# Saskatoon Water

**2015 Annual Report**

City of Saskatoon
Transportation & Utilities Department

# Saskatoon Water 2015 Annual Report

## MESSAGE FROM THE DIRECTOR

Saskatoon Water's management and staff are committed to providing exceptional quality water, wastewater, and storm water management services in the most reliable and cost-efficient way for the citizens of Saskatoon. I am pleased to present our results in the *Saskatoon Water 2015 Annual Report* on behalf of our division.

The report describes our contributions to achieving the City of Saskatoon's Strategic Plan. We take great pride in receiving the highest citizen satisfaction rating of any City service for the quality of our water. Several initiatives have been completed and more are underway that will further enhance service to citizens, increase efficiencies, reduce costs, and strengthen our environmental leadership.

Our financial statements show responsible stewardship of the resources that Saskatoon citizens have entrusted to us. We continue to provide excellent value to our citizens as we maintain the lowest average water, wastewater, and storm water Utility Bill among major Western Canadian cities. Our utility rates are designed to fund the needed capital and operating costs for current and future water and wastewater services.

A key focus has been addressing growing demands and changing expectations for water-related services. In 2015, we completed the most significant Water Treatment Plant upgrade in over 50 years, resulting in further improved water safety and an increase in water storage capacity. Enhancements underway at the Wastewater Treatment Plant will significantly reduce odour emissions.

Our emphasis on safety has also paid off in 2015 through a reduction in employee injuries. Our lost-time frequency rate was lower than in previous years and lower than the City of Saskatoon average.

Saskatoon Water will continue to plan for the future and make needed infrastructure investments to address the challenges of growth, regulatory changes, and potential impacts of climate change.

Reid Corbett

Director

# SASKATOON WATER

## Executive Summary

Saskatoon Water contributes to our city's quality of life by providing safe and reliable quality drinking water, wastewater treatment that meets health and environmental regulatory standards, and storm water management to minimize flooding.

The division oversees three self-funded public utilities: Water, Wastewater, and Storm Water. The utilities fund all aspects of water services performed by Saskatoon Water and other divisions. Saskatoon Water's 160 employees operate the Water Treatment Plant, the Wastewater Treatment Plant, 28 sanitary sewer lift stations, the Meter Shop, and provide engineering and planning services. The utilities also fund other divisions to deliver day-to-day operation and maintenance of the water distribution, wastewater collection, storm drainage systems, asset preservation and construction, and billing services.

Saskatoon Water provides water services to over 72,000 residential and commercial customers. The Water Treatment Plant supplies water to almost 300,000 Saskatchewan residents. Average monthly residential water-related Utility Bills of $96.72 remained the lowest among Western Canadian cities in 2015.

In 2015, the utilities collected $130.0 million in revenues, incurred $125.3 million in expenses, and contributed $4.7 million to stabilization and capital reserves. Total revenues in 2015 increased by 13% compared to 2014, as a result of growth and development, rate increases, the phase-in of roadways and redevelopment levies, and increased water use for irrigation due to a dry spring. A 9.5% annual increase in water and wastewater rates was approved for 2014 through 2016 to ensure that the utilities can meet needs of current and future citizens.

In 2015, almost half of Saskatoon Water's revenues, or $63.9 million, was allocated to capital to fund longer-term water-related infrastructure projects. Significant capital projects in 2014 and 2015 include the Water Treatment Plant expansion, new water reservoirs at Avenue H and 42nd Street, Spadina Sanitary Lift Station, Lakeview Sanitary Superpipe, East Riverbank Slope Stabilization at 17th Street, and construction started on the Wastewater Odour Abatement Project.

# SASKATOON WATER

## 1.0 OVERVIEW

### 1.1 Introduction

Saskatoon Water is a division that oversees three self-funded utilities: Water, Wastewater, and Storm Water that fund the planning, designing, operating, maintenance, and capital for all water, wastewater, and storm water services for existing and future citizens and businesses. The utilities have assets with a replacement value estimated at over $9.5 billion (Appendix One).

The utilities also fund Public Works, which delivers the day-to-day operation and maintenance of the water distribution, collection, and drainage systems. Major Projects and Construction & Design manage infrastructure assessment and construction projects. Corporate Revenue provides customer billing, meter reading, and collection services. The following summarizes the responsibilities of Saskatoon Water's five sections.

The **Water Treatment Plant** (WTP) supplies all consumers with safe and reliable, high-quality drinking water. Core functions include operating and maintaining the South Saskatchewan River Raw Water Intake, the WTP, and three potable water storage reservoirs with a capacity of 114 million litres.

The **Wastewater Treatment Plant** (WWTP) ensures that wastewater is treated to meet high provincial and federal regulatory standards before being returned to the South Saskatchewan River. The wastewater's system includes the WWTP, 28 pumping stations, and the Biosolids Facility where solids from the treatment process are handled and disposed. Sales of the plant's slow-release fertilizer create additional revenues.

**The Meter Shop** is responsible for the purchase, installation, testing, repair, and replacement of water meters, as well as the installation and termination of water services. The Meter Shop also operates the Cross Connection Control program to ensure that proper backflow prevention devices on multi-unit residential, commercial, industrial, and institutional service connections protect the City of Saskatoon's (City) potable water.

**Engineering & Planning** is responsible for the planning and design of water and sewer servicing for new land development, as well as capacity analysis and improvement within existing neighbourhoods. A city-wide network of sewer and rain gauge monitors are operated and maintained by the system modeling group to assist with water-related planning and design activities.

Engineering & Planning manages the Storm Water Utility and provides storm water engineering expertise. The section also monitors and mitigates damage to public property from riverbank settlement and instability due to high ground water levels.

**Engineering Services** provides capital planning and feasibility studies, and project management services for Saskatoon Water's capital expansions and asset replacements.

## 1.2 Strategic Linkages

The City's Strategic Plan 2013-2023 provides the direction that guides Saskatoon Water's activities. The following section outlines our Mission, Vision, and linkages to the Corporate Strategic Goals, Leadership Commitments, and Values.

### Our Mission

Saskatoon Water delivers safe, reliable, and cost-effective water, wastewater, and storm water services that meet and exceed health and environmental regulatory standards.

### Our Vision

Saskatoon citizens have exceptionally high-quality water, dependable wastewater handling, and effective storm water services that sustain people, property, and the environment.

## Our Strategic Goals

*Quality of Life:* Provide citizens with affordable, reliable and high-quality water, wastewater treatment, and storm water services.

*Continuous Improvement:* Increase workplace efficiencies and improve services through implementing innovative approaches that maximize value.

*Asset and Financial Sustainability:* Implement capital preservation and expansion plans that provide the most cost-effective water-related infrastructure for current and future citizens and businesses.

*Environmental Leadership:* Implement leading-edge innovations for environmentally responsible water-related infrastructure and services.

*Sustainable Growth:* Work closely with other divisions to provide efficient and resilient designs for water, wastewater, and storm water infrastructure for new developments.

*Moving Around:* Collaborate with all stakeholders to minimize water-related transportation disruptions.

*Economic Diversity and Prosperity:* Provide competitively priced and reliable water-related services, and cost-effective water and sewer designs for new developments.

## Our Leadership Commitments

Our employees support leadership commitments in our day-to-day work:

- Reliable and Responsible Service
- Strong Management and Fiscal Responsibility
- Effective Communication, Openness, and Accountability
- Innovation and Creativity

## Our Corporate Values

*Trust:* We build trust with citizens and colleagues by providing accurate technical information, analysis, and responses in a timely manner.

*Integrity:* We lead by example, making the best decisions and striving to work beyond the scope of the position.

*Respect:* We build on each other's strengths; respectfully acknowledging individual beliefs.

*Honesty:* We are honest to each other, and encourage frank, honest discussions while being sincere, admitting mistakes, and learning from them.

*Courage:* We take smart risks, thinking through challenges, suggesting new approaches, and embracing change to enhance our level of service.

# 2.0 OUR CUSTOMERS

## 2.1 Number of Customers

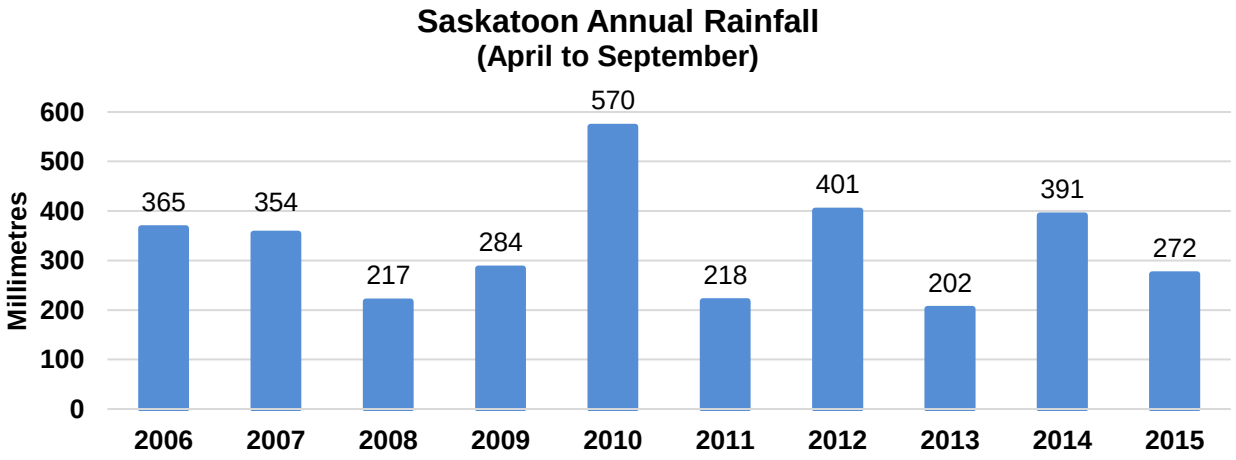
Water treatment and distribution, wastewater collection and treatment, and storm water management services are provided to Saskatoon's 260,900 citizens and to commercial, industrial, and institutional customers. Saskatoon Water also sells treated water to SaskWater, which receives this water at eight supply points around the city's perimeter and re-distributes it to 35,300 customers outside of Saskatoon.

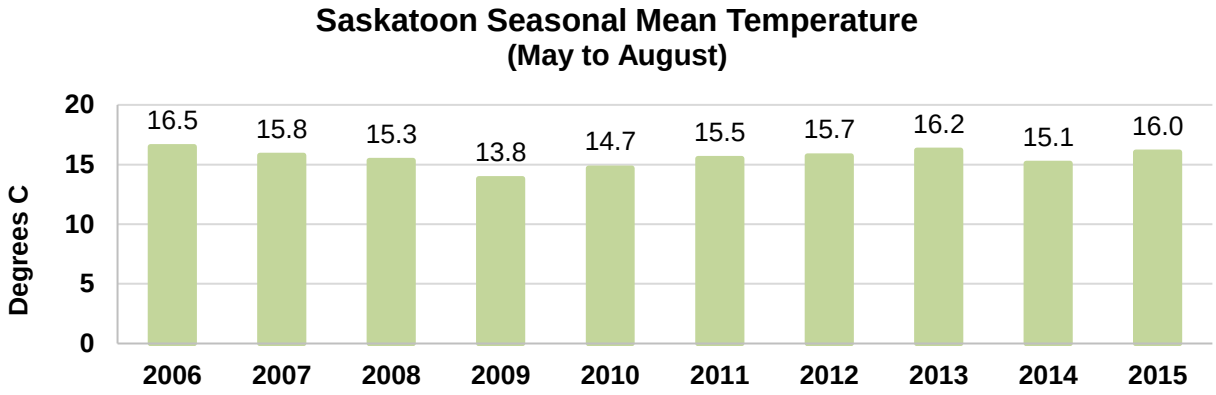
In 2015, Saskatoon Water provided water services to over 72,000 residential and commercial water meters. Over the last five years, the average number of active water service connections increased by 10.8%.

Storm water customers include residential properties with water meters and commercial, industrial, and institutional properties that generate storm water run-off. In 2015, storm water management charges were applied to over 67,000 total properties in the city. Agriculture-zoned property, roads, right-of-ways, and City-owned parks were exempted from storm water charges.

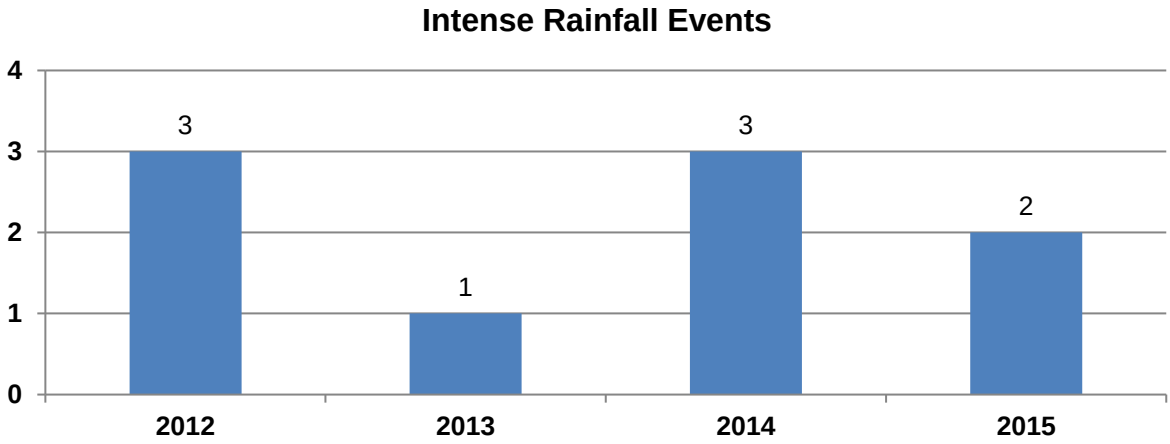
## 2.2 Rainfall and Temperature

Variations in annual water sales correlate closely with summer rainfall and temperatures, which show irrigation is a significant portion of total sales volume. Saskatoon's 2015 spring was the fifth driest spring on record, in terms of rainfall, while 2014 was the third wettest on record.





