waterless urinals, the initial cost would be \$1,188. Brighton Bar could see a cost savings of approximately \$9 per year per fixture resulting in a payback period of 77 years.

Brighton Bar does utilize a pre-rinse spray nozzle that helps to reduce kitchen water use. In addition, Brighton Bar utilizes air cooled ice makers which also help to reduce water use. Brighton Bar has five kitchen and bar hand wash sinks that use between 3 and 5 gallons per minute. Replacing the aerators in these sinks with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and could have a combined water and energy savings of about \$20 per sink per year.

Brighton Bar indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$3,503 and may bring a reduction of about \$222 in annual water and energy costs.

Table 1 - Inventory of Brighton Bar's Water Using Fixtures and Appliances

			Ī					
Location	brignton	n bar						
Address	245 S. main St.	st.						
Contact	Donna							
	3/17/2010							
Type of Business	Restaurant							
Account Number	26.0440.0.2; 26.0435.0.4	26.0435.0.4	t					
Notes								
Built Date 1960's	1960's							
4 of Employees	4							
# of Customers Weekdays 75/day; weekends 100 +	Weekdays 75	5/day; week	cends 100 +					
- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	J 0C 4	7 - 7	3 0 6	J 7 C				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
lollets	1.28 gpr	T.6 gpr	2.U gpī	3.5 gpr				Comment
Mens		Т						
Womens			2					Do not flush well, have to flush twice
<u> </u>	J C 2 0		1 E 904					
Urinais	U.S gpr	I gpr	1.5 gpr					
Mens		3						
Sinks	0.5 gpm	$1{ m gpm}$	2 gpm	2.5 gpm	3 gpm		e gpm	
Pots and Pans						2		
Kitchen Handwash					3			
Bathroom Mens				1				
Bathroom Womens			2					
Bar Dish Sink							1	
Bar Handwash Sink					7			
Mop Sink					1			
Pre Risnse Spray						1		
Other Uses	Use	Make		Model		Capacity		
Ice machines								
		Scotsman		167529-26B	18			Water dripping from white pipe
Steam Table								
						3'x1'		doesn't work
Hot Water Heater								
						150 degrees	S	In basement, couldn't reach
Dish Washer								
		Energy Mizer	zer	A2 SR: 0038	38			
Refrigeration								
		Kenmore Elite	Elite					
Cooling Towers								
								Air conditioner/ Swamp cooler
Outdoor Irrigation								
	None							

Table 2 - Summary of Current Water Use and Potential Water Savings Brighton Bar Audit Summary

Maximum Use Calculation		Weekdays 75/day; weekends 100+, 4 employees	ay; weekend	ls 100+, 4 er	mployees						
:	Inu	number hot		per use cold	total	uses/day	hot	subtotal gpd cold	total		
Toilets	Mens	← か		1.6	1.6 gpf 2 gpf	6 flushes 6 flushes			10	0 00	
Urinals	Mens	ო		~	1 gpf	6 flushes		,	18	18	
Bathroom Sinks	Mens	- 0	1.25	1.25	2.5 gpm 2 gpm	1.8 minutes 0.9 minutes		6 L	6 ٢	6 4 -	
Kitchen Sinks: Pots and Pans		2	4	~	5 gpm	15 minutes		120	30	150	
Kitchen Handwash Sink		ю	1.5	1.5	3 gpm	2 minutes		ō	თ	18	
Mop Sink		-	0	3	3 gpm	2 uses		,	9	9	
Bar Sink		-	в	в	e gpm	10 minutes		30	30	09	
Bar Hand Sink		8	1.5	1.5	3 gpm	2 minutes		9	9	12	
Other Ice Machine (Scotsman) Air Cooled Dishwasher (Energy Mizer)		7 -	0	17.8	17.8 gp100# 1.2 gpcycle	3 100# lce 3 too# lce 20 cycles	Φ	181 observed	107 24 316	107 24 497 max day 15,000 max month	
Average Hea Calculation								observed		500.00 max day	
Average Use Calculation								subtotal apd			
Toilets	nu	number hot		ploo	total	uses/day	hot	ploo			
	Womens	- 5		6. 6.	1.6 gpr 2 gpf	4 nusnes 2 flushes			20 20	20	
Urinals	Mens	ო		~	1 gpf	3 flushes			ō	ø	
Bathroom Sinks	Mens Womens	- 0	1.25	1.25	2.5 gpm 2 gpm	1.05 minutes 0.3 minutes		10 01	10 01	£ rv	
Kitchen Sinks: Pots and Pans		8	4	-	5 gpm	7.5 minutes		09	15	75	
Kitchen Handwash Sink		က	1.5	1.5	3 gpm	1.5 minutes		7	7	14	
Mop Sink		-	0	2	5 gpm	2 uses		,	10	10	
Bar Sink		-	ю	3	e gpm	5 minutes		15	15	30	
Bar Hand Sink		2	1.5	1.5	3 gpm	1 minutes		ю	ო	Q	
Other Ice Machine (Scosman) Air Cooled Dishwasher (Energy Mizer)		0 +	0	17.8	17.8 gp100# 1.2 gpcycle	# 1 100# lce	Φ	92 observed observed	36 12 140	36 12 233 avg day 6,714 avg month 29 days at avg 223.81 avg day	

Table 2 - Summary of Current Water Use and Potential Water Savings Brighton Bar Audit Summary

Maximum Use Water Savings	gs									I		
]	per use	ISe		3	subtotal gpd	1777		Savings	3	
Toilets	number	not			=	uses/day not	cold	total		not		
	Mens Womens	- 5		1.28	1.28 gpf 1.28 gpf	6 flushes 6 flushes		8 88	38		22	22 2
Urinals	Mens	в		0	0 gpf	6 flushes	,				8	8
Bathroom Sinks	Mens Womens	- 2	0.25	0.25	0.5 gpm 0.5 gpm	1.8 minutes 0.9 minutes	00	00	4 4			' ' <u>4 +</u> '
Kitchen Sinks: Pots and Pans		7	4	-	5 gpm	15 minutes	120	30	150			
Kitchen Handwash Sink		ю	0.25	0.25	0.5 gpm	2 minutes	2	2	ю	. 80	. ω	15
Mop Sink		-	0	ß	5 gpm	2 uses		10	10		(4)	. (4)
Bar Sink		-	в	က	e gpm	10 minutes	30	30	09			
Bar Hand Sink		7	0.25	0.25	0.5 gpm	2 minutes	-	_	2	22	S.	- 01
Other Ice Machine (Scotsman) Air Cooled Dishwasher (Energy Mizer)		N L	0	17.8	17.8 gp100# 1.2 gpcycle	3 100# lce 20 cycles		107 24	107 24 26 may day			
							observed	3	15,000 max month 37 days at max 500 max day			
Average Use Water Savings	ø											
	number	hot	per use cold	ise total		uses/day hot	subtotal gpd cold	total		Savings cold	d total	
loilets	Mens Womens	- 5		1.28	1.28 gpf 1.28 gpf	4 flushes 2 flushes		13 5	3 5		- ~	- r
Urinals	Mens	ъ		0	0 gpf	3 flushes	,				ი	. ი
Bathroom Sinks	Mens Womens	- 2	0.25	0.25	0.5 gpm 0.5 gpm	1.05 minutes 0.3 minutes		- -	2.5	4 7	4 0	
Kitchen Sinks: Pots and Pans		2	4	~	5 gpm	7.5 minutes	09	15	75			
Kitchen Handwash Sink		ဗ	0.25	0.25	0.5 gpm	1.5 minutes	-	-	2	9	9	, E
Mop Sink		-	0	2	5 gpm	2 uses	•	10	10			
Bar Sink		-	е	ო	e gpm	5 minutes	15	15	30			
Bar Hand Sink		7	0.25	0.25	0.5 gpm	1 minutes	-	-	-	'	, ო '	22
Other Ice Machine (Scotsman) Air Cooled Dishwasher (Energy Mizer)		N L	0	17.8	17.8 gp100# 1.2 gpcycle	1 100# Ice 10 cycles		36 109	36 12 187 avg day			
							observed		6,714 avg month 36 days at avg 223.81 avg day			

Table 2 - Summary of Current Water Use and Potential Water Savings Brighton Bar Audit Summary

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	number Ha	ardware In	number Hardware Installation Total	_	Water Savings (gpy)	Energy Savings (kWhr)		Total Cost Savings/yr	Savings/yr	Tota	Total Cost Savings/yr/fixture
Toilet	\$ 9	282 \$	95 \$ 2,262	262 153.16 yrs	3,053			s	25	s	4
Urinal	8	311 \$	85 \$ 1,188	188 77.30 yrs	3,240	•		s	27	69	о
Bathroom Sink	8	1.61	s S	20 0.27 yrs	4,320		569	θ	72	69	24
Kitchen/ Bar Handwash Sinks	5	1.61	5 \$ 33	33 0.34 yrs	5,850		022	69	86	69	20
			9 9	003				A	222.02		
	AF Savings:	0.05	\$/ AF:	\$ 69,333	Replacement Water Cost*:	\$ 1,2	235	Avoided Cost**:	Sost**: \$ 127	127	
					* Calculation based on \$30 000 per AF	00 per AF		** Calculati	** Calculation based on \$9.50/ 1000 gal	1000 gal	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy

GREAT WESTERN INSTITUTE



SMART WATER Audit Report



Bubba Chino's

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 201 S Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Bubba Chino's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Bubba Chino's in 2008 and 2009.

Water Use Summary

Bubba Chino's was built in the 1970's. Similar to many restaurants built before 1994, Bubba Chino's has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The sink faucets in both the upstairs and downstairs bathrooms use about 2.5 gallon per minute. Changing these aerators would cost approximately \$6 per sink and may result in a water and energy savings of approximately \$145 dollars per year per sink.

The upstairs toilet at Bubba Chino's uses about 1.6 gallons per flush and is used most often by customers. The downstairs toilet, used mostly by employees uses 3 gallons per flush. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend about \$754 with a potential total savings of approximately \$61 per year.

Bubba Chino's does utilize a pre-rinse spray nozzle in the kitchen that helps to reduce water use. In addition, Bubba Chino's utilizes air cooled ice makers which help to reduce water use. Bubba Chino's has two kitchen hand wash sinks that use approximately 2.5 gallons per minute; however one is not in use. Replacing the aerators in these sinks with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and may save a combined water and energy savings of about \$18 per sink per year.

Bubba Chino's indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$780 and may bring a reduction of about \$387 in annual water and energy costs.

Table 1 - Inventory of Bubba Chino's Water Using Fixtures and Appliances

Location	Bubba (Chinos						
Address	201 S. Main St	it						
Contact	Junior							
Date	3/17/2010							
Type of Business	Restaurant							
Account Number	26.0410.0.2							
Notes								
Built Date								
# of Employees	3							
# of Customers								
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3 gpf				Comment
Mens/Womens		1		1				
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	6 gpm	
Pots and Pans						1		2 but only one is ever used
Kitchen Handwash				2				
Mens/Womens				2				
Pre Risnse Spray						1		
Other Uses	Use	Make		Model		Capacity		
lce machines								
		Scotsman						Soda ice machine
Steam Table								
						2'x4'		
Refrigeration								
x2		Kenmore						
Freezer								
x2								
Cooling Towers								
								Swamp cooler
Outdoor Irrigation								
	Hose to rinse off deck	off deck						

Table 2 - Summary of Current Water Use and Potential Water Savings Bubba Chino's Audit Summary

Maximum Use Calculation		40-50/day 2 employees	ployees								
i i	number	hot	cold	use total	 	nses/day	hot	subtotal gpd cold	total		
lollets	Upstairs Unisex Downstairs Unisex			9. 9. 8.	1.6 gpf 3 gpf	15 flushes 15 flushes			24 45	24 45	
Bathroom Sinks	Unisex	8	1.25	1.25	2.5 gpm	4.5 minutes		45	45	06	
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	40 minutes		160	40	200	
Kitchen Handwash Sink		7	1.25	1.25	2.5 gpm	2 minutes		Ŋ	ιO	10	
								210 observed	159	369 max day 11,000 max month	
								observed		30 days at max 367 max day	
Average Use Calculation	tion										
	number	hot	per use cold	use total		nses/day	hot	subtotal gpd cold	total		
Toilets	Upstairs Unisex Downstairs Unisex			1.6 3	1.6 gpf 3 gpf	10 flushes 10 flushes			16 30	16 30	
Bathroom Sinks	Unisex	8	1.25	1.25	2.5 gpm	3 minutes		30	30	09	
Kitchen Sinks: Pots and Pans		-	4	~	5 gpm	25 minutes		100	25	125	
Kitchen Handwash Sink		7	1.25	1.25	2.5 gpm	1.5 minutes		4	4	80	
								134 observed	105	239 avg day 7,087 avg month	
								observed		30 days at avg 236 aver day	

Table 2 - Summary of Current Water Use and Potential Water Savings Bubba Chino's Audit Summary

Maximum Use Water Savings	Savings												
			ber use	ө			subtotal gpd			Savings			
	number	hot		total		uses/day hot	ploo	total			cold	total	
Toilets	you'd aicted	•		90	1 20 onf	4 ft ch co		ç	ç		ч		-
	Opstalls Ollisex	- ,		0 7	1.28 92.1	io liusiles		n (n (0 8		, 8
	Downstairs Unisex	-		1.28	1.28 gpt	15 flushes	•	16	18		8		×
											•	'	
Bathroom Sinks											٠		ï
	Unisex	2	0.25	0.25	0.5 gpm	4.5 minutes	o	6	18	98	36		2
											•	'	
											•	•	
Kitchen Sinks: Pots and Pans		-	4	_	5 gpm	40 minutes	160	40	200		٠		
											•		
Kitchen Handwash Sink		2	0.25	0.25	0.5 gpm	2 minutes	-	-	2	4	4		ω
							170	88	258 max day				
							observed		11,000 max month				
									43 days at max				
							observed		367 averday				
							observed						
Average Use Water Savings	avings												
			ber use	9			subtotal apd			Savings			

	number	r hot	ploo	total	la	uses/day	hot	cold	total		hot	ploo	total	
Siets	Upstairs Unisex Downstairs Unisex			1.28	1.28 gpf 1.28 gpf	10 flushes 10 flushes			13	13 2		3	3 71	
Bathroom Sinks	Unisex	8	0.25	0.25	0.5 gpm	3 minutes		9	9	12	, , ₂ ,	4 	' ' 84 '	
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	25 minutes		100	25	125			1 1	
Kitchen Handwash Sink		7	0.25	0.25	0.5 gpm	1.5 minutes		-	←	8	· `´	ເ	9	
								107 observed	57	164 avg day 7,087 avg month				
								observed		43 days at avg 236 aver day				
Costs to Implement														ſ
Toilet Bathroom Sink Kitchen Handwash Sinks	number	0 0 0	Hardware Installation 282 \$ 95 1.61 \$ 5	\$ \$ \$ \$	754 Pay 754 13 13 780	Pay Back 12.42 yrs 0.05 yrs 0.36 yrs	Water Savings (gpy)	Energy Savings (kVPm) 7,405 17,424 2,262 2,178 283	(kvv hr) 2,262 283	10tal Cost Savings/yr \$ 61 \$ 290 \$ 36	yr 61 290 36 387	\$ 30 \$ 145 \$ 18	10tal Cost Savings/yr/rixture \$ 30 \$ 145 \$ 18	0
								0.08 AF Saved						

Avoided Cost**:

Replacement Water Cost*: \$
* Calculation based on \$30,000 per AF

9,416

\$/ AF:

0.08

AF Savings:

BRIGHTON

SMART WATER Audit Report



Chili's Restaurant

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 2211 Prairie Ctr. Pkwy in Brighton on February 23, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Chili's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Chili's in 2008 and 2009.

Water Use Summary

Chili's Restaurant uses water in a manner consistent with newly constructed restaurants throughout Colorado. Similar to many restaurants built after 1994, Chili's has sinks and toilets that have been outfitted with water efficient fixtures which are currently available in the marketplace. For this reason, limited water and energy savings can be realized by Chili's.

Chili's Restaurant does utilize a pre-rinse spray nozzle that helps to reduce kitchen water use. In addition, Chili's utilizes air cooled ice makers which help to reduce water use. The bathroom sink faucet aerators in the women's bathroom already use the 0.5 gallon per minute aerators. Water use efficiency improvements in the men's bathroom sinks could reduce water and energy costs if the 2.2 gallons per minute aerators were replaced with the 0.5 gallons per minute faucet aerators. Changing these aerators would cost approximately \$6 per sink including labor and could save about \$250 per year in water and energy costs.

Chili's has six kitchen and bar hand wash sinks that use between 2 and 5 gallons per minute. Replacing the faucet aerators on these sinks with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and may have a combined water and energy savings of about \$228 per sink per year.

The water modeling effort indicates that Chili's appears to have an ongoing leak of about 0.5 gallons of water per minute that has consistently occurred over the last 2 years. It would be of benefit for the facility to try and identify where this water waste is occurring (leaking flushing valve, leaking kitchen spigot, etc.) such that the leak could be repaired. This ongoing leak appears to waste over 250,000 gallons of water per year.

Chili's eliminated outdoor irrigation in 2009; therefore no evaluation was performed to characterize outdoor water use for this property.

Overall, there are only a few potential water saving measures that could be implemented at Chili's. These measures are listed at the bottom of attached Table 2. In addition to fixing the suspected leak, if all the recommended water saving fixtures were implemented, it would cost approximately \$1,995 and may create total water and energy cost savings of about \$2,249 annually.

Table 1 - Inventory of Chili's Water Using Fixtures and Appliances

Location	Chili's							
Address	2211 Prairie Ctr. Pkwy	Ctr. Pkwy						
Contact	Rebecca							
Date	2/24/2010							
Type of Business	Restaurant							
Account Number	15.5002.0.1							
Toilets	1.28 gpf	1.6 gpf	2.5 gpf	3.5 gpf				Comment
Mens		2						Flushvalves
Womens		3						Flushvalves
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		2						
Sinks	0.5 gpm	1.5 gpm	2.2 gpm	2.5 gpm	3 gpm	5 gpm	6 gpm	
Pots and Pans							1	
Food Processor						1		Pre Rinse Spray w/ Spigot (1-5 gpm)
Bathroom Mens			2					
Bathroom Womens	2							
Bar Handwash			2					Not used
Bar Dish Sink					2			
Kitchen Handwash						4		
Mop Sink						1		
Other Uses	Make	Model		Capacity				
Ice machines								
2x	Manitowoc							Air cooled, Two of these
Dishwasher								
	Stero	ET-44B						
Hot Water Heater								
	American	DCG31100T1996N		100bgal				
Steam Table								
				5'x1'				
Outdoor Irrigation								
	Some irrigation in 2008; turned off irrigation in 2009 and later.	on in 2008; 1	:urned off ir	rigation in 2	009 and la	ter.		
				ı				

Table 2 - Summary of Current Water Use and Potential Water Savings Chili's Audit Summary

Maximum Use Calculation	4200	4200/month	140	9			bas letotding			
A section of the sect	number	oer hot	ploo	total	ĺ	uses/day hot	ploo	total		
Tollets - Flushing Values	Mens	9.0		1.6	1.6 gpf 1.6 gpf	35 flushes 65 flushes		112 312	112 312	
Urinals	Mens	2		-	1 gpf	70 flushes		140	140	
Bathroom Sinks	Mens Womens	2 2	1.1	1.1	2.2 gpm 0.5 gpm	15.75 minutes 9.75 minutes	139 20	139	277 39	
Kitchen Sinks: Pots and Pans		-	8.8	1.2	e gpm	220 minutes	1,056	264	1,320	
Kitchen Sinks: Food Processor w/ pre rinse spray	se spray	-	4	-	5 gpm	120 minutes	480	120	009	
Kitchen Handwash Sink		4	2.5	2.5	5 gpm	30 minutes	300	300	009	
Mop Sink		-	0	2	5 gpm	3 uses		15	15	
Bar Sink		2	1.5	1.5	3 gpm	60 minutes	180	180	360	
Bar Hand Sink (Not used often)		2	11	1.1	2.2 gpm	2 minutes	4	4	Ō	
Other Ice Machine (Manitowoc) Air Cooled Dishwasher (Stero) ET- 44B Steam Table		0 	0	17.8 1.2 3.12	17.8 gp100# 1.2 gpcycle 3.12 gpuse	8 100# Ice 250 cycles 2 daily		285 300 6	285 300 6	
y e		-	0	0.50	0.5 gpm	1440 minutes	2,179 observed observed	720 2,917	720 5,095 max day 147,000 max month 29 days at max 4,900 max day	
Average Use Calculation	number	oer hot	per usi cold	use		uses/day hot	subtotal gpd cold	total		
Toilets	Mens Womens	3 8		1.6	1.6 gpf 1.6 gpf	25 flushes 50 flushes		80 240	80 240	
Urinals	Mens	2		-	1 apf	60 flushes	,	120	 25	
Bathroom Sinks					ī					
	Mens Womens	7 7	1.1	1.1	2.2 gpm 0.5 gpm	12.75 minutes 7.5 minutes	112 15	112	224 30	
Kitchen Sinks: Pots and Pans		-	8.8	1.2	e gpm	180 minutes	864	216	1,080	
Kitchen Sinks: Food Processor w/ pre rinse spray	se spray	-	4	-	5 gpm	110 minutes	440	110	550	
Kitchen Handwash Sink		4	2.5	2.5	5 gpm	25 minutes	250	250	200	
Mop Sink		-	0	2	5 gpm	2 uses		10	10	
Bar Sink		7	1.5	1.5	3 gpm	50 minutes	150	150	300	
Bar Hand Sink (Not used often)		7	1.25	1.25	2.5 gpm	2 minutes	2	2	10	
Other Ice Machine (Manitowoc) Air Cooled Diskwascher (Stern) FT. 448		2 +	c	17.8	17.8 gp100#	5 100# Ice		178	178 276	
eam Table			o c	3.12	3.12 gpuse	2 daily		9 9 5	9 9 6 6	
da.		-			C. C.	000000000000000000000000000000000000000	1,836 observed	2,488	7.20 4,325 avg day 127,500 avg month 29 davs at avg	
							observed		4,250 avg day	

Table 2 - Summary of Current Water Use and Potential Water Savings Chili's Audit Summary

			esn Jed				ndh iainne			200	
Tollot	number	hot	ploo	total	_	uses/day hot	ploo	total	Ī	hot cold	total
2	Mens Womens	3 2		1.6	1.6 gpf 1.6 gpf	35 flushes 65 flushes		112 312	112 312		
Urinals	Mens	2		0	0 gpf	70 flushes					140
Bathroom Sinks	Mens Womens	2 2	0.25	0.25	0.5 gpm 0.5 gpm	15.75 minutes 9.75 minutes	20 23	32	93 38 38	107	107
Kitchen Sinks: Pots and Pans		-	8.8	1.2	e gpm	220 minutes	1,056	264	1,320		
Kitchen Sinks: Food Processor w/ pre rinse spray	inse spray	-	4	-	5 gpm	120 minutes	480	120	009		
Kitchen Handwash Sink		4	0.25	0.25	0.5 gpm	30 minutes	30	30	09	- 270	270
Mop Sink		-	0	2	5 gpm	3 uses		15	15		
Bar Sink		2	1.5	1.5	3 gpm	60 minutes	180	180	360		
Bar Hand Sink (Not used often)		2	0.25	0.25	0.5 gpm	2 minutes	-	-	2	Г	. ღ
Other Ice Machine (Manitowoc) Air Cooled Dishwasher (Stero) ET-44B		2 +	0	17.8	17.8 gp100#	8 100# Ice 250 cycles		285	285		
Steam Table Leak Fixed			0	3.12	3.12 gpuse 0.5 gpm	2 daily 1440 minutes		6 720	6 720		
							observed	2	147,000 max month	3	3
one of the West Course	ş						observed		4,900 max day		
erage ose water saving	number	hot	per use cold	use total		uses/day hot	subtotal gpd cold	total		Savings hot cold	total
Tollets	Mens Womens	3.2		1.6	1.6 gpf 1.6 gpf	25 flushes 50 flushes		80 240	80 240		
Urinals	44	c		c		40.04					
or o	Neris	٧		o	idő n	Selicine 00					- 120
Datrilogiii Oliks	Mens Womens	0 0	0.25	0.25	0.5 gpm 0.5 gpm	12.75 minutes 7.5 minutes	26 15	26 15	30	. 8	
Kitchen Sinks: Pots and Pans		-	8.8	1.2	e gpm	180 minutes	864	216	1,080		
Kitchen Sinks: Food Processor w/ pre rinse spray	inse spray	-	4	-	5 gpm	110 minutes	440	110	550		
Kitchen Handwash Sink		4	0.25	0.25	0.5 gpm	25 minutes	25	25	50	225	225
Mop Sink		-	0	2	5 gpm	2 uses	,	10	10		
Bar Sink		2	1.5	1.5	3 gpm	50 minutes	150	150	300		
Bar Hand Sink (Not used often)		2	0.25	0.25	0.5 gpm	2 minutes	-	-	2	, 4	4
Other Ice Machine (Manitowoc) Air Cooled Dishwasher (Stero) ET- 44B Steam Table Leak Fixed		0 	0 0	17.8 1.2 3.12 0.50	17.8 gp100# 1.2 gpcycle 3.12 gpuse 0.5 gpm	5 100# Ice 230 cycles 2 daily 1440 minutes		178 276 6 720	178 276 6 720		
							1,521 observed	1,333	2,853 avg day 127,500 avg month	316	436

Table 2 - Summary of Current Water Use and Potential Water Savings Chili's Audit Summary

Costs to Implement				
	number Hardware Installation Total Pay Back	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr Total Cost Sav	Fotal Cost Savings/yr/fixture
Urinal	2 \$ 311 \$ 85 \$ 792 2.21 yrs	43,800	\$ 359 \$ 180	
Men's Bathroom Sink	2 \$ 1.61 \$ 5 \$ 13 0.03 yrs		\$ 519 \$ 259	
Kitchen/ Bar Handwash Sinks	0.03	167,170 21,706	\$ 1,371 \$ 228	
Fix Leak	1 \$ 300 \$ 850 <u>\$ 1,150</u> 1.37 yrs		\$ 841 \$ 841 \$ 2,249	
	AF Savings: 1.65 \$/.AF: \$ 1.210	Replacement Water Cost*: \$ 49,445	Avoided Cost**: \$ 5,102	
		* Calculation based on \$30,000 per AF	** Calculation based on \$9.50/ 1000 gal	



SMART WATER Audit Report



Jerry's Bar and Grill

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 130 N. Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Jerry's Bar and Grill water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Jerry's Bar and Grill in 2008 and 2009.

Water Use Summary

Jerry's Bar and Grill was built in the 1970's. Similar to many restaurants built before 1994, Jerry's Bar and Grill has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The two sink faucets in both the men's and women's bathrooms use about 2 gallons per minute. Changing these aerators would cost approximately \$6 per sink and could result in a water and energy savings of approximately \$170 dollars per year per sink.

The three toilets at Jerry's Bar and Grill use between 1.6 and 3 gallons per flush. The toilets are 1.6 gallon per flush units, however most likely due to the age of the toilets; they flush at a higher rate. One of the toilets in the women's bathroom was cracked. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend \$1,131 with a total savings of approximately \$268 per year resulting in a payback period of approximately 4 years. In addition, by replacing the current 1 gallon per flush urinal with the Water Sense approved high efficiency waterless urinal, the initial cost would be \$396. Jerry's could see a cost savings of approximately \$74 per year per fixture resulting in a payback period of about 5 years.

Jerry's Bar and Grill has one kitchen/bar hand wash sink that use approximately 2 gallons per minute. Replacing the aerator in this sink with a new 0.5 gallon per minute faucet aerator would cost about \$6 per sink and may save a combined water and energy savings of on average about \$87 per sink per year.

Jerry's indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$1,547 and may bring a reduction of about \$769 in annual water and energy costs.

Table 1 - Inventory of Jerry's Bar and Grill Water Using Fixtures and Appliances

Location	Jerry's Bar		and Grill					
Address	130 N. Main St	St						
Contact	Linden Morris	S						
Date	3/17/2010							
Type of Business	Restaurant							
Account Number	47.515.0.2							
Notes								
Built Date								
# of Employees 2/shift	2/shift							
# of Customers 40-50/day	40-50/day							
Toilets	1.28 gpf	1.6 gpf	3.0 gpf	3.5 gpf				Comment
Mens		1						
Womens			2					1 was broken
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		1						
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	e gpm	
Pots and Pans						8		used 1 or 2 nights/wk - steak night
Kitchen Handwash			1					
Bathroom Mens			1					
Bathroom Womens			1					
Mop Sink						1		once/day
Other Uses	Use	Make		Model		Capacity		
Cooling Towers								
								air conditioner/swamp cooler
Outdoor Irrigation	None							

Table 2 - Summary of Current Water Use and Potential Water Savings Jerry's Audit Summary

Maximum Use Calculation	40-50/day	ay 2 employees	oyees							
			ber use				subtotal gpd			
Toilote	number	hot	ploo	total		uses/day hot	cold	total		
	Mens Womens	- 2		9.1	1.6 gpf 3 gpf	20 flushes 40 flushes		32 240	32 240	
Urinals	Mens	-		-	1 gpf	30 flushes		30	90	
Bathroom Sinks	Mens Womens	- -			2 gpm 2 gpm	7.5 minutes 6 minutes	30	30	60 48	
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	110 minutes	440	110	550	
Kitchen Handwash Sink		-	-	-	2 gpm	15 minutes	15	15	30	
Mop Sink		-	0	2	5 gpm	1 uses		ĸ	ſĊ	
							509 observed observed	486	995 max day 31,000 max month 31 days at max 1,033 max day	
Average Use Calculation										
	number	hot	per use cold	total		uses/day hot	subtotal gpd cold	total		
l oilets	Mens Womens	- 2		9. 8	1.6 gpf 3 gpf	15 flushes 25 flushes		24 150	24 150	
Urinals	Mens	-		-	1 gpf	25 flushes	•	25	25	
Bathroom Sinks	Mens Womens				2 gpm 2 gpm	6 minutes 3.75 minutes	24 15	24 15	48 30	
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	40 minutes	160	40	200	
Kitchen Handwash Sink		-	-	-	2 gpm	10 minutes	10	10	20	

502 avg day
 15,400 avg month
 31 days at avg
 513 avg day

293

observed

209

1 uses

5 gpm

Mop Sink

Table 2 - Summary of Current Water Use and Potential Water Savings Jerry's Audit Summary

Maximum Use Water Savings	ngs									I		
			ber use	ď.			subtotal gpd			Savings		
	number	hot	ploo	total		uses/day hot	ploo	total	a	hot cold		total
Ollets	Mens	- 0		1.28	1.28 gpf 1.28 gpf	20 flushes 40 flushes		26 102	26 102		9 138	9 238
Urinals	Mood			c	5 6	30 flichae		,	,			٠ . ۶
	O I D I	_		>		ngi ngi			•		S .	g .
Bathroom Sinks	Mens	7	0.25	0.25	0.5 gpm	7.5 minutes	15	15	30	- 15	- 15	. %
	Womens	2	0.25	0.25	0.5 gpm	6 minutes	12	12	24	12	12	24
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	110 minutes	440	110	550	•		
Kitchen Handwash Sink		-	0.25	0.25	0.5 gpm	15 minutes	4	4	ω	, E	, E	23
Mop Sink		-	0	2	5 gpm	1 uses		S	S			
							471 observed observed	274	745 max day 31,000 max month 42 days at max 659 max day			
Average Use Water Savings	st											

Average Use Water Savings	SI												
			ber use	se				subtotal gpd			Savings		
Toilote	number	hot	ploo	total		uses/day hot		cold	total		hot cold	total	
2000	Mens	-		1.28	1.28 gpf	15 flushes	•		19	19		2	2
	Womens	7		1.28	1.28 gpf	25 flushes	•		64	64		98	98
Urinals	Mens	-		0	0 gpf	25 flushes						25	25
Bathroom Sinks	e e	•	0	0	i 1	0		ú	G	ć	ć	ć	Ģ
	Womens		0.25	0.25	0.5 gpm	3.75 minutes		04	0 4	<u> 8</u>	° -	° -	23 8
Kitchen Sinks: Pots and Pans		-	4	-	5 apm	40 minutes	16	160	40	200			
Kitchen Handwash Sink		-	0.25	0.25	0.5 gpm	10 minutes		က	ო	5	∞	œ	15
Mop Sink		-	0	2	5 gpm	1 uses	•		2	S			
							÷	172 observed	140	313 avg day 15,400 avg month			
								observed		49 days at avg 513 avg day			

Table 2 - Summary of Current Water Use and Potential Water Savings Jerry's Audit Summary

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	number Hardware In:	stallation Total	Pay Back	Water Savings (gpy) Energ	Energy Savings (kWhr)	Total Cost Savings/yr	ngs/yr	Total	Total Cost Savings/yr/fixture	
Toilet	3 \$ 282 \$ 95 \$ 1,131 4.22	95 \$ 1,131	4.22 yrs	32,688		s	268	S	68	
Urinal	1 \$ 311 \$	85 \$ 396	5.37 yrs	000'6		69	74	s	74	
Bathroom Sink	2 \$ 1.61 \$	5 \$ 13	0.04 yrs	21,060	2,574	69	340	s	170	
Kitchen/ Bar Handwash Sinks	1 \$ 1.61 \$	5 \$ 7	0.08 yrs	5,400	099	49	87	છ	87	
		\$ 1,547				69	692			
	AF Savings: 0.21	\$/ AF:	\$ 7,396	Replacement Water Cost*: \$	6,274	Avoided Cost**: \$. \$ 647	347		
				* Calculation based on \$30 000 per AF	ц	** Calculation based on \$9.50/ 1000 gal	05.89.50	1000 dal		

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



Jordinalli's

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 25 N. Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Jordinalli's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Jordinalli's in 2008 and 2009.

Water Use Summary

Jordinalli's is housed in a building that was built in the 1930's. Similar to many restaurants built before 1994, Jordinalli's has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The five sink faucet aerators in both the men's and women's bathrooms use about 2.5 gallon per minute. Changing these aerators would cost approximately \$6 per sink and could result in a water and energy savings of approximately \$169 dollars per year per sink.

