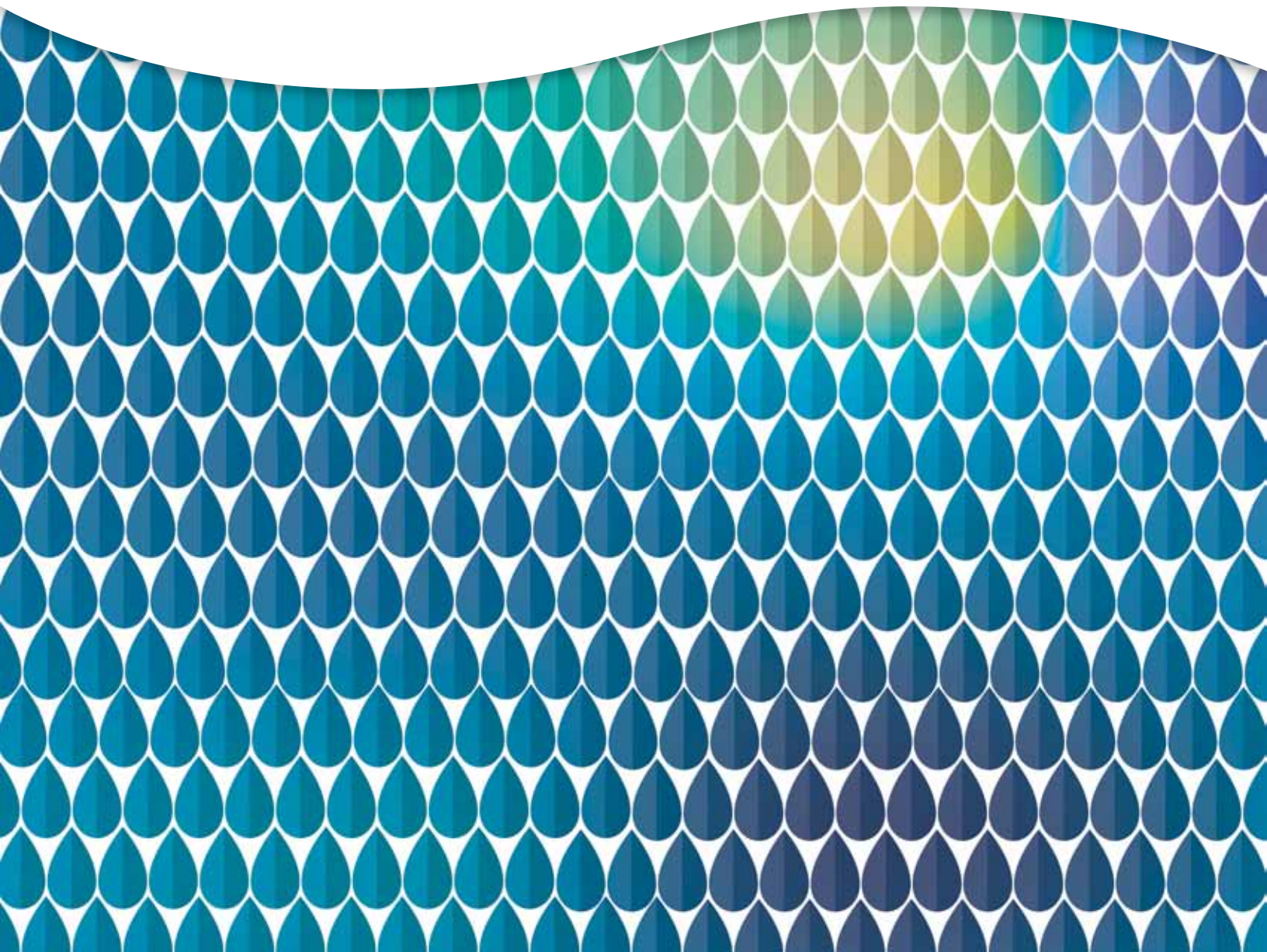


2012 | CITY OF ST. ALBERT

# Water Conservation, Efficiency and Productivity Plan





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# 1.0 Introduction

Water. Life depends on water. For all of us, our quality of life lies in the ability to access healthy and adequate water supplies. Yet, there is misunderstanding about the abundance of water in Canada making many people feel that conservation is unnecessary. In reality, only a small portion of our water is renewable and located in proximity to where most Canadians live (Brandes 2007, Stat Can 2009). Continuing to take water for granted and ignoring wasteful water use practices will lead us to a waterless future.

Alberta is no different. Although Alberta is fortunate to have significant water supplies, resources and technology to treat, distribute and protect it, this doesn't mean that we are protected from water supply issues, particularly in the southern parts of our province (City of Calgary 2005). In fact, while 80 per cent of Alberta's water supply lies in the northern part of the province, 80 per cent of our water demand comes from the southern half of the province (Alberta Water Smart 2011).

The City of St. Albert, located northwest of Edmonton, covers an area of over 2,800 hectares of developed land and continues to grow steadily. St. Albert's population has

increased 2.80 per cent in the last two years, increasing from 58,501 in 2008 to 60,138 in 2010 (Census 2010). The Utilities Branch in Public Works manages the potable water and wastewater systems for St. Albert. The Utilities Branch consists of 25 full time staff and 14 casual/seasonal staff (includes two summer students) who are dedicated to supply potable water, collection of wastewater and management of stormwater within the city boundaries.

Through the Environmental Master Plan (EMP), the City of St. Albert committed to reducing water consumption and protecting water supplies. The municipal corporation and the community respect water resources by employing many conservation techniques to reduce the amount of potable water required for day-to-day living and the wastewater that requires treatment.

St. Albert's vision for water in 2020 is to find the Sturgeon River and its entire watershed healthy and sustainable and our potable water resources safe, protected and available to all (EMP 2009).

**Alberta has roughly 10% of Canada's population and 7% of the land area, but only 2% of Canada's water supply**

(Alberta Water Smart 2011)

## 1.1 The Case for Water Conservation

The Water Conservation, Efficiency and Productivity Plan is designed to help the City of St. Albert address a number of challenges affecting the supply and treatment of water. Although the City does not have

direct control over some challenges, for example the weather (climate change), it is important to set long-term water conservation and efficiency measures.

- Population growth in St. Albert and the Capital Region will most likely effect the demand for water and wastewater treatment.
- Impacts of climate change are predicted to both reduce source flows into the North Saskatchewan River through glacier shrinkage and lower snowfall in the mountains, as well as altering precipitation patterns. Also, shifts in water quality are anticipated due to physical changes in the upstream watershed (EPCOR 2010).
- Rising costs of water supply and treatment may have an impact on residential cost of living and business competitiveness (EPCOR 2010).
- Ongoing maintenance and upgrades of water and wastewater infrastructure is estimated at \$2 to 3 million per year over the next 10 years.
- The City's Environmental Policy commits the City of St. Albert to maintain a healthy natural environment and ensure its sustainability for future generations. As a leader in environmental resource management, the City has a responsibility to ensure adequate and healthy water supplies are available well into the future.
- Fostering sustainable behavioural changes in water users through education and knowledge is a process and will take time to cultivate a sustainable water culture within the community.
- The City of St. Albert finances its utility on the principle that water, sewer (wastewater), stormwater and solid waste should be self-sustainable. Therefore, the City does not subsidize its utility fund through contributions from the general tax base. Rates will continue to increase to ensure adequate operating and capital funding for future utility projects. The rate of increase in 2012 was 9.5 per cent with an estimated increase of 6.5 per cent in 2013 (CSA 2011).

**Table 1: Summary of Water Efficiency Benefits in St. Albert\***

WHO BENEFITS?	HOW DO THEY BENEFIT?
Customers	<ul style="list-style-type: none"> <li>• Save money on their water bills.</li> <li>• Less likely to face inconvenience of emergency watering restrictions.</li> </ul>
Community at large	<ul style="list-style-type: none"> <li>• Maintains affordability of water and wastewater services by making the most out of current infrastructure.</li> <li>• Expands capacity to accommodate population and growth while maintaining water demands.</li> <li>• Cultivates a culture of water sustainability among residents.</li> <li>• Promotes economic development and quality of life by creating a city in which people want to live and do business.</li> </ul>
Water utility (City)	<ul style="list-style-type: none"> <li>• Maximizes efficient utilization of existing infrastructure by extending its longevity.</li> <li>• Reduces operating and maintenance costs for distributing and purchasing treated water.</li> <li>• Increases the ability to adapt to uncertainties like climate change.</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Reduces water use which keeps more water in our rivers and reduces the stress on watersheds.</li> <li>• Reduces greenhouse gas emissions associated with treating, distributing, and heating water.</li> </ul>
Business and Industry	<ul style="list-style-type: none"> <li>• Saves money and improves competitiveness by increasing process and operational efficiencies.</li> </ul>

\* Modified from City of Calgary (2005) and EPCOR (2010)

## 1.2 Alberta's Water For Life Strategy

Water Conservation, Efficiency and Productivity (CEP) planning aligns with Alberta's *Water For Life Strategy*. Adopted by the Alberta Government in 2003 the strategy contains the following three goals:

- safe, secure drinking water supply;
- healthy aquatic ecosystems;
- reliable, quality water supplies for a sustainable economy.

The strategy also contains three key directions to achieve the goals, one of which is water conservation. The specific direction states that "Albertans will be leaders in conservation by using water efficiently and effectively" (AWC 2008). A key action in the strategy is "to prepare water conservation and efficiency plans for all water using sectors" (AWC 2008).

As a member of the Alberta Urban Municipalities Association (AUMA), the municipal water using sector, the City of St. Albert was asked to prioritize water CEP targets. The AUMA CEP plan targets are:

1. By December 2010, all AUMA member municipalities with water systems in place will report water use data through Alberta Environment's electronic Water Use Reporting System (WURS).
  - EPCOR, as the City's water provider, reports water use data on behalf of the City of St. Albert
2. By December 2012, AUMA member municipalities will estimate their Infrastructure Leakage Index (ILI) and identify ways to reduce leaks according to the population participation rates.
  - City of St. Albert is currently working with staff to reach this target.
3. By December 2011, AUMA member municipalities will implement incentives and/or disincentives of their own choosing, to increase uptake of water efficient fixtures and technologies.
  - The Office of Environment received funding through the 2011 budget process for a toilet rebate program.
4. By December 31, 2011, AUMA member municipalities will develop Conservation, Efficiency and Productivity Plans according to population participation rates.

Not only is St. Albert's Water CEP plan addressing challenges facing our community but it is providing water users with the City's 'water story'. The plan will provide water use and system information to the City's water customers, to encourage and facilitate good decisions leading to reduced water use in our community.

### **St. Albert's Water CEP plan will discuss the following topics:**

- St. Albert's water source and treatment
- St. Albert's potable water and wastewater systems
- St. Albert's water losses
- St. Albert's water conservation efforts
- St. Albert's water targets and future conservation initiatives



Photo courtesy of the North Saskatchewan Watershed Alliance



### What is a watershed/basin?

*It is an area of land in which all the water drains into the local water body.*

### What is a tributary?

*A stream or river that flows into the main stem or river.*

2.0

## Sturgeon River: Our River

The City of St. Albert is situated along the Sturgeon River within the Sturgeon River Watershed. The Sturgeon River is a tributary of the North Saskatchewan River and one of twelve sub-watersheds in the North Saskatchewan River basin (NSWA 2005). The headwaters of the Sturgeon River begin at Hoople Lake, flow east through Lake Isle, Lac

St. Anne, Big Lake and empty into the North Saskatchewan River at Fort Saskatchewan (NSWA 2005) (Appendix A: Sturgeon River Watershed map). For more information on the Sturgeon River Watershed, please consult the report at [www.stalbert.ca/sturgeon-river-watershed](http://www.stalbert.ca/sturgeon-river-watershed).

## 3.0

# St. Albert's Water Source

Although the City of St. Albert is situated along the Sturgeon River, St. Albert obtains its potable water from the North Saskatchewan River. The North Saskatchewan River is part of the North Saskatchewan River Watershed which covers approximately 80,000 square kilometres (NSWA 2005) (Appendix A Sub-watersheds and Municipal Boundaries in the North Saskatchewan Basin).