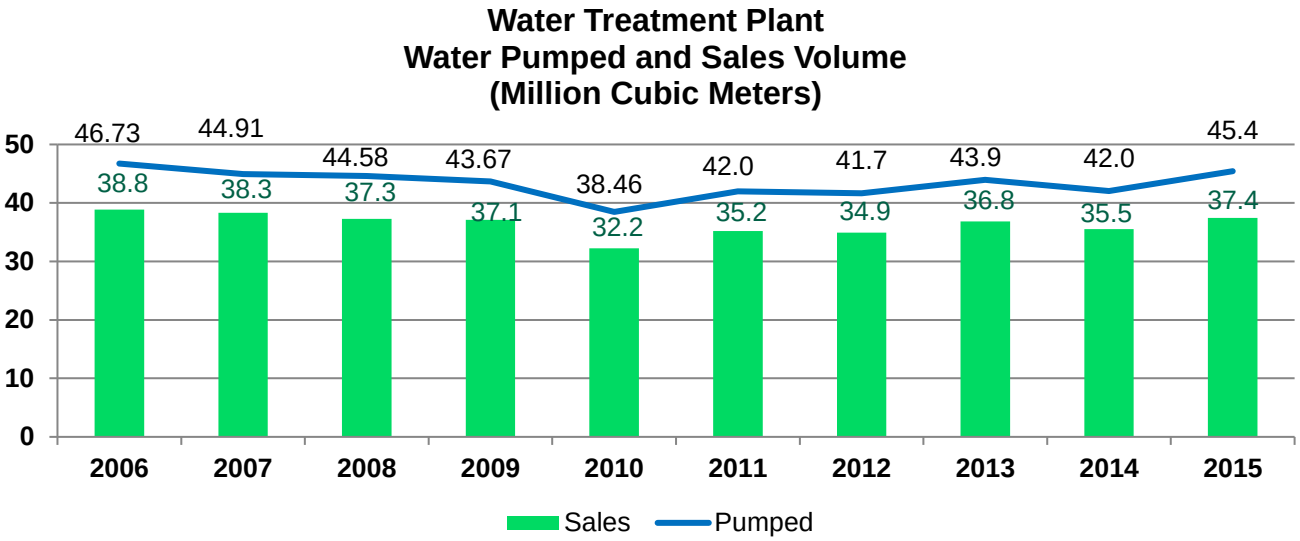

Average summer (May to August) temperatures in 2015 were 1$^{o}$ C warmer than historical summer averages. In 2014, summer monthly temperatures were an average 0.8 $^{o}$ C cooler than normal.




Intense rainfalls place demands on the storm water infrastructure. Since 2012, Saskatoon has operated eight rain gauges. In 2015, an average of two rain events (minimum two-year return period) per gauge was recorded. Saskatoon had a maximum 24-hour rainfall of 63 mm on July 27 and 28, 2015. In eight of the last ten years, Saskatoon experienced maximum 24-hour rainfall levels that were higher than the historical 100-year average (37 mm).

## 2.3 Water Treatment Plant Volumes

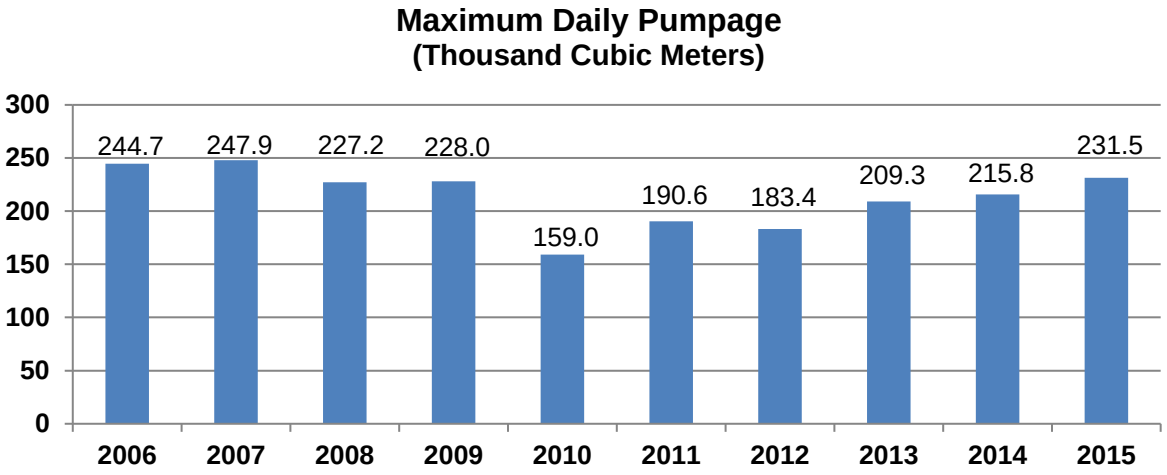
Based on customer meter readings, 35.5 and 37.4 million cubic meters of water were sold in 2014 and 2015, respectively. In 2014, the volume of water sold decreased slightly from the 2013 level, mostly due to increased rainfall during May, July, and August, which reduced the need for irrigation. The dry spring in 2015 resulted in a higher demand for irrigation; however, even with population growth, the volume of water sold in 2015 was lower than volumes sold in 2006 and 2007.



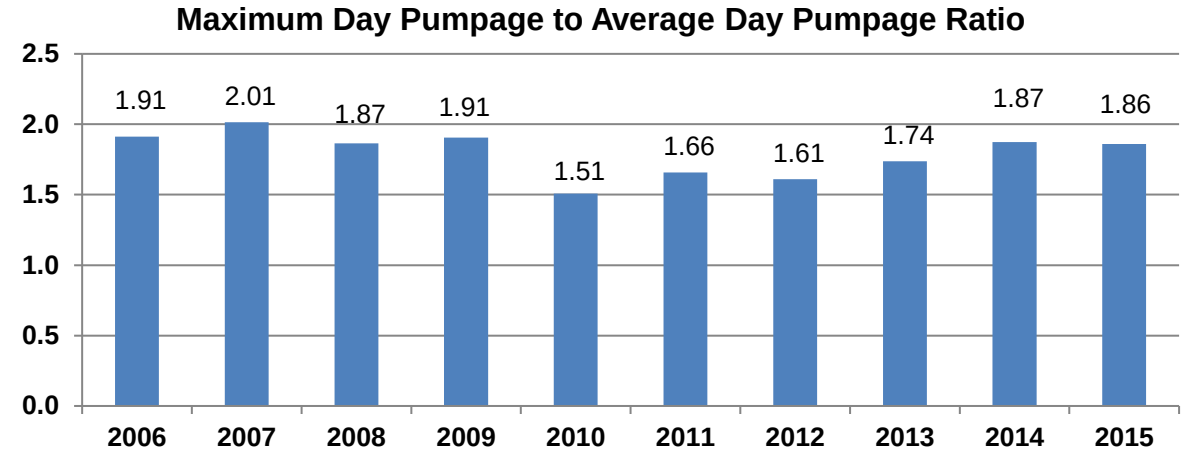

The above chart compares the annual volume of treated water pumped from the WTP into the distribution system and the volume of water sold. Due to a water meter failure, the pumpage was estimated from 2010 to 2013 based on an assumed water leakage rate of 16.2%. In 2015, unmetered water was 17.6% of total water pumpage. The difference between the volume of treated water pumped and sold was due to the following:

- Water loss through leaks
- Water main breaks
- Unauthorized water use
- Authorized but unmetered consumption (e.g. flushing water mains and fire flow)
- 2015 commissioning of two water reservoirs, which involved draining and refilling
- Estimated consumption and year-end unbilled volumes
- Water meter accuracy

Maintenance and investment in the water distribution system will reduce water loss and lower water treatment operating costs.




The WTP's capacity must be able to meet the maximum daily water demand. Maximum daily pumpage has increased over the last three years, with a maximum of 231,465 $m^3$ in June 2015. The City's population growth and the dry, hot spring impact the maximum daily pumpage. Conservation initiatives have helped to reduce maximum daily pumpage from the levels seen in 2006 and 2007, even with population growth.

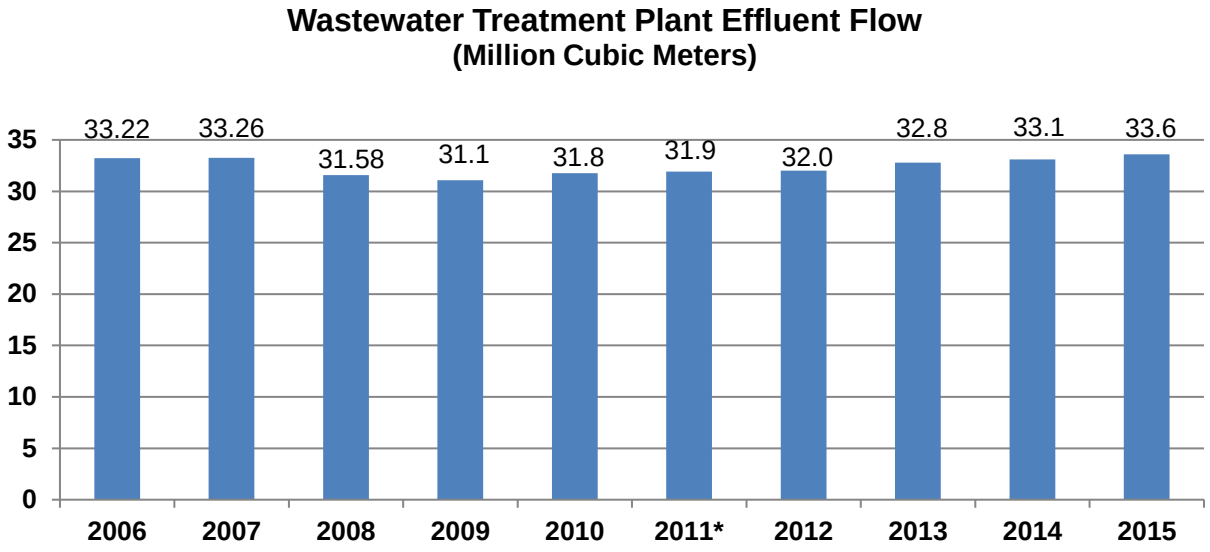



"Maximum Day Pumpage to Average Day Pumpage Ratio" reflects the extra capacity required for the maximum daily volume of water consumption at the height of summer irrigation relative to average daily water consumption.

The 2015 "Maximum Day to Average Day Pumpage Ratio" of 1.86 was similar to the ratio in 2014. As higher utility rates and customer education begin to impact consumer behaviour, conservation will increase and the ratio should fall. The ratio; however, is still expected to be higher during years of high summer temperatures and drought.

Over the next decade, as demand approaches plant capacity, construction of a new WTP can be deferred by reducing the peaking caused by irrigation during periods of hot, dry weather. The ratio can be significantly reduced through peak demand management initiatives such as implementing watering schedules.

## 2.4 Wastewater Treatment Plant Volumes



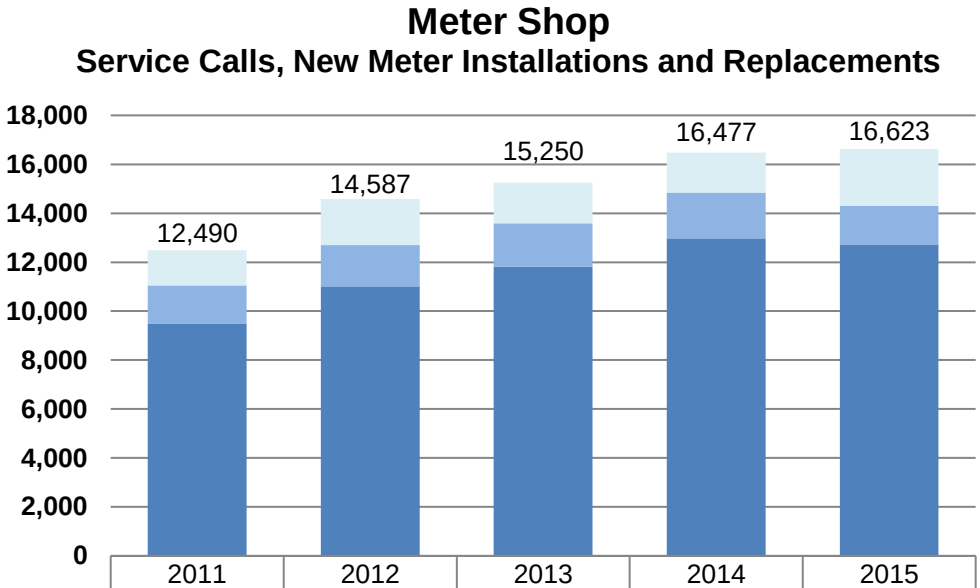

*2011 was estimated due to missing flow data. The monitoring instrumentation was replaced.

In 2015, WWTP effluent was the most it had been in the last 10 years. WWTP effluent flow increases as the population grows and decreases when households install water-saving appliances such as low-flush toilets. Wet weather or intense storm conditions also influence effluent flow due to inflow (e.g. weeping tiles) and infiltration (e.g. leaky pipe joints and manholes) into the wastewater collection system. Less effluent is expected in dry years.

