The City of Kitchener’s stormwater management program controls, treats, and safely manages stormwater from its urban areas.

Stormwater is water, mostly from rain or snow melt, that flows across our urban spaces into the city’s drainage system. Stormwater flows through catch basins and sewers into our natural areas, such as creeks, lakes and wetlands.

In undeveloped areas, most of the rain and snow is absorbed into the ground and only a little enters creeks and rivers.

As our landscape becomes developed with buildings, roads, parking lots, and other hard surfaces, stormwater no longer absorbs into the ground and the amount of runoff increases. This causes flooding, erosion, and poor water quality.

The policies and controls within the stormwater management program reduce the impact of stormwater runoff.
What is the city doing to manage stormwater?

In 2001, the City of Kitchener completed the *Kitchener Stormwater Management Master Plan* to guide the location, design, and implementation of future stormwater management measures.

**Inventory** | When the master plan was developed, the city recorded an inventory of existing stormwater management infrastructure. This included wet and dry stormwater management ponds, wetlands, oil-grit separators and streams.

**Monitor** | In 2002, we began monitoring the stormwater management program to evaluate its effectiveness. First, we measured the water quality, to use as a baseline for future comparison. Every year, monitoring the program helps us identify potential issues, such as erosion, sedimentation and stormwater management pond failure.

This monitoring is a critical part of the city’s stormwater management program.

In 2016, we replaced the master plan with a new *Integrated Stormwater Management Master Plan*. The new master plan aligns with shifting industry practices, as well as changes in federal, provincial, regional and local policies. The new master plan recommends measures to improve overall environmental performance, increase efficiencies, and reduce costs.

Stormwater Management Report Card

Since 2006, we have produced stormwater management report cards that document the previous five years.

The report cards summarize overall stream health based on the results of the annual monitoring program.

There are four components to the report card: the physical, chemical and biological health of the city’s streams, as well as an assessment of overall SWM effectiveness.

While annual monitoring evaluates the condition of targeted creeks every year, the report cards look at trends over a longer period of time.

The report cards distill the large amount of monitoring data collected over several years into a format that is clear and accessible.

**Report cards prepared to date**

2011-2015 Report Card, released in 2018

Vegetation that grows along stream banks provides several benefits to the ecosystem. This area is also called the riparian zone.

- Vegetation helps stabilize stream banks and reduces soil erosion.
- Vegetation filters out excess nutrients and reduces suspended solids in stormwater runoff.
- Vegetation provides shading from the sun. This helps to cool the water, especially during summer months.
- In-stream roots and overhanging canopy from trees provide fish habitat, as well as cover for fish and other organisms.
- Organic debris, such as dead leaves, provides energy inputs.

Streams degrade when their banks are covered with less than 75% of riparian vegetation.

Most creeks in the city are rated marginal for riparian cover (20-50%), shown in yellow on the map. Strasburg Creek, Idlewood Creek, and Kolb Creek are rated fair for riparian cover (40-55%), shown in purple on the map. Sandrock Greenway is rated poor for riparian cover (less than 20%), shown in red on the map.

These ratings suggest there are opportunities to improve riparian cover throughout the city, especially during future creek rehabilitation projects.

How do we measure riparian cover?

For this report card, detailed satellite multispectral imagery of the city was used to determine the amount of riparian vegetation along all of the city’s creeks using an efficient, automated process.
Clean water in our creeks and streams:

- Supports a diverse biological community;
- Provides recreational activities within parks and green spaces, and
- Contributes to overall human health within the city.

We measure water quality using a rotating set of monitoring stations in streams throughout the city. The Water Quality Index measures the quality of water at these monitoring stations.

Samples are collected in dry periods and in wet periods during or immediately following rainfall. By comparing water quality between dry and wet conditions, we can determine how effectively our stormwater management facilities are cleaning the water.

Dry conditions | The Water Quality Index has decreased from 2010 in Montgomery Creek, Idlewood Creek, and Kolb Creek. The index remained the same in Strasburg Creek and Sandrock Creek.

Wet conditions | The Water Quality Index remained unchanged in all creeks from 2010 to 2015.

Dry to wet comparison | In many creeks, the quality of water during and after wet weather, such as rainfall. This suggests that new or upgraded stormwater management practices are required to better manage runoff and reduce this water quality degradation.

Each sampling station with more than three years of data is shown as a circle at the location where data were collected. The top half of the circle shows the dry weather sampling Water Quality Index and the bottom shows the wet weather sampling Water Quality Index.
Biological Conditions

Streams and creeks support a wide range of biological life, including fish and aquatic invertebrates (the larval stages of many insects).

