

June 26, 2024

**City of Hamilton
Haldimand County
Regional Municipality of Niagara
Local Area Municipalities**

SENT ELECTRONICALLY

Report No. FA-29-24 RE: Water Quality Monitoring Program Summary Report for the Year 2023

At the Board of Directors meeting held on June 21, 2024, the following resolution was passed:

Resolution No. FA-71-2024

Moved by: Michelle Seaborn

Seconded by: Donna Cridland

THAT Report No. FA-29-24 RE: Water Quality Monitoring Program Summary Report for the Year 2023 **BE RECEIVED**;

AND THAT the Water Quality Fact Sheet 2023 **BE RECEIVED**;

AND THAT the actions identified herein to inform municipalities, stakeholders, and the public about the report findings and best practices to improve local water quality **BE IMPLEMENTED**.

AND FURTHER THAT a copy of this report **BE CIRCULATED** to NPCA watershed municipalities, Ministry of Natural Resources and Forestry (MNRF), Ministry of the Environment and Parks (MECP) and the Federal Ministry of Environment and Climate Change Canada (ECCC).

A copy of Report No. FA-29-24 and associated appendices are enclosed for your reference. The complete Program Summary Report can be viewed online [here](#).

The Watershed Monitoring & Reporting team would be happy to present findings and best practices to support restoration efforts in the community. If Council or staff are interested in learning more about the results and initiatives that can support the quality of surface and groundwater within the Niagara Peninsula watershed, please reach out and I'd be happy to coordinate the opportunity.

Sincerely,



Melanie Davis
Manager, Office of the CAO & Board
Niagara Peninsula Conservation Authority
905.788.3135 ext. 250

cc: Chandra Sharma, CAO / Secretary - Treasurer
Leilani Lee-Yates, A/Director, Watershed Strategies & Climate Change
Josh Diamond, Manager, Watershed Monitoring & Reporting
Eric Augustino, Water Quality Specialist

Report To: Board of Directors

Subject: Water Quality Monitoring Program Summary Report for the Year 2023

Report No: FA-29-24

Date: June 21, 2024

Recommendations:

THAT Report No. FA-29-24 RE: Water Quality Monitoring Program Summary Report for the Year 2023 **BE RECEIVED**;

AND THAT the Water Quality Fact Sheet 2023 **BE RECEIVED**;

AND THAT the actions identified herein to inform municipalities, stakeholders, and the public about the report findings and best practices to improve local water quality **BE IMPLEMENTED**;

AND FURTHER THAT a copy of this report **BE CIRCULATED** to NPCA watershed municipalities, Ministry of Natural Resources and Forestry (MNR), Ministry of the Environment and Parks (MECP) and the Federal Ministry of Environment and Climate Change Canada (ECCC).

Purpose:

The purpose of this report is to provide key highlights of NPCA's "Water Quality Monitoring Program Summary Report for the Year 2023," and to recommend actions to inform our partner and local-area municipalities, First Nations partners, community stakeholders, and the public about the report's findings and actions that can be taken to improve local water quality.

Background:

The NPCA Water Quality Monitoring Program was implemented in 2001 and is operated in partnership with the Ministry of Environment, Conservation and Parks (MECP), Niagara Region, Haldimand County, and the City of Hamilton. This program consists of a

combination of MECP surface water and groundwater monitoring stations combined with locally established NPCA watershed monitoring stations.

The NPCA collects and analyzes hundreds of water samples each year from the streams and groundwater resources within the watershed. From this information, the NPCA can identify sources of pollution, track water quality trends, and help to assess and direct NPCA environmental programs. The long-term data serves as a baseline by which to compare the success of various water quality improvement initiatives being undertaken by different organizations throughout the watershed.

At the October 22, 2020, NPCA Board Meeting, the NPCA Board directed staff (via Resolution FA-134-2020) to share the annual Water Quality Monitoring results and trends to partner municipalities and to develop water quality education resources to facilitate engagement regarding the state of water quality and suggested best practices.