Waste Activated Sludge Stripping to Remove Internal Phosphorous (WASSTRIP) Tank with cover to reduce odour

## 2.5 Meter Shop Customers

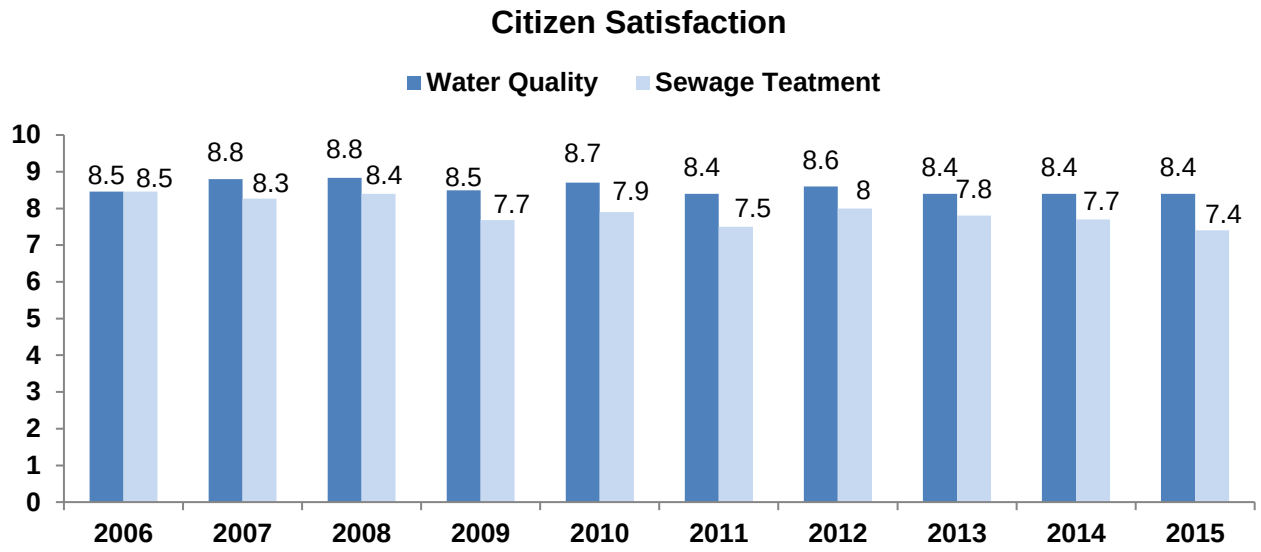
In 2015, the Meter Shop undertook 16,623 total jobs, an increase of about 33% since 2011 with the same number of employees – a significant increase in productivity. Jobs included 2,320 meter replacements, 1,583 new meter installations, and 12,720 service calls, which result from work orders generated by Corporate Revenue, to check malfunctioning meters or for cut-offs and reconnects. New meter installations were down while the number of meter replacements increased by 42%.




| | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Replacements | 1,432 | 1,888 | 1,656 | 1,637 | 2,320 |
| New Installations | 1,564 | 1,689 | 1,787 | 1,872 | 1,583 |
| Service Calls | 9,494 | 11,010 | 11,807 | 12,968 | 12,720 |

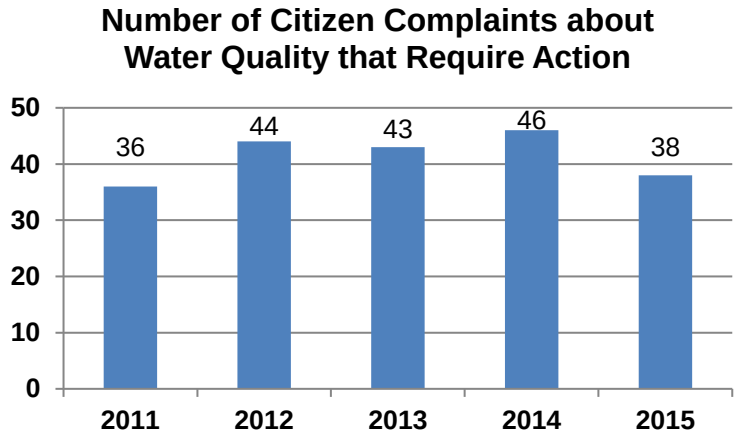
Presently, there are 7,085 active backflow prevention devices. In 2015, 606 new devices were installed and 94.0% of all devices were tested. Almost all of the 6.0% of devices not tested were inactive due to construction or City parks not completed on time.

## 2.6 Customer Satisfaction




Saskatoon citizens ranked water treatment and wastewater treatment as two of the most important civic services, with drinking water quality being the most important service in the annual 2015 Civic Services Satisfaction Study. A score of ten means "excellent" and five means "average". In 2015, the average citizen satisfaction for water quality was 8.4 and sewage treatment was 7.4 out of 10. **Water quality has consistently received the highest Saskatoon citizen satisfaction rating of all civic services**. Satisfaction with sewer services is higher than the average satisfaction of 6.5 for all civic services.

## 2.7 Citizen Calls

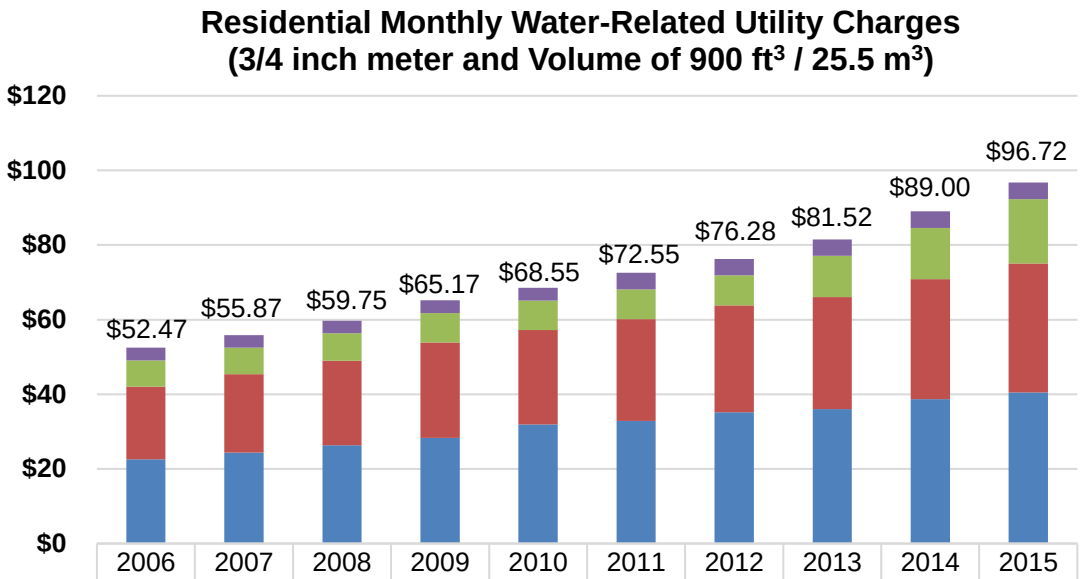



In 2015, citizen calls resulted in lab personnel making 38 on-site visits to conduct water quality testing for bacteria and inorganic material to ensure safe, high-quality water is maintained.

Two calls about WWTP odour were received in 2014 and none in 2015.

# 3.0 OUR FINANCES

## 3.1 Utility Bills



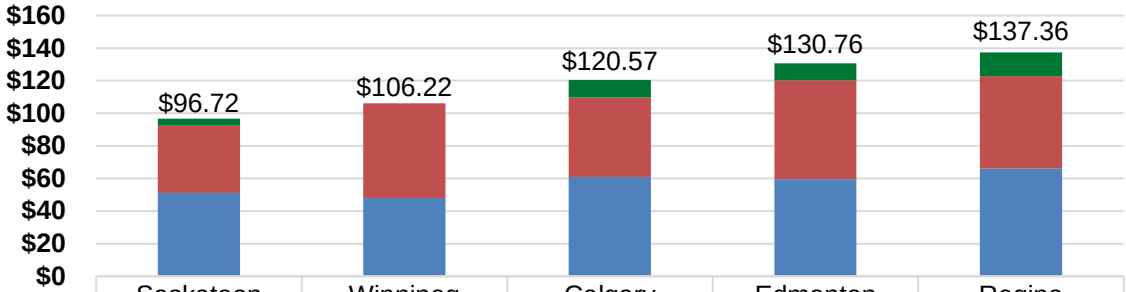

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| Storm Water | $3.40 | $3.40 | $3.40 | $3.40 | $3.40 | $4.40 | $4.40 | $4.40 | $4.40 | $4.40 |
| Infrastructure | $7.05 | $7.05 | $7.38 | $7.92 | $7.93 | $8.00 | $8.06 | $11.09 | $13.73 | $17.25 |
| Wastewater | $19.42 | $21.03 | $22.60 | $25.50 | $25.28 | $27.30 | $28.61 | $29.96 | $32.20 | $34.56 |
| Water | $22.60 | $24.39 | $26.37 | $28.35 | $31.94 | $32.85 | $35.21 | $36.07 | $38.68 | $40.51 |

Total residential water-related utility charges were $96.72 per month in 2015 based on a standard 3/4 inch meter connection and a monthly water volume of 900 ft$^3$. Saskatoon residents with smaller 5/8 inch water meters, which are common in core neighbourhoods, pay $8.72 less per month on the fixed portion of their Utility Bill. In 2015, 55% of meters for single residential homes were 5/8 inch and 45% were 3/4 inch. All new homes are fitted with 3/4 inch meters, which meet citizen expectations for higher water demand, for example: watering larger lawns.

Total water-related utility charges increased by 8.7% in 2015 and increased by 113% since 2005. Infrastructure Levies include the Roadways Levy and Redevelopment Levy, which are being phased in between 2014 and 2016, and its funding is split between the Water and Wastewater Utilities. See *Appendix Two: Understanding Your Utility Bill* for more information about Utility Bill charges.

Saskatoon's total water, wastewater, and storm water Utility Bills remain significantly less than in other cities in Alberta, Manitoba, and Saskatchewan at average water volumes. Based on the standard water meter size and monthly water volume of 900 ft$^3$, water bills in Saskatoon were about $40 less than in Regina.

**2015 Water, Wastewater & Storm Water Monthly Charges by Utility (3/4 inch meter and Volume of 900 $ft^3$ / 25.5 $m^3$)**




| | Saskatoon | Winnipeg | Calgary | Edmonton | Regina |
|---|---|---|---|---|---|
| Storm | $4.40 | $0 | $10.96 | $10.45 | $14.60 |
| Wastewater | $41.15 | $58.11 | $48.71 | $60.79 | $56.61 |
| Water | $51.17 | $48.11 | $60.90 | $59.53 | $66.15 |

Under Saskatoon's inclining block rate system, water and wastewater rates increase at volumes of 600 $ft^3$ (17 $m^3$) and 1,200 $ft^3$ (34 $m^3$). Of the western benchmark cities, only Winnipeg has lower charges for water volume, less than 600 $ft^3$ (17 $m^3$) per month.

The 2014 *Storm Water Utility Program Comparison* report compared the City's storm water rates with 12 other cities for different property types on the basis of costs and "user-pay". Saskatoon residential properties paid the third lowest storm water utility rate and commercial properties paid the ninth lowest rate.

The "user-pay" assessment considered the degree to which properties were charged proportionally for the amount of storm water run-off they generated, ranging from charges based on area size and imperviousness for all types of properties (most "user-pay") to a flat rate for all properties (least "user-pay"). Saskatoon is among the leading "user-pay" cities, ranking fourth among the 13 cities.

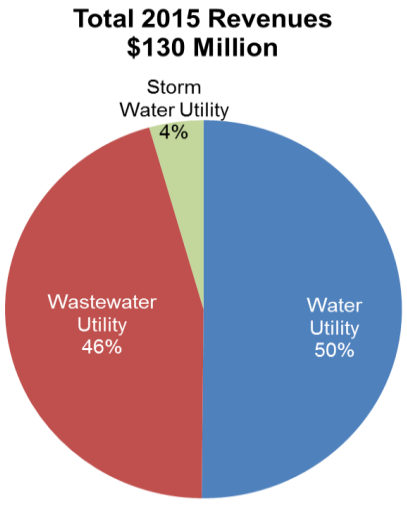
## 3.2 Financial Summary

The Water, Wastewater and Storm Water Utilities are based on a user-pay principal and are fully funded through their rates. In 2015, the three utilities collected $130.0 million in total revenues and had $125.3 million in total expenses for a positive variance of $4.7 million.[1]

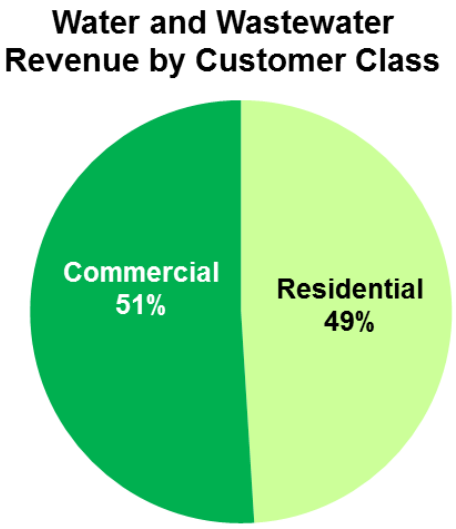
| Water, Wastewater and Storm Water Utilities<br>Statement of Revenues and Expenditures<br>($1,000s) | | | | | |
|---|---|---|---|---|---|
| | Water Utility | Wastewater Utility | Storm Water Utility | Consolidated | Consolidated |
| | 2015 | 2015 | 2015 | 2015 | 2014 |
| ***Total Revenues*** | **$ 65,198** | **$ 59,065** | **$ 5,741** | **$ 130,005** | **$ 115,046** |
| **Expenditures** | | | | | |
| Utility Operations | $ 12,339 | $ 10,879 | $ 418 | $ 23,650 | $ 21,185 |
| Public Works Operations | 11,108 | 6,370 | 2,120 | 19,597 | 19,842 |
| Administration & General | 3,259 | 1,688 | 14 | 4,961 | 4,205 |
| Corporate Services & Billing | 2,752 | 1,843 | 172 | 4,766 | 4,249 |
| Capital Charges | 19,927 | 14,902 | 2,921 | 37,750 | 34,731 |
| Flood Protection Charges | | 3,841 | | 3,841 | 3,769 |
| Infrastructure Services Capital Reserve | 9,367 | 12,935 | | 22,302 | 16,920 |
| Grants-in-lieu of Taxes | 4,838 | 3,642 | | 8,479 | 8,326 |
| ***Total Expenditures*** | **$ 63,589** | **$ 56,099** | **$ 5,644** | **$ 125,347** | **$ 113,226** |
| ***Revenues less Expenditures*** | **$ 1,609** | **$ 2,967** | **$ 97** | **$ 4,658** | **$ 1,821** |
| **(To)/From Stabilization/Capital reserves** | **$ (1,609)** | **$ (2,967)** | **$ (97)** | **$ (4,658)** | **$ (1,821)** |

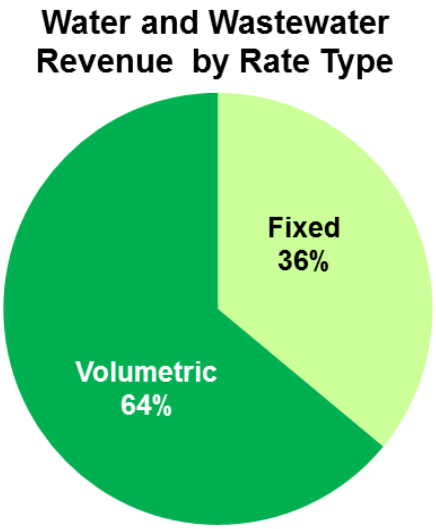
Total utility revenues increased by 13% in 2015 as a result of the infrastructure levy phase-in, rate increases, population growth, and increased demand for water due to a dry spring.

