



**REVIEW OF EXISTING MUNICIPAL WASTEWATER  
EFFLUENT (MWWE) REGULATORY STRUCTURES IN  
CANADA**

*-- Final Report --*

*Prepared for:*

**Canadian Council of Ministers of the Environment (CCME)**

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Claude Fortin, as project manager and Sub-committee Chair, provided the leadership and direction required to undertake and complete the study within the timeline required. All contents of the report are the responsibility of Marbek Resource Consultants.

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## EXECUTIVE SUMMARY

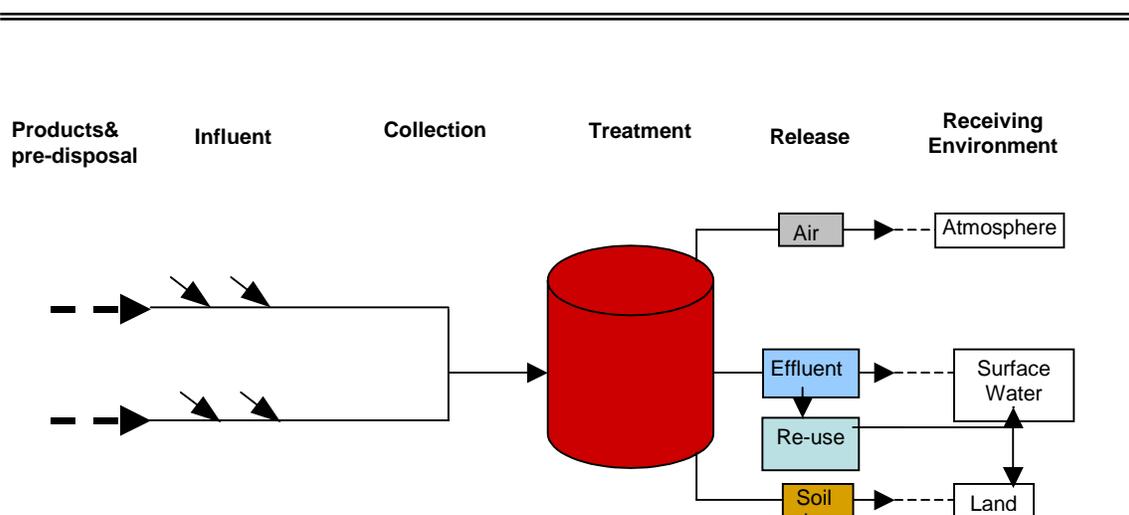
In November 2003, the Canadian Council of Ministers of the Environment (CCME) agreed to engage in the development of a Canada-wide Strategy for municipal wastewater effluent (MWWE). The 14 federal, provincial and territorial member jurisdictions are proposing to develop a Canada-wide Strategy for the management of MWWE where the outcome of the process will be an effective, efficient and harmonized management approach for MWWE. As part of the harmonization process, the Canada-wide Strategy will examine requirements for MWWE at the municipal, provincial, territorial, and federal levels. This report is one of four streams of investigation and is part of the regulatory structure review stream of inquiry. The others include risk-based decision making processes, science and technology review and economic implications.

The purpose of this report is to document, summarize, and analyze current and imminent regulatory measures for MWWE in Canada for several government jurisdictional levels including: federal and aboriginal; provincial and territorial; and, municipal regional and local levels. The focus of this study is on the current status (as of early 2005) of the regulatory structures, with insights to changes planned within about the next twelve months.

Municipal wastewater effluents are the liquid wastes that are discharged to the environment from community’s sewer systems and wastewater treatment plants (WWTPs). These wastes are of two types: sanitary sewage or wastewater, which comes from homes, businesses, institutions, and industries, and stormwater, which comes from rain or melting snow that drains off rooftops, lawns, roads, and other urban surfaces. In this report these wastes do not include releases from separate stormwater sewer systems. The term ‘municipal’ is used in a generic sense in this report and is interchangeable with ‘community’. ‘Municipal’ includes wastewater systems owned by local municipalities, regional municipal governments, provincial and territorial agencies, federal departments and aboriginal communities in rural, urban or mixed developments.

Exhibit ES.1 following indicates the analytical framework used as a basis for analysis of results of this study. The framework identifies six components of a generic municipal wastewater system. Each component is more fully defined within the text (Section 2.2).

**Exhibit ES.1**



A total of 46 jurisdictional profiles were developed through interviews and written responses from jurisdictional representatives. Two federal profiles were developed: one profile as the government of the nation and a second as facility / landowner / ultimate Water Board authority in the Territories of Nunavut and North West Territories and as funder of Aboriginal infrastructure (Federal House). In addition, profiles were developed for 10 provinces, 3 territories, 3 Aboriginal communities and 28 municipalities. Profiles are provided in Appendices A through E.

*Federal and Aboriginal Lands Structure*

The federal regulatory structure has two key pieces of legislation of particular importance to MWWE: the *Canadian Environmental Protection Act 1999* and the *Fisheries Act*. In addition, in its national role, the federal government negotiates international agreements that in some cases have implications for municipal management of wastewater collection and treatment systems. Examples of such agreements include the Kyoto Protocol and the Great Lakes Water Quality Agreement. The federal government also has Federal House responsibilities that it manages primarily through the use of the *Fisheries Act* and federal guidelines. These responsibilities include Aboriginal Lands. An exception to the use of guidelines applies in Nunavut and the Northwest Territories where Water Boards, under the direction of the department of Indian and Northern Affairs (INAC), issue permits for municipal wastewater facilities. All federal Acts and Regulations also apply to Federal House facilities.

*Provincial Structure*

Table ES.1 summarizes the variety of practices adopted by the provinces in managing municipal wastewater systems and effluents. As can be seen from this table, there is no aspect of MWWE management for which all provinces share a common approach. This table provides an overview only; refer to Appendix C for more detailed information.

**Table ES.1  
Provincial Overview**

Province	Delegates Authority for Municipal Sewer Use Bylaws	Regulates Back-stop/ support for Municipal Sewer Use Bylaws	Collection System: Provincial Approval/ Permit for Construction	Collection System: Approval/ Permit for Operation	Treatment Plant: Provincial Approval/ Permit for Construction	Release to water
NL	No	N/A	Required	Planning an Operations Permit	Yes; 2 year limit	Permit required; environmental and fiscal considerations
PEI	Yes	Yes	Required	Guidelines for I/I	Yes; separate permit for operations	Permitted numerical concentrations; loading where applicable
NS	Yes	Yes	Required	Guidelines for I/I	Yes, includes operations	Permit required; site specific study required
NB	Yes	No	Required	Guidelines for I/I	Yes, separate permit for operations	License required; study if less than 8:1 dilution

Province	Delegates Authority for Municipal Sewer Use Bylaws	Regulates Back-stop/support for Municipal Sewer Use Bylaws	Collection System: Provincial Approval/ Permit for Construction	Collection System: Approval/ Permit for Operation	Treatment Plant: Provincial Approval/ Permit for Construction	Release to water
QC	Yes	No	Required	No	Yes, no permit for operations	Permitted to site-specific conditions
ON	Yes	No	Required	No	Yes	Minimum plus site-specific requirements
MB	Yes	No	Required	I/I limits in license to upgrade sewers	Yes, includes operations	Avoidance response by biota; allocation factor
SK	Yes	No	Required	Same permit as for treatment	Yes, separate permit for operations	Minimum plus site-specific requirements
AB	Yes	No	Required	No	Yes, one permit for construction through to reclamation	Minimum plus site-specific requirements
BC	Yes	No	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Minimum plus site-specific requirements

*Territorial Structure*

Yukon is the only Territory currently with delegated authority for water management. Water Boards are in place for all Territories with authority in the Yukon resting with the Yukon Minister and authority in NWT and Nunavut resting with INAC. Water Boards issue permits for wastewater systems, including collection, treatment and release components. Effluent discharges are based on site-specific conditions and with northern requirements identified.

*Municipal Structure*

From our survey, municipalities typically have sewer use bylaws. The exceptions are primarily small, residential (excluding the province of Newfoundland and Labrador, which does not delegate authority for sewer use control to municipalities). A wide range of materials, chemicals, and conditions for discharge are identified in the sewer use bylaws with corresponding objectives that range from narrow to broad. Sewer use bylaw objectives of municipalities include:

- Municipal staff and infrastructure protection
- System efficiency and use
- Prevent stormwater and ‘clear’ water from entering the system
- Protect sludge or biosolids quality
- Public and property protection
- Environment Protection.

There is variation in municipal sewer use bylaws that reflects the respective Provincial expectations and the decisions of municipal councils. Accordingly, there is no common view among municipalities of the municipal role in environmental protection and in particular the most effective municipal role and authority for source control of inputs to sewer systems.

### *Product and Pre-disposal*

The federal government is the only government involved in product and pre-disposal controls of significance for municipal wastewater.<sup>1</sup> Federal controls at this level occur primarily through *CEPA 1999*.

### *Influent*

The federal government (through *CEPA 1999* and the *Fisheries Act*), some provincial governments and many municipal governments have regulatory or management measures controlling or managing influent sources to municipal wastewater systems. One Aboriginal community contacted also has an influent control bylaw although enforcement is a serious limitation in the effectiveness of this bylaw. The Yukon Territory and those provincial governments that do not have influent control regulations expect municipalities to develop sewer use bylaws.

### *Collection*

All but one province (BC) issue permits for construction of sewer systems. Most provinces do not issue operational permits for collection systems. BC manages overflows through the Municipal Sewage Regulation as part of the Liquid Waste Management Plan process. Combined sewers are discouraged in all jurisdictions. Municipalities may identify specific collection controls in sewer use bylaws to limit groundwater, stormwater or other ‘clear’ water entering the sewer system.

### *Treatment*

The federal government has established treatment system performance objectives for certain toxic substances under *CEPA 1999*. To date, substances covered include ammonia, inorganic chloramines and chlorinated wastewater effluents (the later 2 substances are expressed as total residual chlorine). In most cases, the federal objectives under *CEPA 1999* instruments are more stringent for total residual chlorine and for ammonia concentrations than those specified through provincial permits.<sup>2</sup> Provinces and Water Boards establish performance and/ or technology requirements for wastewater treatment. The mechanism for communicating these requirements is typically a permit to construct or operate, although BC has moved to performance-based requirements through the Municipal Sewage Regulation.

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<sup>1</sup> The province of Saskatchewan imposes an environmental surcharge on each can of motor oil sold to encourage reuse. This market measure is a management instrument for a product that would have some influence on municipal wastewater effluent quality control.

<sup>2</sup> Duplication Analysis Report, 2004

*Release*

The federal government has significant regulatory involvement with respect to release of water to the environment through the FA. The FA does not have a regulation defining acceptable releases for the municipal wastewater sector and so the broad restrictions on release of deleterious substances apply to wastewater releases. This is a significant issue for the sector since the FA provisions are not necessarily satisfied by conditions for effluent release as identified in the facility permit from the province or Water Board. Provinces and Yukon Territory implicitly or explicitly incorporate the concept of mixing zones (also called initial dilution areas) into their release policy and/or permits.

*Monitoring and Reporting*

Through *CEPA 1999*, the federal government requires reporting to the NPRI of releases by wastewater treatment facilities meeting the reporting threshold requirements. Monitoring may also be undertaken as part of *Fisheries Act* compliance inspections. Provinces and Water Boards undertake compliance monitoring, however the municipalities are typically the most significant source of information through reports to the provincial or Board level. Municipalities may or may not monitor for bylaw compliance, depending on resources available and the provisions or complexity of their bylaws.

*Gaps, Overlaps and Opportunities*

Table ES.2 illustrates a simplified representation of the legislation and controls at jurisdictional levels. Using the model wastewater system as a basis for analysis, there are regulatory controls in place by at least one level of government for all components of the system.

**Table ES.2  
Simplified Representation of Controls at Jurisdictional Levels**

Area of Regulation	Product/Pre-disposal controls	Source Controls for Municipal Systems	Collection System Construction Controls	Treatment Controls	Release
Typical characteristics of Requirements	Pollution Prevention	Pollution Prevention or Performance Based	Performance Based or Technology Based	Performance Based or Technology Based	Performance Based
Federal Legislation (National role)	CEPA	CEPA and FA		CEPA	FA
BC			Regulation (MSR) and LWMP	Regulation (MSR) and LWMP	Regulation (MSR) and LWMP
AB			Permits	Permits	Permits
SK			Permits	Permits	Permits

Area of Regulation	Product/Pre-disposal controls	Source Controls for Municipal Systems	Collection System Construction Controls	Treatment Controls	Release
MB			Permits	Permits	Permits
ON			Permits	Permits	Permits
QC			Permits	Permits	Permits
NB			Permits	Permits	Permits
NS		Regulated limits as back-stop	Permits	Permits	Permits
PE		Regulated limits as back-stop	Permits	Permits	Permits
NL		Regulated limits and Industrial Permits	Permits	Permits	Permits
Yukon Territory (through Water Board)			Permits	Permits	Permits
Municipal Legislation		Bylaws (wide variance)	(minor)		

*Product Level Controls*

No overlaps of the federal government with other jurisdictions exist in the area of product level controls. Gaps in the control of certain substances appropriate for CEPA 1999 controls in products are likely. An opportunity exists to identify criteria and a process to determine the most suitable and effective level of government to undertake control of a substance, a process that does not currently appear to be in place on a formal basis.

*Influent Controls*

Influent controls are addressed to some degree by all levels of government when examined on a national scale (although practices in individual provinces/ territories differ). There are potential gaps in influent controls in areas of the country where provincial/ territorial regulations or programs and municipal bylaws do not establish discharge limits or establish adequate discharge practices for dischargers of potential concern.

### *Collection System*

Construction of municipal collection systems is subject to regulatory control at the provincial and Water Board level. There are gaps in coverage for the operation of collection systems in some jurisdictions. There is no permitting or licensing process for construction or operation of federal collection facilities and thus a gap exists for this Federal House function.

### *Treatment Controls*

Provincial and Water Board requirements may include CEPA toxics, although the specific requirements (i.e. limits specified in permits) do not duplicate the federal requirements in many instances. From the perspective of municipal practitioners this is perceived to be an area of overlap. There are gaps in some jurisdictions with respect to permits or licenses for wastewater facilities operations. There is no permitting or licensing process for construction or operation of federal wastewater treatment facilities and thus a gap exists for this Federal House function.

### *Release*

The federal government also regulates releases to the environment through the *Fisheries Act* and also manages substances identified as toxic under *CEPA 1999*. Provincial governments and Water Boards control releases through permits or guidelines for release. Again, from the perspective of municipal practitioners, this is perceived to be an area of overlap. The *Fisheries Act* does overlap with the provincial/ Water Board permitting structures. Some jurisdictions have made initial efforts to harmonize these requirements by specifying no acute lethality of the effluent in laboratory bioassay tests. These requirements are not implemented in all facilities in any jurisdiction.

### *Other Potential Gaps and Opportunities*

Three additional potential gaps and one additional opportunity were also identified by contacts in the study:

- The absence of adequate watershed level information to plan and understand the implications of current and future allocations for water uses and assimilation capacity for discharges is a significant gap.
- There is no clear process to identify emerging issues (such as pharmaceuticals and endocrine disruptors for example) or to incorporate them into technologies and practices of wastewater treatment facilities if they eventually are determined to be toxic under *CEPA 1999*. This gap also presents an opportunity to identify the role of *CEPA 1999* in identifying potentially toxic substances present in municipal wastewater and an opportunity to develop a process to adjust permits or standards for wastewater treatment plants as emerging substances of concern become resolved.
- Some municipalities are operating on their own initiative to exceed the provincial license effluent requirements. These actions may indicate the perception of a gap between permitted discharges and the requirements to adequately protect the receiving environment.
- Opportunities exist to examine existing harmonization agreements for successes and to adopt similar principles or approaches where suitable.

- Finally, an opportunity exists to develop or update provincial model sewer use bylaws or to perhaps develop two or three national model bylaws on the basis of population and level of industrial development.

Table ES.3 summarizes the gaps, overlaps and opportunities discussed above.

**Table ES.3  
Summary of Gaps, Overlaps, Opportunities Identified**

Areas of Regulation	Product/ Pre-disposal controls	Influent Controls	Collection System Controls	Treatment Controls	Release	Other
<b>Gap</b>	Likely	Potential gaps in coverage of ICI discharges and/ or substances coverage	Operations permits; Federal House construction and operations permits	Federal House construction and operations permits	Possible gap in level of protection from permit and that needed for environmental protection	<ul style="list-style-type: none"> <li>• Watershed level decision-making</li> <li>• Emerging issues of concern</li> </ul>
<b>Overlap (Note overlap is not necessarily duplication or negative)</b>		Possible for <i>Fisheries Act</i> and some municipal sewer use bylaws		CEPA toxics and associate performance requirements (2 substances to date)	Mixing zones in facility permits overlap and are inconsistent with the <i>Fisheries Act</i>	
<b>Opportunity</b>	Criteria and process to determine the most suitable/ effective level to control a substance (i.e. product or influent source control level)	Develop model sewer use bylaws (National? Provincial/ Water Boards?)		Harmonization of CEPA requirements with facility permits (examine existing examples of regulatory harmonization)	Harmonization of <i>Fisheries Act</i> and <i>CEPA 1999</i> with facility permits (examine existing examples of regulatory harmonization)	<ul style="list-style-type: none"> <li>• Identify role of CEPA in identifying potentially toxic substances and establish a process to adjust permits/ standards</li> </ul>

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## GLOSSARY OF TERMS

For the purposes of this report, the meaning of certain terms used is defined following.

**Backstop Regulation:** Regulations that set a minimum standard of performance in support of policies, programs, voluntary measures or lower tier regulations whose objectives exceed those of the backstop regulation. In this report, backstop regulation is used in reference to provincial regulations that establish sewer discharge limits as a minimum province-wide standard but municipal sewer use bylaws may impose more stringent requirements in keeping with local needs and/ or goals.

**Community Size:** Community size is determined by population, as indicated following:

Small	Less than 10,000 people
Medium	10,000 to less than 100,000 people
Large	100,000 to 999,999 people
Very Large	Greater than 1,000,000

**Northern Community:** Northern communities are determined following approximately the Statistics Canada definition and map, available at:

<http://www.statcan.ca/english/research/92F0138MIE/92F0138MIE2000003.pdf> (accessed January 2005).

**Remote Community:** Statistics Canada has no formal definition of ‘remote community’. For this report, urban centres are not considered remote, irrespective of location. Remote communities are communities over 100 km from a population centre of 10,000.

**Rural Community:** Statistics Canada has several definitions of rural that are used for various analyses. Designation of “rural” for this study was taken from StatCan 2001 Census tables, available at <http://www12.statcan.ca/english/census01/products/standard/popdwell/Table-UR-PS.cfm> (accessed January 2005).

## LIST OF ACRONYMS

<b>BOD</b>	Biochemical Oxygen Demand
<b>CCME</b>	Canadian Council of Ministers of the Environment
<b>CEPA</b>	<i>Canadian Environmental Protection Act</i>
<b>COD</b>	Chemical Oxygen Demand
<b>CRD</b>	Capital Regional District (Victoria)
<b>CSO</b>	Combined Sewer Overflow
<b>EC</b>	Environment Canada
<b>FA</b>	<i>Fisheries Act</i>
<b>GHG</b>	Greenhouse gas emissions
<b>GVRD</b>	Greater Vancouver Regional District
<b>HC</b>	Health Canada
<b>I/I</b>	Inflow and Infiltration
<b>INAC</b>	Indian and Northern Affairs Canada
<b>LWMP</b>	Liquid Waste Management Plan
<b>MWWE</b>	Municipal Wastewater Effluents
<b>NB</b>	New Brunswick
<b>NL</b>	Newfoundland and Labrador
<b>NPRI</b>	National Pollutant Release Inventory
<b>NWT</b>	Northwest Territories
<b>P</b>	Phosphorus
<b>PEI</b>	Prince Edward Island
<b>POP</b>	Persistent Organic Pollutant
<b>SS</b>	Suspended Solids
<b>TSS</b>	Total Suspended Solids
<b>UPOP</b>	Unintentionally Produced POP
<b>YT</b>	Yukon Territory

## 1. INTRODUCTION

### *The CCME Agreement to Develop a Canada-wide Strategy*

The Canadian Council of Ministers of the Environment (CCME) is a forum that recognizes the shared jurisdiction of environmental issues between the federal, provincial and territorial governments. The *Canada-wide Accord on Environmental Harmonization* establishes a framework for CCME co-ordination of environmental issues and standards. The *Canada-wide Environmental Standard Sub-Agreement* is a framework for federal, provincial, and territorial Environment Ministers to co-operatively address key environmental protection and health risk reduction issues that require common environmental standards across the country.

In November 2003, the Canadian Council of Ministers of the Environment (CCME) agreed to engage in the development of a Canada-wide Strategy for municipal wastewater effluent (MWW). The 14 federal, provincial and territorial member jurisdictions are proposing to develop a Canada-wide Strategy for the management of MWW where the outcome of the process will be an effective, efficient and harmonized management approach for MWW. As part of the harmonization process, the Canada-wide Strategy will examine requirements for MWW at the municipal, provincial, territorial, and federal levels. A Development Committee (DC) has been established under CCME to develop a Strategy for the management of MWW. The DC is composed exclusively of CCME member jurisdictions. Four streams of investigation are on-going concurrently: regulatory structure review; risk-based decision making processes; science and technology review; and economic implications.

