

# Saskatoon's Water

## 2009 Annual Water Quality Report

### Access to Safe Quality Drinking Water – Your Expectation, Our Responsibility

The City of Saskatoon is proud to present the 2009 Annual Water Quality Report. This report serves to meet our annual provincial reporting requirement for a "Consumer Confidence Report" and contains information based on the year 2009. This year's report covers details of the water treatment process, water quality test results, watershed protection, capital and operational development plans for the future, as well as many other initiatives and water quality topics.

It's through the ongoing dedication of our water quality team in the areas of water treatment and distribution that we are able to continue to provide safe quality drinking water. As a water customer, you can do your part as a responsible environmental steward to protect and conserve our water resource, through properly disposing of household hazardous wastes, being careful what goes down storm drains, and by using water responsibly.

The planning and construction of several facility expansions and process improvements is well underway. Intensified staff training and improved documentation have been undertaken as part of our succession management planning. These initiatives will enable us to continue to provide the highest standards for water quality and to meet the water demands of Saskatoon's expanding population.

We are proud to report that our drinking water surpassed all Health Canada and Saskatchewan Environment water quality guidelines for 2009. For more information you can visit our website at [www.saskatoon.ca](http://www.saskatoon.ca). If you have any further questions with regard to the information contained in this report or any aspect of water service delivery, please contact us at 975-2534.

Sincerely,  
**Reid Corbett, Manager**  
Water & Wastewater Treatment Branch

### The Water Treatment Process

Treating and supplying quality water to Saskatoon and area residents requires highly trained personnel, constant monitoring, and a huge amount of infrastructure. Our competent team of plant operators, tradespersons, maintenance staff, engineers, technologists, chemists, and administrators all play an important role in the delivery of water to your household.

Every step of the water treatment process, from initial water intake to delivery to your tap, is as important as the next. The City of Saskatoon works hard at ensuring its practices and treatment methods are of the highest quality, while continuing to work to reduce our impact on the environment.

The Water Treatment Plant uses a multi-barrier approach to ensure high quality water is maintained as it travels from the river, through the stages of the treatment process, and through the distribution system to your tap. In addition, each component of the process is duplicated to provide back up in emergency situations and to prevent a single point of failure in the treatment process.



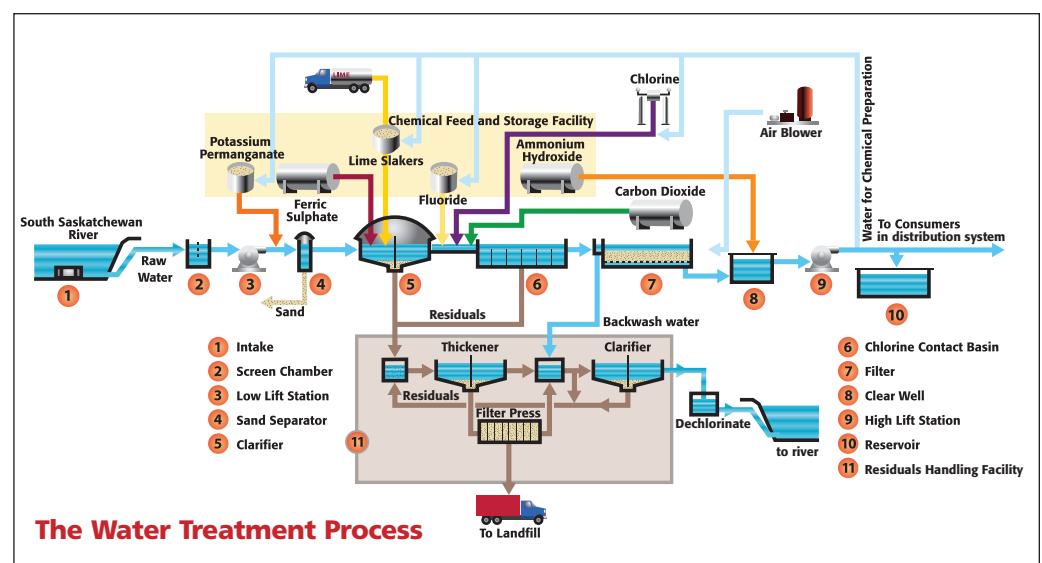
Water Treatment Plant, 1947



Aerial view of Water Treatment Plant, 2002

### The Path Our Water Takes

South Saskatchewan River and water intakes → Water Treatment Plant → Water Reservoirs and Pumping Stations → Water Distribution System → The Consumer → Wastewater Collection System (Sewer pipes) and Lift Stations → Wastewater Treatment Plant → Outfall to the South Saskatchewan River



The Water Treatment Process

# Saskatoon's Drinking Water

## The Highest Quality

### Water Standards and Testing

Did you know your tap water is monitored and regulated more closely than most bottled water to ensure the highest quality and standard? If you are looking for freshness and quality from your water you can't find much better than Saskatoon's tap water. And tap water costs less than a penny per litre!