The Water Utility accounts for 50.2%, Wastewater for 45.4%, and Storm Water for 4.4% of revenues.




[1] Positive Water and Wastewater variances fund the Water & Wastewater Revenue Stabilization Reserve which is utilized in years when there is an operating deficit. The Stabilization Reserve has a maximum balance of 5% of the current year's budgeted metered revenue and Infrastructure Levy. Any amount that exceeds the maximum is transferred to the Waterworks Capital Projects Reserve, the Sewage Treatment Capital Reserve, or the Infrastructure Replacement Reserve.



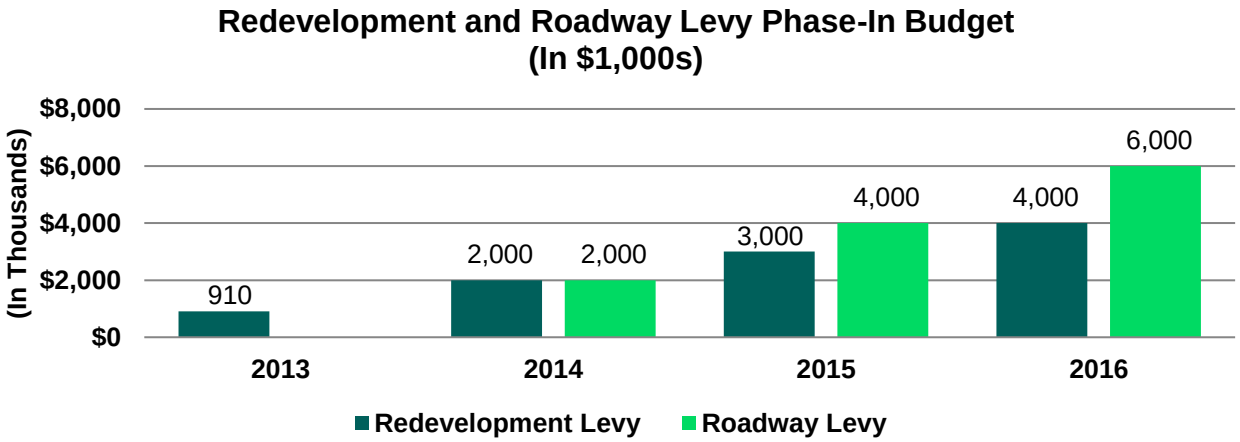




Commercial customers account for just over half of Water and Wastewater's total revenues.

About 64% of revenues are based on volumetric charges and 36% are from fixed charges.

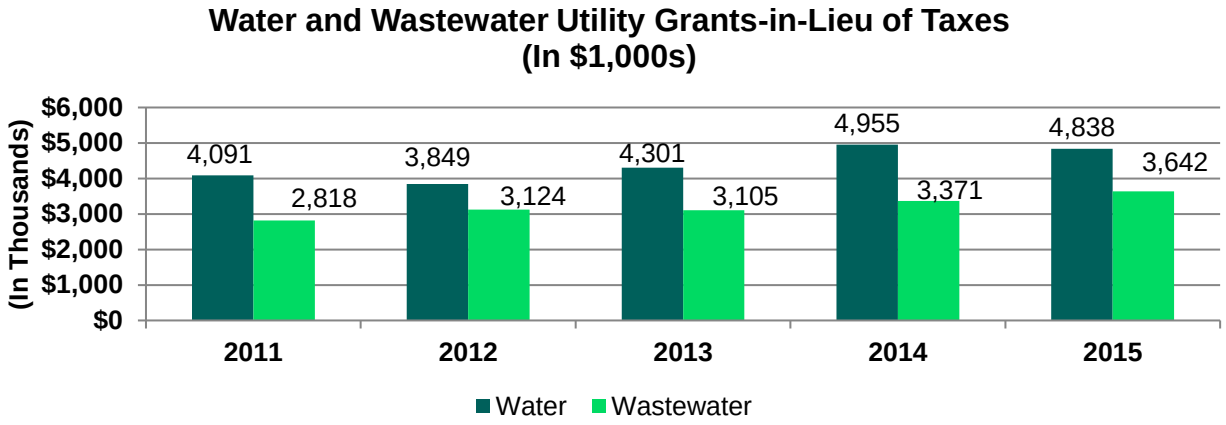
In 2015, total expenditures increased by 11% due to growth, inflation, additional water treatment processes to meet higher standards, and increased contributions to the Infrastructure Services Capital Reserve. In 2014, actual revenue was below budget due to the cool, wet weather. As a result of the reduced revenue, a discretionary spending order was implemented to defer expenditures, which also accounts for a significant portion of the 11% variance between 2014 and 2015 expenditures.

Funding to Public Works to deliver the day-to-day operation and maintenance of the water distribution, collection, and drainage systems accounted for 16% of total expenditures. Funding for the Infrastructure Services Capital Reserve accounted for another 18% of expenditures.




The Infrastructure Levy was originally implemented to fund the Infrastructure Services Capital Reserve for water distribution and wastewater collection system rehabilitation and replacement projects needed to address aging infrastructure (e.g. eliminate the water main replacement backlog to meet current service levels). In 2013, a

Redevelopment Levy was added to the Infrastructure Levy, with a four-year phase-in period to generate $4.0 million annually by 2016. In 2014, a Roadway Levy was added to the Infrastructure Levy with a three-year phase-in period to generate $6.0 million annually by 2016. The new levies accounted for about $7.0 million in 2015, representing 64% of the increase in Infrastructure Levy revenue.




The Water and Wastewater Utilities paid $8.3 million and $8.5 million in 2014 and 2015, respectively, to the City as a Grant-in-lieu of Taxes.

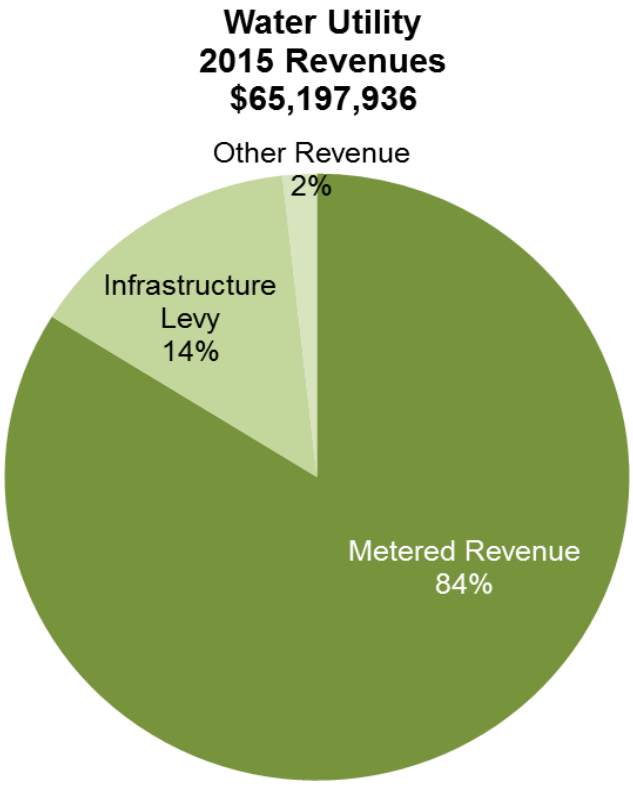
The Water and Wastewater Utilities had a positive variance of $4.6 million, of which, $544,975 was allocated to maximize the allowable balance in the Water and Wastewater Revenue Stabilization Reserve and the remainder was transferred to Capital Reserves to support capital projects and reduce debt requirements.

## 3.3 Water Utility

***Revenues***

The Water Utility's 2015 total revenues of $65.2 million were $1.5 million or 2.3% more than budgeted, mostly due to a drier than normal spring, which increased water demand for irrigation. Total revenues were $6.9 million or 12% more in 2015 than in 2014. Infrastructure Levy revenues, a volumetric charge, increased by 31.8% in 2015.

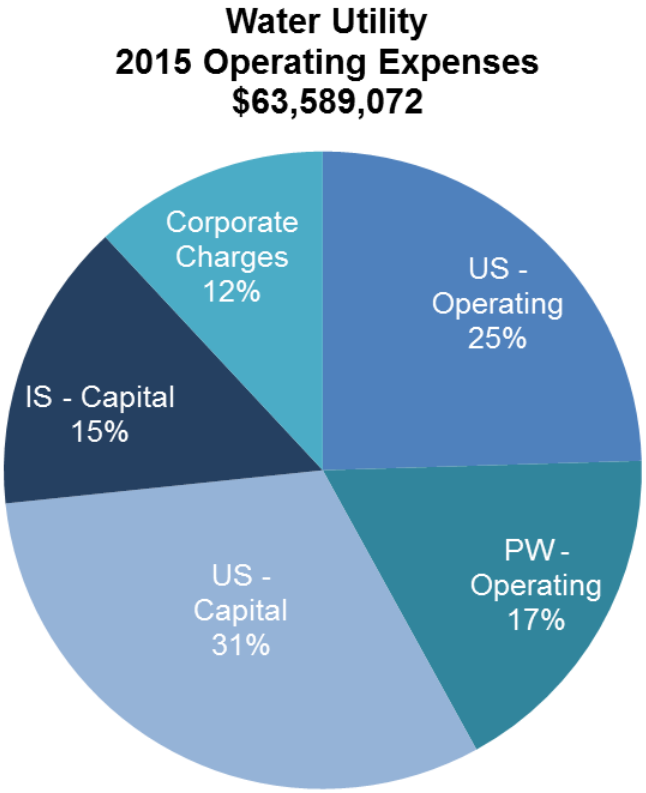
Other revenues included the fire protection charge, late payment penalties, and some miscellaneous revenue.




***Expenses***

The Water Utility's $63.6 million expenses in 2015 included the following:

- Utility Services (US) Operating expenses of $15.6 million include water treatment, pumping, storage, Meter Shop, administration, and general expenses incurred by Saskatoon Water.
- Public Works (PW) Operating expenses of $11.1 million include funding to Public Works to operate and maintain the water distribution system.
- Utility Services (US) Capital of $19.9 million funds all capital work related to the WTP and reservoirs, including debt servicing costs.
- Infrastructure Services (IS) Capital of $9.4 million (funded by the Infrastructure Levy) includes capital replacement of the water distribution systems, roadway damage associated with the utility, and water upgrades for core area developments.
- Corporate Charges of $7.6 million include the Grant-in-Lieu of taxes, cross-charges for customer billing and collections, and corporate administration.



The Water Utility's 2015 total expenses were approximately as budgeted and were 9% more than in 2014, reflecting the 2014 discretionary spending order, inflation, higher costs for additional new treatments, increase in the volume of treated water, increased maintenance, and increased contribution to the Infrastructure Services Capital Reserve. The 2015 expenses under the control of Saskatoon Water were under budget by $0.4 million and were $2.5 million (18.7%) more than in 2014.

## Financial Statement

**Water Utility**
**Operating Revenues and Expenses**
**($1000s)**

| | 2015 Budget | 2015 Actual | 2014 Actual |
|---|---|---|---|
| **Revenues** | | | |
| Metered revenue | $ 53,752 | $ 54,676 | $ 50,035 |
| Infrastructure Levy | 9,007 | 9,367 | 7,106 |
| Other revenue | 987 | 1,156 | 1,118 |
| ***Total Revenue*** | **$ 63,746** | **$ 65,198** | **$ 58,259** |
| | | | |
| **Expenses** | | | |
| Water Treatment, Pumping, Storage | $ 11,061 | $ 10,736 | $ 9,000 |
| Water Meters | 1,533 | 1,603 | 1,454 |
| Administration & General | 3,375 | 3,259 | 2,688 |
| Corporate Services | 2,757 | 2,752 | 2,412 |
| Distribution (Public Works) | 11,280 | 11,108 | 11,811 |
| Capital Charges | 19,895 | 19,927 | 19,166 |
| Provision to Infrastructure Services Capital | 9,007 | 9,367 | 7,106 |
| Grants-in-lieu of Taxes | 4,838 | 4,838 | 4,955 |
| ***Total Expenses*** | **$ 63,746** | **$ 63,589** | **$ 58,591** |
| | | | |
| ***Revenues less Expenses*** | **$ -** | **$ 1,609** | **$ (332)** |
| | | | |
| **(To)/From Stabilization/Capital Reserves** | **$ -** | **$ (1,609)** | **$ 332** |

The positive balance of $1.6 million was allocated to the Water & Wastewater Revenue Stabilization Reserve and to Capital Reserves.

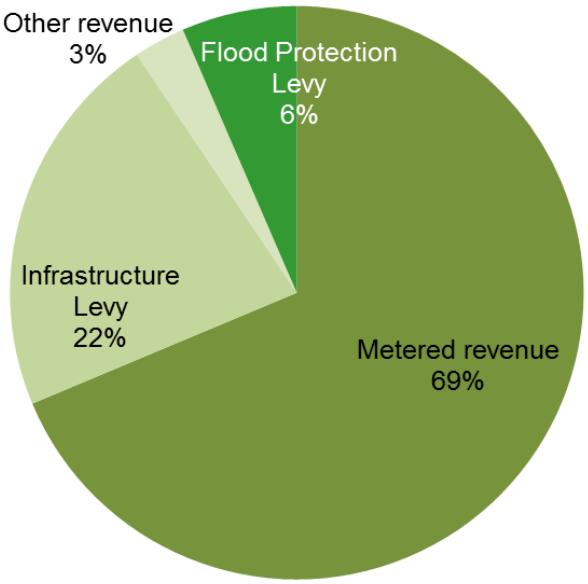
## 3.4 Wastewater Utility

***Revenues***

The Wastewater Utility's 2015 revenues of $59.1 million were about 2.8% more than budgeted.

Revenues increased by 15% from 2014 due to growth, rate increases including the Roadways and Redevelopment Levies, and the higher demand. The plant also received more revenues from liquid waste haulers, which are increasingly bringing septic waste to the plant in anticipation of provincial regulatory changes restricting land spreading of septic tank waste after 2017.