### *Purpose of this Report*

The purpose of this report is to document, summarize, and analyze current and imminent regulatory measures for MWW in Canada for several government jurisdictional levels, including: federal and aboriginal; provincial and territorial; and, municipal regional and local levels. The focus of this study is on the current status (as of early 2005) of the structures, with insights to changes planned within about the next twelve months. An analysis of gaps, overlaps and potential opportunities is presented. This report was initiated in December 2004, under the direction of the Harmonization Sub-Committee to the Development Committee and will be one of the foundation pieces for reference during multi-stakeholder discussions to develop the harmonized framework for MWW.

### *Report Format*

This report is presented in five parts including this introductory section:

- Section 2 provides background including definitions and the analytical framework for structures
- Section 3 provides profiles of the regulatory structures for jurisdictions studied
- Section 4 provides the analysis of gaps, overlaps and opportunities for the regulatory Structure.

## 2. BACKGROUND

### 2.1 DEFINITION OF THE MUNICIPAL WASTEWATER SECTOR

Municipal wastewater effluents<sup>3</sup> are the liquid wastes that are discharged to the environment from community's sewer systems and wastewater treatment plants (WWTPs). These wastes are of two types: sanitary sewage or wastewater, which comes from homes, businesses, institutions, and industries, and stormwater, which comes from rain or melting snow that drains off rooftops, lawns, roads, and other urban surfaces. Since the mid-1950s, most communities in Canada have built separate sewer systems for sanitary wastewater and stormwater, but in older neighbourhoods both sanitary wastewater and stormwater are often carried together in a combined sewer system. Heavy storms can cause overflows of sanitary wastewater and stormwater from the combined system directly into the receiving water body.

It should be noted that the term 'municipal' is used in a generic sense in this report and is interchangeable with 'community'. 'Municipal' may include wastewater systems owned by local municipalities, regional municipal governments, provincial and territorial agencies, federal departments and aboriginal communities in rural, urban or mixed developments.

In Canada, municipalities treat wastewater with a wide range of systems from screening and/ or settling to advanced treatment to remove a range of contaminants, whereas some communities dispose of municipal wastewater directly to receiving waters. Municipal wastewater effluents include those effluents discharged directly from sewer systems to receiving waters, as well as effluents from public wastewater treatment facilities to receiving waters. For the purposes of this study, municipal wastewater effluents do not include private septic systems nor do they include private wastewater treatment systems installed by industrial, commercial or institutional organizations (although the wastewater discharged to a public sewer system from these private systems may become a component of the municipal wastewater effluent). In this report municipal wastewater also does not include releases from separate stormwater sewer systems. Municipal wastewater effluents may include wastewater infrastructure that is privately operated through contract to a municipal government.

In addition to effluents, treatment and/ or release of municipal wastewater results in air emissions and solids, including screen and grit materials, floatables and scum, and biosolids – a product of biological treatment processes.

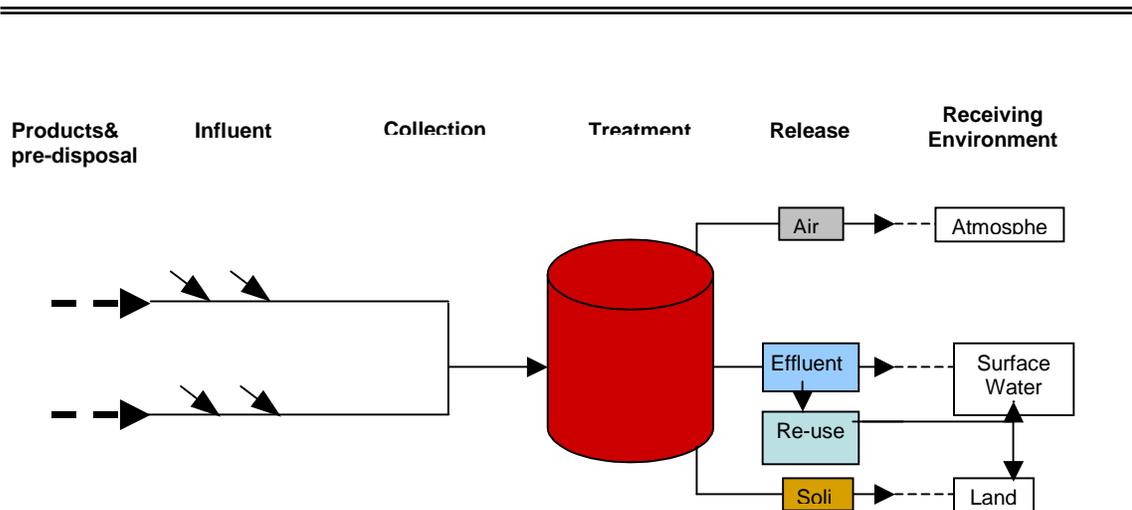
### 2.2 FRAMEWORK FOR THE ANALYSIS

The Request for Proposals for this study identified an analytical framework, based on the components of a generic municipal wastewater treatment system. Exhibit 1 (overleaf) indicates this system, which includes six components described further in this Section.

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<sup>3</sup> Definition adapted from: The State of Municipal Wastewater Effluents in Canada, <http://www.ec.gc.ca/soer-ree/English/soer/MWWE.pdf>, accessed January 2005.

**Exhibit 1**



***Product or Pre-disposal***

With respect to a municipal wastewater system, product or pre-disposal stage measures are activities related to residential (household), commercial, institutional, and industrial products that:

- Prevent products, or substances within products, from being used in processes or products
- Control or limit the amount of the substance used; or
- Prescribe methods of disposal of substances to prevent discharge to sewers.

Product or pre-disposal measures are pollution prevention measures. As such, these measures result in either no possibility of the substance entering a sewer collection system over time or limit the amounts of the substance entering a sewer collection system. The international agreement on persistent organic pollutants and specific regulations under the federal *Canadian Environmental Protection Act 1999 (CEPA 1999)* are two examples of product or pre-disposal measures, as discussed further in this report.

***Influent (Sewer Sources)***

For the purposes of this analysis, influent management measures limit pollutant discharges to the sewerage system. Influent controls often focus on industrial, commercial and institutional (ICI sector) discharges to municipal wastewater systems, but may also include residential, construction, and other activities. Controls may prohibit discharges to the sanitary and/ or storm sewer systems, or they may specify maximum concentration limits for substances or other management measures. Influent management measures do not normally focus on how the substances are to be limited in discharges to sewers. Meeting the source control measures, including regulatory requirements, may require the ICI sector to remove toxic specific pollutants through pre-treatment prior to discharge to the sewer collection system, by recycling of waste by-products, through manufacturing process changes, or by substitution of raw materials. Thus, influent measures may result in pollution prevention instruments or in pre-treatment measures by

the ICI facility or other target sectors. (Note that ‘source controls’ in this context differs from some uses of the term where it means pollution prevention measures specifically.)

According to the National Research Council’s Best Practice document (*InfraGuide*) for Wastewater Source Control (2003), the main objectives of source control are to:

- Manage demand
- Protect sewer workers from toxic, flammable or explosive materials
- Protect the sewer infrastructure from corrosive materials, including for example acids, rocks and sand
- Protect the wastewater treatment processes from substances which may upset the treatment process
- Protect the environment from toxic organics and trace metals
- Improve the quality of biosolids.

Strategies to promote these objectives for municipal wastewater effluents may include: sewer-use bylaws, financial incentives and wastewater rates, clearly defined monitoring requirements, enforcement and compliance activities, education and awareness programs, codes of practice or best management plans, integrated storm water management planning, construction and maintenance activities and pollution prevention plans.

### ***Collection***

The collection systems are the pipes, pumping stations and other associated infrastructure that conveys wastewater to receiving water bodies and/ or wastewater treatment facilities. Three basic types of collection systems are: sanitary, storm and combined. In addition to inflow of surface water (through street access covers, for example), sanitary sewer systems inevitably have infiltration of groundwater. Inflow and infiltration (I/I) are of potential concern when these flows reduce the capacity of the sanitary collection system to handle sanitary flows or when they use significant energy and resources that could otherwise be saved. The age, level of maintenance, and groundwater table characteristics all contribute to the amount of extraneous flows entering a collection system.

### ***Treatment***

A municipal wastewater system may or may not have treatment. Where treatment is in place, it can be thought of in terms of four treatment levels. It must be noted that terminology regarding wastewater treatment levels is not standard across Canada and therefore use of simplified terms, such as secondary treatment, may cause confusion. That said, treatment may consist of simple screening (preliminary), settling processes (primary); biological processes to reduce biological oxygen demand, suspended solids and associated contaminants (secondary), biological processes plus process enhancements to remove phosphorus or nitrogen (enhanced secondary, also sometimes called tertiary); and, secondary plus additional filtering or advanced processes to remove metals or other specific contaminants (tertiary).

Wastewater effluents may be disinfected prior to release. The most common methods of disinfection in Canada are chlorination and ultra-violet radiation. Wastewater treatment facilities may also have biosolids processing facilities to treat solids generated in the process. Biosolids may be treated to varying levels, measured in terms of pathogen risk.

Design, operation and maintenance of a treatment facility will influence the effectiveness and efficiency of the system in removing contaminants from the water phase, as will seasonal and weather trends. The state of the collection system will also factor into the efficiency of the treatment process.

### ***Release***

For the purposes of this analysis, release to the environment represents the final stage within the generic wastewater model where management actions are applied to a wastewater system. Release, for example, includes mixing zones for releases to water. Beyond the release area, the environment is not within the realm managed as part of wastewater effluents. Releases from municipal wastewater systems can be in three forms: air; water; and, solids. Air releases may occur due to spontaneous release of volatile contaminants as the wastewater contacts air; as a result of aeration processes; and also, as a result of process equipment use resulting in release of greenhouse gases (where energy sources are carbon-based).

Water releases occur as wastewater effluent is discharged to receiving water environments or as sewer systems surcharge under unusual conditions or during storms. Water releases may be to groundwater via exfiltration. (Note that this report focuses on releases to surface waters).

Solids are released as part of the effluent releases (i.e. the water releases), in suspended form where treatment takes place and as floatables and other large particles where no treatment is in place. Where wastewater treatment is in place, solids are also released as a result of various phases of the process (described under Treatment, above). Release from a wastewater treatment facility may also include release for water reuse, most typically for irrigation. Land releases may include deposit in landfill sites as well as use on land, in particular agricultural lands. Indirectly, groundwater may be affected by releases to land, as can flora and fauna of an environmental region.

### ***Environment***

The natural environment beyond the mixing zone, i.e. water, land, air, flora, fauna, may be measured against national, provincial or site-specific guidelines, and its health reflects a combination of influences. The ambient environment in this analysis is outside the management realm of wastewater effluents, although it may be influenced by wastewater as well as other local, regional or global inputs.

## **2.3 METHODOLOGY TO PROFILE REGULATORY STRUCTURES**

To undertake an analysis of the regulatory structure across Canada, the study team needed to profile the federal structure, all territorial and provincial jurisdictional structures, and a representative sample of municipal structures and First Nations communities. Marbek initially identified 40 candidate municipalities with the objective to obtain a mix of population sizes, and characteristics. As well, Development Committee and sub-committee representatives provided suggestions for municipalities to profile.

In total, 48 municipalities and First Nations communities were identified on the initial list. Additional supporting data were researched to characterize the municipalities and to develop draft profiles of sewer management practices. The data source used to identify municipal populations was the *2001 Canadian Municipalities Select* database. An Internet search for legislation and bylaws was conducted. Other important information sources included the *Envision Municipal Sewer Use Database* (2000), published references for federal legislation (including the *Canadian Environmental Law Guide*) and the Statistics Canada website.

Once profiles of each jurisdiction were developed in draft, they were sent to jurisdictional representatives by email or fax for verification through telephone interview or by return written response. (Appendix F provides a sample of one of the questionnaires sent to municipalities and Aboriginal community representatives.) Four municipalities in Quebec were not contacted at the request of the Provincial representative. Twenty-five interviews were conducted to verify or supplement profile information, including interviews with representatives of Environment Canada, Indian and Northern Affairs, three Aboriginal communities, nine provinces, the Yukon Territory and ten municipalities. One province (Saskatchewan), 18 municipalities and 2 Territories provided written information. A total of 46 final profiles were developed through interviews and written responses from jurisdictional representatives.

### 3. JURISDICTIONAL PROFILE SUMMARIES

#### 3.1 INTRODUCTION

Profile summaries are provided following in four sections: Federal and Aboriginal Structure; Provincial Structure; Territorial Structure, and Municipal Structure. The profiles are summarized under sub-headings for each of the six components in the analytical framework described in Section 2.2 above, as well as other sub-headings for imminent changes planned and monitoring and reporting. Profiles themselves are provided in Appendices A through E. Additional details on municipal sewer use bylaws are provided under separate cover in Appendix G. Information in the Appendices is in summary form; please refer to original documents on individual legislation or regulation where details and verbatim text are required.

#### 3.2 FEDERAL AND ABORIGINAL REGULATORY STRUCTURES

The federal government has two groups of distinct roles, one as the government of the nation and a second as facility / landowner / ultimate Water Board authority in the Territories of Nunavut and North West Territories and as funder of Aboriginal infrastructure. The discussion in sub-section 3.2.1 following pertains to the first, national role. Profiles for the national role (Profile A) and the second role (Profile B) are provided in Appendix A

##### 3.2.1 Federal Regulatory Structure

The *Constitution Act* of 1867 (Sections 91 and 92) identifies the powers allocated between federal and provincial governments in Canada. Under the division of powers, the Canadian federal government has jurisdiction over subjects of a national, international or inter-provincial nature.<sup>4</sup> The *Constitution Act* clearly lists a number of specific subject areas and which level of government has primary responsibility, such as federal responsibility for protecting and conserving Canada's fisheries resources and its supporting habitats. Considering the date of the *Act* however, it is not surprising that "environment" is not a subject area listed. This silence of the *Act* regarding environment has resulted in shared jurisdiction of the federal and provincial governments for environment, and has necessitated clarification of responsibilities through court decisions on a case-by-case basis.

##### *Fisheries Act*

The *Fisheries Act (FA)* is a very significant piece of federal environmental legislation and it is the principle tool used by the federal government to ensure sustainable fisheries and habitats. The *FA* applies Canada-wide to any body of water that may contain fish. In addition, the legislation is broadly worded. The *Act* is administered by the federal Department of Fisheries and Oceans (DFO) and Environment Canada. Environment Canada has administrative and enforcement responsibilities for the pollution prevention provisions of the *FA* including Section 36 of the *Act*, which contains a prohibition of the

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<sup>4</sup> Parliament also has jurisdiction to regulate works wholly within a province that have been declared by Parliament to be works "for the general advantage of Canada or for the advantage of two or more of the provinces" (such as grain elevators and uranium mines).

deposit (release) of deleterious substances into waters frequented by fish unless authorized under regulations made by the Governor in Council. Also, the federal Cabinet has the power to delegate certain administrative duties under the *FA* to the provinces, such as licensing for sport fisherman. As such, most provinces have some delegated administrative authority under the *FA*.

At the time of drafting this report, there were no regulations under the *FA* that apply to municipal wastewater effluents. Regulations under the *FA* are in place for a number of industrial sectors, including pulp and paper and metal mining activities (see Federal Profile A in Appendix A for more detail).

#### *Canadian Environmental Protection Act, 1999*

*The Canadian Environmental Protection Act, 1999 (CEPA 1999)* is jointly administered by Environment Canada and Health Canada, and it is an Act respecting the protection of the environment and of human health in order to contribute to sustainable development. The Preamble identifies the principles of: sustainable development; pollution prevention; precautionary principle; polluter pays principle; and, removing threats to biological diversity. In decision-making, the preamble encourages consideration of traditional aboriginal knowledge, environmental or health risks, and social, economic and technical factors. The language of the Preamble reflects the evolution of the focus of environmental legislation from one of controlling wastes and requiring clean-ups to pollution prevention and a concern for ecosystem integrity. As such, it will be useful in interpreting the *Act* over time.

Many parts of *CEPA 1999* are concerned with management of toxic substances. *CEPA 1999* defines a substance to be toxic on the basis of its effects on environmental or biological diversity; its danger to the environment on which life depends; or its danger to human life or health. Depending on its characteristics and sources, a toxic substance may be managed through virtual elimination or through life cycle management. Toxic substances are listed in Schedule 1 of the *Act*. The key management objectives<sup>5</sup> with respect to toxic substances are:

- Virtual elimination from the environment of toxic substances that result predominantly from human activity and that are persistent and bioaccumulative; and
- Management of other toxic substances and substances of concern, throughout their entire life cycles, to prevent or minimize their release into the environment.

There are 11 Parts to the *Act*, of which Parts 2, 3, 4, 7 and 9 are of most interest. The *Act* identifies terms for public participation in Part 2. Part 3 establishes the authority for the National Pollutant Release Inventory (NPRI). The NPRI requires annual reporting of specific pollutant releases by sources meeting established criteria. Part 3, Sections 54 and 55 empower Environment Canada and Health Canada to establish objectives for any media, including water. Part 4 sets out the provisions that enables the Minister of Environment to require the preparation and implementation of pollution prevention plans for Schedule 1 toxic substances. Pollution prevention planning, as presented by Environment Canada, is a legal instrument that allows facilities to determine their own

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<sup>5</sup> Toxic Substances Management Policy, Government of Canada, Environment Canada, 1995 (EN 40-499/1-1995)

plan and methods for meeting objectives. Part 7 identifies pollution control powers for a number of federal areas of jurisdiction, including fuels, vehicle, engine and equipment emissions, and control of movement of hazardous wastes.

Part 9 of the *Act* pertains to Government Operations and Federal and Aboriginal Lands, granting the Environment Minister powers to require environmental management systems, pollution prevention plans, to regulate substances and other powers with respect to the federal house. The federal house includes federal departments, boards and agencies, federal works and undertakings, Crown corporations, federal land, persons on that land and other persons insofar as their activities involve that land, and Aboriginal land. Aboriginal land as defined in *CEPA 1999* is limited to reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the *Indian Act*; (b) land, including any water, that is subject to a comprehensive or specific claim agreement, or a self-government agreement, between the Government of Canada and aboriginal people where title remains with Her Majesty in right of Canada. This does not include Aboriginal land where the title of the land has been transferred to an Aboriginal or provincial government.

Under *CEPA 1999* there are 4 recent instruments relevant to municipal wastewater effluent that were published on December 4, 2004:

1. Guideline for Ammonia aimed at a concentration of ammonia in municipal wastewater effluent that is not acutely lethal to fish and does not induce chronic toxicity in the receiving waters;
2. Pollution prevention planning requirements for municipalities addressing inorganic chloramines and chlorinated wastewater effluents aimed at a concentration of total residual chlorine that is not acutely toxic in the effluent released to surface water;
3. Pollution prevention planning requirements for owners of wet processing textile mills addressing their use of nonylphenol (NP) and its ethoxylates (NPEs) as well as the toxicity of their effluents that are discharged to a municipal wastewater system;
4. Pollution prevention planning requirements for manufacturers and importers of Nonylphenol (NP) and its Ethoxylates (NPEs) contained in soap and cleaning products, processing aids used in the wet textile industry and pulp and paper processing aids.

*CEPA* must be reviewed every 5 years.

#### *International Agreements and Protocols*

The federal government has power to negotiate international agreements and commitments on behalf of all Canadian jurisdictions. Some of these agreements may have implications for the wastewater sector in terms of operations and also in terms of pollution prevention for substances of international or global concern. Three key agreements for the wastewater sector are outlined following.

### ***1. The Kyoto Protocol***

The Kyoto Protocol was signed by about 180 countries at Kyoto, Japan, in December 1997 as part of the Convention on Climate Change. The protocol commits 38 industrialised countries, including Canada, to cut their emissions of greenhouse gases (GHGs) between 2008 to 2012 to levels below 1990 levels. Canada has committed to reduce GHGs by 6%. Many municipalities have committed under the Partners for Climate Protection program to meet or exceed this target at the community and/ or municipal operations levels. Such a commitment has potential implications for wastewater operations, in particular where energy sources are primarily carbon-based.

### ***2. Protocols to the Convention on Long-range Transport of Air Pollution***

The Convention on Long-range Transboundary Air Pollution addresses some of the major environmental problems of the United Nations Economic Commission for Europe, which includes Canada. Canada, for example is signatory to the Protocol on Persistent Organic Pollutants (POPs) of 1998. Among 16 contaminants addressed, the Protocol on POPs restricts the use of PCBs. This protocol has implications for the wastewater sector in that it provides pollution prevention measures for contaminants of global origin and of potential concern in wastewater effluents.

Environment Canada is taking domestic action under each of the primary source control obligations of the *Stockholm Convention on Persistent Organic Pollutants*, including: prohibitions on production, use, export and import of POPs; measures to minimize unintentionally produced POPs (UPOPs); managing POP stockpiles and wastes; and disposing of them as required by the Convention. With respect to wastewater, the Stockholm Convention provides lists of primary and secondary source categories having potential for the formation and release of UPOPs such as PCBs. Wastewater is not identified as a source of POPs targeted for control measures.