The six toilets at Jordinalli's were found to use between 2 gallons and 3.5 gallons per flush. The toilets are 1.6 gallon per flush fixtures; however it was noted during the audit that customers report having to flush the toilets multiple times per use. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend \$2,262 with a total savings of approximately \$207 per year. By replacing the two current 1 gallon per flush urinals with Water Sense approved high efficiency waterless urinals, the initial cost would be \$792. Jordinalli's could see a cost savings of approximately \$60 per year per fixture resulting in payback period of 15 years.

Jordinalli's does utilize a pre-rinse spray nozzle as well as air cooled ice makers which help to reduce kitchen water use. Jordinalli's has two kitchen/bar hand wash sinks that use between 2 and 3 gallons per minute. Replacing the aerators in these sinks with new 0.5 gallon per minute faucet aerators would cost about \$6 per sink and could have a combined water and energy savings of about \$33 per sink per year.

Jordinalli's indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$3,098 and may bring a reduction of about \$1,239 in annual water and energy costs.

Table 1 - Inventory of Jordinalli's Water Using Fixtures and Appliances

Activity	Location	Jordinalli's	li's						
Eusiness		25 N. Main S	t.						
17/7010 State St		Dan							
Fusiones Restaucant A		3/17/2010							
# of Employees 5 1.8 gpf 1.6 gpf 1.5 gpm 1.5 g		Restaurant							
# of Employees 30-250 (weekend) 1.58 gpf 1.58 gpf		47.0395.0.1;	47.0400.0.	1					
# of Englioyees 5 # of Customers 3 0-250 (weekend) Momens	Notes								
# of Employees S # of Customers 30-250 (weekend) Mens		1934							
# of Customers 30-250 (weekend) 3-5 gpf 1-5 gpf 1-5 gpf 3-5 gpm									
Mens 1.28 gpf 1.6 gpf 2.0 gpf 3.5 gpf 3.5 gpf 4 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 3 3 3 3 3 3 3 3 3 4	# of Customers	30-250 (weel	kend)						
Womens 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 2 2 2 2 2 3 3 3 3 3 3 4 <th></th> <th></th> <th>1.6 gpf</th> <th>2.0 gpf</th> <th>3.5 gpf</th> <th></th> <th></th> <th></th> <th>Comment</th>			1.6 gpf	2.0 gpf	3.5 gpf				Comment
S	Mens	5	5						Runs, very old; Glacier Bay
Same	Womens		1						Customer said doesn't work properly
Memory Memory Memory Pots and Pans Eathroom Memory Bathroom Bath		0.5 gpf	1 gpf	1.5 gpf					
Disk but washer Eco Lab Estate Whirlpool Estate Whill washer Erezer Estate Whirlpool Estate Whirlgation Estate Whill washer Estate Whill washer Estate Whillpool E	Mens		2						
O.5 gpm 1 gpm 2 gpm 3 gpm 5 gpm 6 gpm 6 gpm 1 gpm 2 gpm 3 gpm 5 gpm 6 gpm 2 gpm 4 gpm 5 gpm 5 gpm 6 gpm 5 gpm 6 gpm 2 gpm 6 gpm 2									
Kitchen Handwash Kitchen Handwash Bathroom Mens Bathroom Momens 1 2 2 Bathroom Womens Bathroom Womens Bathroom Womens Bathroom Womens Bathroom Womens Bar Dish Sink Bar Handwash Sink Bar Handwash Sink Bar Handwash Sink Mop Sink Mop Sink Mop Sink Mop Sink Mop Sink Bar Handwash Sink Mob Sink			1 gpm	2 gpm	2.5 gpm	3 gpm		6 gpm	
Kitchen Handwash 1 1 1 1 1 1 2 2 2 2 2 3 2 3 3 3 3 3 3 3 4	Pots and Pans						2		
Bathroom Womens 2 2 4 2 4 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4	Kitchen Handwash				1				
Bar Dish Sink 3 2 2 2 2 2 2 2 2 2 2 3 3 2 3 3 2 3 4	Bathroom Mens				2				
Bar Dish Sink Sac Handwash Sink 1 <th< th=""><th>Bathroom Womens</th><th></th><th></th><th></th><th>6</th><th>-</th><th></th><th></th><th></th></th<>	Bathroom Womens				6	-			
Bar Handwash Sink 1 1 1 Mop Sink 1 1 1 Pre Risnse Spray 1 1 1 Pre Risnse Spray 1 1 1 Pre Risnse Spray 1 1 1 Breed Make Model Capacity 1 Rot Water Heater Rheem Rhud 6100-200 100gal/20 gal 1 Dish Washer Eco Lab Eszonocs 1 1 Refrigeration Freezer Estate Whirlpool Estate Whirlpool Estate Whirlpool Image: Prescond Cooling Towers Image: Prescond Cooling Towers<	Bar Dish Sink					Ž			
Mop Sink Mode In the Risnse Spray Mode In the Risnse Spray 1 2	Bar Handwash Sink				1				
Pre Risnse Spray Make Model Capacity Ice machines Scottsman CM3 100gal/20 gal Hot Water Heater Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab E52000CS 100gal/20 gal Refrigeration Traulsen Traulsen 100gal/20 gal Freezer Estate Whirlpool 100gal/20 gal Cooling Towers Trane 100gal/20 gal Transen Trane 100gal/20 gal	Mop Sink						1		
Use Make Model Capacity Ice machines Scottsman CM3 Capacity Hot Water Heater Scottsman CM3 CM3 Los washer Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab ES2000CS Escotate Whirlpool Traulsen Freezer Traulsen Cooling Towers Trane Trane Cooling Towers Trane Trane Trane Isation None None Isatic Whirlpool	Pre Risnse Spray						1		
Lce machines Make Model Capacity Ice machines Scottsman CM3 (CM3 (CM3 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></td<>									
Ice machines Scottsman CM3 ot Water Heater CM3 CM3 ot Water Heater Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab ES2000CS FS2000CS Refrigeration Traulsen Traulsen Traulsen Freezer Estate Whirlpool Trane Trane Cooling Towers Trane Trane None		Use	Make		Model		Capacity		
ot Water Heater Scottsman CM3 x2 Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab ES2000CS ES2000CS Refrigeration Traulsen Traulsen Estate Whirlpool Cooling Towers Trane Trane None None Towers	Ice machines								
ot Water Heater x2 Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab ES2000CS 100gal/20 gal Refrigeration Eco Lab ES2000CS 100gal/20 gal Refrigeration Traulsen 100gal/20 gal Freezer Estate Whirlpool 100gal/20 gal Cooling Towers Estate Whirlpool 100gal/20 gal X2 Trane 100gal/20 gal None 100gal/20 gal			Scottsmar		CM3				air cooled, no dripping
x2 Rheem Rhud G100-200 100gal/20 gal Dish Washer Eco Lab ES2000CS 100gal/20 gal Refrigeration Eco Lab ES2000CS 100gal/20 gal Freezer Traulsen 100gal/20 gal 100gal/20 gal Cooling Towers Estate Whirlpool 100gal/20 gal 100gal/20 gal Cooling Towers Trane 100gal/20 gal 100gal/20 gal None None 100gal/20 gal 100gal/20 gal	Hot Water Heater								
Dish Washer Eco Lab ES2000CS Refrigeration Traulsen Traulsen Freezer Estate Whirlpool Cooling Towers x2 Trane None None	x2		Rheem Rh	pn	G100-200		100gal/20	gal	
Refrigeration Eco Lab ES2000CS Refrigeration Traulsen Traulsen Freezer Estate Whirlpool Estate Whirlpool Cooling Towers Trane Trane	Dish Washer								
Refrigeration Traulsen Freezer Estate Whirlpool Cooling Towers Trane x2 Trane None			Eco Lab		ES2000CS				5 x day
Freezer Traulsen x3 Estate Whirlpool Cooling Towers Trane x2 Trane None	Refrigeration								
Freezer x3 Estate Whirlpool Cooling Towers Trane			Traulsen						walk in cooler
Cooling Towers Estate Whirlpool Cooling Towers Trane Industry None	Freezer								
Cooling Towers x2 Trane In Indian Indi	x3		Estate Wh	irlpool					Arctic Air Commercial Freezer
x2 Trane Industrial In	Cooling Towers								
	x2		Trane						5 ton air conditioners
None									
		None							

Table 2 - Summary of Current Water Use and Potential Water Savings Jordinallis Audit Summary

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			ber use					subtotal gpd			
Toleto	number	hot	ploo	total	Ī	uses/day	hot	cold	total		
	Mens	2		2	2 gpf	12 flushes			48	48	
	Womens	4		2	2 gpf	25 flushes			200	200	
Urinals	Mens	8		-	1 gpf	25 flushes			20	20	
Bathroom Sinks	Mens Womens	0 %	1.25	1.25	2.5 gpm 2.5 gpm	5.55 minutes 3.75 minutes		20	56 56	111	
Kitchen Sinks: Pots and Pans		7	4	-	5 gpm	35 minutes		280	70	350	
Kitchen Handwash Sink		-	1.25	1.25	2.5 gpm	5 minutes		9	9	13	
Mop Sink		-	0	s.	5 gpm	2 uses			10	10	
Bar Sink		7	1.5	1.5	3 gpm	40 minutes		120	120	240	
Bar Hand Sink		~	1.5	1.5	3 gpm	2 minutes		8	ю	9	
Other Ice Machine (Scotsman CM3) Air Cooled Dishwasher (Eco Lab)		0 -	0	17.8 1.2	17.8 gpt100# 1.2 gpcycle	2 100# Ice 45 cycles		521 observed observed	17 44 7	71 54 1,266 max day 37,000 max month 29 days at max 1,233 max day	άX

Table 2 - Summary of Current Water Use and Potential Water Savings Jordinallis Audit Summary

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Toilets Mens 2 2 2 gpf 8 flushes https://muses 6 flushes Urinals Mens 2 2 gpf 2 gpf 2 flushes 2 flushes Urinals Mens 2 1.25 1.25 2.5 gpm 4.2 minutes Bathroom Sinks Womens 3 1.25 1.25 2.5 gpm 4.2 minutes Kitchen Handwash Sinks 1 1.25 1.25 2.5 gpm 3 minutes Mop Sink 1 1.25 1.25 2.5 gpm 3 minutes Bar Sink 1 1.25 1.25 2.5 gpm 3 minutes Bar Hand Sink 1 1.25 1.25 3 gpm 2 uses Bar Hand Sink 1 1.5 3 gpm 2 minutes Other 1 1.5 3 gpm 2 minutes Other 1 1.5 1.5 3 gpm 2 minutes Other 1 1.5 1.5 2 cycles Dishwasher (EcoLab)	cold total uses/day 1.25 2 gpf 8 flushes 1.25 2 gpf 20 flushes 1.25 2.5 gpm 4.2 minutes 1.25 2.5 gpm 3 minutes 1.25 2.5 gpm 3 minutes 1.25 1.25 gpm 3 minutes 1.26 2.5 gpm 2 uses 1.27 3 gpm 2 uses 1.5 3 gpm 2 minutes 1.5 3 gpm 2 minutes 1.5 1.7.8 gptoyole 2 minutes 1.7.8 17.8 gptoyole 2 cycles
Momens 2 2 2 gpf Mens 2 2 2 gpf Mens 2 1.25 1.25 2.5 gpm Nomens 3 1.25 1.25 2.5 gpm Nomens Sinks: Pots and Pans 2 4 1.25 2.5 gpm In Handwash Sink 1 1.25 1.25 gpm	2 2 gpf 8 flushes - 1 1 gpf 20 flushes - 1.25 2.5 gpm 42 minutes 42 minutes 1.25 2.5 gpm 35 minutes 45 1.25 2.5 gpm 3 minutes 4 1.25 2.5 gpm 3 minutes 4 1.25 3 gpm 2 uses - 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 1.5 3 gpm 2 minutes 3 1.5 17.8 gpt/ode 2 minutes 3 1.5 17.8 gpt/ode 2 cycles - 1.7 1.2 gpc/ode 25 cycles - 1.2 0bserved
Momens 4 2 2 gpf Mens 2 1.25 1.25 2.5 gpm om Sinks: Pots and Pans 2 1.25 1.25 2.5 gpm n Handwash Sink 1 1.25 1.25 2.5 gpm ink 1 1.25 1.25 3.5 gpm ink 1 1.25 1.25 3.5 gpm ink 1 1.25 1.25 3.5 gpm chine (Scotsman CM3) Air Cooled 1 1.5 3 gpm saher (Eco Lab) 1 1.5 1.5 gptochel	2 2 gpf 20 flushes 1.25 2.5 gpm 4.2 minutes 4.2 minutes 45 1.25 2.5 gpm 35 minutes 280 1.25 2.5 gpm 3 minutes 105 1.25 2.5 gpm 2 uses 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 1.5 3 gpm 2 minutes 105 1.5 3 gpm 3 gpm 2 minutes 105 1.5 3 gpm 3 gpm 2 minutes 105 1.5 3 gpm 3 gpm 2 gpm 3
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Om Sinks Mens 2 1.25 1.25 2.5 gpm Nomens 3 1.25 1.25 2.5 gpm n Sinks: Pats and Pans 2 4 1 5 gpm n Handwash Sink 1 1.25 1.25 gpm nink 1 0 5 gpm nk 2 1.5 gpm nk 2 1.5 gpm chine (Scotsman CM3) Air Cooled 1 1.5 gpm seher (Eco Lab) 1 1.5 gpcycle	1.25 2.5 gpm 42 minutes 45 1.25 2.5 gpm 35 minutes 280 1.25 2.5 gpm 3 minutes 4 5 5 gpm 2 uses - 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 1.5 17.8 gpt/ode 1 100# loe - 1.2 1.2 gpc/ode 25 cycles - 1.2 1.2 gpc/ode 25 cycles - 1.2 1.2 gpc/ode - - 1.2 1.2 gpc/ode - - 1.2 1.2 gpc/odes - - 1.2 1.2 gpc/odes - -
Nomens 2 1.25 1.25 2.5 gpm n Sinks: Pats and Pans 2 4 1 5 gpm n Handwash Sink 1 1.25 1.25 2.5 gpm ink 2 1.5 1.25 2.5 gpm 1 1.25 1.25 gpm 1 1.25 1.25 gpm 1 1.25 1.25 gpm 1 1.25 1.25 gpm 1 1.25 1.2 gpm 2 1.5 1.5 gpm 1 1.5 gpm 2 1.5 1.5 gpm 1 1.5 gpm 2 1.5 1.5 gpm 1 1.5 gpm 2 1.5 gpm 1 1.5 gpm	1.25 2.5 gpm 3 minutes 45 1.25 2.5 gpm 3 minutes 280 1.25 2.5 gpm 3 minutes 4 5 5 gpm 2 uses - 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 1.5 3 gpm 3 gpm 3 gpm 3 gpm 3 gpm 3 gpm 4 gpm 4 gpm 4 gpm 5 gpm 6 g
n Sinks: Pots and Pans 2 4 1 5 gpm n Handwash Sink 1 1.25 1.25 2.5 gpm nik 2 1.5 1.5 gpm 2 1.5 1.5 gpm 2 1.5 1.5 gpm 1 1.5 1.5 gpm 1 1.5 1.5 gpm 1 1.5 gpm	1 5 gpm 35 minutes 280 125 2.5 gpm 3 minutes 4 5 5 gpm 2 uses - 1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 17.8 17.8 gpt00# 1 100# toe - 1.2 1.2 gpcycle 25 cycles 479 observed
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In Handwash Sink In Handwash Sink In 0 5 5 gpm Ink In 0 5 5 gpm Ink In 1.5 1.5 gpm Ink In Ink	1.25 2.5 gpm 3 minutes 4 5 5 gpm 2 uses - 1.5 3 gpm 35 minutes 105 1.5 3 gpm 2 minutes 3 1.5 17.8 gp100# 1100# lce - 1.2 1.2 gpcycle 25 cycles 479 observed observed
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1.5 1.5 3 gpm and Sink 1.5 1.5 3 gpm and Sink 1.5 1.5 3 gpm chine (Scotsman CM3) Air Cooled 2 1.2 1.2 gpt/de scher (Eco Lab) 1 0 1.2 1.2 gpc/de	1.5 3 gpm 2 minutes 105 1.5 3 gpm 2 minutes 3 17.8 17.8 gp100# 1 100# lce - 1.2 1.2 gpcycle 25 cycles - 1.2 05 served
and Sink 1.5 1.5 3 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# sher (Eco Lab) 1 0 1.2 gpcycle	1.5 3 gpm 2 minutes 3 17.8 17.8 gp100# 1100# lce
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2 17.8 17.8 gg100# 1 0 1.2 1.2 gbcycle	17.8 17.8 gpt/00# 1100# lce
1 0 1.2 1.2 gpcycle	1,2 1,2 gpcycle 25 cycles 479 479 observed
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Water	
Use	
Maximum	

total uses/day 1.28 1.28 gpf 12 flushes 1.28 gpf 25 flushes 0.25 0.5 gpm 5.55 minutes 0.25 0.5 gpm 3.75 minutes 0.26 0.5 gpm 2 minutes 1 5 gpm 2 uses 5 5 gpm 2 uses 1.5 3 gpm 40 minutes 0.25 0.5 gpm 2 uses 1.5 3 gpm 2 uses 1.5 3 gpm 2 uses 1.5 3 gpm 2 uses 1.5 1.2 gpc/des 2 too# toe 1.2 1.2 gpc/des 45 cycles	ber use			subtotal apd			Savings		
Mones 2 1.28 gpf 1.28	hot	total	uses/day hot	ploo	total		hot cold		total
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Mens 2 0.25 0.5 gpm 5 Mens 2 0.25 0.25 0.5 gpm 3 0.25 0.25 0.5 gpm 1 1 0.25 0.25 0.5 gpm 1 0.25 0.25 0.25 gpm 1 0.25 0.25 0.25 0.25 gpm 1 0.25 0.25 0.25 0.25 gpm 1 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	4		25 flushes		128	128		72	72
om Sinks Mens Vomens Vomens Sinks: Pots and Pans Handwash Sink It O25 O25 O25 O25 O25 O25 O25 O2							,		
Mens 2 0 0 gpf om Sirks Mens 2 0.25 0.25 0.5 gpm 3 1 Sinks: Pots and Pans 2 4 1 5 gpm 3 1 Handwash Sink 1 0.25 0.25 0.5 gpm 3 1 k 1 0 5 5 gpm 1 k 2 1.5 1.5 3 gpm 1 chine (Scotsman CM3) Air Cooled 1 0.25 0.25 0.5 gpm 1 chine (Scotsman CM3) Air Cooled 2 1.5 1.7.8 97100# 1 cooled 1 0.15 1.2 gpcycle									
om Sinks Mens 2 0.25 0.25 0.5 gpm 5 Nomens 3 0.25 0.25 0.5 gpm 3 Slinks: Pots and Pans 2 4 1 5 gpm I Handwash Sink 1 0.25 0.25 gpm Ink 1 0 5 5 gpm Ink 2 1.5 1.5 3 gpm India 3 gpm 1 0.25 0.25 gpm Inchine (Scotsman CM3) Air Cooled 2 1.5 1.5 1.78 gpt100# Issher (Eco Lab) 1 0 1.2 1.2 gpcycle			25 flushes					20	20
om Sirks Womens Sinks: Pots and Pans 1 Sinks: Pots and Pans 1 Handwash Sirk I Handwash									,
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Womens 3 0.25 0.25 0.5 gpm 3 1 Sinks: Pots and Pans 2 4 1 5 gpm 1 Handwash Sink 1 0.25 0.25 gpm 1 K 1 0 5 5 gpm 1 K 1 0 5 5 gpm 1 M 0 5 5 gpm 1 M 0.25 0.25 gpm 1 Contine (Scotsman CM3) Air Cooled 1 0.25 0.5 gpm 1 Sherr (Eco Lab) 1 1.2 gpcycle	2 0.25		5.55 minutes	11	1	23	44	44	88
1 Sinks: Pots and Pans 2 4 1 5 gpm 1 Handwash Sink 1 0.25 0.5 gpm 1 0.25 0.25 0.5 gpm 1 0.25 0.15 gpm 1 0.25 0.15 gpm 1 0.25 0.15 gpm	3 0.25		3.75 minutes	7	1	23	45	45	06
1 0.25 0.25 0.5 gpm 1 Mandwash Sink 1 0.25 0.25 0.5 gpm 1 0 5 gpm 2 1.5 1.5 gpm 1 0.25 0.25 gpm									
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I Handwash Sink 1 0.25 0.25 0.5 gpm nk 1 0 5 5 gpm ik 2 1.5 1.5 3 gpm nd Sink 1 0.25 0.25 gpm odhine (Scotsman CM3) Air Cooled 1 0.25 0.25 gpm ssher (Eco Lab) 1 0 1.2 1.2 gpcycle	2 4	1 5 gpm	35 minutes	280	20	350			
1 0.25 0.5 gpm nk nk 1 0 5 5 gpm nk k 2 1.5 1.5 3 gpm nd Sink 1 0.25 0.25 0.5 gpm 1 0.25 0.25 gpm							•		
nk 1 0 5 5 gpm nd Sink 2 1.5 1.5 3 gpm nd Sink 1 0.25 0.5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gpt00# ssher (Eco Lab) 1 0 1.2 17.2 gpcycle			5 minutes	-	~	3	2	2	10
1 0 5 5 gpm ik 2 1.5 1.5 3 gpm nd Sink 1 0.25 0.25 0.5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# ssher (Eco Lab) 1 0 1.2 gpcycle							,		
15 1.5 3 gpm nd Sink 1 0.25 0.25 0.5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# 1 0 1.2 pccycle	1 0		2 uses		10	10	•		
1,5 1,5 3 gpm and Sink 1 0,25 0,25 0,5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# sisher (Eco Lab) 1 0 1,2 gpcycle							•		
Ind Sink 1 0.25 0.25 0.5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gpt100# ssher (Eco Lab) 1.2 1.2 gpcycle	1.5		40 minutes	120	120	240			
nd Sink 1 0.25 0.5 gpm chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# ssher (Eco Lab) 1 0 1.2 gpcycle									
chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# sher (Eco Lab) 1.2 1.2 gpcycle			2 minutes	-	-	_	က	က	2
chine (Scotsman CM3) Air Cooled 2 17.8 17.8 gp100# issher (Eco Lab) 1.2 1.2 gpcycle									
2 17.8 17.8 gp/10# 1 0 1,2 1.2 gpcycle									
1 0 1.2 1.2 gpcycle	2				71	71			
				•	54	54	,		,
				424	208	932 max day			
				observed		37,000 max month			
						40 days at max			
				opserved		1,233 max day			

Table 2 - Summary of Current Water Use and Potential Water Savings Jordinallis Audit Summary

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			ber use	9				subtotal gpd			Savings			
	number	hot	cold	total	ĺ	uses/day h	hot	ploo	total		hot	ploo	total	
Offices	Mens Womens	2 4		1.28	1.28 gpf 1.28 gpf	8 flushes 20 flushes			20 102	20 102			12	12
Urinals	Mens	2		0	o gpf	20 flushes							, , 04	40
Bathroom Sinks	Mens Womens	0 0	0.25 0.25	0.25	0.5 gpm 0.5 gpm	4.2 minutes 3 minutes		യ ത	ထတ	17	. ' 34 . ' 36	4.0	. 38 ' ' 36 ' '	67
Kitchen Sinks: Pots and Pans		7	4	-	5 gpm	35 minutes		280	70	350				
Kitchen Handwash Sink		-	0.25	0.25	0.5 gpm	3 minutes		-	-	7	,	e	_. د	9
Mop Sink		-	0	ß	5 gpm	2 uses			10	10				
Bar Sink		2	1.5	1.5	3 gpm	35 minutes		105	105	210				
Bar Hand Sink		-	0.25	0.25	0.5 gpm	2 minutes		-	-	-		8	_. د	. 5
Other Ice Machine (Scotsman CM3) Air Cooled Dishwasher (Eco Lab)		0 -	0	17.8	17.8 gp100# 1.2 gpcycle	1 100# Ice 25 cycles		404 observed observed	36 30 395	36 30 786 avg day 30,875 avg month 39 days at avg 1,029 avg day				

Costs to Implement

	number Hardware Installation Total Pay Back	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr Total Cost Savings/yr/fixture	xture
Toilet	6 \$ 282 \$ 95 \$ 2,262 26.38 yrs	25,229	\$ 207 \$ 34	
Urinal	2 \$ 311 \$ 85 \$ 792 15.31 yrs	- 14,600	\$ 120 \$ 60	
Bathroom Sink	5 \$ 1.35 \$ 5 \$ 32 0.04 yrs	50,808 6,597	\$ 845 \$ 169	
Kitchen/ Bar Handwash Sinks	2 \$ 1.35 \$ 5 <u>\$ 13</u> 0.19 yrs \$ 3.098	4,015 521	\$ 67 \$ 33 \$ 1,239	
	AF Savings: 0.29 \$ /AF: \$ 10,667	Replacement Water Cost*: \$ 8,714	Avoided Cost**: \$ 899	
		*Calculation based on \$30,000 per AF	** Calculation based on \$9.50/ 1000 gal	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



La Estrellita's

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 45 N. Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of La Estrellita's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at La Estrellita's in 2008 and 2009.

Water Use Summary

La Estrellita's is housed in a building that was built in the late 1800's. Similar to many restaurants built before 1994, La Estrellita's has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The sink faucets in both the men's and women's bathrooms use about 2 gallon per minute. Changing these sink faucet aerators would cost approximately \$6 per sink and could result in a water and energy savings of approximately \$148 per year per sink.

The three toilets at La Estrellita's use about 2 gallons per flush and are estimated to have been installed in 1985. All three toilets continue to run for approximately 20 seconds after being flushed. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush, the restaurant would spend \$1,131 with a total savings of approximately \$138 per year resulting in an 8 year payback period. By replacing the two current 1 gallon per flush urinals with the Water Sense approved high efficiency waterless urinals, the initial cost would be \$792. The restaurant could see a cost savings of approximately \$89 per year per resulting in a payback period of approximately 9 years.

La Estrellita's does utilize two pre-rinse spray nozzles that help to reduce kitchen water use. In addition, La Estrellita's utilizes air cooled ice makers which help to reduce water use. La Estrellita's has three kitchen/bar hand wash sinks that use between 2 and 5 gallons per minute. Replacing these sink aerators with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and could have a combined water and energy savings of about \$70 per sink per year.

La Estrellita's indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

The water modeling effort indicates that La Estrellita's appears to have an ongoing leak of about 1 gallon per minute of water that has consistently occurred over the past 2 years. It would be of benefit for the owner to try to find and fix this suspected water waste such that over ½ million gallons of water could be saved per year.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$2,756 and may bring a reduction of about \$733 in annual water and energy costs.

Table 1 - Inventory for La Estrellita's Water Using Fixtures and Appliances

Location	La Estre	rellita's						
Address	45 N. Main St.	ندا						
Contact	Angelita: Gin	;						
Date	3/17/2010	5						
	0102/11/6							
	Kestaurant							
Account Number	47.0370.0.1							
Notes								
Built Date	Built Date Late 1800's							
# of Employees 20 in the		summer, 15 per shift	r shift					
# of Customers 200								
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Mens			T					Could be as old as 1985
Womens			2					Both run 20 seconds after flushing
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		2						
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	e gpm	
Pots and Pans						4		1 sink is a lot smaller
Kitchen Handwash			2					
Bathroom Mens			T					
Bathroom Womens			1					
Bar Dish Sink					1			
Bar Handwash Sink					1			
Mop Sink						1		
Pre Risnse Spray						2		
Other Uses	Use	Make		Model		Capacity		
Ice machines								
		Scotsman CM3	SM3	B9485; SR:				air cooled
Steam Table								
x2						2'x6'		
Hot Water Heater								
						100 gal		Back of storage closet, 150 degrees
Dish Washer								
Bafrigaration		ES 2000		Ser: ES11343	43			Runs all day long
Nei i geration								No name: old
Cooling Towers								5 ()
0								Swamp cooler
Outdoor Irrigation								
	Hose used to clean patio in summer	clean patic	in summer					

Table 2 - Summary of Current Water Use and Potential Water Savings La Estrellitas Audit Summary

Maximum Use Calculation		200 customers/day		15	15 employees/shift	200 customers/day				
			ber use	esn			subtotal gpd	al gpd		
Toilate	number	r hot	ploo	total	Ī	uses/day hot	ploo	total		
2000	Mens	-		2	2 gpf	30 flushes		09	09	
	Womens	7		7	2 gpf	40 flushes		160	160	
Urinals	Mens	7		~	1 gpf	25 flushes		20	50	
Bathroom Sinks	Mens Womens			~ ~	2 gpm 2 gpm	8.25 minutes 6 minutes	33	24 33	66 48	
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	60 minutes	096	240	1,200	
Kitchen Handwash Sink		7	-	-	2 gpm	20 minutes	40	40	80	
Mop Sink		-	0	2	5 gpm	3 uses	,	15	15	
Bar Sink		-	1.5	1.5	3 gpm	45 minutes	89	89	135	
Bar Hand Sink (Not used often)		-	1.5	1.5	3 gpm	2 minutes	б	ю	9	
Other Scotsman Air Cooled		-		17.8	17.8 gp100#	3 100# Ice		53	53	
Dishwasher ES2000		← (0	1.2	1.2 gpcycle	75 cycles		S 8	06	
Steam Table Hose to clean patio		v -	0	5.40	7.46 gpuse 5 gpm	z daliy 5 minutes		22 82	30 25	
Leak		-	0	1.075	1.075 gpm	1440 minutes	1,128	1,548 2,439	1,548 3,566 max dav	
							observed	ved	107,000 max month	
							observed	ved	3,566.67 max day	

Table 2 - Summary of Current Water Use and Potential Water Savings La Estrellitas Audit Summary

Average Use Calculation

			ber use					subtotal gpd	pdb		l
	number	hot	cold	total	3	uses/day h	hot	cold	total		
lollets	Mens	-		7	2 gpf	15 flushes			30	30	
	Womens	7		7	2 gpf	25 flushes			100	100	
Urinals	Mens	7		←	1 gpf	15 flushes			90	30	
Bathroom Sinks	Mens Womens				2 gpm 2 gpm	4.5 minutes 3.75 minutes		8 5	18	36 30	
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	25 minutes		400	100	200	
Kitchen Handwash Sink		2	-	-	2 gpm	10 minutes		20	20	40	
Mop Sink		-	0	2	5 gpm	2 uses			10	10	
Bar Sink		-	1.5	1.5	3 gpm	20 minutes		30	30	09	
Bar Hand Sink (Not used often)		-	1.5	1.5	3 gpm	2 minutes		ю	က	9	
Other Scotsman Air Cooled		~			17.8 gp100#	2 100# Ice			98	36	
Dishwasher ES2000		- 0	0	1.2	1.2 gpcycle	50 cycles			9 S	900	
Hose to clean patio		1 ←	0		5 gpm	5 minutes			22 8	25	
Leak		-	0	. 9201	1.075 gpm	1440 minutes		. 1	1,548	1,548	
								observed	pe pe	76,250 avg month	
								observed	Þ	30 days at avg 2,541.67 aver day	

Table 2 - Summary of Current Water Use and Potential Water Savings La Estrellitas Audit Summary

Maximum Use Water Savings	ngs										ĺ	
	number	hot	per use	se total		uses/day	hot	subtotal gpd cold	l gpd total		Savings hot cold	d total
Toilets	Mens	-		1.28	1.28 gpf	30 flushes			38	38		22
	Womens	2		1.28	1.28 gpf	40 flushes		,	102	102		28
Urinals	Mens	2		0	0 gpf	25 flushes						95
Bathroom Sinks	Mens	← •	0.25	0.25	0.5 gpm	8.25 minutes		ω (ω (71	25	52 5
	w omens	-	0.75	C7:0	mdb c.o	o minutes		٥	٥	7	20 .	<u>»</u> .
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	60 minutes		096	240	1,200		
Kitchen Handwash Sink		8	0.25	0.25	0.5 gpm	20 minutes		10	10	20	. 06	. 06
Mop Sink		-	0	2	5 gpm	3 uses			15	15		
Bar Sink		-	1.5	1.5	3 gpm	45 minutes		89	89	135		
Bar Hand Sink (Not used often)		-	0.25	0.25	0.5 gpm	2 minutes		-	-	-		ნ
Other												
Scotsman Air Cooled			c	17.8	17.8 gp100#	3 100# Ice			23	23		
Steam Table		- 8	>	7.48	7.48 gpuse	2 daily			30 8	30		
Hose to clean patio		-	0	2	5 gpm	5 minutes			25	25		- 1
								1,052	989	1,739 max day		-
								observed	pe	107,000 max month		
								observed	pə.	3,566.67 max day		

Table 2 - Summary of Current Water Use and Potential Water Savings La Estrellitas Audit Summary

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Average Ose water Savings								-				
			ber use				subtotal gpd	pdf				
Toilot	number	hot	cold	total	nses/day	/day hot	cold	total		hot cold	total	77
	S	_		1.28	1.28 gpf	15 flushes		19	19		£	7
Womens	SI	2		1.28	1.28 gpf	25 flushes		49	64		98	36
Urinals Mens	8i	2		0	0 gpf	15 flushes					. , 8	8
Bartroom Sinks Mens Womens	<u>১</u> ন		0.25	0.25	0.5 gpm 0.5 gpm	4.5 minutes 3.75 minutes	ro 4	ro 4	ന യ	' ' <u>4</u>	'' 4 = '	 27 23
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	25 minutes	400	100	200			
Kitchen Handwash Sink		2	0.25	0.25	0.5 gpm	10 minutes	2	2	10	. 15	15	30
Mop Sink		-	0	2	5 gpm	2 uses		10	10			
Bar Sink		-	1.5	1.5	3 gpm	20 minutes	30	30	09			
Bar Hand Sink (Not used often)		-	0.25	0.25	0.5 gpm	2 minutes	-	-	-	ი	د	٠ 2
Other												
Scotsman Air Cooled		_		. 8.71	17.8 gp100#	2 100# Ice		36	36			
Dishwasher ES2000		_	0		1.2 gpcycle	50 cycles		09	09			
Steam Table		2			7.48 gpuse	2 daily		30	30			
Hose to clean patio Leak Fixed		-	0		5 gpm	5 minutes		22	25		1,548	1,548
							444	387	831 avg day			
							observed	D	76,250 avg month			
							observed	Т	92 days at avg 2,541.67 aver day			

Costs to Implement

costs to implement													
	number	Hard	number Hardware Installation Total	ation		Pay Back	Water Savings (gpy) Ene	Energy Savings (kWhr)	Total Cost Savings/yr	/ings/yr	Total Co	Total Cost Savings/yr/fixture	
Toilet		3 \$	282 \$	\$ 26	1,131	8.19 yrs	16,848		s	138	s	46	
Urinal	. •	2 \$	311 \$	82	792	8.94 yrs	10,800		69	68	69	4	
Bathroom Sink		2 \$	1.61 \$	2	13	0.04 yrs	17,820	2,314	49	297	69	148	
Kitchen/ Bar Handwash Sinks		3	1.61	2	20	0.09 yrs	12,600	1,636	ss	210	s	70	
Fix Leak		8	300	200	\$ 800	0.44 yrs	565,020		69	1,808	8	808	
				9	2,730				9	202			
	AF Savings:	1.91	1.91	€\$	% AF:	\$ 1,441	Replacement Water Cost*: \$	57,366	Avoided Cost**:	*: \$ 5,919	919		
							* Calculation based on \$30,000 per AF	oer AF	** Calculation b	** Calculation based on \$9.50/1000 gal	o gal		-

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



Lone Star Restaurant

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 305 Pavilion Place in Brighton on February 23, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Lone Star's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Lone Star in 2008 and 2009.