**Wastewater Utility**
**2015 Revenues**
**$59,065,370**

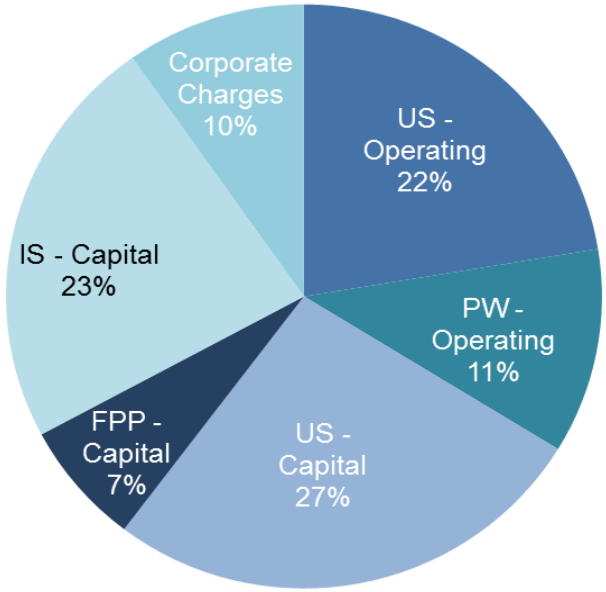



***Expenses***

The Wastewater Utility's 2015 expenses of $56.1 million included the following:

- Utility Services (US) Operating expenses, of $12.6 million, include wastewater treatment, pumping, sludge handling and disposal, administration, and general expenses incurred by Saskatoon Water.
- Public Works (PW) Operating expenses, of $6.4 million, include funding to Public Works to operate and maintain the wastewater collection system.
- Utility Services (US) Capital, of $14.9 million, funds capital work related to the WWTP.
- Flood Protection Program (FPP) Capital, of $3.8 million, funds projects that reduce sewer back-ups during major storms.
- Infrastructure Services (IS) Capital Reserve, of $12.9 million, funds capital replacement of the wastewater collection systems, roadway damage associated with the utility, and wastewater upgrades for core areas.
- Corporate Charges of $5.5 million include the Grant-in-lieu of Taxes, cross-charges for customer billing and collections, and corporate administration.

**Wastewater Utility**
**2015 Operating Expenses**
**$56,098,864**



The Wastewater Utility's 2015 expenses were 2.4% less than budgeted and about 15% more than in 2014, which reflected the 2014 discretionary spending order, the increase to the Infrastructure Services Capital Reserve, inflation, and increased volume. The 2015 expenses under control of Saskatoon Water were under budget by $0.4 million and were $0.7 million (6.2%) more than in 2014.

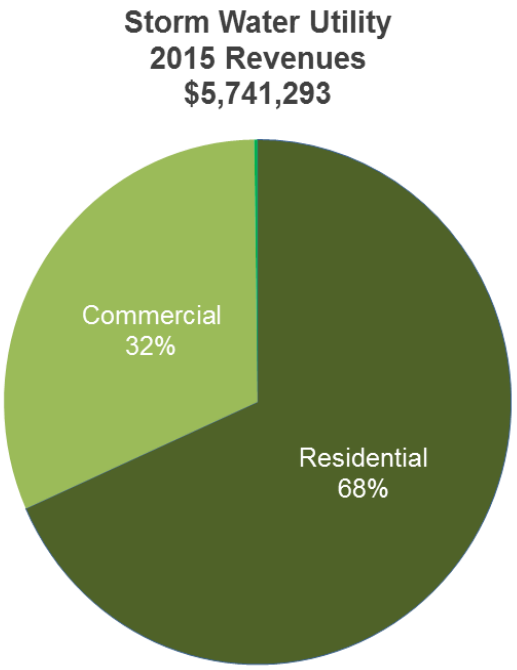
**Financial Statement**

**Wastewater Utility**
**Operating Revenues and Expenses**
**($1000s)**

| | 2015 Budget | 2015 Actual | 2014 Actual |
|---|---|---|---|
| **Revenues** | | | |
| Metered revenue | $ 40,461 | $ 40,566 | $ 36,114 |
| Infrastructure Levy | 12,438 | 12,935 | 9,813 |
| Other revenue | 870 | 1,723 | 1,713 |
| Flood Protection Levy | 3,697 | 3,841 | 3,769 |
| ***Total Revenues*** | **$ 57,466** | **$ 59,065** | **$ 51,409** |
| | | | |
| **Expenses** | | | |
| Wastewater Treatment | $ 7,695 | $ 7,418 | $ 7,038 |
| Wastewater Lift Stations | 1,396 | 1,750 | 1,763 |
| Wastewater Sludge Handling & Disposal | 2,002 | 1,710 | 1,591 |
| Administration & General | 1,841 | 1,688 | 1,445 |
| Corporate Services | 1,848 | 1,843 | 1,669 |
| Collection (Public Works) | 7,968 | 6,370 | 5,903 |
| Capital Charges | 14,941 | 14,902 | 12,547 |
| Flood Protection Program | 3,697 | 3,841 | 3,769 |
| Provision to Infrastructure Services Capital | 12,438 | 12,935 | 9,813 |
| Grants-in-lieu of Taxes | 3,642 | 3,642 | 3,371 |
| ***Total Expenses*** | **$ 57,466** | **$ 56,099** | **$ 48,909** |
| | | | |
| ***Revenues less Expenses*** | **$ -** | **$ 2,967** | **$ 2,500** |
| | | | |
| **(To)/From Stabilization/Capital Reserves** | **$ -** | **$ (2,967)** | **$ (2,500)** |

The positive balance of $2.97 million was allocated to the Water & Wastewater Revenue Stabilization Reserve and to Capital Reserves.

## 3.5 Storm Water Utility




***Revenues***

The Storm Water Utility's revenues include single-family residential charges ($52.80 per year), multi-residential, commercial, industrial, and institutional charges, which are proportional to the storm water generated based on property size and surface imperviousness. A seven-year phase-in of commercial rates started in 2012, with a maximum charge of $2,904 per property in 2015.

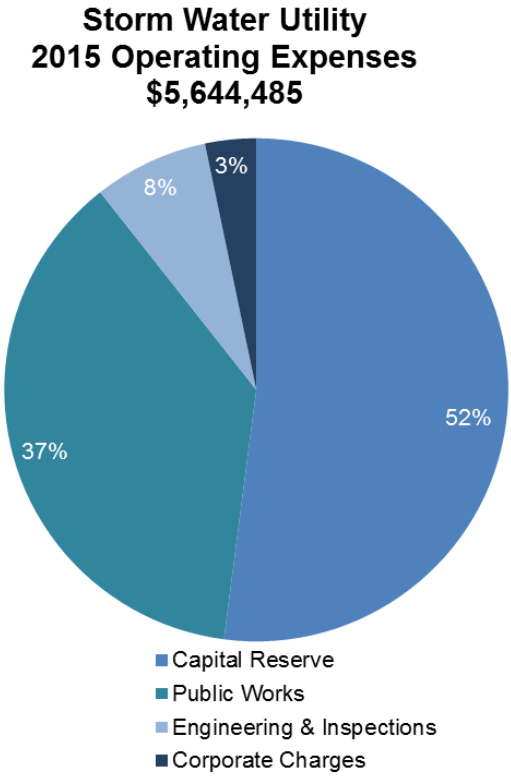
The Storm Water Utility's revenues in 2015 were $5.7 million, an increase of 6.7% from 2014. Residential customers accounted for about two thirds of revenues while commercial customers accounted for one third of revenues.

The Storm Water Utility's revenues were less than budgeted because City-owned parks became exempt from charges in 2015 and the process to assess run-off changes to commercial and multi-residential properties did not capture all new developments.

***Expenses***

The Storm Water Utility's 2015 operating expenditures were $5.6 million, which was about the same as in 2014. Operating expenditures in 2015 were 8.9% lower than budgeted because of the dry spring and staff vacancies.

- Engineering and inspections, of $0.4 million, included drainage inspections and overall utility management by Saskatoon Water.
- Over half of expenditures ($2.96 million) was an allocation to the Capital Reserve to fund storm water infrastructure rehabilitation and the east riverbank slope stabilization.
- Public Works received $2.1 million to operate and maintain the storm water system, including handling citizen drainage calls, keeping storm drains clear, the fall street sweep, and replacing and repairing the infrastructure.
- Corporate Charges, of $0.2 million, included billing services by Corporate Revenue and financial and administration services from Business Administration, Transportation & Utilities Department.



The Storm Water Utility's positive variance of $97,000 was allocated to the Stabilization Reserve, which the utility can draw on in years when there is a negative annual operating balance. The Stabilization Reserve balance was almost $1.2 million at the end of 2015.

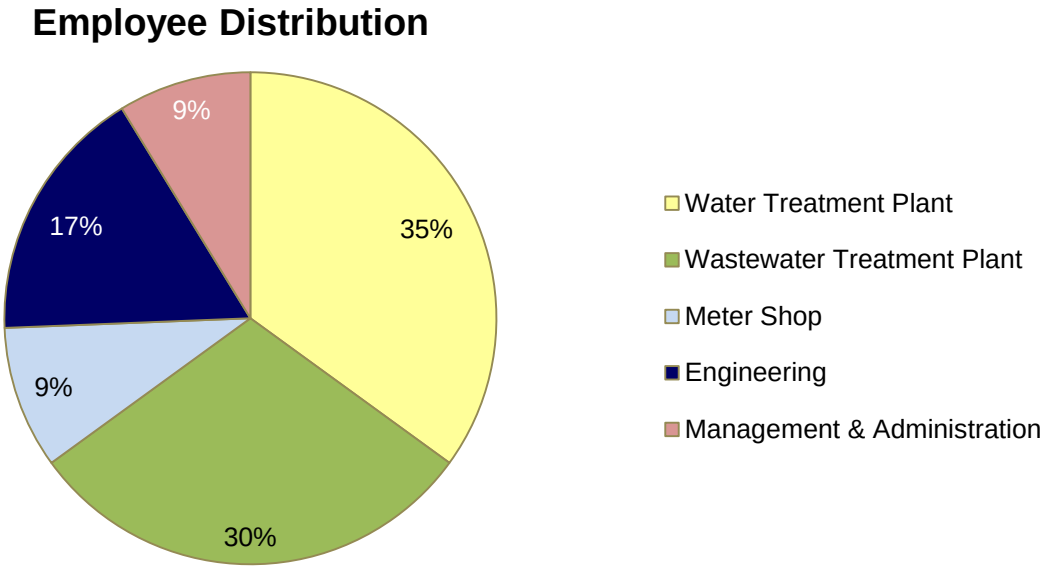
**Financial Statement:**

| Storm Water Utility<br>Operating Revenues and Expenses<br>($1000s) | 2015 Budget | 2015 Actual | 2014 Actual |
|---|---|---|---|
| **Revenues** | | | |
| Storm Water Charges | $ 6,184 | $ 5,729 | $ 5,369 |
| Late Charges | 10 | 12 | 9 |
| **Total Revenues** | **$ 6,194.30** | **$ 5,741.29** | **$ 5,378.31** |
| | | | |
| **Expenses** | | | |
| Engineering & Inspections Operations | $ 407 | $ 418 | $ 269 |
| Maintenance (Public Works) | 1,831 | 1,449 | 1,314 |
| Drainage (Public Works) | 789 | 671 | 813 |
| Customer Billing | 121 | 122 | 114 |
| Corporate Services | 50 | 50 | 49 |
| Licenses & Insurance | 76 | 14 | 76 |
| Interest Expense/(Revenue) | (35) | (35) | (10) |
| Provision to Capital Reserve | 2,957 | 2,957 | 3,028 |
| **Total Operating Expenses** | **$ 6,194** | **$ 5,644** | **$ 5,654** |
| | | | |
| **Revenues Less Expenses** | **$ -** | **$ 97** | **$ (276)** |
| | | | |
| **(To)/From Stabilization/Capital Reserves** | **$ -** | **$ (97)** | **$ 276** |

# 4.0 OUR PEOPLE

## 4.1 Number of Employees

Saskatoon Water had 160 employees as of December 2015. The graph shows the distribution in major areas. (Engineering includes Engineering Services and Engineering & Planning sections.)




## 4.2 Representative Workforce

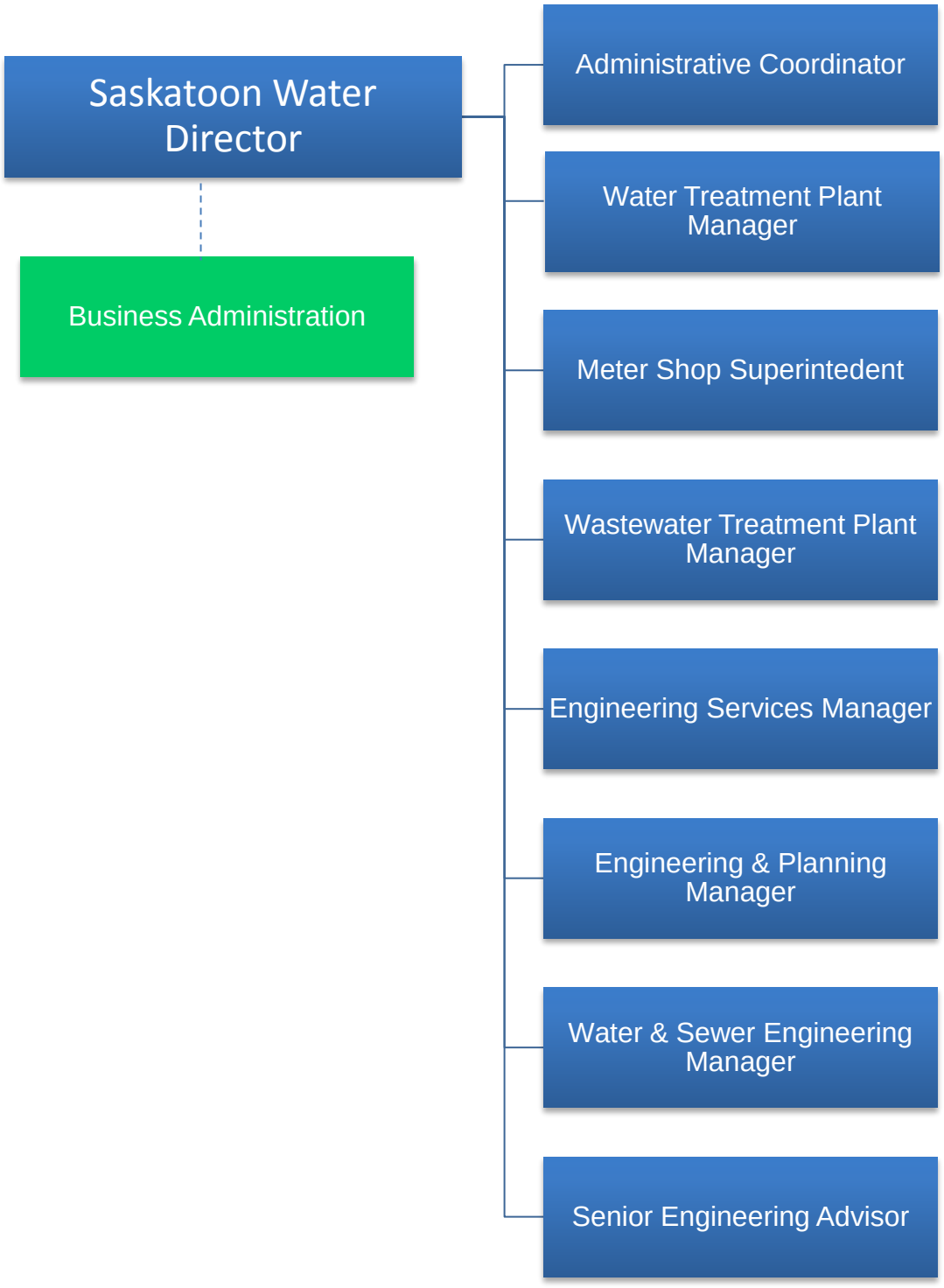
Saskatoon Water participated in diversity programs with Human Resources and other organizations to increase awareness among under-represented groups of career opportunities with Saskatoon Water. Examples of programs include Gabriel Dumont Institute Work Experience for Aboriginal People, Women in Trades - Grade XII Girls, and Open House for New Canadians.