Discussion:

The NPCA Water Quality Monitoring Report for the Year 2023 summarizes the results of the NPCA's surface water and groundwater monitoring program. The complete report can be found on the NPCA's website at the following link: <https://npca.ca/watershed-health#water-quality-monitoring>

Surface Water

The NPCA collects monthly surface water quality samples, during the ice-free season, at 84 monitoring stations. Including 13 Provincial Water Quality Monitoring Network stations and 71 NPCA stations, samples are analyzed using several indicator parameters including chloride, nitrate, total phosphorus, total suspended solids, copper, lead, zinc, and *E. coli*. These indicator parameters are used to calculate the Canadian Water Quality Index (WQI) which provides a descriptive water quality rating for each station.

The NPCA also monitors surface water quality using benthic invertebrates (aquatic insects and animals) as indicators of stream health. Due to their restricted mobility and habitat preferences, benthic invertebrates usually remain in a localized area. As a result, they are continuously subjected to the effects of all pollutants and environmental stream conditions and can provide a broad overview of water quality related problems. They are abundant in all types of aquatic systems and can be easily collected and identified.

For surface water, the biological and chemical monitoring results indicate that many of Niagara's watersheds have poor or impaired water quality. Total phosphorus, *E. coli*, suspended solids, and chlorides from non-point sources (agricultural and livestock operations, faulty septic systems, winter de-icing operations) and point sources (combined sewer overflows, urban stormwater runoff) continue to be the major causes of impairment in the Niagara Peninsula watershed.

Watercourses under the direct influence from the Great Lakes and Niagara River, such as the Lower Welland River, cause dilution of contaminate concentrations and therefore have higher water quality ratings. Watercourses that are strongly influenced by groundwater discharge, like the Upper Twelve Mile Creek (Effingham Branch) and Upper Welland River, also have higher water quality ratings as do watercourses located in areas with substantial natural landscapes like the Point Abino Drain and Beaver Creek (both located in Fort Erie). Additional information can be found in Appendix 1 on the water quality ratings from 2019-2023.

Groundwater

The NPCA collects water quality data from 46 groundwater monitoring wells, comprised of 15 wells Provincial Groundwater Water Monitoring Network and 31 NPCA wells. Appendix 2 identifies the location of the wells within the NPCA groundwater monitoring network.

This data is important to assess the ambient conditions of several bedrock and overburden aquifers found in NPCA watershed. For groundwater, monitoring results indicate that water quality was found to be highly variable with some wells exceeding the Ontario Drinking Water Standards. All groundwater quality exceedances were related to naturally occurring bedrock conditions, have been investigated through MECP exceedance protocols, and appropriate municipal Public Health Departments have been notified.

Next Steps

The NPCA Water Quality Monitoring Program continues to provide valuable information about the health of the watershed. The poor surface water quality in the NPCA watershed has been caused by decades of environmental degradation. However, water quality programs that improve how nutrients are managed, serve to increase riparian buffers, and improve forest cover can contribute to addressing these impacts.

While collective efforts across the NPCA watershed will improve water quality over time, there is much work to be done before the water quality in the NPCA watershed improves to the point where it is able to meet federal and provincial ambient water quality guidelines.

Going forward into 2024, this program continues to inform the NPCA's restoration priorities, such as "Trees for All" and provide critical data for the Welland River Soil and Water Assessment Tool (SWAT) project with the University of Guelph, which will model nutrient loading in that watershed.

As such, the Water Quality Monitoring Report recommends that the NPCA continue to monitor both our surface water and groundwater to ensure that there is up-to-date water quality information available, quantify trends, and continue to identify sources of contamination within the Niagara Peninsula watershed.

