

**Report No.:** WMPSC-2010-12-02a **Date:** December 7, 2010  
**Updated:** March 22, 2011  
**To:** Grand River Water Management Plan Steering Committee  
**From:** A. Wong, GRCA  
**Subject:** Water Use Inventory Report 2011

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### SUMMARY:

The updated Water Use Inventory Report was finalized in February 2011. The report is a summary of all the municipal, rural domestic, permitted and agricultural water uses throughout the Grand River watershed. Water uses are divided by source (groundwater and surface water). The report details the difference between the permitted maximum water takings and actual water taking as assessed through user reports and educated estimates. Municipal water takings are over 60% of all the water demand in the watershed. The total water demand across the watershed amounts to approximately 152 Mm<sup>3</sup>/year.

### REPORT:

A comprehensive assessment of water demand in the Grand River watershed has been the subject of detailed investigative studies throughout the past decade. The first water use inventory commenced in the early 2000's and was published in 2005. Much of the information was estimated based on the maximum takings permitted by the Permits to Take Water issued by the Ministry of the Environment.

As the need for water demand management has become more apparent, better information has become available including requirements for permit holders to submit actual water taking reports. An update to the assessment of water use in the Grand River watershed was undertaken to encompass the new information. GRCA staff have prepared an updated water use summary including up to date and more representative data sets that help reduce some of the uncertainty regarding total water demand. The data compiled for the report is based on 2008 values for water demand.

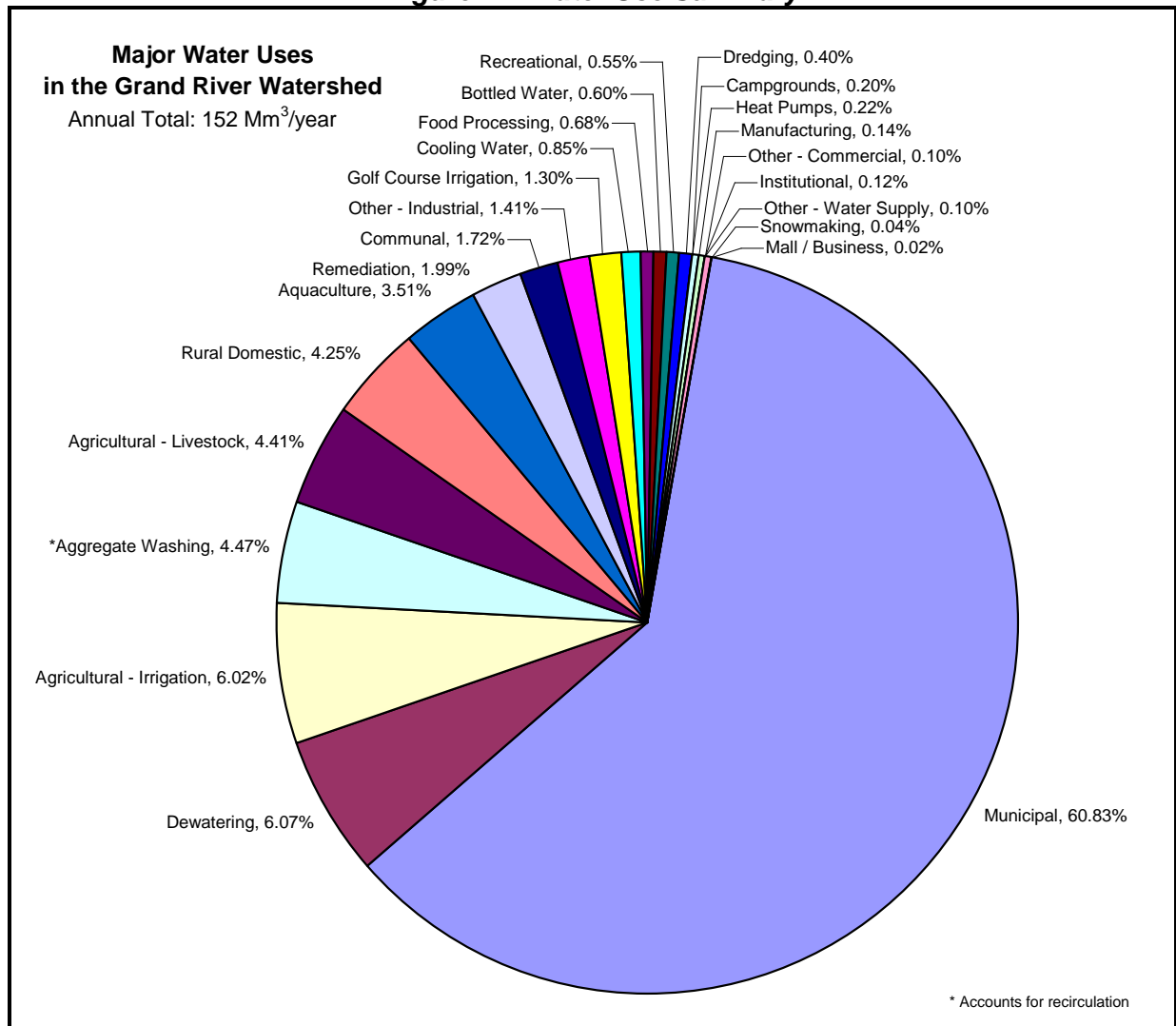
The current Water Use Inventory Report compiles information on four main categories: municipal water supply systems, rural domestic water demand, agricultural water uses and permitted water takings (greater than 50,000L/day). The Permit to Take Water database provides the information for the permitted water takings and includes approximately 700 permits with over 1200 sources in the Grand River watershed in 2008. The Grand River watershed relies heavily on groundwater sources, which comprise over 70% of the volume of water demand. The total assessment of all water takings for the Grand River watershed amounts to 152 million cubic metres per year.