Water Use Summary

Lone Star Restaurant uses water in a manner consistent with newly constructed restaurants throughout Colorado. Similar to many restaurants built after 1994, Lone Star has sinks and toilets that have been outfitted with water efficient fixtures which are currently available in the marketplace. For this reason, limited water and energy savings can be realized by Lone Star.

Lone Star Restaurant does utilize a pre-rinse spray nozzle that reduces water use in the kitchen. In addition, Lone Star utilizes air cooled ice makers which help to reduce water use. The bathroom sink faucet aerators at Lone Star already use the 0.5 gallon per minute aerators.

Lone Star has five kitchen and bar hand wash sinks that use 2.5 gallons per minute. Replacing the aerators in these sinks with new 0.5 gallon per minute faucet aerators would cost about \$6 per aerator and save a combined water and energy savings of about \$52 per sink per year.

By replacing the two current 1 gallon per flush urinals with the Water Sense approved high efficiency waterless urinals, the initial cost would be \$792. Lone Star would see a cost savings of approximately \$100 per year per fixture resulting in payback period of about 4 years.

Lone Star indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

Overall, there are only a few potential water saving measures that could be implemented at Lone Star. These measures are listed at the bottom of attached Table 2. If all the recommended water savings fixtures are implemented, it would cost approximately \$825 and may bring a reduction of about \$466 in annual water and energy costs to this business.

Table 1 - Inventory of Lonestar's Water Using Fixtures and Appliances

Location	Lonestar							
Address	305 Pavillion Pl	Pl						
Contact	Marney							
Date	2/23/2010							
Type of Business	Restaurant							
Account Number	26.0538.0.1							
Notes								
# of Employees								
# of Customers 500 customers/day	500 custome	rs/day						
Toilets	1.28 gpf	1.8 gpf	2.5 gpf	3.5 gpf				Comment
Mens			2					Flushvalve
Womens		3						Flushvalve
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		2						
Sinks	0.5 gpm	2.2 gpm	2.5 gpm	2.7 gpm	3.5 gpm	5 gpm	e gpm	
Pots and Pans						4		
Kitchen Handwash		2		2				2.7 gpm sinks are used most often
Bathroom Mens	2							
Bathroom Womens	2							
Bar Handwash			1					
Bar Dish Wash					2			
Mop Sink						1		
Other Uses	Make	Model		Capacity				
Ice machines	_							
	Hoshizaki							Air cooled
Dishwasher								
	Hobart	C44A Seria	rial: 85-10120					w/ Ecolab System
Steam Table								
				2x (2.5'x2.5')	()			
Outdoor Irrigation								
	None							

Maximum Use Calculation	500/day		350							
			per use	ise				subtotal gpd	p	
Control of the contro	number	hot	ploo	total		uses/day	hot	ploo	total	
	Mens Womens	3.0		2.5	2.5 gpf 1.8 gpf	25 flushes 55 flushes			125 297	125 297
Urinals	Mens	2		-	1 gpf	55 flushes			110	110
Bathroom Sinks	Mens Womens	2 2	0.25	0.25	0.5 gpm 0.5 gpm	12 minutes 8.25 minutes		24 17	24 17	33
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	120 minutes		1,920	480	2,400
Kitchen Handwash Sink		4	1.225	1.225	2.45 gpm	10 minutes		49	49	86
Mop Sink		-	0	2	5 gpm	3 uses			15	15
Bar Sink		2	1.75	1.75	3.5 gpm	180 minutes		630	630	1,260
Bar Hand Sink		-	1.25	1.25	2.5 gpm	5 minutes		9	9	13
Other Ice Machine (Hoshizaki) Air Cooled Dishwasher (Hobart) Ser# 1.85-1012074 C44A Steam Table	,44A	a	0	17.8 1.2 7.79	17.8 gp100# 1.2 gpcyde 7.79 gpuse	6 100# Ice 350 cycles 3 daily		2,646 observed	107 420 47 2,326 ed	420 47 4,72 max day 149,000 max month 30 days at max 4,966.67 max day

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Toilets Mens Urinals Bathroom Sinks Womens Mens Wens 2	not	cold total		uses/day not	Dioo	total			
		2.5 1.8	2.5 gpf 1.8 gpf	15 flushes 37 flushes		75 200	75 200		
		-	1 gpf	35 flushes		02	70		
	0.25	0.25	0.5 gpm 0.5 gpm	7.5 minutes 5.55 minutes	1 1 2 1 1 2 1	£ L	22 30		
Kitchen Sinks: Pots and Pans 4	4	-	5 gpm	70 minutes	1,120	280	1,400		
Kitchen Handwash Sink	1.225	1.225	2.45 gpm	5 minutes	25	25	49		
-	0	2	5 gpm	2 uses		10	10		
2	1.75	1.75	3.5 gpm	110 minutes	385	385	770		
-	1.25	1.25	2.5 gpm	2 minutes	ю	ю	Ŋ		
Other Ice Machine (Hoshizaki) Air Cooled Dishwasher (Hobart) Ser# 1.85-1012074 C44A 1 Steam Table	0	17.8 1.2 7.79	17.8 gp100# 1.2 gpcycle 7.79 gpuse	4 100# lce 250 cycles 3 daily		71 300 23	71 300 23		
					1,558 observed observed		3,026 avg day 90,571 avg month 30 days at avg 3,019.05 aver day		
Maximum Use Water Savings									
number	hot	per use cold total	tal	uses/day hot	subtotal gpd cold	gpd total		Savings hot cold	total
Mens 2 Womens 3		1.28	1.28 gpf 1.28 gpf	25 flushes 55 flushes		64 211	64 211		
Mens 2		0	Jdb 0	55 flushes		,			0
		•	į	-	į	•	!		
Mens 2 Womens 2	0.25	0.25	0.5 gpm 0.5 gpm	12 minutes 8.25 minutes	24 17	24	33 33		
Kitchen Sinks: Pots and Pans 4	4	-	5 gpm	120 minutes	1,920	480	2,400		
Kitchen Handwash Sink	0.25	0.25	0.5 gpm	10 minutes	10	10	20	. 39	o o
-	0	5	5 gpm	3 uses		15	15		
2	1.75	1.75	3.5 gpm	180 minutes	930	630	1,260		
-	0.25	0.25	0.5 gpm	5 minutes	-	-	က		2
hizaki) Air Cooled		17.8	17.8 gp100#	6 100# Ice		107	107		
Dishwasher (Hobart) Ser# 1.85-1012074 C44A	0	1.2	1.2 gpcycle	350 cycles		420	420	•	
=		67:7	esnd6 <i>6/:/</i>	3 daliy	2,602	7		44	23 23 324 368
					observed	ved	149,000 max month 32 davs at max		
					observed	ved			

GREAT WESTERN INSTITUTE

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			ber use			•		subtotal gpd	D		Savings		
	number	hot	ploo	total	ĺ	uses/day	hot	cold	total		hot	cold	total
Tollets		2		1.28	1.28 gpf	15 flushes			88	38	٠	37	37
Womens		3		1.28	1.28 gpf	37 flushes			142	142		58	28
- C C C C C C C C C C C C C C C C C C C											•		
Officials		0		c	on o	35 flushes						- 20	. 2
				•	5								
Bathroom Sinks											•		
Mens				0.25	0.5 gpm	7.5 minutes		15	15	30			
Womens		2 0	0.25	0.25	0.5 gpm	5.55 minutes		1	1	22			
Kitchen Sinks: Pots and Pans		4	4	-	5 gpm	70 minutes		1,120	280	1,400			
Kitchen Handwash Sink		4	0.25	0.25	0.5 gpm	5 minutes		2	ວ	10	20	20	39
Mop Sink		_	0	2	5 gpm	2 uses			10	10			
Bar Sink		2	1.75	1.75	3.5 gpm	110 minutes		385	385	770			
Bar Hand Sink		1 0	0.25	0.25	0.5 gpm	2 minutes		-	-	-	2	2	4
Other													
Ice Machine (Hoshizaki) Air Cooled		-			17.8 gp100#	4 100# lce			71	71			
Dishwasher (Hobart) Ser# 1.85-1012074 C44A		-	0	1.2	1.2 gpcycle	250 cycles			300	300			
Steam Table		1	7		7.79 gpuse	3 daily			23	23			
								1,537	1,282	2,818 avg day	22	186	207
								opserved	Р	90,571 avg month			
										32 days at avg			
								opserved	Ф	3,019.05 aver day			

Costs to Implement

	maja = - de maja m	l	-10	V	(-1/4/1)		
Urina			3.83 Vrs	water Savirigs (gpy)	Energy Savings (Kwrii)	S 207	1 Otal Cost Savings/yr/lixture 5 103
Kitchen/ Bar Handwash Sinks				15,480	2,038	\$ 259	\$ 52
	AF Savings: 0.12		609'9	Replacement Water Cost* :	\$ 3,745	Avoided Cost**:	\$ 386
				* Calculation based on \$30,000 per AF	,000 per AF	** Calculation based on \$9.50/ 1000 gal	n \$9.50/ 1000 gal

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



Mojo's

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 174 S. Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Mojo's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Mojo's in 2008 and 2009.

Water Use Summary

Mojo's was built in the 1970's. Similar to many restaurants built before 1994, Mojo's has plumbing fixtures that should be updated to improve water use efficiency, thus saving water and energy costs. The six sink faucets in both the men's and women's bathrooms use about 2 gallon per minute. Changing these faucet aerators would cost approximately \$6 per sink and would result in a water and energy savings of approximately \$70 dollars per year per sink.

The seven toilets at Mojo's use approximately 1.6 gallons per flush. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush and work correctly, the restaurant would spend \$2,639 with and could have a total savings of approximately \$70 per year. By replacing the five current 1 gallon per flush urinals with the Water Sense approved high efficiency waterless urinals, the initial cost would be \$1,980. The restaurant could see a cost savings of approximately \$21 per year per fixture resulting in a payback period of about 20 years.

Mojo's does utilize a pre-rinse spray nozzle as well as air cooled ice makers which help to reduce kitchen water use. Mojo's has five kitchen/bar hand wash sinks that use approximately 2 gallons per minute. Replacing the aerators in these sink aerators with 0.5 gallon per minute faucet aerators would cost about \$6 per sink and may save a combined total water and energy savings of about \$171 per year.

Mojo's indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$4,692 and may bring a reduction of about \$764 in annual water and energy costs.

Table 1 - Inventory of Mojo's Water Using Fixtures and Appliances

Address								
Address	7170	,						
	1/4 S. Main St.	ot.						
Contact	ā	rdo spoke with	/ith					
Date	3/17/2010							
Type of Business	Restaurant							
Account Number	47.0591.0.1							
Notes								
Built Date	Built Date Approximately 1970's	ly 1970's						
# of Employees 6 average at	6 average at	a time						
# of Customers 200	200							
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Mens		2						
Womens		2						
	1	,	,					
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		5						
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	udg 9	
Pots and Pans						2		
Kitchen Handwash			3					1 drips
Bathroom Mens			3					
Bathroom Womens			3					
Bar Dish Sink					1			1 sink, 2 faucets
Bar Handwash Sink			2					
Mop Sink					1			
Pre Risnse Spray						1		
Other Uses	Use	Make		Model		Capacity		
Ice machines								
		Scotsman CM3	CM3	AquaArmor				water dripping from white pipe
Steam Table								
						3'x2'		
Hot Water Heater								
								Locked in Bathroom
Refrigeration								
x2		Harford, Delfield	elfield					
Cooling Towers								
								Air conditioning with temp control
Outdoor Irrigation	None							

6 employees/shift

140

200 custome

Maximum Use Calculation

			ber use					subtotal gpd		
Toilate	number	hot	cold	total	Ì	uses/day	hot	cold	total	
Oldis	Mens Womens	2 5		1.6	1.6 gpf 1.6 gpf	10 flushes 15 flushes			32 120	32 120
Urinals	Mens	Ŋ		-	1 gpf	10 flushes			20	50
Bathroom Sinks	Mens Womens	ოო	- -		2 gpm 2 gpm	3 minutes 2.25 minutes		36 27	36 27	72 54
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	135 minutes		1,080	270	1,350
Kitchen Handwash Sink		ю	-	-	2 gpm	10 minutes		30	30	09
Mop Sink		-	0	ო	3 gpm	2 uses			9	9
Bar Sink		-	1.5	1.5	3 gpm	40 minutes		09	09	120
Bar Hand Sink		2	-	-	2 gpm	2 minutes		4	4	80
Other Ice Machine (Scotsman CM3) Air Cooled		-			17.8 gp100#	3 100# Ice			53	53
Dishwasher Steam Table		0 ←	0	3.74	1.2 gpcycle 3.74 gpuse	cycles 2 daily			- 2	. 7
					i	•		1,237		1,933 max day
								observed		58,000 max month
								observed	÷	30 days at max 1,933.33 max day

Average Use Calculation

			ber use	0				subtotal gpd		
Toilot	number	hot	ploo	total		uses/day	hot	ploo	total	Ī
Special	Mens	2		1.6	1.6 gpf	7 flushes		,	22	22
	Womens	2		1.6	1.6 gpf	12 flushes			96	96
Urinals	Mens	2		-	1 gpf	7 flushes			35	35
Bathroom Sinks	Mens Womens	ოო			2 gpm 2 gpm	2.1 minutes 1.8 minutes		25 22	25	50 43
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	110 minutes		880	220	1,100
Kitchen Handwash Sink		က	-	-	2 gpm	5 minutes		15	15	30
Mop Sink		-	0	c)	5 gpm	2 uses			10	10
Bar Sink		-	1.5	1.5	3 gpm	30 minutes		45	45	06
Bar Hand Sink		5	-	-	2 gpm	2 minutes		4	4	8
Other Ice Machine (Scotsman CM3) Air Cooled Dishwasher Steam Table		-0-	0	17.8 1.2 3.74	17.8 gp100# 1.2 gpcyde 3.74 gpuse	2 100# lce cycles 2 daily		991 observed	36 - 7 7 7 7 537	36 7 1,528 avg day 45,909 avg month 30 days at avg 1,530.30 aver day

Maximum Use Water Savings	S											
i i	number	hot	cold	use total		uses/day hot	subtotal gpd cold	total		savings hot cc	cold to	total
lollets	Mens Womens	2 5		1.28	1.28 gpf 1.28 gpf	10 flushes 15 flushes		26 96	26 96		6 24	6 24
Urinals	Mens	2		0	0 gpf	10 flushes					- 20	20
Bathroom Sinks	Mens Womens	ღღ	0.25	0.25	0.5 gpm 0.5 gpm	3 minutes 2.25 minutes	9 7	6 7	6 1 4	27 20	27 20 20	. ' 2 4 '
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	135 minutes	1,080	270	1,350			
Kitchen Handwash Sink		က	0.25	0.25	0.5 gpm	10 minutes	ω	œ	15	- 23	23	45
Mop Sink		-	0	2	5 gpm	2 uses		10	10		. (4)	(4)
Bar Sink		-	1.5	1.5	3 gpm	40 minutes	09	09	120			
Bar Hand Sink		8	0.25	0.25	0.5 gpm	2 minutes	-	-	2			. 9
Other Ice Machine (Scotsman CM3) Air Cooled Dishwasher		- 0	0	17.8	17.8 gp100# 1.2 gpcvcle	3 100# Ice 0 cycles		. 53	53			
Steam Table		-		3.74	3.74 gpuse	2 daily	1 164	7 547	7 1711 max dav			
							observed		58,000 max month 34 days at max 1 933 33 max day			
Average Use Water Savings								_				
)	number	hot	per	use total		uses/day hot	subtotal gpd cold	total		savings hot cc	cold to	total
S1910 I	Mens Womens	2 5		1.28	1.28 gpf 1.28 gpf	7 flushes 12 flushes		18	18 77		4 6	4 6
Urinals	Mens	2		0	Jdb 0	7 flushes					35	32
Bathroom Sinks	Mens Womens	ღღ	0.25	0.25	0.5 gpm 0.5 gpm	2.1 minutes 1.8 minutes	ъ	2 0	13	19 19 1	61 .	38 , ,
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	110 minutes	880	220	1,100			
Kitchen Handwash Sink		ო	0.25	0.25	0.5 gpm	5 minutes	4	4	80	Έ	- =	53
Mop Sink		-	0	2	5 gpm	2 uses		10	10			
Bar Sink		-	1.5	1.5	3 gpm	30 minutes	45	45	06			
Bar Hand Sink		2	0.25	0.25	0.5 gpm	2 minutes	-	-	2	_. ۳	က '	9
Other Ice Machine (Scotsman CM3) Air Cooled Dishwasher Steam Table		-0-	0	17.8 1.2 3.74	17.8 gp100# 1.2 gpcycle 3.74 gpuse	2 100# lce 0 cycles 2 daily		36	36			
							941 observed observed	429	1,371 avg day 45,909 avg month 33 days at avg 1,530.30 aver day			

	number Hardware Installation	Installation	_	Pay Back	Water Savings (gpy) Energy Sa	Energy Savings (kWhr)	Total Cost Savings/yr	Total Cost Savings/yr/fixture
Toilet	7 \$ 282	282 \$ 95 \$	\$ 2,639	37.75 yrs	8,525		\$ 20	\$ 10
Urinal	5 \$ 311 \$	\$ 85	\$ 1,980	19.16 yrs	12,600		\$ 103	\$ 21
Bathroom Sink	6 \$ 1.61	2	\$ 40	0.09 yrs	25,272	3,281	\$ 421	\$ 70
Kitchen/ Bar Handwash Sinks	5 \$ 1.61	\$	\$ 33		10,260	1,332	\$ 171	\$ 34
			4,092				40/	
	AF Savings: 0.17	_	\$/ AF:	\$ 26,983	Replacement Water Cost*:	5,216	Avoided Cost**: \$ 538	538
					* Calculation based on \$30,000 per AF		** Calculation based on \$9.50/ 1000 gal	\$9.50/ 1000 gal

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



Taco Bell

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your restaurant at 2121 Prairie Center in Brighton on April 2, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Taco Bell's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Taco Bell in 2008 and 2009.

Water Use Summary

The Taco Bell Restaurant uses water in a manner consistent with newly constructed restaurants throughout Colorado. The toilets at Taco Bell are flush valves which only use 1 gallon per flush. These toilets are as water efficient as can be expected given the current available market and technology. However, the current 1 gallon per flush urinals could be improved with Water Sense high efficiency waterless urinals, at an initial cost of about \$396. Taco Bell could see a cost savings of approximately \$209 per year associated with the improvement resulting in a payback period of about 2 years.

Taco Bell also utilizes a pre-rinse spray nozzle as well as air cooled ice makers which help to reduce water use. However, the bathroom sink faucets at Taco Bell use 2 gallon per minute aerators. By changing the aerators to 0.5 gallon per minute water efficient aerators, Taco Bell will incur an initial cost of approximately \$6 per fixture and will potentially save \$539 per year per fixture.

Taco Bell has three kitchen hand wash sinks that use 3 gallons per minute. However, these sinks are not able to be retrofitted with new aerators due to their foot pedal design.

Overall, there are only a few potential indoor water saving measures that could be implemented at Taco Bell. These water saving measures are listed at the bottom of attached Table 2. If all the recommended indoor water saving fixtures were to be installed, it would cost approximately \$422 and it may create a reduction of about \$2,366 in annual water and energy costs.

Changes to the irrigation system, on the other hand, could create substantial savings since Taco Bell is currently over irrigating its turf and landscape areas. An outdoor water audit which will evaluate the sprinkler system clock settings, system pressure, and other irrigation system efficiencies is recommended. Water savings associated with a more efficient operation of its automated irrigation system could be as much as 80,000 gallons of water per month.

Table 1 - Inventory of Taco Bell's Water Using Fixtues and Appliances

, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	Taco Rell	_						
	200							
Address	2121 Prairie Center	enter						
Contact	Kelly S.							
Date	4/2/2010							
Type of Business	Restaurant							
Account Number	18.2001.3.1							
Notes								
Built Date 2007	2007							
# of Employees								
# of Customers								
Toilets	1.0 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Mens	1							Flushvalve 2007; Crane
Womens	2							Flushvalve 2007
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		1						
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	e gpm	
Pots and Pans						2		
Kitchen Handwash					3			Foot pump
Bathroom Mens			2					
Bathroom Womens			2					
Mop Sink						1		
Pre Risnse Spray						1		
Other Uses	Use	Make		Model		Capacity		
Ice machines								
		Manitowac	S					Air Cooled
Steam Table								
						4'x4'		
Hot Water Heater								
		State Ultra	ra HE	SUF100199NF	JNF	100 gal		2007; 180 degrees
Outdoor Irrigation	Sprinklers; 24 zones; RainBird Controller	zones; Rai	nBird Contro	oller				
	7 @ 25 min; 1	17 @10 mir	_					
))						

Table 2 - Summary of Current Water Use and Potential Water Savings Taco Bell Audit Summary

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			40	45	85		89	312	750	45	15	10	68	1,659 max day 50,000 max month
	total			45				156	150	23	8	10	88	789 1,6 50,0
subtotal gpd	cold						84	156	009	23	8			870 observed
	hot													
	uses/day		70 flushes	45 flushes	85 flushes		10.5 minutes	19.5 minutes	75 minutes	5 minutes	3 uses	1 daily	5 100# Ice	
			1 gpf	1 gpf	1 gpf		2 gpm	2 gpm	5 gpm	3 gpm	5 gpm	9.97 gpuse	17.8 gp100#	
	total		_	-	~		-	-	-	1.5	2.5			
ber use	ploo						-	-	4	1.5	2.5			
	hot		2	-	-		2	7	2	က	-	-	-	
	number		Womens	Mens	Urinal		Womens	Mens						
		Toilets				Bathroom Sinks			Kitchen Sinks: Pots and Pans	Kitchen Handwash Sink w foot pump	Mop Sink	Steam Table	Ice Machine Air Cooled	

Average Use Calculation

		120	35	70		228	252	650	36	10	10	71	1,482 avg day	44,571 avg month	30 days at avg ,485.71 aver day
	total	120	35	70		114	126	130	18	2	10	71	699	44	1,48
subtotal gpd	cold					114	126	520	18	22			783	observed	observed
	hot														
	uses/day	e0 flushes	35 flushes	70 flushes		14.25 minutes	15.75 minutes	65 minutes	4 minutes	2 uses	1 daily	4 100# Ice			
,		1 gpf	1 gpf	1 gpf		2 gpm	2 gpm	5 gpm	3 gpm	5 gpm	9.97 gpuse	17.8 gp100#			
9	total	-	-	-		-	-	~			26.6				
ber use	ploo					_	-	4	1.5	2.5					
	hot	2	_	-		2	2	2	ဗ	_	_	-			
	number	Womens	Mens	Urinal		Womens	Mens								
	Toilets				Bathroom Sinks			Kitchen Sinks: Pots and Pans	Kitchen Handwash Sink w foot pump	Mop Sink	Steam Table	Ice Machine Air Cooled			

Page 1 of 2

		2
Winter C		
•	-	

			ber use	e e				subtotal gpd					
	number	hot	cold	total		uses/day	hot	ploo	total	hot	cold	total	
Toilets													
	Womens	2		-	1 gpf	70 flushes			140	140			
	Mens	_		-	1 gpf	45 flushes			45	45			
	Urinal	_		-	1 gpf	85 flushes		,	85	85			
Bathroom Sinks													
	Womens	2	0.25	0.25	0.5 gpm	10.5 minutes		21	21	42	63	63	126
	Mens	2	0.25	0.25	0.5 gpm	19.5 minutes		39	39	78	117	117	234
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	75 minutes		009	150	750			,
Kitchen Handwash Sink w foot pump		က	1.5	1.5	3 gpm	5 minutes		23	23	45			
Mop Sink		_	2.5	2.5	5 gpm	3 uses		8	∞	15			
Steam Table		_		26.6	9.97 gpuse	1 daily			10	10			
Ice Machine Air Cooled		_		17.8	17.8 gp100#	3 100# Ice		•	53	53		36	36
									i				
								069	5/3	1,263 max day			
								opserved		50,000 max month			
								observed	_	40 days at max .666.67 aver day			

Average Use Water Savings

तर्वा वहुट ठउट गवाटा ठवगाचु													
			ber use					subtotal gpd		savings			
	number	hot	cold	total	Ī	uses/day	hot	ploo	total	hot	cold	total	
Toilets													
	Womens	2		-	1 gpf	60 flushes			120	120			
	Mens	-		-	1 gpf	35 flushes		,	35	35			
	Urinal	-		0	o gpf	70 flushes		•				20	20
Bathroom Sinks													
	Womens	2	0.25	0.25	0.5 gpm	14.25 minutes		29	29	22	98	86	171
	Mens	2	0.25	0.25	0.5 gpm	15.75 minutes		32	32	63	92	92	189
Kitchen Sinks: Pots and Pans		2	4	-	5 gpm	65 minutes		520	130	020		,	,
Kitchen Handwash Sink w foot pump		8	1.5	1.5	3 gpm	4 minutes		18	18	36			
Mop Sink		-	2.5		5 gpm	2 uses		2	2	10			
Steam Table		_		26.6	9.97 gpuse	1 daily			10	10			
Ice Machine Air Cooled		_			17.8 gp100#	3 100# Ice			53	53		18	18
								603	431	1 034 ave day			
								opserved		44,571 avg month			
									•	43 days at avg			
								DEVENO	_	4X5 / 2VEL C2V			

Costs to Implement

	number Hardware Installation	Total	Water Savings (gpy)	nergy Savings (kWhr)	Total Cost Savings/yr	avings/yr	Total Cost Savings/yr/fixture
urinal	1 \$ 311 \$	85 \$ 396 1.89	25,550		s	210	\$ 209.51
Bathroom Sink	4 \$ 1.61 \$	5 \$ 26 0.01 yrs \$ 422	129,600	16,828	क क	2,157	\$ 539
	AF Savings: 0.48	\$/ AF: \$ 887	Replacement Water Cost* :	11,932		Avoided C	Avoided Cost**: \$ 1,231
			* Calculation based on \$30,000 per AF	er AF		** Calcula	** Calculation based on \$9.50/1000 gal

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer. \$0.065/kwh cost of e

SMART WATER Audit Reports

Commercial

Other



SMART WATER Audit Report



Brighton Care Center

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 2025 Egbert St. in Brighton on April 2, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Brighton Care Center's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Brighton Care Center in 2008 and 2009.

Water Use Summary

Brighton Care Center is an assisted living facility in Brighton with 56 individual rooms. There is an average of 88 residences living at the facility with a maximum capacity of 108 residences.

Substantial water and energy savings can be realized by Brighton Care Center by changing out the bathroom sink faucet aerators from the existing 3.5 gallon per minute flow rate to 0.5 gallons per minute devices. The cost will be about \$6 per sink, and will result in a combined water and energy savings of about \$228 per sink per year or \$7,750 total cost savings per year for the facility. In addition, Brighton Care Center could save an additional \$218 in water costs per year by replacing the two kitchen hand wash sink faucet aerators.

The toilets at the facility use 1.6 gallons per flush. They could be replaced with the new Water Sense approved high efficiency toilets which use 1.28 gallons per flush. The initial cost for this change would be \$12,818 with a total cost savings of \$40 per year per fixture for a total of \$1,363 per year for the facility.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures are implemented, it would cost approximately \$13,056 and it would expect to bring a reduction of about \$9,332 in annual water and energy costs.

Brighton Care Center has an outdoor irrigation system. With respect to outdoor use, a comparison was made between applied irrigation water and seasonal evapotranspiration (ET). Applied irrigation water was determined using the monthly water billings for 2008 and 2009. Seasonal ET was estimated based on irrigated acreage and ET. Irrigated acreage was estimated using aerial photography, whereas ET rates were estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate for a given location and weather condition (i.e., average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center. Figure 2 presents a comparison of the irrigation rate and the monthly ET for the Brighton Care Center.

Based on this comparison, the property as a whole irrigates at a rate approximately equivalent to the estimated ET (for the 82,000 square feet of irrigated turf). This evaluation does not preclude the chance that individual irrigation practices at some locations within the subject property may be higher than the ET rate, but on average all irrigation combined is about 85% of observed ET.

