

## Clear Water Projects in Sheridan Creek Watershed

### Unifay-Fedar Investments

#### What is a Watershed?

No matter where you are, you are in a watershed. A watershed is the area of land that catches rain and snow which travels over land or through soil into a marsh, stream, or lake. Another way to understand a watershed is to think of an area of land that drains to a low point such as a stream, marsh, creek or lake.

#### Sheridan Creek Watershed

Sheridan Creek starts at Highway 403 and flows approximately five kilometers through Mississauga into Lake Ontario. Sheridan Creek Watershed has many unique natural features and important water resources. Did you know Sheridan Creek flows into Rattray Marsh, a provincially significant wetland, which represents one of the few remaining examples of a coastal wetland along the western side of Lake Ontario? Nestled within the city, Sheridan Creek Watershed faces many challenges as a result of urbanization.



Sheridan Creek

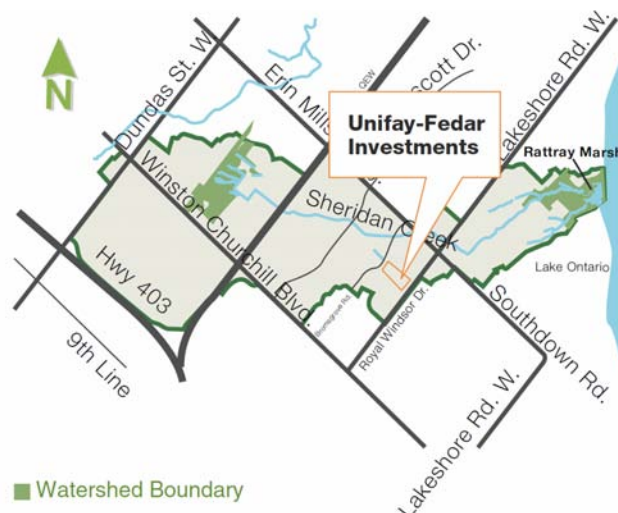
To protect Rattray Marsh and Sheridan Creek, it is important to have clean water. One threat to clean water is rain water that washes across lawns, parking lots and roads carrying with it sediment, lawn fertilizers, pesticides, metals and pollution such as road salt. Pollutants are then washed into Sheridan Creek impacting environmental health and Lake Ontario, the source of Mississauga's drinking water.

#### Leading the Charge

The good news for restoration is that leaders like **Unifay-Fedar Investments** (in partnership with the City of Mississauga and Ministry of the Environment) are implementing projects on their property that will help to protect the health of Sheridan Creek and Lake Ontario.



Rattray Marsh



Unifay-Fedar Investments is located at 2265 Royal Windsor Dr., Mississauga in Sheridan Creek Watershed

## Implementation Planning

### Funding

Unifay-Fedar Investments, in partnership with CVC and the City of Mississauga, received funding from the Ministry of the Environment to implement in-the-ground projects to protect surface water supply for small and medium sized businesses.<sup>1</sup>

Through development of demonstration sites, the goals were to:

- remove and reduce threats to surface water and municipal drinking water supplies;
- empower stakeholders to take action and protect municipal drinking water supplies by implementing projects;
- increase public and community awareness of the importance of pollution prevention and making a connection between stormwater drainage and municipal drinking water supplies;
- gain knowledge and experience to apply to future watershed studies pertaining to innovative pollution prevention and protecting surface water municipal drinking sources.

### Demonstration Site Selection

Demonstration sites were selected based on building a community where a number of properties could showcase pollution prevention practices. Each landowner could be an expert on pollution prevention measures implemented on their own property and could be a resource to other property owners within their community.

## Strategy

The following sections describe potential sources of pollutants that may wash into the storm sewer system and strategies for keeping water clean.

**Prevention** is stopping or avoiding pollutants and waste from coming into contact with water in the first place. CVC's initiatives take a multi-faceted approach to prevent negative water quality impacts.

**Treatment** is implementing measures that filter and treat rainwater runoff before entering Sheridan Creek.

## Prevention

A first line of defence is education to discourage detrimental actions that have a direct impact on Sheridan Creek, Rattray Marsh and Lake Ontario.