Originating in the Columbia Icefields in Banff National Park, the North Saskatchewan River flows past Rocky Mountain House, through the City of Edmonton to the Alberta/Saskatchewan border and into the South Saskatchewan River (NSWA 2005). In the Capital Region, EPCOR, a private utility owned by the City of Edmonton, extracts water from the North Saskatchewan River, treats the water for consumption before pumping the water to St. Albert and other regional water customers.

EPCOR operates two potable water treatment plants – Rossdale plant and E.L. Smith plant. City of St. Albert obtains its drinking water from EPCOR's E.L. Smith water treatment plant in west Edmonton.

St. Albert does not hold a water diversion licence to supply its own potable water. Water is purchased by the City from EPCOR through a water supply agreement and distributed to St. Albert customers. City of St. Albert is a member of the Regional Water Customers Group, a group of customers that obtain water from EPCOR. St. Albert is one of five municipalities in the Capital Region that are supplied directly from EPCOR. The remaining municipalities are supplied by a regional water service commission (AIT 2005) (Appendix A Capital Region Service Map).



Photo courtesy of the North Saskatchewan Watershed Alliance



# 4.0

## Potable

## Water System



### 4.1 Potable Water System

St. Albert's water storage and distribution system is monitored around the clock by the Supervisory Control And Data Acquisition (SCADA) system that provides system status, water quantity and quality data reports to Utilities operational staff.

The City of St. Albert distributes safe, reliable drinking water to a range of customers within the city boundaries. This includes more than 60,000 residents and over 750 industrial, commercial and institutional customers. In

2011, the City of St. Albert supplied 5,824,100 megalitres of drinking water to meet the needs of these customers.

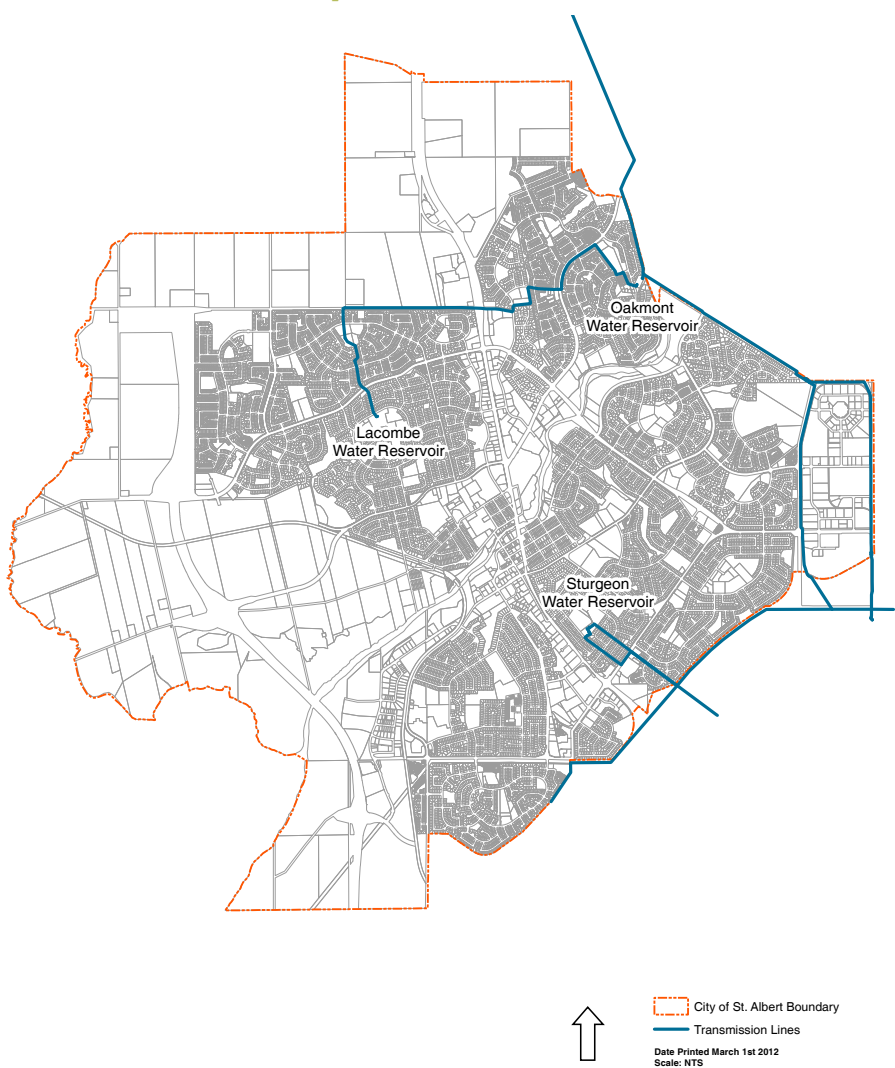
Once treated at EPCOR's E.L. Smith water treatment plant in Edmonton, potable water is pumped through two transmission pipelines to the Sturgeon and Oakmont reservoirs in St. Albert (Figure 1). Oakmont reservoir supplies treated water to the Lacombe reservoir in St. Albert.

**EPCOR withdraws 2%-5% of the North Saskatchewan River volume and returns 90% of that through the wastewater treatment system (EPCOR 2010)**

**St. Albert's potable water distribution system consists of:**

- **three reservoirs**
- **approximately 320 kilometers of distribution (290) and transmission (31) pipelines**
- **14 reservoir pumps (including one emergency pump at Sturgeon reservoir)**
- **more than 19,000 service connections**
- **five pressure zones**

**Figure 1: City of St. Albert Water Reservoir Locations and Transmission System**



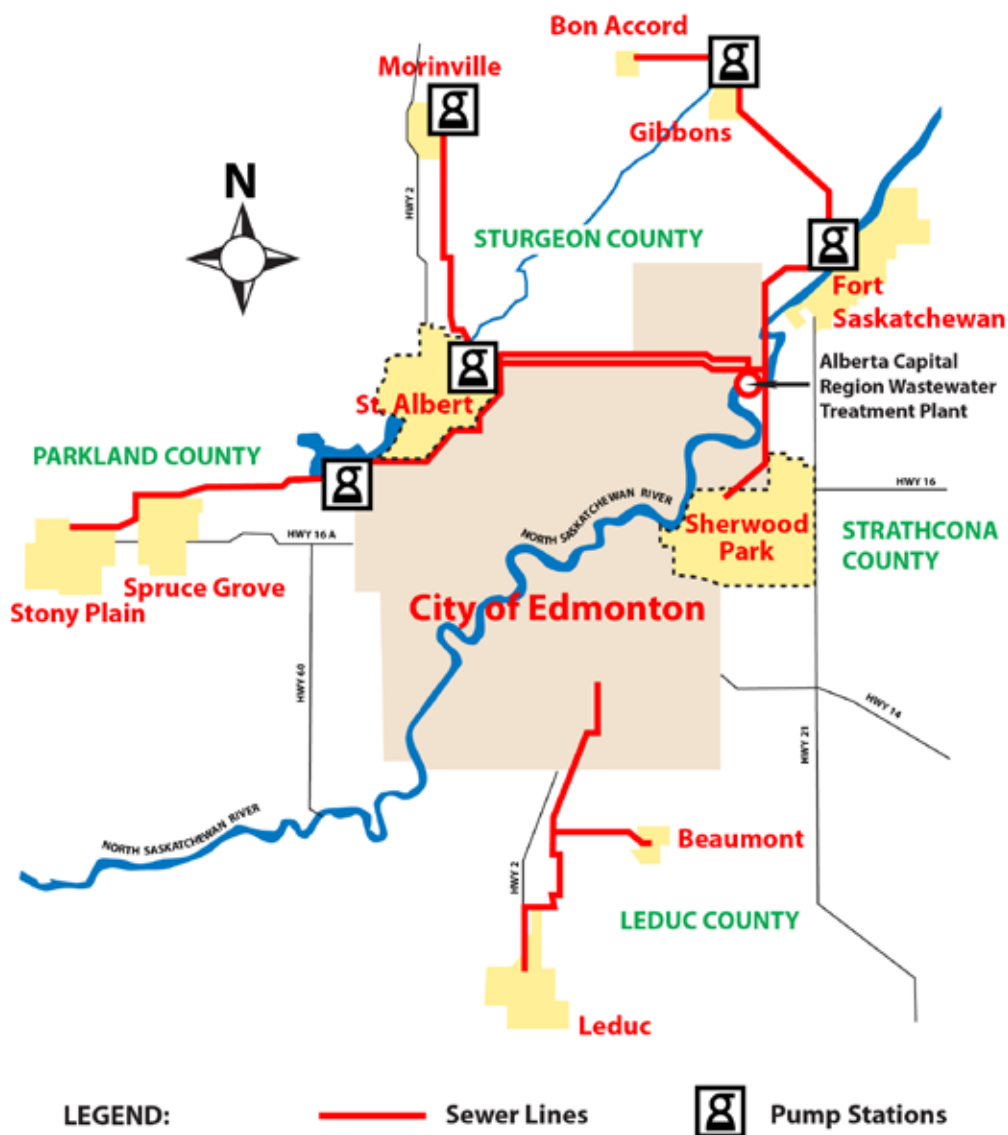
**Table 2: Potable Water Reservoir System Capacity**

Average Daily Supply Capacity	16.52 ML /day
Reservoir storage capacity	42.6 ML/day (two and half day storage)
Peak hour system capacity	1.238 ML/hour

During times of drought, the City’s reservoir levels trigger three demand management conditions which are used by EPCOR’s regional customers:

- Condition A is a reduction in internal municipal operations such as hydrant flushing, fire fighting training and other non-essential water uses.
- Condition B expands to external customers and voluntary reductions by residents communicated through road signage and media.
- Condition C is put into place when water demand far exceeds water supply. In this situation a full ban on all non-essential water uses is communicated to St. Albert water customers through a media blitz and enforcement of compliance with the water ban is monitored. The City of St. Albert and EPCOR’s regional customers have not had to direct a demand management Condition C.

**Figure 2: Alberta Capital Region Wastewater Commission Water Transmission Network**



## 4.2 Wastewater System

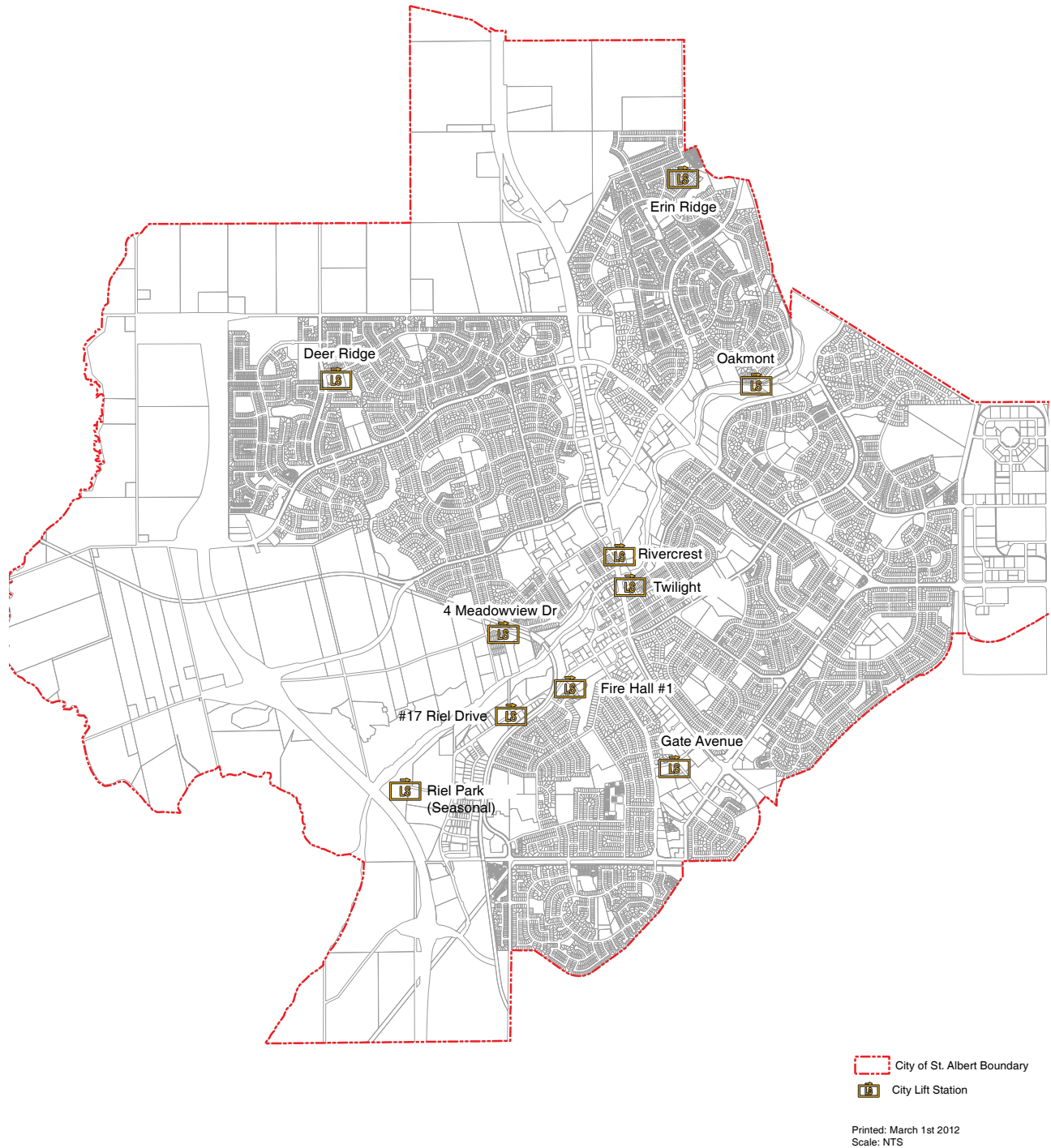
St. Albert is a part of the Alberta Capital Region Wastewater Commission (ACRWC) that collects wastewater from 13 communities around the City of Edmonton (Figure 2) for treatment at their facilities located in Fort Saskatchewan (ACRWC).