### ***3. The Great Lakes Water Quality Agreement***

The governments of Canada and the United States signed the Great Lakes Water Quality Agreement (GLWQA) in 1972 and have since amended the agreement several times. Under the Agreement, which also includes the international section of the St. Lawrence River, the two countries commit to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem. A number of objectives and guidelines are identified to achieve goals. In 1987, a Protocol was signed amending the 1978 Agreement. The amendments aim to strengthen the programs, practices and technology described in the 1978 Agreement and to increase accountability for their implementation. Timetables are set for implementation of specific programs. New annexes address atmospheric deposition of toxic pollutants, contaminated sediments, groundwater, and non-point sources of pollution. Annexes are also added to incorporate the development and implementation of remedial action plans for Areas of Concern and lakewide management plans to control critical pollutants. This agreement has had implications for the wastewater sector within the Great Lakes Basin since it was signed. For example, Remedial Action Plan (RAP) areas were identified. RAPs focus on geographic areas of concern, take an ecosystem approach, and draw upon broad local

community involvement. Effluents in RAP areas may be required to meet stringent conditions, such as reduced phosphorus releases for example.

The Governments of Canada and the United States are in the process of reviewing the Canada - United States Great Lakes Water Quality Agreement (GLWQA). The process will be completed in 2006.

### **3.2.2 Aboriginal Community Wastewater Management Measures**

#### *Summary of Aboriginal Structures*

Responsibility for wastewater is shared between First Nation Band Councils and the federal government. In many cases it is the First Nation Band Councils that have the responsibility for ensuring that wastewater facilities are designed, constructed, maintained and operated in accordance with established federal or provincial standards, whichever are more stringent. In other cases, this responsibility rests with Indian and Northern Affairs Canada (INAC). The Federal Government has a fiduciary responsibility to act on behalf of First Nations, particularly in those communities that do not have full capacity to ensure delivery of the environmental service.

INAC provides funding to First Nations to assist them in the provision of water services within the reserve community and monitors the design, construction and maintenance of the facilities. INAC also provides funding assistance for operating and maintaining First Nations sewer facilities, and for the training of staff. A current priority is water treatment plant operators. Priorities are guided by INAC's First Nations Water Management Strategy (refer to Federal Profile B in Appendix A for a brief description of this strategy).

Profiles of sewer use bylaws and influent source controls of three First Nations communities are provided in Appendix B.

### **3.3 PROVINCIAL REGULATORY STRUCTURES**

As discussed in Section 3.2.2 above, the *Constitution Act* of 1867 identifies specific areas of jurisdictional authority for the provinces and federal governments. One of the most important areas of provincial jurisdiction for municipal wastewater effluents is provincial authority over local works and undertakings. This provides provinces with authority to issue and control operating permits and construction or alteration of industrial facilities. Provinces also have authority over development, conservation and management of non-renewable natural resources and forestry, and sites and facilities for production of electrical energy. In all provinces, human health concerns are a primary driver for regulatory controls on environmental releases.

Provinces have the authority to delegate their responsibilities to municipal governments, and the regulatory foundation for delegation of MWW is also identified in the provincial profiles, found in Appendix C.

### 3.3.1 Summary

The following table summarizes the variety of practices adopted by the provinces in managing municipal wastewater systems and effluents. This table provides an overview only; refer to Appendix C for more detailed information.

**Table 3.1  
Provincial Overview**

Province	Delegates Authority for Municipal Sewer Use Bylaws	Regulates Back-stop/support for Municipal Sewer Use Bylaws	Collection System: Provincial Approval/ Permit for Construction	Collection System: Approval/ Permit for Operation	Treatment Plant: Provincial Approval/ Permit for Construction	Release to water
NL	No	N/A	Required	Planning an Operations Permit	Yes; 2 year limit	Permit required; environmental and fiscal considerations
PEI	Yes	Yes	Required	Guidelines for I/I	Yes; separate permit for operations	Permitted numerical concentrations; loading where applicable
NS	Yes	Yes	Required	Guidelines for I/I	Yes, includes operations	Permit required; site specific study required
NB	Yes	No	Required	Guidelines for I/I	Yes, separate permit for operations	License required; study if less than 8:1 dilution
QC	Yes	No	Required	No	Yes, no permit for operations	Permitted to site-specific conditions
ON	Yes	No	Required	No	Yes	Minimum plus site-specific requirements
MB	Yes	No	Required	I/I limits in license to upgrade sewers	Yes, includes operations	Avoidance response by biota; allocation factor
SK	Yes	No	Required	Same permit as for treatment	Yes, separate permit for operations	Minimum plus site-specific requirements
AB	Yes	No	Required	No	Yes, one permit for construction through to reclamation	Minimum plus site-specific requirements
BC	Yes	No	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Municipal Sewage Regulation and Liquid Waste Mgmt Plan	Minimum plus site-specific requirements

### 3.4 TERRITORIAL REGULATORY STRUCTURES

As indicated in Section 3.2.1 above, the federal government is the ultimate authority for Water Boards in the Territories of Nunavut and NWT. The Yukon Territory was recently delegated authority for water resource management and has retained the Water Board structure except the Yukon Government has ultimate authority for Water Boards in the Territory. The profiles in Appendix D reflect these variations in Territorial authority.

#### 3.4.1 Summary

Yukon is the only Territory currently with delegated authority for water management. Water Boards operate in Yukon under a similar structure as prior to devolution, with the exception that the Board falls under the direction of the Territorial Premier rather than the federal government. Nunavut and NWT water resources are managed by the federal government through INAC with delegated authority to Water Boards. Water Boards issue permits for wastewater systems, including collection, treatment and release components, usually based on site-specific conditions and with northern requirements identified.

### 3.5 MUNICIPAL REGULATORY STRUCTURES

This Section summarizes the characteristics of municipalities profiled and summarizes the results of the review of municipal sewer use bylaws. Municipal jurisdictions were identified and profiled as described in Section 2.3 above. Profiles of municipal wastewater regulatory structures are presented Appendix E, sorted first by province and next alphabetically by municipality.

#### 3.5.1 Municipalities Profiled

Table 3.2 provides a summary of the municipalities profiled, including the three First Nations communities discussed in Section 3.2.2 above. In total, 31 municipalities/communities were profiled. Tables 3.3 and 3.4 provide further summaries of the characteristics of these jurisdictions.

**Table 3.2  
Municipalities and Aboriginal Communities Profiled  
(Sorted by Population)**

Jurisdiction	Municipality	Population (2001)	Size Category	Rural (%Pop)	Northern	Remote
ON	Toronto	2385400	VL			
BC	GVRD	1978500	VL			
ON	Peel	960000	L			
AB	Calgary	860800	L			
ON	Ottawa	700000	L	8%		
MB	Winnipeg	631700	L			
ON	Waterloo RM	431300	L	7%		

Jurisdiction	Municipality	Population (2001)	Size Category	Rural (%Pop)	Northern	Remote
NS	Halifax RM	343000	L	21%		
BC	Capital Regional District	299730	L	10%		
SK	Regina	187400	L			
NS	Cape Breton Regional Municipality	122700	L	23%		
NB	Moncton	117730	L			
ON	Thunder Bay	113600	L	5%		
AB	Alberta Capital Region Wastewater Commission		L			
ON	Cornwall	47,400	M			
NB	Fredericton	47000	M	2%		
YT	Whitehorse	22900	M	11%	N	
NL	Corner Brook	21900	M			
NWT	Yellowknife	17500	M		N	
PEI	Summerside	14600	M			
AB	Camrose	14290	M			
First Nations	Six Nations of the Grand River	11000	M			
MB	Rural M of Hanover	8900	S	Rural		
AB	Banff	6100	S			
BC	Fort Nelson	4461	S		N	
SK	La Ronge	3000	S	Rural	N	
NB	Village of McAdam	1570	S	Rural		
YT	Carmacks	500	S	Rural	N	Remote
First Nations	What Ti	300	S		N	Remote
NUN	Cape Dorset	<500	S	Rural	N	Remote
First Nations	James Smith Cree Nation	<500	S	Rural		

**Table 3.3**  
**Community Size Distribution and Mode of Information Collection**

	Interviewed	Written Response
Very Large	1	1
Large	3	8
Medium	3	5
Small	3	4
Aboriginal	3	

**Table 3.4**  
**Jurisdictional Distribution of Municipalities and Aboriginal Communities**

	Municipality	Aboriginal Community
<b>BC</b>	3	
<b>AB</b>	4	
<b>SK</b>	2	1
<b>MB</b>	2	
<b>ON</b>	6	1
<b>QC</b>	-	
<b>NB</b>	3	
<b>NS</b>	2	
<b>PEI</b>	1	
<b>NL</b>	1	
<b>Yukon</b>	2	
<b>NWT</b>	1	1
<b>Nun</b>	1	

**3.5.2 Summary**

The majority of municipalities in this study have sewer use bylaws<sup>6</sup>. Municipalities without sewer use bylaws are typically small (in terms of population) and have primarily residential development.

The nature of the bylaws varies greatly among municipalities. For example, bylaws may be designed to control flows of ground or surface water into sanitary sewers. Other bylaws control or prohibit the discharge of a wide range of substances to sewer systems and establish planning and reporting requirements. Parameters and allowable concentrations also vary widely, as do the opportunities for surcharge agreements where dischargers do not meet specified limits. Discharge limits are performance-based and many bylaws also have technology-based requirements (e.g. interceptor requirements)

Objectives for municipal sewer use bylaws vary somewhat in scope, but include one or more of the following:

- Municipal staff and infrastructure protection:
  - Prevent harm to sewer workers
  - Prevent harm to sewer infrastructure or treatment process
  
- System efficiency and use:
  - Prevent stormwater or other ‘clear’ water from entering the system (i.e. protect or maintain system efficiency)

<sup>6</sup>Note, as indicated in Section 3.3 above, that Newfoundland and Labrador does not delegate authority to municipalities to enact sewer use bylaws and so no municipalities in that province have sewer use bylaws.

- Prevent sludge or biosolids from failing to meet requirements for use on agricultural lands (some)
- Public and property protection:
  - Prevent harm to people, property, animals, vegetation
- Environment Protection:
  - Prevent harm to environment (some).

This list of objectives matches that of the *InfraGuide* Best Practice for sewer source controls identified in Section 2.2 above.

The range of objectives for sewer use bylaws indicates a variation in the roles various municipalities assume with respect to wastewater management. The presence of sewer use bylaw objectives for environmental protection indicates that these municipalities include environmental protection within their mandate. Other municipalities focus on infrastructure, property and human health protection because they understand environmental protection to be outside their mandate. Municipal mandates reflect municipal council policy decisions and provincial expectations. In short, among municipalities there is not a common view of the municipal role in environmental protection.

Further information on municipal sewer use bylaws is provided in the analysis in Section 4.

## 4. ANALYSIS OF REGULATORY STRUCTURES FOR MWWE

This section summarizes the regulatory coverage by the levels of government studied for the components of the model wastewater system (see Exhibit 1 in Section 2.2). Where not specified in the following discussion, discussion of federal regulations refers to the national role.

### 4.1 SUMMARY OF PRODUCTS AND OTHER PRE-DISPOSAL CONTROLS OR REQUIREMENTS

The federal government is the only government involved in product and pre-disposal controls of significance for municipal wastewater.<sup>7</sup>

Federal controls at this level occur in two areas:

- Management controls on toxic substances through *CEPA 1999*; and,
- International agreements to manage substances of global concern. (These are of limited impact until translated into federal or provincial programs or regulations.)

The effect of these regulations is to mandate (for specific substances) a degree of pollution prevention. An example of a *CEPA 1999* regulation with important implications for the wastewater sector is the regulation setting specific limits on phosphorus in laundry detergents. The Stockholm Convention on Persistent Organic Pollutants is an example of an international agreement to manage substances, with the effect that the potential for persistent organic pollutants to enter sewer systems through direct disposal and indirect entry through deposition is reduced.

### 4.2 SUMMARY OF INFLUENT CONTROLS

The federal government, some provincial governments and many municipal governments have regulatory or management measures controlling or managing influent sources to municipal wastewater systems. One Aboriginal community contacted also has an influent control bylaw.

The federal government, through *CEPA 1999*, deals with some sources of toxic substances at the industrial discharge level. For example, textile mills that use wet processing and use products with nonylphenols or its ethoxylates are required to prepare and implement pollution prevention plans to control releases in textile mill effluents. These effluents are discharged to municipal wastewater sewer systems.

Certain regulations under the *FA* also apply to discharges from specific industrial sectors to municipal wastewater sewer systems. In its role as regulator for northern, aboriginal and federal facilities, the federal government does not further regulate or control sources of discharge to sewer systems.

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<sup>7</sup> The province of Saskatchewan imposes an environmental surcharge on each can of motor oil sold to encourage reuse. This market measure is a management instrument for a product that would have some influence on municipal wastewater effluent quality control.

Provincial practice in this area varies widely. Generally, provincial governments delegate legislative authority to municipalities to manage and control primarily industrial, commercial and institutional sources of discharge to their sewer systems. The primary legal instrument used is municipal sewer use bylaws. Newfoundland and Labrador is the exception in this area, as this province does not delegate authority to municipalities to control discharges to sewers. Two other provinces have enacted regulations to support municipalities in source control: PEI established minimum requirements for quality of discharges to sewers; and, NS established minimum requirements which Town Engineers have been delegated authority to enforce. On the other hand, some provinces encourage municipalities to adopt sewer use bylaws through performance standards. For example, B.C. requires that municipal effluent be non-toxic with the idea that municipalities will then be motivated to enact stringent bylaws. Similarly, Manitoba sets strict metals loading limits for wastewater solids land application with the objective of establishment of strong sewer use controls by municipalities. Yukon is the only Territorial government with delegated authority in this area and it relies on municipalities to control influent sources.

Provinces typically support municipalities in their influent source control efforts through one or two routes: direct negotiations with industrial sectors discharging to sewers; and/ or, programs to collect household hazardous wastes such as paints and oils. For example, NS negotiated with the dry cleaning sector to reduce releases and Manitoba negotiated a self-regulating system with dentists to control release of mercury. One example of a provincial program that supports source controls is BC's Product Care Program.

A clear majority of municipalities identified in our study have sewer use bylaws. Those without bylaws are typically small, primarily residential communities (or those with governing Provincial regulations as described above). The largest municipality contacted without a sewer use bylaw is the Regional Municipality of Cape Breton, however this municipality is currently in the process of developing a bylaw to establish more stringent requirements than those of the provincial regulation mentioned above.

Municipal sewer use bylaws consist primarily of performance-based requirements that establish the maximum allowable concentrations of specified substances discharged to municipal sewers. The requirements also typically include a list of prohibited substances and occasionally reference the need to meet provincial requirements (for discharge of radioactive or hazardous wastes, for example). Municipal sewer use bylaws also employ technology-based requirements for specific purposes. The most typical technology requirement is for interceptors on connections likely to have high solids, sediments or grease, such as automotive garages and restaurants. Larger municipalities tend to offer a sanitary sewer surcharge agreement option for treatable pollutants such as phosphorus and BOD. The roles assumed by municipalities for environmental protection vary among municipalities, as reflected in the objectives and requirements of sewer use bylaws.

One of the three First Nations communities contacted has a sewer use bylaw. This is a relatively large community (11,000 pop.) in Southern Ontario. The bylaw was developed under the authority of the community's Chief and Council. Enforcement is a serious limitation in the effectiveness of the bylaw since the community must pay costs to carry any charges through the Ontario provincial court system. The other two communities contacted are small communities with almost exclusively residential development.

### 4.3 SUMMARY OF COLLECTION SYSTEM CONTROLS OR REQUIREMENTS

The federal government establishes requirements for the Federal House and First Nations communities through the 1976 Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments for wastewater system design. The federal government does not have regulations concerning municipal collection system design outside of Federal House and First Nations communities. The Federal *FA* applies to releases to surface waters and would therefore apply to overflows and bypass events.

All but one province (BC) issue permits for construction of sewer systems. BC has rules for the construction of sewers in the Municipal Sewage Regulation (MSR). Most provinces do not issue operational permits for collection systems. One province (Manitoba) however, examines inflow and infiltration (I/I) rates to assess sewer system condition and imposes requirements for system improvements through licence renewal. Many other provinces include I/I considerations in guidelines and design standards. Overflows are managed by many provinces through design standards that limit the number of overflow events. BC manages overflows through the MSR as part of the Liquid Waste Management Plan process. Combined sewers are discouraged in all jurisdictions. Practices regarding repair or replacement of combined systems vary; some provinces require separation but others allow repairs or replacement of existing combined systems. Water Boards (under federal or, in the case of Yukon, territorial jurisdiction) also issue permits for construction of collection systems, however these are typically part of a whole system approval, including treatment.

Municipalities may identify specific collection controls in sewer use bylaws to limit groundwater, stormwater or other ‘clear’ water entering the sewer system. Municipalities may also require owners of industrial facilities to provide monitoring chambers for monitoring and enforcement purposes.

### 4.4 SUMMARY OF TREATMENT SYSTEM CONTROLS OR OPERATIONAL REQUIREMENTS

The federal government has established treatment system performance objectives for certain toxic substances under *CEPA 1999*. To date, substances covered include ammonia, inorganic chloramines and chlorinated wastewater effluents (the later 2 substances are expressed as total residual chlorine). In most cases, the federal objectives under *CEPA 1999* instruments are more stringent for total residual chlorine and for ammonia concentrations than those specified through provincial permits.<sup>8</sup> BC is an exception with more stringent standards for total residual chlorine and chronic ammonia in the MSR.

Provinces and Water Boards (under federal or, in the case of Yukon, territorial jurisdiction) establish performance and/ or technology requirements for wastewater treatment. The mechanism for communicating these requirements is typically a permit to construct or operate (also called license or approval in some jurisdictions). For the balance of the federal house, there are no licensing or permitting bodies to help define treatment system performance objectives. All provinces except BC issue permits for wastewater treatment system construction covering issues including monitoring and reporting and discharge requirements. BC uses the MSR to establish performance and technology requirements that are to be met.

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<sup>8</sup> Duplication Analysis Report, 2004

BC identifies performance requirements for effluent quality in the MSR and requires a professional engineer to design the plant to meet these standards. Some provinces issue separate permits to operate, others rely on the permit issued at the time of construction approval to communicate operational requirements.

#### **4.5 SUMMARY OF RELEASE TO ENVIRONMENT CONTROLS OR REQUIREMENTS**

The federal government has significant regulatory involvement with respect to release of water to the environment through the FA. The FA does not have a regulation defining acceptable releases for the municipal wastewater sector and so the broad restrictions on release of deleterious substances apply to wastewater releases. This is a significant issue for the sector since the FA provisions are not necessarily satisfied by conditions for effluent release as identified in the facility permit from the province or Water Board.

Provinces and Yukon Territory implicitly or explicitly incorporate the concept of mixing zones (also called initial dilution areas) into their release policy and/or permits. Techniques to define an acceptable mixing zone delineation vary, with some jurisdictions applying models or dilution factor calculations. Some provinces have their own receiving water objectives or guidelines (e.g. BC) while others rely on the CCME guidelines (e.g. Alberta). Site-specific conditions and downstream uses are typically taken into consideration to determine acceptable release parameters. BC, Yukon and Ontario have, or are considering, stipulating zero toxicity of the effluent upon release for facilities.

#### **4.6 SUMMARY OF MONITORING AND REPORTING**

Through *CEPA 1999*, the federal government requires reporting to the NPRI of releases by wastewater treatment facilities meeting the reporting threshold requirements. Monitoring may also be undertaken as part of *Fisheries Act* compliance inspections.

Provinces and Water Boards undertake compliance monitoring, however the municipalities are typically the most significant source of information through reports to the provincial or Board level. Monitoring and reporting requirements are identified in permits, or in the case of BC, in the Municipal Sewage Regulation and through the LWMP process. Unusual events, such as sanitary sewer overflows and plant bypass events, are typically reportable by municipalities to the province immediately upon occurrence.

Municipalities may or may not monitor for bylaw compliance, depending on resources available and the provisions or complexity of their bylaws. The most comprehensive bylaws include a requirement for the installation of manhole or equivalent monitoring location for use by the discharger and the municipality to assess compliance.

#### **4.7 INITIAL ANALYSIS – OVERLAPS, GAPS AND OPPORTUNITIES**

Table 4.1 (overleaf) provides a simplified representation of the legislation and controls at jurisdictional levels. Using the model wastewater system as a basis for analysis, there are regulatory controls in place by at least one level of government for all components of the system.

**Table 4.1**  
**Simplified Representation of Controls at Jurisdictional Levels**

Area of Regulation	Product/Pre-disposal controls	Source Controls for Municipal Systems	Collection System Construction Controls	Treatment Controls	Release
Typical characteristics of Requirements	Pollution Prevention	Pollution Prevention or Performance Based	Performance Based or Technology Based	Performance Based or Technology Based	Performance Based
Federal Legislation (National role)	CEPA	CEPA and FA		CEPA	FA
BC			Regulation (MSR) and LWMP	Regulation (MSR) and LWMP	Regulation (MSR) and LWMP
AB			Permits	Permits	Permits
SK			Permits	Permits	Permits
MB			Permits	Permits	Permits
ON			Permits	Permits	Permits
QC			Permits	Permits	Permits
NB			Permits	Permits	Permits
NS		Regulated limits as back-stop	Permits	Permits	Permits
PE		Regulated limits as back-stop	Permits	Permits	Permits
NL		Regulated limits and Industrial Permits	Permits	Permits	Permits
Yukon Territory (through Water Board)			Permits	Permits	Permits
Municipal Legislation		Bylaws (wide variance)	(minor)		

### ***Product Level Controls***

No overlaps of the federal government with other jurisdictions exist in the area of product level controls. Control of certain substances may be most effectively undertaken by managing a product or substance itself within the Canadian market as a whole, such as pharmaceutical controls for example. Gaps in the control of certain substances appropriate for *CEPA 1999* controls in products are likely. Other substances may be more effectively controlled through municipal source control actions at the sewer discharge level. An opportunity exists to identify criteria and a process to determine the most suitable and effective level of government to undertake control of a substance, a process that does not currently appear to be in place on a formal basis.