### Education

Education is a preventative measure that raises awareness and understanding of how certain activities affect the environment. Education helps increase environmental awareness, changes attitudes and behaviours and provides knowledge for making change.

### Fact Sheets

Fact sheets are an educational tool to provide technical information about how to change a particular behaviour or practice. Fact sheets have been developed to show businesses actions they can take to improve operations and protect watershed health. This includes:

- Outdoor fueling stations
- Outdoor material storage
- Parking lot maintenance

Fact sheets are accessible online at [www.creditvalleyca.ca/sustainability/](http://www.creditvalleyca.ca/sustainability/).

<sup>1</sup> This project has received funding support from the Government of Ontario. Such support does not indicate endorsement by the Government of Ontario or the contents of this material.



### Dumpster Management

IN INDUSTRIAL & COMMERCIAL DISTRICTS

Dumpsters can be a major source of pollutants that can affect area water quality. Dumpsters are often left open to the air, allowing rainwater to mix with the trash, resulting in a leaking fluid, or "dumpster juice" that can contain toxic organic and inorganic materials.

If not treated, this dumpster juice can enter the storm drain system, contributing to poor water quality. In addition, dumpster storage areas are often unsightly, can contribute to higher populations of vermin, and have unpleasant odours associated with them.



Examples of uncovered dumpsters with evidence of leakage and "dumpster juice" trails leading to nearby storm drain inlets.

#### Pollution prevention opportunities include:

- Locate dumpsters in secure areas to prevent illegal dumping.
- Locate dumpsters on a flat concrete surface that does not slope or drain to the storm drain system.
- Install a secondary containment system such as a berm or curb around the dumpster if it is close to the storm drain.
- Install protective covers or lids to keep rainfall from accumulating in the dumpster or secondary containment area.
- Close lids of dumpsters located at vehicle service areas, fast food restaurants, and convenience stores.
- Install an oil and grease separator or pump out for dumpsters that receive waste with a high moisture content.
- Place clear and visible signs on dumpsters indicating what kind of waste can be accepted.
- Never throw oil and grease or other liquids into a dumpster - provide alternative disposal locations for impermeable substances.
- Close and secure lids properly when the dumpster is not being loaded or unloaded.
- Empty dumpsters frequently to prevent overflowing or storage outside the dumpster.
- Repair leaking or damaged dumpsters immediately.
- Never use bleach and soap to clean the container unless the wash water is sent to the sanitary sewer system.
- Pick up and sweep trash and silt from around the dumpster regularly.
- If you use a service provider, add language to protect water quality in the maintenance contract.
- Consider adding secondary containment around dumpsters.

www.creditvalleyca.ca

Example of the fact sheets available on CVC's website

### Signs

Different signs have been created to reach the greatest audience. This was done in three tiers, with a large sign notifying passersby that there is a clear water project on site. The next type of sign was posted either in front or inside the business to provide more information about the type of technology implemented. The third type, warning signs, alert people on site of the project and discourage illegal activities.

#### Informational Signs

This sign provides facts about the site and connections to the local watershed including:

- Who the project partners are
- Connection to Sheridan Creek Watershed
- Site map
- Projects implemented
- Where to get more information

#### Warning Signs

Many businesses are faced with the challenge of controlling waste being illegally dumped after regular business hours. This issue can be attributed to a lack of public understanding about the local environment and how pollution impacts the health of Sheridan Creek

Watershed. Drainage features, such as swales, may appear as a convenient location to dispose of waste far from the property owner's line of vision.



Illegal dumping on site

Educating with warning signs is a simple solution to discourage illegal dumping. Signs educate everyone about the direct connection between Unifay-Fedar Investments' property with Sheridan Creek, Rattray Marsh and Lake Ontario. Signs also inform potential offenders dumping is an illegal activity subject to fines under Mississauga's Storm Sewer By-Law 259-05 (with fines up to \$100,000).



Example of the signage to be installed

### Preventing Illegal Dumping

Existing site conditions were the result of combined factors. Illegal dumping was one of many prevalent issues. The building didn't have a tenant or any customers. There was a lack of understanding about the local environment. There were no signs or demarcation buffers and the property was covered with invasive plants, such as common reed grass, which provided a convenient opportunity to hide trash in the swale far from the property owner's line of vision.