St. Albert Utilities Branch operates and maintains approximately 250 kilometres of sewers and 10 sewage lift stations located at Riel Park (seasonal), 4 Meadowview Dr., Deer Ridge, Erin Ridge, Fire Hall #1, Gate Ave, Oakmont, #17 Riel Dr, Rivercrest and Twilight (City of St. Albert 2007) (Figure 3).

ACRWC owns and operates the lift station at the corner of Sturgeon Road and Sir Winston Churchill Avenue which receives wastewater flows from St. Albert for treatment in Fort Saskatchewan.



**Figure 3: City of St. Albert Wastewater Lift Station Locations**

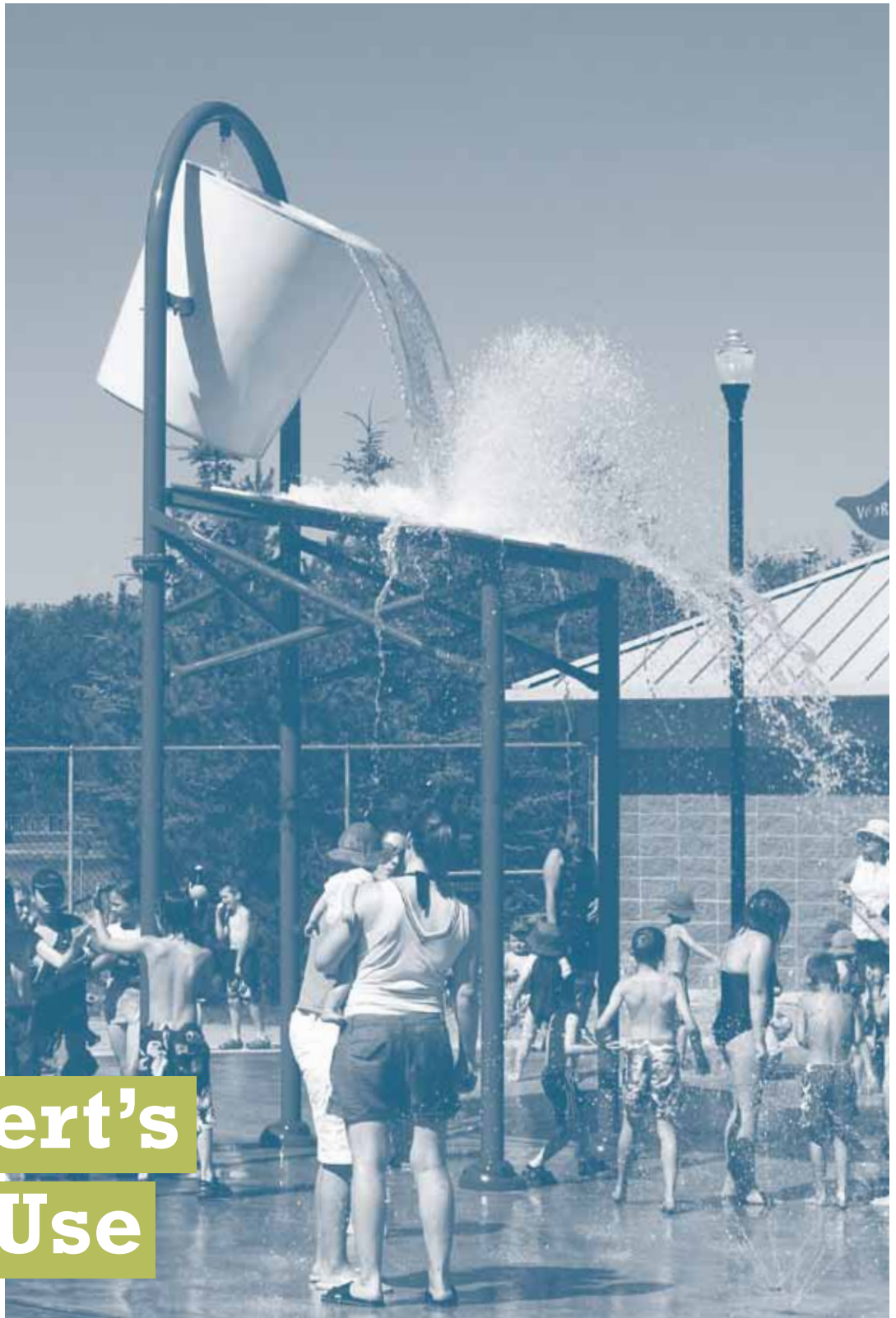


Similar to many municipal wastewater systems, St. Albert's system operates on a network of pipes relying on gravity to move wastewater from the source (i.e., household) to a lift station. Lift stations are strategically situated in St. Albert at locations where the pipe has reached the lowest depth. Once the wastewater reaches the lift station, it is pumped into another gravity-fed system or

goes into the interceptor pipe for treatment in Fort Saskatchewan. Once wastewater leaves St. Albert for Fort Saskatchewan, the water is put through a complex process at the ACRWC wastewater treatment facilities, allowing the treated water to be released back into the North Saskatchewan River as it flows east.

## 5.0

# St. Albert's Water Use

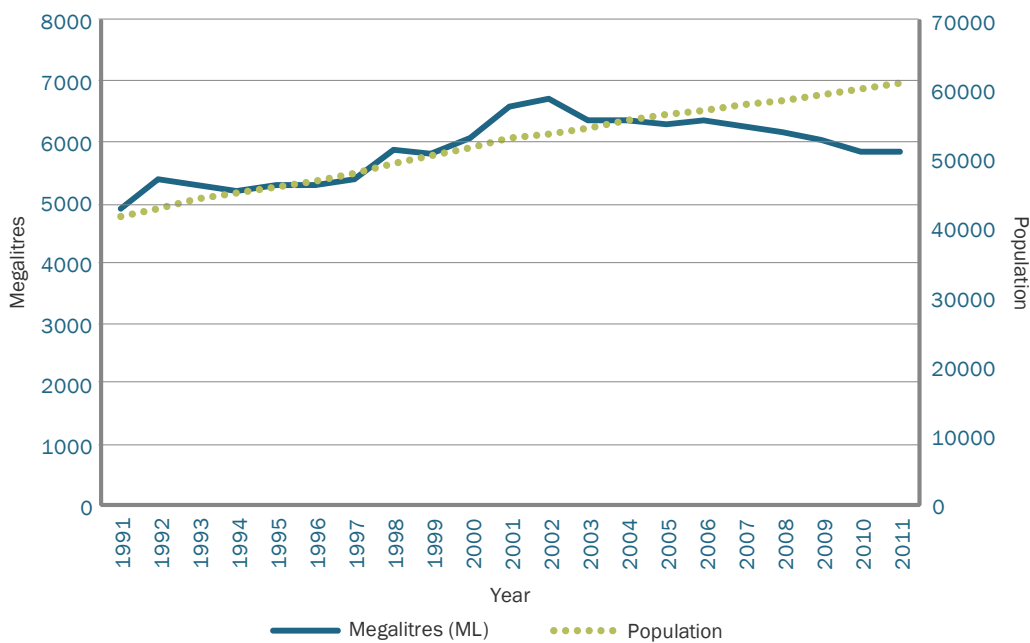


### 5.1 Total Annual System Demands

As St. Albert's population has increased, so has the total annual system demands; however, over the last four years this pattern has reversed, with annual water consumption decreasing as the City's population increases

(Figure 4). This may be a result of the City's efforts to reduce system leaks, increased uptake of water-efficient fixtures in homes, water conservation awareness and billing rates.

Figure 4: Total Annual Water Consumption

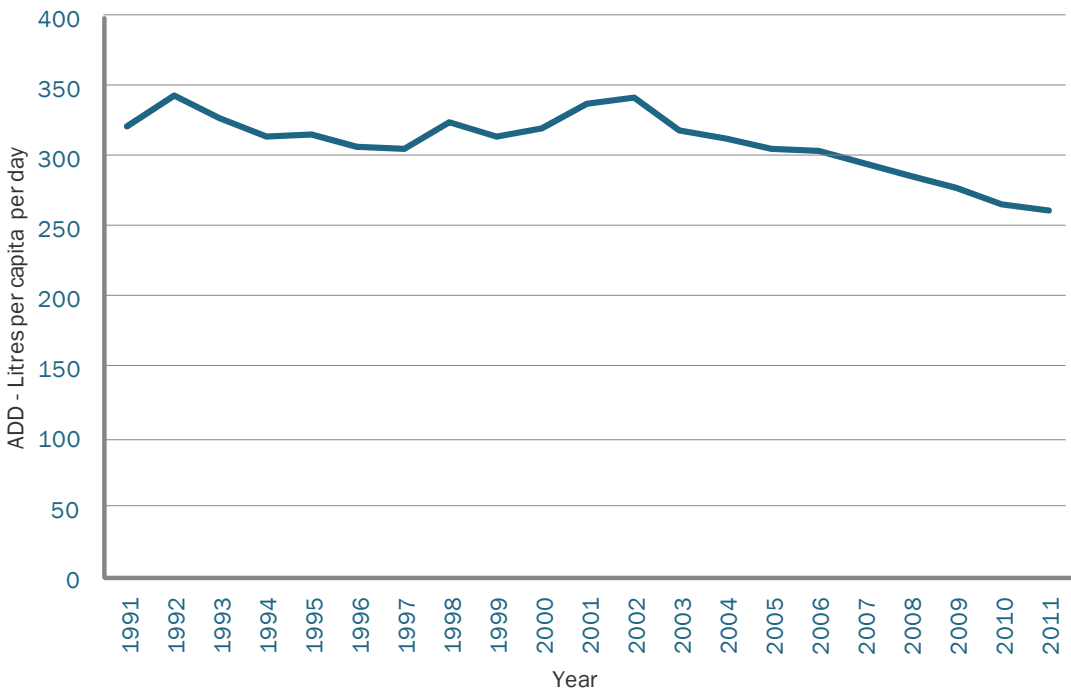


Total annual system demand is the total volume of water used by all customers in a calendar year.

5.2 Daily Water Demands

St. Albert’s gross per capita demand of water has followed a similar reduction pattern to total system demand; however, decreasing daily water demands occurred over the past 10 years (2002-2011). Figure 5 illustrates average yearly demand per capita of all customer sectors, including non-revenue water.