Table 1 - Inventory of Brighton Care Center's Water Using Fixtures and Appliances

Location	Brighto	Brighton Care Center	Center					
Address	2025 Egbert St	St.						
Contact	Paul							
Date	2-Apr							
Type of Business	Care Center	Care Center/Nursing Home	ıme					
Account Number	51.0260.0.1							
Notes	1001							
Built Date	47 / 42 7	7						
# of employees 45/ ddy; 3 still ts # of recidente 88 Recidents usually 77,01: may 108	45/ day; 3 smits	mires e menally 77	-01. may 108	~				
# or rooms	56	s, usualiy / /	-71, IIIdA 10C					
Toilets	1.28 gpf	1.6 gpf	2.5 gpf	3.5 gpf				Comments
Typical Room Bathroom		28		5				I per two rooms; Western 2001
Public/Staff 1			1					American Standard 2008
Public/Staff (Kitchen) 2					1			Bemis
Shower Room Toilet		7	4					Elger, 1997
3,0,,,,,	1	1 -	2 000	7 E gpm	2 9 9 9		+	
Showers Shower Room	- R	T.3 80	2 gp.	2.2 gplll	3 gpiii			Hand held
	0.5 gpm	1.5 gpm	2 gpm	2.2 gpm	2.5 gpm 3.5 g	3.5 gpm 5 gpm	n 6 gpm	
Typical Room Bathroom						28		
Public/Staff 1			1					
Public/Staff (Kitchen) 2			1					
Shower Room Sink		7	4					
Kitchen Pots and Pans								3
Breakroom Sink					1			
Kitchen Handwash			2					Not used often
Laundry wash sink							1	Not used often
Mop Closet							1	
Grinder							Н	InSinkerator; automatic on and off
Other Uses	Use	Make		Model		Capacity	city	
Hot Water Heater								
x2		Bradford White	White	D80T1993	D80T1993N; D80T1993N	80 gal	_	140 degrees
		AeoSmith		BTR365A118	.18	80 gal	-	158 degrees
Boilers								
		RayPak						5 yrs old, recirculated water
Coffee Maker								Located in Dining Room
Ice Maker								
x2		Scotsman		CME 1056RS	iRS			Air Cooled
Dishwasher								
		Eco Lab ES 4000 Accutemp	3 4000					
Clothes Washer								
х		UniMac		0304M72658	928	82 bc	85 pounds	
Steamtable								
x2						2'x6'		
Cooling Towers								
								Swamp Coolers
Outdoor Irrigation	Sprinklers							
	000							

Maximum Use Calculation	ulation	56 rooms		88 res	88 residents 45 employees/day	loyees/day						
				per	per use				subtotal			
Typical Room		number	hot	ploo	total	1	uses/ day	hot	ploo	total		
	Toilet	+	28		1.6	1.6 gpf			,	1,690	1,690	
	Sint	~	28	1.75	1.75	3.5 gpm	15.7 minutes		792	292	1,534	
Shower Room												
	Toilet	+	4		1.6	1.6 gpf	29 flushes		,	188	188	
	Shower (hand held)	_	4	2	0.5	2.5 gpm	377 minutes		3,017	754	3,771	
	Sink	~	4	0.75	0.75	1.5 gpm	4 minutes		13	13	26	
Public Bathroom												
	Public Toilet 1	_	~		3.5	3.5 gpf	84 flushes			295	295	
	Public Toilet 2	Δ.	_		1.6	1.6 gpf	84 flushes			135	135	
	Sink	~	2	-	-	2 gpm	13 minutes		25	25	51	
Kitchen												
	Pots and Pans	ro.	ဗ	3.0	3.0	6.0 gpm	160 minutes		1,440	1,440	2,880	
	Breakroom Sink	~	_	1.3	1.3	2.5 gpm	25 minutes		31	31	63	
*	Kitchen Handwash Sink	_	2	1.0	1.0	2.0 gpm	12 minutes		24	24	48	
	Dish Washing Machine	m.	_	0.5	0.5	0.9 g/rack	210 racks		92	92	189	
	Grinder w/ water	_	_	2.5	2.5	5.0 gpm	150 minutes		375	375	750	
	Coffee Maker	_	_		1.0	1.0 g/use	15 daily		,	15	15	
	Steam Table	m.	2		7.5	7.5 gpuse	1 daily			15	15	
2	ce Machine Air Coolec	-	2	,	17.8	17.8 gp100#	4 100# Ice		•	142	142	
	Mop Sink	~	_	,	5.0	5.0 gpm	8 uses		,	40	40	
Laundry	Laundry Handwash Sink	~	-	2.5	2.5	5 gpm	4 minutes		10	10	20	
Clo	Clothes Washing Machine	•	_	30	30	esn/b 09	32 use		096	096	1,920	
Clo	Clothes Washing Machine		_	30	30	esn/6 09	32 use		096	096	1,920	
Leak			-	0	0.65	0.65 gpm	1,440 minutes			936	936	
									7,718	8,911	16,628 max day	
									opserved		505,900 max month	
											30 days at max	
									opserved		16,863 max day	

Average Use Calculation

			bei	per use			subtotal		
Typical Room	number	er hot	ploo	total		uses/ day hot	cold	total	
	Toilet	28		1.6	1.6 gpf	31 flushes		1,408	1,408
	Sink	28	1.75	1.75	3.5 gpm	14.7 minutes	721	721	1,442
Shower Room	:					:			
	Toilet	4		9.1	1.6 gpf	25 flushes		161	161
	Shower (hand held)	4	2	0.5	2.5 gpm	251 minutes	2,011	503	2,514
	Sink	4	0.75	0.75	1.5 gpm	4 minutes	7	1	23
Public Bathroom									
	Public Toilet 1	-		3.5	3.5 gpf	56 flushes		195	195
	Public Toilet 2	-		1.6	1.6 gpf	56 flushes		88	88
	Sink	7	-	-	2 gpm	8 minutes	17	17	33
Kitchen									
	Pots and Pans	ဗ	3.0	3.0	6.0 gpm	120 minutes	1,080	1,080	2,160
	Breakroom Sink	-	1.3	1.3	2.5 gpm	25 minutes	31	31	63
	Kitchen Handwash Sink	2	1.0	1.0	2.0 gpm	12 minutes	24	24	48
	Dish Washing Machine	~	0.5	0.5	0.9 g/rack	160 racks	72	72	144
	Grinder w/ water	-	2.5	2.5	5.0 gpm	100 minutes	250	250	200
	Coffee Maker	-		1.0	1.0 g/use	10 daily		10	10
	Steam Table	2		7.5	7.5 gpuse	1 daily		15	15
	Ice Machine Air Cooled	2		17.8	17.8 gp100#	2 100# Ice		71	71
	Mop Sink	-		5.0	5.0 gpm	2 nses		25	25
Laundry							:	:	;
	Laundry Handwash Sink	-	2.5	2.5	5 gpm	4 minutes	10	10	20
	Clothes Washing Machine	-	30	30	esn/b 09	25 use	750	750	1,500
	Clothes Washing Machine	-	30	30	esn/6 09	25 use	750	750	1,500
Leak		-	0	0.5	0.5 gpm	1,440 minutes		720	720
							5,728	6,913	12,641 avg day
							observed		386,636 avg month
									31 days at avg
							observed		12,888 avg day

Maximum Use	Maximum Use Water Savings									ı		
			þ	er use			subtotal			Savings		
Typical Room	number Toilet Sink	hot 28 28	cold 0.25	total 1.28 0.25	1.28 gpf 0.5 gpm	uses/ day hot 38 flushes 15.7 minutes	cold - 110	total 1,352 110	1,352 219	hot cold - 658	total 338 658	1 338 1,315
Shower Room	Toilet Shower (hand held) Sink	4 4 4	2 0.25	1.28 0.5 0.25	1.28 gpf 2.5 gpm 0.5 gpm	29 flushes 377 minutes 4 minutes	3,017 4	150 754 4	150 3,771 9	ა .	88 ₀	8 , 8
Public Bathroom	Public Toilet 1 Public Toilet 2 Sink	0	0.25	1.28 1.28 0.25	1.28 gpf 1.28 gpf 0.5 gpm	84 flushes 84 flushes 13 minutes	 ©	108 108 6	108 108 13	6	187 27 19	187 27 38
Kitchen	Pots and Pans Breakroom Sink Kitchen Handwash Sink Dish Washing Machine Grinder w water Coffee Maker Steam Table Ice Machine Air Cooled	w + u + + + u u +	3.0 0.3.3 0.5.3 1	3.0 0.5 0.5 2.5 7.5 7.5 7.5	6.0 gpm 2.5 gpm 0.9 g/ank 5.0 gpm 7.5 gpuse 7.5 gpuse 17.8 gp100#	160 minutes 25 minutes 12 minutes 210 racks 150 minutes 15 daily 1 daily 1 daily 1 doily	1,440 31 6 6 95 375	1,440 31 6 95 375 15 142	9880 88 2 2 2 2 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5		8	8
Laundry	wop Sink Laundry Handwash Sink Clothes Washing Machine Clothes Washing Machine		2.5 30 30	30 3.5 30 3.5 30 3.5	9.0 gpm 6 g/wse 9.0 g/wse	o uses 4 minutes 32 use 32 use	10 960 960	10 960 960	40 1,920 1,920			
Leak Average Use Water Savings	later Savings	-	0	0.65	0.65 gpm	1,440 minutes	7,014 observed observed	936 7,618	936 14,632 max day 505,900 max month 35 days at max 16,863 max day			
Typical Room	number Toilet Sink	hot 28 28	cold 0.25	per use d total 1.28 0.25	1.28 gpf 0.5 gpm	uses/ day hot 31 flushes 14.7 minutes	subtotal cold .	total 1,126 103	1,126	Savings hot cold 618	total 282 618	1 282 1,236
Shower Room	Toilet Shower (hand held) Sink	4 4 4	2 0.25	1.28 0.5 0.25	1.28 gpf 2.5 gpm 0.5 gpm	25 flushes 251 minutes 4 minutes	2,011 4	129 503 4	129 2,514 8		32 8	32 - 12
Public Bathroom	Public Toilet 1 Public Toilet 2 Sink	0	0.25	1.28 1.28 0.25	1.28 gpf 1.28 gpf 0.5 gpm	56 flushes 56 flushes 8 minutes	4	12 t 4	F F 8	, , c	124 18 13	124 18 25
Kitchen	Pots and Pans Breakroom Sink Kitchen Handwash Sink Dish Washing Machine Ginder w water Coffee Maker Steam Table Ice Machine Air Cooled	6 - 0 0 0 ·	3.0 0.3.3 0.5.3 0.3.3 1. ' '	3.0 0.3 0.5 0.5 1.0 7.5 7.7	6.0 gpm 2.5 gpm 0.9 g/rack 5.0 gpm 7.5 gpuse 7.5 gpuse 17.8 gp100#	120 minutes 25 minutes 12 minutes 160 racks 100 minutes 10 daily 1 daily 1 daily 1 daily	1,080 31 6 77 250	1,080 31 6 72 250 10 15	2,160 83 144 500 10 15 17			, , 8 , , , , ,
Laundry	Mop Sink Laundry Handwash Sink Clothes Washing Machine Clothes Washing Machine		2.5 30 30	5.0 2.5 30	5.0 gpm 5 gpm 60 g/use 60 g/use	5 uses 4 minutes 25 use 25 use	10 750 750	25 10 750 750	25 20 1,500 1,500			
Leak		-	0	0.5	0.5 gpm	1,440 minutes	5,072 observed observed	720 5,802	720 10,874 avg day 386,636 avg month 36 days at avg 12,888 avg day			

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	number Hardware	Hardware Installation To	otal F	Pay Back	Water Savings (gpy)	Energy Savings (kWhr)	Total Cost Savings/yr	Total Cost Savings/yr/fixture
Toilet	\$	s	12,818	23.88 yrs	166,159		\$ 1,362.50	\$ 40.07
Bathroom Sink	34 \$ 1.61	\$ 2 \$	225	0.03 yrs	465,793	60,481	\$ 7,750.79	\$ 227.96
Kitchen/Laundry Handwash Sinks	2 \$ 1.61	\$ 2 \$	13	0.06 yrs	13,140	1,706	\$ 218.65	\$ 109.32
		\$	13,056				\$ 9,332	
	AF Savings: 1.98	\$/ AF:		6,595	Replacement Water Cost*:	\$ 59,391	Avoided Cost**: \$ 6,128	128
					C C C C C C C C C C C C C C C C C C C	L	2000 t / On Oe and Landschild Co.	0000

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy

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GREAT WESTERN INSTITUTE



SMART WATER Audit Report



Brighton Terrace Apartments

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your apartment complex at 101 Egbert St. in Brighton on April 2, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a residential and commercial audit program intended to assist in improving water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Brighton Terrace Apartment's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Brighton Terrace Apartments in 2008 and 2009.

Water Use Summary

Brighton Terrace Apartments was built in 1962 and it contains 36 separate apartments in three different buildings. There is an estimate of 3 to 4 people per unit.

Substantial water and energy savings can be realized by Brighton Terrace Apartments by changing out the bathroom sink faucet aerators from the existing 2.5 gallon per minute flow rate to 0.5 gallons per minute devices. The cost will be about \$6 per sink, and may result in a combined water and energy savings of about \$175 per sink per year or \$6,294 total cost savings per year for the complex. This is the most substantial and cost effective method for reducing water use at the complex. It has a payback period of about two weeks.

Another substantial water reduction could be realized by installing water efficient shower heads. New shower heads with a 1.5 gallon per minute flow rate could result in a \$198 savings per fixture which translates into a total cost savings of \$7,130 per year for the complex. The payback period for the showerhead replacements is estimated to be approximately 3 months.

The toilets in the complex use 1.6 gallons per flush. They could be replaced with the new Water Sense approved high efficiency toilets which use 1.28 gallons per flush. The initial cost for this change would be \$13,572 with a total cost savings of \$46 per year per fixture for a total of \$1,660 per year for the entire complex.

In addition, the washing machines at the Brighton Terrace Apartments use approximately 42 gallons per load. By replacing these washing machines with new Water Sense approved high efficiency washing machines, there could be a savings of \$364 per machine or \$1,458 for the complex. The initial investment would be approximately \$3,700 with a payback period of about two and a half years.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures are implemented, it would cost approximately \$18,558 and it would expect to bring a reduction of about \$16,724 in annual water and energy costs.

Table 1 - Inventory for Brighton Terrace Apartments Water Using Fixtures and Appliances

Location	Brighton Terrac	n Terra	ıce						
Address	101 W. Egbert St.	t St.							
Contact	Jeff Young, Derek	erek							
Date	2-Apr								
Type of Business	Apartment Complex	omplex							
Account Number	27.0015.0.5*.4.3; 27.0020	.4.3; 27.00.		.0.5*.4.3; 27.0025.0.5*.4.3	.4.3				
Notes	1 tap/building	מם							
Built Date 1962	1962								
# of residents average 4 people/room; varies month to month	average 4 pe	ople/room;	varies mont	h to month					
# or apartments 36	36								
Toilets	1.28 gpf	1.6 gpf	2.5 gpf	3.5 gpf					Comments
Typical Room Bathroom		36							Possibly 4-5 gpm due to leaks
Showers	1 gpm	1.5 gpm	2 gpm	2.5 gpm	3 gpm				
Typical Shower				36					
Sinks	0.5 gpm	1.5 gpm	2 gpm	2.2 gpm	2.5 gpm	3.0 gpm	5 gpm	udg 9	
Typical Room Bathroom					36				Several have been changed to 1.5 aerators
Kitchen						36			
Other Uses	Use	Make		Model			Capacity		
Clothes Washer									
x4		Speed Queen	en	SWTT20WN Commercial	J Commerc.	al			MacGray.com; contract
Outdoor Irrigation	None; some hose watering	nose wateri	ing						

Table 2 - Summary of Current Water Use and Potential Water Savings Brighton Terrace Audit Summary

Maximum Use Calculation		36 Apts		4people/apt	abt							
				ber use					subtotal gpd	po		
	number	-	hot	cold	total]	uses/day	hot	ploo	total		
1 Bathroom Apartment	H	ć			L		47 41			700	700	
		9			Z.3	1db c.2	sauspii ci			1,304	1,004	
	Shower	36			0.5	2.5 gpm	30 minutes		2,160	540	2,700	
	Bathroom Sink	36	1.25		1.25	2.5 gpm	17 minutes		777	777	1,555	
	Kitchen Sink	36	1.5		.25	2.5 gpm	15 minutes		675	675	1,350	
Clothe	Clothes Washing Machine	4	N	24	21	42 g/use	4 use		336	336	672	
	•					o			3,948	3,692	7,640 max day	
									observed			
											30 days at max	
									observed			
acitalizate O coll cacasia	<u>.</u>											
Average Use Calculat	5			per use					subtotal apd	þ		
		- anderson	bod.	o lo o	otot	1		p q	4	4		
1 Bathroom Apartment			<u> </u>	000	00		uses/day	101	DIOS	Dial		
	Toilet	36			2.5	2.5 gpf	13 flushes			1,136	1,136	
	Shower	36		2	0.5	2.5 gpm	25 minutes		1.800	450	2,250	
	Bathroom Sink	36	1.5		1.25	2.5 gpm	14 minutes		648	648	1,295	
	Kitchen Sink	36	1.25		.25	2.5 gpm	10 minutes		450	450	006	
Clothe	Clothes Washing Machine	4	N	21	21	42 g/use	2.5 use		210		420	
									3,108	2,894	6,002 avg day	
									observed		180,000 avg month	
											30 days at avg	
									observed		6,000 avg day	
											167 g/apt 66.67 gp.cd	
											300	

Table 2 - Summary of Current Water Use and Potential Water Savings Brighton Terrace Audit Summary

gs	
ater Savin	
um Use W	
Maxim	

		ed	ber use				subtotal gpd	Q		Savings		
	number	hot cold	ld total		uses/day	hot	ploo	total			cold to	total
1 Bathroom Apartment												
Toilet	36		1.28	1.28 gpf	15 flushes			869	869		999	999
Shower	36		0.3	1.5 gpm	30 minutes		1,296	324	1,620	864	216	1,080
Bathroom Sink	36	0.25	0.25	0.5 gpm	17 minutes		155	155	311	622	622	1,244
Kitchen Sink	36		1.25	2.5 gpm	15 minutes		675	675	1,350			
Clothes Washing Machine	4	6	o	18 g/use	4 use		4	144	288	192	192	384
				•			2,270	1,997	4,267 max day			
							observed		229,000 max month			
									54 days at max			
							observed		7,633 max day			
Average Use Water Savings												
		ed	ber use				subtotal gpc	р		Savings		
	number	hot cold	ld total	Ī	uses/day	hot	ploo	total		hot α	cold to	total
1 Bathroom Apartment												
Toilet	36		1.28	1.28 gpf	13 flushes			582	582		224	554
Shower	36		0.3	1.5 gpm	25 minutes		1,080	270	1,350	720	180	006
Bathroom Sink	36	0.25	0.25	0.5 gpm	14 minutes		130	130	259	518	518	1,036
Kitchen Sink	36		1.25	2.5 gpm	10 minutes		450	450	006	,		
Clothes Washing Machine	4	0	6	18 g/use	2.5 use		06	06	180	120	120	240
				•			1,750	1,521	3,271 avg day			
							opserved		180,000 avg month			
									55 days at avg			
							observed		6,000 avg day			
Costs to Implement												
1 E	number	Hardware Ir	Installation	Total Pay Back		Water Savings (gpy)		ings (kWhr)	Total Cost Savings/yr		otal Cost S	Total Cost Savings/yr/fixture
Toilet	\$ 98	\$ 282 \$	\$ 96	13,572 20.80 yrs	yrs		202,389		\$ 1,660		\$ 46	

Costs to Implement								
	number Hardware Installation	ľ		Pay Back	Water Savings (gpy) Energy Sa	Energy Savings (kWhr)	Total Cost Savings/yr	Total Cost Savings/yr/fixture
Toilet	36 \$ 282 \$	95 \$ 1	13,572	20.80 yrs	202,389		\$ 1,660	\$ 46
Bathroom Sink	36 \$ 1.61 \$	2	238	0.04 yrs	378,268	49,117	\$ 6,294	\$ 175
Showerheads	36 \$ 33.00 \$	10 \$	1,548	0.22 yrs	328,500	68,247	\$ 7,130	\$ 198
Clothes Washing Machines 1	4 \$ 850.00 \$	75 \$ 3,700 \$ 19,058	3,700	2.54 yrs	87,600	11,375	\$ 1,458	\$ 364
	AF Savings: 3.06	\$/ AF;		\$ 6,230	Replacement Water Cost*:	91,768	Avoided Cost**: \$ 9,469	469
1 Average bardware and installation pricing	Average hardware and installation pricing for front loading. high-efficional washing machine from Sears	achine from Sear	ę		4 700 000 830 board mileting A		2 000 t /03 to board acitalization **	7000 301

GREAT WESTERN INSTITUTE



SMART WATER Audit Report



Bromley Lane Car Wash

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 4112 Bromley Lane in Brighton on February 24, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs. Figure 1 presents the monthly water use at the Bromley Lane Car Wash in 2008 and 2009.

Water Use Summary

The Bromley Lane Car Wash is one of the largest water use customers in the City. The facility operates two automated and four manual wash bays year-round, with peak use typically in the winter months. Based on the available literature, it is estimated that the car wash uses about 25 gallons per vehicle in the manual wash bays, and 35 and 70 gallons per vehicle in the automated brush and touch free bays, respectively. It is estimated that the number of uses one the car wash facility varies from about 4,000 to 14,000 individual trips per month, with the manual wash bays receiving about 70% of total uses.

Given these estimates, the Car Wash could reduce water use by converting the automatic brush wash to a touch free wash, saving about $\frac{1}{2}$ of the water used for this type of car wash service, saving about 60,000 gallons of water per month (\$210 per month or about \$2,500 per year). The cost of a touch free car wash retrofit can vary from \$85,000 to \$120,000.

GREAT WESTERN INSTITUTE

BRIGHTON

SMART WATER Audit Report



Colorado Cinema

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 250 Pavilion Place in Brighton on February 24, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Colorado Cinema's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Colorado Cinema in 2008 and 2009.

Water Use Summary

Built in 2004, Colorado Cinema uses water in a manner consistent with commercial buildings built throughout Colorado in areas of new construction. Colorado Cinema has sinks and toilets that have been equipped with water efficient fixtures that are currently readily available in the marketplace. Colorado Cinema also uses air cooled ice makers which help to reduce water use.

Additional water and energy savings can be realized by Colorado Cinema simply by changing out the kitchen sink faucet aerators (in those sinks not used for pots and pans) from the existing 1-2 gallon per minute flow rate to 0.5 gallons per minute. The initial cost will be about \$6 per sink and will result on average in a combined water and energy savings of about \$30 per sink per year. The bathroom sink faucet aerators at Colorado Cinema already use the 0.5 gallon per minute aerators. Colorado Cinema also already has in place water efficient toilets which use only 1.6 gallons per flush. The toilet in the family bathroom uses about 2 gallons per flush and could be replaced with a more efficient 1.6 gallon per flush for an initial cost of \$377. The Colorado Cinema would see a cost savings of \$54 per year with this replacement.

By replacing the 11 current 1 gallon per flush urinals with the Water Sense approved high efficiency waterless urinals, the initial cost would be \$4,356. The cinema would see a cost savings of approximately \$24 per year per fixture for a total of \$263 per year.

Colorado Cinema indicated that they do not have any outdoor irrigation therefore no evaluation was performed to characterize outdoor water use for this property.

Overall, Colorado Cinema is doing well with their water saving fixtures and appliances. There are only a few potential water saving measures that could be implemented. These measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures are implemented, it would cost approximately \$4,746 and may bring a reduction of about \$378 in annual water and energy costs.

Table 1 - Inventory of Colorado Cinema's Water Using Fixtures and Appliances

Location	Colorado Cin	lo Cine	ema					
Address	250 Pavillion Pl	Pl						
Contact	Sean							
Date	2/24/2010							
Type of Business	Entertainment	nt						
Account Number	26.0536.0.1							
Notes								
Built Date 2004	2004							
# of Customers 775,000 customers/y	775,000 cust	omers/yr						
# of Employees 6 employees wkday;	6 employees		10-17 employees wkend	es wkend				
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Mens		4						Flushvalves, Crane w/ Sloan
Womens		16						Flushvalves
Family			1					
Urinals	0.5 gpf	1 gpf	1.5 gpf					
Mens		11						Automatic
Sinks	0.5 gpm	1 gpm	2 gpm	2.5 gpm	4 gpm	5 gpm	e gpm	
Pots and Pans							2	
Kitchen Handwash		1	1					
Bathroom Mens	9	10						Automatic
Bathroom Womens	9	9						Automatic
Family Bathroom	1							Automatic
Mop Sink						2		
Other Uses	Make	Model		Capacity				
Water Fountains								
x4	x4 Oasis							
Ice machines								
	Hoshizzki			8"x18"x15"x6 for 1	"x6 for 1			Filled 2-10 times daily (for 3 each)
Hot Water Heater								
x2	x2 AO Smith	DEN40110		40gal				140 degrees
		DEN52110		50gal				
Outdoor Irrigation								
	None							

Table 2 - Summary of Current Water Use and Potential Water Savings Colorado Cinema Audit Summary

Maximum Use Calculation	1 275,000/yr		753.424658 ~10 employees/day	mployees/da	ý	376.7123				
Toilote Elucian Voluse	number	hot	per use	total		uses/day h	hot	subtotal gpd cold	total	
	Mens Womens Family - Tank	4 9 -		6. 6. 6. 6.	1.6 gpf 1.6 gpf 2 gpf	20 flushes 15 flushes 35 flushes			128 384 70	128 384 70
Urinals	Mens	7		-	1 gpf	10 flushes			110	110
Bathroom Sinks	Mens Womens Family	99-	0.25 0.25 0.25	0.25 0.25 0.25	0.5 gpm 0.5 gpm 0.5 gpm	9 minutes 4.5 minutes 5.25 minutes	54 27 5		54 27 5	108 54 11
Water Fountain (Oasis)		4	0	2	5 g/day	20 g/day	٠		1,600	1,600
Kitchen Sinks: Pots and Pans		2	4.8	1.2	e gpm	30 minutes	288		72	980
Kitchen Handwash Sink		2	0.75	0.75	1.5 gpm	10 minutes	15		15	30
Mop Sink		2	0	S	5 gpm	2 uses	•		20	20
Other Ice Machine (Hoshizzki) 8°x18°x15°x6 for 1	for 1	α		17.8	17.8 gp100#	10 100# Ice	389	observed	356 2,841	3.231 max day 3.231 max day 97,000 max month 30 days at max
Average Use Calculation								observed		3, <u>2</u> 33.33 max day
	number	hot	per use	se total		nses/day h	hot	subtotal gpd cold	total	
Toilets	Mens Womens Family	4 9 -		6. 6. 6. 6. 4	1.6 gpf 1.6 gpf 2 gpf	15 flushes 11 flushes 25 flushes			96 282 50	96 282 50
Urinals	Mens	Έ		-	1 gpf	8 flushes			88	88
Bathroom Sinks	Mens Womens Family	99-	0.25 0.25 0.25	0.25 0.25 0.25	0.5 gpm 0.5 gpm 0.5 gpm	6.9 minutes 3.3 minutes 3.75 minutes	4 4 4		14 20 4	83 40 8
Water Fountain (Oasis)		4	0	4	4 g/day	16 g/day	•		1,024	1,024
Kitchen Sinks: Pots and Pans		7	8.4	1.2	e gpm	20 minutes	192		48	240
Kitchen Handwash Sink		2	0.75	0.75	1.5 gpm	5 minutes	8		80	15
Mop Sink		2	0	c)	5 gpm	2 uses			20	20
Other Ice Machine (Hoshizzki) 8'x18'x15'x6 for 1	for 1	8		17.8	17.8 gp100#	7 100# Ice	. 264	observed	249 1, 929	249 2.194 avg day 65,929 avg month 30 days at avg 2,197.62 aver day

Table 2 - Summary of Current Water Use and Potential Water Savings Colorado Cinema Audit Summary

			ber use			subtotal gpd	_		Savings		
	number	hot	cold total	al	uses/day hot	ploo	total		hot	ploo	total
Mens	4		1.28	1.28 gpf	20 flushes		102	102	٠	26	
Womens	16		1.28	1.28 gpf	15 flushes		307	307	•	77	1
Family	-	_	1.28	1.28 gpf	35 flushes	•	45	45		25	
Urinals											
Mens		_	0	0 gpf	10 flushes	•				110	
Bathroom Sinks											
Mens		6 0.25	0.25	0.5 gpm	9 minutes	22	24	108			•
Womens		6 0.25	0.25	0.5 gpm	4.5 minutes	27	27	54	•	•	•
Family	_	1 0.25	0.25	0.5 gpm	5.25 minutes	5	2	11	•		
									•		
Water Fountain (Oasis)	7	0	2	5 g/day	20 g/day		1,600	1,600	•		
Kitchen Sinks: Pots and Pans		2 4.8	1.2	e gpm	30 minutes	288	72	360			
				5						•	•
Kitchen Handwash Sink	.,	2 0.25	0.25	0.5 gpm	10 minutes	ю	S	10	10	10	70
Mop Sink	.,	2 0	2	5 gpm	2 uses		20	20			
Other											
Ice Machine (Hoshizzki) 8"x18"x15"x6 for 1	.,	2	17.8	17.8 gp100#	10 100# Ice		356	356			•
				i		379 observed	2,594	2,973 max day 97.000 max month	10	248	
								33 days at max			
						opserved		3,233.33 max day			
Average Hee Water Savings											
Avelage Ose Maic: carings											

Average Use Water Savings										ĺ		
			per use				subtotal gpd			Savings		
	number	hot	ploo	total		uses/day hot	ploo	total		hot	cold	total
Toilets						•						
	Mens	4		1.6	1.6 gpf	15 flushes		96	96	•	٠	٠
M	omens	16		1.6	1.6 gpf	11 flushes		282	282		•	•
	Family	-		1.28	1.28 gpf	25 flushes	•	32	32	•	18	18
Urinals												
	Mens	7		0	0 gpf	8 flushes	•	ı			88	88
Bathroom Sinks												
	Mens	9		0.25	0.5 gpm	6.9 minutes	41	4	83	٠		•
M	omens	9	0.25	0.25	0.5 gpm	3.3 minutes	20	20	40			•
	Family	_		0.25	0.5 gpm	3.75 minutes	4	4	80	•		٠
Water Fountain (Oasis)		4	0	4	4 g/day	16 g/day	•	1,024	1,024		•	•
Kitchen Sinks: Pots and Pans		2	8.4	27	6 apm	20 minutes	192	48	240			
		ı	!	ļ	b		ļ	!	?			•
Kitchen Handwash Sink		2	0.25	0.25	0.5 gpm	5 minutes	ဧ	ю	5	S)	2	10
Mop Sink		2	0	2	5 gpm	2 uses		20	20			
Other Ice Machine (Hoshizzki) 8"x18"x15"x6 for 1		0		8 24	17.8 an100#	7 100# Ice	,	249	249			
		ı		2	,		259 observed	1,818	2,078 avg day 65,929 avg month	2	11	116
							observed		32 days at avg 2,197.62 aver day			

Table 2 - Summary of Current Water Use and Potential Water Savings Colorado Cinema Audit Summary

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Costs to Implement	number Hardware Installation Total Pay Back	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr Total Cost Savings/yr/fixture
Toilet	\$ 377	6,570	\$ 54 \$ 54
Urinal	\$ 85 \$ 4,356 16.54	32,120	\$ 263 \$ 24
Kitchen Handwash Sinks	2 \$ 1.61 \$ 5 <u>\$ 13</u> 0.22 yrs \$ 4.746	3,650 474	\$ 61 \$ 30 \$ 378
	AF Savings: 0.13 \$/ AF: \$ 36,527	Replacement Water Cost*: \$ 3,898	Avoided Cost**: \$ 402
		□ A 200 000 000 and benefit alicely of *	100 000 100 00 00 00 00 00 00 00 00 00 0



SMART WATER Audit Report



Cottonwood Care Center

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 2311 East Bridge St. in Brighton on April 2, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Cottonwood Care Center's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Cottonwood Care Center in 2008 and 2009.

Water Use Summary

Cottonwood Care Center is an assisted living facility in Brighton with 54 individual rooms and 4 quad rooms. There is an average of 107 residences living at the facility with a maximum capacity of 114 residences.

Substantial water and energy savings can be realized by Cottonwood Care Center by changing out the bathroom sink faucet aerators from the existing 1.5 gallon per minute flow rate to 0.5 gallons per minute devices. The cost will be about \$6 per sink, and may result in a combined water and energy savings of about \$94 per sink per year or \$5,449 total cost savings per year for the facility. In addition, Cottonwood Care Center could save an additional \$228 in water costs per year by replacing the four kitchen hand wash sink faucet aerators.

The toilets at Cottonwood use 1.6 gallons per flush. They could be replaced with the new Water Sense approved high efficiency toilets which use 1.28 gallons per flush. The initial cost for this change would be \$21,866 with a total cost savings of \$27 per year per fixture for a total of \$5,449 per year for the facility.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures are implemented, it would cost approximately \$22,269 and it would expect to bring a reduction of about \$7,267 in annual water and energy costs.

Cottonwood Care Center has used limited outdoor irrigation in the past. The facility is in the process of installing an automated sprinkler system; however, the efficiency of the new installation could not be evaluated at this time, since data do not exist to characterize the new irrigation practices at this time.

Contact Ceith	.5 gpf 1 3 gpm 3.5 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	S gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Selection	.5 gpf 1 1 2 gpm 3 gpm 2 gpm 3.5 gpm 1 1 1 1	gpm 1	Comments Lineach room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
2-Apr	.5 gpf 1 2 gpm 3 gpm 3.5 gpm 2 dpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	mq8	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Sample Care Center/Nursing Home	.5 gpf 1 3 gpm 3.5 gpm 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Built Date 33.0065.1.1	.5 gpf 1 1 2 gpm 3 gpm 3.5 gpm 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
# of Employees 45/ day, 20-30 day shift; 15-20 night shift # of residents 107; max 114 # of residents 11.28 gpf	.5 gpf 1 1 .5 gpm 3 gpm 3.5 gpm 2 2 2 2 2 2 2 2 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
# of Employees 45/day; 20-30 day shift; 15-20 night shift # of Employees 45/day; 20-30 day shift; 15-20 night shift # of residents 107; max 114	.5 gpf 1 1 .5 gpm 3 gpm .2 gpm 3.5 gpm 1 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
# of Employees 45/ day; 20-30 day shift; 15-20 night shi # of residents 107; max 114 # or rooms 54; 4 quads Typical Room Bathroom Typical Room Bathroom Shower Room Toilet Shower Room Sink Public 1 Kitchen Pots and Pans Kitchen Handwash Laundry Handwash Laundry Handwash Coinder w/ Water table Grinder w/ Water Heater Boilers Boilers Coffee Maker Ice Maker Ide Maker Ide Maker Manitowac; Scotsman Cf	.5 gpf 1 1 1 2 gpm 3 gpm 3.5 gpm 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
# of residents 107; max 114 # or rooms 54; 4 quads	3.5 gpf 1 2.5 gpm 3 gpm 2.2 gpm 3 gpm 2.2 gpm 1 3.5 gpm 1 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Typical Room Bathroom	3.5 gpf 1 2.5 gpm 3 gpm 2.2 gpm 3 gpm 1 1 1 1 1	gpm 1	Comments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Typical Room Bathroom	3.5 gpm 3 gpm 2.5 gpm 3 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	md8	Lonments 1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower
Typical Koom Bathroom S4	2.5 gpm 3 gpm 2.2 gpm 3 gpm 3.5 gpm 1 1	mgg 1	1 in each room Replaced last few years 2 shower rooms, 2 shower faucets/shower Handheld
Public 1 Public 2	2.5 gpm 3 gpm 3.5 gpm 2.2 gpm 3 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	Replaced last tew years 2 shower rooms, 2 shower faucets/shower Handheld
Shower Room Toilet	2.5 gpm 3 gpm 2.2 gpm 3.5 gpm 3.5 gpm 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.	gpm 1	2 shower rooms, 2 shower faucets/shower Handheld
Shower Room Toilet 2 2 2 2 2 2 2 2 2	2.5 gpm 3 gpm 2.2 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	2 shower rooms, 2 shower faucets/shower Handheld
1 may 1 may 1 may 2 ma	2.5 gpm 3 gpm 2.2 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	2 shower rooms, 2 shower faucets/shower Handheld
Shower Room 2 2 2 2 2 2 2 2 2	2.2 gpm 3.5 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	2 shower rooms, 2 shower faucets/shower Handheld
Typical Room Bathroom Shower Room Sink Public - 1 Kitchen Pots and Pans Kitchen Pots and Pans Kitchen Handwash Laundry Handwash Mop Closet Grinder w/ Water Heater Hot Water Heater Boilers Coffee Maker Ice Maker Ice Maker Manitowac; Scotsman CP	2.2 gpm 3.5 gpm 3.5 gpm 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	Handheld
Typical Room Bathroom 1.5 gpm 2 gpm Shower Room Sink 54 2 gpm Public - 1 6 2 gpm Ritchen Pots and Pans 7 kitchen Handwash 2 Kitchen Pots and Pans 2 2 Kitchen Handwash 2 2 Landry Handwash 3 2 Mop Closet 6 Anake Grinder w/ Water table 1 Anake Grinder w/ Water Heater 1 Make Hot Water Heater 8 Radford Water Boilers 8 WELLMcLain Coffee Maker NELMcLain Ice Maker Manitowac; Scotsman Cf	2.2 gpm 3.5 gpm 3.5 gpm 1.5 gpm 2.2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	gpm 1	
Shower Room Sink 54 Shower Room Sink 6 Public - 1 7 Ritchen Pots and Pans 2 Kitchen Handwash 2 Laundry Handwash 1 Laundry Handwash 2 Laundry Handwash 1 Mop Closet Make Grinder w/ Water table Make Hot Water Heater Make Hot Water Heater Radford Water Sollers Ray Pak Boilers Ray Pak Coffee Maker MeLLMcLain Ice Maker Manitowac; Scotsman Cf Ice Maker Manitowac; Scotsman Cf	1 1 1 7 7	п	
Shower Room Sink Public - 1 Public - 2 Coffee Maker Kitchen Pots and Pans 2 Kitchen Handwash 2 Laundry Handwash 1 Laundry Handwash 1 Mop Gloset 6 Grinder w/ Water table Make Hot Water Heater Make Rollers Bradford Water Ray Pak Ray Pak Coffee Maker WELLMcLain Ice Maker Manitowac; Scotsman Cf Manitowac; Scotsman Cf Manitowac; Scotsman Cf		1	
Kitchen Pots and Pans Kitchen Handwash Laundry Handwash Laundry Handwash Corinder w/ Water table Hot Water Heater Hot Water Heater Ray Pak Boilers Coffee Maker Ice Maker Ice Maker Manitowac; Scotsman Cf		1	
Kitchen Pots and Pans Kitchen Pots and Pans 2 Kitchen Handwash 2 2 Laundry Handwash 1 2 Grinder w/ Water table Make 1 Grinder w/ Water table Make Make Hot Water Heater Radford Water Ray Pak Rollers Ray Pak Coffee Maker WELLMcLain Ice Maker Manitowac; Scotsman Cf Manitowac; Scotsman Cf		п	
Kitchen Pots and Pans Kitchen Handwash Laundry Handwash Grinder w/ Water table Hot Water Heater Hot Water Heater Az Bradford Water X2 Bradford Water Rollers Ray Pak	1	н	
Kitchen Handwash 2 Laundry Handwash 1 Mop Closet 1 Grinder w/ Water table Make Hot Water Heater Make Kability Bradford Water Kability Ray Pak Boilers Ray Pak Coffee Maker MELIMcLain Ice Maker Manitowac; Scotsman Cf Ice Maker Manitowac; Scotsman Cf	1		
Laundry Handwash	1		
Grinder w/ Water table Grinder w/ Water table Use Hot Water Heater x2 Boilers Boilers Coffee Maker Ice Maker Ice Maker Make Maker Manitowac; Scotsman Cf			
Grinder w/ Water table Use Make		1	
Hot Water Heater x2 Bradford Water x2 Ray Pak Boilers x2 WEILMCLain Coffee Maker Ice Maker Manitowac; Scotsman Cf		1	
Hot Water Heater x2 Bradford Water Boilers Ray Pak R	laboM	Canacity	
Bradford Water Ray Pak WEILMcLain Manitowac; Scotsman Cl		(1,000)	
Ray Pak WEILMcLain Manitowac; Scotsman Cl	D80T1993N: D100L1993N-823	90 gal; 100 gal	110-120 degrees
WEILMcLain Walitowac; Scotsman Cl		80 gal	119 degrees, 2005
)	Baseboard heating
ivianitowac; scotsman ci		1400lb-:	7 - 1
		18 gal/ 100lbs ice	Air Cooled
Dishwasher			
AH2			
Wascomat Selecta 28	S28/185		65 pounds
30 loads/day Wascomat Selecta 28 E7	EASIVI 230		Su pounds, 20 years old
Steamtable			
x2 2'x4'			
Cooling Towers			
	-		swamp coolers
Outdoor Irrigation Sprinklers just recently hooked up but not used 2008-2009	not used 2008-2009		
Last year hand watered			