Communication Strategy

In response to the direction for the NPCA Board of Directors, staff will undertake the following actions:

1. The Water Quality Monitoring Summary Report for the Year 2023 will be distributed to the Clerks at Niagara Region and its lower-tier municipalities, the City of Hamilton, Haldimand County, Mississaugas of the Credit First Nation, and Six Nations on the Grand River. Further, an offer will be extended for NPCA staff to present the report and its associated findings to respective councils and/or senior staff, should any partners be interested in additional information.
2. The Summary Report for the Year 2023 will further be distributed to all Public Health Departments within the Niagara Peninsula watershed and the local Ministry of Environment, Conservation and Parks Office for their information.
3. A NPCA Water Quality Fact Sheet 2023 summarizing the report's findings and a list of actions that individuals, communities, and businesses can undertake to improve local water quality will also be published via various mediums. Please see Appendix 3 for a copy of the 2023 summary report fact sheet.
4. The Water Quality Monitoring Summary Report and Fact Sheet will be posted on the NPCA website.
5. NPCA will seek opportunities to share information about our Water Quality Monitoring Program through other NPCA programs and events.

Financial Implications:

The Water Quality Monitoring Program is funded through the annual operating budgets.

Links to Policy/Strategic Plan:

The NPCA Water Quality Monitoring Program directly supports Goal 1.1 of the *2021-31 Strategic Plan* by providing information to partners and members of the community to support evidence-based decision-making for climate-resilient watersheds.

Related Reports and Appendices:

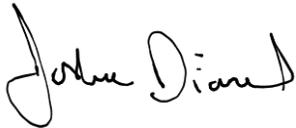
Appendix 1 – Water Quality Ratings in 2019-2023
Appendix 2 – NPCA Groundwater Monitoring Network
Appendix 3 – NPCA 2023 Water Quality Fact Sheet

Authored by:



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Water Quality Specialist

Reviewed by:



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Manager, Watershed Monitoring and Reporting

Original Signed by:

Leilani Lee-Yates, BES, MSPL.RPD, MCIP, RPP
Director, Watershed Strategies & Climate Change

Submitted by:

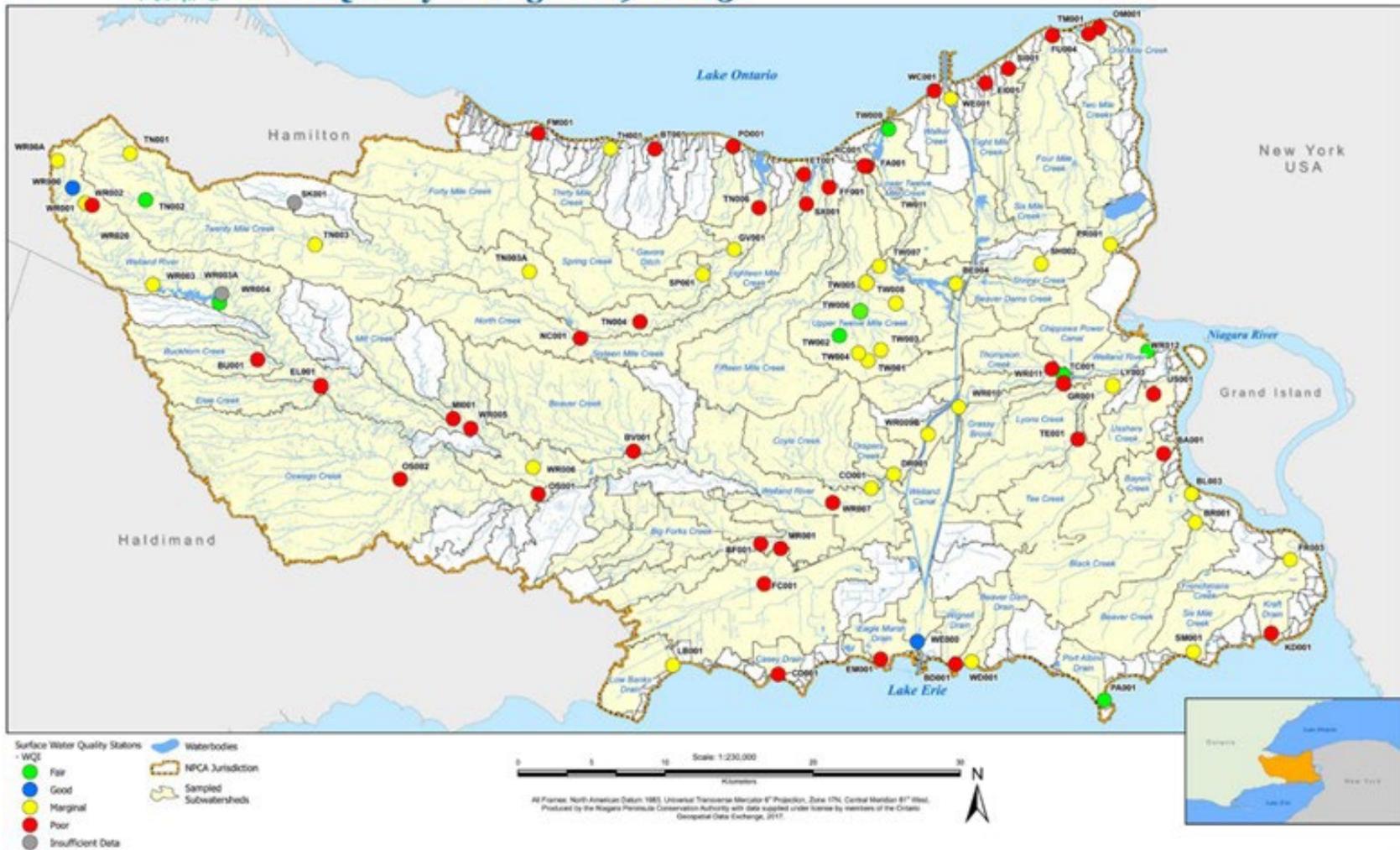
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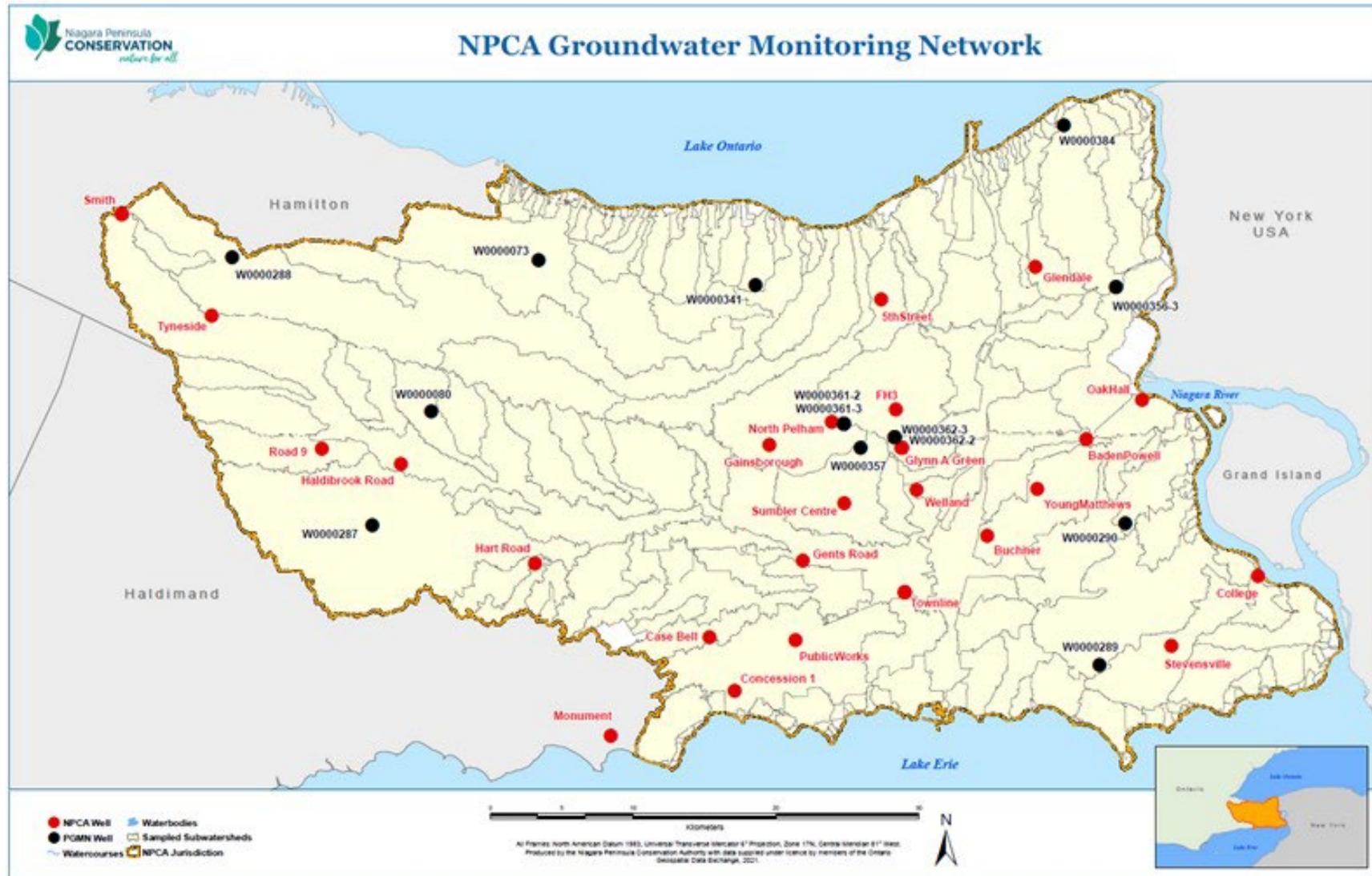
Chandra Sharma, MCIP, RPP
Chief Administrative Officer/Secretary-Treasurer