Figure 5: Average Daily Demand (ADD)



Per capita water demand is calculated based on average volume per day divided by the total population for the given year



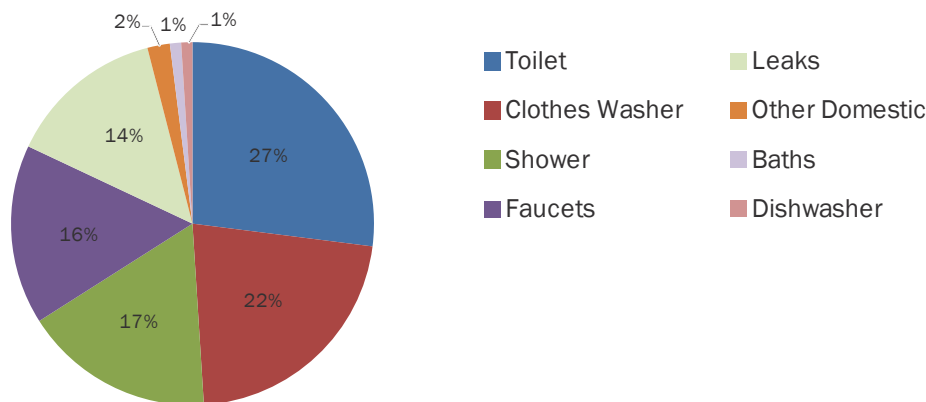
### 5.3 Seasonal Residential Water Use

Since St. Albert residents are the largest water users, it is important to examine household water use. Figure 6 shows how and where the average North American home uses water indoors. Toilets, showers/baths, and washing machines are the highest indoor water uses.

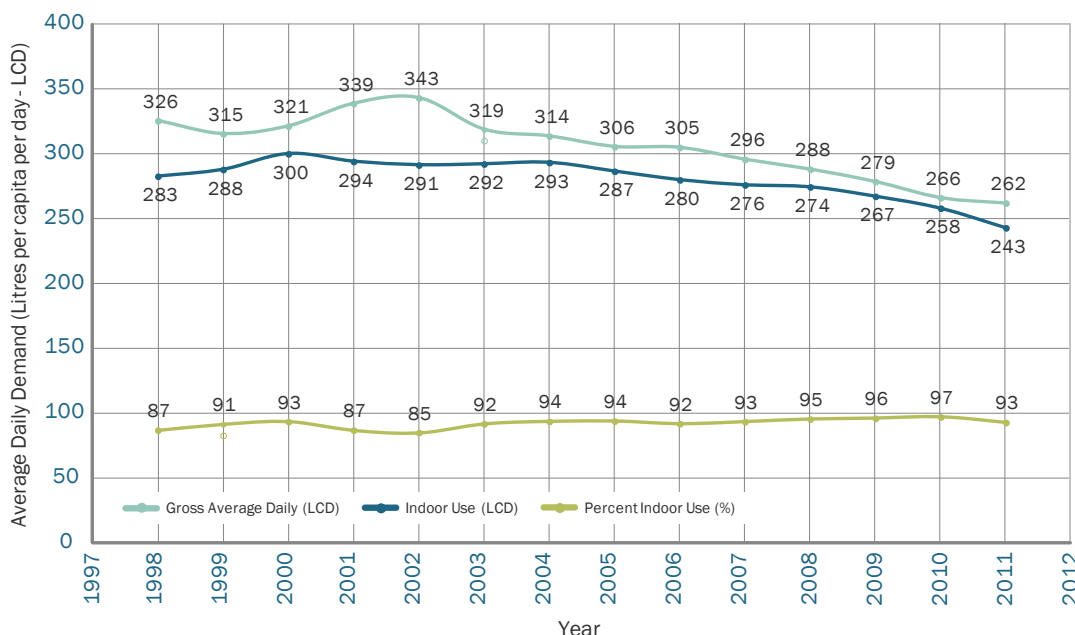
For St. Albert, indoor water use can be determined by comparing the monthly water use data for summer and winter. The difference, or ratio, between the summer and winter water use numbers provides the average indoor and outdoor water usages on an annual basis (Figure 7).

Typically outdoor water use can vary depending on weather, precipitation and frequency; however, St. Albert's indoor and outdoor water use has remained fairly constant. Between 2003 and 2010, outdoor water use as a proportion of total annual use ranged from three per cent in 2010 to eight per cent in 2003.

**Figure 6: Average North American Indoor Water Use Pattern (single-family home)**



**Figure 7: City of St. Albert Total Seasonal Gross Water Demand Trend (all sectors)**



In the summer, residential water use can increase up to 50%, mostly due to lawn and garden watering (EPCOR 2011)

The City of St. Albert's water consumption per person per day has been decreasing with time (Table 3). Alberta's average water usage

is 209L/capita/day (Environment Canada, 2011). St Albert residents actually use less than this at 200L/capita/day as of 2011.

**Table 3: Monthly Residential Water Use**

(76.4% of Total = Residential Only)

	Average Daily Demand (ADD) (L/cap/day)													
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Jan	208	203	218	244	227	218	209	216	220	226	198	193	191	190
Feb	215	216	238	222	224	216	217	214	211	210	218	201	193	186
Mar	225	234	227	215	204	220	231	222	210	204	210	207	206	184
Apr	240	233	226	274	253	224	229	222	213	224	205	201	211	189
May	280	240	283	350	293	255	279	266	268	231	227	221	226	230
Jun	294	277	282	257	358	289	297	258	265	247	249	222	233	218
Jul	269	249	257	292	358	285	243	256	302	272	239	222	200	191
Aug	300	297	272	281	248	265	271	258	237	224	238	239	217	222
Sep	275	245	241	241	287	266	225	231	223	208	242	243	194	219
Oct	224	222	252	263	236	243	215	226	229	242	209	199	193	183
Nov	227	242	233	232	216	203	234	218	216	209	193	207	193	203
Dec	228	234	218	235	239	238	223	215	204	213	215	198	182	187
<b>Average</b>	<b>249</b>	<b>241</b>	<b>246</b>	<b>259</b>	<b>262</b>	<b>244</b>	<b>240</b>	<b>233</b>	<b>233</b>	<b>226</b>	<b>220</b>	<b>213</b>	<b>203</b>	<b>200</b>

## 5.4 Total Annual Max Day Demand and Peaking Factor

Maximum daily demand (MDD) refers to the highest total water use experienced by a water supply system during a single calendar year. MDD is one of the most important factors driving infrastructure expansion (AUMA 2011). Even though it may occur only once a year, water infrastructure has to be built to meet this demand.

In 2011, St. Albert's MDD was 407 litres per person per day which is the lowest compared to the past five years. This can be attributed to a wet season during typical high demand months.

Table 4 shows a summary of St. Albert's daily water demands over the past six years. A unique piece of information is the Peak Hour Demand (PHD) date and time of day. The peak hour flow typically occurred on Sunday

evenings between 7 p.m. and 9 p.m. This may suggest residents were watering their lawns before the work week, or completing inside chores like running the dishwasher or washing machine. This interesting fact is important to note in order to help St. Albert target water conservation initiatives, specifically to reduce water consumption during peak times.

Peaking factor (PF) is the ratio between a city's annual peak hour demand and average day demand for the same year. Max day factor (MF) is the ratio between the city's maximum day demand and average day demand for the same day. Municipalities use these ratios for planning and engineering design. It is important for a municipality to reduce peak water uses to help alleviate strain on local infrastructure.

**Table 4: Daily Water Demands**

	Gross ADD (LCD)	MDD (LCD)	PHD (LCD)	Date/Time of Peak Flow	MF	PF	Comments
2006	305	548	1051		1.80	3.44	
2007	296	543	978	June 3 20:20-21:15	1.83	3.31	
2008	287	437	764	Aug 17 20:15-21:10	1.52	2.66	
2009	278	510	1063	June 14 20:35-21:30	1.83	3.82	Hot Sunday after long warm weather stretch
2010	267	433	813	May 16 19:55-20:50	1.62	3.05	
2011	262	407	672	May 29 19:25-20:20	1.55	2.56	2011 wet year during typical high-demand months

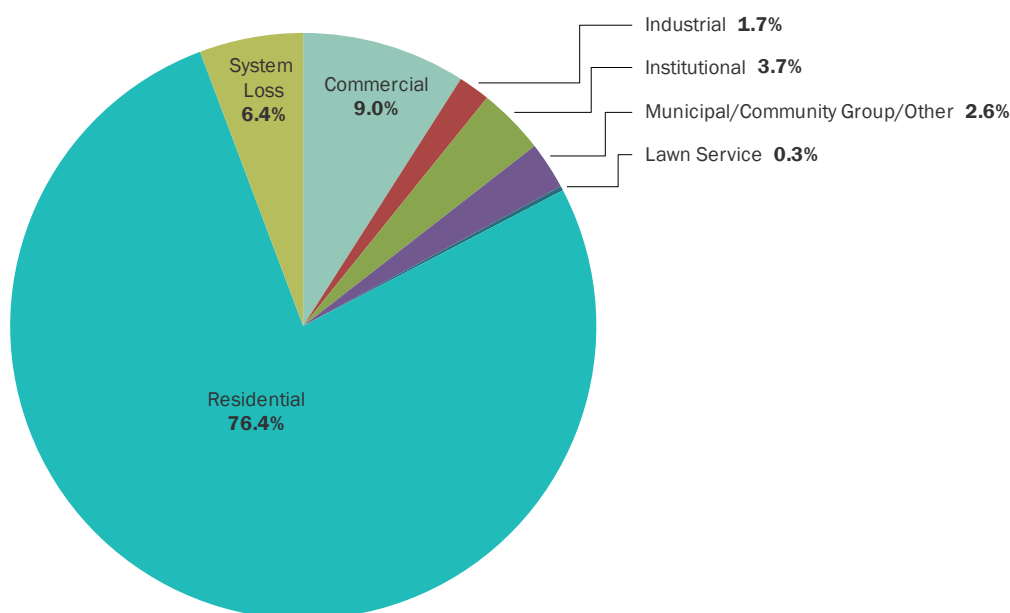
## 5.5 Water Use by Sector

Typical of many smaller Canadian urban municipalities, St. Albert's residential customers use on average 76.4 per cent of the total annual water treated and distributed in our city. Institutional, commercial and industrial customers make up approximately 14 per cent of the connections (Figure 8). Lawn service connections are set up at

commercial and multi-family properties which are metered and billed separately. In terms of actual volume of water used, 64 per cent is used by single family detached (including duplex) homes and 13 per cent by multi-family residences. The City uses approximately two per cent for municipal operations.

“In terms of actual volume of water used, 64 per cent is used by single family detached (including duplex) homes and 13 per cent by multi-family residences.”

**Figure 8: City of St. Albert's Water Use by Sector**



## 5.6 Water Losses and Non-Revenue Water

Non-revenue water is the difference between the system input volumes (from EPCOR) and the sum-total of all billed water consumption (AUMA 2011). It is important for a municipality to examine non-revenue water to determine losses through system leaks, bypasses or system errors.