Municipal water demand continues to be the predominant use in the watershed at 60% of the total annual volume of water used (**Figure 1**). The top 10 non-municipal water uses were identified through the assessment of all water takings, using actual takings where available and estimated elsewhere.

## Water Management Plan: TECHNICAL MEMORANDUM

- |                                      |                                |
|--------------------------------------|--------------------------------|
| 1. Dewatering                        | 6. Aquaculture                 |
| 2. Agricultural – Irrigation         | 7. Remediation                 |
| 3. Aggregate washing                 | 8. Communal Water Supply       |
| 4. Agricultural – Livestock watering | 9. Unspecified Industrial Uses |
| 5. Rural Domestic Water Supply       | 10. Golf Course Irrigation     |

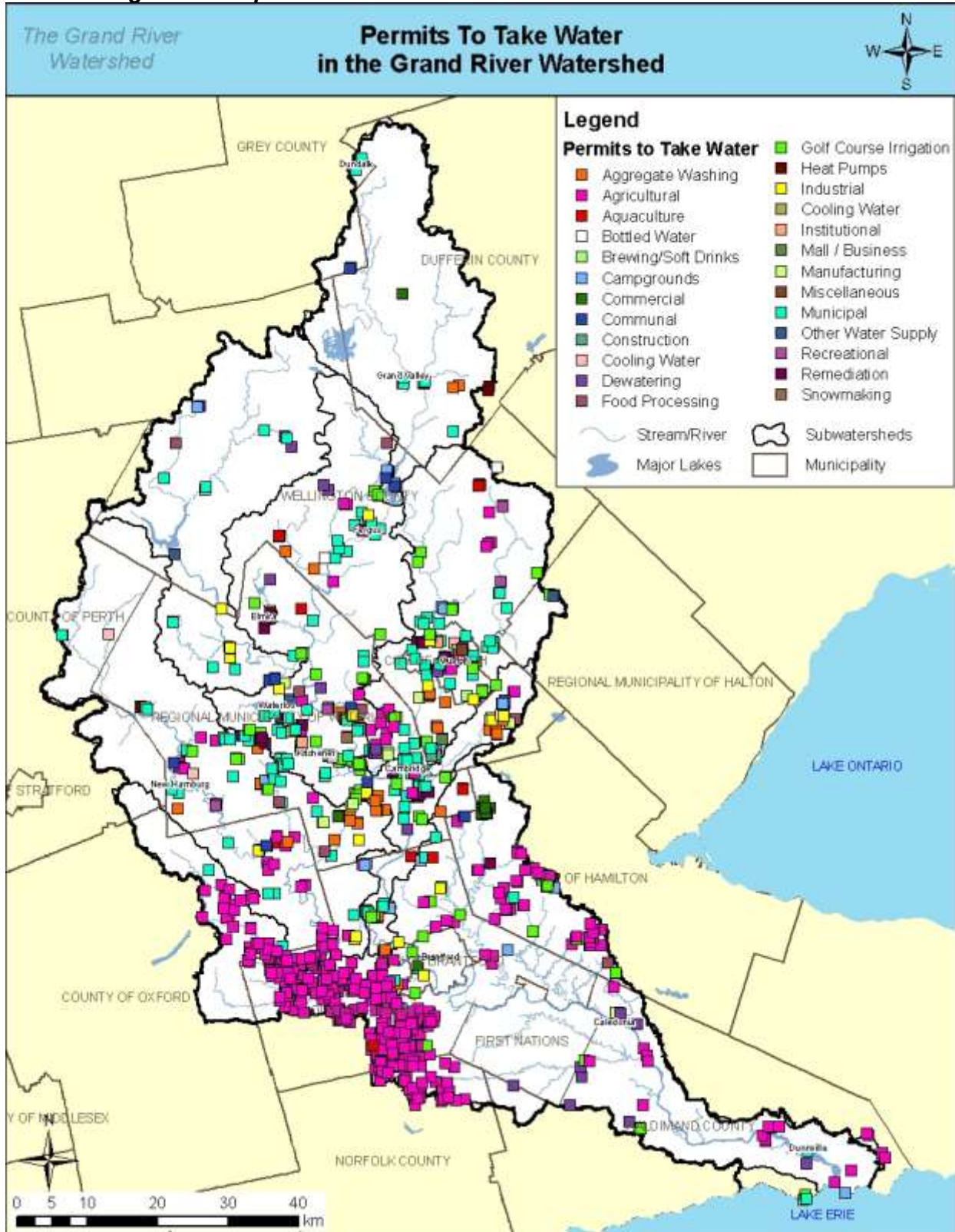
**Figure 1: Water Use Summary**



The assessed volume of the annual taking has decreased by half from the 2005 report due to the availability of actual reports from over half of the 1200 sources and additional data to make educated estimates for the remaining uses. The reliance on estimation using the permitted maximum taking has been greatly reduced due to the actual water taking reports.

