



Town of Morinville

Water Conservation , Efficiency & Productivity Plan (CEP)

2012

Morinville Water Conservation, Efficiency & Productivity Plan (CEP)

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***All the water that
will ever be, is right
now.***

**National Geographic
October, 1993**

1. Definitions

As defined in the Alberta Water Council's report Water Conservation, Efficiency and Productivity: Principles, Definitions, Performance Measures and Environmental Indicators.

Water Conservation

- Any beneficial reduction in water use, loss, or waste.
- Water management practices that improve the use of water resources to benefit people or the environment.

Water Efficiency

- Accomplishment of a function, task, process, or result with the minimal amount of water feasible.
- An indicator of the relationship between the amount of water needed for a particular purpose and the actual quantity of water used or diverted. Amount of water that is required to produce a unit of any good, service, or societal value.



Water Productivity

- The amount of water required to produce a unit of any good, service, or societal value.



Average Daily Domestic Water Use

2. Background

Protecting water is one of the most important issues of our time. With concerns growing both internationally and locally over dwindling water supply, water plays a key role in the health of our environment, our economy and our society. Because Alberta's municipalities provide water services to the majority of the province's citizens and businesses, they have a central role to play in safeguarding this precious resource. Provision of this service comes with a cost. There are also worries that there just won't be enough water to go around. In response to these pressures, Alberta's urban municipalities are committing to water Conservation, Efficiency and Productivity (CEP). CEP planning aligns with the Government of Alberta's Water Management Strategy "Water for Life: Alberta's Strategy for Sustainability". Released in 2003, the Strategy includes a number of goals and outcomes related to water management in Alberta and one of the key elements of the strategy is conservation.



The Alberta Urban Municipalities Association (AUMA) was one of the first Sectors to complete a CEP Plan in Alberta. In consultation with an advisory expert panel and a stakeholder advisory committee, AUMA invested 14 months into the development of what is now referred to as an AUMA CEP Policy. AUMA's CEP Plan is based on the template created by the Alberta Water Council (AWC) in their document, "Recommendations for Understanding Infrastructure Leakage, Developing CEP Plans, Encouraging Water Efficient Fixtures and Technologies, and Understanding Municipal Water Use." Through these actions, a better understanding of municipal water use will be realized, thus allowing for medium- and long-term goals to be established. Along with other communities' efforts to further support the Province's efforts, Morinville has identified water stewardship as one of its goals within the Infrastructure pillar of the Municipal Sustainability Plan (MSP). Our long term target is for Morinville to have the lowest per capita water consumption rate of comparable Municipalities in the Capital Region by 2035.

AUMA Short-term Targets

AUMA members have worked together to identify the short-term targets for the AUMA CEP Plan. The plan was adopted at AUMA's 2009 Convention. The targets are:

1. By December 31, 2010, all urban municipalities with water systems in place will report water use data through Alberta Environment's electronic Water Use Reporting System (WURS).
2. By December 31, 2011, urban municipalities will develop CEP Plans according to the following participation rates:
 - 100% of municipalities with populations greater than 10,000
 - 75% of municipalities with populations between 2,500 and 10,000
 - 50% of municipalities with populations under 2,500
3. By December 31, 2011, urban municipalities will implement incentives and/or disincentives of their own choosing to increase the uptake of water efficient fixtures and technologies. Different programs may apply to new and existing developments. Participation rates will be:
 - 100% of municipalities with populations greater than 10,000
 - 75% of municipalities with populations between 2,500 and 10,000
 - 50% of municipalities with populations under 2,500
4. By December 31, 2012, urban municipalities complete a water audit and identify ways to reduce leaks according to the following distribution
 - 100% of municipalities with populations greater than 10,000
 - 75% of municipalities with populations between 2,500 and 10,000
 - 50% of municipalities with populations under 2,500



Rain water is actually better for your plants as it does not contain any chlorine and is at ambient temperature.