Highly trained and certified operating staff closely monitor the Water Treatment Plant and reservoir operations 24 hours a day, 365 days a year to ensure the quality, safety, and reliability of our water supply. The City of Saskatoon is proud to have many of our Operators certified to Level 4, the highest level of certification, while many other staff hold various other levels of certification. The Water and Wastewater Treatment Branch has developed a comprehensive, hands-on training program to ensure that we continue to have a highly competent operations staff with an in-depth knowledge of our specific water treatment process and related systems.

In addition, the Plant's comprehensive maintenance and equipment inspection program ensures Saskatoon's Water Treatment Plant meets the requirements of a Class 4 facility, the highest standard in North America.

The Water Treatment Plant also maintains a C.A.L.A. (Canadian Association for Laboratory Accreditation Inc.) certified water-testing laboratory to ensure standards are met and water quality is never compromised. Water chemists, technologists, and treatment plant operators conduct over 50,000 water treatment quality tests and a further 5,000 distribution water quality tests every year as part of its quality control program.

The City's water treatment and distribution systems are regulated by a Permit to Operate issued from Saskatchewan Environment. 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. These regulations set standards to ensure treated water is safe for consumption. The City of Saskatoon consistently meets or exceeds these regulatory limits for drinking water quality.

### Chlorine Use in the Treatment Process



Chlorine is used to ensure water is safe for consumption by eliminating harmful viruses and bacteria. Chlorine is added at the Water Treatment Plant and the concentration is maintained throughout the distribution system to ensure safe water quality at your tap. Extensive testing is carried out to verify Saskatoon's water consistently meets Health Canada guidelines.

Fortunately, Saskatoon has an excellent source of water that is naturally low in organics. When these organics in the source water react with chlorine, they form

Trihalomethanes (THMs) which is a concern due to their potential to cause cancer. Saskatoon's Water Treatment Plant process reduces organics before chlorination, thereby decreasing the potential for THMs to form. Saskatoon's drinking water consistently has levels of THMs around 0.041 mg/L, well below the Health Canada's regulatory limit of 0.1 mg/L.

Saskatoon's water is also consistently well below maximum acceptable concentrations (MAC)\* for heavy metals, chemical pesticides, synthetic organic chemicals, and radiological compounds regulated by the *Guidelines for Canadian Drinking Water Quality*. A detailed chemical analysis and full report is available on the City of Saskatoon's website or for more information, please contact 975-2534.

\* Maximum Acceptable Concentrations are determined based on safe exposure levels for continuous consumption over a lifetime.

### City of Saskatoon Water Quality Data 2009

WATER QUALITY CHARACTERISTIC	REPORTED AS	TREATED WATER	REGULATORY LIMITS	SOURCES
<b>Physical Characteristics</b>				
pH		8.6	9	
Turbidity	NTU	0.11	1	Soil erosion and runoff
<b>Inorganic Constituents</b>				
Aluminum	mg Al/L	0.043	0.2	Naturally present in our environment
Total Hardness	mg CaCO <sub>3</sub> /L	123	800	occurring dissolved minerals
Chlorine Residual	mg Cl <sub>2</sub> /L	1.88 <sup>A</sup>	3.0 <sup>A</sup>	Additive in water treatment process for disinfection
Copper	mg Cu/L	0.002	1	Naturally present in our environment
Fluoride	mg F/L	0.52	1.5	Additive in water treatment process to prevent tooth decay
Lead	mg Pb/L	<0.002	0.01	Naturally present in our environment
Potassium	mg K/L	3.0	n/a	Naturally present in our environment
Sodium	mg Na/L	23	300	Naturally present in our environment
<b>Nutrient Constituents</b>				
Nitrate (& Nitrite)	mg NO <sub>3</sub> /L	1.12	45 (32)	Agricultural use of fertilizers
<b>Microbiological</b>				
E. Coli	CFU/100ml	0	<1	Naturally present in the intestines of warm-blooded animals
Total Coliform	CFU/100ml	0	<1	Naturally present in our environment
<b>Disinfection Byproducts</b>				
Total Trihalomethanes	mg/L	0.034 <sup>1</sup>	0.1	By-product of drinking water disinfection using chlorine