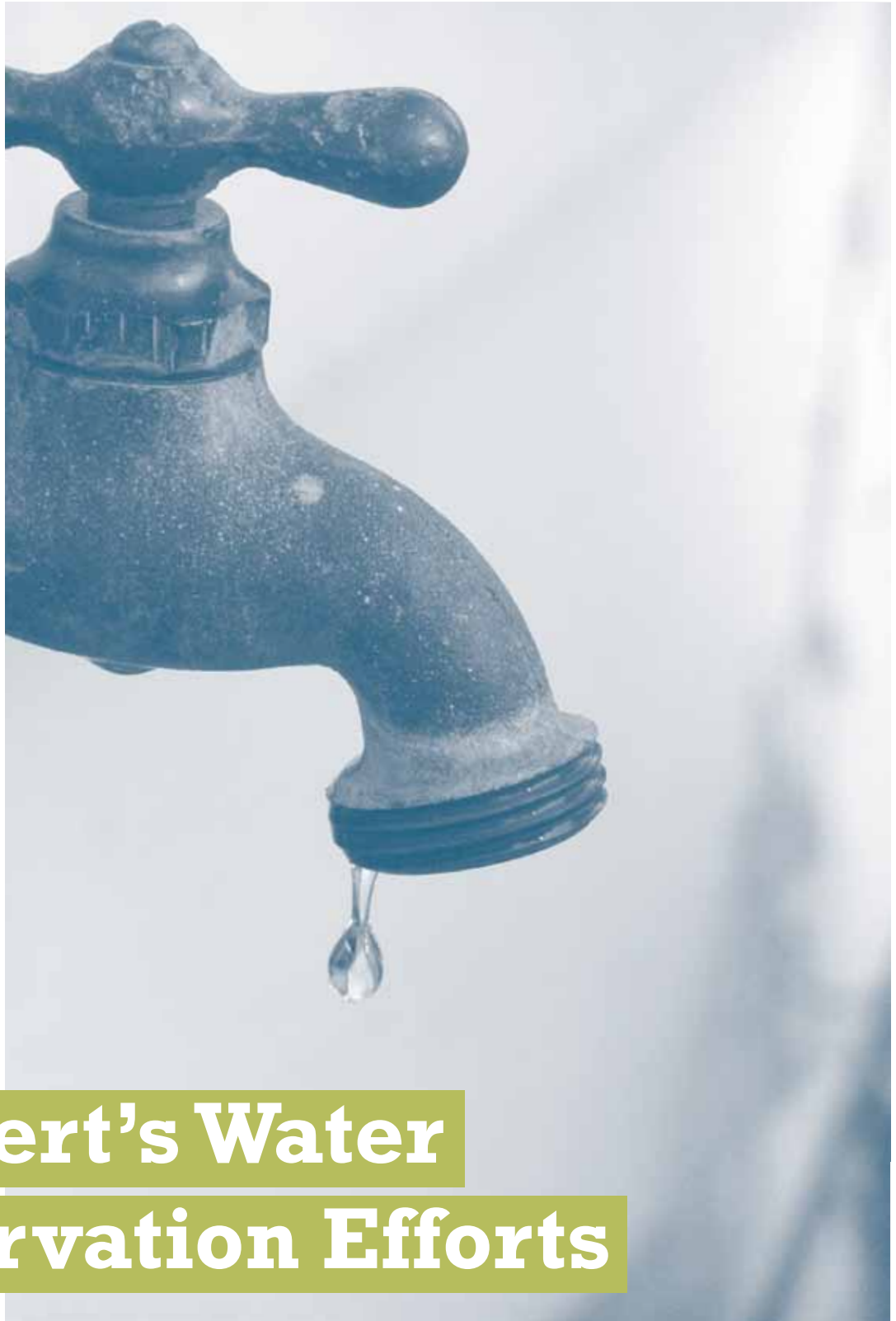
Environment Canada reports that 13.3 per cent of water is lost from distribution systems before reaching customers (Environment Canada 2011). They also suggest that system water loss through leaks and system maintenance increases with larger municipalities (population over 500,000)

as opposed to smaller municipalities (population under 1000). Water losses are related to a number of issues including condition of distribution infrastructure and level of pressure maintained in the distribution system. As a result of a newer distribution system (approximately 60 years old), good soil conditions, tracking water main breaks and hydrant flushing in addition to other preventative maintenance programs (see section 6.2.1), St. Albert has maintained a system loss of between 5.0 per cent (2009) and 7.9 (2007) per cent in the past five years (2007 – 2011).

St. Albert's water distribution system experiences nearly three times less water loss than the average Canadian municipality



If every household in St. Albert purchased a rain barrel, after just one rain event, enough water would be saved to fill the main pool at Fountain Park Recreation Centre five times



## 6.0

# St. Albert's Water Conservation Efforts

### 6.1 Education and Outreach

#### 6.1.1 Rain Barrel Program

In 2006, the City's Rain Barrel Program was introduced to residents in an effort to reduce the amount of treated drinkable water used for outdoor watering. Based on the success of past rain barrel programs, the City continues

to purchase rain barrels to sell to residents at cost. Since the program began in 2006, there has been more than 3,100 rain barrels sold to St. Albert residents. For more information visit [www.stalbert.ca/rain-barrel-program](http://www.stalbert.ca/rain-barrel-program).



### 6.1.2 Water Conservation Campaigns

In order to promote water conservation to St. Albert residents, the City of St. Albert partnered with EPCOR to initiate a water conservation program in 2007. Summer and winter water conservation programs used a variety of communication tools, including newspaper ads, webpage content, door hangers, contests, billboard ads, bill and newspaper inserts, grocery store ad bars, and demonstration projects.

Summer water conservation campaigns focused on outdoor lawn watering by promoting the message: 'One hour a week, keeps your lawn at its peak'. Other key lawn watering tips included:

- Choice of drought-tolerant native turf, trees and shrubs. (St. Albert partnered with St. Albert Botanic Park in 2008 to plant a xeriscape demonstration garden for residents to get ideas.)
- Lawns may turn slightly brown during dry periods but will green up when it rains again.
- Cut grass higher than usual – seven centimetres to provide shade for roots and soil.

Winter water conservation campaigns focus on detecting and repairing leaks in toilets. In March 2008, City residents received an insert in the St. Albert Gazette. Dye tablets were attached to the insert encouraging residents to test their toilets for leaks twice a year. Utilities Customer Service staff continues to

promote and provide dye tablets to residents for toilet leak detection in their homes.

### 6.1.3 Homeowner Water Variances

Utility Customer Service Representatives use water variance information reports to identify possible leaks for residential customers on a monthly basis. This is communicated to residents through a phone call and possible solutions are discussed with the homeowner.

### 6.1.4 Water Conservation Webpage

The Office of Environment continues to provide and is currently enhancing information on the City website related to water conservation, water quality and quantity. Up until 2006, water conservation information wasn't available to residents on the City's website.

### 6.1.5 Good Growing Neighbours

The City of St. Albert partners with the City of Edmonton, Strathcona County, and the City of Leduc to bring Good Growing Neighbours to St. Albert. Good Growing Neighbours partners provide lawn and garden tips that reduce the need for pesticides and fertilizers in the yard.

### 6.1.6 Yellow Fish Road Program

The Yellow Fish Road Program is a proactive environmental initiative, which educates the public about the storm sewer system and encourages people not to dump oil, pesticides, turpentine, paint and other unwanted substances containing chemicals into the storm sewer system.

### 6.1.7 Fats, Oils and Grease Information

The Utilities department and Office of Environment developed information on the City website related to the causes and prevention of fats, oils and grease in homeowner's sewer system. Similar information was produced in a brochure for Utilities staff to hand out to homeowners when responding to sewer backups.

The average home loses 14% of its water annually to leaks from toilets and faucets.



## 6.2 Utility Operations

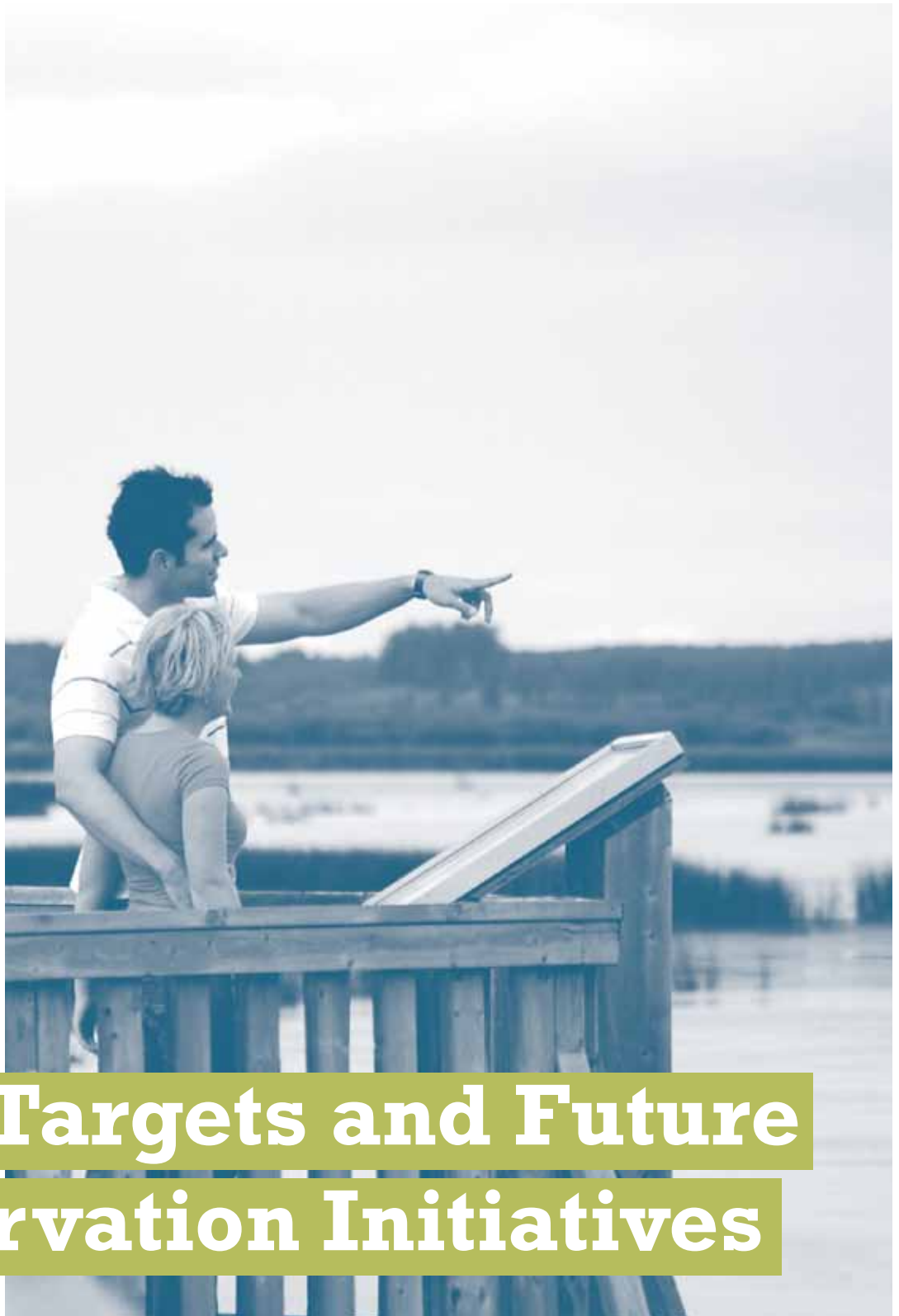
### 6.2.1 Preventative Maintenance Programs

**Table 5: Summary of Utility Operations Preventative Maintenance Programs**

Program/Initiative	Description
Replace Cast Iron Water Mains	Replaced all cast iron potable water transmission lines with PVC water mains. Cast iron pipes are more susceptible to corrosion. Only one cast iron main remains in the Mission area.
Lift Stations	Continually follow recommendations from the operations and maintenance manual for preventative maintenance of lift stations.
Wastewater Main Rehab Program	Rate wastewater main lines from 1 (good condition) – 5 (poor condition) to create a priority maintenance list.
Wastewater Collection System	Using Closed Circuit Television (CCTV), inspect all sewer mains on a 10-year cycle, or as needed in high-risk areas. Flush lines throughout the city based on a list of priorities (PW Long-Term Department Plan, 2009).
Sewer Trunk Installations	Upgraded to accommodate future growth and to reduce surcharging and overflows (2003 ROE).
Wastewater Service Connections	Preventative maintenance programs and replacement of services as per City policies and procedures with strong emphasis on risk management and liability issues (PW Long-Term Department Plan 2009)
Zoom Camera Technology	This camera is used to inspect sewer mainlines through manholes to determine if flushing of the line is required. The technology has reduced the number of mainline flushings the Utilities department has completed in 2011 by 50 per cent, saving water and improving preventative maintenance procedures. As a result of this technology, the Utilities department has been able to focus on other areas of the preventative maintenance program like root cutting.
Non-Account Water	Track loss from water breaks, hydrant flushing, and hydrant metres for contractors and fire halls.
Continuous Improvement	Through Utilities ISO 14001 Environmental Management System Programs.
Infiltration and Inflow (INI) Program	Implemented in 1993 this program aims at reducing the amount of surface and ground water that leaks into the sanitary sewers. Reduced inflow means a reduction in the volume of wastewater for both conveyance and treatment and hence a savings in cost and energy (2003 ROE).
Sewage Lift Station Upgrades	Installing new generators for backup power to help prevent surcharges and overflows to the Sturgeon River (2003 ROE).
Meter Replacement Program	Replace water meters on a 15-year replacement cycle.
Hydrant Replacement	City continuously replaces fire hydrants that have reached the end of their life cycle. Priority replacement is given to older hydrants that parts are not readily available for.
Hydrant Testing	All hydrants are pressure tested each year.
Water Loss Audit	Completed a water audit in 2009 by comparing water purchased from EPCOR to volumes sold through meters, hydrant meters, projected fire fighting/training, and an estimated volume of water break losses.
Meter Calibration	Staff corrected variances in data (SCADA versus EPCOR) by re-calibrating reservoir water meters. As a result, system losses will be accurately analyzed (distribution system, reservoir, end user).