Where we are now

1. Morinville's existing water distribution system consists of two reservoirs and two pumphouses with a looped network of distribution pipes, 150 mm to 300 mm in diameter. Morinville receives its water from EPCOR Water Services in Edmonton.
2. In 2010, Public Works identified a 9.1% Infrastructure Leakage Index (ILI) which is considered very good and lower than several other municipalities in the Capital region. Although an accepted target for unaccounted water across the nation is 10-12%, a range of 40% and greater is not uncommon. Morinville's ILI for 2011 remained relatively the same at 9.2%.
3. Morinville's composite **total water demand** for recent years are as follows in Litres per capita per day (Lcpd):

2011: 227 Lcpd	2008: 274 Lcpd
2010: 265 Lcpd	2007: 295 Lcpd
2009: 274 Lcpd	2006: 284 Lcpd

"Total water demand" means the composite water demand from residential, industrial, commercial and institutional sectors.

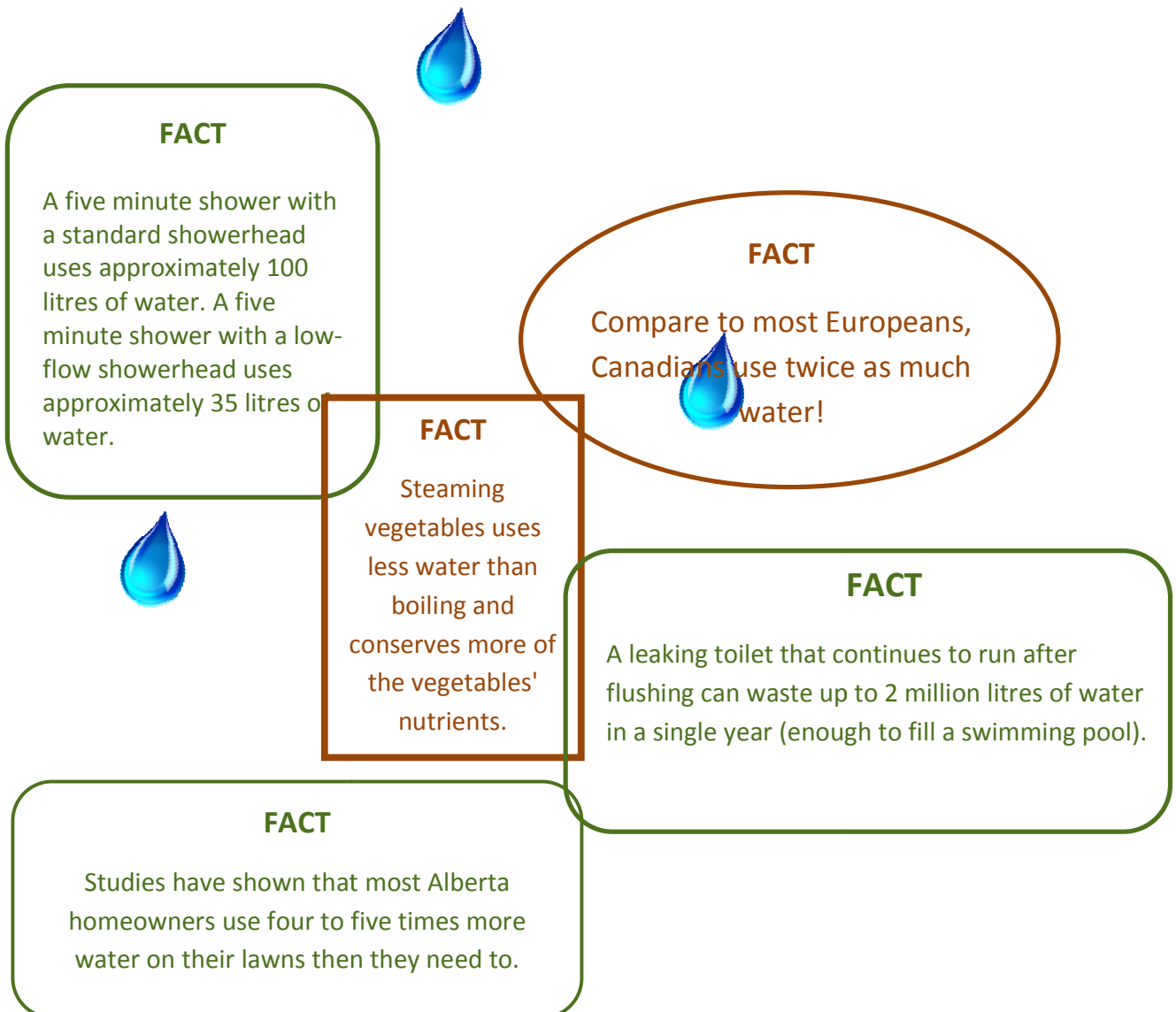
Residential water demand in Alberta is estimated at 271 Lcpd while the total water demand is estimated at 488 Lcpd. For comparison, the national averages are 609 Lcpd (total) and 329 Lcpd (residential). Edmonton's total water demand was 400 Lcpd in 2008. For 2011, Morinville's total water demand was 227 Lcpd while residential water demand was only 149 Lcpd.



