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# Municipal Wastewater Treatment Indicator

## Data Sources and Methods

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# 1. Introduction

This report is released under the Canadian Environmental Sustainability Indicators (CESI) initiative. Each indicator reported under CESI has an associated “data sources and methods” report to provide technical detail and other background to facilitate interpretation of each indicator or allow others to conduct further analysis using the CESI data and methods as a starting point.

This report addresses the underlying methods and data for the Municipal Wastewater Treatment indicator as published on the CESI website ([www.ec.gc.ca/indicateurs-indicators/](http://www.ec.gc.ca/indicateurs-indicators/)).

## 2. How the measure is calculated

Data for this measure for 1983 to 1999 come from Environment Canada’s Municipal Water Use and Pricing (MUD) survey. More recent data are from Environment Canada’s Municipal Water and Wastewater Survey (MWWS), which has been conducted every two to three years since 2001.

Wastewater treatment levels described below were categorized following OECD definitions (OECD n.d.).

- Primary treatment refers to the treatment of urban wastewater by a physical and/or chemical process involving the settlement of suspended solids or other processes in which the 5-day Biological Oxygen Demand (BOD<sub>5</sub>) of the incoming waste water is reduced by at least 20% before discharge and the total suspended solids (TSS) of incoming wastewater are reduced by at least 50%. The “primary” and “preliminary” treatment categories in the MUD and MWWS surveys were considered as primary treatment for this indicator.
- Secondary treatment is the further treatment of municipal wastewater by biological treatment with a secondary settling pond, or other processes, resulting in a Biological Oxygen Demand (BOD) removal of at least 70% and a chemical oxygen demand (COD) removal of at least 75%. For this indicator, the “secondary treatment” and “waste stabilization ponds” categories in the MUD and MWWS surveys were considered to be secondary treatment.
- Tertiary treatment is the treatment of the effluent from secondary treatment to remove nitrogen, phosphorus and/or any other pollutant affecting the quality or a specific use of water. Other parameters may include microbiological pollution, colour, etc. For this indicator, the “advanced and tertiary treatment” category in the MUD and MWWS surveys was categorized as tertiary treatment.

The MUD and MWWS surveys only consider the population served by municipal sewer systems. Wastewater treatment statistics were thus weighted by the total Canadian population served by municipal sewer systems. The Canadian population served by private individual systems is not included in this indicator.

## 3. Caveats and limitations

The MUD survey underwent a major overhaul after 1999 to become the MWWS survey. For the first MWWS survey (2001), the number of municipalities surveyed increased and the format changed. As a result, the response rate was low and sewage treatment level data was not computed. The 2001 survey was not considered for CESI accounting for the gap in the graph.

The MUD surveys (1983-1999) only collected data from municipalities with a population greater than 1000 people. The MWWS surveys (2004-2006) now collect data from a representative sample of rural municipalities with population less than 1000. The data are still comparable between surveys

as the effect of rural municipalities on the aggregate statistics is negligible due to population weighting.

The definition of treatment categories has changed between the MUD and MWWS surveys. In MUD surveys (1983-1999), treatment systems with combined primary and tertiary treatment were categorized as secondary treatment. In the MWWS surveys (2004-2006), tertiary treatment was only considered possible if secondary treatment is also provided. Data from the MUD are also used in the MWWS database when new data have not been provided. This change in definition likely accounts for the drop in the number of Canadians served by tertiary treatment in 2004.

Excluded from the MUD and MWWS surveys are municipalities on federal lands including First Nations.

## 4. Data source(s)

Environment Canada. 2010. 2010 Municipal Water Use Report: Municipal Water Use 2006 Statistics. [www.ec.gc.ca/Publications/default.asp?lang=En&xml=596A7EDF-471D-444C-BCEC-2CB9E730FFF9](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=596A7EDF-471D-444C-BCEC-2CB9E730FFF9)

Environment Canada. 2007. 2007 Municipal Water Use Report: Municipal Water Use 2004 Statistics. [www.ec.gc.ca/Publications/default.asp?lang=En&xml=8D951F7A-3866-47AA-98D6-1C49AB04E1BA](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=8D951F7A-3866-47AA-98D6-1C49AB04E1BA)

Environment Canada. Municipal Water Use Database (MUD) 1983-1999. [www.ec.gc.ca/eau-water/default.asp?lang=En&n=ED0E12D7-1](http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=ED0E12D7-1)

## 5. Reference

Organisation for Economic Co-operation and Development. no date. Glossary for Statistical Terms. <http://stats.oecd.org/glossary/search.asp>