### ***Influent Controls***

Influent controls are addressed to some degree by all levels of government when examined on a national scale (although practices in individual provinces/ territories differ). Federal involvement in influent controls pertains to specific toxic substances, usually from an identified industry sector selected through a risk management process. Also, certain federal *Fisheries Act* regulations pertain to discharges to sewer collection systems, thus the *FA* may overlap with municipal sewer use bylaws in some jurisdictions. Provincial/ Territorial involvement in influent control is inconsistent across Canada, with active involvement in programs or regulations in some jurisdictions and full delegation to municipalities in others. Municipal bylaws range in scope and complexity, some providing comprehensive controls while others focus exclusively on infrastructure efficiency. Thus, there are potential gaps in influent controls in areas of the country where provincial/ territorial regulations or programs and municipal bylaws do not establish discharge limits or establish adequate discharge practices for dischargers of potential concern.

### ***Collection System***

There is no permitting or licensing process for construction or operation of federal collection facilities and thus a gap exists for this Federal House function. Construction of municipal collection systems is subject to regulatory control at the provincial and Water Board level. There are gaps in coverage for the operation of collection systems in some jurisdictions. The municipal role in this area is minor and pertains to monitoring and controlling ‘clear’ water influent to collection systems. (Note that releases from overflow events and plant bypass events are considered under Release and are subject to federal controls under *CEPA 1999* and the *FA*.)

### ***Treatment Controls***

The federal requirements under *CEPA 1999* establish performance objectives for wastewater treatment facilities. There is no permitting or licensing process for construction or operation of federal wastewater treatment facilities and thus a gap exists for this Federal House function. Provincial governments control a range of substances through wastewater plant permitting and standards for construction and, in some jurisdictions, operation. Provincial and Water Board requirements may include *CEPA* toxics, although the specific requirements (i.e. limits specified in permits) do not duplicate the federal requirements in many instances. From the perspective of municipal practitioners this is perceived to be an area of overlap. There are gaps in some jurisdictions with respect to permits or licenses for wastewater facilities operations.

## ***Release***

The federal government also regulates releases to the environment through the *Fisheries Act*. The federal government also manages substances identified as toxic under *CEPA 1999* and therefore has a regulatory presence in wastewater effluents (as mentioned in Treatment, above). Provincial governments/ Water Boards control releases through permits or guidelines for release. Again, from the perspective of municipal practitioners, this is perceived to be an area of overlap.

With the very broad and unspecific prohibition of the Section 36 provisions of the FA, federal legislation does overlap with the provincial/ Water Board permitting structures. Some jurisdictions have made initial efforts to harmonize these requirements by specifying no acute lethality of the effluent in laboratory bioassay tests. These requirements are not implemented in all facilities in any jurisdiction.

## ***Other Potential Gaps Identified***

One significant gap identified by municipal contacts is the absence of adequate watershed level information to plan and understand the implications of current and future allocations for water uses and assimilation capacity for discharges. Concern was expressed regarding the impact over time of increasing population and other uses of receiving waters. Manitoba and Quebec, for example, employ loading limits in combination with concentration limits in wastewater plant permitting to encourage improvements in facility performance as population increases. Nova Scotia considers reserving assimilative capacity for future dischargers where assimilation capacity is known to be very limited. Opportunities to apply similar approaches more broadly could be explored.

Another potential gap exists in the area of emerging issues of concern, such as pharmaceuticals and endocrine disruptors for example. Conventional contaminants (BOD, SS), nutrients and disinfection are commonly addressed by provinces / Water Boards through permits or standards; ammonia and chlorine residual are addressed by the federal government. Some provinces require monitoring of less conventional substances and the federal government supports scientific research in the aquatic environment. However, there is no clear process to identify emerging issues or to incorporate them into technologies and practices of wastewater treatment facilities if they eventually are declared toxic. There is an opportunity to identify the role of *CEPA 1999* in identifying potentially toxic substances present in municipal wastewater and an opportunity to develop a process to adjust permits or standards for wastewater treatment plants as emerging substances of concern become resolved.

Interestingly, some municipalities are operating on their own initiative to exceed the provincial license effluent requirements (for example, the Village of McAdam has reduced phosphorus to 0.6 mg/L versus the licence limit of 1.0; the City of Thunder Bay has instituted capital investments to install better-than secondary treatment (i.e. ammonia removal), to undertake pollution prevention planning, and to establish an organizational structure to manage “from lake to lake” in terms of municipal services for drinking water and sewage). Although these actions are not regulatory, they may indicate the perception of a gap between permitted discharges and the requirements to adequately protect the receiving environment. Additional information would be required to better define this potential gap and its significance would need to be assessed in context of other municipalities that are struggling to meet current regulatory requirements.

**Additional Opportunities Identified**

Opportunities exist to examine existing harmonization agreements for successes and to adopt similar principles or approaches where suitable. In particular, the Province of Alberta has a harmonization agreement in place pertaining to the pulp and paper industry with respect to *CEPA 1999* and provincial environment regulations (see Province of Alberta profile). Also, many provinces have harmonization agreements with the federal government for environmental assessments and these could be examined for successes and lessons learned.

An opportunity exists to develop or update provincial model sewer use bylaws or to perhaps develop two or three national model bylaws on the basis of population and level of industrial development. Many municipalities rely on model sewer use bylaws where these are available. For example, in the province of Quebec, the similarity of municipal bylaws demonstrates high reliance on the model as a guide. At least two municipalities reported that they were reviewing the City of Toronto bylaw as a model for their own bylaw changes.

Table 4.2 summarizes the gaps, overlaps and opportunities identified above.

**Table 4.2  
Summary of Gaps, Overlaps, Opportunities Identified**

Areas of Regulation	Product/Pre-disposal controls	Influent Controls	Collection System Controls	Treatment Controls	Release	Other
<b>Gap</b>	Likely	Potential gaps in coverage of ICI discharges and/ or substances coverage	Operations permits; Federal House construction and operations permits	Federal House construction and operations permits	Possible gap in level of protection from permit and that needed for environmental protection	<ul style="list-style-type: none"> <li>• Watershed level decision-making</li> <li>• Emerging issues of concern</li> </ul>
<b>Overlap (Note overlap is not necessarily duplication or negative)</b>		Possible for <i>Fisheries Act</i> and some municipal sewer use bylaws		CEPA toxics and associate performance requirements (2 substances to date)	Mixing zones in facility permits overlap and are inconsistent with the <i>Fisheries Act</i>	
<b>Opportunity</b>	Criteria and process to determine the most suitable/ effective level to control a substance (i.e. product or influent source control level)	Develop model sewer use bylaws (National? Provincial/ Water Boards?)		Harmonization of CEPA requirements with facility permits (examine existing examples of regulatory harmonization)	Harmonization of <i>Fisheries Act</i> and <i>CEPA 1999</i> with facility permits (examine existing examples of regulatory harmonization)	Identify role of CEPA in identifying potentially toxic substances and establish a process to adjust permits/ standards



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## **APPENDIX A**

### **Federal Profiles**

## APPENDIX A

### Federal Profiles

As indicated in the text (Section 3.2), the federal government has two groups of distinct roles, one as the government of the nation and a second as facility and landowner and ultimate Water Board authority in the Territories of Nunavut and NWT, and as funder of Aboriginal infrastructure. The following profile, Profile A, outlines the first role. Profile B outlines the second role.

**Profile: Federal Government – Profile A**, National Structure (see also, Profile B, Northern, Aboriginal and Federal House)

#### *Product or Pre-disposals Management Measures*

##### CEPA 1999

*CEPA 1999* empowers the federal government to regulate or otherwise control substances found to be toxic. Once a substance is found to be toxic under *CEPA 1999*, the federal government is obliged under *CEPA 1999* to meet timelines as laid out in *CEPA 1999* to implement an instrument to manage the toxic substance. Management instruments under *CEPA 1999* may include one or a combination of measures such as regulations, pollution prevention planning requirements, guidelines, codes of practice, and these may be supported by information and reporting tools, economic instruments, environmental performance agreements and other tools. Examples of current regulations under *CEPA 1999* for management of substances, products or pre-disposal requirements of potential interest to MWWWE include:

- PCBs (SOR/91-152 and SOR/90-5)
- Contaminated fuels (SOR/91-486)
- Lead in gasoline (SOR/90-247)
- New Substances Notification Regulations (SOR/94-260)
- Phosphorus in laundry detergents (SOR/89-501)
- Prohibition of specific toxic substances, for example benzidine dihydrochloride, HCB, Mirex, (SOR/2003-99 and others)
- Defoamers used by pulp and paper mills are limited to 10 ppb of dibenzodioxin and forty ppb dibenzofuran (SOR/92-268)
- Disposal restriction for returnable containers for ethane, 1,2-dichloro-, polymer with ammonia, N-substituted reaction products sodium hydroxide, without on-site waste treatment procedures in Ontario - the amount of the substance to be released into the regional wastewater treatment system shall not exceed 20kg/day (Ministerial Condition Number 6396; see also source)

These regulations are of potential interest to MWWWE since they control substances of concern at the source, thus potentially reducing the levels released to wastewater.

#### *Influent (Source)*

##### CEPA 1999

*CEPA 1999* empowers the federal government to regulate or otherwise control substances found to be toxic. Examples of current regulations under *CEPA 1999* for sources of interest to MWWWE include:

- Prevention of the formation of dioxins and furans and limits on their discharge from pulp and paper mills (SOR/92-268); Prohibition on the releases of dioxins and furans in pulp and paper mill effluents and sampling and reporting requirements (SOR/92-267)
- Reduction of releases of trichloroethylene (TCE) and tetrachloroethylene (PERC) into the environment from solvent degreasing facilities (SOR/2003-283)
- Storage requirements for materials, wastes or equipment containing more than fifty parts per million chlorobiphenyls (PCBs)
- Reduction of releases of tetrachloroethylene from dry-cleaning facilities including managing the collection

and disposal of residues and waste water (requirements for wastewater transportation to a waste management facility or on-site wastewater treatment with equipment) (SOR/2003-79).

- Proposed controls through *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations*
- Notice to prepare and implement pollution prevention plans for textile mills that use wet processing for Textile Mill Effluents (TMEs) and nonylphenol (NP) and its ethoxylates (NPEs), including a risk management objective to achieve a maximum acute toxicity of 13 percent IC50 for effluent discharged to an off-site [municipal] wastewater collection and treatment facility
- Notice requiring the preparation and implementation of pollution prevention plans in respect of nonylphenol and its ethoxylates contained in products. This Notice applies to any person or class of persons who (a) (i) owns or operates a facility that manufactures soap and cleaning products, or processing aids used in textile wet processing, or pulp and paper processing aids, or (ii) imports soap and cleaning products, or processing aids used in textile wet processing, or pulp and paper processing aids into Canada; and (b) purchases or otherwise acquires 2 000 kg or more of NP and NPEs, including, but not limited to, raw NP and NPEs, NP and NPEs in formulations, and NP and NPEs in final products in at least one calendar year between January 1, 2003, and December 31, 2012, for any of the activities outlined. Includes use reductions risk management objectives.
- Code of Practice for the Environmental Management of Road Salts
- Disposal restriction for returnable containers: when disposing of ethane, 1,2-dichloro-, polymer with ammonia, N-substituted reaction products sodium hydroxide, all liquid wastes generated from the cleaning operation shall be subjected to on-site treatment using flocculation or adsorption before being released into the regional wastewater treatment system (Ministerial Condition Number 6396)
- Notice to manufactures of synthetic rubber using acrylonitrile resulting in releases to the environment to prepare and implement a pollution prevention plan for manufacturing, storage, handling and wastewater treatment activities involving acrylonitrile (i.e. control of air emissions from wastewater collection and treatment systems (specifically the wastewater systems of large industrial point source releases not municipal wastewater systems).
- The proposed Total, Partial or Conditional Prohibition of Certain Toxic Substances Regulations (proposed Regulations) will replace the current Prohibition of Certain Toxic Substances Regulations, 2003. The proposed Regulations provide greater flexibility to use partial and conditional as well as total prohibitions of certain toxic substances requiring the strictest controls. The proposed Regulations add n-nitrosodimethylamine (NDMA), dichlorodiphenyltrichloroethane (DDT), and hexachlorobutadiene (HCBD) to the existing list of substances prohibited under the current Regulations. This will prevent the reintroduction of the substances to the Canadian market.

#### Fisheries Act

Currently regulations under the *FA* manage discharges of effluent from sector-specific sites to water frequented by fish. Regulations are in place for the pulp and paper sector, chlor-alkali mercury liquid effluent, metal mining, petroleum refinery, potato processing plants, meat and poultry products plants. Some of these regulations contain measures aimed specifically at effluent releases to municipally owned sewer collection and treatment systems (described as wastewater treated at a site outside of the plant). For example, the Pulp and Paper Regulations include measures related to an off-site treatment facility, where "off-site treatment facility" means a facility that treats effluent from a mill if the facility is neither owned nor operated by the owner of a mill, such as a wastewater collection and treatment system owned by a municipality.

#### Arctic Waters Pollution Prevention Act (AWPPA)

The AWPPA applies to Arctic waters (i.e. waters north of the 60<sup>th</sup> parallel). The AWPPA prohibits the deposit of waste (broadly defined) in Arctic waters or in any place where waste may enter those waters except in compliance with AWPPA or its regulations. The Arctic Waters Pollution Prevention Regulations prohibit the deposit of domestic waste and industrial waste unless it is deposited under conditions authorized: 1) by the Public Health Ordinance of the Northwest Territories or of the Yukon Territory in the case of domestic sewage; 2) by the federal *Oil and Gas Production and Conservation Act*, the *Territorial Lands Act* or the *Public Lands Grants Act* in the case of industrial sewage.

### **Collection System**

#### CEAA

Where collection system design and/ or construction involve federal land, require federal approvals or permits, have federal funding or are initiated by the federal government, requirements of the *Canadian Environmental*

*Assessment Act* (CEAA) must be met. The CEAA requirements may or may not be met through harmonized environmental assessment requirements for studies and recommendations at the provincial/ territorial level.

#### Fisheries Act

There is a general prohibition under the *FA*, Section 36, which prohibits the release or deposit of a deleterious substance into waters frequented by fish. There are no *FA* regulations specifically pertaining to releases to water from sewers (sanitary, storm, or combined) however, the general prohibition applies.

### **Treatment**

#### CEPA 1999

*CEPA 1999* empowers the federal government to regulate or otherwise manage substances found to be toxic. Currently there are no regulations under *CEPA 1999* specifically regarding municipal wastewater treatment. Refer to *Release*, following for *CEPA* measures pertaining to release of ammonia and chlorinated wastewater effluents).

#### CEAA

Where collection system and treatment system design and/ or construction involve federal land, require federal approvals or permits, have federal funding or are initiated by the federal government, requirements of the *Canadian Environmental Assessment Act* (CEAA) must be met. The CEAA requirements may or may not be met through harmonized environmental assessment requirements for studies and recommendations at the provincial/ territorial level. Navigable Waters permits may be needed for outfalls.

### **Release**

#### Fisheries Act

The general prohibitions of the *FA*, Section 36, on the deposit (release) of deleterious substances into waters frequented by fish except under conditions authorized by regulations apply to any body of water frequented by fish. There is no regulation under the *FA* for the effluents released from municipal wastewater systems. This is a significant issue for the municipal wastewater sector because the broad prohibitions of the *FA* are not defined within a regulation for the sector.

#### CEPA 1999

*CEPA 1999* instruments address releases of substances of concern (including toxic substances under the *Act*) to air, water and/ or soil. Currently there are no regulations under *CEPA 1999* specifically regarding municipal wastewater treatment. In December 2004, Environment Canada published 2 instruments under *CEPA 1999* applicable to ammonia and chlorine released from wastewater systems meeting specific criteria:

- Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents
- Notice requiring the preparation and implementation of pollution prevention plans for inorganic chloramines and chlorinated wastewater effluents.

See NPRI requirements under the Monitoring and Reporting Section following, requiring reports of direct and indirect (via sewer systems) releases to water, land, and air.

### **Environment**

#### Fisheries Act

Undertakings in the water environment are controlled under the *FA*: No person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat except as authorized by the Minister (*FA*, section 35).

#### CCME

In terms of ambient conditions, the federal government applies the Canadian Environmental Quality Guidelines for air, water, soil, sediment and tissue residue, developed under the CCME. Similarly, Guidelines for Canadian

Recreational Water apply where appropriate. Note that the CCME guidelines are not federal guidelines; some other jurisdictions also rely on the CCME guidelines for jurisdictional decision-making regarding the water environment.

### ***Compliance and Promotion***

Two policies are in effect to guide federal compliance and enforcement of *CEPA 1999* and the *FA*:

- Compliance and Enforcement Policy for CEPA 1999 (March 2001) Parliament has made it a matter of law that enforcement of CEPA 1999 must be fair, predictable and consistent. The Compliance and Enforcement Policy establishes principles for enforcement and tells stakeholders what to expect from Environment Canada and the officers who enforce CEPA 1999.
- Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the *FA* (November 2001) The policy sets out principles of fair, predictable and consistent enforcement that govern application of the law and responses by enforcement personnel to alleged violations. The policy was developed co-jointly by Environment Canada and the Department of Fisheries and Oceans.

### ***Monitoring and Reporting***

#### NPRI

The NPRI requirements under *CEPA 1999* apply to industries and other dischargers to sewer systems where the discharges meet reporting thresholds (a management measure that applies to influent sources). Owners or operators of collection systems where no treatment is in place are required to report releases to the NPRI where threshold conditions are met (i.e. a minimum volume released). Similarly, owners and operators of wastewater treatment systems meeting the threshold conditions are required to report annual releases to water, air, land and disposal or recycling volumes to the NPRI. A wastewater facility is defined for NPRI purposes as “wastewater collection systems that discharge treated or untreated wastewater into surface waters with an annual average flow rate of 10 000 cubic metres or more per day. Therefore, a wastewater facility for NPRI-reporting purposes includes both treatment and collection systems.” For the wastewater sector, Environment Canada has determined that all substances in the influent, or produced during the process, at wastewater treatment facilities are incidentally processed or otherwise used in the process, and are therefore to be considered "by-products" of the process... As a result, no lower threshold of concentration by weight applies for substances in the influent, and wastewater treatment facilities are expected to report the releases of NPRI substances that exceeded the specific total annual accumulated mass reporting thresholds. There are over 250 core substances (Part 1a) reportable under the NPRI, including ammonia and nitrate ion. Other substance lists include certain metals, poly-aromatic hydrocarbons, and criteria air contaminants. (Reporting on Part 3 substances - dioxins, furans and hexachlorobenzene - is not applicable to the wastewater sector).

#### CEPA 1999

Under the pollution prevention planning notice for inorganic chloramines and chlorinated wastewater effluents (see Release, above), owners are required to file Declarations of Preparation and Implementation in a manner, format and time specified by the Minister of Environment. This requirement is a legal obligation for persons subject to the Notice.

### ***Imminent Changes Planned***

Proposed regulatory or management measures are included within appropriate categories above.

Environment Canada is working with the other jurisdictions through the CCME to develop a Canada-wide Strategy for the management of municipal wastewater effluents. One of the outcomes of the Strategy is expected to be a process or mechanism to co-ordinate the management of CEPA Schedule 1 substances in the future.

In addition, the federal government has stated its intention to develop a regulation under the *FA* specifically for the municipal wastewater sector. This regulation will be a significant part of the federal governments action to implement the Canada-Wide Strategy for municipal wastewater effluent. This regulation will also apply to the wastewater systems within the federal House.

The following federal profile, Profile B, outlines the second role of the federal government, as facility and landowner, ultimate Water Board authority in the Territories of Nunavut and NWT, and as funder of Aboriginal infrastructure. Note that all relevant regulatory provisions under Profile A also apply to federal lands and areas of responsibility. Contents of Profile A are not repeated in Profile B but need to be kept in mind to have a full understanding of the federal profile.

**Profile:** Federal Government – **Profile B**, Northern, Aboriginal and Federal House (see also, Profile A, National Structure).

This profile describes federal requirements for wastewater facilities owned and operated by federal departments, agencies and Crown corporations, on federal lands north of the 60<sup>th</sup> parallel in the Territories of Nunavut and NWT, and on aboriginal lands both north and south of the 60<sup>th</sup> parallel.

The Government of Canada fully supports the principles of sustainable development and as such has a Code of Environmental Stewardship. Under the code, the Government commits to “meet or exceed the letter and spirit of federal environmental laws, and where appropriate, to be compatible with provincial and international standards”. It should be kept in mind that this is a policy of the federal government but does not have the same authority as a regulatory requirement. It should be noted that all relevant regulatory provisions in Profile A including the *Fisheries Act* apply to Profile B.

### ***Influent (Source)***

#### Federal House:

The Code of Environmental Stewardship commits the Government to apply environmentally responsible management practices to hazardous substances used in government operations, including biological products, specifically with regard to the acquisition, handling, storage, safety in use, transportation and disposal of such substances.