<sup>A</sup>As Chloramine    <sup>1</sup> Tested in Distribution System    mg/L is equivalent to parts per a million (ppm)

# Protecting the South Saskatchewan River and its Surrounding Environment for Future Generations



Illustration left: Saskatchewan portion of South Saskatchewan River Watershed

Saskatoon is fortunate to have an excellent source of water from the South Saskatchewan River. Protecting the river and its surrounding watershed (drainage area) is vital to the long-term sustainability of our water supply. The City of Saskatoon is committed to this goal and is working in partnership with the South Saskatchewan River Watershed Stewards and other stakeholders to protect the river's watershed.

## Reducing Our Environmental Impacts

Climate change has the potential to impact many aspects of our lives including our rivers and other water sources. To play our part in ensuring an adequate water supply for the future, the Water Treatment Plant is committed to taking action on climate change through the initiatives set out in our Environmental Management System.

The Environmental Management System is also helping reduce other environmental impacts of our operations and guide us in continually improving our environmental performance.

In addition to the Environmental Management System and South Saskatchewan Source Watershed Protection, the Water and Wastewater Treatment Branch has sponsored and will continue to sponsor several water conservation initiatives with the Environmental Services Branch at the City. In 2010 a compost bin and rain barrel truckload sale were held and over 1,000 rain barrels were bought at a discounted rate by residents. In June 2010, the Environmental Services Branch held two xeriscaping workshops promoting low-maintenance and low-water gardening and landscaping.

## Water Returning to Our River

In 1996, the City of Saskatoon invested over \$50 million in improvements to the Wastewater Treatment Plant with the introduction of a Biological Nutrient Removal process. This process significantly reduces the levels of nitrogen and phosphorous in the treated wastewater being discharged to the South Saskatchewan River. These elements, in high concentrations, can cause damage to natural ecosystems within the river and its watershed.

In early 2009, the Wastewater Treatment Plant commissioned a Septage Kiosk for liquid waste haulers. This will allow for careful monitoring of liquid waste and prevent process disruption by dumping of inappropriate effluent.

Also in 2009, construction of an Ultraviolet Disinfection Facility was completed. The Ultraviolet Disinfection Facility eliminates the requirement of chlorine disinfection. The Ultraviolet Disinfection step in the process is more effective at destroying bacteria still present in the Plant's effluent than simple chlorine disinfection and improves the quality of the final effluent being discharged to the South Saskatchewan River.

## Watershed Protection

The City of Saskatoon is actively involved in protecting our water source through its involvement and support for the *South Saskatchewan River Watershed Stewards (SSRWSI or SSR Watershed Stewards)*. The SSR Watershed Stewards is a community based nonprofit corporation that was formed to implement the South Saskatchewan River Watershed Source Water Protection Plan. The Plan identifies recommendations and key actions to help ensure the source water in the South Saskatchewan River watershed is protected. To review the final document please go to [www.swa.ca](http://www.swa.ca).

