

Grand River Watershed Water Management **ACTION** Plan 2014 *Report on Actions*

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Six Nations of the Grand River
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Introduction

The Grand River Watershed Water Management Plan calls for annual progress reporting on the implementation of actions, starting in 2015.

The Actions identified in the Plan move us toward achieving the goals – to reduce flood damages, ensure water supplies, improve water quality and build resilience to deal with a changing climate.

This inaugural *Report on Actions* summarizes activities from the previous year and provides insight into the collective work plans of the partners for the coming year.

In addition, watershed conditions are highlighted. A complete report that summarizes watershed conditions and trends will be prepared every five years starting in 2019.

Partnerships and co-ordination

The Plan was endorsed by 27 municipalities, Six Nations of the Grand River, Environment Canada, the provincial ministries of Environment and Climate Change, Natural Resources and Forestry, and Agriculture, Food and Rural Affairs, and the GRCA Board in 2014.

Four meetings of the Water Managers Working Group, the Plan's main implementing body, will take place in 2015.

Stormwater managers continue to meet to discuss best practices for stormwater management. Wastewater managers are meeting to continue to optimize wastewater treatment plants and share lessons learned. The southern Grand River working group continues to advance work in the Dunnville area.

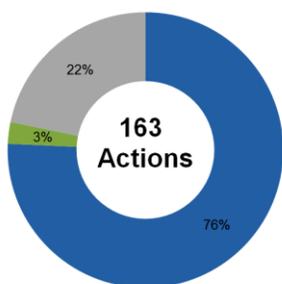
Partners are working together to optimize efforts for monitoring the conditions of the watershed to support good stormwater, wastewater and land use planning. Good information supports good decisions. This work will enable a comprehensive report on the status of the watershed to be completed for 2019.

Summary of progress

2014 marks the first year of Plan implementation.

Partners are advancing 120 of the 163 actions listed in the Plan. Some actions have been completed and are highlighted in this report while other actions are scheduled to start in the next few years.

Status of the Implementation of Actions



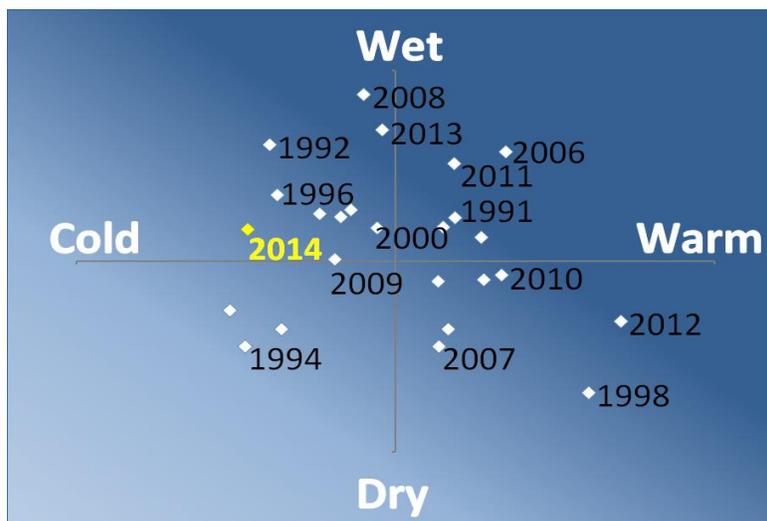
- In Progress
- Completed
- Future

Watershed conditions

In 2014, conditions were generally wetter and cooler than average and reservoir levels were above average due to the wet conditions. Dissolved oxygen levels in the river were generally good due to the high flows.

Water resource engineers operate the reservoirs to maintain river flows to meet **low flow targets** on the Grand River at Doon and Brantford. This is important for the Region of Waterloo, City of Brantford, and Six Nations who take some or all of their drinking water from the river. Flows are also maintained to dilute the treated wastewater discharged from wastewater treatment plants. Consideration is given for the ecological needs of the river system as well. Active reservoir management helps to maintain a healthy river system.

River flows were consistently above the low flow targets in 2014



Watershed conditions were generally cooler and wetter than average in 2014. This chart shows yearly conditions as described by deviations from average annual precipitation (wet/dry) and temperatures (warm/cold) since 1990. 2014 is highlighted in yellow.

Reducing flood damages

Reservoir operations, flood forecasting and warning

The seven multi-purpose reservoirs managed high flows in both the spring and fall. The reservoirs effectively reduced downstream flooding. For instance, the reservoirs cut river flows by 25% in the spring and up to 55% during a large snowmelt event in November.

