



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

The City of Saskatoon is proud to present the 2014 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 2014. 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.

Our citizens and customers expect high water quality. Through the ongoing dedication of our water quality team, we continue to provide safe, high quality drinking water that adds to the quality of life in Saskatoon. As a water customer, you can do your part as a responsible environmental steward to protect and conserve our water resource, by 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 are 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 Water Security Agency water quality guidelines for 2014. For more information you can visit our website at [saskatoon.ca](http://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 306-975-2534 .

Sincerely,  
**Reid Corbett, Director**  
*Saskatoon Water*

## The Water Treatment Process

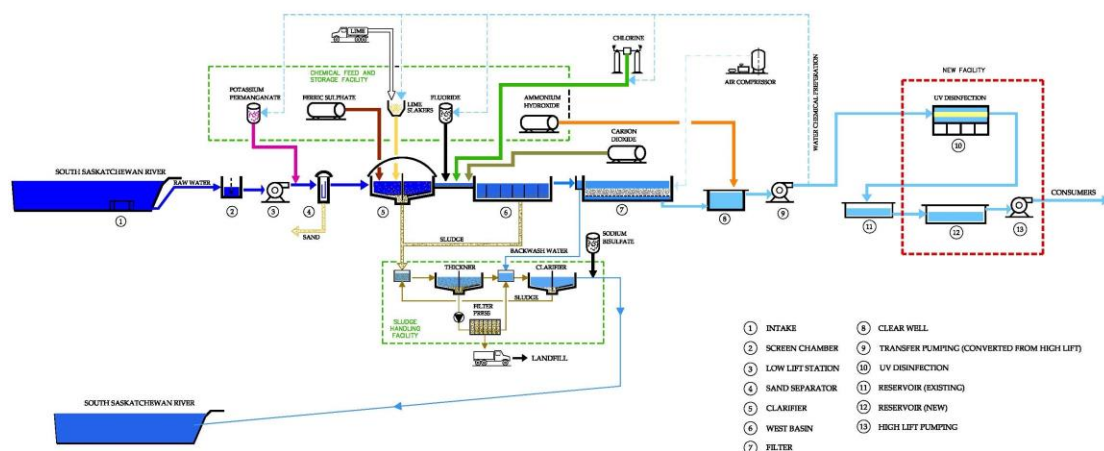
Treating and supplying quality water to Saskatoon and area residents requires highly trained personnel, constant monitoring, and extensive infrastructure. Our competent team of plant operators, tradespersons, maintenance staff, engineers, technologists, chemists, and administrators all play an important 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 to ensure its practices and treatment methods are of the highest quality, while continuing to work to reduce our impact on the environment.

The Raw Water Intake and Pump Station Facility is the primary raw water supply system for the City's Water Treatment Plant. Commissioned in 2012, the facility is a source of high quality raw water and provides capacity to ensure that current and future raw water peak demands are met.

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 the distribution system to your tap. In addition, each component of the treatment process is duplicated to provide back up in emergency situations to prevent a single point of failure.

## The Water Treatment Process



## The Path our Water Takes

Raw water intakes in South Saskatchewan River -> 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

## 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. Saskatoon Water has developed a comprehensive, hands-on training program to ensure that we continue to have 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.

Saskatoon Water also maintains a CALA (Canadian Association for Laboratory Accreditation Inc.) accredited 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 our quality control program.

The City's water treatment and distribution systems are regulated by a Permit to Operate issued from the Water Security Agency. 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 complies with these drinking water quality standards.

## 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 well below 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 306-975-2534.