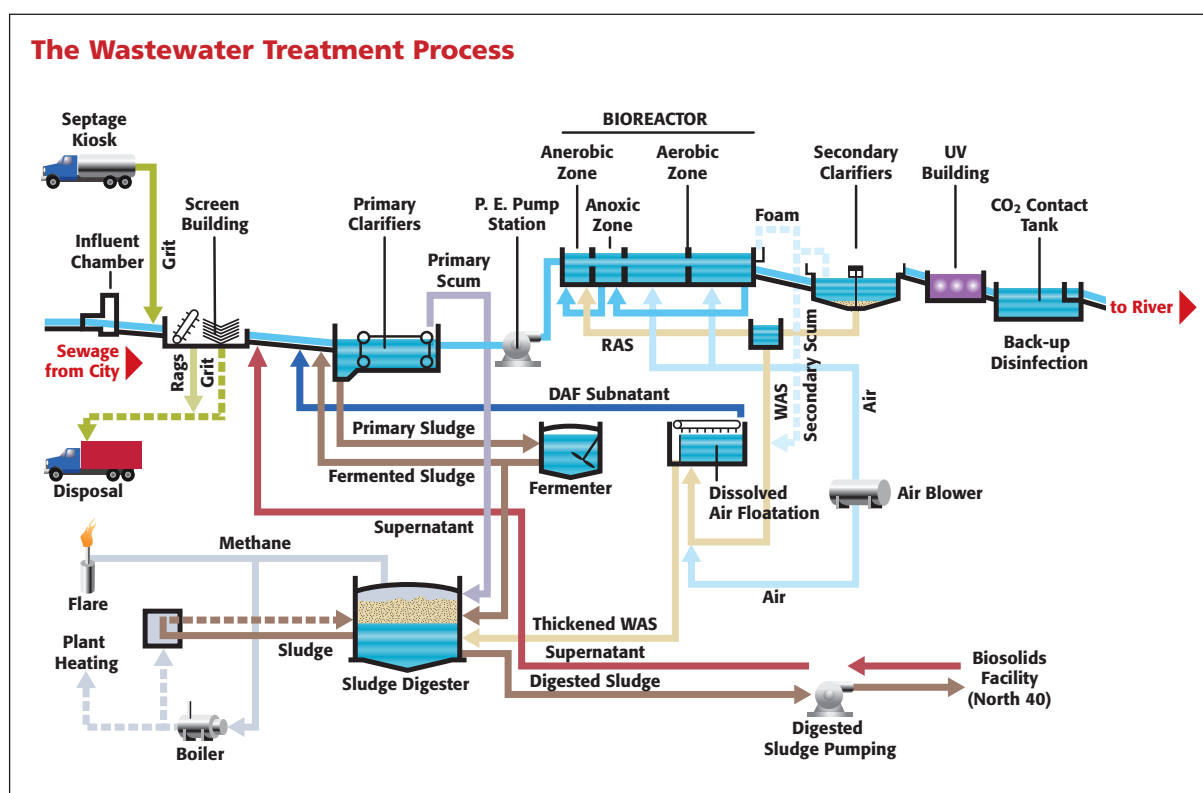
## Where Does our Water Come From?

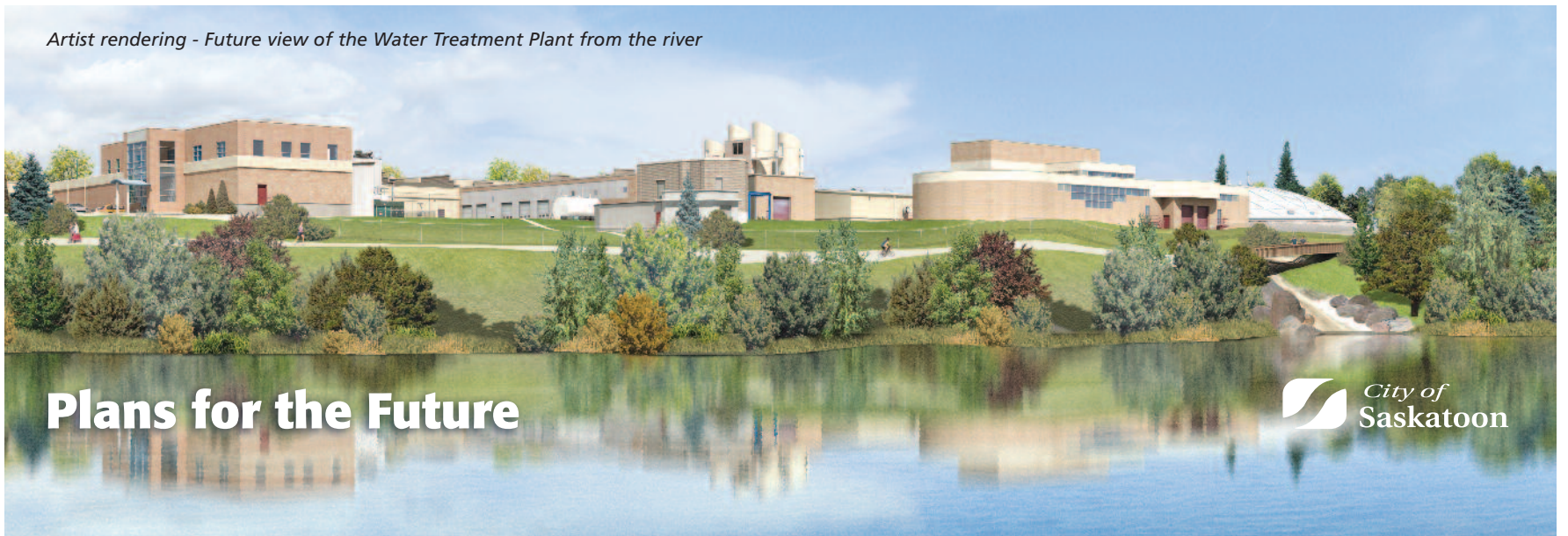
Saskatoon residents get their drinking water from the South Saskatchewan River. The river travels all the way from the Rocky Mountains, down the Bow River Valley, past Calgary, and through Lake Diefenbaker before reaching Saskatoon. After passing Saskatoon, water from the South Saskatchewan River passes by many other communities and merges with the North Saskatchewan River before finally reaching Hudson Bay. Glaciers, melting snowpack, precipitation, and runoff feed the river and its tributaries, which impacts on the supply of water for Saskatoon and other communities along the South Saskatchewan River.