4. Morinville's Public Works department has already put in place the following Water Conservation Initiatives:
 - a. Provided public Information on leak detection and conservation tips both indoor and outdoor. This information can be found at Town Hall, Public Works building and on the Morinville website.
 - b. Conducted research on long term best practices for water reduction strategies.
 - c. Conducted a water audit to identify potential water losses. Unaccounted for water loss was considerably lower than the regional average.
 - d. Development of this draft water Conservation, Efficiency and Productivity plan (CEP).

5. During the 2012 Business Planning and Budget Process, Council agreed to the concept of developing a water CEP Plan which would consider the following:
 - a. Water Conservation Strategies/Programs,
 - b. Indoor/Outdoor Water Efficient Technologies,
 - c. Regulatory Methods (enforcement through bylaws),
 - d. Engineering Constraints/Capabilities,
 - e. Fiscal responsibility, and
 - f. Social Marketing – (“Buy in”, Education).

6. CEP development is identified as one goal of the Municipal Sustainability Plan (MSP), under the Infrastructure Pillar, as adopted by Council in 2011.



3. Plan Objectives

Morinville's CEP plan outlines a water consumption reduction target for Morinville, and includes recommendations on how reduction may be achieved through the development of initiatives and strategies as well as establishing timelines and budget to successfully implement the plan.

a) Education (residents, businesses, town staff):

One objective of the plan is to provide education and increase awareness through various means such as pamphlets, mail out flyers, Morinville's website and others. The plan initiatives target residential as well as Industrial, Commercial and Institutional (ICI) users of treated water.

b) Reduction in total water consumption:

Based on an excellent rating of Morinville's current total water demand (as shown previously), the plan intends to reduce Morinville's average per capita composite water consumption from the baseline 5 year average, now at 267 Lpcd, by 5% by 2020. This targeted approach to water reduction helps support Morinville in achieving the target identified in the MSP plan by 2035, while also providing methods of measurement towards that goal.



4. Programs and Projects

a) Partnership and Collaboration Initiatives

Stakeholder participation in both planning and implementation is critical to a successful conservation and management program. Morinville would create a committee comprised of various stakeholders (staff, residents, businesses, developers and builders) to discuss the feasibility of different water conservation options, cost-benefit analysis, public support, barriers, timeline, survey, etc.

b) Survey

A water conservation focused survey would be developed to solicit information on the public's current level of water conservation awareness, identify water conservation initiatives already in use and determine support for proposed public water conservation initiatives such as rebates for water efficient toilets, water reduction programs for high users, bylaw for new construction, rebates for rain barrels, water saving kit giveaways, xeriscaping contests, rate increase or reductions, etc.

c) Public Education (website, pamphlets, posters, mail outs)

As mentioned previously, the Public Works department has already put in place public information on leak detection and conservation tips for both indoor and outdoor use. This information can be found at the Town Hall, Public Works building and the Morinville website from which several links to EPCOR Water Services are also available along with other water conservation tools and programs.