St. Albert uses approximately 200L of water/person/day which is less than the Canadian average of 280L/person/day



## 7.0

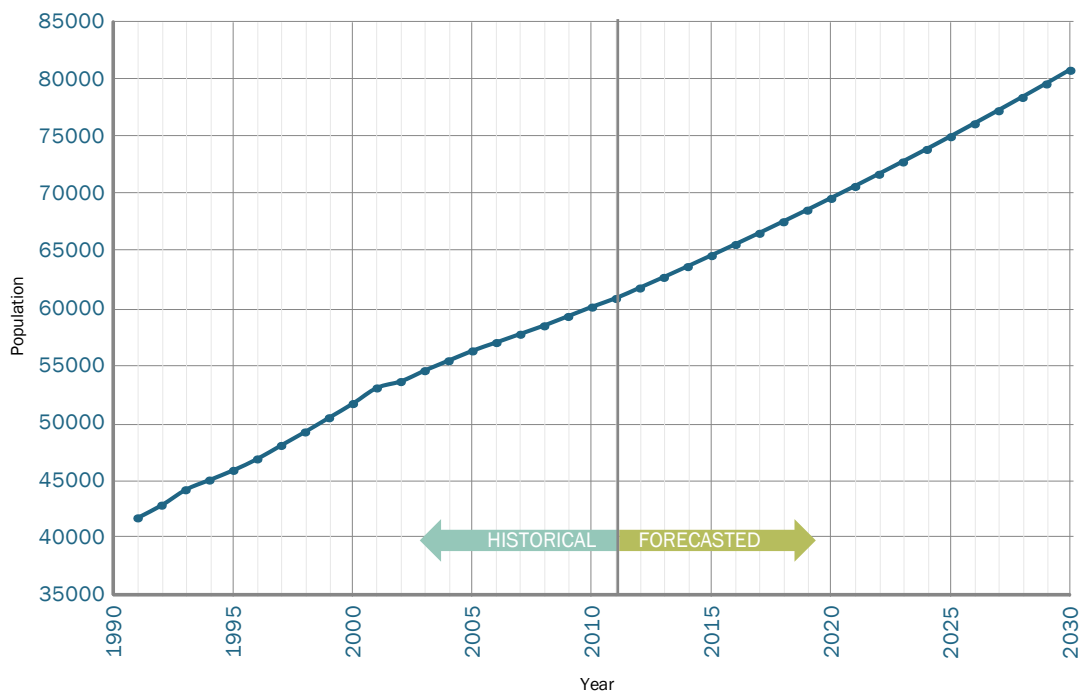
# Water Targets and Future Conservation Initiatives

### 7.1 Future Water Demand

St. Albert's population has increased on average 1.26 per cent each year over the past decade (Figure 9). Current estimates indicate St. Albert's population could reach over 80,000 by 2030. Typically accompanying such increases in population are similar increases

on demand for water and water treatment. As explained in section 5.0 this was the case in St. Albert until 2004 when per capita daily water use reduced as population increased.

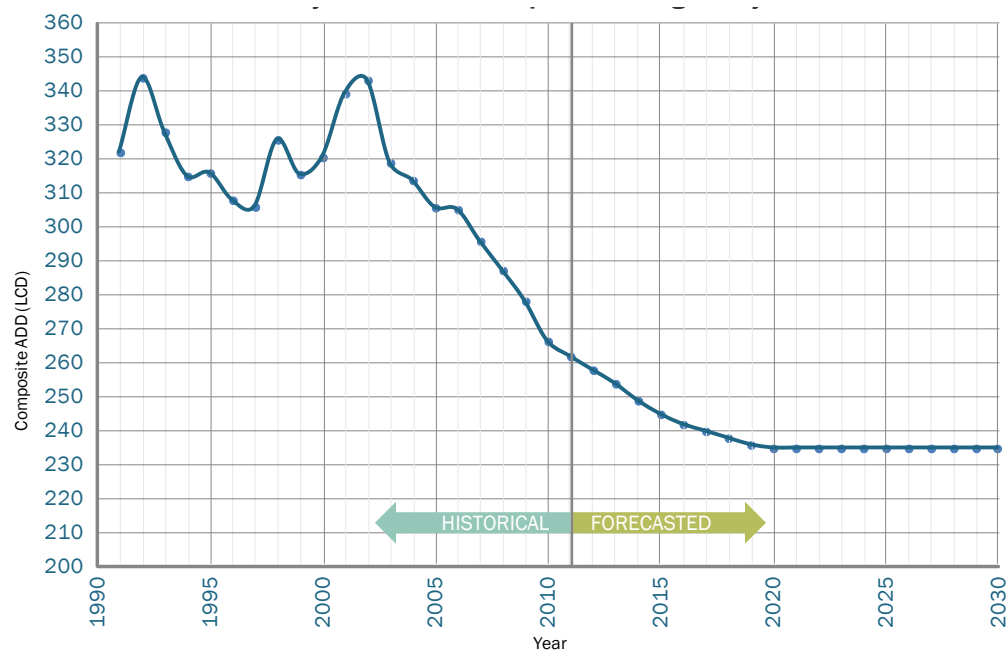
**Figure 9: City of St. Albert Population**



Future water demand is estimated for five years forward and updated each year by Engineering Services. Figure 10 shows St. Albert's composite average daily demand will continue to decrease leveling off in 2020.

As a result, the City of St. Albert has taken this trend into consideration when setting targets and recommending water conservation initiatives.

**Figure 10: City of St. Albert Composite Average Daily Demand**



## 7.2 Targets

Indicators are a performance measurement that assesses our progress over time and targets a specific goal to strive towards. Targets were selected based on a review of targets used by other municipalities, past and

forecasted consumption patterns, regional trends and existing city planning documents (Table 6).

**Table 6: Water Conservation Indicators and Targets**

Indicator	Description	Target
Per capita demand	Average volume of water used per person per day. Calculated based on average volume per day (all sectors) divided by population in a given year.	Environmental Master Plan commits to reduce water consumption to 200L or less per person per day by 2020.
Per cent water loss	Water lost through apparent losses (unauthorized consumption, customer metering inaccuracies, systematic data handling errors) and real losses (leakage on transmission, distribution mains and service connections, leakage at reservoirs).	Maintain water losses at seven per cent or below.

## 7.3 Water Conservation Initiatives

A comprehensive list of water conservation initiatives (Table 7) was developed by reviewing Alberta municipal best practices, initiatives approved in the Environmental Master Plan and suggestions from the City's Environmental Advisory Committee.

See Table 7: Proposed and Recommended Water Conservation Initiatives on Page 24

A water conservation initiatives workshop was conducted on March 22, 2012 with the City's Environmental Advisory Committee (EAC) (Appendix B for workshop summary and Appendix C for EAC's Recommendations to Council). As a result of the workshop, the EAC identified the following three water conservation initiative priorities:

- Water-Efficient Bylaw – adopt water-efficient bylaw, requiring water-efficient fixtures in all new developments and retrofits.
- Escalating Block Rates – adopt escalating block rates on water bills, which increase water rates when a user consumes above average water volumes.
- Targeting Industrial, Commercial & Institutional (ICI) Programs – print materials, website information and audits for ICI customers.

Water-efficient bylaw and escalating block rates were initiatives approved in the City's Environmental Master Plan.

Additional highlights based on the feedback and discussion from the workshop includes:

- Continue with residential education efforts.
- ICI specifically refers to schools and big water users (larger audience).
- Use a champion in the community to promote and help with water conservation initiatives and messaging (i.e., Hole's).
- Can't forget what the City is already doing – emphasis should continue on the water conservation initiatives that are already in place (i.e., rain barrel program).
- Leadership in Energy and Environmental Design (LEED) Silver equivalent can be obtained for water conservation. It was suggested the City seek the target design embracing LEED-principles by forgoing the certification as a means to reduce costs.
- Wastewater reuse will definitively be part of the future in Alberta—suggest the City include purple pipes in the development planning stages so the infrastructure (or space for it) is in place when the plumbing code is updated in the next two to five years.
- Utilities and operational tools category were not highlighted since they were deemed part of best management practices and were already funded.

## Table 7: Proposed and Recommended Water Conservation Initiatives

Proposed Initiative	Target Sector	Description	Costs	Time Frame	Benefits/Challenges	Priority		Recommended
						OE	EAC	
Utilities Management and Operations Tools								
SCADA System Upgrades	All	Part 1 wastewater lift stations and Part 2 reservoirs upgraded from dial up to radio frequency signals.	\$\$	•	Improved emergency response times Financial savings			Funded initiative through Utilities department
Sturgeon Reservoir Upgrade	All	Upgrades to reservoir (2012) will prolong the lifecycle of the reservoir another 10 years.	\$\$\$	•	Direct long-term water savings and energy efficiencies Financial savings			Funded initiative through Utilities department
Data collection system upgrade	All	Upgrading to Hansen 8.0, a web-based system, will enable staff to look up and input data in the field rather than come back to the PW building to input information.	\$\$\$	• • •	Operational efficiencies Financial savings (reduced over time)	✓		Funded initiative through Utilities department
Update City Building Water Audit (Energy Audit)	Municipal buildings	Complete an update of the City's building energy audit (2005). This can also look at potential water savings for each building.	\$\$\$	• •	Direct energy and water savings Financial savings Lead by example	✓		Logical to include water savings potential in the audit. Anticipated action from GHG Local Action plan.
LEED-Silver Equivalent	Municipal buildings	Develop a City policy that would require new City buildings or facilities to be built to a minimum of a LEED-Silver equivalent.	\$\$	• •	Lead by example Long-term and direct water savings to the City	✓		Initiative approved in the City's Environmental Master Plan
Spatial Water Consumption Analysis	All	Analysis of consumption data based on neighbourhood, demographic, housing type and age. Results of this analysis will facilitate targeted water conservation campaigns to highest water users.	\$	•	Data gap – collect and analyze information to select initiatives best suited for the community and the utility system	✓		Results will be used to develop targeted water education initiatives and plan for future water conservation initiatives.
Rain Harvesting for municipal buildings (pilot), ICI sector and businesses	Municipal buildings & ICI	Investigate opportunities for rain harvesting at City facilities.  Promote the use of rain harvesting technology in new and existing developments through changes to the City's Sanitary Sewer Bylaw (fee schedule).	\$\$\$ (municipal buildings)  \$ (ICI & Business)	• • •  • •	Lead by example Long-term and direct water savings to the City and water customers Promotion of new water technology			City would like to encourage more facilities to undertake rain harvesting through financial incentives
Regulatory Tools								
Water-Efficient Bylaw	All	Adopt a bylaw requiring water-efficient fixtures in all new developments and retrofits. This can ensure uptake of water efficiency and increase technology market penetration, resulting in innovations and new technologies (City of Edmonton).	\$	•	Permanent water savings	✓	✓	Initiative approved in the City's Environmental Master Plan EAC Priority
Escalating Block Rates and/or Seasonal Water Rate	All	Adopt escalating block rates on water bills, which increase water rates when a user consumes above average water volumes. This rewards users who practice water conservation and is an incentive for residents to reduce their water (City of Edmonton implemented in 2012).  Option of having a basic rate for average winter water use and increase rate for additional summer watering.	\$	•	Direct water savings Educational opportunity (encourage uptake of water-saving practices i.e. rain barrels)  Unsure about compatibility with St. Albert's billing system	✓	✓	Initiative approved in the City's Environmental Master Plan EAC priority
Land Use Bylaw	All	In new developments outline maximum area for turf; non-turf areas must be low water needs plants; no run-off from irrigation systems (Strathcona County and City of Red Deer).	\$	• •	New developments will be more water-efficient than pre-bylaw amendment developments			More research required to assess the success.  Block rates may drive this.