Table 2 - Summary of Current Water Use and Potential Water Savings Cottonwood Audit Summary

Maximum Use Calculation		54 rooms		2 people	2 people/room 4 quads	spi						
				ber use	ě				subtotal gpd			
Typical Room	nun	number	hot	ploo	total		uses/day	hot	cold	total	Ī	
	Toilet	25			1.6	1.6 gpf	29 flushes		i	2,508	2,508	
	Sink	54	0.75		1.75	1.5 gpm	16 minutes		662	662	1,325	
Shower Room												
	Toilet	2			1.6	1.6 gpf	41 flushes			132	132	
	Shower 1	2			0.5	2.5 gpm	275 minutes		1,100	275	1,375	
	Shower 2	2	1.2		0.3	1.5 gpm	275 minutes		099	165	825	
	Sink	2			1.1	2.2 gpm	6 minutes		14	14	27	
Public Bathroom												
	Public Toilet 1	_			3.5	3.5 gpf	51 flushes			177	177	
	Public Toilet 2	_			1.6	1.6 gpf	51 flushes			81	81	
	Sink	2	1.1		1.1	2.2 gpm	8 minutes		17	17	33	
Kitchen												
	Pots and Pans	_	2.5		2.5	5 gpm	240 minutes		009	009	1,200	
	Handwash Sink	2	- "			2 gpm	10 minutes		20	20	40	
	Dish Washing Machine	_	0.45		0.45	0.9 g/rack	240 racks		108	108	216	
	Grinder w/ water	_				5.00 gpm	160 minutes			800	800	
	Coffee Maker	_		<u>_</u>		1.00 gpuse	15 daily			15	15	
	Steam Table	2		4		1.99 gpuse	1 daily		i	10	10	
	Ice Machine Air Cooled	2		_		17.8 gp100#	4 100# Ice		i	142	142	
	Mop Sink	_	_	0		5 gpm	2 uses			10	10	
Laundry	Laundry Handwash Sink	-	,-	-	-	2 gpm	5 minutes		2	2	10	
	Clothes Washing Machine	_	30	0	30	esn/b 09	30 use		006	006	1,800	
	Clothes Washing Machine	_	ਲ	0	30	esn/b 09	30 use		006	006	1,800	
	Leak	-	J	0	2.2	2.2 gpm	1,440 minutes			3,168	3,168	
						5			4,986	10,709	15,695 max day	
									observed		474,000 max month	
									observed		15,800 max day	

Table 2 - Summary of Current Water Use and Potential Water Savings Cottonwood Audit Summary

Average Use Calculation

		-	1,280		114	1,031	619	23		177	81	33		006	40	340	009	10	10	142	10	10	1.500	1,500	2,880 13,202 aver day	380,071 aver month 29 days at avg	12 210 pyorday
	total		640		114	206	124	12		177	81	17		450	20	170	009	10	10	142	10	ĸ	750	750	2,880 9,068		
subtotal gpd	ploo		640			825	495	12				17		450	20	170				,		ıo	750	750	4,133	observed	poznosdo
	uses/day hot	22 flushes	16 minutes		35 flushes	206 minutes	206 minutes	5 minutes		51 flushes	51 flushes	8 minutes		180 minutes	10 minutes	200 use	120 minutes	10 daily	1 daily	4 100# Ice	2 uses	5 minutes		25 use	1,440 minutes		
	Ī	1.6 gpf	1.5 gpm		1.6 apf	2.5 gpm	1.5 gpm	2.2 gpm		3.5 gpf	1.6 apf	2.2 gpm		5 gpm	2 gpm	1.7 g/use	5.00 gpm	1.00 gpuse	4.99 gpuse	17.8 gp100#	5 gpm	2 apm	es a/nse	esn/6 09	2 gpm		
per use	total	1.6	0.75		1.6	0.5	0.3	1:1		3.5	1.6	1.1		2.5		0.85							30	30	2		
	cold		0.75			2	1.2	1.1				1:1		2.5	-	0.85	0	0	0	0	0	-	30	30	0		
	per hot	54	24		2	2	2	2		-	-	7		_	2	-	-	-	2	2	-	-	-	-	-		
	number	Toilet	Sink		Toilet	Shower	Shower 2	Sink		Public Toilet 1	Public Toilet 2	Sink		Pots and Pans	Handwash Sink	Dish Washing Machine	Grinder w/ water	Coffee Maker	Steam Table	Ice Machine Air Cooled	Mop Sink	Laundry Handwash Sink	Clothes Washing Machine	Clothes Washing Machine	Leak		
	Tvpical Room			Shower Room					Public Bathroom				Kitchen									Laundry					

Table 2 - Summary of Current Water Use and Potential Water Savings Cottonwood Audit Summary

Maximum Use Water Savings

				þ	ber use			ns	subtotal gpd		Savings		
Typical Room		number	hot	cold	total	ĺ	uses/dav	hot	total		hot	cold	total
					1.28	1.28 gpf		•	2,006	2,006		502	502
			54	0.25	0.25	0.5 gpm	16 minutes	221	221	442	442	442	883
Shower Room													
		Toilet	2		1.28	1.28 gpf			106	106		26	26
	Sho		2	2	0.5	2.5 gpm	275 minutes	1,100	275	1,375			
	Shc		2	1.2	0.3	1.5 gpm		099	165	825			,
		Sink	2	0.25	0.25	0.5 gpm		ю		9	1	7	21
Public Bathroom													
	Public Toilet 1	oilet 1	_		1.28	1.28 gpf			65	65		112	112
	Public Toilet 2	oilet 2	_		1.28	1.28 gpf	51 flushes		65	92		16	16
		Sink	2	0.25	0.25	0.5 gpm		4	4	80	13	13	56
Kitchen													
	Pots and Pans	Pans	_	2.5	2.5	5 gpm	240 minutes		009	1,200			
	Handwash Sink	Sink	2	-	-	2 gpm	10 minutes	20	20	40			
	Dish Washing Machine	chine	_	0.45	0.45	0.9 g/rack	240 racks		108	216			
	Grinder w/	water	_		5.00	5.00 gpm	160 minutes		800	800			,
	Coffee Maker	Maker	-		1.00	1.00 gpuse	15 daily		15	15			
	Steam Table	Table	2		4.99	4.99 gpuse	1 daily		10	10			
	Ice Machine Air Cooled	peloo,	2		17.8	17.8 gp100#	4 100# Ice		142	142		,	,
	Mop	Mop Sink	_	0	S)	5 gpm	2 uses		10	10			
Laundry	Sindry Handwash Sink	Sink	-	-	+	2 dom	5 minites	ĸ	uc.	10			
	Clothes Washing Machine	chine	. —	30	30	es/nse	30 use	006	006	1.800			,
	Clothes Washing Machine	chine	_	30	30	esn/6 09	30 use	006	006	1,800	•		
		Leak	~	0	2.2	2.2 gpm	1,440 minutes		3,168	3,168	•	,	,
								4,521	9,588	14,109 max day			
								observed		474,000 max month			
								peyresdo	De/ya	34 days at max			
										for 00.00			

Table 2 - Summary of Current Water Use and Potential Water Savings Cottonwood Audit Summary

Average Use Water Savings

	0			0	000				pas latataina			o di no			
				bec	ber use				suproral gpd						
Typical Room		number	hot	cold	total		uses/day	hot	cold	total		hot	cold	total	
	Toilet	Č	4		1.28	1.28 gpf				1,521	1,521		380	380	0
	Sink	54		0.25	0.25	0.5 gpm	16 minutes		213	213	427	427	427	853	3
Shower Room															
	Toilet	.,	2		1.28	1.28 gpf	35 flushes			91	91		23	23	3
	Shower	. •	2	2	0.5	2.5 gpm	206 minutes		825	206	1,031				
	Shower 2	.,		1.2	0.3	1.5 gpm	206 minutes		495	124	619				
	Sink	••		1.25	0.25	0.5 gpm	5 minutes		3	က	2	6	6	18	80
Public Bathroom															
	Public Toilet 1		_		1.28	1.28 gpf	51 flushes			65	65		112	112	2
	Public Toilet 2	• *	_		1.28	1.28 gpf	51 flushes			65	92		16	16	03
	Sink	.,	2 C	0.25	0.25	0.5 gpm	8 minutes		4	4	8	13	13	26	c C
Kitchen															
	Pots and Pans		_	2.5		5 gpm	180 minutes		450	450	006				
	Handwash Sink	.,	2 0	0.25	0.25	0.5 gpm	10 minutes		2	2	10	15	15	30	0
	Dish Washing Machine		1	.85		1.7 g/use	200 use		170	170	340				
	Grinder w/ water		_	0		5.00 gpm	120 minutes			009	009				
	Coffee Maker		_	0		1.00 gpuse	10 daily			10	10				
	Steam Table	- 1	2	0		4.99 gpuse	1 daily			10	10				
	Ice Machine Air Cooled	•	5	0		17.8 gp100#	4 100# Ice			142	142				
	Mop Sink		_	0		5 gpm	2 uses			10	10				
Laundry	Laundry Handwash Sink	•	0	.25	0.25	0.5 gpm	5 minutes			-	m	4	4	00	~
	Clothes Washing Machine		_	30	30	esn/b 09	25 use		750	750	1,500	•			
	Clothes Washing Machine		_	30	30	esn/b 09	25 use		750	750	1,500				
	Leak	•	_	0	7	2 gpm	1,440 minutes	c	999	2,880	2,880	,	٠	•	
								•	observed	600,0	380,071 aver month				
									observed		32 days at avg 12.669 aver day				

Costs to Implement

	number Hardware Installation	e Installation	Total	Pay Back	Water Savings (gpy)	Energy Savings (kWhr)	(kWhr)	Total Cos	Total Cost Savings/yr	Total	Total Cost Savings/yr/fixture
Toilet	58 \$ 28	282 \$ 95	\$ 21,866	34.94 yrs	193,9	.82		s	1,591	s	27
Bathroom Sinks	58 \$ 1.6	.61 \$ 5	\$ 383	0.07 yrs	327,448	48	42,518	69	5,449	49	94
Handwash Sinks	3 \$ 1.6	51 \$ 5_	\$ 20	0.09 yrs	13,688	88	1,777	69	228	s	92
			\$ 22,209					A	1,401		
	AF Savings: 1.64		\$/ AF:	\$ 13,560	Replacement Water Cost*:	ક્ક	49,267	Avoided Cost**:	Cost**: \$ 5,084	084	
					* Calculation based on \$30,000 per AF	000 per AF		** Calcula	** Calculation based on \$9.50/ 1000 gal	' 1000 gal	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



Eastgate Mobile Home Park

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 3060 East Bridge St. in Brighton on February 24, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses and facilities volunteered to help The City complete a commercial and residential audit program intended to assist in improving water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Eastage's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Eastgate in 2008 and 2009.

Water Use Summary

Eastgate Mobile Home Park is one of the largest water users in the City. The mobile home park contains 453 home sites with an average of three to four people per home, of which 428 are currently occupied. All homes are equipped with in-home laundry and 1 or 2 bathrooms. Each individual site is sub metered by the owner; however this data was not made available to the audit team. Estimates on the number of fixtures and types of appliances were made in order to determine the water use from individual mobile homes so that the best recommendations for water savings could be determined.

Overall, the mobile home park utilizes City water for both indoor and outdoor, seasonal uses. The indoor use of water at the mobile home park was estimated to be about 70,000 gallons per day for an average winter day, or about 160 gallons per home (which is about 45 gallons per person assuming 3.5 persons per home). Total water use at the mobile home park averages about 240 gallons per home year round or about 70 gallons per person (assuming 3.5 persons per home).

Substantial water and energy savings can be realized by Eastgate Mobile Home Park by changing out the bathroom faucet aerators from the existing 2 gallon per minute flow rate to 0.5 gallons per minute. The cost will be about \$6 per sink, and could result in a combined water and energy savings of about \$56 per sink per year or \$36,060 total cost savings per year for the community. This is the most substantial and cost effective method for reducing water use at Eastgate. Another substantial water reduction could be realized with the installation of water efficient shower heads. New shower heads with a 1.5 gallon per minute flow rate would result in a \$45 savings per fixture per home. Thus, there would be a total cost savings of \$19,215 per year for the community.

The toilets in the Clubhouse at Eastgate Apartments use 1.6 gallons per flush. They could be replaced with the new Water Sense approved high efficiency toilets which use 1.28 gallons per flush. The initial cost for this change would be \$1,131 with a potential water savings of about \$24 per year or about 2,920 gallons per year.

These indoor water saving measures are listed at the bottom of attached Table 2. If all the recommended indoor water saving fixtures are installed, it would cost approximately \$23,805 and may bring a reduction of about \$55,409 in annual water and energy costs to the mobile home residents.

With respect to outdoor use, a comparison was made between applied irrigation water and seasonal evapotranspiration (ET). Applied irrigation water was determined using the monthly water billings for 2008 and 2009. Seasonal ET was estimated based on irrigated acreage and ET. Irrigated acreage was estimated using aerial photography, whereas ET rates were estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate for a given location and weather condition (i.e., average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center. Figure 2 presents a comparison of the irrigation rate and the monthly ET for Eastgate.

Based on this comparison, the property as a whole irrigates well below the estimated ET (for the 1,000,000 square feet of irrigated turf). This evaluation does not preclude the chance that individual irrigation practices at some locations within the subject property may be higher than the ET rate, but on average all irrigation combined is about 50% of observed ET. If suspicions of localized overwatering exist in the mobile home park, more rigorous testing of the existing irrigation system should be implemented in order to evaluate individual irrigation practices.

Table 1 - Inventory of Eastgate's Water Using Fixtures and Appliances

Location	Eastgate	0						
Address	3030 E. Bridge St.	e St.						
Contact	Mac							
Date	2/24/2010							
Type of Business	Community							
	31.0005.1.1							
	2 meters for entire facility; all submetered for residents	entire facili	ty; all subme	stered for res	idents			
	452 Sites; 24	are empty;	average 4 p	ersons/home	; most hav	re 1 or 2 bat	hrooms; al	452 Sites; 24 are empty; average 4 persons/home; most have 1 or 2 bathrooms; all in home laundry
Toilets	1.28 gpf	1.6 gpf	2.5 gpf	3.5 gpf				
Clubhouse								
Mens		1						
Womens		7						
Individual Homes								
1 Bathroom Home				214				
2 Bathroom Home				428				
	J	J== 1	7					
Urinais	U.5 gpr	т дрт	1.5 gpr					
Mens		1						
Sinks	0.5 gpm	1.5 gpm	2 gpm	2.5 gpm 4	4 gpm	5 gpm	6 gpm	
Kitchen Clubhouse			1					
Bathroom Mens			2					
Bathroom Womens			7					
1 Bathroom Home				214				
2 Bathroom Home				428				
Kitchen Sink				428				
Showers								
1 Bathroom Home				214				
2 Bathroom Home				428				
Other Uses	Make	Model		Capacity		Use		
Ice machine Clubhouse								
	Sears	253.7481340J	40)			1		
Dishwasher Clubhouse								
	Kenmore	5B715103801	801			1		
Clothes Washing Machine								
						428		
Pool								
				44'x30'x4.5'		44,000gal		Fill pool in May
Outdoor Irrigation								
17 Zones	17 Zones 4 controllers; have rain sensors in place; rotator and popups	have rain s	ensors in pl	ace; rotator a	andod pu	S		

Table 2 - Summary of Current Water Use and Potential Water Savings Eastgate Apartments Audit Summary

Maximum Use Calculation	452 sites	24 emp	24 empty 4people/home	le/home							
			ber use	9				subtotal gpd	pd6		
:	number	hot	cold	total		uses/day	hot	ploo	total		
1 Bathroom Home		214		c	7				0	0	
IOIIGI				ກ	s gpr				5,836	5,830	
Shower			2	0.5	2.5 gpm			6,163	1,541	7,704	
Sink			1.25	1.25	2.5 gpm			2,772	2,772	5,544	
Kitchen Sir			2.25	2.25	4.5 gpm	10 minutes		4,815	4,815	9,630	
Clothes Washing Machine			17.5	17.5	35 g/use	0.25 use		936	936	1,873	
Dish Washing Machine			5.5	5.5	11 g/use	0.25 use		294	294	589	
2 Bathroom Home	2	41									
Toilet		428		8	3 gpf				11,347	11,347	
Shower			2	0.5	2.5 gpm			11,984	2,996	14,980	
Sink			1.25	1.25	2.5 gpm			5,036	5,036	10,072	
Kitchen Sink			2.25	2.25	4.5 gpm	12 minutes		5,778	5,778	11,556	
Clothes Washing Machine			17.5	17.5	35 g/use	0.50 use		1,873	1,873	3,745	
Dish Washing Machine			5.5	5.5	11 g/use	0.50 use		589	589	1,177	
Public Bathroom/ Club House											
Mens	SI	_		1.6	1.6 gpf				80	80	
Womens	SI	2		1.6	1.6 gpf	10 flushes			32	32	
Urinal	a	_		-	1 gpf				2	2	
Sink	¥	4	-	-	2 gpm			12	12	24	
Kitchen	u,										
Dish Washing Machine (Kenmore 5B715103801)	-	_	10	10	20 g/use			10	10	20	
Sink	놎	_	-	-	2 gpm	5 minutes		2	2	10	
Ice Maker (Sears 253.7481340J)		-	0	15	15 gal/100#				2	2	

 40,267
 43,886
 84,153 max day

 observed
 2,500,000 max month

 30 days armax observed
 83,333 max day

Table 2 - Summary of Current Water Use and Potential Water Savings Eastgate Apartments Audit Summary

Average Use Calculation

				per use				,		subto	subtotal gpd	
	inu	number	hot	ploo	total		uses/day		hot	ploo	total	al
1 Bathroom Home		2	4									
	Toilet	2	4		က	3 gpf	5				3,210	3,210
	Shower	2		2	0.5	2.5 gpm	10			4,280	1,070	5,350
	Sink	2		52	1.25	2.5 gpm	10			2,608	2,608	5,216
	Kitchen Sink	2		22	2.25	4.5 gpm	10			4,815	4,815	9,630
O	Nothes Washing Machine	2		17.5	17.5	35 g/use	0.15	nse		299	562	1,124
	Dish Washing Machine	2	214 5	5.5	5.5	11 g/use	0.15			177	177	353
2 Bathroom Home		21	4									
	Toilet	42			ო	3 gpf	9				7,704	7,704
	Shower	2	214	2	0.5	2.5 gpm	20	minutes		8,560	2,140	10,700
	Sink	42		22	1.25	2.5 gpm	6			4,922	4,922	9,844
	Kitchen Sink	2		52	2.25	4.5 gpm	12			5,778	5,778	11,556
O	Nothes Washing Machine	2		.5	17.5	35 g/use	0.35			1,311	1,311	2,622
	Dish Washing Machine	21		5.5	5.5	11 g/use	0.50			589	589	1,177
Public Bathroom/ Club House												
	Mens		_		1.6	1.6 gpf	5	flushes			80	80
	Womens		2		1.6	1.6 gpf	10	flushes			32	32
	Urinal		_		-	1 gpf	5	flushes			2	2
	Sink		4	-	-	2 gpm	9	minutes		12	12	24
	Kitchen											
Dish Washing Machine (Kenmore 5B7151	(Kenmore 5B715103801)		_	10	10	20 g/use	_	esn		10	10	20
	Sink		_	_	-	2 gpm	2	minutes		2	2	10
Ice Maker (Sears 253.7481340J)	340J)		_	0	15	15 gal/100#	0	100#			2	2

avg day	avg month	days at avg	avg day	g/home	apcd
982'89	2,053,773	30	68,459	160	53
34,958	observed		observed		
33,628					

Table 2 - Summary of Current Water Use and Potential Water Savings Eastgate Apartments Audit Summary

Maximum Use Savings										ı		
	- day	per us	nse total		1	***	subtotal gpd	pd		Savings		-
1 Bathroom Home	number not					ō	Diop	total			ioi noo	lotal
	214		ო	3 gpf	9 flushes			5,836	5,836			
Shower	214	1.2	0.3	1.5 gpm			3,698	924	4,622	2,465	616	3,082
Sink	214	0.25	0.25	0.5 gpm			554	554	1,109	2,218	2,218	4,436
Kitchen Sink	214	2.25	2.25	4.5 gpm			4,815	4,815	9,630			
Clothes Washing Machine	214	17.5	17.5	35 g/use	0.25 use		936	936	1,873			
DISH Washing Machine	41 7	0.0	0.0	esn/6			787	462	800			
2 Bathroom Home	214											
Toilet	428		ო ი	3 gpf	9 flushes		1700	11,347	11,347	- 1		, 0
Jaiowell Vais		7:1 7:2 7:2	0.5 25	1.5 gpm	20 minutes		1,190	1,790	0,900	4,734	7, 130	2,332
Kitchen Sink		2.25	2.25	4.5 dpm			5,778	5.778	11.556	4,023	4,029	60,0
Clothes Washing Machine	214	17.5	17.5	35 a/use			1.873	1.873	3.745			
Dish Washing Machine	214	5.5	5.5	11 g/use			589	589	1,177	٠		
Public Bathroom/ Club House												
			1.28	1.28 gpf				9	9		2	2
Womens			1.28	1.28 gpf				26	26		9	9
Urinal	← 4	0.25	7,0	1 gpf 05 gpm	5 flushes		, "	ന സ	ഗധ	, σ	, σ	٠ ٢
	r	0.53	0.53	11db 0:0			,	,	Þ	n	D	9
Kitchen Kitchen	•	ç	ç	000			ç	ç	ć			
Dish washing Machine (Kenmore 56/15103801)		2 -	2 +	3 gnm	1 USe		<u> </u>	<u> </u>	20			
Sillin Ice Maker (Sears 253.7481340J)		- 0	- 5	2 gpm 15 gal/100#	0 100#		ה י	2 0	2 0			
	-	,	2				26.752	35.808	62.560 max day			
							observed					
							-					
							opserved		63,333 max day			
Average Use Savings												
	1		nse			100	subtotal gpd	pd	ſ	1		
1 Bathroom Home	number not	DIOS			uses/day n	5	Dioc					
Toilet	214		ო	3 apf	5 flushes			3,210	3,210			
Shower		1.2	0.3	1.5 gpm	10 minutes		2,568	642	3,210	1,712	428	2,140
Sink		0.25	0.25	0.5 gpm			522	522	1,043	2,087	2,087	4,173
Nitchen Sink Alleria Machina Machina	214	2.25 17 F	2.25	4.5 gpm	10 minutes		4,815	4,815	3,630			
Dish Washing Machine	214	5.5	5.5	33 g/use 11 g/use	0.15 use		177	177	353			
2 Bathroom Home	214											
Toilet	428		က	3 gpf	e flushes			7,704	7,704			
Shower		1.2	0.3	1.5 gpm			5,136	1,284	6,420	3,424	856	4,280
XIIO Acio dedority	428 214	0.25 2.25	0.25	0.5 gpm 4.5 gpm	9 minutes		5 778	984	1,969	3,938	3,938	6/8/7
Clothes Washing Machine	214	17.5	17.5	35 g/use			1,311	1,311	2,622			
Dish Washing Machine	214	5.5	5.5	11 g/use			589	589	1,177			
Public Bathroom/ Club House												
Mens	← 0		1.28 1.28	1.28 gpf	5 flushes			9 %	9 9		۷ ۷	7 4
Urinal				1 ap				J 10	J rc		,	,
Sink		0.25	0.25				ဗ	· 6	9	6	6	18
Kitchen Kitchen Machine Waching Warmen E B716-100001	•	ç	ć	00			ç	ć	ç			
Distrivasing magnine (Neminore 35/15/15/3001)		2 -	2 ←	2 gpm	5 minutes		5 ro	<u>ο</u> το	2 0			
Ice Maker (Sears 253.7481340J)	-	0	15	15 gal/100#			٠.	2	2			
							22,459	27,633				
							opserved		2,053,773 avg month			
							observed	7	41 days at avg 68,459.09 avg dav			
							9 9 9					

Table 2 - Summary of Current Water Use and Potential Water Savings Eastgate Apartments Audit Summary

	number Hardware Insta	llation Total Pay Back	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr	Total Cost Savings/yr/fixture
Bathroom Sink	642 \$ 1.61 \$ 5 \$ 4,244 0.	5 \$ 4,244 0.30 yrs		\$ 36,060	\$ 56
Showers	428 \$ 33 \$	10 \$ 18,404 2.45 yrs	2,343,300 486,829	\$ 19,215	\$ 45
Clubhouse Toilet	3 \$ 282 \$	24	2,920	\$ 24	8
Clubhouse Sinks	4 \$ 1.61 \$	24	6,570 853	\$ 109	\$ 27
_		\$ 23,805		\$ 55,409	
	AF Savings: 20.72	\$/ AF: \$ 1,149	Replacement Water Cost*: \$ 621,486	Avoided Cost** \$ 64,129	اء د

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report



VFW

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 161 N. Main St. in Brighton on March 17, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of VFW's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at VFW in 2008 and 2009.

Water Use Summary

VFW is housed in a building built in the early 1900's. As indicated in attached Table 1, similar to many restaurants and bars built during this time period, VFW has aged plumbing and fixtures. The sink faucets in both the men's and women's bathrooms use between 1-2 gallons per minute. Changing these aerators would cost approximately \$6 per sink and would result in a water and energy savings of approximately \$21 dollars per year per sink.

The eight toilets at VFW use between 1.6 and 2 gallons per flush. The toilets are 1.6 gallon per flush units, however due to the age of the toilets and plumbing, they flush at a higher flow rate. By installing new Water Sense approved high efficiency toilets which use 1.28 gallons per flush and work correctly, VFW would spend \$3,016 with a total savings of approximately \$35 per year. In addition, by replacing the two current 1 gallon per flush urinal with the Water Sense approved high efficiency waterless urinal, the initial cost would be \$792. VFW would see a cost savings of approximately \$15 per year per fixture.

VFW has two kitchen/bar hand wash sinks that use approximately 1-2 gallons per minute. Replacing these sink aerators with new 0.5 gallon per minute faucet aerators would cost \$6 per sink and save a combined water and energy savings of on average of about \$17 per sink per year.

Noteworthy is that the VFW facility appears to have an ongoing leak of between 0.2 and 0.5 gallons per minute, or about 100,000 to 250,000 gallons per year. It would be of benefit for the owner to try to find and fix this suspected water waste.

These water saving measures are listed at the bottom of attached Table 2. If all the recommended water saving fixtures were to be implemented, it would cost approximately \$4,700 and it would expect to bring a reduction of about \$602 in annual water and energy costs.

The VFW Hall has a new outdoor irrigation system. With respect to outdoor use, a comparison was made between applied irrigation water and seasonal evapotranspiration (ET). Applied irrigation water was determined using the monthly water billings for 2008 and 2009. Seasonal ET was estimated based on irrigated acreage and ET. Irrigated acreage was estimated using aerial photography, whereas ET rates were estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate for a given location and weather condition (i.e., average daily temperature and precipitation). Daily weather data for Brighton in 2008 and

2009 was obtained from the NOAA National Data Center. Figure 2 presents a comparison of the irrigation rate and the monthly ET for the VFW Hall.

Based on this comparison, the property as a whole irrigates at a rate approximately twice the estimated ET (for the 6,000 square feet of irrigated turf). The VFW Hall should have a more detailed irrigation audit performed to evaluate the settings on the irrigation clock, the pressure of the system, and the overall efficiency of the irrigation system.