Relative to goals set in 2014 by the Saskatchewan Human Rights Commission (SHRC) and adopted as corporate targets by the City, Saskatoon Water had a higher proportion of self-declared visibility minority employees and lower proportions of employees who self-declared as Aboriginal, female, or with a disability as of December 2015.

| Percentage of Employees Self-Declared as an Equity Group Member December, 2015 | | | |
|---|---|---|---|
| **Equity Group** | **Saskatoon Water** | **City of Saskatoon** | **SHRC Goal** |
| Self-Declared as Aboriginal Ancestry | 5.3% | 7.2% | 14.0% |
| Self-Declared as Visible Minority | 12.7% | 10.3% | 11.0% |
| Self-Declared as Person with Disability | 1.3% | 3.9% | 12.4% |
| Self-Declared as Female | 18.7% | 38.0% | 46.0% |

## 4.3 Organizational Chart

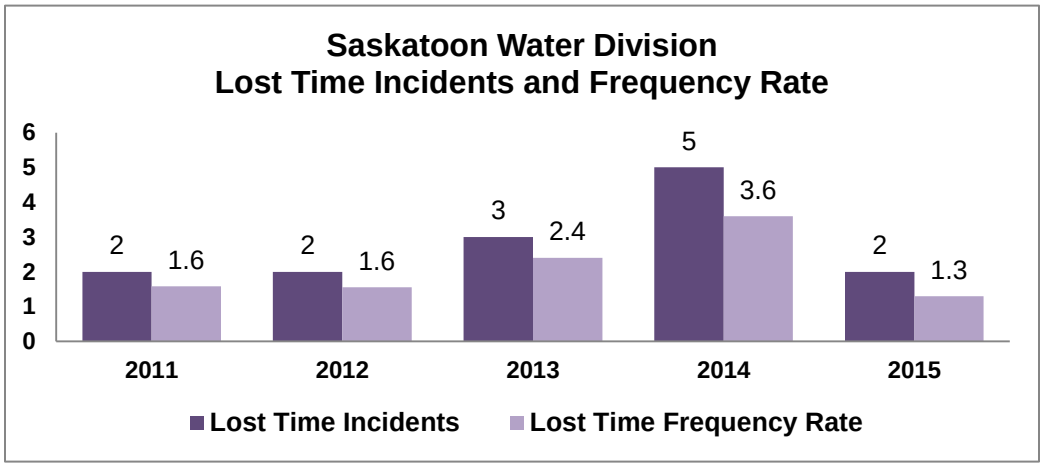
The organizational chart provides a high level overview of how Saskatoon Water is organized and key positions in 2015.

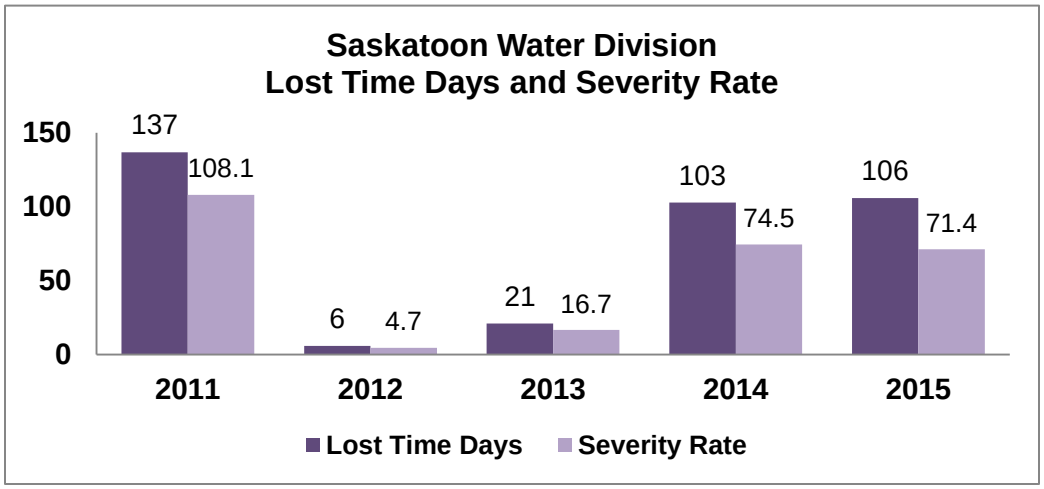


## 4.4 Employee Safety

Management and staff placed a strong emphasis on safety in the workplace to strive to meet the corporate target of zero lost-time injuries. Progress has been made by holding safety meetings, "tool box" meetings, work observations, inspections, and work planning. In 2015, Saskatoon Water achieved 100% of safety meetings, 100% of inspections, and 87% of the work observations planned for the year. The emphasis on safety improved employee engagement and morale and reduced lost-time incidents.

Saskatoon Water employees' Lost Time Frequency Rate of 1.3 in 2015 was the lowest it had been in the last five years and lower than the 3.9 average for all City employees. Our employees had two lost-time incidents in 2015, compared to five incidents in 2014. The 106 lost-time days experienced in 2015; however, was similar to the 103 lost-time days in 2014. The number of lost-time days and severity rate in 2014 and 2015 were both higher than in the previous two years.



# 5.0 OUR WORK

## 5.1 Community Awareness and Engagement

***Water Quality Reporting:*** The Water Security Agency (WSA) requires that at least once each year, Saskatoon Water provide notification to consumers of the quality of water produced and supplied, as well as information on the performance of the waterworks in submitting samples as required by a Minister's Order or Permit to Operate a Waterworks. In compliance with this order, Saskatoon Water produces the annual Drinking Water Quality and Compliance report annually.

For general information on water quality, water and wastewater treatment processes, environment, major capital projects, and water conservation, Saskatoon Water posts Saskatoon Water's 2014 Annual Water Quality Report on the City's website.

***Guided Tours of Water Treatment and Wastewater Treatment Plants:*** Guided tours are available to the public, ages 16 and older, to increase awareness of how the utilities operate in providing safe, reliable water and in returning quality effluent to the South Saskatchewan River. In 2015, the WTP had 315 people booked on 21 tours and the WWTP recorded 305 participants on 23 tours.

***Water Week:*** Saskatoon's Water Week, March 16 to 22, 2015, was themed "*Know Your $H_2O$".* Communication and engagement activities to increase water awareness included a Water Week website, Facebook Water Week Question of the Day, Twitter, YouTube videos about the WTP and the WWTP, and media interviews.


*Avenue H Reservoir*

***Open House and Tour of the Avenue H Water Reservoir Expansion:*** The general public and dignitaries were invited to an open house and tour of the Avenue H Reservoir Expansion project.

***Open House for Odour Abatement Project:*** Over $10 million have been allocated for an odour abatement project at the WWTP. When completed, the project will reduce the odour by up to 76%, which will enhance the quality of life for nearby residents. An open house was held to present the project and expected results for nearby residents.

***Open House for Surface Flooding:*** Over 60 people attended an open house to secure input from citizens in the five areas with known surface flooding to discuss the impact of flooding and options to control flooding. Consultation results were summarized and are being considered in the Storm Water Utility Business Plan.

***11th Street Reporting:*** Public meetings were held with residents concerned about slumping resulting from high groundwater levels. Regular results of monitoring by Golder Associates were provided to residents in the immediate area.

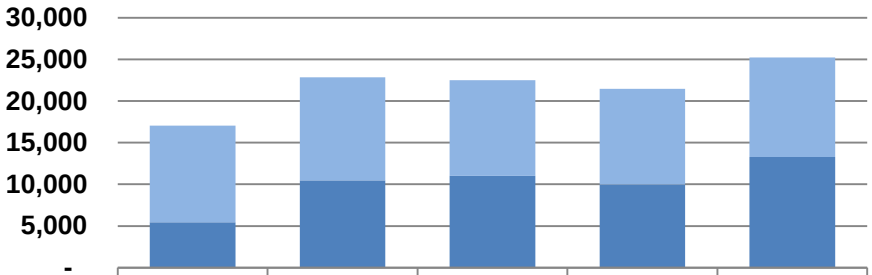
***Montgomery Local Area Plan:*** A presentation at a Community Association event encouraged local residents to keep culverts in front of their properties clear to maintain neighbourhood drainage.

## 5.2 Operating Highlights

***Water Quality:*** The City's water treatment and distribution systems are regulated by a "Permit to Operate a Waterworks" issued by the WSA. Our drinking water quality is further regulated by Health Canada's *Guidelines for Canadian Drinking Water Quality* and Saskatchewan Environment's *The Water Regulations, 2002.* Water quality is closely monitored 24 hours a day, 365 days a year.

The WTP's comprehensive Maintenance and Equipment Inspection Program meets the highest standard in North America. In 2015, a total of 13,293 water treatment quality tests and 11,945 distribution water quality tests were conducted by our WTP Laboratory accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Additional quality tests were conducted at every step of the treatment process for a total of over 50,000 tests.

**Number of Water Quality Laboratory Tests**




| | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| Distribution Water Quality Tests | 11,616 | 12,389 | 11,473 | 11,511 | 11,945 |
| Water Treatment Quality Tests | 5,440 | 10,476 | 11,017 | 9,968 | 13,293 |

The following table shows the results of some of the many types of testing completed by the WTP, which are well within acceptable limits under the Permit to Operate.

| Water Distribution System Values | | | | | | |
|---|---|---|---|---|---|---|
| | **2011** | **2012** | **2013** | **2014** | **2015** | **Allowable Values** |
| Yearly Total Chlorine Median (mg/L) | 1.73 | 1.83 | 1.8 | 1.78 | 1.83 | > 0.5 |
| Yearly Turbidity Median (NTU)[2] | 0.16 | 0.16 | 0.12 | 0.14 | 0.18 | < 1.0 |
| Total Coliforms >0 (CFU/100mL)[3] | 0 | 0 | 0 | 0 | 0 | 0 |

[2] Nephelometric Turbidity Units (NTU) is a measure of scattered light. A high turbidity level is caused by organic matter which can promote the growth of pathogens as well as being aesthetically unappealing.
[3] Colony Forming Unit (CFU) is a measure of viable bacterial cells.

In addition to the *Drinking Water Quality and Compliance* report, the *2015 Waterworks System Assessment* was completed to meet the WSA's requirements for a thorough five-year reporting of the WTP and distribution system.

***Wastewater Quality:*** The City's wastewater collection and treatment systems are regulated by a "Permit to Operate a Sewage Works" issued by the WSA. Our final effluent water quality is further regulated by Saskatchewan Environment's *Sewage Works Regulations, 2010, Saskatchewan Environmental Code, 2015*, and the *Federal Wastewater System Effluent Regulation, 2012*. Final effluent water quality is closely monitored 365 days a year.

The WWTP's comprehensive Maintenance and Equipment Inspection Program meets the highest standard in North America. In 2015, a total of 6,370 final effluent quality tests and over 20,000 water quality tests of other samples, including groundwater, ponds, outfalls, industries, and the river were conducted by our WWTP CALA-accredited Environmental Laboratory. Over 40,000 tests were conducted throughout the treatment process.

The following table shows the results of some of the many types of testing completed by Saskatoon Water, which are well below the maximum allowable values under the Permit to Operate.

| **Wastewater Distribution System Values** | | | | | |
|---|---|---|---|---|---|
| | **2012** | **2013** | **2014** | **2015** | **Wastewater Effluent Standard** |
| Yearly Median CBOD[4] | 4.9 | 4.6 | 4.3 | 3.9 | <25 mg/L |
| Yearly Median TSS[5] | 10.7 | 8.8 | 10.0 | 8.0 | <25 mg/L |
| Yearly Median Total Phosphorous (TP) | 0.15 | 0.26 | 0.24 | 0.2 | <0.5 mg/L |
| Yearly Median E.coli[6] | <10 | <10 | <10 | <10 | <200 mpn/100mL |

***Drainage Inspections:*** The Storm Water Utility helps developers and citizens ensure that drainage is meeting Saskatoon's Drainage Bylaw. The drainage inspector responded to 377 and 416 citizen drainage issues in 2014 and 2015, respectively.

***Rainfall Reporting:*** Eight rainfall gauges were regularly monitored and protocol for reporting was implemented that informed the City of flood potential and assessed past storms. *The 2015 Annual Rainfall Report* provides a summary of Saskatoon's 2014 and 2015 rainfall seasons.

***Rainfall Intensity-Duration-Frequency Curves:*** Engineering & Planning worked with the University of Saskatchewan to integrate climate change patterns into its models for severe storms. The new models will impact design standards for storm sewers and retention ponds.

[4] Measures the oxidation of carbons in water
[5] Total Suspended Solids
[6] E.coli is a common indicator of fecal contamination and is quantified using the Most Probable Number (MPN) method. MPN is a probabilistic test which assumes coliform bacteria meet certain criteria.