Watershed flood coordinators met in February 2014. All municipalities successfully responded to the test flood alert.



The flood program issued many statements in 2014

Dam and dike safety studies

The GRCA owns and operates 29 of the 150 dams in the watershed. There have been safety studies completed for specific components of each GRCA dam. In 2014, a dam embankment study for the Luther Dam and a gate reinforcement analysis for the Shand Dam were completed.

Major repairs and maintenance was completed on six GRCA dams in 2014 including the rebuilding of Drimmie Dam in Elora; stop log replacements at Damascus and New Dundee dams; concrete restoration on a wingwall of the Wellesley Dam; gates and gate seals repaired or replaced at Guelph and Conestogo dams, and new fencing erected at the Caledonia Dam.

Floodplain mapping and emergency preparedness

Accurate floodplain mapping is the foundation of emergency preparedness. In 2014, the GRCA and the Ministry of Natural Resources and Forestry started a project to update floodplain mapping.

Permits and plan review to reduce future flood damages

To reduce future flood damages, the GRCA has the responsibility to regulate activities in natural and hazardous areas. This is done through the application of regulations affecting areas in and near rivers, streams, floodplains, wetlands, slopes and the Lake Erie shoreline.

Seven multipurpose reservoirs and dams are operated to reduce flooding and maintain water in the river during the summer. Ongoing maintenance is needed to maintain these assets.



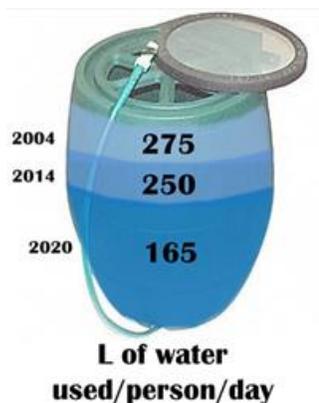
Dam embankment upgrade completed at the Luther Dam, Amaranth Township, to ensure future stability of the dam.

104 permits were reviewed to protect people from flooding and ensure damage to property was avoided or minimized

236 permits were reviewed near wetlands to ensure water stays in place and does not cause downstream flooding

3 subwatershed studies were endorsed – Waterloo North, Cambridge West and Freeport Creek, to maintain the natural water cycle

Permits and plan review prevent future flood damages



Average per person water use has dropped to about 250 L per person per day in 2014 from 275L. The future target is 165 L per person per day for Guelph and the Region of Waterloo.



Renovation of an old irrigation pond, before (top) and after (bottom), helps reduce takings directly from creeks.

Many agency partners worked together with the farming community to identify alternative water supplies for irrigation.

Ensuring water supplies

Water supply planning and water security

Water budgets help identify where and how much water is available for municipal supplies, irrigation and environmental needs. Water budgets are being considered as a way to help the process of issuing a Permit To Take Water in Ontario.

The Tier III Water Budget for the City of Guelph and Region of Waterloo is now complete. The Whiteman's Creek Tier III Water Budget study has started.

Many municipalities are actively managing water demand through conservation programs. They regularly develop master plans for long-term water supply management.

The Region of Waterloo and City of Guelph completed their Water Supply Master Plans in 2014. The Region has also completed a Water Efficiency Master Plan. Conservation efforts continue to be encouraged and, as a result, water demand is decreasing.

Drought contingency planning

A specific drought contingency plan for Whitemans creek subwatershed was completed.

A drought contingency plan for the Grand River watershed was completed.

The agricultural community was active in the Whitemans Creek watershed in 2014 by implementing irrigation system assessments and identifying alternative sources of irrigation water. Work was done through the Water Adaptation Management and Quality Initiative (funded by Agriculture Canada and the Ministry of Agriculture, Food and Rural Affairs under Growing Forward – 2. Other project partners were the ministries of Environment and Climate Change, Natural Resources and Forestry, Brant and Oxford Federations of Agriculture, Farm and Food Care and GRCA.

Protecting drinking water

Drinking water is an important use of both ground and surface water in the watershed.

The proposed Grand River Source Protection Plan was submitted to the Ministry of the Environment and Climate Change in 2013; reviewed and updated in 2014 for resubmission in 2015.

Six Nations commissioned its new water treatment plant. Brant upgraded the treatment system at the Mount Pleasant municipal well and they are bringing the Bethel Road municipal wells into service.

A groundwater study was completed for the Bethel wells to determine the wellhead protection area.

Improving water quality

Managing point sources

Wastewater treatment plants are significant sources of nutrients to the river system in the summer. Municipalities are improving their plants through upgrades and optimization.