Table 1 - Inventory of VFW's Water Using Fixtures and Appliances

Address161 N. Main StContactSharonDate3/17/2010Type of BusinessRestaurantAccount Number47.0285.0.1; 47NotesBuilt DateBuilt DateBar 1990's, Built Date	161 N Main Gt		/	,)		
t f Business it Number Built Date				•		
f Business ht Number Built Date	IVIAIII OL.					
f Business nt Number Built Date						
f Business nt Number Built Date	010					
nt Number Built Date						
	5.0.1; 47.0280.0.1	- 1				
Built Date Bar 199						
	30's, Building early 1900's	y 1900's				
# of Employees 4; 2 per shift	r shift					
# of Customers Slow - 10-12; Busy - 60	10-12; Busy - 60					
Dinner	on Friday nights,	breakfast or	Dinner on Friday nights, breakfast on Sunday, occasional big events	કો big events		
Toilets 1.28 gpf	اf 1.6 gpf	2.0 gpf	3.5 gpf		ŏ	Comment
Mens	1					
Womens	3	2			Bã	Back - 2 yrs old, Front - 11 yrs old
Urinals 0.5 gpf	1 gpf	1.5 gpf				
Mens	2					
Sinks 0.5 gpm	n 1 gpm	2 gpm	2.5 gpm 3 gpm	5 gpm 6 gpm	ш	
Pots and Pans				1		
Kitchen Handwash		1				
Bathroom Mens		4				
Bathroom Womens	4					
Bar Dish Sink			1			
Bar Handwash Sink	1					
Mop Sink				2	1	1 is used once per day
Other Uses Use	Make		Model	Capacity		
Ice machines						
	Scotsman		Size 200		ai	air cooled
Hot Water Heater						
x2	Rheemglas		21v50-60N Ser:	50 gal	17	140 degrees
Dish Washer None						
Refrigeration						
x2	Superior					
Cooling Towers						
					ai	air conditioning/ swamp cooler
Outdoor Irrigation Sprinklers; 100		x60'; Irrigates in summer	mer			

Table 2 - Summary of Current Water Use and Potential Water Savings VFW Audit Summary

:									
Maximum Use Calculation		0 (weekend	30-250 (weekend), 5 employees						
			per use	96			subtotal gpd		
F S S S S S S S S S S S S S S S S S S S	number	er hot		total		uses/day hot	ploo	total	
Significant	Mens	8		2	2 gpf	6 flushes		36	36
	Womens	2		7	2 gpf	6 flushes		09	09
Urinals	Mens	7		-	1 gpf	10 flushes		20	20
Bathroom Sinks	Mene	4	+	+	e day	2.4 minutes	æ	α	#
	Womens	4	0.5	0.5	1 gpm	0.9 minutes	2	25	. 4-
Kitchen Sinks: Pots and Pans		-	4	-	2 gpm	25 minutes	100	25	125
Kitchen Handwash Sink		-	-	-	2 gpm	5 minutes	S	S	10
Mop Sink (Only 1 is used)		7	0	2	5 gpm	2 uses		20	20
Bar Sink		-	1.25	1.25	2.5 gpm	30 minutes	38	38	75
Bar Hand Sink		-	0.5	0.5	1 gpm	5 minutes	ю	ю	S
Other Ice Machine (Scotsman) Air Cooled		-		17.8	17.8 gp100#	1.5 100# Ice		27	27
Leak		-	0	0.5	0.5 gpm	1440 minutes	- 191	720 998	720 1,189 max dav
							observed		36,000 max month
							observed		30 days at max 1,200.00 aver day

Table 2 - Summary of Current Water Use and Potential Water Savings VFW Audit Summary

Average Use Calculation

			ber use	ě				subtotal gpd		
Toilot	number	hot	ploo	total	Ī	uses/day	hot	cold	total	Ī
Sielo	Mens	ဗ		2	2 gpf	2 flushes			12	12
	Womens	2		2	2 gpf	2 flushes	•		20	20
Urinals	Mens	7		-	1 gpf	5 flushes	•		0	10
Bathroom Sinks	Mens Womens	4 4	1 0.5	1 0.5	2 gpm 1 gpm	1.05 minutes 0.3 minutes	-	7 2	17 2	45 °C
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	20 minutes	8	80	20	100
Kitchen Handwash Sink		-	~	-	2 gpm	2 minutes		2	2	4
Mop Sink (Only 1 is used)		2	0	2	5 gpm	1 uses	•		10	10
Bar Sink		-	1.25	1.25	2.5 gpm	15 minutes	₹	19	19	38
Bar Hand Sink		-	0.5	0.5	1 gpm	5 minutes		8	ю	2
Other Ice Machine (Scotsman) Air Cooled		-		17.8	17.8 gp100#	1 100# Ice	•		18	18
Leak		-	0	0.2	0.2 gpm	1440 minutes	. 199	,	288	288 543 ave dav
							!	observed		6,667 avg month
								observed		31 days at avg 556 avg day

Table 2 - Summary of Current Water Use and Potential Water Savings VFW Audit Summary

Maximum Use Water Savings			300	ş				losoddd o			0		
	number	hot	ploo	total		uses/day F	hot	cold	total		bot cold	total	_
	Mens Womens	23		1.28	1.28 gpf 1.28 gpf	6 flushes 6 flushes			38	38 38		13	13
Urinals	Mens	2		0	0 gpf	10 flushes						50	50
Bathroom Sinks	Mens Womens	4 4	0.25	0.25	0.5 gpm 0.5 gpm	2.4 minutes 0.9 minutes		0 4	0 4	19	29	29	58
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	25 minutes	7	100	25	125			
Kitchen Handwash Sink		-	0.25	0.25	0.5 gpm	5 minutes		←	-	ဇာ	4	4	80
Mop Sink (Only 1 is used)		2	0	2	5 gpm	2 uses	•		20	20			
Bar Sink		-	1.25	1.25	2.5 gpm	30 minutes		38	38	75			
Bar Hand Sink		-	0.25	0.25	0.5 gpm	5 minutes		-	-	8	-	-	е
Other Ice Machine (Scotsman) Air Cooled		-		17.8	17.8 gp100#	1.5 100# Ice			27	72			
Leak		-	0	0	0 gpm	1440 minutes	. 1	- 153	186	- 340 max dav		720	720
								observed		86,000 max month			
								observed		1,200 aver day			

GREAT WESTERN INSTITUTE

Table 2 - Summary of Current Water Use and Potential Water Savings VFW Audit Summary

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4	9	Į

Average Use water savings										1		
			per use				subtotal gpd			Savings		
	number	hot	ploo	total		uses/day hot	ploo	total		hot cold	total	a
Ollets	Mens	က		1.28	1.28 gpf	2 flushes		œ	80		4	4
	Womens	2		1.28	1.28 gpf	2 flushes		13	13		7	7
Urinals	Mens	2		0	0 gpf	5 flushes					10	10
Bathroom Sinks	Mens Womens	4 4	0.25	0.25	0.5 gpm 0.5 gpm	1.05 minutes 0.3 minutes	4 F	4 ←	8 7	6 –	€ -	25 2
Kitchen Sinks: Pots and Pans		-	4	-	5 gpm	20 minutes	80	20	100		,	
Kitchen Handwash Sink		-	0.25	0.25	0.5 gpm	2 minutes	_	-	←	2	2	8
Mop Sink (Only 1 is used)		7	0	2	5 gpm	1 uses		10	10			
Bar Sink		-	1.25	1.25	2.5 gpm	15 minutes	19	19	38			
Bar Hand Sink		-	0.25	0.25	0.5 gpm	5 minutes	_	-	ဇ	-	-	е
Other Ice Machine (Scotsman) Air Cooled		-		17.8	17.8 gp100#	1 100# loe		18	18			
Leak		-	0	0	шdб 0	1440 minutes	106 observed observed	, 6	200 avg day 16,667 avg month 83 days at avg 556 avg day		288	288

Costs to Implement							
	number Hardware Installation	Installation	Total	Pay Back	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr	Total Cost Savings/yr/fixture
Toilet	8 \$ 282	\$ 95	3,016	163.42 yrs	4,205	8	\$
Urinal	2 \$ 311	\$ 85 \$	792	47.48 yrs	3,650	30	\$ 15
Bathroom Sink	8 \$ 1.61	\$ 2	53	0.32 yrs	10,074 1,308	\$ 168	\$ 21
Kitchen/ Bar Handwash Sinks	2 \$ 1.61	\$ 2	13	0.40 yrs	2,008	\$ 33	\$ 17
Fix Leak	1 \$ 300	\$ 200	800		105,120	\$ 336	\$ 336
			4,674			\$ 602	
	AF Savings: 0.38	67	\$/ AF:	\$ 12,179	Replacement Water Cost*: \$ 11,514	Avoided Cost**: \$ 1,188	1,188
					* Calculation based on \$30,000 per AF	** Calculation based on \$9.50/ 1000 gal	3.50/ 1000 gal

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy

GREAT WESTERN INSTITUTE





Walmart

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your facility at 60 W. Bromley Lane in Brighton on February 23, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local businesses volunteered to help The City complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of Walmart's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at Walmart in 2008 and 2009.

Water Use Summary

Walmart is one of the biggest users of water in the City of Brighton. Walmart has bathroom sinks and toilets that have been equipped with water efficient fixtures that are currently readily available in the marketplace. Walmart does utilize pre-rinse spray nozzles in their food prep kitchens. In addition, Walmart and the store's Subway utilize air cooled ice makers. Both of these features help to reduce facility wide water use.

Substantial water and energy savings can be realized by Walmart by changing out the kitchen sink faucet aerators (in those sinks not used for pots and pans) from the existing 2 to 2.5 gallon per minute flow rate to 0.5 gallons per minute. This will cost about \$6 a piece, and will result on average in a combined water and energy savings of about \$61 per sink per year. The bathroom sink faucet aerators at Walmart already use the 0.5 gallon per minute aerators. Other water efficient faucet aerators could be installed at the Beauty Center and the Eye Care Center. With an initial cost of about \$6 per sink, the Beauty Center could see a cost savings of \$46 per sink per year and the Eye Care Center could see a savings of \$24 per sink per year. The hand wash sinks located in the Subway use a foot pedal system that does not allow for the changing of faucet aerators.

Additionally, Walmart could see significant water savings by replacing the four 1 gallon per flush urinals with Water Sense approved high efficiency waterless urinals. The initial cost would be about \$1,584. Walmart would see a cost savings of approximately \$269 per year per fixture resulting in payback period of about 4 years.

The in store Beauty Care Center would see a substantial water savings by replacing the top load, heavy duty Maytag washing machine. By replacing the current model with a new Water Sense approved high efficiency washing machine, the Beauty Care Center could see a combined water and energy savings of about \$287 per year with an initial cost of approximately \$925 resulting in a payback period of about 2 months.

The water modeling effort indicates that Walmart may have an ongoing leak of about 0.3 to 0.5 gallons per minute of water that has consistently occurred over the past two years. It would be of benefit for the owner to try to find and fix this suspected water waste such that over 180,000 to 250,000 gallons of water could be saved per year.

These potential indoor water saving measures are listed at the bottom of attached Table 2. If all the recommended indoor water saving fixtures are implemented, it would cost approximately \$3,375 and may bring a reduction of about \$3,500 in annual water and energy costs.

Walmart also uses substantial water for outdoor, seasonal uses which include irrigation of turf and landscape in the parking lot and the irrigation of plant materials in the nursery. Given that the distribution of water use is mixed between the outdoor irrigation and the nursery, no attempt was made to evaluate the efficiency of this use since information on the quantity and type of planting materials irrigated during the summer in the nursery have not been available.

Table 1 - Inventory of Walmart's Water Using Fixtures and Appliances

	Walmart	+							
Address	60 W Bromley Lane	anelv							
	Bill	2131							
	2/23/2010								
of Business	Store/Grocery Store	y Store							
	26.0010.0.1								
Notes									
# of Employees	500 employees/day	es/day							
# of Customers	5000 customers/wkday; 6800 customers/wkend	ers/wkday;	6800 custo	mers/wkend					
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3.0 gpf					
Public Mens		4							Flushvalve
Public Womens		8		1					Flushvalve
Family			1						
Urinals	0.5 gpf	1 gpf	1.5 gpf						
Mens		4							Flushmate
	0.5 gpm	1.5 gpm	2 gpm	2.5 gpm	3.5 gpm	4 gpm 5	5 gpm (6 gpm	
Walmart Store									
Breakroom Sink		1							
Bathroom Mens	9								Automatic
Bathroom Womens	9								
						н			
Bakery/Food prep/Meat									
Pots and Pans								9	1 runs nearly all day for power soak; 4 w/ pre rinse spray
Kitchen Handwash		1	2	2	₩				
Subway									
Pots and Pans			1	1					1 pre rinse spray
Subway Handwash Sink				2					w/ foot pedal
Mop Sink							1		
Eye Care									
Handwash				4					only 2 are used often
Beauty Center									
			1						
Hairwash Sink			2						
Other Uses	Make	Model		Capacity					
Water Fountains									
	Elkay								
Subway Ice machines									
	Manitowoc			18g/100#					
Pure Water Filtration									
									Drinking Water
AC									
	Konn- Whisperkool Heat Craft	WK1000AC							
Water Softenting Unit									
Control Marchine									
	Maytag	DRE 80917		2-3 loads/dav; 80 gal	1V; 80 gal				Topload/heavy duty
Produce spray nozzles				10,					
Outdoor Irrigation									
	Includes: Corral, garden center, outdoor irrigation, grass islands	al, garden	center, out	door irrigatic	ın, grass islar	spu			

Maximum Use Calculation	5000 custo	m 6800 cu	stomers/wke	5000 custom 6800 customers/wkend 500 employees/day	ployees/day	1700				
Customer Bathrooms number	s number	hot	per use	total	-	uses/day hot	subtotal gpd cold	total		
I ollets: Flushing Valve Mens Womens	8 8 8	2 4		1.6	1.6 gpf 1.6 gpf	150 flushes 250 flushes		480 1,600	480 1,600	
Urinals	ñ	2		←	1 gpf	250 flushes	•	200	200	
Bathroom Sinks Mens Womens		n n	0.25	0.25	0.5 gpm 0.5 gpm	60 minutes 37.5 minutes	180 113	180	380 225	
Break Room Bathrroms	s									
Loilets Mens Womens Womens Family	8 8 ×	04-		9; 1 9; 2 2	1.6 gpf 1.6 gpf 2 gpf	35 flushes 35 flushes 15 flushes		112 224 30	112 224 30	
Urinals Mens	ω	7		-	1 gpf	40 flushes		80	08	
Bathroom Sinks Mens Womens Family	887	e e −	0.25 0.25 2	0.25 0.25 2	0.5 gpm 0.5 gpm 4 gpm	11.25 minutes 5.25 minutes 2.25 minutes	34 16 18	34 81 81	88 SS 88	
Bakery/Food Prep/Meat Kitchen Sinks: Pots and Pans (4 pre rinse spray)	Ħ	22	8	0.5	2.5 gpm	120 minutes	1,200	300	1,500	
Kitchen Sinks: Pots and Pans all day for power soak		_	400	100	500 batch	6 batches	2,400	009	3,000	
Kitchen Handwash Sink		9	1.25	1.25	2.5 gpm	5 minutes	38	38	75	
Water Fountain		2	0	4	4 g/day	8 g/day		8	8	
Break Room/Employee Area Water Fountain	ø	2	0	22	5 g/day	10 g/day	•	10	10	
Pure Water Filtration Unit for Drinking water		-	0	10	10 g/day	10 g/day		10	10	
Kitchen Sink		-	0.75	0.75	1.5 gpm	60 minutes	45	45	06	
Subway Kitchen Sinks: Pots and Pans (1 pre rinse spray)	>	8	1.25	1.25	2.5 gpm	100 minutes	250	250	200	
Hand Sink (w/foot pedal)		2	1.25	1.25	2.5 gpm	4 minutes	10	10	20	
Mop Sink		-	0	2	5 gpm	2 uses		10	10	
Ice Machine (Manitowoc) Air Cooled		7		17.8	17.8 gp100#	8 100# lce		285	285	
Eye Care (4 employees)										
Hand Sink (4 but only 2 are used)		2	1.25	1.25	2.5 gpm	2 minutes	S	2	10	
Beauty Center	-									
Hand Sink		-	-	-	2 gpm	5 minutes	S	2	10	
Hair Wash Sink		7	1.1	1.1	2.2 gpm	240 minutes	528	528	1,056	
Washing machine (Maytag, topload, heavy duty)		-	0	42	42 gpcyde	8 loads/day		336	336	
Leak		-	0	9.0	0.6 gpm	1440 minutes		864	864	
							4,841 observed	6,689	11,530 max day 346.000 max month	
							observed		30 days at max 11,533.33 max day	

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Parameter Bate	Customer Bathrooms pumber	ż	per use	e total		hot hot	subtotal gpd	at ct	
Custoffield Date Toilets: Flushing Valve		2	3						
	Mens Womens	2 4		1.6	1.6 gpf 1.6 gpf	85 flushes 125 flushes		272 800	272 800
Urinals	Mens	7		-	1 gpf	150 flushes	,	300	300
Bathroom Sinks W	Mens Womens	ოო	0.25	0.25	0.5 gpm 0.5 gpm	35.25 minutes 18.75 minutes	106 56	106 56	212 113
Break Room Bathrroms Tollets Mens Womens	Bathrroms Mens Womens Family	04-		6. 6. 6.	1.6 gpf 1.6 gpf 2 gpf	20 flushes 30 flushes 15 flushes		9 5 6 2 6	64 192
Urinals	Mens	- 2		۰ -	2 19 gp 1	30 flushes		g 9	os 09
Bathroom Sinks	Mens Womens Family	ღღ−	0.25 0.25 2	0.25 0.25 2	0.5 gpm 0.5 gpm 4 gpm	7.5 minutes 4.5 minutes 2.25 minutes	23 14 1 18	23 4 4 8	45 27 36
Bakery/Food Prep/Meat Kitchen Sinks: Pots and Pans (4 pre rinse spray)	p/Meat	2	2	0.5	2.5 gpm	100 minutes	1,000	250	1,250
Kitchen Sinks: Pots and Pans all day for power soak	¥	-	400	100	500 batch	4 batches	1,600	400	2,000
Kitchen Handwash Sink		9	1.25	1.25	2.5 gpm	5 minutes	38	88	75
Water Fountain		2	0	4	4 g/day	8 g/day		80	80
Break Room/Employee Area Water Fountain	e Area	2	0	2	5 g/day	10 g/day	•	10	10
Pure Water Filtration Unit for Drinking water		-	0	10	10 g/day	10 g/day		10	10
Kitchen Sink		-	0.75	0.75	1.5 gpm	60 minutes	45	45	06
Sitchen Sinks: Pots and Pans (1 pre rinse spray)	Subway	8	1.25	1.25	2.5 gpm	60 minutes	150	150	300
Hand Sink (w/foot pedal)		2	1.25	1.25	2.5 gpm	4 minutes	10	10	20
Mop Sink		-	0	2	5 gpm	2 uses		10	10
Ice Machine (Manitowoc) Air Cooled		2		17.8	17.8 gp100#	4 100# Ice		142	142
Eye Care (4 employees)	loyees)								
Hand Sink (4 but only 2 are used)		2	1.25	1.25	2.5 gpm	2 minutes	2	Q	10
Beauty	Beauty Center								
Hand Sink		-	-	-	2 gpm	5 minutes	Ŋ	2	10
Hair Wash Sink		2	1.1	1.1	2.2 gpm	135 minutes	297	297	594
Washing machine (Maytag, topload, heavy duty)		-	0	42	42 gpcyde	4 loads/day		168	168
Leak		-	0	0.35	0.35 gpm	1440 minutes		504	504
							3,366 observed	3,986	7,351 avg day 221,250 avg month
							observed		30 days at avg 7,375 avg day

Maximum Use Water Savings						bas letotalis			Society		
Customer Bathrooms number		hot	cold to	total	uses/day hot	ploo	total		hot		total
I ollets: Flushing Valve Mens Womens	0.4		1.6	1.6 gpf 1.6 gpf	150 flushes 250 flushes		480 1,600	480 1,600			
Urinals	8		←	1 gpf	250 flushes	,	200	200			
Bathroom Sinks Mens Womens	ოო	0.25	0.25	0.5 gpm 0.5 gpm	60 minutes 37.5 minutes	180 113	180 113	360 225			
Break Room Bathrroms											
Toilets Mens Womens Family	04-		1.6 1.6 2	1.6 gpf 1.6 gpf 2 gpf	35 flushes 35 flushes 15 flushes		112 224 30	112 224 30			
Urinals	8		←	1 gpf	40 flushes	,	80	80			
Bathroom Sinks Mens Womens Womens Family	ოო ←	0.25 0.25 2	0.25 0.25 2	0.5 gpm 0.5 gpm 4 gpm	11.25 minutes 5.25 minutes 2.25 minutes	34 16 81	£ 2 8	8 22 88			
Bakery/Food Prep/Meat Kitchen Sinks: Pots and Pans (4 pre rinse spray)	ď	2	0.5	2.5 gpm	120 minutes	1,200	300	1,500			
Kitchen Sinks: Pots and Pans all day for power soak	-	400	100	500 batch	6 batches	2,400	009	3,000	•		
Kitchen Handwash Sink	9	1.25	1.25	2.5 gpm	5 minutes	38	88	75	,		'
Water Fountain	2	0	4	4 g/day	8 g/day		80	∞			
Break Room/Employee Area Water Fountain	8	0	2	5 g/day	10 g/day	,	10	10		,	
Pure Water Filtration Unit for Drinking water	-	0	10	10 g/day	10 g/day		10	10	•		
Kitchen Sink	-	0.75	0.75	1.5 gpm	60 minutes	45	45	06	,		
Subway Kitchen Sinks: Pots and Pans (1 pre rinse spray)	2	1.25	1.25	2.5 gpm	100 minutes	250	250	200			'
Hand Sink (w/foot pedal)	2	1.25	1.25	2.5 gpm	4 minutes	10	10	20			
Mop Sink	~	0	2	5 gpm	2 uses		10	10	,		
Ice Machine (Manitowoc) Air Cooled	2		17.8	17.8 gp100#	8 100# Ice		285	285	,		
Eye Care (4 employees)											
Hand Sink (4 but only 2 are used)	7	1.25	1.25	2.5 gpm	2 minutes	S	S	10	,		'
Beauty Center											
Hand Sink	-	-	-	2 gpm	5 minutes	S	Ŋ	10	,		'
Hair Wash Sink	2	1.	1.7	2.2 gpm	240 minutes	528	528	1,056	•		'
Washing machine (high efficiency)	-	0	18	18 gpcycle	8 loads/day		144	144	,	192	19
Leak	-	0	0	mdg 0	1440 minutes			ī	,	864	98
						4,841 observed	5,633	10,474 max day 346,000 max month			

33 days at max 11,533.33 max day

observed

Average Use Water Savings									ĺ		
Customer Bathrooms number	nher	per use	Jse	ĺ	hot hot	subtotal gpd	5		Savings	tot	<u>n</u>
Toilets: Flushing Valve Mens Womens	0.4		1.6	1.6 gpf 1.6 gpf	5 flushes 5 flushes		272	272 800			
Urinals	7		0	Jdb 0	150 flushes					300	300
Bathroom Sinks Mens Womens	ოო	0.25	0.25	0.5 gpm 0.5 gpm	35.25 minutes 18.75 minutes	106 56	106 56	212 113			
Break Room Bathrroms Toilets Mens Womens Family Family	04-		6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6	1.6 gpf 1.6 gpf 2 onf	20 flushes 30 flushes 15 flushes		49 <u>6</u> 2 65	64 202 30			
Urinals	. 2		. 0	bd 0	30 flushes		}		•	9	09
Bathroom Sinks Mens Womens Family	ოო ←	0.25 0.25 0.25	0.25 0.25 0.25	0.5 gpm 0.5 gpm 0.5 gpm	7.5 minutes 4.5 minutes 2.25 minutes	23 2 4 5 2 6	23 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	45 27 5	91	9	32
Bakery/Food Prep/Meat Kitchen Sinks: Pots and Pans (4 pre rinse spray)	S	8	0.5	2.5 gpm	100 minutes	1,000	250	1,250	,	,	
Kitchen Sinks: Pots and Pans all day for power soak	~	400	100	500 batch	4 batches	1,600	400	2,000			
Kitchen Handwash Sink	9	0.25	0.25	0.5 gpm	5 minutes	æ	80	15	30	30	09
Water Fountain	2	0	4	4 g/day	8 g/day		80	ω			
Break Room/Employee Area Water Fountain	2	0	Ŋ	5 g/day	10 g/day		01	10	,	,	
Pure Water Filtration Unit for Drinking water	-	0	10	10 g/day	10 g/day		10	10			
Kitchen Sink	~	0.75	0.75	1.5 gpm	60 minutes	45	45	06			
Subway Kitchen Sinks: Pots and Pans (1 pre rinse spray)	2	1.25	1.25	2.5 gpm	60 minutes	150	150	300	•	,	
Hand Sink (w/foot pedal)	2	1.25	1.25	2.5 gpm	4 minutes	10	10	20			
Mop Sink	~	0	ς	5 gpm	2 uses		10	10		,	
lce Machine (Manitowoc) Air Cooled	2		17.8	17.8 gp100#	4 100# Ice		142	142			
Eye Care (4 employees)											
Hand Sink (4 but only 2 are used)	2	0.25	0.25	0.5 gpm	2 minutes	-	-	2	4	4	œ
Beauty Center											
Hand Sink	~	0.25	0.25	0.5 gpm	5 minutes	-	-	е	4	4	00
Hair Wash Sink	2	1.1	1.1	2.2 gpm	135 minutes	297	297	594			
Washing machine (high efficiency)	~	0	18	18 gpcyde	4 loads/day		72	72		96	96
Leak	-	0	0	0 gpm	1440 minutes		·			504	504
						3,312 observed	2,972	6,284 avg day 221,250 avg month			
						observed		35 days at avg 7,375 avg day			

Costs to Implement											
	number Hardware Installation To	allation T	tal	Pay Back	Water Savings (gpy)	Energy Savings (gs (kWhr)	Total Cost	Total Cost Savings/yr	Total Cost Savings/yr/fixture	9.
Urinals	4 \$ 311.00 \$	82 \$	1,584	3.72 yrs	131	131,400		ક્ક	1,077	\$ 269	
Bathroom Sinks	1 \$ 1.61 \$	2	7	0.16 yrs	11,49	7.50	1,493	49	191	\$ 191	
Walmart Kitchen Handwash Sinks	6 \$ 1.61 \$	2	40	0.53 yrs	21,900	006'	2,844	69	364	\$ 61	
Beauty Center Handwash Sinks	1 \$ 1.61 \$	2	7	0.15 yrs	2,73	7.50	355	49	46	\$ 46	
Washing Machine	1 \$ 850 \$	75 \$	925	3.22 yrs	35,04	0.00	,	49	287	\$ 287.33	
Eye Care Handwash Sinks	2 \$ 1.61 \$	2	13	0.27 yrs		2,920	379	49	49	\$ 24.29	
Leak	1 \$ 750.00 \$	20 \$	800	0.53 yrs	183	096		49	1,508	\$ 1,508	
		eΩ	\$ 3,375						3,523		
	AF Savings: 1.20	\$/ AF		5 2,824	Replacement Water Cost*:	€	23,758	Avoided C	voided Cost**: \$ 3,700	00	
					* Calculation based on \$30,000 per AF	00 per AF		** Calculat	** Calculation based on \$9.50/ 1000 gal	30/ 1000 gal	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy

SMART WATER Audit Reports Residential

PRIGHTON V

SMART WATER Audit Report



The Gossert's Home

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your home at 279 Birch Ave on April 2, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of residences volunteered to help The City complete a residential audit program intended to assist in improving water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of the Gossert's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at the Gossert's in 2008 and 2009.

Water Use Summary

In an effort to determine the reason for high water bills, the house was visited to evaluate current and past water use. An inventory of water using fixtures and appliances was prepared and leaks and other water wasting behaviors were evaluated.

Based on the site visit, it appears that the Gossert have done a good job retrofitting their home with water efficient appliances; however their indoor wintertime water use (ignoring the leak found) is somewhat higher than average at about 86 gallons per person per day. The two toilets in the home were recently replaced as of 2007. These toilets use roughly 1.6 gallons per flush. However, the downstairs toilet did run slightly longer than expected, using about 2 gallons per flush. By installing new Water Sense approved high efficiency toilets which use only 1.28 gallons per flush and work correctly, the Gossert's would spend \$750 with a total savings of approximately \$8 per year.

The Gossert's have already installed low flow shower heads which uses between 2.2 and 2.5 gallons per minute. They also have a new Water Sense clothes washer which uses only 24 gallons per load.

The bathroom hand wash sinks use between 2.5 and 2.7 gallons per minute. Replacing these sinks with new 0.5 gallon per minute faucet aerators would cost about \$6 per sink and may allow for a combined water and energy savings of on average about \$6 per sink per year.

A summary of the water use at the Gossert's home is presented in Table 2. Based on the analyses conducted, it appears that the Gossert's have a leak of about 0.1 to 0.15 gallons per minute on their side of the water meter. At a later visit by the City, upon recommendations of GWI, it was determined that there was a leak at the irrigation system connection on the Gossert's side of the meter resulting in the large water bills. The leak has since been fixed.

Finally, Figure 2 presents a comparison between applied irrigation water and seasonal evapotranspiration (ET). Applied irrigation water was determined using the monthly water billings for 2008 and 2009. Seasonal ET was estimated based on irrigated acreage and ET. Based on this comparison, the Gossert's appear to over water during some months by about 50% (especially late in the season), whereas they irrigate at a rate consistent or below ET early in the season. Given that the irrigation practices indicate that the irrigation clock is adjusted on a monthly basis, it would appear that the Gossert's could improve their irrigation practices by self-adjusting their irrigation controller. A more detailed irrigation system may also be warranted.

Table 1 - Inventory for Gossert Residence Water Using Fixtures and Appliances

Location	Gossert	t						
Address 2	279 Birch Ave	ve						
Contact G	Glen and Sherry	erry						
Date 4	4/2/2010							
Type of Business	Residential							
Account Number	27.0745.0.1							
Notes								
Built Date 1	1970							
# of People 2	-							
Toilets 1	1.28 gpf	1.6 gpf	2.0 gpf	2.5 gpf	3 gpf	5 gpf		Comment
Bathroom 1 (downstairs)			1					Bemis 2007 - Ran a little long
Bathroom 2 (upstairs)		1						Jacuzzi 2009
Showerhead 1	1.28 gpm	1.6 gpm	2.2 gpm	2.5 gpm	3 gpm	5 gpm		
Bathroom 1			1					
Bathroom 2				1				
Sinks 0	0.5 gpm	1 gpm	2 gpm	2.5 gpm	2.7 gpm	5 gpm	6 gpm	
Kitchen					1			
Bathroom 1					1			
Bathroom 2				1				
Other Uses	Use	Make		Model		Capacity		
Hot Water Heater								
		GE Energy Star	Star	SG40T12AVG00	VG00	40 gal		120 degrees, 2009
Dish Washer								
		Maytag		MDB4010AWB	٩WB			
Clothes Washer								
		Tromm LG		WM2277HW	W	24 gal/load	F	2006
Refrigeration								
		Maytag						w/ ice maker
Cooling Towers								
								swamp cooler - May - September
Outdoor Irrigation	sprinklers; 4	10'x52' bac	Sprinklers; 40'x52' backyard; 0.16 acre lot	acre lot				
d	Pressure read	06 - pe						
2	5 zones in back - 3 zones	ack - 3 zon	es in front;	8-12 popup	s (1/2 are R	ainBird); 25	in front; 8-12 popups (1/2 are RainBird); 25 min in summer; 3-5 min in spring	i min in spring
5	5 AM water	ing, manua	5 AM watering, manual shut off during rain	uring rain				
		ò)				

Table 2 - Summary of Current Water Use and Potential Water Savings Gossert Residence Audit Summary

Maximum Use Calculation	2 people									
	number	tot	per use	total	ĺ	tod hot	Subjuign gpd	total		
Bathroom Downstairs		<u> </u>								
	Toilet	-		2	2 gpf	4 flushes		80	8	
	Shower	-	1.76	0.44	2.2 gpm	15 minutes	26	7	33	
	Sink	-	1.35	1.35	2.7 gpm	0.6 minutes	-	-	2	
Rathroom Unstaire										
	Toilet	,			1.6 apf		,	10	10	
	Shower	· -	2	0.5	2.5 apm	20 minutes	40	10	50	
	dui	-	1 25		25 anm				,	
Š	Kitchen Neis	- +	135		2.2 gpm		- 00	- 6	4 2	
ridseW settoD	Machine		5 5		24 0/150		27	2 ~		
Dillion Washington	S Macillia		4 6		96n/6 47	960 00	~ 6	- 4	1	
DISH WASHI	ig macrime	-	0		esn/6 oz		n	n	2	
	LEAK	-		0.12	0.12 qpm	1,440 minutes		173	173	
								241	342 max day	
							opserved		10,000 max month	
									29 days at max	
							observed		333.33 max day	
Average Use Calculation										
0			ber use				subtotal gpd			
	number	hot	cold	total		uses/day hot	ploo	total		
Bathroom Downstairs	tolio L	,		c	9000			٥	٥	
	Oller		4 76	7 7	2 gpl			1 0	D (
	Sink		1.35	1.35	2.7 gpm	0.6 minutes	1		2 2	
Rathroom Hostaire										
	t ich				16 006			4	6	
	1000		c		Ide o			2 5	2 6	
	Snower		7 10		2.5 gpm		40	2 '	ne °	
3	žio di		27.7	1.25	mdg c.2	0.9 minutes	- 6	- 6	7 ;	
× :	Kitchen Sink		1.35		2.7 gpm		20	δ.	141	
Clothes Washing Machine	ng Machine		77		54 g/use	0.3 use	4	4 :	_ :	
Dish Washir	ng Machine	-	10		20 g/use		10	10	20	
							102 observed	02	172 avg day	
									30 days at avo	
							observed		172 avg dav	

Table 2 - Summary of Current Water Use and Potential Water Savings Gossert Residence Audit Summary

			asirad	g				pop letotidus			Savings	5	toto!	
	number	hot	ploo	total		uses/day	hot	ploo	total		2			
Bathroom Downstairs														
	Toilet	<u>_</u>	į	1.28	1.28 gpf	4 flushes		. '	വ	2			3	
	Shower		1.76	0.44	2.2 gpm			26	_	33				
	Sink	-	0.25	0.25	0.5 gpm	0.6 minutes		0	0	0		-	-	
Rathroom Hostaire														
danio of the control	Toile	+			1 28 anf	6 fliches			α	α			,	
	Shower		0	0.5	25 apm	20 minutes		40	, £	50.05				
	1000		1 20		200			p c	2 0	3			,	
	2100		2.5		0.0 gpm			0 6	0 8	2		-	7	
4-0	Nicrem Sink		55.		2.7 gpm			70	7 7	- 1				
Clomes wasning Machine	ning Machine	_	71		54 g/use			,		14			. '	
Dish Wash	ning Machine	-	n		e g/use	0.5 use		2	2	က		*		
	100	•		c	0	4.440 minimum								
	× × ×			•	2	200		96	9	154 may day				
								pervedo	3	10 000 max month				
								observed						
Average Use Water Savings	s													
			Dec	dS.				baptator			Savings	ploo	tot	
	number	hot	ploo	total	ĺ	uses/day	hot	ploo	total		į		į	
Bathroom Downstairs	i i	,		9	9				ı	ı				
	Tollet	- ,	,	97.1	1.28 gpi				1 0	ი (5	
	Sink		0.25	0.25	0.5 gpm	1 minutes		0 0	. 0	30				
Bathroom Upstairs									,					
	loilet		ď		1.28 gpt			, ,	ω ς	ထင္			7	
	Oilowel Oilowel	- +	25.0		7.5 gpm	20 minutes		0,	2 0	00 0				
	Kitchen Sink	- +	1.35		map 7.0			30	2 0	2 6		- ,		
Clothes Wash	Machine	- +	5 5		24 gyllise			0 4	07 4	· ^				
Dish Washing Machine	ning Machine		iω	iω	esn/6 9	1 use		r 100	r m	- 9		7	7 14	
								94 observed	22	150 avg day 5 167 avg month				
										34 days at avg				
								observed		381 avg day				
Costs to Implement														
	number	Hard	Hardware Install	ation	otal Pav Back		Water Savings (gbv)	v) Energy Savings (kWhr)	(kWhr)	Total Cost Savii	ings/vr	Total	Cost Savings/vr/	/fixture
Toilet Bathroom Sink		8 &	.61	95 5 8	754 52 13 0.89 767	2 yrs 9 yrs		1,752	. 85	14	4.37 4.88 29	\$ \$	\$ 7.18 \$ 7.44	
	AF Savings:		0.000	\$/ AF:	F: \$ 86,481	_	Replacement Water Cost*:	ar Cost*: \$	266	Avoided Cost**:	↔ 	27		
						II						Ĭ		

Page 2 of 2

** Calculation based on \$9.50/1000 gal
Cost Savings Assumptions: \$6.50/1000 gal - cost of energy

* Calculation based on \$30,000 per AF





The Hansen Home

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your home at 283 N. 9th Ave on August 25, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of residences volunteered to help The City complete a residential audit program intended to assist in improving water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of the Hansen's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at the Hansen's in 2008 and 2009.

Water Use Summary

Mr. Hansen was interested in the water audit program because he is surprised at the amount of water he was using with only one person living in his home. An inventory of water using fixtures and appliances was prepared and leaks and other water wasting behaviors were evaluated.

Based on the site visit, it appears that Mr. Hansen has done a good job of managing water use in his home with some water efficient appliances; however, the toilet is a 1950's vintage fixture using approximately 3.5 gallons per flush. By installing a new Water Sense approved high efficiency toilet, which uses only 1.28 gallons per flush, Mr. Hansen would spend about \$375 with a total savings of approximately \$20 per year.

Mr. Hansen does utilize two showerheads in his one shower, however both use only 1 gallon per minute and therefore it is not necessary to change them. Mr. Hansen's washing machine was purchased on 2005 and therefore is a high efficiency model. Replacing this appliance will not create substantial water savings.

The bathroom hand wash sink uses 2 gallons per minute. Replacing this sinks with a 0.5 gallon per minute faucet aerator would cost \$6 per sink and could save a combined water and energy savings of about \$4 per year.