Illegal dumping on site

### New Fencing

After removing invasive species and cleaning up the property, the landowner installed fencing to discourage illegal dumping of waste materials.



New fencing installed

### Waste Management

#### New Dumpsters

Dumpsters are a common fixture in urban environments and if not properly maintained can result in pollutants washing into storm sewers.

CVC worked with Unifay-Fedar to remove the cracked, rusted and leaky dumpsters to eliminate contaminants to Sheridan Creek, as waste materials or "dumpster juice" drained to a receiving catch basin. In addition, other dumpsters on site were too small for the amount of waste tenants produced.



Leaky dumpsters after it has rained

Replacing old dumpsters with new dumpsters prevented fluids from escaping. The waste management provider is the responsible for maintaining dumpsters in reasonable condition. If waste materials are escaping from a dumpster then it should be immediately replaced by the company providing the waste management service free of charge. A properly sized dumpster also prevents the lid from being left open or putting items beside the dumpster, which would otherwise be left uncontained and susceptible to washing away.



New dumpsters installed

### New Waste Oil Storage

New spill containment pads were provided to place under the oil drum. Guidance and instructions were provided on how to safely dispose of waste oil, where to dispose it and applicable regulations tenants should be aware of.



New spill containment pads installed

### Paint and Solvent Storage

Replacing outdoor storage units with better containment and indoor storage helps prevent materials from spilling or leaking into the environment.



Former openly stored paints and solvents

Properly stored chemicals in closed cabinets will contain possible spills. New storage bins were provided to prevent any impact to water quality.

### Spill Containment

Improving practices inside the facility prevents materials from leaving the building.

Spill pallets were provided for one tenant to demonstrate containment and awareness around safe material storage and spill containment. The pads can contain spills or leaks from 100 gallon drums.



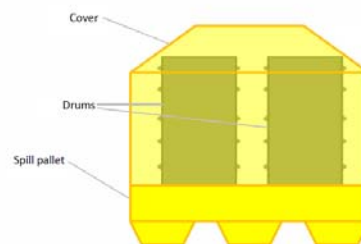
New covered spill pallet for 100 gallon drums

#### COVERED SPILL PALLET INSTRUCTIONS FOR USE

1. The spill pallet is intended to be stored outside.
2. Up to four drums can be stored inside the pallet.
3. The lid should be closed when not in use to prevent rainwater from accumulating in the pallet.
4. Depending on the type of material stored in the drums, applicable regulations must be adhered to (e.g. Fire code regulation O. Reg 213/07 for combustible or flammable liquids, etc.).
5. If the drums are used to store waste chemicals, provincial regulations for storage of liquid industrial and hazardous waste must be adhered to (O. Reg 347).\*

\*Note: Certain liquid industrial and hazardous wastes are regulated by the Ontario Ministry of the Environment's O. Reg. 347. As per O. Reg. 347, if you generate more than the allowed small exemption quantity in a one month time period, or accumulate more than the exempted quantity on your site over any time period, registration to the Hazardous Waste Information Network (HWIN) is required (for more information visit [www.hwinc.ca](http://www.hwinc.ca)).

#### Drum & Spill Pallet Configuration



Covered spill pallet instructions

Instructions have been developed to provide direction for on-site prevention measures, including the covered spill pallet. The instructions cover how to use the spill pallet and provincial regulations that apply to waste storage.

## Treatment

A second line of defense incorporates features into the site to filter and treat rainwater and snow melt before it reaches Sheridan Creek, Rattray Marsh and Lake Ontario.

### Clear Water Buffer Creation

To reduce sediment loading into the drainage swale, establishing buffers aids in filtering any rainfall runoff and melt water originating from the snow dump. Buffer creation included the following components:

- Removing invasive species
- Establishing vegetated clear water buffers
- Consideration of snow storage areas and snow melt treatment
- Demarcation

### Clear Water Buffer Strips

Where space is permitted, clear water buffer strips were enhanced or created to help filter runoff before reaching swales and catch basins that drain to the storm sewers. Buffer strips were prepared by excavating and disposing 300 mm of compacted soil and replacing it with 300 mm of clean topsoil. Lab tests were performed on the new topsoil to ensure it had desired characteristics. Soil amendments and buffers filter runoff coming from the gravel laneway. The rate of overland flow will be reduced while promoting infiltration.



