



# MUNICIPAL INFRASTRUCTURE

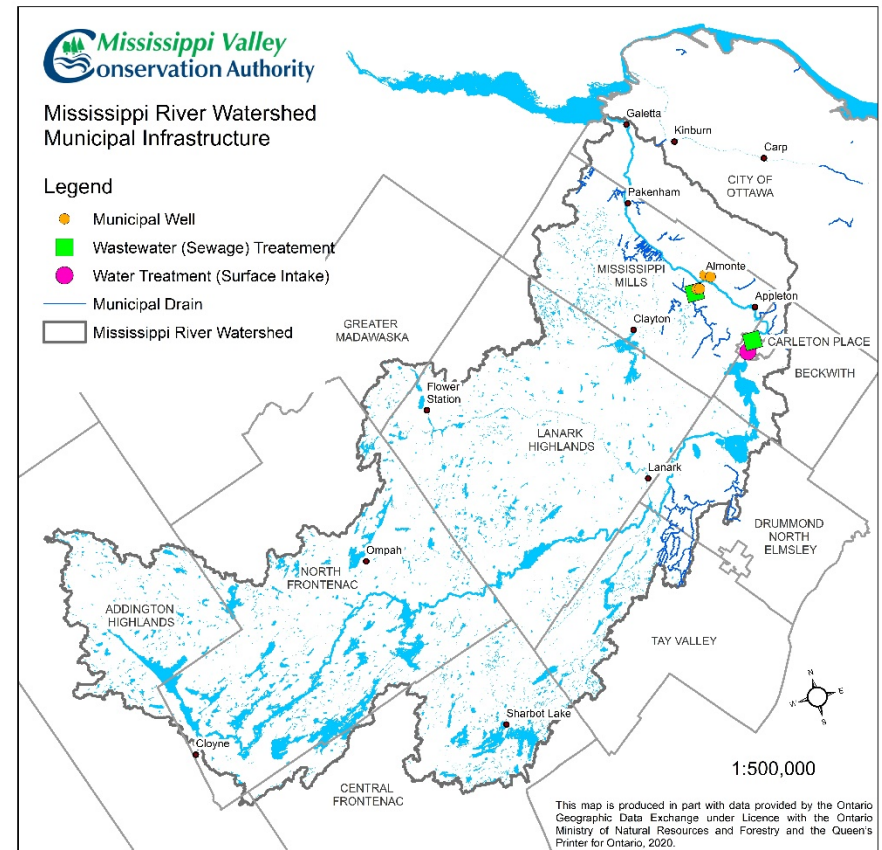
# Mississippi River Watershed Plan Discussion Paper Series

## MUNICIPAL INFRASTRUCTURE IN THE MISSISSIPPI WATERSHED

The Mississippi River watershed is mostly rural with urban development in and around Carleton Place and Almonte. The eleven local municipalities are responsible for a range of infrastructure including, roadways and culverts, sewers and stormwater systems, water and wastewater facilities, and management of public lands. Drainage, and water supply and quality are key infrastructure concerns. The eastern municipalities are experiencing high growth and development, with increased drinking water, stormwater management and other servicing demands.

### KEY FACTS:

- Carleton Place services 25% of the watershed population with a water treatment plant that takes its water from the Mississippi River. Almonte has four municipal groundwater wells that supply water to 12% of the watershed’s population. Both communities discharge treated wastewater into the river system.
- The remaining 63% of the watershed population rely on private septic systems, and private wells or surface water intakes.
- Carleton Place, Almonte and rural subdivisions have stormwater systems that collect rainfall and snowmelt runoff from roads, parking lots, rooftops and sidewalks, and outlet to the river via roadside ditches, storm sewers, and the wastewater plant. Pre 1980s developments have limited or no stormwater management.
- Roadways, culverts, and bridges account for a large component of municipal maintenance and budget allocations. Road crossings can act as dams on the drainage system. Some roadways are located in floodplains



where during extreme flood events they are flooded, cutting off access to local traffic and emergency vehicles. Winter road salt application is standard practice to improve safety,

- Most municipal parklands in the watershed have frontage on water, some with trails, public beaches and boat launches.

### MUNICIPAL INFRASTRUCTURE - CHALLENGES

Mississippi Valley Conservation Authority (MVCA) and its member municipalities share a number of infrastructure and watershed management challenges. Growth and climate change are expected to place pressures on water demand, availability, quality (effluent discharge limits, water chemistry, etc.) and flooding and erosion.

**Stormwater flooding** occurs when rainfall and snow melt overwhelm the capacity of drainage collection systems such as ditches, culverts and storm sewers. Areas developed before the 1980s have limited or no stormwater management. Most stormwater flooding occurs outside formally designated floodplains and affects both urban and rural areas, including farmland. Municipalities are responsible for ensuring proper drainage of new developments.

**Climate change** is expected to cause more frequent and severe wet and dry weather events with impacts to municipal infrastructure.