Report No. FA-29-24
 Appendix 1 – Water Quality Ratings, 2019-2023



Niagara Peninsula Conservation Authority Water Quality Ratings 2019 - 2023





2023 Water Quality Monitoring Report Fact Sheet

NPCA Water Quality Monitoring Program by the Numbers

-  **84**
Surface Water Monitoring Stations
-  **980**
Surface Water Samples Collected
-  **17**
MacroInvertebrate Samples
-  **11,204**
Surface Water Samples Collected Since 2001
-  **46**
Groundwater Monitoring Wells
-  **41**
Groundwater Samples
-  **2**
Decommissioned Abandoned Water Wells for Watershed Landowners

NPCA SURFACE WATER MONITORING STATIONS

- 48% are rated as poor
- 40% are rated as marginal
- 10% are rated as fair
- 2% are rated as good

The NPCA regularly collects and tests surface water and groundwater samples (non-drinking water) at stations located throughout our watershed jurisdiction.

SURFACE WATER: WHAT ARE WE FINDING?

- Surface Water monitoring results indicate most of the watersheds in the NPCA's jurisdiction have marginal to poor water quality.
- The high concentrations of total phosphorus, E. coli and chlorides within the surface water continue to be a major cause of poor water quality.
- The sources of these pollutants are generally from both rural areas (agricultural runoff and faulty septic systems) and urban areas (combined sewer overflows and stormwater runoff).
- The best water quality is found in watercourses where water is introduced from Lake Erie and the Niagara River, in watercourses with significant groundwater discharges and in watersheds with substantial natural landscapes.

