Table of Contents

1.0 INTRODUCTION

In a world of changing conditions and constantly evolving information, we must approach management of our watersheds in an adaptive manner. We need to update technical information regularly and fill data gaps to provide a more informed basis for decisions affecting watersheds. We need to reassess the significance of potential stressors, which may influence future watershed conditions, so that we can update strategic management recommendations to incorporate the latest understanding, consider innovative approaches and utilize lessons learned. By proactively managing the present use of watersheds, we can ensure they are sustained for future use.

In the Etobicoke and Mimico Creeks Watersheds, new information has become available since the watershed revitalization strategy was published. Greening Our Watersheds: A Strategy for the Etobicoke and Mimico Creek Watersheds (TRCA, 2002) was prepared based on 1995 data, which are now over 15 years old. A more recent report Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card (TRCA, 2006) noted data and information gaps. Urban growth, a primary stressor in these watersheds, has continued and additional growth is expected through intensification in response to the Provincial Places to Grow plan. Watershed municipalities have recognized the need to incorporate climate change considerations in management decisions. In response to this evolving management context, it was felt that an updated watershed study was necessary.

The Etobicoke and Mimico Creeks Watersheds Technical Update Study serves three purposes:

1. Compile new technical information available since the last watershed strategy and report card publications;
2. Develop an improved understanding of current watershed conditions and issues; and
3. Update the strategic management recommendations and implementation priorities for these watersheds.

1.1 TECHNICAL UPDATE APPROACH

Typically, watershed planning involves a three phased process which is followed by a regular schedule of updates. The phases of watershed planning are organized as a scoping and characterization phase, followed by analysis and evaluation, leading to development of a watershed plan. This process is a sound model which should continue to be followed for regular large scale updates. However, in light of the new transferable technical information available through recent large scale watershed plans, such as the Rouge and Humber River watershed plans, and in recognition that a watershed strategy had been completed for Etobicoke and Mimico Creeks watersheds in 2002, and more recently a report card in 2006, TRCA staff recommended that an interim update of the technical characterization of these watersheds would be beneficial. The work would focus on filling information gaps and updating management and implementation priorities.

1.2 REPORT SCOPE AND ORGANIZATION

This technical update study focused only on those watershed themes where work was needed to address previously identified data gaps, or where there was substantial new information available. The technical team applied an integrated approach to the work, such that all study findings were analysed from an interdisciplinary perspective. The report has been written for a technical audience.

The report consolidates and integrates updated information in the following areas:

- Groundwater quantity and quality
- Surface water quantity
  - Baseflow and water use
  - Stormwater management and streamflow
- Fluvial geomorphology
- Surface water quality
- Terrestrial natural heritage system
- Aquatic system - Instream barriers to fish passage

A section in this report is devoted to each of these technical subjects and contains the following information: relevant watershed objectives and targets; data sources and methods; existing conditions; revised management recommendations and strategic implementation priorities.

Concluding sections present an overall, integrated summary of study findings with respect to current watershed systems and strategic management directions.

Sections 1.3 and **1.4** draw forward the vision and management framework from the watershed strategy and **Section 2.0** provides updated information on the physical setting and land use, all of which serves as a helpful reference in the interpretation of technical findings.

1.3 WATERSHED VISION

During the creation of *Greening Our Watersheds: Revitalization Strategies for Etobicoke and Mimico Creeks* in 2002, the multi-stakeholder Etobicoke and Mimico Watersheds Coalition (Task Force) developed a vision for the watersheds in 2025 which formed the basis of the management strategies in that document. This Etobicoke and Mimico Creek Watersheds Technical Update report continues to use this vision as a guiding management framework. That vision is reprinted here:

VISION

In the year 2025, the Etobicoke and Mimico Creek watersheds will be places where people live in harmony with the environment, where fish and wildlife thrive.

In order to realize our vision we must respect, protect and regenerate the natural and human heritage of the watersheds.

We will Respect the watersheds by:

- *Recognizing that there are inter-connections between air, land, water and living organisms including people;*
- *Encouraging community stewardship and individual responsibility for the health of the watersheds;*
- *Developing awareness of the watersheds and celebrating achievements for their protection and regeneration; and*
- *Promoting the use of an ecosystem approach to planning by governments, businesses, communities and individuals.*

We will Protect the watersheds by:

- *Conserving the natural and human heritage of the watersheds.*

We will Regenerate the watersheds by:

- *Improving the natural hydrological functions to reduce runoff and maintain baseflow;*
- *Improving water quality in the creeks and Lake Ontario;*
- *Reestablishing forests, wetlands and natural connections;*
- *Enhancing self-sustaining native fish, wildlife, and plant populations; and*
- *Promoting the value of the links between the natural and human heritage of the watersheds.*

By the year 2025, these natural and cultural shifts will result in more sustainable and healthier watersheds.