**Costs:** \$ (Low) | \$\$ (Medium) | \$\$\$ (High) **Time Frame:** • (2012-2013) | • • (2013-2015) | • • • (2015-2020)

**Continued >>**



Proposed Initiative	Target Sector	Description	Costs	Time Frame	Benefits/Challenges	Priority		Recommended
						OE	EAC	
Outdoor Water Restrictions	All	Outdoor water restrictions between May 1 and October 31 (Example: odd and even addresses are assigned two days a week to water for one hour (exceptions include new turf, using a watering can, etc.) or restricted hours of watering (6 a.m. – 9 a.m.) (7 p.m. to 11 p.m.) (Town of Okotoks).	\$	• •	Educational opportunity Provide a tool to address water waste No immediate water shortages – have emergency water plan in place (regional)			More research required to assess the success Suggest combining this tool with the implementation of escalating block rates
Seasonal Water Conservation Officers	Residential	In partnership with the seasonal Utilities ICI program, summer staff will talk to residents about low water-use landscaping, rain barrels and other water conservation tips. Also a good opportunity to pilot a water savings kit.	\$\$	• •	Implement public education campaign and assist with administration and enforcement of water conservation strategies	✓		Resource intensive Public consultation points to education and awareness campaigns as preferred initiatives

### Economic and Financial Tools

Residential Rain Barrel Program	Residential	Offer rain barrels at cost \$50 to collect rainwater. Approximately 400-500 rain barrels/year sold since 2006.	\$	•	Direct water savings Cost is largely for education	✓	✓	Maintain existing program
Residential Toilet Rebate Program	Residential	Offer a rebate of \$50 and \$75 for low-flush and dual-flush toilets with a maximum of one rebate per household to increase the uptake of water efficient technology in residents' homes.  Option of adding water-efficient shower heads and fixtures (Town of Canmore) or recycle old toilets free of charge at the Recycle Depot (City of Red Deer).	\$\$ 2012 program - \$30,000	• Expansion/continuation medium term	Direct water savings Educational opportunity	✓	✓	Initiative approved in the City's Environmental Master Plan Implemented March 2012 Based on review of 2012 program offer in future years
Washing Machine Rebate Program	Residential	Offer a rebate for the purchase and replacement of inefficient washing machines with an ENERGY STAR rated washing machine.	\$\$	• •	Direct water savings Educational opportunity			High cost and most households have ENERGY STAR washing machines
Water-Efficient Irrigation System Rebate Program	Residential	Offer a rebate to residents who install water efficient irrigation systems or retrofit water efficient components to their existing irrigation systems.	\$\$	• • •	Reduce peak demand (summer months) Direct water savings to resident Educational opportunity			More research required to assess the need for more efficient irrigation systems; difficult to ensure systems are maintained
Institutional, Commercial, Industrial (ICI) Toilet Rebate Program	ICI	If an institution, commercial or industrial water customer is replacing an inefficient toilet with a new low-flow or dual-flow model, offer rebate of each toilet replaced (City of Camrose pays 25% of each toilet up to \$50).	\$\$	• •	Direct water savings Targeted initiative			More research required to assess the need for more efficient toilets in the ICI sector
Dishwashing Spray Valve Replacement	ICI – restaurants	Replace water wasting spray valves with low water spray valves for dish rinsing in restaurants (City of Edmonton).	\$\$	• •	Direct water and energy savings Targeted initiative			Success in other Alberta municipalities

### Education and Outreach Tools

Toilet Leak Detection Program	All	Provide dye tablets free to residents to test toilets for leaks.	\$	•	Direct water savings to customers Educational opportunity	✓	✓	Maintain existing program Opportunity to expand to ICI
Targeted outdoor water campaign	All	Coordinated outdoor campaign with surrounding regions–One hour a Week Keeps your Lawn at its Peak.  Option to expand to include only watering during the hours of 7 p.m. and 9 p.m.	\$	•	Direct water savings to customers Educational opportunity	✓	✓	Maintain existing program Opportunity to expand to include watering hours Opportunity to refine program using spatial analysis
Targeting ICI Program	Largely schools and high users	Print materials, website information and audits for ICI customers (City of Edmonton and Calgary).	\$	• •	Targeted initiative Education opportunity	✓		Identified as an EAC priority

**Costs:** \$ (Low) | \$\$ (Medium) | \$\$\$ (High) **Time Frame:** • (2012-2013) | • • (2013-2015) | • • • (2015-2020)

**Continued >>**

Proposed Initiative	Target Sector	Description	Costs	Time Frame	Benefits/Challenges	Priority		Recommended
						OE	EAC	
Water Use Graphs on Utility bills/ Online Water Calculator	Residential	Water use data graphs on utility bills so residents can compare their water use to previous time periods or community average. Online water calculator compares residents' average household water use in the community and shares tips for water saving (Strathcona County).	\$	• •	Educational opportunity Current software does not allow for this option			Suggest combining this tool with the implementation of escalating block rates
Demonstration Xeriscape gardens	All	Demonstrate water-efficient landscaping at City-owned facilities incorporating drought tolerant plants, high-efficiency irrigation system (incorporates seasonal weather changes), and rain harvesting (Strathcona County and City of Calgary).	\$\$	• to • •	Long-term water savings Reduction in peak season demand Public education opportunity Lead by example			Demonstration xeriscape garden at Botanic Park funded by City Future potential for City facilities
Xeriscape Contest	Residential	Hold a contest where individual residents can submit a design to xeriscape a piece of their property. The winning design would receive funding to complete the project on the property. The contest would raise public awareness and promote the use of xeriscaping principles (City of Red Deer).	\$\$	• • •	Education opportunity			Limited success in other municipalities Business and Tourism is organizing a Cultivate Your Front Yard contest where one category is naturalization
Workshops	Residential	Host workshops on various water-related topics such as water-wise gardening, indoor water conservation and leak repairs.	\$ - \$\$\$	• to • •	Partnership and educational opportunity			Some workshops are available through the Botanic Park May consider City run workshops in future
Outreach at Special Events	Residential	Attend trade shows, festivals and community events to promote water conservation messages, information and tools for residents. Information and tools should be coordinated to align with larger campaigns and seasonal customer activities (summer/seasonal staff positions).	\$\$	• • to • • •	Reach more residents in a short amount of time			Do not have the staff resources at this time; however, if the resources became available this tool would be recommended
Indoor and Outdoor Water Savings Kits	Residential	Partner with a local hardware store to offer indoor and water savings kits to residents.	\$\$	• • •	Direct water savings to customers Educational opportunity Bulk purchases allow for savings			Resource intensive and difficult to administer

**Costs:** \$ (Low) | \$\$ (Medium) | \$\$\$ (High) **Time Frame:** • (2012-2013) | • • (2013-2015) | • • • (2015-2020)

## 7.4 Recommended Water Conservation Initiatives – Implementation Schedule

The recommended water conservation initiatives were selected based on feedback from the Environmental Advisory Committee, approved initiatives in the Environmental Master Plan, City priorities and initiatives that

would provide more information on water consumption within the City of St. Albert. Table 8 outlines the implementation schedule and initiatives which are the key recommendations for the City of St. Albert's Water CEP plan.

**Table 8: Recommended Water Conservation Program Initiatives Implementation Schedule**

Strategy Initiative	Short to Medium-Term		Long-Term	
	2012	2013	2014*	2015
Residential Toilet Rebate Program				
SCADA System Upgrades				
Sturgeon Reservoir Upgrade				
Water-efficient Bylaw for new developments				
Sanitary Sewer Bylaw: Incorporate rain harvesting in the fee schedule				
Escalating Block Rates				
Outdoor water restrictions and water use graphs on utility bills				
LEED-Silver equivalent policy for new City buildings with emphasis on water and energy conservation				
Develop ICI programs: Schools				
City Spatial Water Consumption Analysis: Use results to develop targeted education and outreach initiatives for higher water users				
Develop ICI programs: Industrial and Commercial – Investigate partnerships, produce web & print information				
City Building Water Audit: Incorporate with City Facility Energy Audit Update Anticipated initiative from Greenhouse Gas Reductions Local Action Plan				

\*Environmental Master Plan Review

# 8.0 Reporting

The City is committed to communicating its policies, objectives and targets to the corporation and the public by issuing regular updates. This is achieved, in part, through the City's annual Report on the Environment. The annual Report on the Environment is the City's way of sharing progress and achievement on the goals and targets of the

City's Environmental Master Plan. The report is published in the St. Albert Gazette and posted on the website at [www.stalbert.ca/report-on-the-environment](http://www.stalbert.ca/report-on-the-environment). Progress on the City's goal to reduce water consumption and its associated targets will be communicated through this report.

# 9.0 References

Alberta Capital Region Wastewater Commission (ACRWC). Transmission webpage. Available from [www.acrwc.ab.ca/](http://www.acrwc.ab.ca/) (December 1, 2011).

Alberta Environment. 2008. Glossary of Terms Related to Water and Watershed Management in Alberta.

Alberta Environment. 2011. Municipal Water Use Report 2011. Available from <http://www.ec.gc.ca/doc/publications/eau-water/com1454/survey2-eng.htm>

Alberta Infrastructure and Transportation (AIT). 2007. Capital Region Integrated Growth Management Plan Final Report on Core Infrastructure.

Alberta Urban Municipalities Association (AUMA). 2009. AUMA Water Conservation, Efficiency and Productivity Plan.

Alberta Urban Municipalities Association (AUMA). 2011. AUMA Water Conservation, Efficiency and Productivity Planning Guide.

Alberta Water Council (AWC). 2008. Recommendations for Water Conservation, Efficiency and Productivity Sector Planning. Available from [www.albertawatercouncil.ca](http://www.albertawatercouncil.ca) (December 28, 2011)

Alberta Water Council (AWC). 2007. Water Conservation, Efficiency and Productivity: Principles, Definitions, Performance Measures and Environmental Indicators Final Report. Available from [www.albertawatercouncil.ca](http://www.albertawatercouncil.ca) (December 28, 2011)

Alberta Water Smart. 2011. Alberta Water Smart Website: Water Facts. Available at <http://www.albertawatersmart.com/altafacts.html> (December 1, 2011)

Brandes, Oliver M. and David B. Brooks. 2007. The Soft Path for Water in a Nutshell. The POLIS Project on Ecological Governance. University of Victoria: Victoria, BC.

City of Calgary, Water Resources. 2005. Water Efficiency Plan 30-in-30, by 2033.

City of St. Albert (CSA). 2010. Census 2010 Census Results Summary July 2010. Available at [www.stalbert.ca](http://www.stalbert.ca) (February 2011)

City of St. Albert (CSA), Engineering Services. 2008. Utility Master Plan (UMP).

City of St. Albert (CSA). 2009. Environmental Master Plan (EMP). Available at [www.stalbert.ca/environmental-master-plan](http://www.stalbert.ca/environmental-master-plan) (December 1, 2011).

City of St. Albert (CSA). 2011. 2011 – 2013 Business Plan. Available at [www.stalbert.ca](http://www.stalbert.ca) (March 2012).

Environment Canada. 2011. 2011 Municipal Water Use Report Municipal Water Use 2009 Statistics. Available at <http://www.ec.gc.ca> (February 6, 2012)

EPCOR. 2010. 2010-2030 Edmonton Long Term Water Efficiency Report. Available from [www.epcor.ca](http://www.epcor.ca) (December 1, 2011).

North Saskatchewan Watershed Alliance (NSWA). 2005. State of North Saskatchewan Watershed Report. Available from [www.nswa.ab.ca](http://www.nswa.ab.ca) (December 21, 2011)

Statistics Canada. 2011. Human Activity and the Environment: Economy and the environment. Available from [www.statscan.gc.ca/](http://www.statscan.gc.ca/) (December 28, 2011)



# 10.0 Glossary

## Commonly Used Acronyms

**ACRWC:** Alberta Capital Region Wastewater Commission

**ADD:** Average Daily Demand

**AUMA:** Alberta Urban Municipalities Association

**CEP:** Conservation, Efficiency and Productivity

**EMP:** Environmental Master Plan

**PDD:** Peak Day Demand

**LCD:** Litres per Capita per Day

**LEED:** Leadership in Energy and Environmental Design

## Glossary Of Terms Used In This Report

**Distribution pipeline:** pipe used to distribute water to end users.

**Escalating block rate:** a water rate in which the unit price increases with increasing water use.

**Gravity sewer:** conveys wastewater from one point in the network to another under gravity flow conditions (UMP 2008).

**Inflow:** considered a rapid response to rainfall, is flow created from rainfall directly entering the sanitary system through manhole covers and weeping tile connections (UMP 2008).

**Infiltration:** considered a slower and more extended response to rainfall, is flow created from rainfall entering the system through cracked manholes and pipes (UMP 2008).

