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Integrated municipal water resources management within the North American Great Lakes.

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Abstract–
The North American Great Lakes is the source of drinking water for over forty million inhabitants around the perimeter of the Great Lakes system both in Canada and USA. The waters of the Great Lakes are interconnected and part of a single hydrologic system. The multiple uses of these resources for municipal, industrial and agricultural water supply, mining, navigation, hydroelectric power and energy production, recreation, and the maintenance of fish and wildlife habitat and a balanced ecosystem are interdependent. Many of these source waters face several threats. Municipal wastewater is a complex mixture of human waste, suspended solids, debris and a variety of chemicals derived from residential, commercial, and industrial sources. The volume of the wastes, the pollutants they contain, and potential for impacts to water quality make municipal wastewater a concern. For example, waterborne pathogens can pose a problem to drinking water supplies and recreational waters. Taste and odour in drinking water is another example that can be man-made (industrial, municipal, etc.) or biogenic. However, the recent occurrences in the Great Lakes come at a time where nutrient levels have reached their lowest levels in decades. Until recently, these source waters were taken for granted and little attention paid for their long term sustainable management. Recent severe outbreaks of waterborne diseases pointed to a risk of outdated infrastructure and emerging chemical and biological threats. Because of these concerns an integrated multi-barrier approach (MBA) was developed by Federal-Provincial-Regional governments to protect the source water supply from the Great Lakes. It is an integrated system of procedures, processes and tools that collectively prevent or reduce the contamination of drinking water from source to tap in order to reduce risks to public health. In this process the source protection authorities and municipalities will be able to complete the required science-based assessment of threats to drinking water sources. Municipalities would be able to act on significant threats around municipal wells or surface water. In this paper we will discuss the population pressure and associated environmental issues in the western Lake Ontario. This paper presents examples of source water characteristics of the Great Lakes and long-term management strategies in the basin.