In addition to emphasizing the values of water conservation, this plan should allow for the development, funding and distribution of pamphlets, water saving kits, rebates and contests. Information could also be made available through schools and businesses in order to raise additional awareness.

d) Seasonal Water Conservation Community Liaison Officer (WCCLO)

A seasonal WCCLO could be hired to focus mainly on education, information, and communication. After the orientation and training period, the WCCLO would establish a random “patrol” schedule (including evenings and weekends). The WCCLO would “patrol” residential neighborhoods and irrigated commercial / institutional facilities offering advice and tips on water conservation and also respond to specific observations, calls, and complaints in conjunction with our Community Peace Officers regarding possible enforcement. The WCCLO would spend time communicating with residents, providing information about water conservation and xeriscaping and generally raising awareness of the need for good watering practices. The WCCLO would be located within the Public Works Shop and, while in the office, would answer e-mail and phone messages, do research, develop communication materials and complete routine administrative tasks. At the end of the summer employment, the WCCLO would provide a report on activities to summarize the experience, make suggestions for improvement, and document the sources developed during the term of employment. Other target areas for the program would encompass the weekly Farmers’ Market, presentations at kids’ summer camps, and attendance at special events such as Canada Day, trade show and others.



e) Water Meter Replacement Program

An effective water conservation-based pricing system requires a metered system. Metering is most effective when paired with conservation rate structures. Meters are a basic water management tool to reduce water demand and foster greater awareness and accountability for water use. Pricing and rate structures are effective economic incentives for reducing water consumption. All clients connected to Morinville municipal water supply, including residences and businesses, are metered. High quality metering will help ensure that Morinville staff, residents and businesses know exactly how much water is being used and that billing is appropriate. Accurate water consumption data also enables Public Works Utility Division staff to monitor water use, identify potential problems (such as leaks or other unexplained water loss), and to effectively manage the flow and storage of municipal water. As of summer 2012, 100% of Morinville is metered. Normal replacement cycles will be maintained.

f) Geographic Information System (GIS) vs. Water Conservation

By using GIS and asset management tools we can monitor relative water losses in Morinville's system by comparing metered billings to pumphouse outputs. We can inventory our assets and use GIS and asset management to map repair locations and identify problem areas to plan infrastructure repairs prior to pipe or valve failures thus lowering water loss due to leakage. We can also track life cycle of the infrastructure through proper preventative maintenance or replacement schedules. As technology improves, the customer's meters and Morinville's monitoring and management systems will be upgraded, data collected, analyzed, and mapped by Public Works staff that will require upgrading on GIS applications.

g) Seasonal Restrictions

In the dry summer season from May through October, Morinville may impose seasonal outdoor water use restrictions, including mandatory time of day watering periods. A Water Conservation Bylaw would need to be developed including water demand measures or rationing in order to be enforceable when required.



FACT- Established lawns *can* endure 4 - 6 weeks without water and not suffer long term damage.

h) Water Conservation Bylaw

In order to properly monitor and ensure success of our water CEP plan, it is imperative to adopt specific water conservation measures through a bylaw to provide authority to our Community Peace Officers to implement enforcement when required. The bylaw would also include Water Demand Management Measures. Those measures already exist outside of a bylaw and are driven by the Regional Water Customer Group. It would be best to have those measures within the bylaw in case enforcement is required. Furthermore, incorporating the CEP plan by adopting or amending appropriate bylaws to include the requirement for water efficient fixtures in all new construction, development or renovation will allow Morinville to ensure permanent future water reductions for all new residential and commercial projects. The Bylaw should be developed in 2013 followed by adequate education and notification to affected parties (builders, developers, contractors) in order to have the bylaw in effect for summer 2014.

i) Rebates (low flow fixtures)

Since toilets can use the most water among household plumbing fixtures, a toilet rebate program would help reduce residential water consumption significantly. Providing rebates for water efficient toilets is likely to create the biggest impact on water conservation. It is recommended that rebates be set at \$75 per toilet with a maximum number of two rebates per household per year. Homeowners would be required to submit appropriate documentation as outlined in the rebate application and would receive the rebate as a credit on their utility bill. The rebate program is intended to provide an incentive/reward to homeowners who choose to replace higher flow toilets with water efficient models when they have the option. Toilets installed for new construction would be required to install water efficient toilets under the Water Conservation Bylaw and would therefore not be eligible for rebates. Administration of this program would require additional staff time to review applications and input data into the utility billing software. It is recommended that this program be implemented in 2013.



Rebates for Rain Barrels/Rain Barrel Sale

In addition to xeriscaping, installing rain barrels to use rainwater for lawn and garden watering could significantly reduce peak summer use. Morinville would purchase safe, clean rain barrels in bulk and sell them to residents at cost. A one day, high profile rain barrel sale could be conducted at minimal cost and would also provide a public opportunity to discuss outdoor water use. Rain barrel sales have been very successful in other Alberta municipalities and a pilot program in Morinville could be undertaken in 2013. If successful, the rain barrel sale could be repeated in subsequent years. Morinville may also investigate the possibility of joining Sturgeon County in purchasing rain barrels as part of their existing program in order to offer an even better incentive.