Buffer strip and soil amendments

Working with landowners on adjacent properties, features were designed to function in unison. Runoff through the system begins on Unifay-Fedar's property, through buffer strips and soil amendments, to Bernardi Building Supply's enhanced swales and sediment traps.

### Invasive Species Removal

Invasive plants out-compete local species, grow aggressively and reproduce rapidly. After direct habitat loss, invasive plants are the next primary threat to native biodiversity. Common reed grass, European buckthorn, and Manitoba maple (all invasive plants), were well established throughout the site and were a seed source to downstream areas, especially Rattray Marsh, which is a provincially significant wetland.



Invasive species on the east side of the property prior to removal

Invasive species were sprayed with weed killer (Roundup) and remaining plants were physically removed. To prevent plants from re-establishing, remaining seeds and roots were eliminated by removing 300 mm of soil and adding 300 mm clean soil.



Invasive species removed, buffers created and protected

## Summary

Table 1 below provides a summary of all restoration opportunities for Unifay-Fedar Investments. Following the table is a diagram that shows how the features work together (Figure 1).

Overgrown invasive species created a thick wall of vegetation that hid illegal dumping. Removing the Reed grass and other invasive species (Manitoba maple, European buckthorn and Purple Loosestrife) established a clear view of swales and buffers creating a visible link to the area's condition. In addition, a clear sightline to the buffer deters dumping and helps the property owner and tenants quickly recognize when illegal dumping has occurred.



After soil amendments, buffer creation, and local species planted

### Plant Local Species

Once invasive plants have been cleared, the site will be planted and seeded with local species. The following are some native species that will be planted on swales and buffers:

- Eastern white cedar
- Red osier dogwood
- Nannyberry
- Serviceberry
- Grasses/sedges/wetland species