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

## City of Saskatoon Water Typical Quality Characteristics

| WATER QUALITY CHARACTERISTIC | REPORTED AS             | TREATED WATER     | REGULATORY LIMITS | SOURCES  |
|------------------------------|-------------------------|-------------------|-------------------|--|
| Physical Characteristics     |                         |                   |                   |  |
| pH                           |                         | 8.10              | 9.0               |  |
| Turbidity                    | NTU                     | 0.14              | 1.0               | Soil erosion and runoff                                    |
| Inorganic Constituents       |                         |                   |                   |  |
| Aluminum                     | mg Al/L                 | 0.017             | 0.2               | Naturally present in our environment                       |
| Total Hardness               | mg CaCO <sub>3</sub> /L | 167               | 800               | Occurring dissolved minerals                               |
| Chlorine Residual            | mg Cl <sub>2</sub> /L   | 1.98 <sup>A</sup> | 3.0 <sup>A</sup>  | Additive in water treatment process for disinfection       |
| Copper                       | mg Cu/L                 | 0.0015            | 1                 | Naturally present in our environment                       |
| Fluoride                     | mg F/L                  | 0.7               | 1.5               | Additive in water treatment process to prevent tooth decay |
| Lead                         | mg Pb/L                 | <0.0001           | 0.01              | Naturally present in our environment                       |
| Potassium                    | mg K/L                  | 3.1               | n/a               | Naturally present in our environment                       |

|                                |                       |                    |         |   |
|--------------------------------|-----------------------|--------------------|---------|---|
| Sodium                         | mg Na/L               | 25                 | 300     | Naturally present in our environment                        |
| <b>Nutrient Constituents</b>   |                       |                    |         |   |
| Nitrate (& Nitrite)            | mg NO <sub>3</sub> /L | 1.3                | 45 (32) | Agricultural use of fertilizers                             |
| <b>Microbiological</b>         |                       |                    |         |   |
| E. Coli                        | CFU/100ml             | <1                 | <1      | Naturally present in the intestines of warm-blooded animals |
| Total Coliform                 | CFU/100ml             | <1                 | <1      | Naturally present in our environment                        |
| <b>Disinfection Byproducts</b> |                       |                    |         |   |
| Total Trihalomethanes          | mg/L                  | 0.046 <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

*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

The Water Treatment Plant is committed to reducing the environmental impacts of its operations through a variety of measures included in the Environmental Management System – a structured process to identify, manage, and continually improve the Plant's most environmentally significant aspects. Current environmental objectives identified by the Water Treatment Plant include reducing energy use, minimizing greenhouse gas emissions, and minimizing effluents created by the water treatment process.

In addition to complying with the Environmental Management System and the South Saskatchewan River Watershed Source Water Protection Plan, Saskatoon Water continues to promote and sponsor water quality and water conservation initiatives with Environmental & Corporate Initiatives. Using low-maintenance and low-watering

gardening practices (xeriscaping) and collecting rainwater for various purposes (rainwater harvesting) are encouraged to promote the responsible stewardship of our water resources.

## Water Returning to Our River

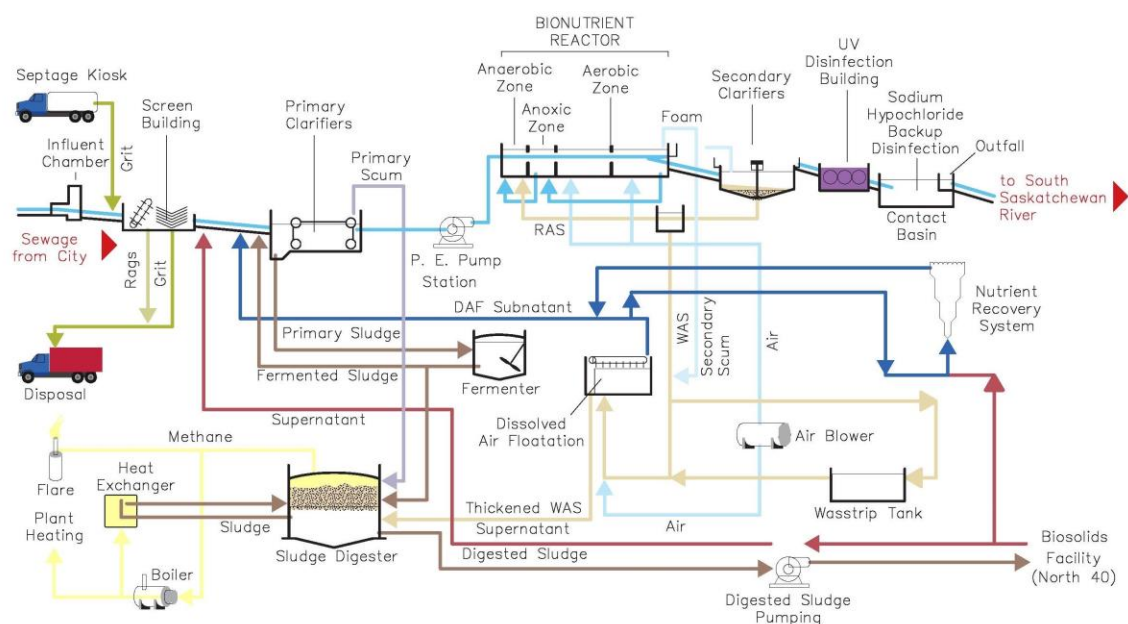
In 1996, the City of Saskatoon invested over \$50 million in improvements to the Wastewater Treatment Plant with the introduction of a Biological Nutrient Removal process. This process significantly reduces the levels of nitrogen and phosphorous in the treated wastewater being discharged to the South 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 allows for careful monitoring of liquid waste and prevents process disruption caused 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.