The type and diversity of organisms in our streams is a good indicator of water quality and overall stream health.

The annual SWM monitoring program includes monitoring for both fish and invertebrates.

All of the creeks in Kitchener have a rating of marginal to poor for their biological conditions.

The conditions in Strasburg Creek south branch and Idlewood Creek decreased between 2010 and 2015.

Only Kolb Creek saw an improvement in its biological conditions.

Most creeks remained unchanged between 2010 and 2015 (Schneider Creek, Henry Sturm Greenway, Montgomery Creek, Strasburg Creek north branch, and Sandrock Creek).

Kitchener Stormwater Management Program

For the stormwater management report card, the biological condition score is based on the type and number of invertebrates found in each creek. Invertebrates are lower on the food chain and are more sensitive to changes in water quality than fish, making them an excellent measure of stream health.

The number of fish species and the presence of indicator fish species are an indirect qualitative indicator, and form another important consideration even though they are not included in the overall score.
The overall goal of the city's 2001 stormwater management strategy was to increase the areas that are treated for stormwater quality.

The Integrated Stormwater Management Master Plan, introduced in 2016, outlined an approach to ensure our existing stormwater management infrastructure is effectively improving surface water quality:

- Proper maintenance, such as cleanouts of oil and grit separator units and catch basins, and removing sediment from existing stormwater management facilities.
- Increase the number of planned retrofits of existing stormwater management facilities. These retrofits will improve or enhance the performance of water quality, quantity and erosion control.
- Identify areas where new stormwater management facilities can be constructed when existing parks are being rehabilitated. This will increase the area that receives stormwater treatment.
- Naturalize channels and reduce the number of concrete-lined streams. This will enhance and restore natural features and functions of these channels.

The map shows the areas of Kitchener that are currently being serviced by city-owned stormwater management ponds and the stream channel types.

To measure the city's progress on these goals, the following two parameters are evaluated:

- Drainage area treated by city owned SWM ponds;
- Type of stream channel (i.e., natural/naturalized versus straightened and/or hardened).
Looking Ahead ...

The current situation

The city is continually striving to improve the health of its streams and rivers through the citywide stormwater management program. This has most recently been demonstrated by the development of the Integrated Stormwater Management Master Plan.

We plan for and prioritize work that will most effectively improve the natural function of streams, including maintaining and upgrading stormwater management facilities and restoring streams.

The city is committed to improving water quality, physical stability and aquatic ecosystem functions to enhance the local environment, and improve residents’ health and enjoyment of Kitchener.

The next five years

Over the next five years, the city will be working to implement the recommendations of the recently completed Integrated Stormwater Management Master Plan. This includes: constructing new and upgrading existing stormwater management facilities; restoring and naturalizing streams; cleanouts of sediment in stormwater management ponds, and continuing the annual monitoring program.

For more information, visit the city’s website at: www.kitchener.ca/stormwatermasterplan

Did you know?

You can apply for stormwater credits - and possibly reduce up to 45 per cent of the stormwater portion of your monthly utility bill! Open to owners of residential, commercial, industrial and institutional properties.

Apply online: www.kitchener.ca/en/city-services/stormwater-credits.aspx

What you can do to help

Kitchener residents have an important role in conserving water and keeping our creeks clean:

- Use a rain barrel to collect water for your garden. Rain barrels reduce runoff and conserve water.
- Limit the use of fertilizers on your lawn. These chemicals are often carried away by rainwater into our storm drains and, ultimately, into natural areas such as creeks, lakes and wetlands.
- Dispose of hazardous products like motor oil and anti-freeze properly. Drop them off at the Region of Waterloo’s waste management facilities. Never pour these or any other waste products into catch basins, or down sewers.
- Wash your car at a car wash, rather than in your driveway, to prevent soapy water and sediment from entering our stormwater system.
- Sweep dirt from your sidewalks and driveways and put it in the garbage, instead of on the road where it will wash into the stormwater system.
- Pick up pet waste regularly and dispose of it appropriately.
- Reduce the use of salt for ice melting in the winter.
- Ensure your downspouts drain onto your lawn or garden areas, not directly onto driveways, sidewalks or streets.
- Report spills to the Ministry of the Environment Spills Action Centre (toll free 1-800-268-6060).

We all have a role to play when it comes to managing stormwater. Spread the word!

For more information about Kitchener’s stormwater management program, visit www.kitchener.ca/stormwater or contact:

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Kitchener Stormwater Management Program