### Buffer Protection

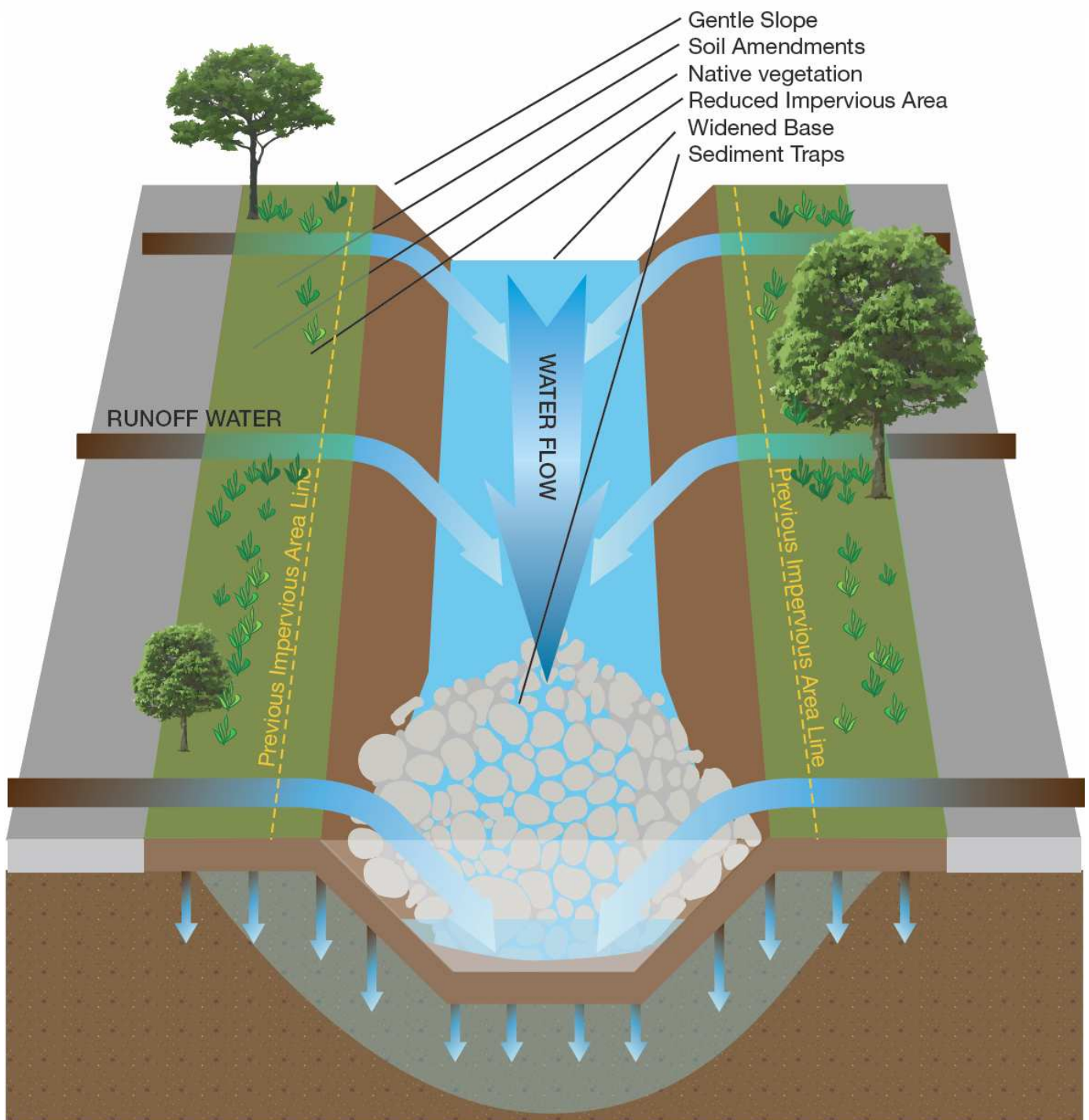
Demarcating swales clearly indicates where the buffer starts with established posts and stones. It provides a physical barrier to snow being dumped or pushed into the swale. This will also prevent encroachments into the buffer and discourage illegal dumping.

### Signs

Signs indicate the property's link with Sheridan Creek, Rattray Marsh and Lake Ontario, which is the source of our drinking water. Signs help prevent snow from being dumped directly in drainage swales.

<b>Summary of Strategies Implemented at Unifay-Fedar Investments</b>		
<b>Opportunity</b>	<b>Prevention</b>	<b>Treatment</b>
<b>Fact Sheets</b>	✓	
<b>Prevention of Illegal Dumping</b>	✓	
<b>Signs</b>	✓	
<b>Buffer Protection</b>	✓	
<b>Removal of Invasive Species</b>		✓
<b>Clear Water Buffer Strips</b>		✓
<b>Plant Local Species</b>		✓

**Table 1:** Summary of Strategies Implemented at Unifay-Fedar Investments



**Figure 1:** Runoff water from Unifay-Fedar is filtered as it flows laterally through newly constructed clear water buffers, soil amendments, and native vegetation (local species). Runoff then flows to enhanced swales and sediment traps on Bernardi Building Supply, allowing particulates to settle before draining to the catch basin.

## Lessons Learned

Reflecting on original objectives of the project, the following are some lessons learned.