In 2012, Saskatoon opened the Ostara Nutrient Recovery Facility at the Wastewater Treatment Plant. This facility transforms phosphorous and nitrogen recovered from waste streams into Crystal Green®, a marketable, eco-friendly fertilizer, while improving reliability of the Wastewater Treatment Plant.

## The Wastewater Treatment Process





## 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 Inc. (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. It is fed by the Bow River, Red Deer River, and Oldman River and passes 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.

## Plans for the Future

*In December 2009, CH2M HILL Canada Limited completed a Water Treatment Plant Long Term Capital Development and Expansion Plan. The study provides a strategic development and expansion vision to 2039. A similar study was completed in October 2012 for the Wastewater Treatment Plant. The plan, conducted by Stantec Consulting Limited, outlines needs for the next 30 years. Both plans will guide the capital budget process for the two utilities.*

## Major projects being undertaken in the coming years:

**2011-2015** Avenue H Reservoir Expansion, High Lift Pump Station, UV Disinfection - \$47.1 Million

A combined reservoir expansion, high lift (distribution) pumping station, and ultraviolet (UV) disinfection facility at the Avenue H reservoir site was approved for construction.

Expanding the storage capacity for treated water (reservoir), adding an ultraviolet (UV) disinfection system, and installing a new high lift pump station will optimize operation of the Water Treatment Plant. The new UV system will further enhance the City's ability to treat water, provide an additional barrier to the multi-barrier treatment process, and meet evolving regulations.

#### **2011-2015 42nd Street Reservoir Expansion, Pumphouse Expansion and Distribution Improvement - \$27.0 Million**

Additional reservoir capacity and a new pumping facility servicing the north industrial and northeast sectors will provide greater operational flexibility and allow construction of the northeast sector reservoir to be delayed by up to five years.

#### **2014-2016 Wastewater Odour Abatement System - \$9.4 Million**

This project provides for the design and construction of an odour abatement system at the Wastewater Treatment Plant. An odour study identified odour sources and recommended treatment strategies to maximize reduction. Tendering is to occur December 2014 with construction in 2015-2016.

#### **2015-2016 Water Treatment Plant Clarifier Tube Settler - \$3.0 Million**

This project involves the addition of tube settlers to Clarifier #3. The addition of tube settlers to Clarifiers #1, 2, and 4 resulted in increased capacity and higher water quality.

## **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? BE WATER WISE!**

#### **In Your Yard**

- Avoid watering during the heat of the day or during windy times to minimize evaporation.
- Water your lawn deeply, but not more than once a week. During periods of extended rain, water even less frequently.
- Water new lawns every other day until the grass reaches 5 cm; then water less frequently.
- Set a tuna can in each of your sprinkler zones and time how long it takes to fill it with water. That's how long you should run your sprinkler once a week if your lawn is dry.
- Ensure your sprinklers are working properly and are targeted away from sidewalks.
- Use drip irrigation and/or sprinkler systems that are timed to turn on and off automatically. Remember to turn them off if it's raining.
- Collect rain water in rain barrels – it contains minerals and nutrients that are good for plants. Be sure barrels are properly covered to discourage mosquito larvae from



developing.

- Use mulch and drought-tolerant plants (xeriscaping) in your flower beds to reduce your need to water frequently.

#### Around Your Home

- Install a dual flush or low flow toilet.
- 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.