Overall, Mr. Hansen operates a water efficient home – using about 45 gallons per day in the wintertime months. Mr. Hansen could improve his water use efficiency by replacing a few indoor fixtures which are outdated for about \$380, saving an estimate of about \$24 per year. These water saving measures are listed at the bottom of attached Table 2

Mr. Hansen does have a large irrigated backyard with 4 irrigation zones. However, he has his Rain Bird controller programmed correctly and waters his grass according to the amounts suggested by estimated evapotranspiration (ET). He also has his controller programmed according to the watering days specified by the City.

Table 1 - Inventory for Hansen Residence Water Using Fixtures and Appliances

Address	283 N 9th Ave	Δνρ						
Contact	Alden Hansen	en						
Date	8/25/2010							
Type of Business	Residential							
Account Number	45.0430.0.4	1						
Notes								
Built Date 1952	1952							
# of People	1							
Toilets	1.28 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Bathroom 1				П				Old toilet/runs for 10 seconds
Shower	1 gpm	2 gpm	5 gpm					
Bathroom 1								2 showerheads each 1 gpm
Sinks	0.5 gpm	1.5 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	e gpm	
Kitchen			1					
Bathroom 1		1						
Other Uses	Use	Make		Model		Capacity		
Hot Water Heater								
						30 gal		In basement
Dish Washer								
		GE Potscrubbe	ubber 720	GSD720X-68WB	/B			used 2x/wk
Clothes Washer								
		Kenmore			23822100			year 2001
Refrigeration								
		Kenmore		25	25371822102			
Cooling Towers								
								Small window air conditioner
Outdoor Irrigation	4 stations; ı	run betwee	ո 15-25 min	4 stations; run between 15-25 mintues each. 2 full cycles around	Il cycles arou	.pur		
	Waters on	Waters on specified days,		3 days/wk at 3 am.				
	Yard size - F	ront = Twc	15 ft x15 ft	Yard size - Front = Two 15 ft x15 ft sections; Back = 69 ft x 36 ft	= 69 ft x 361	ft		

Table 2 - Summary of Current Water Use and Potential Water Savings Hansen Residence Audit Summary

Maximum Ose Carculation			ber use					subtotal gpd			
Bathroom	number	hot	cold	total		uses/day	hot	ploo	total		
	Toilet Shower Sink	- 0 -	0.8	3.5	3.5 gpf 1 gpm 2 gpm	4 flushes 15 minutes 0.6 minutes		24 1	4 9 -	14 30 1	
	Kitchen Sink Clothes Washing Machine Dish Washing Machine		12 9	12 6	2 gpm 24 g/use 12 g/use	7 minutes 0.15 use 0.43 use		► N 6	2 2 4	4 t s	
								36 observed	32	68 max day 2,000 max month 29 days at max	
Average Use Calculation	Calculation							opserved		67 max day	
	number	hot	per use cold	se total		uses/day	hot	subtotal gpd cold	total		
Bathroom	Toilet Shower Sink	- 2 -	0.8	3.5	3.5 gpf 1 gpm 2 gpm	3 flushes 10 minutes 0.5 minutes		16 0	1 4 0	1 20 1	
	Kitchen Sirk Clothes Washing Machine Dish Washing Machine		- Z 9	- 1 2 9	2 gpm 24 g/use 12 g/use	5 minutes 0.10 use 0.25 use		2 + 5	2 + 2	10 2 3	
								24 observed	83	47 avg day 1,308 avg month 28 davs at avg	
Maximum Use	Maximum Use Water Savings							observed		44 avg day	
	number	pot	per use cold	se total		uses/day	hot	subtotal gpd cold	total		Savings hot cold total
Bathroom	Tollet Shower Sink	- 2 -	0.8	1.28 0.2 0.25	1.28 gpf 1 gpm 0.5 gpm	4 flushes 15 minutes 0.6 minutes		- 24 0	0 6 5	30	o o
	Kitchen Sink Clothes Washing Machine Dish Washing Machine		0.5 12 5	0.5 12 5	1 gpm 24 g/use 10 g/use	7 minutes 0.15 use 0.43 use		4 0 0	400	7 4 4	4 4 7
								32 observed	6	50 max day 2,000 max month	
\verage Use \	Average Use Water Savings							observed		40 days at max 67 max day	
	number	hot	per use cold	se total		nses/day	hot	subtotal gpd cold	total		Savings hot cold total
Bathroom	Tollet Shower Sink	- 2 -	0.8	1.28 0.2 0.25	1.28 gpf 1 gpm 0.5 gpm	3 flushes 10 minutes 0.5 minutes		- 16 0	4 4 0	20 0	۲ 0
	Kitchen Sink Clothes Washing Machine Dish Washing Machine		0.5 12 5	0.5 12 5	1 gpm 24 g/use 10 g/use	5 minutes 0.1 use 0.3 use		ω ← ←	e ← ←	3 7 2	3 3 2
								21 observed observed	13	34 avg day 1,308 avg morth 39 days at avg 44 avg day	
Costs to Implement	ement										
Toilet Bathroom Sink	numbe		Hardware Insta \$ 282 \$ \$ 1.61 \$	nstallation T 95 \$ 5 \$	otal Pay Back 377 29.50 7 1.61 384	k 50 yrs 51 yrs	Water Savings (gpy) Energy Savings 2,431 246	s (kWhr) - 32	Total Cost Saving: \$ 16	19.93 \$ 19.93 4.10 \$ 4.10
	AF Savings:	ings:	0.008	\$/ AF:	AF: \$ 46,689	<u>6</u>	Replacement Water Cost*:	er Cost* : \$	246	Avoided Cost**:	\$ 25

Page 1 of 1

* Calculation based on \$30,000 per AF





The Morales's Home

Overview

The City working with Great Western Institute, conducted a SMART WATER Audit of your home at 209 S. 13th Ave. on August 25, 2010. The SMART WATER Audit was conducted as part of the City's audit project, whereby a select group of local residences volunteered to help The City complete a residential audit program intended to assist in improving water use efficiency and in doing so, reduce water and energy operational costs.

The inventory of the Morales's water using fixtures and appliances is provided in Table 1. Figure 1 presents the monthly water use at the Morales's in 2008 and 2009.

Water Use Summary

The Morales have recently moved into this home, such that past water use records are not helpful in determining their water use behaviors. Since only the July 2010 water use data was available for the water audit, no quantitative analysis could be made to evaluate indoor or outdoor water use practices at this location.

Qualitatively, in the Morales's home, two low flow toilets have been installed within the last few months. These toilets use 1.6 gallons per flush. By installing new Water Sense approved high efficiency toilets which use only 1.28 gallons per flush, the Morales's would spend \$750 with a total savings of approximately \$12 per year.

The Morales's have already installed low flow shower heads which use 2.5 gallons per minute. They also have a new Water Sense clothes washer which uses only 18 gallons per load.

The bathroom hand wash sinks use between 2.5 and 3 gallons per minute. Replacing these sinks with the new 0.5 gallon per minute faucet aerators would cost about \$6 per sink and save a combined water and energy savings of on average about \$6 per sink per year.

The significant source of the Morales's water use is a result of their large irrigated yard. They have irrigation covering two lots of which a majority is turf grass. They expressed an interest in cutting back on their water use by installing Xeriscape gardens and replacing turf with rocks. The Rain Bird irrigation controller at the Morales's home is an older version and is not compatible with programming to the City's watering schedule. Mr. Morales runs the sprinklers by hand every 3-5 days in order to avoid conflicts with the City's required watering schedule. Note that the Morale's water use in July 2010 is consistent with the irrigation applied by a previous owner/renter in 2009.

Table 1 - Inventory for Morales Residence Water Using Fixtures and Appliances

Address	209 S. 13th Ave	Ave						
Contact	Mary Morales	les						
Date	8/25/2010							
Type of Business	Residential							
Account Number	13.0525.0.3	3						
Notes								
Built Date 1962	1962							
# of People	3							
<u>Toilets</u>	1.28 gpf	1.6 gpf	2.0 gpf	3.5 gpf				Comment
Bathroom 1		1						Brand new toilet
Bathroom 2	7	1						Brand new toilet
Shower	1.2 gpm	2.5 gpm	5 gpm					
Bathroom 1		1						
Bathroom 2	ī	1						
<u>Sinks</u>	0.5 gpm	1 gpm	2 gpm	2.5 gpm	3 gpm	5 gpm	6 gpm	
Kitchen		1						
Bathroom 1			1					
Bathroom 2					1			
Other Uses	Use	Make		Model		Capacity		
Dish Washer								
		Fridgeaire Gallery	Gallery	DGBD2432KFL	2KFL			Only used w/ company, 1/month
Clothes Washer	L							
		Samsung		WF210ANWXAA	WXAA			Brand new
Refrigeration	ı							
		Samsung		RB217ABPN	N			Ice maker
Cooling Towers	9							
								Swamp Cooler in Living Room
Outdoor Irrigation	Sprinklers;	Sprinklers; used 1 to 2 ti	times/wee	mes/week or every 5 days	days			
	Yard size =	2 lots; Fron	t = approxir	nately 225	ft x 195 ft +	54 ft x 36 f	Yard size = 2 lots; Front = approximately 225 ft x 195 ft + 54 ft x 36 ft; Back = 45 ft x 93 ft	
	Controls th	e sprinklers	manually.	Each zone	set to 20 m	Controls the sprinklers manually. Each zone set to 20 mintues each.		





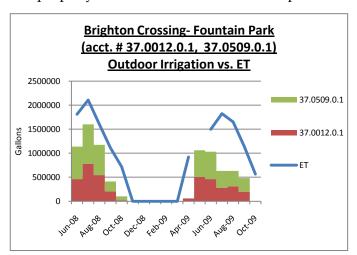
Brighton Crossing HOA

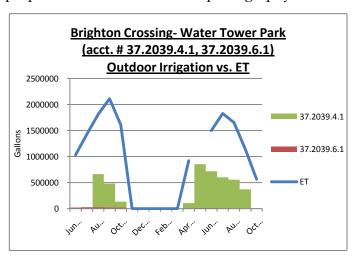
Overview

The City of Brighton, working with Great Western Institute, conducted a SMART WATER Audit of four separate outdoor Brighton Crossing taps in August, 2010. The SMART WATER Audit was conducted as part of the City's audit project; whereby a small group of volunteer home owners associations' irrigation systems were evaluated, and a comparison of actual water use data was made against expected water usage during the summer months. The SMART WATER Audit program is intended to assist Brighton's water customers improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Irrigation at the Brighton Crossing is managed by Overlook Property Management. The two outdoor taps (37.0012.0.1 and 37.0509.0.1) used in the Fountain Park area of Brighton Crossing irrigate an a combined area of nine acres; and the two taps (37.2039.4.1 and 37.2039.6.1) together used to irrigate the Water Tower Park area of Brighton Crossing cover about three and a half acres. All of these taps utilize automated sprinkler systems to irrigate turf and various landscape materials in the Brighton Crossing area. Irrigated area was estimated for each property based on a review of as-built plats of the properties, verified with aerial photography.





Seasonal evapotranspiration (ET) was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate ET for a given location and prevailing weather conditions (based on average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center.

Monthly observed water use is compared to estimated ET for both irrigation areas in the above figures. As indicated in these figures, irrigation in both sections of Brighton Crossing is below the budgeted irrigation rates for every summer month with observed monthly water use data.

Note that, there may be locations within the irrigation delivery system that were over irrigated; however, the audit conducted by the City, within the limitations of the CWCB grant, was unable to differentiate water application rates for individual turf areas. If suspicions of localized overwatering exist in Brighton Crossing, more rigorous testing of the existing irrigation system may be warranted to better characterize localized irrigation practices.





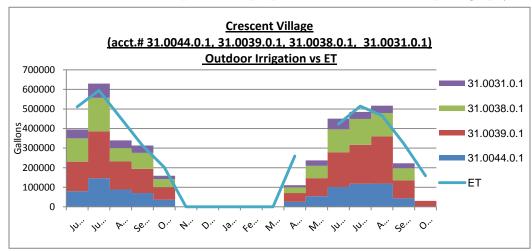
Crescent Village HOA

Overview

The City of Brighton, working with Great Western Institute, conducted a SMART WATER Audit of four separate outdoor Crescent Village taps in August, 2010. The SMART WATER Audit was conducted as part of the City's audit project; whereby a small group of volunteer home owners associations' irrigation systems were evaluated, and a comparison of actual water use data was made against expected water usage during the summer months. The SMART WATER Audit program is intended to assist Brighton's water customers improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Crescent Village's four outdoor taps (31.0044.0.1, 31.0039.0.1, 31.0038.0.1, 31.0031.0.1) irrigate a combined area of about two and a half acres. All of these taps utilize automated sprinkler systems to irrigate turf and various landscape materials in the Crescent Village area. Irrigated area was estimated for each property based on a review of as-built plats of the properties, verified with aerial photography.



Seasonal evapotranspiration (ET) was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate ET for a given location and prevailing weather conditions (based on average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center.

Monthly observed water use is compared to estimated ET for both irrigation areas in the above figures. As indicated in these figures, irrigation in Crescent Village follows the budgeted irrigation rates for every summer month with observed monthly water use data.

Note that, there may be locations within the irrigation delivery system that were over irrigated; however, the audit conducted by the City, within the limitations of the CWCB grant, was unable to differentiate water application rates for individual turf areas. If suspicions of localized overwatering exist in Crescent Village, more rigorous testing of the existing irrigation system may be warranted to better characterize localized irrigation practices.





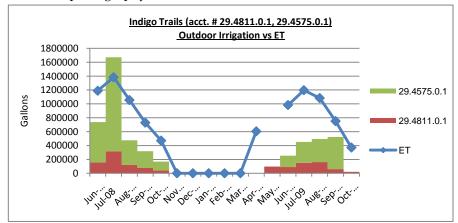
Indigo Trails HOA

Overview

The City of Brighton, working with Great Western Institute, conducted a SMART WATER Audit of two separate outdoor Indigo Trails taps in August, 2010. The SMART WATER Audit was conducted as part of the City's audit project; whereby a small group of volunteer home owners associations' irrigation systems were evaluated, and a comparison of actual water use data was made against expected water usage during the summer months. The SMART WATER Audit program is intended to assist Brighton's water customers improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Irrigation at the Indigo Trails is managed by Homestead Management. Indigo Trails' two outdoor taps (29.4575.0.1, 29.4811.0.1) irrigate a combined area of just under six acres. All of these taps utilize automated sprinkler systems to irrigate turf and various landscape materials in the Indigo Trails area. Irrigated area was estimated for each property based on a review of as-built plats of the properties, verified with aerial photography.



Seasonal evapotranspiration (ET) was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate ET for a given location and prevailing weather conditions (based on average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center.

Monthly observed water use is compared to estimated ET for both irrigation areas in the above figures. As indicated in these figures, irrigation in Indigo Trails is below the budgeted irrigation rates for every summer month with observed monthly water use data.

Note that, there may be locations within the irrigation delivery system that were over irrigated; however, the audit conducted by the City, within the limitations of the CWCB grant, was unable to differentiate water application rates for individual turf areas. If suspicions of localized overwatering exist for Indigo Trails, more rigorous testing of the existing irrigation system may be warranted to better characterize localized irrigation practices. The irrigation system clocks should also be checked to verify that the correct seasonal watering adjustments are being made. The irrigation system clocks should also be checked to verify that the correct seasonal watering adjustments are being made.





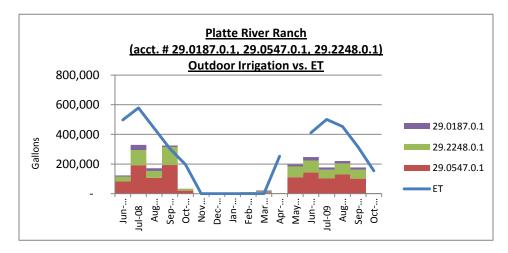
Platte River Ranch HOA

Overview

The City of Brighton, working with Great Western Institute, conducted a SMART WATER Audit of three separate outdoor Platte River Ranch taps in August, 2010. The SMART WATER Audit was conducted as part of the City's audit project; whereby a small group of volunteer home owners associations' irrigation systems were evaluated, and a comparison of actual water use data was made against expected water usage during the summer months. The SMART WATER Audit program is intended to assist Brighton's water customers improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Irrigation at the Platte River Ranch is managed by Overlook Property Management. Platte River Ranch's three outdoor taps (29.0187.0.1, 29.0547.0.1, 29.2248.0.1) irrigate a combined area of about two and a half acres. All of these taps utilize automated sprinkler systems to irrigate turf and various landscape materials in the Platte River Ranch area. Irrigated area was estimated for each property based on a review of as-built plats of the properties, verified with aerial photography.



Seasonal evapotranspiration (ET) was estimated using the Northern Colorado Water Conservancy District's Turf Irrigation Management (TIM) Program, which utilizes the 1985 Hargreaves equation to calculate ET for a given location and prevailing weather conditions (based on average daily temperature and precipitation). Daily weather data for Brighton in 2008 and 2009 was obtained from the NOAA National Data Center.

Monthly observed water use is compared to estimated ET for both irrigation areas in the above figures. As indicated in these figures, irrigation in Platte River Ranch is below the budgeted irrigation rates for every summer month with observed monthly water use data.

Note that, there may be locations within the irrigation delivery system that were over irrigated; however, the audit conducted by the City, within the limitations of the CWCB grant, was unable to differentiate water application rates for individual turf areas. If suspicions of localized overwatering exist in Platte River Ranch, more rigorous testing of the existing irrigation system may be warranted to better characterize localized irrigation practices. The irrigation system clocks should also be checked to verify that the correct seasonal watering adjustments are being made.

Appendix D Smart Water Audit Reports for Each City Facility



SMART WATER Audit Report

Brighton City Hall



Overview

The City of Brighton working with Great Western Institute conducted a SMART WATER Audit of this facility at 22 South 4th Avenue in Brighton in July of 2009. The SMART WATER Audit was conducted as part of the District's demonstration audit project, whereby a small group of City facilities was selected to help the City of Brighton complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Brighton City Hall uses water in a manner consistent with other small government facilities throughout Colorado. Similar to many facilities built before 1993, Brighton City Hall has sinks, urinals and toilets that have not been updated with water efficient fixtures that are currently available in the marketplace.

A water demand model was created to estimate maximum and average daily water uses per existing fixture and to project the annual water savings that may be realized with the installment of new water smart fixtures. The water demand model for Brighton City Hall included the following assumptions:

- The water demand model for Brighton City Hall was configured and calibrated with the monthly water use data from 2009
- An analysis of the monthly water use data for Brighton City Hall indicated that there is no existing outdoor irrigation; therefore, no evaluation was performed to characterize outdoor water use for this property

Based on the 2009 audit, the following fixture replacements occurred in May and June of 2010. There are a total of eleven sink faucet aerators in the public restrooms in Brighton City Hall. Four of these faucet aerators were found to already be low-flow fixtures, using only 0.5 gallons of water per minute (gpm), while the remaining seven sink faucet aerators used 2 gpm. An additional six faucet aerators, located in private restrooms, used 1.5 gpm. These thirteen aerators were replaced with 0.5 gpm aerators at a cost of about \$7 per sink and are estimated to have a water and energy savings of approximately \$23 per year per sink. This savings results in a payback period of 3.5 months.

There are thirteen toilets located in the public restrooms in Brighton City Hall. Three of these public toilets are flushometer toilets and use 1.6 gallons of water per flush (gpf). Due to the flushing-valve mechanism on these toilets, new water smart toilet installations come at a higher cost, which ultimately negates the cost-effectiveness of the retrofits; therefore, these three toilets were not replaced. Six more toilets found in the private restrooms used an average of 4 gpf. Ten public toilets and four private toilets were replaced with new Water Sense approved high efficiency toilets which use 1.28 gpf at a cost of \$377 per toilet. These retrofits are estimated to have a water and energy savings of approximately \$61 per year per toilet, resulting in a payback period of just over six years.

In total, 14 toilets and 13 faucet aerators were updated in Brighton City Hall at a cost of \$5,364. From the water demand model, it is estimated that a total annual water and energy cost savings of \$1,151 will result from these changes, saving nearly 122,144 gallons in water and 2,305 kilowatt hours of energy annually.

Table 1 - Summary of Current Water Use and Potential Water Savings City Hall Audit

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	total		200	72	360		135			169	24	79	240		55.2	32.0	1,666 max day	50,000 max month	30 days at max	1,667 max day
	to		200	72	360		135			85	12	39	120		55.2	32.0	1,410			
subtotal gpd	cold									85	12	39	120		0	0	256	observed		observed
	hot																			
	uses/day		20 flushes	15 flushes	15 flushes		45 flushes					5.3 minutes			3 daily	2 loads				
	л 		2.5 gpf	1.6 gpf	4.0 gpf		1.0 apf			2.0 gpm	0.5 gpm	2.5 gpm	5.0 gpm		18.4 gp 100#	16 gpl	i			
	total		2.5	1.6	4.0		1.0	2		1.0	0.25	1.25	2.5		18.4	16				
ber use	ploo											1.25								
	hot	19	10	က	9	٣	, m	,	21	7	4	6	4		_	_				
	number	Toilets	Public Restrooms (tanks)	Public Restrooms (flushometers)	Private	Irinals	Public Restrooms		Sinks	Public Restrooms (other)	Public Restrooms (0.5 gpm currently)	Private	Galleys	Other	Ice Maker (Scotsman C0830MA)	Dish Washer (Hobart 271001481)				

Average Use Calculations

10 1.6 gpf 10 flushes				ber use	Ф				subtotal gpd		
19 1.0		number	hot	ploo			ses/day	hot	ploo	to	otal
tetres) 10 - 2 5 9pf 10 flushes - 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Toilets		19								
Hushes 5 - 1.6 gpf 5 flushes - 24 Thyrate 6 - 4.0 gpf 10 flushes - 240 3 - 1.0 1.0 gpf 33 flushes - 240 21	Public Restrooms (tanks)	•	10		2.5		10 flushes			250	250
10 10 10 10 10 10 10 10	Public Restrooms (flushometers)	~	ဗ		1.6		5 flushes			24	24
come 3 - 1.0 gpf 33 flushes - 99 other) 21 1.0 1.0 gpm 2.9 minutes 20 20 20 remity) 4 0.25 0.25 gpm 2.9 minutes 3 3 3 rivate 6 1.25 1.25 2.5 gpm 1.5 minutes 80 80 80 alleys 4 2.5 2.5 5.0 gpm 8.0 minutes 8.0 minutes 80 18.4 1 - 18.4 gp 100# 1 daily 0 18.4 1 - 16 gpl 1 daily 0 16.0 1 - 16 gpl 1 loads 115 Observed	Private	. 0	9		4.0		10 flushes			240	240
come 3 - 1.0 gpf 33 flushes - 99 other) 7 1.0 2.0 gpm 2.9 minutes 2.0 2.0 2.0 remitty) 4 0.25 0.25 gpm 1.5 minutes 3 3 3 alleys 4 2.5 gpm 1.5 minutes 8.0 minutes 8.0 minutes 8.0 18.4 alleys 4 2.5 2.5 gpm 1.6 gpl 1 daily 0 18.4 1 - 16 gpl 1 daily 0 16.0 16.0 1 - 16 gpl 1 loads 115 Accessived	Irinals		က								
21 1.0 1.0 2.0 gpm 2.9 minutes 20 20 20 20 20 20 20 20 20 20 2.5 gpm 2.9 minutes 3 11 11 11 2 18.4 18.4 gp 100# 1 floads 20 20 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Public Restrooms	S	က		1.0		33 flushes			66	66
other) 7 1.0 10 2.0 gpm 2.9 minutes 20 20 20 20 20 20 20 20 20 20 20 20 20	inks		21								
ently) 4 0.25 0.25 0.5 gpm 2.9 minutes 3 3 3 3 3 3 3 3 3 4	Public Restrooms (other)	_	7	1.0	1.0	2.0 gpm			20	20	41
11 - 18.4 pp 100# 1 loads 115	Public Restrooms (0.5 gpm currently)	-	4	0.25	0.25	0.5 gpm			က	က	9
Alleys 4 2.5 2.5 5.0 gpm 8.0 minutes 80 80 80 80 80 80 80 80 80 80 80 80 80	Private	ø.	9	1.25	1.25	2.5 gpm			11	11	23
184 18.4 gp 100# 1 daily 0 18.4 18.6 gpl 1 loads 0 16.0 16.0 16.0 1762 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Galleys	s	4	2.5	2.5	5.0 gpm	8.0 minutes		80	80	160
1 - 18.4 18.4 gp.100# 1 daily 0 18.4 18.4 16. gpl 1 loads 0 16.0 16.0 16.0 176.2 115 76.2 observed	ther										
1 - 16 gpl 1 loads 0 16.0 115 762 observed observed	e Maker (Scotsman C0830MA)		-		18.4	18.4 gp 100#	1 daily		0	18.4	18.4
115 762 observed observed	ish Washer (Hobart 271001481)		-		16	16 gpl	1 loads		0	16.0	16.0
									115	762	877 avg day
									observed		26,167 avg month
											30 days at av
									observed		872 avg day

Table 1 - Summary of Current Water Use and Potential Water Savings City Hall Audit

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Maximum Use Savings														
			per	ber use				subtotal gpd			Savings			
	number	hot	ploo	d total		uses/day	hot	ploo	to	total	Hot	Cold Total	Total	ì
Toilets		19												
Public Restrooms (tanks)		10		06:0	0.9 gpf	20 flushes			180	180		320	320	_
Public Restrooms (flushometers)		3		1.6	1.6 gpf	15 flushes			72	72				
Private		9		1.9	1.9 gpf	15 flushes			171	171	•	189	189	_
Urinals		ო												
Public Restrooms		ဗ		1.0	1.0 gpf	45 flushes			135	135	•			
Sinks		21												
Public Restrooms (other)		7	0.25	0.25	0.5 gpm	12 minutes		21	21	42	63	63	127	
Public Restrooms (0.5 gpm currently)		4	0.25	0.25				12	12	24				
Private		9	0.25	0.25	0.5 gpm	5 minutes		8	80	16	32	32	63	~
Galleys		4	2.5	2.5	5.0 gpm			120	120	240				
Other														
Ice Maker (Scotsman C0830MA)		-		18.4	18.4 gp 100#	3 daily		0	55.2	55.2				
Dish Washer (Hobart 271001481)		-		16	16 gpl	2 loads		0	32.0	32.0				
								161	908	967 max day				
								observed						
										52 days at max				
								observed		1,667 max day				

Average Use Calculations

]			
			per use	9				subtotal gpd			Savings			ı
mnu	number	hot	ploo	total		uses/day	hot	ploo	total	al	Hot	Cold	Total	1
Toilets	_	19												
Public Restrooms (tanks)	-	. 10		0.90	0.90 gpf	10 flushes			06	06		160		_
Public Restrooms (flushometers)		_.		1.6	1.6 gpf	5 flushes			24	24				
Private		9		1.9	1.9 gpf	10 flushes			114	114		126		'
Urinals		ო												
Public Restrooms		m		1.0	1.0 gpf	33 flushes			66	66				
Sinks	2	21												
Public Restrooms (other)		7 0		0.25		3 minutes		2	2	10	15	15	31	
Public Restrooms (0.5 gpm currently)	•	4		0.25		3 minutes		က	ဇ	9				
Private		0 9	0.25	0.25	0.5 gpm	2 minutes		2	2	22	6	6	18	_
Galleys		4		2.5	5.0 gpm	8 minutes		80	80	160		•	٠	
Other														
Ice Maker (Scotsman C0830MA)		_		18.4	18.4 gp 100#	1 daily		0		18.4		•		
Dish Washer (Hobart 271001481)		_		16	16.0 gpl	1 loads		0	16.0	16.0			•	
					i			06		542 avg day				
								observed		26,167 avg month				
										48 days at avg				
								opserved		872 avg day				

Costs to Implement						
	number Hardware	Installation Total	ď	Water Savings (gpy) Energy Savings (kWhr)	Total Cost Savings/yr Total Cost Savings/yr/fixture	je.
Toilet	14 \$ 282	\$ 96 \$	5,278 6.17 yrs	104,390	26	
Sink	13 \$ 1.61	22	86 0.29 yrs	17,754 2,305	\$ 295 \$ 23	
		Θ	5,364		\$ 1,151	
	AF Savings: 0.37	\$/AF:	\$ 14,310	Replacement Water Cost*: \$ 11,245	Avoided Cost**: \$ 1,160	
				* Calculation based on \$30,000 per AF	** Calculation based on \$9.50/ 1000 gal	

Calculation | 25.007 Floor gall | Cost Savings Assumptions: \$8.5071000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report Inglenook



Overview

The City of Brighton working with Great Western Institute conducted a SMART WATER Audit of this facility at 2195 Egbert St in Brighton in May of 2009. The SMART WATER Audit was conducted as part of the District's demonstration audit project, whereby a small group of City facilities was selected to help the City of Brighton complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Inglenook uses water in a manner consistent with other retirement communities throughout Colorado. Similar to many facilities built before 1993, Inglenook has sinks, showers and toilets that have not been updated with water efficient fixtures that are currently available in the marketplace.

A water demand model was created to estimate maximum and average daily water uses per existing fixture and to project the annual water savings that may be realized with the installment of new water smart fixtures. The water demand model for Inglenook included the following assumptions:

- The water demand model for Inglenook was configured and calibrated with the monthly water use data from 2008
- An analysis of the monthly water use data for Inglenook indicated that some outdoor irrigation exists;
 therefore, a monthly winter average was calculated and used for the water demand model so as to isolate and define indoor water use only.

There are a total of 112 personal bathroom sinks (one for each residence) that used 3.5 gallons of water per minute (gpm). In addition, there are 6 public restroom sinks which had flows of 2.5 gpm. All six public sinks and 81 personal sinks were replaced with 0.5 gpm low flow sink faucet aerators at a cost of about \$7 per sink and are estimated to have a water and energy savings of approximately \$10 per year per sink. This savings results in a payback period of about eight months.

Each of the 112 showerheads in Inglenook had existing flows of 2.5 gpm. Of these, 30 showerheads were replaced with 1.5 gpm low flow fixtures at a cost of about \$43 per showerhead and are estimated to have a water and energy savings of approximately \$133 per year per fixture. This savings results in a payback period of about four months.

The six public toilets at Inglenook used 2.2 gallons of water per flush (gpf) and the 112 personal had flows of 2.4 gpf. All six public toilets and 30 personal toilets were replaced with new Water Sense approved high efficiency toilets which use 1.28 gpf at a cost of \$377 per toilet.

In total, 87 sinks, 30 showers and 36 toilets were updated in Inglenook at a total cost of \$15,437. From the water demand model, it is estimated that a total annual water and energy cost savings of \$5,410 will result from these changes, saving nearly 304,147 gallons in water and 44,861 kilowatt hours of energy annually.