Centre Wellington upgraded the Elora wastewater treatment plant. It now includes nitrification, tertiary filtration and biosolids stabilization.

Haldimand County's application of the Composite Correction Program demonstrated additional capacity that resulted in the re-rating of the Cayuga plant, deferring significant capital costs.

The Region of Waterloo continues to upgrade the Kitchener and Waterloo wastewater treatment plants.

Mapleton, Wellington North and Brant worked with the GRCA to complete Comprehensive Performance Evaluations of their plants to identify opportunities to improve plant performance and/or opportunities to realize additional capacity.



The new Elora wastewater treatment plant will improve river water quality for the world-class brown trout tailwater fishery

*The **Composite Correction Program** is an approach to address performance and capacity limiting factors at wastewater treatment plants. The first step of the CCP is a **Comprehensive Performance Evaluation**, which evaluates the operation, design, maintenance, and administration of a plant to determine the factors that may be affecting performance or capacity.*

Managing urban non-point sources

Stormwater management in the central watershed helps reduce flooding in urban areas and improve local and downstream river water quality. Partners have committed to developing a community of practice through the Stormwater Management Working Group.

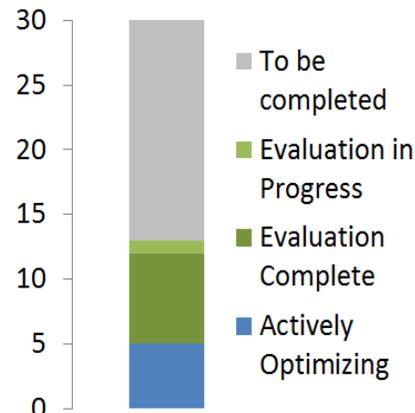
Brantford completed a Master Servicing Plan that included wastewater and stormwater. Kitchener initiated a Stormwater Master Plan update.

Funding for stormwater management is being addressed through a study in Guelph.

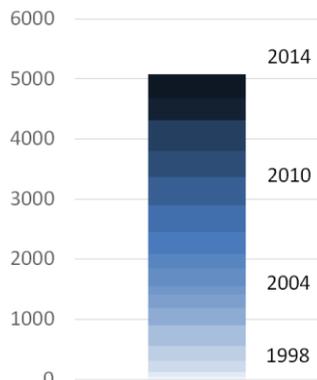
Nearly 1,300 Waterloo and over 5,100 Kitchener residents/businesses have received credit for adopting stormwater best management practices since the stormwater credit programs were started.

The RAIN Program conducted 128 home/business visits and recognized 6 leaders with Community Action Awards in Kitchener and Waterloo. They started reaching out to Cambridge residents.

Municipalities across the watershed continue to promote the Smart About Salt program. The Region of Waterloo launched its Curb the Salt campaign.



*The Wastewater Optimization Program is gaining support across the watershed; 12 of the 30 plants in the watershed have completed a Comprehensive Performance Evaluation. Optimization efforts continue in **Brantford, Haldimand and Guelph.***



Total number of completed Rural Water Quality Program projects since 1997 exceed 5000!

Conservation Services staff are using advanced GIS tools and approaches to engage the farming community about erosion and keeping valuable soil on the land



The Southern Grand River estuary near Port Maitland.

Improving Water Quality *continued*

Managing rural non-point sources

Since 1998, the Rural Water Quality Program has provided financial incentives and technical assistance to rural landowners to implement projects to improve and protect water quality. The agricultural community implemented 380 projects in 2014.

In 2014, the program was available in 75% of the watershed with funding from Waterloo Region, Wellington, Guelph, Brant, Brantford, Oxford and Haldimand. Limited funds were available in the remainder of the watershed.

These projects led to an additional 4,100 kilograms of phosphorus remaining on the land, bringing the total to 104,000 kg of phosphorus retained each year.

The Ministry of Agriculture, Food and Rural Affairs supported further development of decision-support tools to promote efforts to reduce soil erosion and nutrient movement off the farm. As a result, the GRCA developed detailed maps to help identify erosion areas or ‘hotspots’ in six sub-watersheds in the Nith River basin. Work continues in 2015 in the Conestogo River basin.

Improving natural river processes

Streams and rivers in the Grand River watershed carry water and sediment to Lake Erie while also providing valued habitat for fish, amphibians, aquatic insects and plants. Work to facilitate natural river processes in many small streams and the larger rivers will help to support a healthy watershed.