FACT

If you use a Rain Barrel, an average roof can collect up to 590 L (155 gallons) of water during a 6mm (¼ in) rain fall

Water Saver Kits Giveaway

“Water Saver Kits” are packages that include information on water conservation and items that homeowners can use to save water. The Indoor Kit helps residents to detect leaks in toilets and provides recommendations for installing more water efficient fixtures, while the Outdoor Kit provides tools and tips for lawn and garden care. Giving away water saver kits at public events, such as trades shows, would allow Morinville to promote Water Conservation Strategies and empower homeowners with the tools and knowledge necessary to reduce their water use. Kits are relatively inexpensive and can be custom ordered to include specific items to target indoor and/or outdoor water use in Morinville.

j) 3-Tier Water Rates Incentive Program

CEP plan proposes a 3-Tier Water Rate Incentive Program, where the more potable water people use, the more they pay. A 3-tiered rate structure would allow a low rate for minimal water use, a moderate rate for average water use and a higher rate for excessive water use. This would ensure that water required for basic needs remains affordable, but would penalize water users for excessive use. Water rates and thresholds would be established considering impact on revenues and could be designed to have minimal impact on the majority of customers. Commercial water rates should be reviewed along with the residential rate structure.

Changing the rate structure would also require an amendment to the Water and Sewer Bylaws and changes to the current billing software. The base rate and tiers would be adjusted from time to time. Should customers wish to reduce the cost of water on their utility bills, they need only reduce the volume of water they consume. The sewer portion of their utility bill would also decrease correspondingly. Customers can quickly see how effective their personal water conservation efforts are. Additional public consultation will need to be undertaken prior to implementing this initiative. As a result of Morinville's current water demand already being low, feasibility of this initiative will need to be re-assessed prior to future implementation.

k) High Water Use in ICI Sectors

An educational and community based social marketing campaign may be very effective in reducing water use for high water use industries, such as restaurants, car washes, processing plants, etc. This program would involve contacting large water users in the ICI sectors to provide information on the benefits of water audits, water conservation, and how to identify opportunities to reduce water use. Although it is not recommended that Morinville conduct water audits, providing additional information on water reduction strategies to large ICI water users could be undertaken with additional staff time with little cost. This requires specifically targeted programs designed for each type of business that have been very successful in other municipalities and have resulted in long term water savings for minimal financial investment.

l) Xeriscaping Contest

“Xeriscaping” is a method of landscaping that uses drought tolerant plants and creative design to conserve water and protect the environment. There is a wide variety of attractive drought-tolerant plants suitable for Alberta's climate. Morinville can consider holding a contest where individuals can submit a design to xeriscape a piece of Town property. Morinville would then xeriscape the property using the winning design. This contest would raise public awareness, promote the use of xeriscaping principles and could be done for relatively low cost. Alternatively, Morinville could invite submissions of xeriscaped private property and provide prizes for winning contestants. Additional staff time would be required; however, financial costs of running this program would be minimal.



m) Morinville Parks and Flower Beds Maintenance

Parks and Facilities Division staff would use mowing, trimming, mulching, landscaping and watering best practices to control water use on Town properties. Hardy, drought-tolerant plants should be selected wherever possible, and all gardens beds shall be mulched for moisture retention and weed control. Morinville's new tree replacement program would use hardy local stock wherever possible and practical to do so. Older existing exotic trees would be replaced with native prairie species when they are damaged or die off. Self-watering hanging flower baskets would be used for beautification in order to provide continuous watering needs while avoiding over watering. The supply of water for landscaping and watering operations should be investigated as to the possibility of re-using water from Morinville's spray park or storm pond water instead of using fresh potable water.

n) Spray Park

Morinville's Spray Park was built in 2005 with no provision for re-using the water that is consumed. An average day use of 150-175 cubic meters of water (150,000-175,000 litres) of water is equivalent to \$170 to \$200 per day which does not include related sewer charges. During the 2012 budget process, Council directed administration to defer any capital improvement to the Spray Park until the CEP was completed. Through implementation of the CEP plan additional options to re-use the water that is produced through the Spray Park for the purpose of watering trees & plants, sewer flushing, street sweeping, use for compaction of new roads and potentially firefighting will be investigated.