Table 1 - Summary of Current Water Use and Potential Water Savings Inglenook Audit

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	Ī		1,322	134		5,040		294	1,400	360	23		30	150	480	1,600	74	09	10,966 max day	329,000 max month	30 days at max	10,967 max day
	total		1,322	134		1,008		147	200	180	+		30	150	480	1,600	74	09	5,895			
subtotal gpd	cold					4,032		147	200	180	11								5,070	observed		observed
	hot																					
	nses/day		5 flushes	10 flushes		18 minutes		0.8 minutes	5 minutes	20 minutes	1.5 minutes		1 daily	1 daily	10 loads	10 loads	4 daily	50 loads				
				2.2 gpf		2.5 gpm				3.0 gpm	2.5 gpm					40 gpd			i			
ase	total		2.4	2.2		0.5		1.8	1.3	1.5	1.3		30	150	24	40	18.4	1.2				
ber use	ploo		,			2.0		1.8	1.3	1.5	6.1					,						
	hot	118	112	9	112	112	236	112	112	9	9		-	-	2	4	-	-				
	number		Rooms	Public		Rooms		Bath in Rooms	Kitchen in Rooms	Kitchen/Laundry	Other Restrooms		Maneurop Inc Water Cooled Compressor	Rezcon (swamp cooler for kitchen)	3 Tromm)	Laundry (Maytag/Whirlpool Top Loader)	ice Maker (Manitowoc Series 450)	Dish Washer (Jackson ES2000)				
		Toilets			Showers		Sinks					Other	Maneurop I	Rezcon (sw	Laundry (LG Tromm)	Laundry (M.	Ice Maker (Dish Wash				

Average Use Calculations

			925	80		4,200		206	1,400	270	14		30	150	384	.280	36.8	48.0	.024 avg day	.714 avg month	30 days at avg	9,024 avg day
	total		925	80		840 4			700					150								6
subtotal gpd	ploo					3,360		103	200	135	7		0	0	0	0	0	0	4,305	observed		opserved
	hot		60	60		S		SS	SS	S	S											
	uses/day		3.5 flushes	e flushes		15 minutes		0.5 minute	5 minutes	15 minute	0.9 minute		1 daily	1 daily	8 loads	8 loads	2 daily	40 loads				
			2.4 gpf	2.2 gpf		2.5 gpm			2.5 gpm		2.5 gpm			150 gpd								
es es	total		2.4	2.2		0.5		1.8	1.3	1.5	1.3		30	150	24	40	18.4	1.2				
ber use	ploo		,			2.0		1.8	1.3	1.5	1.3		,				,					
	hot	118	112	9	112	112	236	112	112	9	9		-	-	7	4	-	-				
	number		Rooms	Public		Rooms		Bath in Rooms	Kitchen in Rooms	Kitchen/Laundry	Other Restrooms		Maneurop Inc Water Cooled Compressor	Rezcon (swamp cooler for kitchen)	(mmc	g/Whirlpool Top Loader)	itowoc Series 450)	Dish Washer (Jackson ES2000)				
		Toilets			Showers		Sinks					Other	Maneurop Inc ∿	Rezcon (swam	Laundry (LG Tr	Laundry (Mayta	Ice Maker (Mar	Dish Washer (J				

Table 1 - Summary of Current Water Use and Potential Water Savings Inglenook Audit

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Maximum Use Potential Savings												
			per use				subtotal gpd			savings		
unu	number	hot c	cold total		nses/day	hot	ploo	total			cold total	al
Toilets	118											
Rooms	112		2.0	2.0 gpf	5 flushes			1,120	1,120		202	202
Public	9		06:0	0.9 gpf				54	54		80	80
Showers	112											
Rooms	112	1.8	0.4	2.2 gpm	18 minutes		3,548	887	4,435	484	121	909
Sinks	236											
Bath in Rooms	112	0.65	0.65	1.3 gpm			55	22	109	92	92	185
Kitchen in Rooms	112	1.25	1.25	2.5 gpm			700	200	1,400			
Kitchen/Laundry	9	1.5	1.5	3.0 gpm	20 minutes		180	180	360			
Other Restrooms	9	0.25	0.25	0.5 gpm	1.5 minutes		2	2	2	6	6	18
Other												
Maneurop Inc Water Cooled Compressor	_		30		1 daily			30	30			
Rezcon (swamp cooler for kitchen)	_		150	150 gpd	1 daily			150	150			
Laundry (LG Tromm)	2		24					480	480			
Laundry (Maytag/Whirlpool Top Loader)	4		40	40 gpd	10 loads			1,600	1,600			
Ice Maker (Manitowoc Series 450)	_		18.4					74	74			
Dish Washer (Jackson ES2000)	-		1.2	1.2 gpl				09	09			
							4,485	5,391	9,877 max day			
							observed		329,000 max month			
									33 days at max			
							observed		10,967 max day			

Average Use Potential Savings

	,												
			ber use	ě				subtotal gpd			savings		
	number	hot	ploo	total		uses/day h	hot	cold	total		hot cold	total	
Toilets	-	118											
Rooms		112	,	2.0	2.0 gpf	3.5 flushes			784	784		141	141
Public		9		0.90		e flushes			32	32		48	48
Showers	_	112											
Rooms	Υ-	112	1.8	0.4	2.2 gpm	15 minutes		2,957	739	3,696	403	101	504
Sinks	N	236											
Bath in Rooms	-	112 0.	.65	0.65	1.3 gpm			88	38	92	92	65	129
Kitchen in Rooms	-		.25	1.25	2.5 gpm			200	200	1,400			
Kitchen/Laundry		9	1.5	1.5	3.0 gpm	15 minutes		135	135	270			
Other Restrooms			1.25	0.25	0.5 gpm			-	-	3	2	2	£
Other													
Maneurop Inc Water Cooled Compressor		-		30	30 gpd	1 daily		0	30	30			
Rezcon (swamp cooler for kitchen)		-		150	150 gpd	1 daily		0	150	150			
Laundry (LG Tromm)		2		24	24 gpd	8 loads		0	384	384			
Laundry (Maytag/Whirlpool Top Loader)		4		40	40 gpd	8 loads		0	1,280	1,280		,	
Ice Maker (Manitowoc Series 450)		<u>-</u>	,	18.4	18.4 gp 100#	2 daily		0	36.8	36.8			
Dish Washer (Jackson ES2000)		·	,	1.2	1.2 gpl			0	48.0	48.0			
								3,831	4,359	8,190 avg day			
								observed		270,714 avg month			
								-		33 days at avg			
								observed		9,024 avg day			

	unmper	Hardware	nstallation	Total F	Pay Back	Water Savings (gpy) Energy Sa	Energy Savings (kWhr)	Total Cost Savings/yr	1S/yr	Total Cc	Total Cost Savings/yr/fixture
oilet	36	5 \$ 282 \$	\$ 96 \$	13,572	23.98 yrs	63)053		69	266	s	16
Shower	30	33 \$	3 10 \$	1,290	0.32 yrs	183,960	38,218	ь	3,993	€	133
Sink	87	7 \$ 2 \$	69 69	575	0.68 yrs	51,158	6,643	क क	851 5.410	69	10
			•					•			
	AF Savings:	0.93	\$/AF:	. :	16,539	Replacement Water Cost*: \$	28,002	Avoided Cost**:	\$ 2,889	-I	
						C C C C C C C C C C C C C C C C C C C				-	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report





Overview

The City of Brighton working with Great Western Institute conducted a SMART WATER Audit of this facility at 3401 East Bromley Lane in Brighton in July of 2009. The SMART WATER Audit was conducted as part of the District's demonstration audit project, whereby a small group of City facilities was selected to help the City of Brighton complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Brighton Police Station uses water in a manner consistent with other small government facilities throughout Colorado. Similar to many facilities built before 1993, Brighton Police Station has sinks, showers, urinals and toilets that have not been updated with water efficient fixtures that are currently available in the marketplace.

A water demand model was created to estimate maximum and average daily water uses per existing fixture and to project the annual water savings that may be realized with the installment of new water smart fixtures. The water demand model for Brighton Police Station included the following assumptions:

- The water demand model for Brighton Police Station was configured and calibrated with the monthly water use data from 2009
- An analysis of the monthly water use data for Brighton Police Station indicated that some outdoor
 irrigation exists; therefore, a monthly winter average was calculated and used for the water demand
 model so as to isolate and define indoor water use only

Based on the 2009 audit, the following fixture replacements occurred in May and June of 2010. There are four public restroom sinks and four locker room sinks, all of which had flows of two gallons of water per minute (gpm). The five holding cells each contain a sink that used 2.5 gpm and the four galley sinks used five gpm. All of these sinks, except two galley sinks were replaced with 0.5 gpm low flow sink faucet aerators at a cost of about \$7 per sink with an estimated water and energy savings of \$28 per year per fixture. This savings results in a payback period of about three months.

There are three existing showerheads located in the Police Station locker rooms that had flows of 2.5 gpm. Two of these showerheads were replaced with 1.5 gpm low flow showerheads at a cost of about \$43 per fixture, resulting in an estimated water and energy savings of \$166 per year per fixture. This savings also results in a payback period of about three months.

In total, 15 sink faucet aerators and two showerheads were replaced in the Brighton Police Station for a total cost of \$185. From the water demand model, it is estimated that a total annual water and energy cost savings of \$752 will result from these changes, saving nearly 40,506 gallons in water and 6,454 kilowatt hours of energy annually.

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Police Station Audit

Maximum Use Calculations

			peruse				subtotal gpd		
וע	number	hot	cold total		uses/day	hot	ploo	total	
Toilets	20								
Public Restrooms (flushometers)	7		1.6		4 flushes	•	45	45	
Locker Rooms (flushometers)	80		1.6	1.6 gpf	3 flushes	•	38	38	
Holding Cells	S		1.6	1.6 gpf	2 flushes	•	16	16	
Urinals	2								
Public Restrooms	2		1.0		7 flushes	•	14	14	
Locker Rooms	2	,	1.0	1.0 gpf	10 flushes		20	20	
Holding Cells	-		1.0		3 flushes	•	က	ဧ	
Showers	ო								
Locker Rooms	က	2.0	0.5	2.5 gpm	20.0 minutes	120	30	150	
Sinks	17								
Public Restrooms	4	1.0	1.0		1.6 minutes			13	
Locker Rooms	4	1.0	1.0		1.7 minutes			13	
Holding Cells	2	1.25	1.25	2.5 gpm	0.4 minutes		2 2	2	
Galleys	4	2.5	2.5		5.0 minutes	ψ)		100	
Other	*		0		2007		0	27	
Ice inlane! (Scots) all Cossolina)			t :	ndh +:0:	#001 db 7			10	
Dish Washer (Hobart 271001481)	_		16		1 loads	i	16	16	
						185		470 max day	
							observed	14,000 max month	
								30 days at max	
							observed	467 max day	

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Police Station Audit

Average Use Calculations

. 32 32		120 30 150	5 5 9 11 2 2 5 5 5 5 60 50 100	- 18 18 18 18 18 18 18 18 18 18 18 18 18
2.5 flushes 2 flushes	5 flushes 8 flushes 3 flushes	20.0 minutes	1.2 minutes 1.4 minutes 0.4 minutes 5.0 minutes	1 gp 100# 1 loads
1.6 gpf	1.0 gpf 1.0 gpf 1.0 gpf	2.5 gpm	2.0 gpm 2.0 gpm 2.5 gpm 5.0 gpm	18.4 gpd 16 gpl
. . 	1.0 1.0 1.0	0.5	1.0 1.0 1.25 2.5	18.4 16
. w w	7 2 2 2	. s s	77 4 4 4 1.0 2.1 4 4 2.5	
Locker Rooms (flushometers) Holding Cells	Public Restrooms Locker Rooms Holding Cells	vers Locker Rooms	Public Restrooms Locker Rooms Holding Cells Galleys	Other Ice Maker (Scotsman C0830MA) Dish Washer (Hobart 271001481)
	8 - 1.6 1.6 gpf 2.5 flushes - 32 5 - 1.6 1.6 gpf 2 flushes - 16	8 - 1.6 1.6 gpf 2.5 flushes - 32 5 - 1.6 1.6 gpf 2 flushes - 32 5 - 1.0 1.0 gpf 5 flushes - 10 7 - 1.0 1.0 gpf 8 flushes - 16 7 - 1.0 1.0 gpf 8 flushes - 16 7 - 1.0 1.0 gpf 3 flushes - 3	Locker Rooms (flushometers) 8 - 1.6 1.6 gpf 2.5 flushes - 32 32 32 32 32 32 32	Locker Rooms (flushometers) 8 - 1.6 gpf 2.5 flushes - 32 Holding Cells 5 - 1.6 gpf 2 flushes - 16 Public Restrooms 2 - 1.0 1.0 gpf 5 flushes - 16 Locker Rooms 1 - 1.0 1.0 gpf 5 flushes - 16 Holding Cells 1 - 1.0 1.0 gpm 20.0 minutes - 16 Public Restrooms 4 1.0 1.0 2.0 gpm 1.2 minutes 5 5 5 Locker Rooms 4 1.0 1.0 2.0 gpm 1.4 minutes 5 5 5 Galleys 5 1.25 2.5 gpm 5.0 minutes 50 50 50

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Police Station Audit

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		ber use	Ф				subtotal gpd	pdf		Savings		
number	hot	ploo	total		uses/day	hot	ploo	i total		Hot Cold	d Total	a
Toilets	20											
Public Restrooms (flushometers)	7	0	1.6	1.6 gpf	4 flushes			45	45			
Locker Rooms (flushometers)	80	0	1.6	1.6 gpf	3 flushes		,	38	38			
Holding Cells	2	0	1.6	1.6 gpf	2 flushes		,	16	16			
Urinals	2											
Public Restrooms	2	0	_		7 flushes			14	14			
Locker Rooms	7	0	_	1.0 gpf	10 flushes			20	20			
Holding Cells	-	0	_		3 flushes			က	က			
Showers	က								i			
Locker Rooms	က	1.44	98.0	1.8 gpm	20 minutes		98	22	108	34	80	42
-11:0	ļ											
SILIKS	<u> </u>								. '	•	ı	•
Public Restrooms	4	0.25	0.25		1.6 minutes		7	7	က	2	2	ი
Locker Rooms	4	0.25	0.25	0.5 gpm	1.7 minutes		7	2	က	2	2	10
Holding Cells	2	0.25	0.25		0.4 minutes		0	0	_	2	7	4
Galleys	4	1.25	1.25	2.5 gpm	5 minutes		52	25	20	25	52	20
Other												
Ice Maker (Scotsman C0830MA)	-	0	18.4	18.4 gpd	2 gp 100#			37	37			
Dish Washer (Hobart 271001481)	_	0	16	16.0 gpl	1 loads			16	16			
							115	239	354 max day			
							sqo	observed	14,000 max month			
							sqo	observed	467 max day			

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Police Station Audit

Average Use Calculations

		peruse	Se				Subtotal and	þ		Savings		
roden a	†	700	10404		7000	+04	ploo	10404			T	Lotol
Toilets	20	000	iolai		dses/day	<u> </u>			-			ַּ
Public Restrooms (flushometers)	7	0	1.6		3 flushes			34	34			
Locker Rooms (flushometers)	80	0	1.6	1.6 gpf	2.5 flushes			32	32			
Holding Cells	2	0	9.1	1.6 gpf	2 flushes			16	16			
Urinals	2											
Public Restrooms	2	0	_		5 flushes			10	10			
Locker Rooms	2	0	_	1.0 gpf	8 flushes			16	16			
Holding Cells	-	0	-		3 flushes			က	3	,		
Showers	ო											
Locker Rooms	ო	1.44	0.36	1.8 gpm	20 minutes		98	22	108	34	ω	42
Sinks	17											
Public Restrooms	4	0.25	0.25		1.1625 minutes		-	_	2	ო	က	7
Locker Rooms	4	0.25	0.25	0.5 gpm	1.35 minutes		_	-	3	4	4	ø
Holding Cells	2	0.25	0.25		0.39 minutes		0	0	-	2	7	4
Galleys	4	1.25	1.25		5 minutes		25	25	20	25	25	20
Other Ice Maker (Scotsman C0830MA)	-	0	4.8.4		1 ap 100#		,		4			
Dish Washer (Hobart 271001481)	-	0	16	16.0 gpl	1 loads			16	16			,
							114		309 avg day			
							esqo	observed 1	17,286 avg month			
									56 days at avg			
							opserved		576 avg day			

Costs to Implement

	unmper	Hardware	Hardware Installation	Total	Pay Back	Water Savings (gpy) Energy Savings (kWhr) Total Cost Savings/yr	hr) Total Cost Savings/yr	Total Cost Savings/yr/fixture	
Shower		2 \$ 33	\$ 10 \$	98	0.26 yrs	15,330 3,185	\$ 333	\$ 166	
Sink		15 \$ 1.61	\$ 2	66	0.24 yrs	25,176 3,269	\$ 419	\$ 28	
			\$				\$ 752		
	AF Savings:	0.12	//\$	\$/AF:	\$ 1,489	Replacement Water C \$ 3,729	Avoided Cost \$ 385		
						* Calculation based on \$30,000 per AF	** Calculation based on \$9.50/ 1000 gal	\$9.50/ 1000 gal	

Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy



SMART WATER Audit Report

Brighton Recreation Center



Overview

The City of Brighton working with Great Western Institute conducted a SMART WATER Audit of this facility at 555 North 11th Avenue in Brighton in August of 2009. The SMART WATER Audit was conducted as part of the District's demonstration audit project, whereby a small group of City facilities was selected to help the City of Brighton complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Brighton Recreation Center uses water in a manner consistent with other small government facilities throughout Colorado. Similar to many facilities built before 1993, Brighton Recreation Center has sinks, showers, urinals and toilets that have not been updated with water efficient fixtures that are currently available in the marketplace.

A water demand model was created to estimate maximum and average daily water uses per existing fixture and to project the annual water savings that may be realized with the installment of new water smart fixtures. The water demand model for Brighton Recreation Center included the following assumptions:

- The water demand model for Brighton Recreation Center was configured and calibrated with the monthly water use data from 2008
- An analysis of the monthly water use data for the Brighton Police Station indicated that some outdoor irrigation
 exists; therefore, a monthly winter average was calculated and used for the water demand model so as to isolate and
 define indoor water use only
- During the retrofit process in May and June of 2010, three shower timers were installed in the Recreation Center; however, these fixtures were removed soon after the retrofit process due to vandalism. Although these fixtures may have yielded some water savings, it could not be quantified and therefore, was not included in the water demand model.
- An analysis of the monthly water use data for the Brighton Recreation Center also indicated that an undetected leak averaging 10.6 gallons of water per minute (gpm) exists year round. The data provided does not allow for the source of the leak to be determined, however, it does show that the leak is not seasonal. The leak is assumed to be a cold water leak, creating no additional energy impact. Based on the data provided, it appears that this leak was partially addressed in Mid-March of 2010 and reduced to a 0.75 gpm leak.

There are eight sinks in the locker rooms, four sinks in the public restrooms and two sinks located in the daycare restrooms; all of which had flows of two gpm. Of these 14 sinks, 13 were replaced with 0.5 gpm low flow sink faucet aerators at a cost of about \$7 per sink. The water and energy savings from these retrofits is estimated to be \$27 per year per sink with an expected payback period of about 3 months.

In the locker rooms, there are 14 showers which had an average flow volume of 2.5 gpm. All 14 of these showerheads were replaced with 1.5 gpm low flow showerheads at a cost of \$43 per fixture. The water and energy savings from these retrofits is estimated to be \$938 per year per showerhead with an expected payback period of less than one month.

In total, 13 sink faucet aerators and 14 showerheads were replaced in the Brighton Recreation Center for a total cost of \$688. From the water demand model, it is estimated that a total annual water and energy cost savings of \$13,478 will result from these changes, saving nearly 625,901 gallons in water and 128,389 kilowatt hours of energy annually. If the leak is reduced from 10.6 gpm to 0.75 gpm (as the data suggests) in the Brighton Recreation Center, an additional 5,106,240 gallons of water may be saved annually, saving an additional \$41,871 in water costs annually.

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Recreation Center Audit

suc
ulatio
e Calc
m Use
Maximu

			ber use				ndfi lannins		
	number	hot	cold	total		uses/day hot	ploo	total	
l ollets		9 0		4		20 6		890	990
LOCAEI NOOIII	•	0 (9. 6	- CD 0:	So liusiles		007	007
Daycare Restrooms		.7		9.		15 flushes		48	48
Other Restrooms	_	9		1.6	1.6 gpf	8 flushes		77	77
Showers		4							
Locker Rooms		4	2	0.5	2.5 gpm	160 minutes	4,480	1,120	5,600
<u> </u>		Q							
		D							
Locker Rooms		4		1.0	1 gpf	25 flushes		100	100
Other Restrooms		2		1.0	1 gpf	20 flushes		40	40
Sinks		20							
Locker Rooms		· ∞	-	-	2 apm	5 minutes	9 8	39	78
Davcare Restrooms		2	_	_	2 apm	2 minutes	LC C	.co	· 6
Kitchens/Conference Room/Daycare		9	1.5	1.5	3 dbm	15 minutes	135	135	270
Other Restrooms		4	-	~	2 gpm	3 minutes	13	13	26
Other									
Undefined Leak		_		10.6	10.6 gpm	1440 minutes	0	15,264	15,264
Pool		_		994	994 gpd	1 daily	0	994	994
Hot Tub		_		09	pdb 09	1 daily	0	09	09
Sauna (Mister Steam CU 1000)		_		10	10 gpd	1 daily	0	10	10
Ice Maker (Scotsman C0830MA)		_		18.4	18.4 gp 100#	5 daily	0	92.0	92.0
Dish Washer (Hobart 271001481)		_		16	16 gpl	5 loads	0	80.0	80.0
					i		4,672	18,333	23,005 max day
							observed		690,000 max month
									30 days at max
							opserved		23.000 max day

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Hot Cold Total Uses/day Not Total	-	-	ber use			;		subtotal gpd		Ī
Figure F	number	hot 16	ploo	total		uses/day	hot	ploo	total	
setroons 2 16 gpf 10 flushes 1 4 flushes 1 2 flushes 1 2 flushes 1 4 flushes 1 1 flushes 1 1 flushes	Locker Rooms	8		1.6		15 flushes			192	192
From From From From From From From From	are Restrooms	2		1.6		10 flushes			32	32
Freedreck House Best Course Best Best God God House House Best God God God God House Best God God God House Best God God God God God House Best God God God God God God House Best God	her Restrooms	9		1.6		4 flushes			38	38
Froms From From From From From From From From		4								
Froms 6	Locker Rooms	41	2	0.5		120 minutes		3,360	840	4,200
Septembre 1		9								
20 1 1 gpf 15 flushes 2 30 30 30 30 30 8 45 45 45 90 6 6 6 6 6 6 7 7 7 8 8 8 8 8 90 6 90 6 90 80	Locker Rooms	4		_	1 gpf	20 flushes			80	80
20 4 Includes 30 60 60 estrooms 8 1 1 2 gpm 2 minutes 3 6 6 Descree 6 1.5 1.5 3 gpm 2 minutes 8 45 90 estrooms 4 1 1 2 gpm 2 minutes 8 8 16 1 - 1 2 gpm 1440 minutes 8 8 826 <td>her Restrooms</td> <td>2</td> <td></td> <td>-</td> <td>1 gpf</td> <td>15 flushes</td> <td></td> <td></td> <td>30</td> <td>30</td>	her Restrooms	2		-	1 gpf	15 flushes			30	30
ar Rooms 8 1 1 2 gpm 4 minutes 30 60 Setrooms 2 1 1 2 gpm 2 minutes 3 60 Chaycher 6 1.5 3 gpm 2 minutes 45 45 96 Setrooms 4 1 1 2 gpm 2 minutes 8 8 16 Setrooms 4 1 1 2 gpm 140 minutes 8 8 826 826 826 16 15.284		70								
Setrooms 2 1 1 2 gpm 2 minutes 3 3 9 6 6 1 5 15 3 gpm 5 minutes 45 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Locker Rooms	80	τ-	_	2 gpm	4 minutes		30	30	09
Daycace 6 1.5 1.5 3 gpm 5 minutes 45 45 45 90	are Restrooms	2	-	-	2 gpm	2 minutes		ო	ო	9
estrooms 4 1 1 2 gpm 2 minutes 8 8 16 16 gpm 140 minutes 0 15,284	Room/Daycare	9	1.5	1.5	3 gpm	5 minutes		45	45	06
1 - 10.6 gpm 1440 minutes 0 15,264 15	ther Restrooms	4	-	-	2 gpm	2 minutes		80	80	16
1 - 10.6 10.6 gpm 1440 minutes 0 15,264 15,264 15,264 26,264 15,2										
1 - 826 gpd 1 daily 0 826 826 826 926 920 1 daily 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		~		10.6	10.6 gpm	1440 minutes		0	15,264	15,264
1 - 60 60 gpd 1 daily 0 60 60 gpd 1 daily 0 60 60 60 60 60 60 60 60 60 60 60 60 6		-		826	826 gpd	1 daily		0	826	826
1 - 10 10 gpd 1 daily 0 10 55.2 55.2 55.2 1		-		09	pdb 09	1 daily		0	09	09
) 1 - 184 184 gp 100# 3 daily 0 552 55.2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1000)	~		10	10 gpd	1 daily		0	10	10
) 1 - 16 gpl 2 loads 0 32.0 32.0 32.0 32.0 32.0 32.0 32.0 32	30MA)	~		18.4	18.4 gp 100#	3 daily		0	55.2	55.2
17,546 20,992 served 629,800 30 served 20,993	001481)	-		16	16 gpl	2 loads		0	32.0	32.0
629,800 30 20,993								3,446	17,546	20,992 avg day
30 20,993								observed		629,800 avg month
20,993										30 days at avg
								observed		20,993 avg day

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Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Recreation Center Audit

Maximum Use Potential Savings	6											
	-						subtotal gpd			savings		ĺ
number	er hot	cold	total		uses/day	hot	ploo	total		hot cold		total
Locker Rooms	_ ∞		1.6			shes		256	256			
Daycare Restrooms	7		1.6	1.6 gpf	15 flu	shes		48	48			
Other Restrooms	9	,	1.6	1.6 gpf		flushes		77	77	•		
Showers	4											
Locker Rooms	4	1.2	0.3	1.5 gpm	160 mi	minutes	2,688	672	3,360	1,792	448	2,240
Urinals	9											
Locker Rooms	4		1.0			shes		100	100			
Other Restrooms	2		1.0	1.0 gpf	20 flu	flushes		40	40			
Sinks	20											
Locker Rooms	89	0.25	0.25			minutes	10	10	20	59	59	29
Daycare Restrooms	2	0.25	0.25	0.5 gpm	2 mi	minutes	-	-	2	ဗ	ო	7
Kitchens/Conference Room/Daycare	9	1.5	1.5			nutes	135	135	270			
Other Restrooms	4	0.44	0.44	0.9 gpm		minutes	9	9	12	7	7	15
Other fiv lost		,	,		1 440 0	minites	,	1 080	1 080		14 184	14 184
17 16gh	- +		- 00			iliv	i	000,	200,	•	<u>-</u>	<u>-</u>
- F			† C	994.0 gpd		Cally	•	1 0	1 00	•		
Sound (Mister Steem CT 1000)	- +		8 5			daily		90	90			
Sauria (iviliate) Stealii CO 1000)			2 5			dally	•	2 0	0 0			
ice maker (Scotsman Coosomia) Dish Washer (Hobart 271001481)			<u>o</u> ¢	16.0 apl	5.0 da	ualiy loads		92.0	92.0 80.0			
			!				2.840	3,661	6,501 max day			
							observed		690,000 max month			
							opserved		23,000 max day			
Average Use Potential Savings												
		ber use					subtotal gpd			savings		
Toilete	er hot	ploo	total		uses/day	hot	cold	total		hot cold		total
Locker Rooms	<u> </u>		1.6			flushes		192	192			
Davcare Restrooms	2		1.6		10 flu	flushes	,	32	32		,	,
Other Restrooms	9		1.6	1.6 gpf		flushes		38	38		,	
Showers	4											
Locker Rooms	4	1.2	0.3	1.5 gpm	120 mi	minutes	2,016	504	2,520	1,344	336	1,680

Average Use Potential Savings	ings												
			ber use					subtotal gpd			savings		
	number	hot	cold	total		uses/day	hot	ploo	total		hot cold		total
Toilets		16											
Locker Rooms	(O	8		1.6		15 flushes	S		192	192			
Daycare Restrooms	6	2		1.6	1.6 gpf	10 flushe	S		32	32			
Other Restrooms	"	9		1.6	1.6 gpf	4 flushe	s		38	38			,
Showers		4											
Locker Rooms	s	41	1.2	0.3	1.5 gpm	120 minutes	Se	2,016	504	2,520	1,344	336	1,680
Urinals		9											
Locker Rooms	(n	4		1.0			s		80	80			
Other Restrooms	rc.	2		1.0	1.0 gpf	15 flushes	s		30	30			
Sinks		20											
Locker Rooms	(C	80	0.25	0.25			Se	8	00	15	23	23	45
Daycare Restrooms	(C	2	0.25	0.25	0.5 gpm	2 minute	Se	-	-	2	2	2	2
Kitchens/Conference Room/Daycare	6	9	1.5	1.5			Se	45	45	06			
Other Restrooms	s	4	0.44	0.44	0.9 gpm	2 minutes	Se	4	4	7	2	2	6
Other													
fix leak		-		8.0		1,440.0 minutes	S		1,080	1,080		14,184	14,184
Pool		-		826	825.8 gpd	1.0 daily		i	826	826			
Hot Tub		-		0.09		1.0 daily			09	09			
Sauna (Mister Steam CU 1000)		-		10		1.0 daily			10	10			
Ice Maker (Scotsman C0830MA)		-		18		3.0 daily			55.2	55.2			
Dish Washer (Hobart 271001481)		-		16.0	16.0 gpl	2.0 loads		i	32.0	32.0			
									2,996	5,069 avg day			
								observed		152,000 avg month			
										30 days at avg			
								observed		5,067 avg day			

Table 1 - Summary of Current Water Use and Potential Water Savings Brighton Recreation Center Audit

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	number	Hardware	Installation	Total	Pay Back	Water Savings (gpy)	Energy Sa	Energy Savings (kWhr)	Total Cost Savings/yr	Savings/yr	Total Cost Savings/yr/fixture	
Shower	14	\$ 33 \$	10 \$	602	0.05 yrs	604	1,800	125,649	8	13,127	\$ 938	
Sink	13	\$ 1.61 \$	13 \$ 1.61 \$ 5 \$ 86	98	0.24 yrs	21,	21,101	2,740	49	351	\$ 27	
Fix leak	_	\$ 300.00	\$ 028	1,150	0.03 yrs	5,106,240	3,240		69	41,871	\$ 41,871	
			φ.	1,838					ક્ક	13,478		
			•		;		•				!	
	AF Savings: 17.59	17.59	Ð	\$/AF: =	\$ 104	Replacement Water Cost*:	ها د.	527,739	Avoided Cost**:	ost**: \$ 54,455	34,455	
						* Calculation based on \$30,000 per AF	30.000 per AF		** Calculati	** Calculation based on \$9.50/ 1000 gal	000 gal	

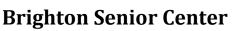
Cost Savings Assumptions: \$8.50/1000 gal - cost of water and sewer, \$0.065/kwh cost of energy

GREAT WESTERN INSTITUTE

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Smart Water Audit Report





Overview

The City of Brighton working with Great Western Institute conducted a SMART WATER Audit of this facility at 575 Bush Street in Brighton in July of 2009. The SMART WATER Audit was conducted as part of the District's demonstration audit project, whereby a small group of City facilities was selected to help the City of Brighton complete a commercial audit program intended to assist local businesses improve water use efficiency and in doing so, reduce water and energy operational costs.

Water Use Summary

Brighton Senior Center uses water in a manner consistent with other small government facilities throughout Colorado. Similar to many facilities built before 1993, Brighton Senior Center has sinks, showers, urinals and toilets that have not been updated with water efficient fixtures that are currently available in the marketplace.

A water demand model was created to estimate maximum and average daily water uses per existing fixture and to project the annual water savings that may be realized with the installment of new water smart fixtures. The water demand model for Brighton Senior Center included the following assumptions:

- The water demand model for Brighton Senior Center was configured and calibrated with the monthly water use data from 2009
- An analysis of the monthly water use data for Brighton Senior Center indicated that there is no existing outdoor irrigation; therefore, no evaluation was performed to characterize outdoor water use for this property

The five public toilets at the Brighton Senior Center were using 2.5 gallons of water per flush (gpf). All five of these toilets were replaced with 1.28 gpf Water Sense high efficiency toilets at a cost of about \$377 per toilet. The water and energy savings from these retrofits is estimated to be about \$26 per year per toilet.

There are three sinks located in the public restrooms which were found to have flows of two gallons of water per minute (gpm). These sinks were replaced with 0.5 gpm low flow sink faucet aerators at a cost of about \$7 per sink. The water and energy savings from these retrofits is estimated to be \$21 per year per fixture with an expected payback period of about 3.5 months.

In total, five toilets and three sink faucet aerators were replaced in the Brighton Senior Center for a total cost of \$1,905. From the water demand model, it is estimated that a total annual water and energy cost savings of \$194 will result from these changes, saving nearly 19,688 gallons in water and 500 kilowatt hours of energy annually.

Table 1 - Summary of Current Water Use and Potential Water Savings Senior Center Audit

Maximum Use Calculations									
number	hot		cold total		uses/day hot	subtotal gpd cold	total		
Tollets Public Restrooms (tanks)	ນ ນ		2.5	2.5 gpf	6 flushes		75	75	
Urinals Public Restrooms			1.0	1.0 gpf	23 flushes		23	23	
Sinks Public Restrooms (other) Galleys	5 3 2	1.0	1.0	2.0 gpm 5.0 gpm	6.2 minutes 5.0 minutes	19 25	19 25	37 50	
Other Ice Maker (Scotsman C0830MA) Dish Washer (Hobart 271001481)		1 1	18.4	18.4 gp 100# 12 gpl	2 daily 1 loads	0 0 44 observed	36.8 12.0 190	36.8 12.0 234 max day 7.000 max month	
						observed		30 days at max 233 max day	
Average Use Calculations						See Indepth of			
number	hot		cold total		uses/day hot	cold	total		
Foliets Public Restrooms (tanks)	വ		2.5	2.5 gpf	5.5 flushes		69	69	
Urinals Public Restrooms			1.0	1.0 gpf	20 flushes		70	20	
Sinks Public Restrooms (other) Galleys	7 3 Q	1.0	1.0	2.0 gpm 5.0 gpm	2.4 minutes 5.0 minutes	7 25	7 25	14 50	
Other Ice Maker (Scotsman C0830MA) Dish Washer (Hobart 271001481)			18.4	18.4 gp 100# 12 gpl	1 daily 1 Ioads	32 0	18.4 12.0 151	18.4 12.0 183 avg day	
						observed observed		5,500 avg month 30 days at avg 183 avg day	

Table 1 - Summary of Current Water Use and Potential Water Savings Senior Center Audit

Maximum Use Savings													
:	number	hot	per u cold	per use cold total		nses/day	hot	subtotal gpd cold	total		Savings	Cold	Total
Toilets Public Restrooms (tanks)	-	വവ		0.90	0.90 gpf	e flushes			27	27		48	48
Urinals Public Restrooms				1.0	1.0 gpf	23 flushes			23	23			
Sinks Public Restrooms (other) Galleys		5 3 2	0.25	0.25 2.5	0.5 gpm 5.0 gpm	6.2 minutes 5.0 minutes		5 25	5 25	9	4 '	4 '	. 58
Other Ice Maker (Scotsman C0830MA) Dish Washer (Hobart 271001481)				18.4	18.4 gp 100# 12 gpl	2 daily 1 loads		0 0 30 observed	36.8 12.0 128	36.8 12.0 158 max day 7,000 max month			
								observed		44 days at max 233 max day			
Average Use Calculations													
Tollade	number	hot	per u cold	per use cold total		uses/day	hot	subtotal gpd cold	total		Savings Hot C	Cold	Total
Public Restrooms (tanks)	_	വ		06:0	0.90 gpf	e flushes			25	25		4	44
Urinals Public Restrooms			,	1.0	1.0 gpf	20 flushes			20	20			
Sinks Public Restrooms (other) Galleys		5 3 2	0.25	0.25	0.5 gpm 5.0 gpm	2.4 minutes 5.0 minutes		1.8 25	1.8 25	3.6 50	, S	ω,	Ε'
Other Ice Maker (Scotsman C0830MA) Dish Washer (Hobart 271001481)				18.4	18.4 gp 100# 12 gpl	1 daily 1 loads		00,6	18.4 12.0	18.4			

	number	Hardwa	rdware Installation	ation 1	Total	Pay Back	Water Savings (gpy)	Energy Savings (kWhr	ngs (kWhr)	Total Cost Savings/y	,Àr	Total Cc	Total Cost Savings/yr/fixture
Toilet (tanks) Sinks		3 & &	.61 \$	92 2 8 8	1,885 20 1,905	14.5 yrs 0.3 yrs	15,840 3,848	8	200	မာ မာ မာ	130 64 194	6 6	26 21
	AF Savings:		0.06	\$/ AF	ų.	\$ 31,527	Replacement Water Cost*:	φ	1,813	Avoided Cost** :	\$ 187	ال .	
							* Calculation based on \$30,000 per AF	ber AF		** Calculation based on \$9.50/ 1000 gal	1 on \$9.50/ 1000 a	lec	

18.4 12.0 129 avg day 5,500 avg month 43 days at avg 183 avg day

18.4 12.0 **102**

0 0 **27** observed observed