The *CEPA 1999 Regulation Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands or Aboriginal Lands Regulations* (SOR/97-10) applies to the Federal House (including Aboriginal lands).

#### North of 60 degrees latitude (excluding Yukon Territory):

Water management, including permits to discharge wastewater effluents are governed by Water Boards north of the 60<sup>th</sup> parallel. The Water Boards are arm’s length organizations that take actions on a watershed basis, with conditions in the north in mind. Except in Yukon Territory, the federal department of Indian and Northern Affairs Canada (INAC) has ultimate power to direct or approve Board actions.

In Nunavut, commercial / industrial wastewater must be characterized before acceptance to a municipal system. The Guidelines for the Discharge of Domestic Wastewater In Nunavut are authorized under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, 2002, a Federal act. The guidelines are administered by the Nunavut Water Board, and apply to commercial / industrial wastewater discharged to municipal systems. Parameters that may be included in a licence for raw sewage quality guidelines for commercial or industrial wastewater discharged to a municipal treatment facility are:

- Aluminium, Arsenic, BOD, Cadmium, Chlorides, Chromium, Copper, Cyanide, Fluoride, Lead, Iron, Mercury, Nickel, Molybdenum, Nitrate, Phosphorus, Residual Chlorine, Selenium, Silver, Tin, Zinc
- Oil & Grease, pH, Phenolic compounds
- Sulphates, Sulphides, Suspended Solids, Temperature
- Explosives or chemicals in combination with others that would be explosive
- Pesticides, herbicides, or molluscicides
- Flammable materials
- Dirt, gravel, wood or construction wastes; and
- Abattoir wastes which would cause sewer clogging or treatment problems.

**Aboriginal Lands** (north and south of 60 degrees latitude):

First Nations communities often have responsibility for infrastructure on their lands, if they do not have reserve status. INAC also has responsibility for infrastructure in cases of official reserve lands. Very few Aboriginal communities have sewer use bylaws in place for source controls (see profiles in next section). INAC guidelines for wastewater systems provide guidance for interceptors.

**Collection System Controls****Federal House:**

The federal government does not have CSO performance standards. Treasury Board policy requires all federal departments to meet the spirit of municipal and provincial environmental regulations as appropriate for the various facilities of each department. *The Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* (1976 Guidelines) apply to federal facilities.

**North of 60 degrees latitude (excluding Yukon Territory):**

Water Boards have authority to review and approve wastewater systems as a whole, including collection systems. Section 2.3 of the Guidelines for the Discharge of Domestic Wastewater in Nunavut state that, once a licence has been issued, the Water Board may set out specific terms and conditions including: Modifications to wastewater collection, treatment, or disposal facilities and practices. In general, design of wastewater collection is to conform to all applicable regulations, and to good engineering practice. In cases where design notification is required, plans and specifications must be approved by the Water Board before construction begins. There are no combined sewers in Nunavut Territory.

**Aboriginal Lands** (north and south of 60 degrees latitude):

First Nations communities often have responsibility for infrastructure on their lands. INAC also has responsibility for infrastructure in some cases. As a significant infrastructure funding agency, INAC issues guidelines for infrastructure design, construction and operation, as identified, for example, in the federal Corporate Manual System, Indians Program, Volume 1 Chapter on Capital Facilities and Maintenance. INAC and HC also administer the First Nations Water Management Strategy (refer to “*Treatment*” for more information). As a minimum, systems are designed to the *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* (1976) or to provincial standards, whichever are more stringent. Although systems are designed to this standard, they are often built in phases and so may not conform to guideline requirements when constructed.

**Treatment Controls****Federal Facilities:**

*Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* (1976) apply to effluent from federal and aboriginal facilities. In addition, it is Treasury Board policy that all federal departments meet the spirit of municipal and provincial environmental regulations as appropriate for the various facilities of each department. No permitting or licensing system for construction and operation of federal facilities is in place.

CEPA Part 9 has potential authority but no instruments have been created under it. Part 9 has the power to potentially expand the regulatory capacity of CEPA beyond what is covered under the other parts to include, for example, provincial-like capabilities just for federal house.

**North of 60 degrees latitude (excluding Yukon Territory):**

In Nunavut, INAC regulates and enforces wastewater treatment through the *Nunavut Water and Surface Rights Tribunal Act*. The Nunavut Water Board issued the Guideline for the Discharge of Domestic Wastewater in Nunavut, which is applicable to all licensed facilities. Facilities are licensed on a site-specific basis but the Guideline for the Discharge of Domestic Wastewater in Nunavut sets out provisions for BOD5, TSS, pH, oil and grease, coliforms, and heavy metals. The federal 1976 Guidelines also apply to discharge of effluent from wastewater collection and treatment systems; discharge of effluent from land used for the treatment of wastewater; and disposal of sewage sludge on land. See parameters listed under *Source Controls* above. Water licences normally state limits on effluent concentrations of BOD5, suspended solids (TSS), pH, oil and grease, and faecal coliform. Low water use results in more concentrated raw domestic wastewater. Licence limits may be set considering the type and relative size of the receiving environment, and the community’s per capita wastewater flow rate. Higher effluent standards (for fecal coliform, pH, and oil and grease) are imposed in

communities where the per capita use of water and discharge of wastewater is high.

In NWT, INAC is responsible for water boards established under the federal *Northwest Territories Waters Act* and the *Mackenzie Valley Resource Management Act* (MVRMA). The Acts establish the authority of the Northwest Territories Water Board, the Gwich'in Land and Water Board, the Sahtu Land and Water Board and the Mackenzie Valley Land and Water Board. (Effective December 31, 1998, the Land and Water Board for the Gwich'in and Sahtu Settlement Areas assumed their responsibilities and on March 31, 2000, the Mackenzie Valley Land and Water Board was established.) The Mackenzie Valley Land and Water Board issues licences and permits outside settlement areas and for those development activities that have impacts on more than one settlement area, or impacts that extend beyond the Mackenzie Valley. This valley-wide board also ensures consistency between regional land and water panels.

#### Aboriginal lands:

First Nations communities often have responsibility for infrastructure on their lands (if non-reserve status). INAC also has responsibility for infrastructure in some cases (on reserve lands). As a significant infrastructure funding agency, INAC issues guidelines for infrastructure design, construction and operation. INAC guidelines address wastewater system design and operation. Systems are designed to the federal 1976 guidelines or to provincial standards, whichever are more stringent. Although systems are designed to this standard, they are often built in phases.

INAC also administers the First Nations Water Management Strategy. The First Nations Water Management Strategy is aimed at improving the safety of water supplies in First Nations communities. Strategy implementation includes elements for infrastructure upgrades, operations and maintenance, certification of operators, and stronger inspection, monitoring and reporting regimes. The seven-part strategy will be implemented over five years, and is consistent with the multi-barrier (source to tap) approach. The seven parts of the strategy include:

- Upgrading and building water and wastewater facilities;
- Water quality monitoring combined with a compliance and reporting regime;
- An operation and maintenance program to ensure the quality of water supplies;
- Operator training and certification programs;
- Integrated water quality management protocols;
- A public awareness campaign targeted at First Nation leaders, administrators and individual householders; and the establishment of standards, protocols and policies.

The INAC guidelines may be used as a basis for funding approval of wastewater infrastructure on First Nations lands, providing the federal government with an indirect means to specify desired wastewater effluent conditions for the facility being designed. (Note that the FA applies to facilities on Aboriginal lands and all federal facilities.)

North of 60 degrees latitude, First Nations community wastewater effluents fall under Water Board authority and effluent permits are issued by the Boards. South of 60 degrees latitude, no Water Boards are in place and so wastewater systems are subject to the general prohibition under S36(3) of the FA, INAC guidelines, the federal 1976 Guideline, and community based requirements.

### ***Release***

#### To Water:

The *Canada National Parks Act* applies to releases to water within national marine parks and national parks.

The Guideline for the Discharge of Domestic Wastewater in Nunavut outlines effluent quality parameters for discharges from all domestic systems to receiving waters. In most cases, the effluent quality from a single-cell lagoon provides the basis for the guideline. The Water Board uses these guidelines and site-specific information to determine the effluent quality limits to be applied in each water licence. The Water Board may set limits that are more stringent or less stringent than these guidelines, depending on site-specific considerations. Site-specific studies may be required where a municipal system collects effluent from industrial or commercial enterprises. The guidelines also outline parameters for mixing zones considering drinking water intakes, shellfish beds, fish routes, areas significant to biological resources, recreational areas; objectionable materials such as oil, grease,

scum, or floating debris which constitute any aesthetic nuisance; and bio-concentration of toxic materials. Mixing zones may overlap provided that cumulative effects within and outside mixing zones remain within and applicable water quality objectives and license limits.

In NWT, waste disposal into water is controlled through regulatory processes established under the federal *Northwest Territories Waters Act*, the *Mackenzie Valley Resource Management Act* (MVRMA). Waste disposal in or near water must be either licensed by water licensing boards or authorized by regulation.

Aboriginal communities north of 60 degrees latitude are subject to Water Board permitting requirements.

South of 60, release is guided by INAC guidelines, which include guidance on mixing zones. INAC guidelines outline the need for a feasibility study, and include considerations for mixing zones.

#### To Land:

For effluent discharges to land in Nunavut, the potential of the sewage treatment process to accumulate contaminants is reviewed as well as: microbiological quantity and types present in sewage sludge; permafrost conditions; effects on ice lenses; ground water; migratory birds and animals; aesthetic nuisance; and impacts on other uses of land. Parameters for sewage sludge disposed on the land are also outlined (ammonia sulphide, maleic anhydride, benzidine, methylamine, benzyl chloride, potassium permanganate, diethylamine, quinoline, ethylamine, strychnine thylenediamine, tetrachloroethanes, dioxins and furans).

INAC guidelines for biosolids or sludges from First Nations communities call for best practices and disposal to credited sites; solids are disposed of in leaching beds where road access is not available.

### ***Compliance and Promotion***

The federal government is a self-regulating agency. There are no permits or licenses issued by the federal government for its operations or for Aboriginal lands south of 60 (note that Water Boards issue permits for effluents north of 60).

As the regulatory agency for releases to water in Nunavut, INAC requires reporting by licensees to the Nunavut Water Board and also conducts site-specific audits. The Water Board specifies the parameters to be sampled and the frequency of sampling. Approved sampling methods are provided in the current edition of "Standards Methods for the Examination of Water and Wastewater". The Water Board defines a Surveillance Network Program for each Water Licence. This program lists the required parameters, sampling locations, and a reporting schedule. Compliance sampling frequency is based on population. The requirement for compliance sampling also considers the treatment process and its potential to accumulate metals and toxic compounds. Receiving water needs to be sampled to ensure that objectives are being met. Normally, the Water Board will arrange for sampling of the receiving environment. In specific cases, the Water Board may require licensees to undertake a receiving environment sampling program. Except where otherwise required, compliance is based on grab samples.

Every two years, each First Nations community system receives a thorough inspection according to the Acres Condition Reporting System. Effluent monitoring may improve on an on-going basis when operator certification training is completed within the next three years.

### ***Monitoring and Reporting***

Under *CEPA 1999*, owners or operators of treatment systems are required to report releases to the NPRI where threshold conditions are met, such as a minimum volume released. Reportable releases include releases to air, water, land and disposal or recycling volumes. (Refer to Federal Profile A)

### ***Imminent Changes Planned***

The *CEPA 1999* will be reviewed by a Parliamentary Committee sometime after March 31, 2005. The Review Committee may decide to examine the extent of the authorities under Part 9 (e.g. to clarify the role of Environment Canada within the Federal House, for example).

The regulation that the federal government intends to develop under the *FA* will eventually replace the 1976

Guidelines. Complementary instruments may also be developed to address the issues specific to the Federal House.

INAC is developing a Memorandum of Understanding with Environment Canada to develop capacity and representative groups of First Nations communities for Regional Watershed issues.



## **APPENDIX B**

### **First Nations Community Profiles**

**APPENDIX B****First Nations Community Profiles****Profile: Wha Ti (NWT)*****Influent (Source) Controls***

Wha Ti does not have a community bylaw. Dischargers to the sewer system are residential and there have been no problems experienced with quality of sewage. The wastewater treatment facility operates within its Water Board licence parameters.

***Imminent Changes Planned***

There are no imminent changes planned. The community is planning to open more to tourism, with plans for a hotel. This may change the nature of discharges to the sewer but no problems are anticipated.

**Profile: James Smith Cree Nation (SK)*****Influent (Source) Controls***

The James Smith Cree Nation community does not have written sewer use controls. The sewer catchment area is primarily residential. New residents are advised not to dispose of paints, oils, rags, industrial chemicals and other substances that would cause problems for the collection or treatment systems. (The treatment system does not discharge to a surface water body; treatment consists of a primary lagoon, a secondary lagoon and an evaporation pond.)

***Collection System Controls***

The community garage has a separate septic system that is pumped and drained periodically to the primary treatment lagoon.

***Compliance and Promotion***

Verbal communication as needed with residents.

***Imminent Changes Planned***

The community does see a need for more formal, written rules, upheld through a by law. The representative contacted has interest in a national First Nations forum or network to look at standards and regulations for water and wastewater across Canada and to develop suitable guidance/ standards or regulations for First Community systems. A recommendation for such a forum was made in 2003 after the Water and Wastewater Advisory Committee for Operator Training in First Nations completed its mandate.

**Profile: Six Nations of the Grand River (ON)**

***Influent (Source) Controls***

The Six Nations of the Grand River has a sewer use bylaw that is modelled on Ontario Regulations under the *Ontario Environmental Protection Act*. The bylaw was developed by a policy analyst working for the band. The bylaw sets numerical limits for some parameters, such as biochemical demand. A garage facility owned by the band has a separate wastewater disposal system that is not conveyed to the community lagoons. No major industrial dischargers are connected to the community system. The band provides a private system pumpage service and encounters problems with high groundwater infiltration to those systems due to failing system conditions.

The band also operates a landfill site and runs a household hazardous waste day to collect materials such as paints, oil and gas.

The most significant issue facing the community with respect to the bylaw is a lack of realistic enforcement capability. To enforce the bylaw, the band would have to pay costs to bring the charges through the Ontario court system. These costs are prohibitive considering the fine limitations.



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## **APPENDIX C**

### **Provincial Profiles**

## Appendix C

### Provincial Profiles

#### **Profile: Province of Newfoundland and Labrador**

##### ***Delegation of Authority to Municipalities***

The province does not delegate industrial permitting for discharges to sewers to municipalities. All dischargers must conform to the provincial requirements described following, including industrial dischargers to municipal systems as well as municipalities for their wastewater effluent discharges.

*Municipalities Act, 1999.* Water and sewage systems: 156. (1) A council may construct, own and operate b) a public sewage system for the collection and disposal of sewage within or, with the approval of the minister, outside of the municipality.

##### ***Product or Pre-disposal Controls***

S. 40 of the *Environmental Protection Act (EPA)* prohibits the disposal of pesticides or containers for pesticides in a manner not approved; although disposal of pesticides to sewers is not specifically mentioned, it is prohibited under this section.

##### ***Influent (Source) Controls***

Industrial dischargers to municipal sewers fall under the Environmental Control Water and Sewage (ECWS) Regulations of the EPA, which requires any person discharging sewage and other materials into a body of water, public sewer or sewer leading to a public sewer to comply with conditions for discharged materials. The control of industrial dischargers is intended to protect the municipal sewer system as well as environmental protection.

The quality of wastewater entering the sanitary sewer system must meet conditions outlined by the Province, specifically:

- Limits are placed on the concentrations of specific substances and substances with specific characteristics (e.g. flammable, cause obstructions, temperature, pH). See the Envision Compliance Sewer Use Bylaw record in Appendix A for Corner Brook and St John's for details on specific substances controlled and their concentration limits or characteristics (note that this appendix contains details of the previous Regulation 156/80).
- Materials controlled include oil or by-products of oil, flammable, explosive, toxic, poisonous or corrosive liquids, solids or gases, fats, congealing materials and other substances. In addition, limits are specified for a list of substances and temperatures in excess of 65° Celsius are prohibited; pH less than 5.5 or greater than 9.0 is prohibited. Similarly, discharge of radioactive substances is controlled.
- Section 4 prohibits discharge of materials that would impede the flow of sewage or interfere with the public sewer works.
- General statement that the regulation must not be interpreted as permission to discharge a pollutant into a body of water.

##### ***Collection System Controls***

The Initial Permit to Construct and Operate under the ECWS Regulation addresses the issue of conservation as a means to limit inflow and infiltration to collection systems. In future, the province plans to issue permits to operate wastewater collection systems where wastewater treatment permits are issued (see Imminent Changes, below).

CSOs are not prohibited under regulation, but the province encourages municipalities to separate sewers where possible.

### ***Treatment Controls***

Wastewater treatment facilities are permitted under the EPA. Facilities require permits to construct and these permits have a two year limit. A process has been established to issue operational permits to all facilities with specific monitoring, reporting and other operational and maintenance requirements (see *Imminent Changes*, following.).

Treatment objectives are to achieve 20 mg/L BOD, 30 mg/L suspended solids, and bacteriological limits (i.e. equivalent to secondary treatment). In permitting treatment facilities and other discharges, the province also takes into consideration fiscal constraints of communities and receiving water characteristics.

The *Water Resources Act (WRA)* also makes provisions to require plans and specifications for the construction of sewage works or changes to existing sewage works, and the location of the discharge of the effluent, together with other information that the minister may require, in order to obtain a permit for the proposed works. The *WRA* provides the Lieutenant-Governor in Council power to make regulations (d) respecting sewage or other works for which a person is required to obtain a licence or permit under the *Act*.

### ***Release***

Release of wastewater effluent is subject to permit under the EPA. Discharge points must be in the best dispersion areas, and avoid sensitive areas such as mud flats and tidal areas. CCME Guidelines are used as well as Environment Canada Environmental Quality Guidelines for shellfish.

There are no controls on releases to air for municipal wastewater effluents.

Sludge and biosolids are not land-applied in the province. Sludge stabilization plants are in place to accept sludge from haulers for the east and west portions of the island; stabilized waste is disposed of adjacent to the plant; there are plans to eventually use the biosolids for soil conditioning. Currently, central island sludges are deposited in pre-excavated pit, covered with lime and re-buried.

Section 64 of the *WRA* notes that the Lieutenant-Governor in Council may make regulations prohibiting or restricting the discharge of stormwater, sewage and waste effluents into bodies of water.

### ***Environment***

In areas where receiving water sensitivity or resource conflicts are of concern, the level of treatment necessary to satisfy quality issues or no adverse effects would be requested in a receiving water assessment report. Guidance is provided related to receiving water study for sensitive areas and sewage quality.

The *WRA* states that the minister may control the use of wetlands, including the addition of wastewater or stormwater discharges to, or the physical, chemical or biological modification of wetlands where there may be an impact upon the hydrology of that wetland or its recreational, aesthetic or other natural functions and uses.

### ***Monitoring and Reporting***

The province endeavours to sample each wastewater treatment facility at least annually but, where the need arises, resources are allocated to specific areas for more frequent sampling. With the plans for new permitting requirements, monitoring and reporting responsibilities will also be required of facility operators/ owners.

A Federal / Provincial agreement is in place for monitoring of inland waters for the province. Results are in the process of being available on the Internet in real time. This is known as the Canada Newfoundland/ Labrador Aqua Link (CANAL) and it is focused on public delivery of ambient water quality information. The website provides dynamic access to station descriptions, data and metadata for over 100 shared water quality stations throughout Newfoundland and Labrador (see URL: <http://map.ns.ec.gc.ca/canal/root/main/>; accessed March 2005).

The Province conducts monitoring within the mixing zones of municipal discharges as well as undertaking monitoring for ambient conditions.

The WRA states that the minister may require the person responsible for an undertaking to carry out and report on tests on water emitted from, surrounding or connected with that undertaking. The *Environmental Control Water and Sewage Regulations, 2003* state that all analytical work in relation to effluent samples and receiving water samples is to be carried out using analytical procedures acceptable to the Assistant Deputy Minister of Environment.

### ***Compliance and Promotion***

It is a condition of every licence and permit issued under the *Act* that the holder allows inspectors to carry out inspections. An inspector may inspect sewage works and issue tickets for offences. Ministerial Orders can be issued to shut down, alter or add to sewage works in accordance with directions set out in the order. The provincial approach to compliance for municipal facilities is consultative, negotiated compliance over time.

### ***Imminent Changes Planned***

The province has developed a model permit for operational and monitoring requirements for wastewater treatment facilities. The permits will encourage a proactive approach to operations and maintenance to institute a multi-barrier approach to water resources protection. In addition, training requirements and monitoring and reporting requirements will be identified. Implementation of these permits will be undertaken once those for potable water treatment are issued, due to provincial resource limitations in this area.

Additional parameters in wastewater, such as ammonia and pharmaceuticals are of potential interest in future permits.

A Policy Directive is proposed related to wastewater discharge quality/quantity based on protection of the environment, other resource uses, receiving water characteristics, hydrotechnical data, dispersion, dilution, mixing zone dimensions, and desired quality, control and monitoring requirements.

## **Profile: Province of Prince Edward Island**

### ***Delegation of Authority to Municipalities***

Section 30 of the *Municipalities Act* states that ...the council of a town or village set out in Schedule 1 has the power to provide sewerage collection and treatment and drainage services...