FACT

Nearly 97 percent of the entire world's water is salty or otherwise undrinkable. Another 2 percent is locked in ice caps and glaciers.

That leaves 1% for all our needs.



5. Monitoring and Reporting

Water conservation strategies must maintain some flexibility to address ineffective and/or inefficient programs. As such, the success of an initiative will be determined by evaluating implementation costs, customer feedback, and actual water reduction numbers. Each project should be evaluated to determine its effectiveness and ease of implementation. The overall Water CEP Plan will be reviewed on a yearly basis to determine effectiveness and establish new goals, if necessary. Feedback will be provided to inform water users about the success of the programs and the positive impacts their efforts have had. Periodic updates will be included on Morinville’s webpage and/or local newspapers. An annual update will be included in the annual report to Council.

6. Recommendations

The following water CEP plan and initiatives are recommended for adoption by Council in accordance with our approved MSP and Strategic Plan under the infrastructure pillar. The water CEP plan and initiatives therein would be reviewed annually by staff and brought to Council for consideration as part of the annual budgeting process. Departmental support for these initiatives has already been sought and some of these initiatives have already been put into action to various degrees. Administration is recommending that the initiatives outlined in Table 1 be implemented in accordance with the timeline and budget identified.



7. Budget

Morinville will be researching funding opportunities to assist with the implementation of strategies and projects outlined in the water CEP plan. Joint partnerships as well as grant research will be conducted each year in order to alleviate the burden and potential tax increase on Morinville’s residents and businesses. However, implementing the initiatives identified in the Water Conservation Strategy could result in water savings that will help to offset cost so that the average homeowner will not see any increase in their monthly water bill. Although successful implementation of these water conservation strategies may slightly reduce water revenues, it will also result in savings to Morinville through deferred infrastructure expansions, maintenance and resource efficiency.

Table 1: Proposed Water Conservation Initiatives - Detailed

Proposed Initiative	Audience	Details	2013 (Approved)	2014 Tentative	2015 Tentative	2016 Tentative
Partnership and Collaboration Initiatives	All	Coffee, snacks, office supplies	\$500	0	0	0
Survey Residents	Residential	Survey platform	\$2,500	0	0	0
Public Education	All	Website, pamphlets, posters, mail outs	\$1,000	0	0	0
Hire Seasonal Water Conservation Community Liaison	All	Vehicle, salary	0	\$13,000	\$14,000	\$15,000
Water Meter Replacement Program	All	Meter cost	\$2,000	\$2,000	\$2,000	\$2,000
GIS Implementation	Town	Software upgrades, office supplies	\$1,000	\$1,000	\$1,000	\$1,000
Seasonal Restrictions	All	Advertising	0	\$1,000	\$1,000	\$1,000
Water Conservation Bylaw	Town	Office supplies, education, enforcement	\$4,000	\$2,000	\$2,000	\$2,000
Toilet Rebates	Residential	\$75 per toilet x 100	\$7,500	\$7,500	\$7,500	\$7,500
Rain Barrels Program	Residential	Subsidy program \$50 per barrel	0	\$5,000	\$5,000	\$5,000
Water Saver Kit Give-away	Residential	\$20 per kit x 200	0	\$4,000	\$4,000	\$4,000
3 Tier Water Rates Incentive Program	All	Consultant time, education, billing	0	\$5,000	\$2,000	\$2,000
High Water Use in ICI Sectors	ICI	Consultant time, reports	0	0	\$3,000	0
Xeriscaping Contest	All	Advertising, prizes	0	0	\$2,000	\$2,000
Town Parks and Flower Beds Maintenance	Town	Parks and flower beds, maintenance	\$35,000	\$40,000	\$40,000	\$45,000
Spray Park Water Re-circulation	Town	Design to re-circulate/re-use water from spray park	0	0	\$450,000	\$6,000
TOTAL			\$53,500	\$80,500	\$533,500	\$92,500