***Surface Flooding Control Strategy:*** Thirty sites with known surface flooding were assessed and prioritized based on risks of surface water reaching the site and the building, classification of roadway affected, and number of properties potentially affected. In 2014, the three highest ranking sites were examined in detail and the costs of alternative solutions, such as ponds and increased pipe sizes, were assessed. The cost to provide "1 in 100-Year" flood control for 286 houses, was estimated to be $52.3 million.

## 5.3 Capital Projects

Saskatoon Water had 93 active capital projects as of December 31, 2015, budgeted at more than $216.6 million. The following table summarizes the active capital projects by section:

| Active Capital Projects as of December 31, 2015 | | | |
|---|---|---|---|
| **Section** | **# of Active Projects** | **Approved Funding** | **Net Unspent Funding** |
| Water Treatment | 30 | $124,033,400 | $25,977,515 |
| Wastewater Treatment | 44 | $ 89,920,000 | $32,710,303 |
| Storm Water | 19 | $ 2,685,000 | $ 1,617,000 |
| Total | 93 | $216,638,400 | $60,304,818 |

The following section describes some of the major capital projects funded by the water-related utilities.

***Water Treatment Plant Expansion:***
Saskatoon Water substantially completed its most significant WTP upgrade in over 50 years, with a total cost of $77 million. This project included reservoir expansions and new pumphouses at the Avenue H and 42nd Street facilities. An ultraviolet disinfection system was added at the new four-storey-tall Avenue H facility. Although our stringent drinking water processes already complied with water quality regulations, this additional measure further ensures safe, high-quality drinking water.

*Ultraviolet Disinfection System*

The Avenue H and 42nd Street reservoir expansions increased useable water storage capacity from 42 to 72 million litres at these two sites to meet the growing needs of the

city. New high lift pumping stations at each location improved efficiency and reduced operating costs.

*42nd Street Reservoir Expansion Outside*

***Acadia Drive Capacity Improvements:*** Work also began to improve pumping capacity at the Acadia Drive Water Reservoir and Pumphouse, which serves customers located south of College Drive and east of Preston Avenue. The upgrade is expected to be completed in 2016.

***Clarifier Upgrades:*** The WTP upgraded clarifiers by adding tube settlers to Clarifier #2 in 2014 and to Clarifier #4 in 2015, resulting in an increased capacity that enables the City to postpone construction of an additional clarifier, estimated at $15.0 million.

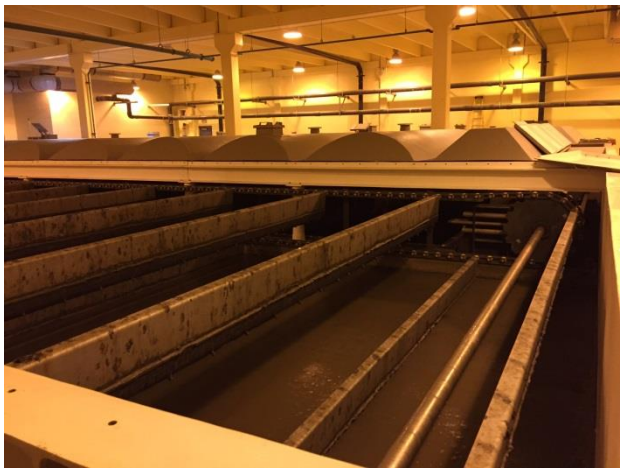
***Water Treatment Plant Transfer Pumping and Electrical Upgrades:*** A "Terms of Reference" was prepared for engineering consulting services for transfer pumping and electrical upgrades. These future upgrades will provide dedicated efficient pumps to transfer water to the Avenue H Reservoir facility.

***Sanitary Lift Station Upgrades:*** Upgrading lift stations improved the efficiency and reliability of the wastewater collection system. The Spadina Lift Station upgrade work started in 2015 and is expected to be completed in 2016. The 33rd Street Lift Station was decommissioned as sanitary sewer flow was permanently diverted to the new Elk Point Lift Station.

***Wastewater Odour Abatement Project:*** Design work for the $10.0 million wastewater odour abatement was completed in 2014. The Odowatch continuous odour monitoring system was installed and over 50% of the odour abatement construction was completed by the end of 2015. The project will reduce approximately 76% of all odour emissions during normal operations.

The Marquis Odour Control Facility and Drop Structure were commissioned in 2015.

***Wastewater Treatment Plant Digester:*** An analysis of options identified a conventional digester as the preferred technology for a fourth WWTP digester required to meet demands of growth and increase treatment reliability. The new digester is expected to be operational by 2018.



The above pictures show the WWTP Dissolved Air Flotation (DAF) tanks before and after covers have been added to reduce odour. The thickening process allows more solids to be removed from wastewater and contributes to the clarification process.

***Sanitary Sewer Superpipe:*** The Lakeview Sanitary Sewer Storage facility, funded by the Flood Protection Program (FPP), was the 11th "superpipe" facility installed in the city to increase capacity and mitigate risk of sewer backup.

***Mackie Crescent:*** A trenchless storm sewer replacement project was completed at Mackie Crescent, minimizing cost and disruption to residents.

***14th Street and 15th Street Storm Sewer Outfall Rehabilitation:*** Construction was completed to restore storm sewer trunk outfalls along the river that had been damaged as a result of soil erosion.

The above pictures show the 14th and 15th Street Storm Sewer Trunk Outfall Rehabilitation

***East Riverbank Stabilization - 17th Street and Saskatchewan Crescent:*** Golder Associates designed an award-winning solution to remediate slope failure at 17th Street. The $1.8 million project stabilized the road embankment with lightweight fill and installation of a sub-drainage system.

The above picture shows the expanded polystyrene fill used to stabilize the embankment.

## 5.4 Continuous Improvement Initiatives

Saskatoon Water is committed to Continuous Improvement (CI) through improved customer service and continually implementing innovations to improve efficiencies and reduce costs. In addition to the operating and capital projects described above, Saskatoon Water has undertaken the following CI initiatives:

***Water Treatment Plant Chemical Optimization:*** The amount of lime and ferric required in the water treatment process was reduced by optimizing the chemical dosage, with significant cost savings.

***Procurement Process Improvements:*** The procurement process was improved by securing large contracts with major suppliers to take advantage of bulk discounts, which resulted in savings of over $200,000. Blanket orders with major suppliers eliminated unnecessary paperwork and sole source contracts. Procurement also was streamlined by using electronic ordering and payments. All parts are now delivered to stores, resulting in higher productivity for onsite staff. This process has reduced the administrative costs of procurement for the City by over $25,000, while also increasing transparency and reducing wait times for repair and maintenance materials.

***Filter Optimization:*** Through extensive testing, the WTP extended the filter run time (time between cleaning) to minimize the water wasted during the cleaning process, reduce chemical usage/pumping at the Residual Handling Facility, and save energy. The increase in the filters' overall capacity will defer future capital expenditures.

***Residual Handling Facility Pump Optimization:*** After a six-month trial, a new pump brand for the WTP was selected to increase reliability and reduce facility down time as well as reduce operating and maintenance costs.

***Inventory Management System:*** A master inventory list and kitting of related items was completed for the WWTP with active tracking of assets. The proper critical spares list and "right time" ordering has resulted in cost savings due to reduced downtime and less risk to the plant.

***Wastewater Nutrient Recovery and Wastewater Discharge Quality:*** The Nutrient Recovery Facility (Ostara system) transforms phosphorous and nitrogen from waste streams into a marketable, eco-friendly fertilizer; reduces struvite (a naturally occurring, hard deposit that plugs pipes and pumps); and improves reliability of the WWTP. System optimization increased nutrient recovery and reduced the volume of sludge sent to the holding ponds by 7% in 2015. The optimization resulted in a $65,000 savings and improved quality of effluent discharged to the river. Saskatoon's Ostara system is one of two of its kind in North America and is the top performing worldwide Ostara site, in terms of nutrient yield.

***Bio-solids Handling:*** The WWTP's in-house innovation and ideas led to experimentation of many different methods of bio-solids applications. Material handling has been reduced by a factor of four, thereby reducing costs. Odour emissions also have been significantly reduced.

***Advanced Metering Infrastructure:*** Hardware was installed and testing started for the new Advanced Metering Infrastructure (AMI) System, which will be used to electronically transmit actual water consumption data. When AMI is fully installed, all meter reading for billing purposes and some electrical service connects and disconnects will be done remotely, leading to reduced operating costs. The system will also provide automatic notification of metering errors and tampering which will reduce lost revenue. Better data through AMI will allow customers to save money by changing their water consumption habits, and the City will have better information to allow more efficient operation of the electrical and water distribution systems.

***Run-off Assessment Process Improvement:*** A review was initiated to identify a more proactive assessment process to capture the correct revenue from storm water charges resulting from growth and development of multi-residential and commercial properties.

# 6.0 OUR ENVIRONMENT

## 6.1 Stewardship

Protecting the river and its surrounding watershed is vital to the long-term sustainability of our water supply. The public expects, and Saskatoon Water is committed to, responsible watershed management and stewardship. Saskatoon Water is a member of the South Saskatchewan Watershed Stewards Incorporated, a community-based organization that was formed to implement the South Saskatchewan River Watershed Source Water Protection Plan.

The WWTP consistently meets or exceeds all regulatory limits for effluent discharged to the river under WSA's "Permit to Operate a Sewage Works". Phosphorous is the key nutrient the WWTP removes because of its negative impacts on the South Saskatchewan River. The implementation of the Ultraviolet Disinfection Facility, to replace chlorine disinfection, has improved the quality of the final effluent being discharged to the South Saskatchewan River.

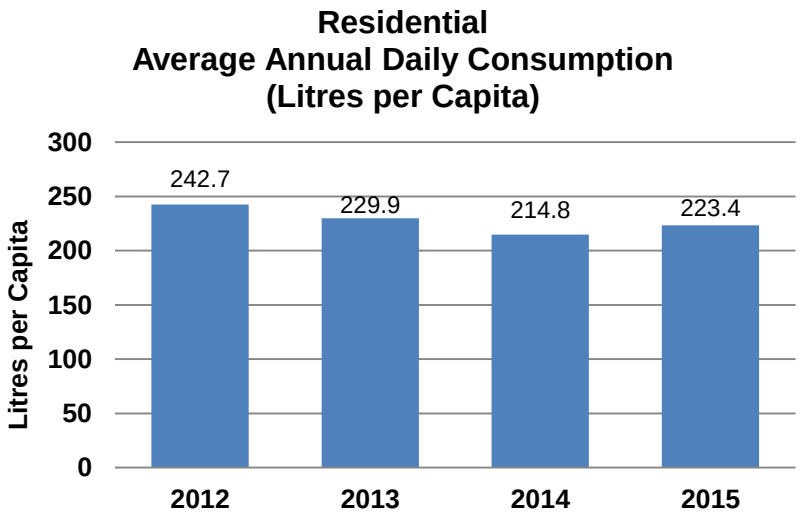
The Environmental Laboratory at the WWTP received ISO/IEC 17025:2005 accreditation from CALA in July 2015. Accreditation was maintained at the WTP Laboratory.

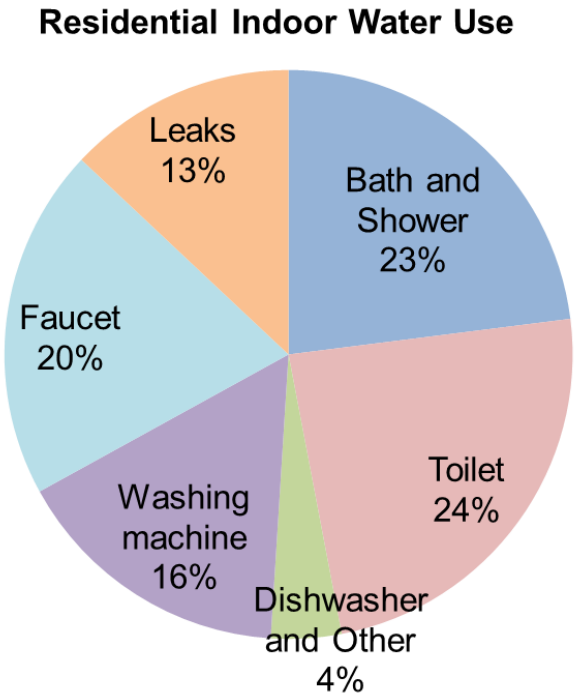
Saskatoon Water supports the Provincial Operator Certification Program, for both the Water and Wastewater Treatment Plants, which helps protect both the public and the environment.

## 6.2 Conservation

Saskatoon water rates are designed to encourage water conservation in order to defer the need for high capital intensive capacity projects. Customer education to reduce the summer maximum day volume (peak demand management) can also assist in deferring some capital expenditures.

Due to fluctuating seasonal irrigation demands, Saskatoon's total average annual daily consumption varies significantly from year to year.






A recent study conducted by the Water Research Foundation shows that indoor household water use in a single family home has decreased by 22% from 1999 to 2016. The City of Saskatoon has experienced a similar downward trend as citizens implement low-flow fixtures.

The chart provides an indication of how indoor water is consumed in average residential homes in Canada and the United States.

Source: Water Research Foundation, April 2016

## 7.0 OUR CHALLENGES

Saskatoon Water has been proactive in anticipating and managing the following ongoing challenges it faces:

***Keeping Up with Growth:*** Saskatoon's rapid growth in population and development has required additions to water infrastructure with large up-front capital expenditures. Construction costs have been higher because of the strong competing demands for contractor services. The division coordinated multiple capital projects, trained staff for new facilities, and identified ways to defer capital expenditures.

***Infill Development:*** Cumulative impacts of infill development are placing higher demands on the carrying capacity of existing water and sewer infrastructure. More infill reduces greenspace and increases surface runoff so appropriate policies are needed to minimize surface flooding.

***Age and Condition of Existing Infrastructure:*** Aging infrastructure has entered into a "replacement era" where asset sustainability and reliability will be at risk if not properly managed. Some of the infrastructure is over 100 years old and does not meet design standards for new development areas. Monitoring and assessing the physical condition and capacity of the infrastructure has been initiated as a foundation for an asset management program to better maintain our assets, prolong life, and increase resiliency.

***Climate Change and Rainfall:*** Changing rainfall patterns impact demand for water, with high peak demands during dry stretches. Wet weather conditions also have created drainage issues throughout the city. High groundwater levels have impacted neighbourhood drainage and resulted in east riverbank slumping and slope failure that damaged infrastructure.