### ***Influent (Source) Controls***

For central municipal sewage systems, the PEI Municipal Water & Sewerage Utilities General Rules and Regulations set a *minimum standard* for discharge to municipal sewers, with prohibited sewage discharges including:

- i. Storm water, surface water, ground water, roof run-off
- ii. Matter having a temperature of >66° C
- iii. Gasoline, benzene, naphtha, fuel oil, motor oil, grease, acetone, solvents...
- iv. Ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, cellulose, garbage, or other solids of a type or quantity capable of causing obstruction to the flow in sewers
- v. Matter having a pH < 5.5 or > 9.5
- vi. Matter that may cause the death or injury to any person or capable of causing damage or hazard to equipment or personnel.
- vii. Hydrogen sulphide, carbon bisulphide, ammonia, trichloroethylene, sulphur dioxide, formaldehyde, chlorine, bromine, pyridine or matter that may cause an offensive odour.
- viii. Matter with BOD > 300 ppm.
- ix. Animal wastes

- x. Poisonous substance to interfere with sewage treatment or a hazard to humans or animals including Cr (hexavalent) 3 ppm; HCN 2 ppm; Phenol equivalents (primary t) 50 ppb; Phenol equivalents (secondary t) 100 ppb; Cu 1 ppm.

Charlottetown and Summerside are exempt from this regulation and can control discharges to sewers as most appropriate for their municipalities. Summerside has adopted the provincial regulation requirements into its bylaw with no additional requirements (see Summerside profile in Appendix E).

### ***Collection System Controls***

Section 25 of the *EPA* authorizes the Lieutenant Governor in Council to make regulations respecting the method of collection, treatment, and disposal of contaminants. Any works requires approval under Section 13 of the *Act*.

CSOs are not addressed in PEI regulations.

PEI follows the Atlantic Canada Standards and Guidelines Manual for the Collection, Treatment, and Disposal of Sanitary Sewage (updated in 2003), which outlines detailed engineering parameters for all aspects of system design.

### ***Treatment Controls***

See *Collection Systems* above regarding Section 25 of the *EPA*. Approvals are issued for wastewater treatment facility construction under Section 13. Requirements for facility operations are issued under Section 16 and include numerical minimum effluent standards, and loading requirements where applicable.

Secondary treatment with disinfection is a minimum standard for PEI facilities. Recent upgrades at Charlottetown and Summerside include nitrogen/ ammonia removal requirements and UV disinfection.

The *Water and Sewerage Act*, 1998 was designed to establish rates, and regulate utility operational procedures to deal with municipal sewerage.

The Prince Edward Island (PEI) Municipal Water & Sewerage Utilities General Rules and Regulations were established under the *Water and Sewerage Act* (updated in 2003). As required by the *Water and Sewerage Act*, S 16, the General Rules and Regulations were approved by the Island Regulatory and Appeals Commission for application by all municipal sanitary sewerage utilities. (However these Rules and Regulations do not apply to municipal utilities operating in Charlottetown, Summerside, Cornwall or Stratford. These utilities are exempt from the jurisdiction of the Commission).

### ***Release***

Section 25 of the *EPA* authorizes Lieutenant Governor in Council to make regulations prescribing limits, terms and conditions on the release of contaminants, and respecting wastewater emissions.

- Receiving water mixing zone guidelines are not formally documented; acceptable mixing zones are identified on a case-by-case basis
- Releases to air fall under the Air Quality Regulation of the EPA and apply to fuel-burning equipment in the case of wastewater facilities
- The Sewage Disposal Regulations have some requirements regarding land releases. Changes to biosolids management have been developed under a new sludge management strategy, whereby Charlottetown and Summerside will produce Class A biosolids in accordance with the USEPA standards. Treatment at one of these facilities will be required of all land applied sludges. The goal is to produce dewatered Class A biosolids by 2007.

### ***Environment***

PEI monitors provincial waters but not necessarily wastewater receiving waters. Charlottetown and Summerside harbour monitoring has been in place over 30 years. CCME guidelines are used and Environment Canada quality guidelines for shellfish.

***Monitoring and Reporting***

Section 25 of the *EPA* authorizes Lieutenant Governor in Council to make regulations respecting the methods of analyzing samples and prescribing the equipment or apparatus or structures to be used for taking samples.

PEI monitors wastewater treatment plant effluents 6 to 8 times per year. Charlottetown and Summerside also conduct their own monitoring. PEI does not monitor industry discharge to municipal sewers; municipalities are encouraged to undertake this monitoring and to charge appropriately for discharges to their systems.

***Compliance and Promotion***

Section 32 of the *EPA* states that any person who contravenes or violates the *Act* or the regulations, is guilty of an offence and liable to a fine of not less than \$200 or more than \$10,000, or to imprisonment for 90 days, or to both. Corporations guilty of an offence under the *Act* or regulations are liable to a fine of not less than \$1,000 or more than \$50,000, or its directors to imprisonment for 90 days, or both.

***Imminent Changes Planned***

A new regulation under the *EPA* was passed in December 2004 called the Drinking Water and Wastewater System Operations Regulation (not yet posted to the provincial site.) Minimum standards are established in three areas under this regulation: certification for operators; monitoring and reporting requirements based on the size of the system; and, well field protection (i.e. protection of ground surface areas in the vicinity of well systems).

See the new biosolids strategy developments under *Releases*, above.

**Profile: Province of Nova Scotia*****Delegation of Authority to Municipalities***

The *Municipal Government Act (MGA)*, 1998, grants power to municipalities or villages to pass bylaws and to govern. The council or village commission may, by bylaw (a) prohibit the discharge of named substances into any building service connection, wastewater facilities or stormwater system; (b) prescribe conditions under which the discharge of contaminants may be permitted.

***Influent (Source) Controls***

Under the Activities Designation Regulation, 1995, of the *Environment Act (EA)*, designated activities do not require an approval if the activity generates only a liquid effluent which is discharged to a municipal wastewater treatment facility approved by the Minister and in accordance with any applicable municipal sewer use bylaw (i.e. the province does not issue approvals to industries).

Section 333 of the MGA identifies prohibited discharges. The province does not enforce this section of the *Act* but rather, delegates this authority to the Town Engineer. The Section is not as detailed as typical municipal Sewer Use Bylaws, and is not intended to replace municipal Sewer Use Bylaws.

Section 333 of the MGA prohibits discharge of high temperature substances, explosive matter, matter capable of obstructing the flow in the operation of sewage works, sewage that has any corrosive property, sewage of such quality that an offensive odour could emanate from the wastewater facilities system, sewage containing fish or animal offal or pathological or medical wastes, contents of septic tanks, holding tanks or wastes from marine vessels or vehicles or sludge from sewage treatment plants, sewage containing animal fats, wax, grease or vegetable oil, sewage containing herbicides, pesticides, xenobiotics, polychlorinated biphenols or radioactive materials not approved, sewage in concentrations of suspended solids that exceed limits specified, or sewage that causes BOD/COD to be greater than the amount specified into wastewater facilities or a stormwater system. No limits are stated in the Section. Municipalities may further define the requirements in municipal sewer use bylaws.

Section 338 prohibits discharge of stormwater, surface water, ground water, roof runoff, subsurface drainage, cooling water or industrial process waters into a municipal sewer. The province has a Model Sewer Use bylaw.

Dry cleaners are required to contract with third party treatment service providers for waste effluents. The original objective of this requirement was to protect groundwater but it also has the effect of reducing releases to municipal sewers. The province has voluntary programs to encourage source controls and pollution prevention planning by specific industry sectors. The Province has an overall objective of establishing at least two large industry partnerships per year for three years and has several and has also initiated a number of public sector agreements for pollution prevention. As part of this initiative, the Province has developed guidance material available on-line. A code of practice is in place for dentists and doctors for waste disposal.

### ***Collection System Controls***

Collection system construction is a designated activity under the Activities Designation Regulation, 1995 of the EA, and therefore requires approval from the Minister; operations and maintenance activities for collection systems are not typically included in the approval but are identified in the Atlantic Canada Standards and Guidelines Manual for the Collection, Treatment, and Disposal of Sanitary Sewage (ACSGM), updated in 2003. The ACSGM also outlines detailed engineering parameters for all aspects of system design. There are inflow/infiltration standards in the Guidelines.

CSOs are regulated under the Emergency Spills Regulations of the EA where spills greater than 100 litres of sewage need to be reported. Similarly, sanitary sewer overflows must be reported. Existing combined sewers may be replaced with combined systems, but new combined sewers are not approved.

### ***Treatment Controls***

Section 110 of the EA grants the Governor in Council power to make regulations respecting the construction, operation, classification and maintenance of sewage-treatment facilities and the operators of such facilities. Under Section 105 of the EA, the Minister may approve sewage works and through approvals the Minister may add specific terms and conditions to their operating requirements. Construction of a wastewater treatment facility is a designated activity under the Activities Designation Regulation, 1995 of the EA.

End of pipe performance standards are set for a variety of parameters depending on the assimilative capacity of the receiving water, determined through study by the proponents' consultants and in accordance with the ACSGM. Approvals vary with the plants and receiving water but approvals specify requirements for BOD, suspended solids, coliform counts, pH where required. The province is also considering including requirements for ammonia, phosphorus and total residual chlorine.

The Water and Wastewater Facility Regulations, 1995 (N.S. Reg. 140/2000) were established to classify all wastewater treatment facilities and require operator certification.

### ***Release***

Section 67 of the EA states "No person shall knowingly release or permit the release into the environment of a substance in an amount, concentration or level or at a rate of release that causes or may cause a significant adverse effect, unless authorized by an approval or the regulations." Receiving water studies as required in the Guidelines determine what the effluent limits will be. Some limited adverse effects are expected.

Mixing zones are approved through the site-specific study at the time of approval and depends on factors such as other uses and future needs. The province may choose to reserve capacity for future users where the assimilative capacity is limited.

The ACSGM, Sections 9.1.1.2 and 11.10.2.3 outline parameters for disposal to water and land:

- For water, criteria are set for phosphorus and pH.
- For application to land, criteria are set for pH (of ambient soil and sludge), metals, P, and N. Other aspects of site selection for land application such as surface waters, land use, and land characteristic parameters are

outlined. Application limits on a per hectare basis are also identified.

- Venting parameters to air during treatment and disposal are addressed.

In practical terms, air issues for wastewater treatment facilities are odour problems and these are addressed on a nuisance basis. Biosolids are treated at biosolids disposal facilities that are typically privately owned and hired through tender by municipalities for treatment of their waste. Metals content of the sludges taken to the facilities are a contractual matter between the municipality and service provider but are not known to provide significant incentive for municipalities to keep metals loadings down (i.e. the costs of biosolids treatment by the external service provider are not so high as to encourage metals source controls by municipalities).

### ***Environment***

Section 105 of the EA gives the Minister supervision of the uses of all water resources and watercourses in the Province. The Minister may establish or adopt goals for effluent reduction; establish total allowable wasteloads for water bodies. CCME Guidelines are used to assess ambient water quality.

### ***Monitoring and Reporting***

At one time the province performed monitoring of all plants. This approach has changed to rely on reporting by the facilities as required in the approval. Plants are required to report five times per quarter as a minimum, but the may be higher for sites with issues. Risk-based monitoring by the province is undertaken; twice per year for low risk discharges with increasing frequency where problems have previously been experienced.

### ***Compliance and Promotion***

Penalties for offences under the RS or its regulations range from \$2000 to \$1 million and imprisonment of a term of up to 2 years. Orders may be issued by the Minister respecting the control of adverse effects to the environment. Compliance is typically conducted in cooperation with the municipalities to identify issues and provide assistance.

### ***Imminent Changes Planned***

No significant changes are planned, pending the CCME Harmonization outcome. As mentioned above, the province is considering including requirements for ammonia, phosphorus and total residual chlorine in the approval for treatment plant effluents.

## **Profile: Province of New Brunswick**

### ***Delegation of Authority to Municipalities***

The *Municipalities Act* grants municipalities authority to provide services for "drainage" and "sewerage".

### ***Influent (Source) Controls***

Source controls are a municipal responsibility.

### ***Collection System Controls***

Province strongly discourages combined sewer construction but it is not strictly prohibited. If any sewage is to be conveyed by a sewer, a provincial approval to construct is required and is issued under the Water Quality Regulation under the *Clean Environment Act*.

### ***Treatment Controls***

The Lieutenant-Governor in Council may make regulations for the construction, alteration, operation, location,

repair, monitoring, testing, inspection, discharge or removal of any source of contaminant, danger of pollution, or wastewater works (*Clean Environment Act*). Approval is needed to construct, modify or operate any sewage works. Any person responsible for a sewage works shall ensure that the sewage works is maintained in a good state of repair and is under the control of a competent individual. (Water Quality Regulation). Construction/alteration licenses are separate from those for operation/ maintenance and discharge.

All new treatment facilities must be identified under the Impact Assessment Regulation of the *Clean Environment Act* and if the dilution by volume will not be 8:1 in the receiving waters, an assimilative capacity study is required. More stringent effluent requirements may be required as a result of the study.

The Minister may issue an order requiring installation, replacement, or alteration of a wastewater treatment facility under the *Clean Water Act*. This is a relatively recent *Act* that is currently being implemented. There may be implications for wastewater facilities discharging to the class of watercourse requiring the highest level of care.

### ***Release***

The standard license requirements, issued under the Water Quality Regulation, for effluent are 20 mg/l BOD and 20 mg/l TSS with an 8:1 volume dilution in the receiving water. As indicated above, if this dilution ratio is not achieved more stringent limits may be established. In the case of the Greater Moncton Sewage Commission effluent requirements, less stringent requirements were established in consideration of process capabilities but with the long-term expectation that the same limits will eventually be met. The 20 and 20 limits were based on a guideline developed in the US in the 1980's and are applied to both freshwater and marine environments.

The need for disinfection is established on a case-by-case basis through risk assessment for water uses. Where disinfection is required, dechlorination is needed where chlorination is used; alternatively UV disinfection can be used.

Provincial practice is to not control air releases from wastewater facilities.

### ***Environment***

Schedule A of the *Clean Water Act*, Water Classification Regulation (2002-13) sets Standards by Class of watercourse for aquatic life; dissolved oxygen; bacteria; trophic status (for lakes, ponds and impoundments); and, prohibited activities. Schedule B outlines Mixing Zone Standards.

### ***Monitoring and Reporting***

Monitoring requirements and reporting frequency for wastewater treatment facilities are prescriptive in the licence and vary based on the size and complexity of the system. Requirements include BOD, TSS, DO, temperature and pH monitoring on a routine basis. Some nutrients are collected on an infrequent basis (e.g. a couple of times per year). Monitoring of metals in biosolids is also required.

### ***Compliance and Promotion***

The province relies primarily on facility reports to determine compliance although audits are occasionally conducted by provincial staff. Compliance steps have been required in some cases, most commonly for failure to report a raw sewage bypass. In cases of non-compliance, the province identifies municipalities in terms of priorities for funding for upgrades. In addition, municipalities are grouped into three categories: in compliance, marginal or nearing limits; and, non-compliance. Those in non-compliance are notified that a compliance plan is required to come into compliance (for example, an action by the municipality may include reduction of development). Municipalities are responsible to develop the plans.

### ***Imminent Changes Planned***

The province is considering an exemption clause under the Water Quality Regulation from the approval requirement for construction of collection system extensions. No other significant changes are planned pending the CCME initiative.

**Profile: Province of Québec*****Delegation of Authority to Municipalities***

The Code Municipal du Québec grants municipalities authority to provide services for water related services and the ability to create regulations for the establishment, maintenance and the protection of water works, including wastewater.

***Influent (Source) Controls***

As indicated following, the province has a law through which the province can control releases of contaminants from industrial or other sources. Within municipalities, the provincial practice is to rely on municipalities to enact bylaws for source controls. The province has a model Sewer Use By law and, although it is dated, most municipalities use the model to develop their by laws. Municipalities are encouraged through provincial policy to adopt by laws because, in order to qualify for a provincial subsidy program, the municipalities must have sewer use by laws in place.

The Loi sur la qualité de l'environnement (LQE) states that the Government can ban or limit the release of any matter it considers harmful into any sewer system. The Minister can create and implement a program to reduce the release of contaminants from industrial installations. Under Article 22 of the LQE, the province grants permits to industrial developments. Requirements of the permit may be the same as municipal requirements under sewer use by laws, or conditions may be different. The Loi also defines contaminants as a solid, liquid, or gaseous matter, a micro-organism, a sound, a vibration, a radiation, heat, an odour or any combination of one or the other which can potentially alter in any manner the quality of the environment.

The Loi sur la qualité de l'environnement states that the Government can adopt regulations to specify, for any category of contaminants or of source of contamination, the quantity or the maximum allowed concentration to be released in water. A source of contamination is defined as any activity or any state of things which causes the emission of a contaminant into the environment. The Government can classify sources and contaminants, limit or ban sources and the Government can allow releases into wastewater up to a regulated limit.

***Collection System Controls***

Under article 32, municipalities are obligated to obtain an authorization from the Ministry of the Environment to build or extend a sewer system. However, municipalities are excluded from an obligation under article 32.1 to obtain a permit to operate a sewer system.

Under the provincial model sewer use by law for municipalities, discharges to combined sewers are treated the same as discharges to sanitary sewers.

***Treatment Controls***

The Government can adopt regulations to specify operational norms for any water treatment service and specify the method of wastewater treatment and discharge. Under Article 32 of the LQE, construction permits are required for the installation of treatment plants as well as modification of facilities. These permits indicate water quality criteria based on site-specific objectives, however the criteria are not legally enforceable since the permits specifically apply to construction. The province does not currently have a system of permitting for operation of wastewater facilities.

Under the LQE, the Minister can create and implement a program to reduce the release of contaminants from municipal wastewater works. Site-specific requirements for wastewater treatment are developed for each facility and are established at the time of the construction permit or when the program is developed. Effluent discharge objectives are first determined by the Direction du suivi de l'état de l'environnement du ministère de l'Environnement. An environmental risk management model is used to establish these objectives based on site specific considerations which include the hydrodynamic constraints of the receiving water body and the maintenance of present and recovery of previous natural uses of the water body. Then effluent discharge limits

are established by taking into account water quality that can be achieved by available technology. The contaminants for which limits are established include fecal coliform, organic matter (BOD<sub>5</sub>), suspended solids and phosphorus. Where disinfection is required, wastewater facilities use UV disinfection or lagoon systems because the use of chlorine is banned by the ministère de l'Environnement through a Moratoire sur la chloration. (This moratorium on chlorine has been in effect for over 15 years.)

Under the LQE, the Minister can order a municipality to acquire a wastewater treatment system for public health reasons.

### ***Release***

The LQE prohibits the release of any contaminant into the environment beyond the levels prescribed by Government regulations. Regulations may prescribe levels in terms of quantity or concentration. The Government has authority to adopt regulations to specify any category of contaminant or source of contamination of potential concern as well as the quantity or the maximum allowed concentration to be released in water. The LQE also forces industries of decreed sectors (mines and pulp and paper for now) to get an "Attestation d'assainissement" from the ministère de l'Environnement. This instrument enables the ministère to set more stringent requirements than the regulation when the protection of the receiving environment requires it.

There are no regulations or Attestation d'assainissement that apply to municipal wastewater effluent discharges, so discharge limits are determined on a site specific basis when a request is made to the ministère for a new treatment plant or an extension of an existing one.

### ***Environment***

Under the LQE, 'environment' includes water, air and soil and all combination of one or the other, and in a general manner, the ambient environment with which living species entertain dynamic relationships.

The province has its own water quality criteria, based on the CCME criteria.

### ***Compliance and Promotion***

The Ministry of Municipal Affairs collects performance data on wastewater treatment facilities in operation. Information is collected on the four parameters of interest in the construction permit (see Treatment, above). The data is transmitted to a provincial database called SOMAE, which is accessible by the Ministry of Environment.

In the case of non-compliance by a municipality with the discharge criteria identified in the construction permit, there is no direct mechanism for enforcement. However, the province can encourage compliance through approvals at the time of future sewer extensions or plant upgrades

### ***Imminent Changes Planned***

A permitting approach is being developed for municipalities. An Attestation d'assainissement, like the one used for industrial sectors, will provide more flexibility to the province for compliance and enforcement.

**Profile: Province of Ontario*****Delegation of Authority to Municipalities***

The *Planning Act* grants the Lieutenant Governor in Council power through regulation to authorize municipalities to pass bylaws establishing a system for allocating sewage services to land. The *Municipal Act* states municipalities may, in a by-law prohibiting or regulating the discharge of any matter into a sewage system, provide that a person who contravenes the by-law is guilty of an offence and is liable to fine or conviction.

***Influent (Source) Controls***

Section 76 of the *OWRA* provides the Lieutenant Governor in Council power to make regulations respecting “(v) the content of sewage entering sewage works”. In practice however, the management of wastewater entering a municipal collection system is not regulated by the Ontario Ministry of Environment (OMOE) since the wastewater collected is not entering the natural environment. The OMOE prepared a Model Sewer Use Bylaw in 1989 to assist municipalities in controlling discharges to their sewer systems.

The OMOE regulates nine industrial sectors under the *Environmental Protection Act* (EPA) in a program called the Municipal/ Industrial Strategy for Abatement (MISA); MISA applies to direct dischargers to surface water.

***Collection System Controls***

Section 76 of the *OWRA* grants the Lieutenant Governor in Council power to make regulations prohibiting or controlling (iii) sewers, drain pipes, maintenance holes, gully traps and all other works that form part of or are connected with sewage works.