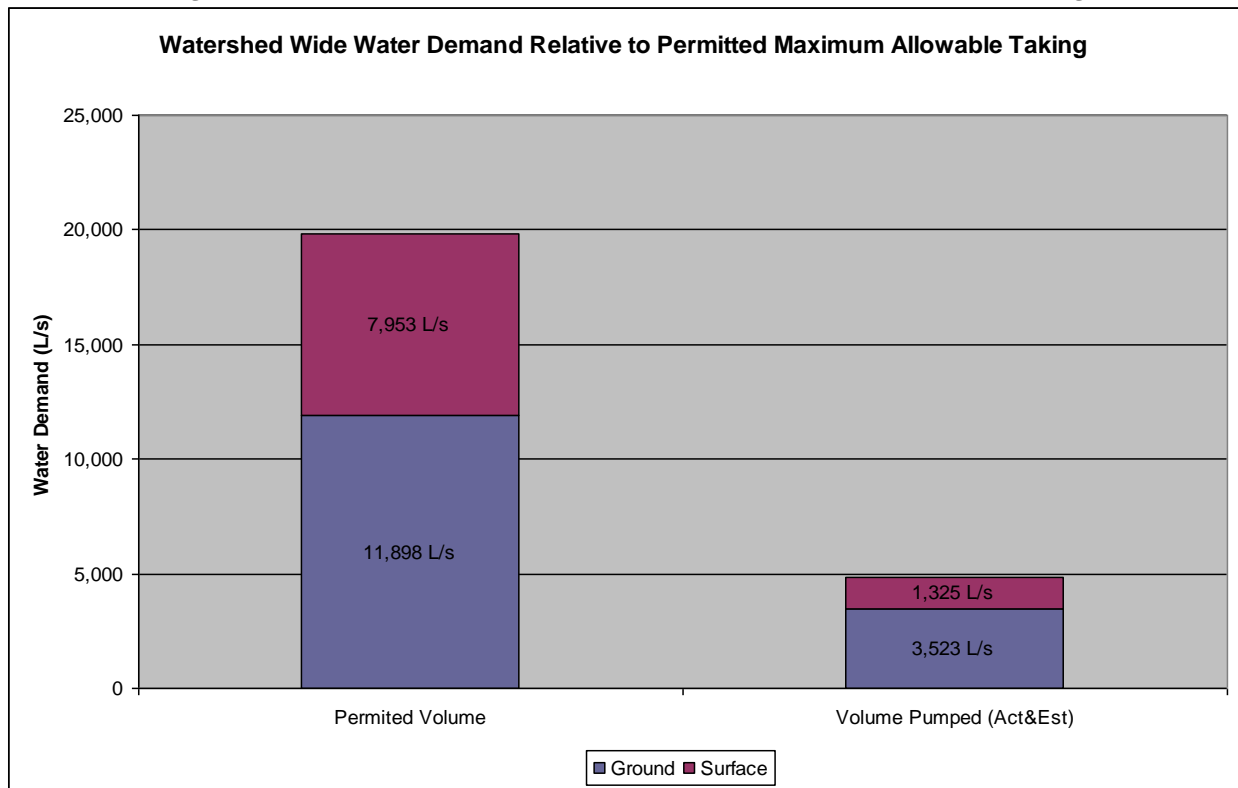
The distribution of water takings can be seen in **Figure 2**. The map shows that municipal takings are predominantly found in the central portion of the watershed. Agricultural water takings for irrigation are concentrated in the Norfolk sand plain area in the south western portion of the watershed. All other water takings are in close proximity to urban centres throughout the Grand River watershed.

Figure 2: Map of Permits to Take Water in the Grand River Watershed



Total assessed water use (actual and estimated values) is 75% of the total permitted maximum allowable for all PTTW takings (see **Figure 3**). The agricultural irrigation PTTW's have the highest uncertainty as they have the lowest percentage of actual water taking reports and the highest variability due to the connection of irrigation to climatic factors. However, analysis of the trends from the agricultural irrigation records and modeling of irrigation water requirements in the watershed provided similar results giving more certainty and accuracy to the estimation.

**Figure 3: Permitted Maximum Volume vs. Assessed Water Taking**



While municipal takings are year-round and vary only slightly month to month throughout the year, many of the top 10 non-municipal uses are seasonal in nature. Uses including and especially irrigation (agricultural and golf courses) and aggregate washing create high demand months in summer and fall, when natural water availability is the lowest. Even municipal and other domestic uses rise slightly in the summer for outdoor water uses such as lawn watering.

In summary, the Water Use Inventory Report has vastly improved the assessment of water demand in the Grand River watershed with the introduction of more accurate and available actual data as provided by the users. Municipal water use is by far the largest water demand in the watershed, as well as the most accurate. As the percentage of actual reporting of water taking increases, the assessment will be further refined to reflect actual water demand in the watershed.

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