1.4 WATERSHED OBJECTIVES, INDICATORS AND TARGETS

In addition to the creation of a vision for these watersheds, the Coalition approved a set of objectives, indicators, targets and future actions to be accomplished to achieve this vision. Over time, with the advancement of science and technology, objectives have been revised; indicators expanded and targets set or refined, to assist in achieving the vision.

Table 1 summarizes the watershed objectives, indicators and targets used in undertaking this technical update study. These are taken from *Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card* (TRCA, 2006), unless otherwise specified. The most notable differences are found in the new groundwater and fluvial geomorphology themes, where this study has made recommendations to fill a previous gap in the management framework. Surface water quantity, terrestrial and aquatic system indicators and targets have been further refined based on updated science available through this study.

These objectives, indicators and targets have been used to guide the scope of work and serve as benchmarks against which to assess condition. Ratings of condition have not been assigned, but would be expected as part of the next comprehensive report card of watershed health.

Table 1: Watershed Objectives, Indicators and Targets

Note: Objectives, indicators and targets are taken from *Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card 2006* (TRCA, 2006), unless otherwise specified. This table presents only the components addressed in this **Technical Update**.

	Objectives	Indicators	Targets
Groundwater Quantity [1]	Current groundwater recharge and aquifer water levels are maintained throughout the watersheds and restored within the Brampton Esker, to the maximum extent possible.	Recharge	• Maintain existing annual average watershed recharge rates of 0.72 m^3/s (103 mm/year) for Etobicoke Creek and 0.22 m^3/s (94 mm/year) for Mimico Creek (as reported in Technical Update, TRCA, 2010). Site specific recharge rates as per **Figure 3-19** of the **Groundwater Quantity and Quality Section**.
		Groundwater Levels	• Maintain 2009 groundwater levels (as per 2009 Provincial Groundwater Monitoring Network (PGMN) data, reported in Technical Update, TRCA, 2010)
Groundwater Quality [1]	Groundwater meets Ontario Drinking Water Standards	Groundwater Quality-Conventional Pollutants	• All aquifers should meet the Ontario Drinking Water Standards for all health-related parameters.
Surface Water Quantity	Creek hydrology is restored to a more natural flow pattern	Streamflow • Baseflow	• Increase baseflow from baseline conditions (as per TRCA Low Flow measurements from 2000)
		• Peak flows	• Maintain or reduce baseline peak flows for 2 to 100 year return period events (baseline values derived from the reports: Etobicoke Creek Hydrology, Fred Schaeffer and Associates, 1996 and Mimico Creek Hydrology, James F. MacLaren Limited, 1978)
		• Flooding	• Maintain or reduce the number of flood vulnerable areas and roads (baseline as per TRCA FVA/FVR Database, reported in *Greening Our Watersheds*, TRCA, 2002)
		• Surface Water Withdrawals	• Protect Environmental Flow Rates (EFR) in areas of surface water withdrawals (EFR to be established as per individual Water Use Management Plans (WUMPs)) [2].

[1] Objectives, indicators and targets were developed as part of the Technical Update (TRCA, 2010) to fill a gap in the previous management framework for these watersheds.

[2] New target developed as part of the Technical Update (TRCA, 2010) to reflect new science available for managing surface water withdrawals.

	Objectives	Indicators	Targets
		Stormwater Management[3]	• Maintain or reduce annual stream volume (based on long-term stream gauge measurements); • Increase the percentage of urban area treated by stormwater management facilities (baseline as per Technical Update, TRCA, 2010); • By 2012, set target for desired level of source controls [4] • By 2025, complete all identified end-of-pipe stormwater retrofits to control quality and quantity of stormwater (*9 stormwater management ponds and 23 outfall retrofit opportunities as per Stormwater Retrofit Plans of each municipality*).
Surface Water Quality	Water in the creeks is safe for people, fish and wildlife.	Conventional Pollutants	• By 2025, at least 75% of the samples meet water quality objectives.
		Metals and Organic Contaminants	• By 2025, levels of six [5] metals of concern meet the PWQO in at least 75% of the samples; • By 2025, priority compounds (the COA Tier 1 list) have been virtually eliminated (e.g., are detected in less than 10% of samples) – *not addressed in this Technical Update;* • By 2025, there are no restrictions on eating sport fish due to contaminants - *not addressed in this Technical Update.*
		Water Contact Recreation (Bacteria)	• *By 2025, E. coli* levels meet the PWQO for at least 95% of the swimming season at Lake Ontario beaches – *not addressed in this Technical Update;* • *By 2025, E. coli* levels meet the PWQO in at least 75% of the samples for Etobicoke Creek Headwaters and for at least 50% of the samples in the remainder of Etobicoke Creek and Mimico Creek.
Fluvial Geomorphology[6]	The natural form and function of the Etobicoke and Mimico Creek Corridors is protected and regenerated.	Channel Morphology	• Maintain or restore natural channel structure and rates of morphologic change (initial reference condition as per 2001 longitudinal profile survey, migration rates and substrate characterization data at RWMN* sites);