**Infrastructure Leakage Index (ILI):** a measure of current losses compared to unavoidable losses in municipal water system (AUMA 2009).

**Interceptor pipe:** single pipe in St. Albert that carries wastewater for treatment in Fort Saskatchewan.

**Manhole:** intersections between two gravity sewers (UMP 2008).

**Pressure Zones:** a zone in the water distribution system in which the pressure

varies within certain limits, generally dictated by the elevation of the pump stations servicing the zone.

**Potable Water:** water that is supplied by a municipal or private waterworks system and is used for drinking, cooking, dishwashing or other domestic purposes requiring water suitable for human consumption (Alberta Environment 2008).

**Regional Water Consumers Group:** a group of customers that obtain water from a water provider, in the case of St. Albert, EPCOR.

**Service connection:** a small water pipe connecting the distribution water main to residential, commercial or industrial buildings (Alberta Environment 2008).

**Transmission pipeline:** carries water from pump house to pump house of treatment plant to reservoir.

**Total annual system demand:** the total volume of water used by all customers in a calendar year.

**Tributary:** is a river or stream flowing into a larger river or lake.

**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 (AWC 2007).

**Water efficiency:** accomplishment of 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 quantity of water used or diverted (AWC 2007).

**Water productivity:** the amount of water that is required to produce a unit of any good, service, or societal value (AWC 2007).

**Watershed (Basin):** area of land in which all the water drains into the local water body.

**Wastewater:** water that has been used for domestic or industrial purposes.

**Wastewater treatment:** the processing of wastewater for the removal or reduction of contained solids or other undesirable constituents.

# Acknowledgements

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## Regional Water CEP group

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# Appendix A

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**Map** – Sturgeon River Watershed

**Map** – Sub-watersheds and Municipal Boundaries in the North Saskatchewan Basin (Source: North Saskatchewan Watershed Alliance)

**Map** – Capital Region Service Map (source: Epcor)

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# STURGEON RIVER WATERSHED

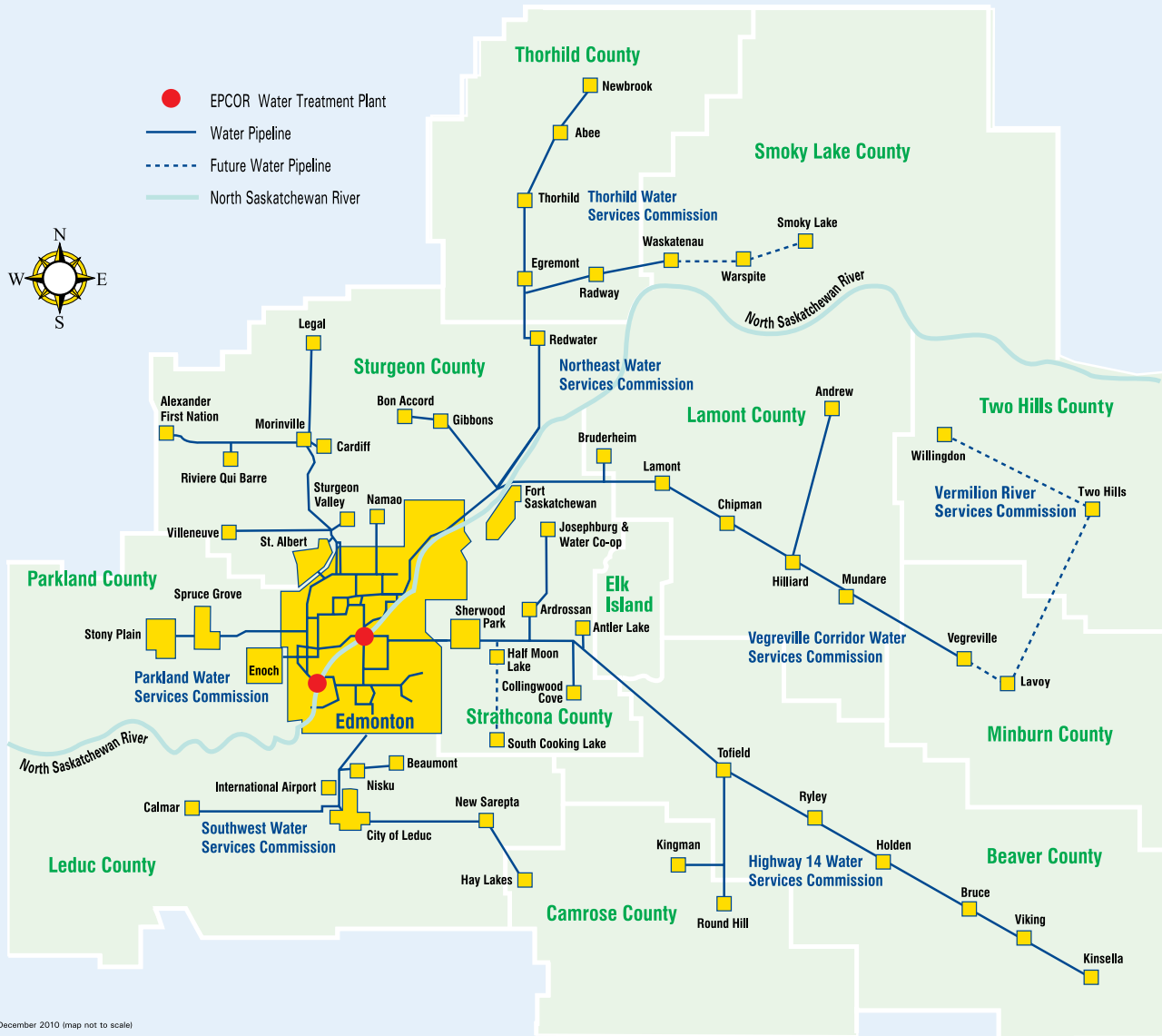




A map of the province of Alberta, Canada. A green-shaded region in the central-eastern part of the province is labeled 'MSR Basin'. Within this basin, the cities of 'Edmonton' and 'Calgary' are marked. A legend in the bottom right corner shows a green box next to the text 'MSR Basin'.



# CAPITAL REGION SERVICE MAP



December 2010 (map not to scale)

# Appendix B

## Environmental Advisory Committee Water Conservation Initiatives Workshop Summary March 22, 2012

As a committee of City Council, the Environmental Advisory Committee (EAC) provides a vehicle for the flow of strategic advice and expert information between and among the public, City administration and Council. In addition, EAC facilitates the public perception on how particular environmental issues impact the community and other City plans. As such, EAC was asked by administration to provide feedback on the City's proposed water conservation initiatives.

Prior to the meeting on March 22, 2012, EAC members were provided with a draft of the Water Conservation, Efficiency and Productivity Plan and a table of proposed water conservation initiatives developed from reviews of best practices and other Alberta municipal water programs.

At the meeting, EAC members were asked to answer the following questions:

- What water conservation initiatives should the City pursue as part of this plan?
- How far should we go?
- Should we use voluntary options or regulatory options?
- Does the table capture all the initiatives?
- What initiatives should the City prioritize?

Members worked in pairs to discuss water conservation initiatives in the table and others that may not have been included. The pairs were then asked to write down what initiatives they thought the City should pursue. These initiatives were placed under the four categories: regulatory tools, economic and financial tools, utilities management and operational tools, and education and outreach tools. Each member received three dots and was asked to place a dot on the initiative(s) viewed as a priority which created a rating. The higher the rating (larger the number), the higher the importance of the issue, based on the vote from the EAC. The results are as follows:

Initiative	Rating
<b>Regulatory Tools</b>	
Water-Efficient bylaw (4 mentions)	9
Land Use bylaw (3 mentions)	0
Outdoor water reduction – odd/even days after 6 pm (3 mentions)	2
<b>Economic and Financial Tools</b>	
Escalating block rates (2 mentions)	7
Clothes washing machine rebates (1 mention)	0
Grey water use – commercial, chilling units (1 mention)	0
Residential toilet rebate program (1 mention)	0
ICI Toilet rebate program (2 mentions)	0
<b>Utilities Management and Operational Tools</b>	
SCADA system upgrades (1 mention)	0
Spatial water consumption analysis (2 mentions)	0
<b>Education and Outreach Tools</b>	
Outreach program – special events (2 mentions)	2
Water graphs on utility bills (2 mentions)	1
Education program for kids (1 mention)	1
Targeting ICI programs (1 mention)	6
Xeriscape on municipal land and owned facilities (2 mentions)	0
Targeted outdoor water campaign	1
Workshops (1 mention)	0
Education (1 mention)	1

Summary of workshop based on the feedback and discussion included:

- Continue with residential education efforts.
- ICI programs specifically refer to schools and big water users (larger audience).
- Use champions in the community to promote water conservation messaging (i.e., Home's).
- Can't forget what the City is already doing - emphasize that the ongoing water conservation initiatives should continue (i.e. rain barrel program).
- LEED-Silver equivalent should be the minimal requirements for new buildings being constructed by the City of St. Albert. The LEED-rating system awards points for certain measures in a number of areas, with water conservation and energy efficiency being two key categories. It was suggested that the City should target designs embracing LEED-principles, but forgo certification as a means to reduce costs.
- Wastewater reuse will definitively be part of the future in Alberta – suggest the City include 'purple pipes' in the development planning stages so the infrastructure (or space for it) is in place when the plumbing code is updated in the next two to five years.
- None of the items, part of the utilities management and operational tools category, were highlighted since they were deemed part of best management practice for a Utility provider and were already funded through operational budgets.



# Appendix C

## **Environmental Advisory Committee – Advice for Council Water Conservation, Efficiency and Productivity Plan April 21, 2012**

Earlier this year, the Office of the Environment provided the Environmental Advisory Committee (EAC) with a draft of the Water Conservation, Efficiency and Productivity (WCEP) Plan and a table of proposed water conservation initiatives developed from reviews of best practices and other Alberta municipal water programs.

At the March 22, 2012 meeting, EAC members took part in a mini workshop session to prioritize the water conservation initiatives the City should pursue as part of the WCEP Plan. The initiatives proposed fall under four main categories: regulatory tools, economic and financial tools, utilities management and operational tools, and education and outreach tools.

The highest priorities identified by the EAC during the workshop were the following:

- Water Efficient bylaw
- Escalating block rates
- Targeting ICI programs
- Outreach program – special events
- Outdoor water reduction – odd/even days after 6 p.m.

As part of the workshop the following were also noted as important points to consider:

- EAC felt that it is important to continue with the current residential education efforts and other conservation efforts - the water conservation initiatives that are already in place should continue (i.e., rain barrel program).
- EAC would like more done on the ICI programs specifically with respect to schools and big water users (larger audience).
- EAC felt that the City needs to use the champions in the community to promote water conservation messaging (i.e., Hole's).
- Although the City Environmental Master Plan targets LEED Silver designation for all new building, the City will need to ensure that when pursued it is achieved with emphasis on both water and energy conservation. It was also suggested that cost could be decrease for such project if City adopted the design principles from the LEED certification without obtaining the certification.
- The future of Alberta will invariably include wastewater re-use, therefore it was mentioned that the City should include 'purple pipes' in their development planning so the infrastructure is in place when the plumbing code is updated in the next 2 to 5 years.
- None of the items as part of the utilities management and operational tools category were highlighted since it was deemed that these are part of Best Management Practice for a Utility provider and were already funded by the Operations Department. The preventative maintenance activities are crucial since in most urban center, the losses from the distribution network typically accounts for the largest losses in the system.

In summary, the EAC has reviewed the resulting report and has the following advice for Council:

- Overall, the EAC recommends that Council adopt the report and that it be used as a strategic vehicle to encourage water conservation by the corporation of the City of St. Albert and by the community. This advice is consistent with the goals expressed within the Environmental Master Plan (EMP).
- The EAC believes that the various targets expressed within the report are reasonable and achievable within the timeframe described.
- The EAC believes that multiple approaches are necessary to meet the reduction targets described in the report. All means described in the report (regulatory tools, economic and financial tools, utilities management and operational tools, and education and outreach tools) must be contemplated and, providing they do not provide an unreasonable financial encumbrance to residents, publicly-funded operations or businesses, implemented as necessary to achieve the stated goals. Emphasis should be placed on seeking the maximum return in efficiency (and thereby greatest reduction in water consumption) for public money that is spent on the various programs. Equally, any regulatory considerations should aim to maximize return in water efficiency for the least financial obligation to the community.



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