***Drainage Bylaw Enforcement:*** Neighbourhood storm water drainage is impacted by properties, which are developed contrary to approved design standards or drainage paths that are not maintained, resulting in flooding for homeowners and their neighbours. Appropriate tools and resources are necessary for inspections when development occurs to minimize future problems.

***Regulatory Requirements:*** The provincial Permit to Operate impacts the required processes and standards for the WTP and WWTP. Further evolving federal and provincial regulations have the potential to impact discharges to the river. Saskatoon Water will continue to monitor regulatory trends and opportunities to be a leader in protecting our watershed.

***Inflow & Infiltration:*** Identifying and removing the amount of inflow and infiltration entering the sanitary sewer system will help to protect the environment, reduce sewer back-ups, and costs for collection and treatment. Partial treatment of high flows, which are mostly rain or groundwater, will be considered as the WWTP reaches capacity.

## 8.0 CONCLUSION

The WTP and the WWTP have long-term strategic capital development and expansion plans. Through its approved 2015 Operating Budget and the approved five-year Capital Plan, Saskatoon Water was able to maintain operations and fund capital projects related to treated water and wastewater quality, city growth, and regulatory matters.

The success of Saskatoon Water is dependent on the dedication and skills of our employees, and their efforts are greatly appreciated. Our competent team of plant operators, tradespersons, maintenance staff, engineers, technologists, technicians, chemists, and administrators play a crucial role. The guidance and support of the General Manager, City Manager, and City Council is appreciated.

The staff of Saskatoon Water look forward to the challenges and the opportunities that the future will provide.

## 9.0 APPENDICES

## Appendix One: Water, Wastewater and Storm Water Infrastructure

In 2014, the replacement value of all water, wastewater, and storm water infrastructure was estimated at over $9.5 billion.

The Water Treatment Plant (WTP) and assets associated with water distribution have an estimated value of $3.4 billion. An update to the valuation of the WTP, water intakes, and reservoirs is planned for 2016.

The Wastewater Treatment Plant and assets associated with the sanitary sewer collection system has an estimated replacement value of $4.0 billion.

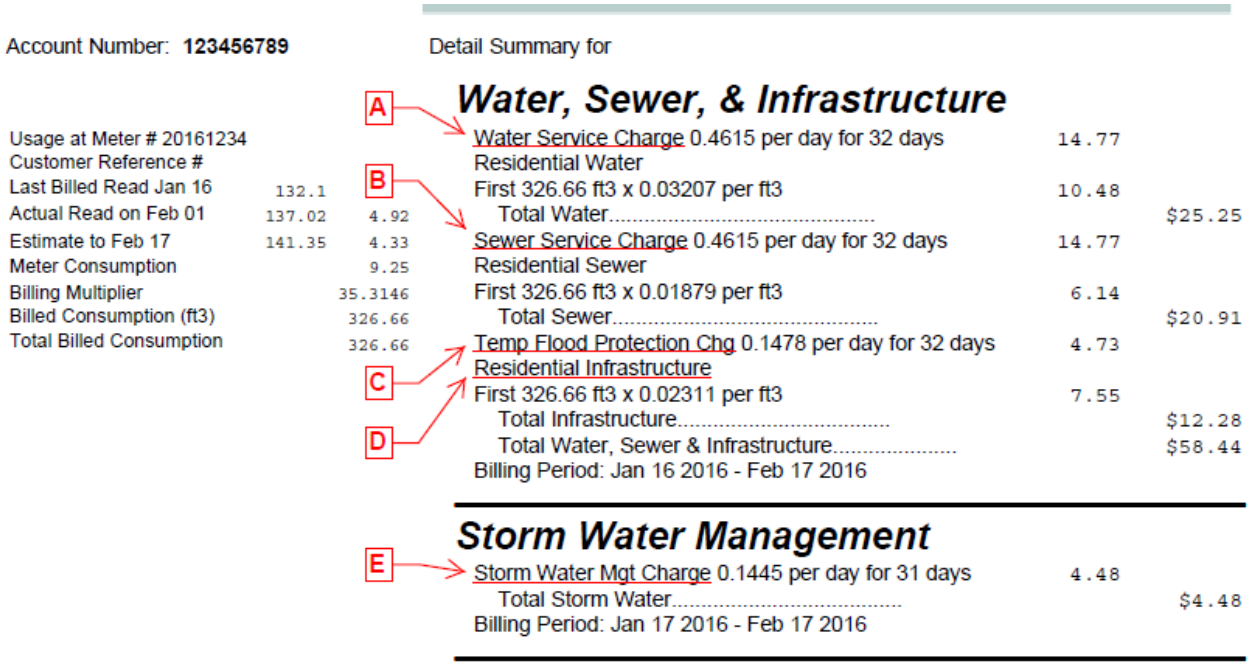
Saskatoon's storm water infrastructure has a replacement value of over $2.0 billion.

| Water Utility Assets | | |
|---|---|---|
| **Asset** | **2014 Inventory** | **Replacement Value ($M)** |
| Water Treatment Plant, Water Intakes and three Reservoirs | | $ 600 |
| Water Pipes | 1,132 km | 2,073 |
| Valves | 13,964 | 175 |
| Hydrants | 7,063 | 76 |
| Service Connections | 71,096 | 519 |
| **Total** | | **$ 3,443** |

| Wastewater Utility Assets | | |
|---|---|---|
| **Asset** | **2014 Inventory** | **Replacement Value ($M)** |
| Wastewater Treatment Plant | | $ 500 |
| Lift Stations | 28 | 154 |
| Wastewater Pipes | 1,030 km | 2,686 |
| Manholes | 11,298 | 208 |
| Forcemains | 44 km | 98 |
| Service Connections | 69,635 | 393 |
| **Total** | | **$ 4,039** |

| Storm Water Utility Assets | | |
|---|---|---|
| **Asset** | **2014 Inventory** | **Replacement Value ($M)** |
| Storm Water Pipes | 702 km | $ 1,797 |
| Manholes | 8,710 | 136 |
| Catch Basins | 11,758 | 44 |
| Leads | 136 km | 34 |
| Service Connections | 2,971 | 17 |
| Wet Ponds | 20 | 16 |
| Dry Ponds | 8 | 2 |
| Culverts | 5 km | 2 |
| Water Outfalls | 92 | 6 |
| **Total** | | **$ 2,053** |

## Appendix Two: Understanding Your 2016 Residential Water-Based Utilities



Account Number: **123456789**

Detail Summary for

| | | |
|---|---|---|
| Usage at Meter # 20161234 | | |
| Customer Reference # | | |
| Last Billed Read Jan 16 | 132.1 | |
| Actual Read on Feb 01 | 137.02 | 4.92 |
| Estimate to Feb 17 | 141.35 | 4.33 |
| Meter Consumption | | 9.25 |
| Billing Multiplier | | 35.3146 |
| Billed Consumption (ft3) | | 326.66 |
| Total Billed Consumption | | 326.66 |

**Water, Sewer, & Infrastructure**

| | | |
|---|---|---|
| A — Water Service Charge 0.4615 per day for 32 days | 14.77 | |
| Residential Water | | |
| B — First 326.66 ft3 x 0.03207 per ft3 | 10.48 | |
| Total Water | | $25.25 |
| Sewer Service Charge 0.4615 per day for 32 days | 14.77 | |
| Residential Sewer | | |
| First 326.66 ft3 x 0.01879 per ft3 | 6.14 | |
| Total Sewer | | $20.91 |
| C — Temp Flood Protection Chg 0.1478 per day for 32 days | 4.73 | |
| Residential Infrastructure | | |
| First 326.66 ft3 x 0.02311 per ft3 | 7.55 | |
| Total Infrastructure | | $12.28 |
| D — Total Water, Sewer & Infrastructure | | $58.44 |

Billing Period: Jan 16 2016 - Feb 17 2016

**Storm Water Management**

| | | |
|---|---|---|
| E — Storm Water Mgt Charge 0.1445 per day for 31 days | 4.48 | |
| Total Storm Water | | $4.48 |

Billing Period: Jan 17 2016 - Feb 17 2016

## Bill

**A. Water Service Charge:** The fixed monthly charge for a 5/8 inch water meter is $9.36, and for a 3/4 inch meter is $14.04. The fee is prorated by the number of days in the month

A second water service charge is based on water usage (volumetric): $3.207 per 100 $ft^3$ for the first 600 $ft^3$, $3.57 per 100 $ft^3$ for the second 600 $ft^3$ and $4.70 per 100 $ft^3$ for over 1,200 $ft^3$. The water service charges are used to fund water utility operations and capital projects.

**B. Sewer Service Charge:** The fixed monthly sewer service charge is based on the size of the water meter and is the same amount as the fixed water service charge.

The sewer volumetric charge is 58.6% of the water volumetric charge. Rates are set on a cost recovery basis and recognize that not all water returns to the sanitary sewer: $1.879 per 100 $ft^3$ for the first 600 $ft^3$, $2.092 per 100 $ft^3$ for the second 600 $ft^3$ and $2.754 per 100 $ft^3$ for over 1,200 $ft^3$. Sewer service charges fund wastewater operations and capital projects.

**C. Temporary Flood Protection Charge:** The charge is a fixed fee of $4.50 per month, prorated by the number of days in the month. The fee is charged on each water meter until December 2018. The charge is used to upgrade the sanitary sewer system to reduce the risk of sewer back-ups during severe rain events.

**D. Residential Infrastructure:** The fee is $2.311 per 100 $ft^3$ of water usage. This fee is used for the capital replacement and upgrade of the water distribution and wastewater collection systems. The Redevelopment Levy to increase capacity of existing infrastructure to accommodate infill developments and the Roadways Levy that funds remediation of roadway damage associated with the utilities are included in the charge.

**E. Storm Water Management Charge:** The monthly charge for residential properties is a fixed amount of $4.40 prorated by the number of days in the month. This fee is used to fund operations and capital projects for storm water and for stabilizing riverbank slumping.

## Appendix Three: Abbreviations

AMI – Advanced Metering Infrastructure

CALA – Canadian Association for Laboratory Accreditation Inc.

CBOD - Carbonaceous Biochemical Oxygen Demand

CFU – Colony Forming Unit

CI – Continuous Improvement

City – City of Saskatoon

IEC – the International Electrotechnical Commission

IS – Infrastructure Services

ISO – the International Organization for Standardization

MPN – Most Probable Number

NTU - Nephelometric Turbidity Units

PW – Public Works

TP - Total Phosphorous

US – Utility Services

WSA – Water Security Agency

WTP – Water Treatment Plant

WWTP – Wastewater Treatment Plant

## Appendix Four: Glossary

**Abatement:** To reduce the amount or lessen the effect of.

**Backflow Prevention Device**: A backwater valve is a device that prevents sewage from backing up into basements.

**Bio-Solids:** Organic matter recycled from sewage.

**Capital Reserve:** Funding that is reserved for long-term infrastructure projects to be undertaken in the future.

**Clarifier:** A settling tank used to remove solids in the water treatment process.

**Colony Forming Unit (CFU):** A measure of viable bacterial cells.

**Commercial customers:** For this report, refers to all non-residential customers and includes retail, wholesale, industrial, and institutional customers.

**Critical Spares:** Parts that may cause significant impact to operations in the event of a failure.

**Cross Connection Control Program:** A cross connection is any link between the water supply and potentially contaminated sources. The Cross Connection Control Program ensures that proper backflow prevention devices are installed to prevent foreign substances from entering the water distribution system.

**Digester**: One step of the wastewater treatment process used to decrease the amount of organic matter present.

**Drop Structure:** A device used in sanitary sewer collection systems to drop wastewater at a level in the manhole so that maintenance can be conducted during flow.

**Effluent:** Treated water discharged back into the river.

**Ferric:** Iron-containing materials or compounds.

**Grant-In-Lieu of Taxes:** Money paid by the Water and Wastewater Utilities in place of taxes.

**Imperviousness:** Ability of a material (e.g. soil, concrete) to not allow fluid to pass through.

**Infill (Development):** Development of land within already developed areas.

**Infiltration:** Groundwater seeping into sanitary sewers through cracks and crevices such as defective pipe joints and broken pipes.

**Inflow:** Water flowing into the sanitary sewer through large openings such as cross connections and weeping tile.

**Irrigation:** Artificial application of water typically due to low amounts of rainfall.

**Kitting:** Process in which individually separate, but related items are grouped, packaged, and supplied together as one unit.

**Lift Station:** Facility designed to move wastewater or storm water from lower to higher elevations with pumps.

**Low-Flow Fixture:** Fixtures that use water efficiently to reduce overall water usage.

**Nephelometric Turbidity Units (NTU):** A measure of scattered light. A high turbidity level is caused by organic matter that can promote the growth of pathogens, as well as being aesthetically unappealing.

**Potable:** Safe to drink.

**Procurement:** The process of obtaining or purchasing.

**Residual Handling Facility:** Removes chlorine and solids, mostly consisting of sand and inert ferric material, from the Water Treatment Plant effluent that is discharged to the South Saskatchewan River.

**Return Period:** The estimate of the likelihood of a rainfall event. A two-year rain event would have a 50% likelihood of occurring in any given year. A five-year rain event would have a 20% likelihood of occurring in any year.

**Right Time Ordering:** An inventory strategy that increases efficiency and reduces costs by balancing having supplies when needed with the costs of carrying inventory.

**Stabilization Reserve:** Water utility revenues fluctuate due to rainfall and demand for irrigation. Annual operating surpluses, which are more likely during drier years, are allocated to the Stabilization Reserve that can be used in years with an operating deficit. The Stabilization Reserve is capped at 5% of the current year's budgeted metered revenue, and any additional surplus is allocated to the Capital Reserve.

**Struvite:** A naturally occurring, hard deposit of magnesium ammonium phosphate crystallization that occurs within the Wastewater Treatment Plant infrastructure.

**Sub-drainage System:** Typically perforated pipe used to drain groundwater and seepage.

**Superpipe:** A large sanitary storage tank to handle surcharged wastewater.

**Surface Runoff:** Rainfall flowing overland and into the storm sewer without being absorbed into the ground.

**Trenchless Replacement:** Sewer pipe replacement without the use of an open cut excavation.

**Turbidity:** The cloudiness or haziness of a fluid caused by a large number of individual particles that are generally invisible to the naked eye.