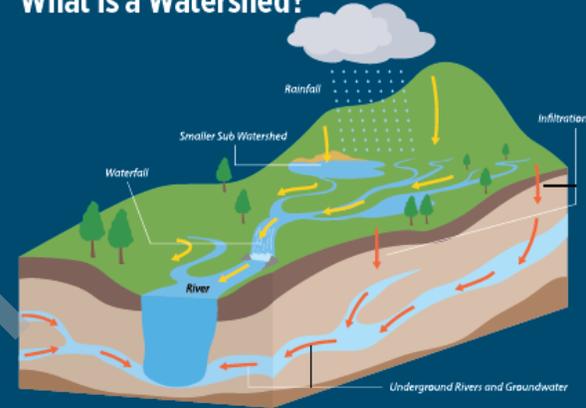
GROUNDWATER: WHAT ARE WE FINDING?

- The groundwater quality in NPCA's jurisdiction was found to be highly variable depending on the aquifer where it was found.
- The natural groundwater conditions from its host rocks and sediments and local human contaminant sources can contribute to poor groundwater quality.
- Private well owners are responsible for having their well water tested regularly and to ensure their well is properly maintained and in good condition.

WATER QUALITY RATINGS 2019-2023



What is a Watershed?



A watershed is an area of land that catches rain and snow, and drains or seeps into a marsh, stream, river, lake or groundwater. Homes, farms, cottages, forests, small towns, big cities and more can make up watersheds. Some cross municipal, provincial and even international borders.



NPCA Restoration Program



BEFORE
RESTORATION



AFTER
RESTORATION

The NPCA has developed a cost sharing program that is geared specifically towards working with area residents to develop projects that will improve water quality, increase habitat diversity and expand forest cover. This program provides funding and expertise to help landowners to undertake restoration projects in priority areas.

Restoration Program by the Numbers

 **24.6**
Hectares Reforested

 **3.9**
Hectares of Wetland Restored

 **3.0**
Hectares of Riparian Habitat

 **70,370**
Trees Planted

 **4,109**
Shrubs Planted



What we can do to help?



What Can You Do?

- Plant native trees, wildflowers, shrubs, and/or rainwater gardens.
- Reduce the amount of mown grass on your property.
- Reduce the amount of pesticides, herbicides and fertilizers.
- Conserve water by using low flow showers and toilets, high efficiency clothes washers and dishwashers.
- Install rain barrels to collect water for use around your yard.



What Can Your Community Do?

- Sponsor community clean ups to keep waste out of natural areas.
- Look for ways to expand the existing urban tree canopy.
- Reduce the amount of pesticides, herbicides and fertilizers used.



What Can Your Business Do?

- Establish a corporate volunteering program to support local initiatives such as tree plantings.
- Invest in 'greener' alternatives to current practices.
- Encourage recycling and composting in the workplace.
- Donate towards water quality and habitat improvement programs.
- Evaluate the effectiveness of environmental programs.

NPCA Corporate Programs and Initiatives

Become an NPCA volunteer: learn new skills, network, support local conservation projects, and step into nature.

Niagara Peninsula Conservation Foundation: is a registered charity, governed by a volunteer Board of Directors who are dedicated to raising funds that aid in the conservation of our natural environment for present & future generations. Donate today!

Land Securement: NPCA's new Land Securement Strategy lays the foundation for an ambitious and technically sound acquisition program that will address priorities for greenspace access, climate change, and protection of natural and cultural heritage across the watershed.

Cost Sharing Programs

Restoration: fostering collaboration among partners in the watershed to protect and restore water quality and diverse habitats by completing projects that meet the long-term mandate of the NPCA.

Water Well Decommissioning: the NPCA is pleased to offer a cost sharing program to watershed residents for the plugging and sealing of abandoned or unused water wells.

More Information

[Annual Water Quality Report](#)

[Watershed Report Cards](#)

Do you have questions not answered by this summary document? Visit npca.ca for the full report or contact us for more information: info@npca.ca

Property owners can scan this QR code for more information on Water Quality Best Management Practices



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