Canada-wide Strategy for Wastewater Effluent Management

In Canada, wastewater treatment plants (WWTPs) are managed under a shared jurisdiction, which has led to varying levels of treatment, maintenance and regulatory inconsistencies. Current treatment levels across approximately 3,500 wastewater facilities in Canada range from non-existent and poor to very good.

Consultation processes consistently indicated the need for a harmonized approach to regulate and manage wastewater facilities across Canada, and the adoption of national effluent standards, similar to those currently followed in the US and the European Union. To this end, the Canadian Council of Ministers of the Environment (CCME) has endorsed a Canada-wide Strategy for the Management of Municipal Wastewater Effluent to form part of the Fisheries Act. The proposed regulation was published on the Canada Gazette in March of 2010 for public and stakeholder consultation.

The strategy will require facilities to meet minimum National Performance Standards, and to develop and manage site-specific Effluent Discharge Objectives if necessary.

National Performance Standards

The adoption of National Performance Standards (NPS) aims to monitor pollutants common to most wastewater discharges and indicate if a second level of treatment for effluent will be required. The standards are:

- Average cBOD of less than or equal to 25 mg/L
- Average concentration of suspended solids of less than or equal to 25 mg/L
- Average concentration of total residual chlorine of less than or equal to 0.02 mg/L
- Maximum concentration of un-ionized ammonia of less than 1.25 mg/L, at 15°C +/- 1°C

Secondary level of treatment for these parameters removes 95% of conventional pollutants in wastewater (BOD, TSS and nutrients). Medium and large facilities will also be required to test whole effluent acute toxicity. If a facility fails this test, a toxicity reduction and evaluation process must be initiated. National Performance Standards will not initially apply to facilities in Nunavut, NWT, Yukon, Newfoundland and Labrador.
WASTEWATER EVALUATION & MONITORING

Compliance Monitoring

Wastewater facilities will be required to regularly monitor their discharge for compliance with the NPS and toxicity. Testing frequencies and requirements are dependant on daily volumes as follows:

<table>
<thead>
<tr>
<th>Facility Size</th>
<th>Flow (m³/day)</th>
<th>Total Residual Chlorine</th>
<th>TSS &amp; CBOD</th>
<th>Acute Tox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Small</td>
<td>&lt; 500</td>
<td>Daily</td>
<td>Monthly</td>
<td>NA</td>
</tr>
<tr>
<td>Small</td>
<td>500 - 2,500</td>
<td>Daily</td>
<td>Monthly</td>
<td>NA</td>
</tr>
<tr>
<td>Medium</td>
<td>2,500 - 17,500</td>
<td>Daily</td>
<td>Bi-weekly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Large</td>
<td>17,500 - 50,000</td>
<td>2x/day</td>
<td>Weekly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Very Large</td>
<td>&gt;50,000</td>
<td>3x/day</td>
<td>5x/week</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

Chronic toxicity was initially listed as a required test in addition to acute toxicity for compliance monitoring. Due to cost concerns by municipalities, Environment Canada will likely remove chronic toxicity from the list, though it may still be necessary if survival growth and reproduction studies are required.

Site-Specific Effluent Discharge Objectives

Facilities will be required to conduct a site-specific risk assessment which includes a one-year initial characterization monitoring program, to determine Effluent Discharge Objectives (EDOs).

Monitoring for Substances & Test Groups for Initial Characterization (over 1 year), Continuous Discharge

<table>
<thead>
<tr>
<th>Facility Size</th>
<th>Category</th>
<th>TRC</th>
<th>CBOD, TSS, Nutrients &amp; E.Coli</th>
<th>Substances / Test Groups</th>
<th>Acute Tox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Small</td>
<td>1</td>
<td>Daily</td>
<td>Monthly</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Small</td>
<td>2</td>
<td>Daily</td>
<td>Monthly</td>
<td>NA</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Medium</td>
<td>3</td>
<td>Daily</td>
<td>Bi-weekly</td>
<td>Quarterly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Large</td>
<td>4</td>
<td>2x/Day</td>
<td>Weekly</td>
<td>Quarterly</td>
<td>Monthly</td>
</tr>
<tr>
<td>Very Large</td>
<td>5</td>
<td>3x/Day</td>
<td>5 days / week</td>
<td>Quarterly</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

The parameter groups include the following:

- Nutrients and Pathogens:
  Total ammonia nitrogen, TKN, and total phosphorous. Temperature and pH must also be measured to determine the level of toxicity of ammonia.

- Substances and Test Groups:
  Anions, metals, mercury, COD, OC Pesticides, PCBs, PAHs, total cyanide, pH, VOCs, phenolic compounds, surfactants and any other substance associated with industrial processes that discharge into the sewer system.
How Maxxam Can Help

With the only national network of analytical laboratories and service centres in Canada, (including three specialized Ecotox Labs located in Burnaby, Edmonton and Quebec City), Maxxam is ideally prepared to assist municipalities across Canada with all the testing required to comply with this regulation. This includes acute and chronic toxicity testing, in addition to Toxicity Identification Evaluations (TIE) and Toxicity Reduction Plans.

Though this regulation will likely not come into effect until 2013, Maxxam is already providing assistance and advice to municipalities that are taking a proactive approach to prepare for these changes. We are committed to being your partners in ensuring a cost-effective yet rigorous scientific approach to meeting these regulatory requirements.

With specialized processes in place to readily support medium to very large facilities (those with continuous daily discharge effluent of > 2,500 m$^3$), our customer service team is trained and ready to answer your questions.

We have prepared the following documents for your reference:

- TIE Fact Sheet
- Maxxam’s Ecotoxicology Capabilities Overview
- CCME Wastewater Effluent Analytical Testing Parameters

For more information about this regulation, visit
http://www.ccme.ca/assets/pdf/cda_wide_strategy_mwwe_final_e.pdf

About Maxxam

Maxxam’s Environmental Services group is the market leader in environmental analytical services to clients concerned with potential soil, water and air contaminants. Our data helps clients comply with environmental regulations and standards that protect the health and safety of people and our environment.

Founded over 40 years ago, Maxxam is the market leader in analytical services and solutions to the energy, environmental, food and DNA industries. Maxxam’s 2,000 dedicated employees proudly lead the industry in depth of technical and scientific expertise and serve customers through the only national network of laboratories. In processing over 2,200,000 samples and generating in excess of 38,000,000 results annually, Maxxam skilfully combines efficiency and customer service with rigorous science and uncompromising quality management. Maxxam is committed to success with responsibility – to its stakeholders, to its communities, and to the environment.