More intense runoff will place pressures on sewers, pump stations, and treatment works, exacerbate local erosion, and cause greater flooding of roadways and culverts cutting-off access to local traffic and emergency vehicles. Many roads, both public and private, became flooded and impassible during the 2019 flood, particularly around Mississippi Lake and Dalhousie Lake.

Severe **drought** conditions could impact the Carleton Place water intake and the quality of water entering the plant. Under such conditions, system operators (Ontario Power Generation, MVCA, Enerdu Power Systems Ltd., Mississippi River Power Corp. and TransAlta Corp) may need to adjust water levels elsewhere on the river system to protect the Town's water supply with potential impacts to waterfront properties.

**Stormwater runoff** is a major source of water pollution by conveying road salt and silt, landscape and agricultural fertilizers and pesticides, e-coli from pets and livestock, and vehicle fluids into creeks and rivers.

Harmful **Algae Blooms** (HABs) have occurred in Mississippi Lake in recent years, which poses a potential threat to private lakeside water intakes as well as the Carleton Place municipal water supply, located 1 km downstream.

**Maintaining a safe and adequate drinking water supply** is a key municipal responsibility. Municipalities *without* communal water services are responsible for ensuring that new developments on private services have sufficient water supply and do not degrade ground and surface water quality or supply. Municipalities that deliver communal drinking water services must implement the *Mississippi-Rideau Source Protection Plan* (MRSPP, 2014), which restricts land uses and activities that pose a high risk to municipal water intakes and wells.

The *Mississippi-Rideau Source Protection Plan* focusses on municipal systems, however, much of the watershed is developed on private services within a Highly Vulnerable Aquifer. Several villages and hamlets have high concentrations of private septic systems and wells. For example, Lanark Village has a documented history of private well contamination from local septic systems. Leaky septic systems are a key source of surface and groundwater contamination throughout the watershed. MRSPP policies and actions for private water systems focus on education and the implementation of best management practices.

### MUNICIPAL INFRASTRUCTURE - OPPORTUNITIES

A **Water Budget** was prepared in 2009 that provides a high-level assessment of water supply and demand in the watershed. While the study identified no major issues with supply, it revealed several gaps in groundwater data and water takings information, and did not consider the potential impacts of climate change. Comprehensive assessment of potential impacts on future development will require a review of data needs and collection, and development of a model that can run different climate scenarios.

Both the Carleton Place Water Purification Plant and Wastewater Treatment Plant are slated for expansion to accommodate growth. Ideally, update of the water budget and climate model are completed prior to the planning and design of these municipal works to allow for consideration of study findings.

**Groundwater data** is primarily collected through the Ministry of the Environment, Conservation and Parks (MECP) Provincial Groundwater Monitoring Network (PGMN). Groundwater data is also collected from monitoring wells that are put in place to meet development review requirements for proposed multi-lot and commercial developments. There is an opportunity to collect and use these data to improve groundwater modeling and risk assessment.

Master Drainage and **Stormwater Management** Planning involves comprehensive modeling that allows for examination and planning of drainage beyond an individual site or development. This is particularly important in areas experiencing growth. Master drainage studies

combined with municipal land use planning policies and design guidelines can help to reduce and slow the rate of stormwater run-off, reduce pollution of receiving waters, and improve community resilience to the impacts of climate change. For example, municipal policies and guidelines regarding Low Impact Development (LIDs) can facilitate on-site infiltration and retention of water to help mitigate both flood and drought impacts. [See our other Discussion Papers.](#)

**Collaborative asset management** is needed to identify and address future needs, flood prone roadways (private and public), inadequate collection and treatment systems, and sustainable ditch and drain maintenance. These systems involve or discharge to waterbodies regulated by the Conservation Authority and coordinated efforts are needed to ensure appropriate design and use. This could include partnering on funding proposals to the federal and provincial governments to improve municipal resiliency to climate change.

The Mississippi River **Low Water Response** Team is made up of local municipalities, key provincial ministries<sup>1</sup>, county-level Emergency Management offices, the Ontario Clean Water Agency (OCWA), Ontario Power Generation (OPG) and Mississippi River Power. Its mandate is to use a combination of water data, provincial and local legislation, communication techniques and local tools to advocate for water conservation during low water conditions. There is an opportunity for this same group to collaborate on pursuit of resiliency projects and to agree on how the system will be managed under extreme conditions.