- Empower stakeholders to take action and protect municipal drinking water supplies through implementing projects.
  - Successful implementation of in-the-ground projects requires full-time construction inspection to ensure project success. Often times the contractor has questions regarding project design and intent of the project. Having an inspector on site to help answer questions helps the construction process move smoothly and the contractor can verify questions or concerns directly on site. This also provides a much smaller potential for errors since the contractor will not be using assumptions.
  - Maintaining constant dialogue between the landowner and contractor also ensured questions and/or concerns could be addressed promptly. Unexpected issues can arise that require adjustments to the design to ensure project success. There were a number of instances when the landowner was able to shed light on activities that took place on site that could impact the project. Minor modifications were made to the design to ensure project success.
  - Through the construction process, modifications were made to facilitate future maintenance issues. For example, higher densities of invasive species were present on some of the sites. Seed mixtures were replaced with mulch to suppress re-colonization of invasive species. Additional native vegetation was planted to form dense thickets to help invasive species from re-invading the site.
  - Landowner cooperation was an integral part of the success of this project. Unifay-Fedar Investments assisted by preparing the site for construction by removing all equipment and obstacles to ensure the contractor could complete work without interruption.
  - Provide operation and maintenance instructions for landowners and tenants.
  - Increase public and community awareness of the importance of pollution prevention and make a connection between storm water drainage and municipal drinking water supplies.
- Based on feedback from participating landowners, interpretive signs were modified to incorporate more images and less text.
  - Once you have captured public attention, offer additional education materials such as fact sheets and case studies to provide more detailed information.
  - Landowners were consulted on how to name and market future workshops to encourage a broad variety of stakeholders. Choosing appropriate words is important to ensure education events are appealing to a broad audience.
  - For additional tips to landowners and property managers interested in pursuing a clear water project, please see CVC's "Recommendations for Future Clear Water Projects". Details can be found on: Management Agreements, Tenders, Maintenance, Constructing to Specification, and Permits

### Benefits of Partnership

This partnership will help to:

- Support MOE with source water protection initiatives and guidelines given this site drains to Lake Ontario – Mississauga's drinking water supplies;
- Support City of Mississauga with pollution prevention efforts, storm sewer bylaws; Storm water Quality Strategy Update, and Green Development Strategy, among others;
- Support Region of Peel's Sanitary Sewer Bylaw;
- Support and complement low impact development initiatives;
- Support the municipality, region and MOE when dealing with spill response and preparedness.

This partnership also supports the vision, goals and objectives of Mississauga's Strategic Plan "Our Future Mississauga" by ensuring healthy and attractive communities, natural environments and drinking water supply. These features would benefit even more by using pollution prevention strategies. This is also consistent with the vision of "Our Future Mississauga". As an environmentally responsible community, the City of Mississauga is committed to environmental protection, conducting its corporate operations in an environmentally responsible manner and promoting awareness of environmental policies, issues and initiatives.

## More Information

For more information on this demonstration site or general information on clear water projects and source water protection please visit the following websites:

### Ministry of the Environment (MOE)

- Sewer Use Best Management Practices (BMP) Documents  
<http://www.ene.gov.on.ca/en/publications/forms/index.php#bmp>
- Snow Disposal and De-icing Operations in Ontario (1994)  
<http://www.ene.gov.on.ca/envision/gp/0412e.pdf>
- Guidelines for Snow Disposal and De-icing Operations in Ontario (1975)  
<http://www.ene.gov.on.ca/envision/gp/B4-1.pdf>
- Ontario Stewardship Drinking Water Program  
<http://www.ene.gov.on.ca/en/water/cleanwater/index.php>

### Region of Peel

- Sanitary Sewer Use Bylaw  
<http://www.peelregion.ca/pw/water/sewage-trtmt/seweruse-bylaw.htm>

### Credit Valley Conservation

- Strategies for Sustainability  
<http://www.creditvalleyca.ca/sustainability/>

### City of Mississauga

- Storm Sewer Use Bylaw  
[http://www.mississauga.ca/file/COM/Storm\\_Sewers.pdf](http://www.mississauga.ca/file/COM/Storm_Sewers.pdf)
- Protect Our Water  
[http://www.mississauga.ca/file/COM/Protect\\_Our\\_Water\\_brochure.pdf](http://www.mississauga.ca/file/COM/Protect_Our_Water_brochure.pdf)

### The Bloom Centre for Sustainability (Formerly OCETA)

- <http://www.bloomcentre.com>

### Canadian Centre for Pollution Prevention (C2P2)

- <http://www.c2p2online.com/>
- <http://www.c2p2online.com/main.php3?session=&section=39&heading=84>

**Landowners and property managers** interested in pursuing a pollution prevention project, please see helpful tips in CVC's Recommendations for Future Pollution Prevention Projects:

- <http://www.creditvalleyca.ca/sustainability/pollutionprevention/index.html>