Minimizing the by-passing of sewage and combined sewer overflows is required in accordance with Procedure F-5-1. Procedure F-5-5, Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems, is a 1997 policy stipulating the following for Minimum CSO Controls:

- No Dry Weather Overflows
- Operation and Maintenance Program
- Pollution Prevention Program including a Pollution Prevention Control Plan requirement to characterize CSOs.
- Control of Floatables
- Maximize use of Collection System
- Maximize use of Sewage Treatment Plant for Wet Weather
- 90% volumetric control of flows from wet weather where the flows are greater than the peak flows (2 to 3 times dry weather flows)
- Minimum level of treatment during wet weather is primary treatment
- As a minimum, achieving an average of 30% BOD removal and 50% total suspended solids removal plus disinfection, especially in areas near beaches.
- Treatment facilities can either be located centrally (at STP) or at distributed locations.

***Treatment Controls***

Section 53 of the *OWRA* requires every discharger to apply for a Certificate of Approval (CofA) prior to construction. The discharger must identify effluent quality and quantity. The CofA specifies numerical limits in accordance with Guideline F-5-1 or more stringent if receiving water conditions warrant.

Section 75 of the *OWRA* grants power to the Lieutenant Governor in Council to make regulations requiring a person responsible for a source of sewage to (b) monitor, record and report on the sources of sewage including materials and methods of production used, wastes and sewage that will be generated, the water or watercourse, water works, sewage works or plumbing that may be affected by the discharge of the sewage, and to perform and report to the Director on research respecting methods of reducing or preventing the generation of wastes and sewage from the sources of sewage (i) prescribing standards of quality for sewage and industrial waste effluents, receiving streams and water courses.

The *OWRA* has a series of Guidelines to address treatment parameters and discharge requirements. Guideline F-5 Levels of Treatment for Municipal and Private Sewage Treatment Works Discharging to Surface Waters 1994, states the normal level of treatment required for municipal sewage treatment works discharging to surface waters is secondary treatment. A relaxation of the normal level of treatment will only be allowed on a case-by-case basis, in an emergency situation, and in accordance with the Ministry procedures. Under no circumstances will the level of treatment required be less than primary treatment. Higher levels of treatment than secondary, up to and including "no discharge to surface waters" may be imposed in accordance with Procedure F-5-1. Higher than normal level of treatment shall be justified by appropriate site-specific assessments of the receiving water. Phosphorus removal is required for certain sewage treatment works discharging to a number of water bodies in the Province (Guideline F-8: "Provision and Operation of Phosphorus Removal Facilities at Municipal, Institutional and Private Sewage Treatment Works"). Effluent disinfection requirements are contained in Procedure F-5-4, Effluent Disinfection Requirements for Sewage Works Discharging to Surface Waters. The Guideline F-5 and its procedures are currently being updated as per MOE commitments under the 2002

Canada/Ontario Agreement Respecting the Great Lakes Ecosystem to develop a management framework for municipal sewage treatment plants.

### ***Release***

Ontario's *EPA* governs releases to the environment, including water. The *EPA* regulates releases to air, water and soil. Generally, *OWRA* is used when issuing approvals for discharges to water and operation of systems that impact water quality such as water works and sewage works. *EPA* focuses on unauthorized releases to water and has strong pollution prevention and abatement powers. Section 31 of the *OWRA* states that a director may by order prohibit or regulate the discharge by any person of sewage into or in any waters

Ontario has a two track approach for effluent discharges: minimum discharge quality requirements; plus, requirements to protect receiving waters. The Ontario Blue Book (Water Management Goals, Policies, Objectives and Implementation Procedures) identifies objectives and other details pertaining to discharge approvals. Mixing zones are not allowed for persistent bio-accumulative contaminants. Conditions are established for conventional contaminants to protect water uses and environment as identified through receiving water assessments.

According to Guideline F-5, the Ministry requires that municipal sewage treatment works, outfall structures and emergency overflow facilities be located, designed, constructed and operated so as to minimize pollution of receiving waters and interference with water uses. The level of treatment required for individual sewage treatment works is subject to periodic review, especially when expansions of sewage treatment works are contemplated. Effluent requirements, including both waste loadings and concentrations shall be incorporated into Certificates of Approval and assigned on a site-specific basis.

As a result of receiving water assessments, higher than normal limits may be included in the Certificate of Approval, and other contaminants may be included in the Certificate of Approval. Guideline F-8: "Provision and Operation of Phosphorus Removal Facilities at Municipal, Institutional and Private Sewage Treatment Works" places phosphorus limits on sewage treatment plant discharges, gauged to the attenuating capacity of the receiving water body. This guideline addresses phosphorus discharges to, specifically, the basins of Lakes Erie, Superior, Huron and Ontario, the St. Lawrence and Ottawa Rivers, and recreational waterways. In addition, more stringent requirements may be assessed on a case-by-case basis. Basin-specific requirements (e.g. all municipal sewage treatment works discharging into the Lake Erie Basin effluents may not exceed a total P concentration of 1.0 mg/l).

### ***Environment***

The Province of Ontario identifies water environment objectives in the Blue Book (see above). Objectives are based on CCME objectives.

***Monitoring and Reporting***

Section 32 of the *OWRA* indicates that the Director may require actions through order in the event that a watercourse becomes impaired.

According to Guideline F-5, a comprehensive monitoring program, including regular sampling of sewage works effluents and recording of flows, shall be undertaken by the sewage works operating authority. This will permit assessment of compliance with effluent requirements and, if necessary, appropriate remedial measures. The compliance assessment and enforcement actions fall under Guideline F-10 and F-2 and Procedure F-5-3. The Ministry's sampling and analysis requirements for municipal sewage treatment works are contained in Guideline F-10.

Guideline F-8: The minimum sampling frequencies for treatment works are described in Procedure F-8-1: "Determination of Phosphorus Removal Requirements for Municipal, Institutional, and Private Sewage Treatment Works". Sample collection and analytical procedures to assess effluent compliance shall be in accordance with Guideline F-10 Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only).

Monitoring may be required for more parameters than specified in the effluent permit, toxicity for example.

***Compliance and Promotion***

For the administration of *OWRA* or the regulations, a provincial officer may make inspections, including, (a) entering any part of the natural environment to ascertain the extent to which any material has impaired any waters, the causes of any impairment, and how any impairment may be prevented, eliminated and the waters and natural environment restored; (b) entering any part of the natural environment to ascertain the quality or quantity of any waters; (c) entering any place from which the officer believes a material that may impair the quality of any waters is being, has been or may be discharged. Every person that discharges or causes or permits the discharge of any material of any kind into any waters or on any shore or in any place that may impair the quality of the water of any waters is guilty of an offence.

The province works with municipalities to achieve compliance with time.

***Imminent Changes Planned***

The province is planning to develop guidance on best management practices (BMPs) for six industrial sectors to assist municipalities in developing sewer use bylaws. Municipalities are the audience for these BMPs in keeping with the provincial approach that municipalities are expected to control releases to their sewer systems.

Biosolids requirements are under review, including metals concentrations for land application.

***Profile: Province of Manitoba******Delegation of Authority to Municipalities***

S.3 of the *Municipal Act (MA)* states that (one of) the purposes of a municipality is to provide services and facilities, where "service" is defined as the acquisition, development, upgrading or renewal of (i) sewage collection, treatment and disposal facilities.

***Influent (Source) Controls***

Municipalities are responsible for source controls. However reduction of pollutants at source has also been applied in a limited manner at the provincial level. In the case of mercury in dental amalgam, the province worked with the provincial Dental Association to develop a self-regulated system whereby mercury control is a requirement for a licence from the professional association to practice dentistry. In some cases of industrial discharge to municipal sewers, the province arranges agreements between wet industries and municipalities that

go beyond typical sewer use agreements. The agreements identify limits for the quantity, quality and timing of discharges, as well as costs for additional treatment required. These agreements clarify responsibilities for treatment of wastewater between the industry and the municipality. The province ties the agreement to industrial facility licenses, issued by the province under the *EA*. The agreement then becomes public and is more easily enforceable by the municipality. One result of the agreements is that the industry will undertake measures to reduce its costs for off-site treatment by the municipality.

Municipalities are encouraged to regulate and to use financial incentives through sewer charges to keep metals loadings and discharges of metals down. Municipalities are motivated to keep metals low in order to meet provincial biosolids requirements (see Release, below). The provincial *Dangerous Goods and Hazardous Waste Act* applies to wastes from metals industries (e.g. plating) in cases where threshold limits of the *Act* are exceeded. More typically, where discharges do not exceed these limits, the discharges become a municipal responsibility.

### ***Collection System Controls***

The objective for CSO's is 4 discharges per year but this is not identified in regulation, but rather is a provincial objective. Very few municipalities have CSOs.

For sanitary sewer systems, limits are specified in licences of municipalities requiring upgrades to collection systems. The province identifies municipal systems with high per capita flow rates and sets requirements in licenses for an assessment of the collection system condition. In addition, the license requires development of action plans to reduce extraneous flows. (Excess flows are usually a result of sewer system condition versus high potable water use.)

### ***Treatment Controls***

The *EA* pertains broadly to construction activities and new developments. It outlines environmental assessment processes required for designated classes of activities and licenses and approvals for various classes of developments. Wastewater treatment lagoons, aerated wastewater treatment lagoons, and sewage treatment plants are considered class 2 developments (Classes of Development Regulation 164/88). Other specific regulations under this *Act* include the Water and Wastewater Facility Operator's Regulation, and the Classes of Development Regulation.

The *Public Health Act* states "The Lieutenant Governor in Council may make such regulations and orders as: "(p) respecting the construction, maintenance, cleansing, and disinfection, of drains, sewerage systems, sewers, sewage treatment plants, sewage disposal plants".

Licenses are issued under the *EA*. The same license covers construction/ alteration and operational requirements.

### ***Release***

S9 of the Waterworks, Sewerage and Sewage Disposal Regulations (331/88) of the *Public Health Act* requires that sewage treatment plants shall be designed, constructed and operated to produce an effluent of sufficient stability and purity to cause no nuisance or offence during periods of minimum flow of the river or water course. BOD, suspended solids, and microbes have specified numerical limits in the facility licence; chemical concentrations may also be applied.

For ammonia, load-based limits are normally specified rather than concentrations based on the receiving environment. Concentrations are not used because loading provides incentive to improve treatment performance as flow volumes increase. Ammonia has been identified in licences for about 15 years. In the case of wastewater stabilization ponds (i.e. smaller systems), an increase in storage time is required to allow time for conversion of ammonia to other nitrogen forms. Wastewater is required to be held until June 15<sup>th</sup>. This method is more effective than a concentration because it requires that facilities be large enough and therefore capable of adequate treatment.

Two facilities currently have chlorination and both these facilities are currently undertaking steps to convert to UV disinfection.

The Manitoba Standards and Guidelines outline mixing zone considerations. The approach differs based on streams and rivers versus lakes. Two key factors that apply to allowable concentrations and loadings for effluent quality and mixing zone calculations are: 1) avoidance response by biota; and, 2) an allocation factor considering other dischargers to the water body.

Manitoba has licensed several facilities for reuse of treated wastewater. Most often these are golf courses and actual implementation of the reuse is about half at most. This is a climate and weather dependent issue with most requests during drought periods and in specific watersheds.

Some licenses cover air releases and modelling requirements prior to facility upgrades. There are no serious emission issues at wastewater treatment plants. Odour may be an issue and is dealt with on a nuisance and complaint basis.

Biosolids are controlled through a land-based approach whereby the lifetime loading of metals to land is limited. Factors considered are the land where application takes place and the type of crops grown. Most municipal biosolids programs are using third party land holdings (i.e. agricultural lands) and the lower the metals concentrations in biosolids the longer they can be applied to a land area. There is no consideration for Class A or

Class B biosolids; it is assumed biosolids are never totally free from element of concern and so a multiple level control approach is taken to limit human contact until the risk is diminished.

### ***Environment***

The Water Quality Objective for ammonia is based on the Manitoba Standards and Guidelines. Monitoring of ambient conditions is undertaken by the province.

### ***Monitoring and Reporting***

Wastewater facility operators must ensure that the processes within an operator's responsibility are measured, monitored, sampled and tested in a manner that permits them to be adjusted when necessary (at the discretion of the Minister) and to ensure that records are maintained of the processes.

Monitoring and reporting requirements are specified in the facility licenses. Reporting requirements vary with the system complexity, from BOD, suspended solids, and microbiological concentrations to ammonia for larger systems. Reporting frequencies increase from monthly to weekly or daily (with reports to the province typically on a monthly basis). A fairly recent monitoring requirement is influent monitoring to encourage municipalities to understand and analyse what is coming into the facility.

### ***Compliance and Promotion***

To determine compliance with the *EA* and regulations under the *Act*, the director, an environment officer, or a public health inspector appointed under The *Public Health Act* may enter and inspect a facility and its equipment and the owner's records relating to its operation. Contravention of the *Public Health Act* can result in a fine up to \$5,000 or to imprisonment for up to three months, or to both.

The province relies on the licensee's data but also has regional staff to monitor and enforce the *Act*. Monitoring stations are required for sample collection.

### ***Imminent Changes Planned***

The province is planning a review of the *EA* to place more emphasis on public involvement.

**Profile: Province of Saskatchewan*****Delegation of Authority to Municipalities***

Part IX, Section 183(1) of the *Urban Municipality Act*, 1984 authorizes municipal councils to establish works for the collection, transmission, treatment and disposal of sewage or storm drainage... Section 190(2) authorizes council to make provisions in a bylaw for: a) controlling and regulating the discharge into sewers of any harmful matter that would harm health, life or property or that would damage any watercourse, sewerage system or sewage treatment plant; b) regulating and controlling the preliminary treatment of any sewage, before it is discharged into a sewer or sewerage system; (c) compelling owners of buildings to construct and maintain any works necessary for treatment of sewage before it is discharged and preventing such discharge where works have not been constructed or are not maintained.

***Product or Pre-disposal Controls***

The Used Oil Collection Regulations prohibit distribution or sale of oil or oil filters unless the first seller operates a product management program, or the seller enters into an agreement with a person who operates a product management program on the first seller's behalf approved by the minister. The used oil and filters return incentive applies to numerous types of oil including motor oil, compressor oil, s cycle engine oil, electrical insulating oil, textile oil, etc.

***Influent (Source) Controls***

The Minister may develop any guidelines, standards, objectives, management criteria, code of practice or similar instrument to protect the environment; or do any other thing to carry out the minister's responsibilities pursuant to the *Environmental Management and Protection Act (EMPA)* and the regulations (Water Regulations, 2002). A permit is also required to construct, alter, or operate industrial effluent works except if the works discharge industrial waste exclusively into sewage works operated by a municipality.

***Collection System Controls***

Detailed guidelines for design, construction, and parameters of the collection systems are outlined in the Guidelines for Sewage Works Design EPB203, as authorized by the Water Regulations and the Act. New CSOs are not allowed. Should an existing CSO require upgrade, stormwater and sewage will likely be required to be separated (Water Regulations 2002). Regulatory approvals are required for the construction, modification and operation of all collection systems. The collection system operational permit is a part of the operating permit for the whole sewage system including the treatment and disposal components.

***Treatment Controls***

Approval is needed to construct, modify or operate any sewage works, and the approval may be subject to terms and conditions. Minimum treatment requirements are stipulated in the Water Regulations. Additional treatment requirements, if required, will depend on other issues such as downstream water uses and receiving environment. The operating permit contains maintenance, monitoring and reporting requirements. All permits must be registered with the Land Title Office (Interest registration).

Guidelines for BOD<sub>5</sub>, TSS, P, N, and total coliforms for primary, secondary, and advanced treatment systems are stated in the Guidelines for Sewage Works Design. Through permit, the minister may require the disinfection of any effluent from the sewage works. Effluent quality specified in permits may be both numeric and descriptive.

***Release***

The EMPA outlines protection and permit requirements for releases to protect "the environment, including air, land, water, and living organisms. The *Clean Air Act* also has specific requirements to protect air quality. Permits for incinerators, for example, are issued pursuant to this Act.

Guidelines used to establish release objectives include the CCME Environmental Quality Guidelines, Saskatchewan Surface Water Quality Objectives, Local Land-use Guidelines, Sludge Disposal and the Sewage Works Design Guidelines. For continuous flowing streams, effluent impact on receiving water quality should be based on the minimum 7-day consecutive stream discharge that may recur once in 10 years. Considerations to minimize effluent impact should include measures to increase dissolved oxygen content; outfall location and full or partial submerged dispersion; and desirable mixing patterns in terms of in-stream and downstream uses. Mixing zones are used to determine release requirements.

### ***Environment***

Under the *EMPA*, the Minister is responsible for the protection of the environment including, air, land and water.

### ***Monitoring and Reporting***

The Water Regulations outline O&M reporting requirements. Monitoring requirements are outlined in facility permits. The frequency and reporting requirements depend on the downstream water uses and the receiving environment. Monitoring requirements may include BOD, TSS, general chemicals, metals, toxicity, flow, microbes, ammonia and other nutrients, disinfection residuals, if disinfected. Upset conditions must be reported. Large systems are required to report annually.

### ***Compliance and Promotion***

Compliance is based on the Saskatchewan Water and Wastewater Enforcement Protocol and due process per the *EMPA*. Environmental Protection Orders can be issued under the *Act* for unauthorized discharges. The minister may, in an environmental protection order, require a person to: monitor a substance being released, lessen or prevent further discharge of a substance; or contain a substance. Under *EMPA*, persons causing adverse environmental affects could be fined up to \$1,000,000.

### ***Imminent Changes Planned***

The province may develop a program for paint and solvents similar to that for used oil collection program already in place. By July 2005, all wastewater works must be under the supervision of a certified operator certified at the level of the plant.

## **Profile: Province of Alberta**

### ***Delegation of Authority to Municipalities:***

Section 7 of the *MGA*, R.S.A. 2000, c.M-26states..."A council may pass bylaws for municipal purposes respecting the following matters...(g) public utilities..." ("public utility" means a system or works used to provide... (ii) sewage disposal ... (v) drainage)..

### ***Product or Pre-disposal Controls***

There are no known product or pre-disposal controls currently in place.

### ***Influent (Source) Controls***

The provincial approach is that source controls will be addressed by municipalities through Sewer Use Bylaws.

### ***Collection System Controls***

Under *Environment Protection and Enhancement Act* (EPEA), R.S.A. 2000, c.E-12, the Activities Designation Regulation (AR 276/2003) establishes schedules of designated activities for which an approval or registration is necessary, or for which advance notice to the Director is required. Collection systems require an approval, as they form part of, and are included within the approval for the overall municipal wastewater system, or in the case

of a collection system connected to a regional wastewater system, a registration is required. The approval or code of practice that addresses the collection system typically covers the lifecycle of the system, including construction, operational requirements, and reclamation. Under sections 5 and 5.1 of the *Wastewater and Storm Drainage Regulation* (AR 119/93), the province has mandatory standards for the design and construction of collection systems. The standards adopted are those in the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, published by the Department, as amended or replaced from time to time. The construction standards include pipe material and slope that are intended to also assist in reduction of inflow and infiltration (I/I). There are no specific requirements for I/I monitoring or reduction of the collection system. It is expected that there will be no sanitary system overflows (SSOs) but if any do occur, they must be reported immediately, as per their approval and under the mandatory release reporting requirements of EPEA.

Best management practices and O&M are used to minimize CSOs. Only one municipality has combined sewers. No new combined sewers are permitted.

### ***Treatment Controls***

The Activities Designation Regulation under EPEA sets out that the construction, operation or reclamation of a wastewater system, whether privately owned or publicly owned, requires an approval or registration. Generally, a single approval is issued for the lifetime of a wastewater system, encompassing construction, operation, and reclamation of the facility. The approval sets out monitoring and reporting requirements and numeric limits for effluent quality. The effluent quality limits incorporated into the approval, or code of practice, are the more stringent of either the technology limits or the receiving water limitations, taking into account the community size. As an example, for smaller facilities, the secondary effluent standard incorporated in approvals is 25 mg/L for BOD and suspended solids, whereas for large municipalities (population more than 20,000) the standard stated in the approvals is 20 mg/L for each. These will be lower as receiving stream conditions require. Phosphorus and nitrogen requirements for larger municipalities have been in place (and set out in approvals) for about 10 years.

Through the Wastewater and Storm Drainage Regulation AR 119/93 under the EPEA, the province references the Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems (S&Gs), thus making these standards part of the legal requirements. The S&Gs set out a full range of design and other requirements for wastewater systems. Secondary treatment standard is universally required, as outlined in the S&Gs. Site-specific standards in an approval can be more stringent and are based on a receiving water quality assessment

### ***Release***

According to the Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems, continuous discharge of effluent from treatment plants to a receiving watercourse are permitted if recorded minimum mean monthly watercourse flow is 10 times the total average daily discharge. At the time of approval application review, the province uses a computer model to assess the allowable mixing zone and includes this in the approval. The guideline requires that the water quality criteria, per the CCME Guidelines, will be met at the edge of the mixing zone.

Releases to air are not managed through approval for wastewater effluents.