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<sup>1</sup> Ministry of the Environment, Parks & Conservation, Ministry of Health, Ministry of Natural Resources & Forestry, Ministry of Agriculture, Food & Rural Affairs

### PARTNERS IN MUNICIPAL INFRASTRUCTURE

Many organizations have an interest in municipal infrastructure. In addition to engaging area municipalities and provincial agencies, the MVCA has been working with a Watershed Public Advisory Committee (PAC) made up of representatives from key communities in the watershed including: agriculture, development, forestry, hydro producers, lake associations, tourism and the general public. Other potential partners include the following:

- Insurance Bureau of Canada (IBC)
- Ontario Centre for Climate Impacts and Adaptation Resources (OCCIAR)
- Canada Water and Wastewater Association (CWWA)
- Ontario Good Roads Association (OGRA)
- Association of Municipalities of Ontario (AMO)
- Eastern Ontario Warden's Caucus

### 35 DRAFT ACTIONS

MVCA has identified 35 potential actions designed to address the goals and objectives identified through the watershed planning process. A much longer list was reviewed and culled in consultation with the Watershed PAC. The following actions are relevant to municipal infrastructure. To see all 35 draft actions visit: <https://mvc.on.ca/watershedplan>

**Action 5.** Prepare a Mississippi River Watershed Model incorporating historical, near real-time, and projected future hydro-climatic data, based on up to date information and science, (e.g. new climate change scenarios based on the upcoming IPCC Assessment Report).

**Action 6.** Update the Mississippi River Water Budget to better evaluate water needs and use by completing the recommendations of the MRSPP Tier 1 budget assessment and incorporating climate change considerations. *This may include:*

- *Improve understanding of local wetland, surface and groundwater interactions. (collaboration with the academic community?)*

- *Assess past drought occurrences to determine impacts on river flow, and the conditions under which the target flows could not be achieved.*
- *Survey (voluntary) partners from all sectors on a regular basis to maintain up to date information on water use, water needs, and water availability.*
- *Work with the Town of Carleton Place to ensure both the projected growth and proposed expansions of its water and wastewater facilities can address water supply/demand, and quality requirements.*

**Action 7.** Update Mississippi River Water Management Plan to address modeling and water budget work completed under Actions 5 and 6, and to assist in rebalancing the competing interests for the watershed's water resources where needed.

**Action 8.** Improve the groundwater monitoring program to meet MVCA and municipal source water protection requirements. *This may include:*

- *Assess groundwater information to determine information needs and gaps, and work with MECP to address.*
- *Establish a centralized system of collecting and consolidating groundwater data collected through the subdivision review process (already in early development with RVCA)*

**Action 9.** Develop and implement an Asset Management Plan for water control structures.

**Action 10.** Undertake a Water Storage Capacity and Management Study of both man-made (dams and reservoirs) and natural storage (wetlands) options and capacity.

**Action 11.** Undertake an Ice Risk Assessment in partnership with hydro power producers and municipalities. *This may include:*

- *Collaborate with hydro power producers in determining solutions for frazil ice issues.*

**Action 12.** Work with municipalities, landowners and other partners to quantify, value and protect wetlands as hydrologic and natural assets.

**Action 13.** Enhance response planning and readiness through the Low Water Response Team to address low water response and to ensure it

includes representation from all key water use sectors. *This may include:*

- *Further implementation of water conservation measures, such as municipal water conservation by-laws, where needed.*
- *Encourage municipalities that haven't already done so, to adopt and implement Water Conservation By-laws.*

**Action 14.** Work with municipalities, landowners and other partners to enhance on-site retention and infiltration of water.

**Action 18.** Work with municipalities to undertake a roadway flood vulnerability assessment to; identify flood prone roadways; and properties potentially impacted by unsafe access; and to develop a strategy to address properties potentially impacted by unsafe access.

*This may include:*

- *Continue to restrict/limit development where the requirements for safe access cannot be achieved (i.e. for private roads, continue to make floodproofing of the roadway a condition of approval).*
- *Encourage municipalities to undertake roadway reconstruction/redesign to address safe access where needed.*

**Action 20.** Support municipalities in assessing and enhancing stormwater management in new and existing developments. *This may include:*

- *Inventory catchment areas lacking, or requiring upgraded, stormwater management facilities and work with municipalities to determine best management practices and retrofit solutions for existing stormwater facilities that are deficient in meeting current quantity and quality objectives.*
- *Promote and participate in the development of master stormwater drainage plans, to address quantity and quality*



*control, for the rural settlement areas where high growth is projected and/or already occurring.*

- *Recommend municipal Official policy for coordinated stormwater planning for concentrated rural settlement.*
- *Promote implementation of Low Impact Development practices in the design of new developments and retrofits to existing development.*

**Action 27.** Continue to support municipalities in actions prescribed by the Mississippi-Rideau Source Protection Program. *This may include:*

- *Review and update the Mississippi-Source Protection Plan to address climate change impacts.*

- *Ensure significant Groundwater Recharge Areas (SGRAs) are identified and protected in municipal Official Plan policies.*
- *Promote implementation of Salt Management Plans and "Smart About Salt" Programs by municipalities.*
- *Review the implementation/effectiveness of the MRSPP best practices guidelines and education/outreach initiatives with respect to rural areas.*
- *Determine whether a rural servicing assessment may be beneficial in determining potential risk to private well water supplies (quantity and quality).*