[3] Stormwater management targets have been defined as per recommendations in *Turning over a new leaf: The Etobicoke and Mimico Creeks Watersheds Report Card 2006* (TRCA, 2006) as follows: New targets have been set for erosion-related concerns as part of the new Fluvial Geomorphology theme in this Technical Update; Other SWM targets have been set or refined based on new water budget science and to address previously identified gaps, as explained in additional footnotes.

[4] Source controls - It is premature to set a target at this time, because several municipalities are currently undertaking studies that may result in the establishment of databases that would inform this target and enable future monitoring and reporting. The desired direction is for an increase in the proportion of urban area treated by source controls and achievement of a target by 2025. Note: This target will replace the previous Report Card target "By 2025, complete all identified lot level and source controls…"(because the reference source is unclear) and the target "By 2025 construct five additional green roofs in each watershed" (because there are numerous source control technologies now available and the emphasis should be on management strategies to promote opportunities for testing innovative approaches).

[5] The list of metals of concern has been decreased from seven (Cu, Fe, Zn, Al, Cd, Pb, Ag) to three (Cu, Fe, Zn) due to lack of analytical capabilities.

[6] Fluvial Geomorphology objectives, indicators and targets were developed as part of the Technical Update (TRCA, 2010) to fill a gap in the previous management framework for these watersheds.

	Objectives	Indicators	Targets
		Flow Regime and Erosion Potential	• Maintain baseline erosion index where stream banks are stable and decrease and/or restore to baseline erosion index where stream banks are unstable (measured at stream flow gauge sites; initial reference condition as per RWMN data 2001); • Maintain baseline stream bank erosion rate (cross-sectional analysis; initial reference condition as per RWMN data 2001).
		Stream Corridor Integrity and Continuity	By 2025, 75 % of the riparian zone should contain natural cover; • By 2025 the long term target is that 75 % of the riparian zone should be made up of forest cover.
		Risk to Public and Private Property from channel evolution and change	• Reduce or eliminate buildings, infrastructure and private property at risk from channel evolution.
Terrestrial Natural Heritage System	Forest and wetland habitats are preserved, regenerated and created, ensuring the healthiest possible conditions, and the greatest possible representation of native plant and animal communities and species.	Quantity of Natural Cover	• 14.1% of the watersheds (combined area) should be natural cover [7]
		Quality of Natural Cover	• There should be an increase in the quality of natural areas in the watersheds as measured by the proportion of "good" (L2) and "fair" (L3) total patch scores (Baseline as per Technical Update, TRCA, 2010))
Aquatic System	Aquatic ecosystems are diverse, balanced and self-sustaining	Fish Communities	• By 2025, the IBI rating at three sites in Etobicoke Creek should be improved to "fair" from "poor" – *Not addressed in this Technical Update.* • By 2025, there will be no further degradation of the aquatic community – *Not addressed in this Technical Update.* • By 2025, fish will be found at all sites sampled in Mimico Creek – *Not addressed in this Technical Update.*
		Benthic Invertebrate Communities	• By 2012, all benthic invertebrate sampling stations should have an invertebrate community that is rated as fair or better – *Not addressed in this Technical Update.* • By 2025, at least 40% of benthic invertebrate stations should have an invertebrate community that is rated as good – *Not addressed in this Technical Update.*
		Riparian Zone	• By 2025, 75% of the riparian zone should contain natural cover; • By 2025 75% of the riparian zone should be made up of forest cover.

[7] Target revised as of Technical Update (TRCA, 2010) to reflect the watersheds (combined area) refined regional target TNHS.

	Objectives	Indicators	Targets
		Fish Passage	• By 2025 have 50% of priority barriers identified in Category A and Category B mitigated for fish passage; and 100 % of Category C barriers removed in Etobicoke and Mimico Creeks (TRCA, 2010) [8] • By 2025 identify strategic barriers to remain throughout the watershed.
		Invasive and Exotic Species	• Actively manage for no further introduction of any invasive or exotic species [9]

[8] New Fish Passage target developed as part of the Technical Update (TRCA, 2010) to fill a gap in the previous management framework for these watersheds.

[9] New Invasive and Exotic Species target developed as part of the Technical Update (TRCA, 2010) to fill a gap in the previous management framework for these watersheds.