## You can do your part to protect the South Saskatchewan River!

- Reduce or eliminate the use of fertilizers, pesticides and other harmful chemicals.
- Don't pour household waste, chemicals or paint down a storm water catch basin.
- Wash your car at a carwash to prevent contaminants such as oils, metals and phosphates from entering the storm water system.
- Pick up any trash or animal waste on your property before it is washed into the storm water system.
- Dispose of hazardous materials properly! One quart of oil can contaminate 945,000 litres of water, effectively eliminating that much water from our water supply.

## The Wastewater Treatment Process





## Plans for the Future

In January 2009, CH2M HILL Canada Limited was retained by the City of Saskatoon to develop a Water Treatment Plant Long Term Capital Development and Expansion Plan. A strategic plan was required due to the numerous components of the water treatment process. A Water Conservation Implementation Plan was also included in the scope of work to identify the potential for reducing demands to defer future capital expenditures. The study was completed December 2009, and provides a strategic development and expansion plan to 2039. These developments will improve drinking water quality, introduce new technologies to add additional barriers of protection for our water, and increase the capacity of the Water Treatment Plant to meet the needs of Saskatoon's growing population.

### Major projects being undertaken in the coming years:

#### 2009-11 New Intake, Pumphouse, River Crossing - \$44.8 Million

The new river intake will be capable of providing adequate pumping capacity for both the existing Water Treatment Plant as well as capacity for future possible expansions of water treatment operations in Saskatoon.

#### 2010-13 Avenue H Reservoir Expansion, High Lift Pump Station, UV Disinfection - \$29.4 Million

Expansion of the existing Avenue H Reservoir combined with a high lift pump station, chlorine contact chamber and ultraviolet disinfection.

#### 2010-14 42nd Street Reservoir Expansion, Pumphouse Expansion and Distribution Improvement - \$21.3 Million

Additional reservoir capacity to service the industrial area and northeast residential combined with a new pumping facility and improvements to the primary/fill main to increase functionality.

## Water Conservation

There are many places around your home and yard where you can help protect the environment by reducing water use.

### What can you do?

#### In Your Yard

- Water lawns and gardens between 6:00 a.m. and 10:00 a.m. to reduce evaporation. Fifty percent of all water used outdoors evaporates before it serves any purpose! When you do water, do so deeply, and not more than once a week. This keeps your lawn healthy and less prone to drought, weed growth and disease.
- Wash your car at the car wash. Washing your car with a hose for ten minutes uses 300 litres of water and sends soap, oil and other chemicals to the river through storm drains. At a car wash, run-off is captured and disposed of properly.
- Use a broom when cleaning your driveway or walkway. The broom doesn't use almost 200 litres of water to do the job.

#### Around Your Home

- Install a dual flush or low flow toilet. Saskatchewan residents are eligible for a Toilet Retrofit Grant and Toilet Rebate Program. Visit [www.swa.ca](http://www.swa.ca) for details.
- Install a low flow showerhead. This will reduce the water flow from approximately 19 L per minute to 9 L per minute.
- Instead of washing by hand, use an Energy Star dishwasher. Remember to run full loads to maximize water savings.
- Chill water in the refrigerator, rather than running the tap.
- When buying a new washing machine, consider purchasing a front loading model. Front loading machines use approximately 40% less water than top loading.

### Canadian Average Indoor Water Use:

For more water saver tips, visit the City's website at [www.saskatoon.ca](http://www.saskatoon.ca) and look under "W" for water conservation.