Ministry of Natural Resources and Forestry and Environment Canada supported studies to improve the technical understanding of the southern Grand River through a formalized decision analysis, development of a new digital elevation model and new river bathymetry.

In partnership with the Fisheries Management Plan Implementation Committee, GRCA collected temperature data near a small dam on McKenzie Creek.

Kitchener naturalized 1.3 km of stream in Schneider Creek subwatershed to help improve water quality in Victoria Lake.

Mill Creek Stewardship Rangers rehabilitated over 450 metres of Mill Creek.

Building resilience requires a commitment to data-based decision making

Data collection, evaluation and decision making

Water monitoring programs in the watershed include stream flow, water quality and groundwater. The data collected by these programs help inform water management decisions.

GRCA and Water Survey of Canada collect stream flow data at 55 stream flow gauges. The data provides the information needed to prepare for and forecast flooding. It also informs the management of the reservoirs to ensure that flow targets are met.

Ambient groundwater is monitored at 27 wells throughout the watershed by the GRCA in partnership with the Ministry of the Environment and Climate Change. The GRCA also monitors ambient groundwater conditions at 23 more wells. Wells are equipped with data loggers for continuous measurement of water levels and temperature. In 2014, the ministry supported the instrumentation of 3 groundwater wells with telemetry for real-time monitoring. In addition, many municipalities have their own groundwater monitoring programs.

GRCA collects river water quality 10 times a year at 37 sites in partnership with the Ministry of Environment and Climate Change. In addition, the ministry recently started collecting water quality data at a new site in the Grand River estuary downstream of the Dunnville Dam.

The Region of Waterloo monitors river water quality at 28 sites above and below their wastewater treatment plants to inform current and future wastewater management. In addition, they evaluate the health of the aquatic community every three years.

A 3-year research project sponsored by the **Canadian Water Network** on Aquatic Cumulative Effects Assessment in the Grand River concluded in 2014. Plan partners will use this research to inform their operational monitoring. The Grand River watershed continues to be a focus of many innovative projects sponsored by the **Southern Ontario Water Consortium**.

The Ontario Geological Survey continues to map the overburden sediments in the watershed. They have focused recently on areas in Haldimand, Wellington and Dufferin counties. These projects allow water managers to understand and better manage the aquifers in these areas.

Cities of Kitchener, Waterloo, Guelph, Brantford, Region of Waterloo and non-government organizations like Trout Unlimited collect water data for informing subwatershed planning, characterizing conditions and river restoration.



Collecting river flow data allows engineers to calibrate flood forecast models



Collecting stream water quality samples help to gauge the health of the stream



Long-term groundwater level data enables hydrogeologists to understand how aquifers respond to changing climate conditions

Looking Ahead – short, mid and long-term workplans

2015-16

- Water Managers will review and optimize water monitoring efforts
- Region of Waterloo to start Wastewater and Biosolids Master Plans
- Centre Wellington to start Water Supply Master Plan
- Nutrient targets will be set for Lake Erie in 2016
- Master Servicing Plan for Paris is expected to be complete in Brant
- Guelph WWTP anticipates the completion of a pilot plant to treat concentrated wastewater
- Environmental assessments to consider wastewater servicing and treatment are expected to be completed for Arthur, Mapleton, Drumbo and St. George
- New hydrography for the watershed should be complete
- Kitchener anticipates completion of the Stormwater Master Plan
- Brantford plans to launch a stormwater flow monitoring program and Subwatershed Master Plan studies.

2017-19

- Major treatment upgrades at the Kitchener WWTP are expected to be completed
- GRCA will review the reservoir operating policy and work with the MOECC to review low flows for wastewater planning
- A watershed resources conditions report will be completed by Plan Partners by 2019
- Water managers will sponsor cost-benefit analysis for evaluating point vs nonpoint source controls for future water quality improvements
- The Implementation Committee will review the Water Management Plan in 2019 & if necessary, initiate a process to update the Plan

2020+

- Brant will carry out studies with plans to upgrade the Paris and St. George wastewater treatment plants
- Water Managers will investigate producer-municipal partnerships to jointly manage nutrients and organic wastes for energy production

Challenges and barriers to success

Having a water management plan is only the beginning. The success of the plan will lie with the partnerships and the people to tackle the following challenges:

1. **Maintaining engagement** as people retire or move on, the transfer of knowledge to new staff and sharing lessons learned or approaches will be critical.
2. **A commitment to implement** the actions and report on progress – *a plan only succeeds if implemented*
3. **Allowing innovation.** Innovative approaches that may not be consistent with current regulatory practices are needed to achieve the goals of the Water Management Plan.