Sludge from a wastewater treatment system and treated water from a wastewater system may be applied to land if it is in accordance with the applicable code of practice or is contemplated and addressed in an approval or with written authorization, under sections 8 and 9 of the Wastewater and Storm Drainage Regulation of the EPEA. Quality criteria for land application are outlined in a letter of authorization. The province is moving increasingly to identifying land application criteria in approvals to eliminate the additional requirement for letters of authorization. An approval for land application of biosolids is typically based on metals criteria, and requires site assessment including soils and groundwater assessment of the application area.

The Code of Practice for Wastewater Systems Using Lagoons, published by the Department, sets out limits and the supporting monitoring and reporting for BOD, COD, TSS, electrical conductivity, sodium adsorption ratio, and pH. Reuse is more common in southern Alberta.

***Receiving Environment***

Alberta uses the CCME Guidelines for Ambient water quality. The province is not planning to develop site specific guidelines for situations in which ambient water quality exceeds the CCME levels; such conditions are considered in the modelling conducted for mixing zone delineation (see Release, above) and the conditions used in the approval.

***Monitoring and Reporting***

S.5 of the Wastewater and Storm Drainage (Ministerial) Regulation AR 120/93 requires that sampling must be conducted and the results must be reported in accordance with an approval, code of practice or Director's notice.

Approval requirements for monitoring depend on the treatment process in place. A mechanical plant approval typically requires daily effluent monitoring of BOD and SS if discharge is continuous. Reporting is typically required on an annual basis. Reporting is required immediately upon violation of a condition of the approval.

In case of use of wastewater for irrigation the approval outlines monitoring requirements for irrigation processes, including groundwater monitoring for pH, conductivity, sodium, total dissolved solids (TDS), (TKN), and chemical oxygen demand (COD). Monitoring for calcium, magnesium, total hardness, potassium, iron, total phosphorus, nitrate-nitrogen, nitrite-nitrogen, ammonia-nitrogen, chloride, fluoride, sulphate, carbonate, bicarbonate, total alkalinity, and total Kjeldahl nitrogen is required only in approvals

***Compliance and Promotion***

Overall, municipalities appear to comply with conditions of approval. Where there are capacity issues in a municipality, the province works with the municipality to address the issues.

EPEA and the Wastewater and Storm Drainage Regulation set out offences and potential fines for failing to comply with approvals or *Act* provisions, and regulation provisions, respectively. The maximum potential fine for each offence where intention is not an element is \$50,000 for individuals and \$500,000 for corporations.

***Imminent Changes Planned***

No imminent changes planned.

***Other***

Alberta has a harmonization agreement in place with Environment Canada for management of toxic substances; certain provisions of the EPEA are recognized as equivalent for the purposes of equivalency provisions of CEPA for specific common requirements. The agreement is applicable to the Pulp and Paper sector and works well from the provincial perspective. Reference URL: <http://www.mb.ec.gc.ca/pollution/e00s61.en.html>

**Profile: Province of British Columbia**

The *Environmental Management Act* was brought into force on July 8, 2004. The *Act* replaces the *Waste Management Act* and the *Environment Management Act* and brings provisions from both of those acts into one statute. The EMA provides enabling provisions for area-based planning and administrative monetary penalties.

***Delegation of Authority to Municipalities***

Under the *Environmental Management Act* (EMA), the Lieutenant-Governor in Council may designate a regional district, or all or part of a municipality, as a sewage control area with the power to make bylaws respecting discharges of waste into sewers of the municipality. Bylaws may be made respecting the direct or indirect discharge of wastes into any sewer operated by the municipality. In addition, Sewer Control Managers in municipalities are authorized under the EMA to issue control orders under the *Act*. Both municipal and regional

sewer districts may cover the same catchment area. Health requirements under the *Public Health Act*, 1996, are met through the EMA. An exemption exists under the EMA for small discharges to ground under 5000 gal/ day; these are managed under the *Public Health Act*.

### ***Product or Pre-disposal Controls***

There are no product or pre-disposal controls regulated by the Province. Consideration was given to developing such controls, but the provincial market was found to be too small to effectively institute controls.

### ***Influent (Source) Controls***

Under the EMA, industries discharging to sewers within a municipal jurisdiction are regulated by the municipality through municipal sewer use and source control programs. Municipalities can ask the Lieutenant Governor in Council to designate sewage control areas that can then be used by the municipality to impose conditions under which waste other than domestic sewage may be discharged to a sewage facility. The EMA prohibits introduction of waste into the environment in the course of conducting a prescribed industry, trade or business, without a permit or other authorization. Through the EMA, the province has an expectation that municipalities will develop good source control programs.

Related regulations to encourage source control programs include the Organic Matter Recycling Regulation to limit metals and specific organics in biosolids or sludges. The province also has guidelines under this regulation on land application and source reduction measures.

The province runs the Product Care Program for product stewardship. Under the EMA, manufacturers are required to have the capacity to take back unused or spent products, including paint and oil.

### ***Collection System Controls***

Permits to construct or operate sewage systems are not issued under the EMA. Instead, the Municipal Sewage Regulation (MSR) under the EMA sets out requirements for construction and operation for sewage collection and treatment systems. It is the intent of the province, through the EMA, to ensure municipalities manage combined sewer overflows, sanitary sewer overflows and sewer inflow and infiltration (I/I) in excess of 2 times the dry weather flows. Over the long term, the province's goal is that CSOs will be eliminated, sanitary sewer overflows will be drastically reduced and I/I controlled to maintain efficient collection systems.

The EMA Municipal Sewage Regulation (MSR) states that existing CSOs require Liquid Waste Management Plans (LWMP) to prevent overflows. Construction of new combined sewers is prohibited. Emergency repairs to existing combined sewer systems are allowed but the feasibility of sewer separation is to be assessed and where possible storm and sanitary sewers are to be separated at the time of repair.

CSO dischargers must estimate existing flows, frequency and number of overflow occurrences including total annual volume. They must take steps to reduce the quantity, frequency and number of overflows and assess the potential impact on the receiving environment at all overflow locations. After January 1, 2004 no person shall allow a CSO to occur during storm or snowmelt events with less than a 5 year return period unless they develop a LWMP for the existing CSOs that includes undertaking measures to eliminate overflows.

Through the LWMP process the municipalities use water quality criteria and objectives as well as federal agency and provincial ministry concerns and public input to decide whether more stringent limits should be applied to CSOs and develop a schedule for implementing the necessary works based on environmental and public health risks and economics. The LWMP are a key tool for the implementation of the MSR objectives for discharge controls over time.

### ***Treatment Controls***

Permits to construct or operate are not issued under the EMA. Instead, the MSR under the EMA sets out requirements for construction and operation for sewage treatment systems. Some wastewater facilities will continue to operate under existing permits until they undertake planning and measures to meet the EMA & MSR requirements.

The Municipal Sewage Regulation (MSR) applies to all discharges except those (a) authorized by a permit, approval, order or operational certificate issued before the regulation came into force; (b) authorized or prohibited by an operational certificate or liquid waste management plan (LWMP) approved by the minister, or (c) authorized or prohibited by an order under the EMA.

S 14 and 15 of the MSR outline the specific engineering certifications required for design and construction of sewage facilities. In addition, detailed operating plans must be in place prior to commencement of construction. The MSR specifies treatment requirements for specific parameters based on flow volume and receiving environment. Schedule 3 of the MSR outlines effluent quality standards for discharges to water including: BOD, TSS, pH, coliforms, Phosphorus (total & ortho) as P, and ammonia as N, for each type of treatment system (septic, primary, secondary, and high quality secondary) for a range of sewage flow volumes, sub-divided by type of receiving water body. Schedule 5 of the regulation outlines geographical areas of the province that are required to have advanced treatment (see *Release* following). If an environmental impact study demonstrates a need for more stringent standards, the discharger may be required to provide more advanced treatment. If chlorination is required for effluent discharge, the discharger must dechlorinate the effluent.

Treatment system requirements for using reclaimed water are outlined in Schedule 2 of the MSR, along with associated monitoring and effluent quality requirements. Effluent limits for discharge to ground are addressed under Schedule 4. Monitoring requirements for discharges to ground include BOD, TSS, coliforms, turbidity, and N according to type of treatment, location of nearest source of well water, and effluent flow volume. Effluent limits in the MSR are established on a maximum concentration basis. Maximum values are more straight-forward for compliance purposes and encourage better treatment facilities design than average limits.

### ***Release***

Section 11 of the MSR requires that effluent must not be discharged to water unless (a) the effluent quality standards for discharges to water as set out in Schedule 3 or 5 are met, and (b) an environmental impact study (EIS) has been conducted in accordance with condition 8 in Schedule 1. Schedule 5 identifies requirements for effluent discharge quality to special areas of the Province, including a requirement for phosphorus removal to lake systems, nitrogen treatment for discharges to land with stressed aquifers. Effluent must not be discharged to a water body identified in Schedule 5 as an area of prohibited discharge (i.e. Saanich Inlet). Final effluent limits (e.g. for nitrogen & phosphorus) are determined through the EIS based on chronic not acute effect limits.

The MSR also has requirements regarding toxicity of effluent. A person must not discharge effluent, unless it passes a 96 hour LC50 bioassay test as defined by Environment Canada's Biological Test Method (unless the discharge is to ground; or it: meets a maximum BOD5 and TSS of 10 mg/l; is discharged to open marine waters, or where the discharger demonstrates to the satisfaction of the Manager that the discharge does not adversely affect the receiving environment. The bioassay test requirement was instituted as a result of a federal Fisheries management requirement. In practical terms, there are issues with the bioassay methodology because ammonia is not taken out of the test. Otherwise, the test can be an important indication of the effectiveness of municipal source control programming.

If effluent is discharged into a water body, there are parameters for initial dilution zone; the specific requirements vary for discharges to lakes, marine bodies of water, or a stream or estuary and are outlined in the MSR. The edge of the mixing zone must meet the Water Quality Objectives or Guidelines (see *Receiving Environment*, following), which ever applies for the water body. Mixing zones typically may not exceed 100 m downstream and not more than 25% across a river.

In the MSR it is up to the emitter to demonstrate no adverse effect. In the LWMP process, there is a combination of concerned Ministries (Health, Municipal Affairs, Environment, Agriculture), federal agencies (Environment Canada, DFO), the municipalities and the public involved in evaluating the possible adverse effects.

The province is trying to encourage reuse of wastewater effluent, allowable under Schedule 2 of the MSR. In developing the management of reuse, the province referred to standards developed in California State, including studies on the presence of viruses in wastewater. Findings of California support unrestricted public access where adequate treatment standards and practices are established.

***Environment***

The province relies on provincial guidelines and on water quality objectives, derived from the guidelines, for specific water bodies where site-specific requirements are needed. A WQO for ammonia has been in place since 1986 and were designed after the USEPA 1984 guidelines for ammonia.

***Monitoring and Reporting***

Section 27 of the MSR sets out monitoring requirements. The discharger must (a) monitor the receiving environment to provide data to assess the potential impact of the discharge and to ensure that the discharge does not or will not cause water quality parameters outside the initial dilution zone to exceed any known water quality guidelines, and (c) when conducting a receiving environment monitoring program, provide at least one control sampling station located upstream of the initial dilution zone of the effluent. (2) A receiving environment monitoring program must document pre-discharge conditions and seasonal variations. A LWMP can outline monitoring and reporting requirements. Facilities operating under the former permit system also have monitoring and reporting requirements specified in the permit.

All sampling and flow measurements are carried out in accordance with the procedures described in “British Columbia Field Sampling Manual for Continuous Monitoring plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment and Biological Samples” or by a suitable alternative. Monitoring is required for BOD, TSS, and coliforms for all environments, NH<sub>4</sub>-N, phosphorus (total & ortho as P), for freshwater receiving environments, and NH<sub>4</sub>-N for marine environments. Data must be submitted daily, weekly, or semi-monthly depending on volume specified.

***Compliance and Promotion***

The province currently relies on reporting by municipalities under the MSR and LWMPs. Formerly, the province conducted regular testing, but now conducts spot checks to assess the credibility of data in municipal reports. Persons in contravention of the Municipal Sewage Regulation under this Act are liable to a penalty not exceeding \$1M or 6 months imprisonment, or both.

***Imminent Changes Planned***

The EMA and MSR are very recent pieces of legislation that are still in the implementation phase; some adjustments will be made to refine or correct small aspects. No substantive changes are planned since the EMA & MSR were developed through a comprehensive technical review.



## APPENDIX D

### Territorial Profiles

## Appendix D

### Territorial Profiles

**Profile: Nunavut Territory**

In Nunavut, responsibility for management of water has not yet been devolved to the territorial government. INAC's Water Resources Division manages the waters of Nunavut and advises the Department's Minister on water matters. The Division manages the collection of water data, conducts specific aquatic ecosystem studies, provides technical advice to water boards (as requested), reviews licence applications, participates in environmental assessments and provides information to the public. Issuing licences for water use has been assigned to several water boards. Along with federal government representatives, Nunavut government representatives (Inuit) sit on the Nunavut Water Board.

***Delegation of Authority to Municipalities***

None found.

***Influent (Source) Controls***

The Guidelines for the Discharge of Domestic Wastewater In Nunavut are authorized under the Nunavut Waters and *Nunavut Surface Rights Tribunal Act, 2002*, a Federal Act. (see Federal Profile B, above)

Section 5 of the *EPA* prohibits discharge of a contaminant into the environment unless the discharge is authorized by the *Act*, regulations, or an order. This provision has been used solely for domestic purposes and discharges from within a dwelling/house.

***Collection System Controls***

The federal Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments (1976) apply in Nunavut. There are no combined sewers in Nunavut.

***Treatment Controls***

The *federal Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments* (1976) also apply to discharge of effluent from wastewater collection and treatment systems. The Department of Community and Government Services is responsible for wastewater infrastructure in the Territory.

***Release***

The *Nunavut EPA* contains a broad prohibition on the discharge of contaminants without appropriate permission.

**Profile: Northwest Territories**

In the Northwest Territories, responsibility for management of water has not yet been devolved to the territorial government. INAC's Water Resources Division manages the waters of the NWT and advises the Department's Minister on water matters. The Division manages the collection of water data, conducts specific aquatic ecosystem studies, provides technical advice to water boards (as requested), reviews licence applications, participates in environmental assessments and provides information to the public. Issuing licences for water use has been assigned to several water boards.

***Delegation of Authority to Municipalities***

The *Charter Communities Act, 2004* (Part 3, section 62) authorizes Charter Communities to establish, deliver and

operate services, public utilities and facilities. Part 4 Section 74 provides council power to make bylaws for municipal purposes respecting public utilities and programs, services, infrastructure and facilities. Part 2 states council is responsible for (a) developing and evaluating the plans, policies and programs of the charter community;(b) making the bylaws and resolutions of the charter community; and (c) ensuring that the powers, duties and functions of the charter community are performed. Section 94 of *The Charter Communities Act*, states a bylaw respecting a public utility may provide for the prohibition or regulation of the discharge of substances and liquids into a water distribution system, a sewage disposal system, a drainage system or a waste management system.

### ***Influent (Source) Controls***

Under the *Public Health Act*, Public Sewerage Systems Regulations, industrial wastes that are of a nature that will adversely affect the sewers, sewage treatment system or final effluent shall be either pre-treated or excluded from the sewerage system.

The *EPA*, 1998, prohibits the discharge of a contaminant into the environment unless the discharge is authorized by the *Act* or regulations, or by an order, or the contaminant has been used solely for domestic purposes and was discharged from within a dwelling-house.

### ***Collection System Controls***

The *Public Health Act* provides guidance in areas relating to public health, including the design of sewers and sewage pumping stations near surface water, potable water sources and in relation to other infrastructure both in and above ground.

### ***Treatment Controls***

Under the *Public Health Act*, the Public Sewerage Systems Regulation outlines treatment parameters for municipal sewage. Sewage treatment systems shall be designed to provide for adequate protection of the receiving water considering the possible uses of the receiving water. Section 10 outlines safety aspects of design.

The *EPA*, 1998 authorizes the Commissioner (a position not defined within the act) to make regulations prescribing any matter that may be prescribed under the *Act* respecting contaminants or the concentration of contaminants that may or may not be discharged into the environment, respecting the maximum permissible concentration of a contaminant in the environment, respecting the reporting of discharges of contaminants or the likely discharge of contaminants, respecting the manufacture, use, installation, removal or modification of equipment designed to control the release of contaminants, and respecting methods of collection, treatment, distribution, recycling, reuse or disposal of contaminants. There are no regulations identified under this act that pertain to municipal wastewater effluent.

### ***Release***

The Public Sewerage Systems Regulations authorize the Chief Medical Health Officer to disinfect municipal wastewater effluent when a public health hazard may be created by the effluent. The effluent shall be disinfected by the use of chlorine or other chemicals. For disinfection, the chlorinator capacity should be adequate to produce a residual of 1 mg/ L in the final effluent.

### ***Environment***

The Public Sewerage Systems Regulations requires that no final disposal of effluent from a sewerage system be carried out in a manner that creates a health hazard with respect to water supplies, swimming beaches or any body of water in the area; or aesthetically unacceptable conditions with respect to temperature, turbidity, colour, taste or odour of any stream or body of flowing water in the area.

### ***Monitoring and Reporting***

Section 34 of The *EPA* authorizes the minister to make regulations respecting the methods for sampling and analyzing contaminants, and respecting the methods for sampling and analyzing the rate of emission of a

contaminant into the environment.

### ***Compliance and Promotion***

The Public Sewerage System Regulations authorizes a Medical Health Officer or a Health Officer to enter any premises of a public sewerage system and examine the premises and anything in the premises that is used in connection with the operation of the public sewerage system and where disposal of sewage or effluent creates a health hazard, he or she may order closure of the public sewerage system.

### **Profile: Yukon Territory (YT)**

Yukon Territory was recently (2002) delegated authority for water management.

### ***Delegation of Authority to Municipalities***

Section 248 of the *Municipal Act 1999* authorizes a municipality to provide for public benefit or convenience, any service or product which the council considers is necessary or desirable. It also states that a municipality may own and operate a public utility as defined in the *Public Utilities Act*, but only with the approval of the Commissioner in Executive Council and if not prohibited under that *Act* or any other act.

### ***Influent (Source) Controls***

Municipalities are responsible to control discharges to municipal sewers.

### ***Collection System Controls***

There are no combined sewers in YT. Sewer construction is not approved separately from the water license (see Treatment Controls, following). No guidelines are currently in place for sewer collection systems.

### ***Treatment Controls***

Section 31 of the *Yukon Water Act (YWA)* authorizes the Commissioner in Executive Council to make regulations prescribing standards for the design, construction, and operation and maintenance of works related to the use of waters or the deposit of waste, for prescribing water quality standards for waters, and for prescribing effluent standards in relation to waters.

Water licensing process is comprehensive and includes approval for construction of wastewater facilities. Water Boards draw up the licenses. The licensing process has changed somewhat since devolution to the YT by the federal government for authority over discharges to water. Water Boards are arms length groups however with the recent changes to YT authority, the Water Board now takes direction from the Premier's office. Water Boards are responsible for writing effluent discharge licenses under the *Waters Act* but the Minister and Premier have signing authority on the type A facility licenses (population over 250). For type B licenses (pop 50 to 250), the Water Board has authority to sign the license. YT is indirectly responsible for licenses through the Water Boards.

The Territory has guidelines, dated 1993, for MWWE. (These guidelines are in the process of being updated, see *Imminent Changes*, following)

The *Yukon Environment Act* mirrored the *Canadian Environmental Assessment Act*, but is now to being updated to create a Yukon environmental assessment process with more accountability to communities.

### ***Release***

Mixing zones were recognized under the old guidelines; currently due to the *FA* requirements, the license for effluents requires no acute toxicity at the end of pipe.

Under section 4 of the YWA, any waste that would be produced by the undertaking will be treated and disposed of in a manner that is appropriate for the maintenance of water quality standards and effluent standards prescribed by regulations or, in the absence of such regulations, such as the Board considers acceptable.

Most YT wastewater systems exfiltrate (i.e. they have no surface discharge). Carcross has a wood lot next to it that will be irrigated from the final of four cells and this will be monitored closely to assess effects of ammonia on vegetation. With the size and characteristics of the MWW systems, municipalities in YT do not meet threshold requirements for ammonia or chlorinated wastewater effluents under CEPA.

### ***Environment***

YT uses CCME guidelines by and large, although it does have some limits in its *Environment Act* relating to contaminated sites that may have the effect of protecting water quality.

### ***Monitoring and Reporting***

YT regulates the license not the Water Board. Licenses identify schedules, parameters limits, and reporting requirements, such as frequency of reporting. Typical parameters included in licenses are: SS, BOD, pH, oil and grease, 96 hour LC50, fecal coliforms, ammonia in selected cases, P, and TRC (in Carmacks). Sometimes a longer list of parameters is identified for monitoring requirements, in cases of site specific receiving environment conditions, such as a community downstream.

Municipalities are typically required to report monthly.

### ***Compliance and Promotion***

YT conducts audit sampling once or twice per year. In general, YT has municipalities both in compliance and out of compliance (i.e. those with dated systems). The YT response to non-compliance is a management response to develop compliance over time. There are seldom issues with lagoons.

Section 34 of the YWA gives inspectors powers to enter to inspect. Those guilty of offences are liable to a fine of up to \$100,000 or to imprisonment for a term of up to one year, or to both.

### ***Imminent Changes Planned***

The 1993 guidelines are in the process of being updated due to capital investments required in the Dawson and Carmacks systems. YT may adopt INAC guidelines developed for NWT in the interim, pending the national strategy.



## **APPENDIX E**

### **Municipal Regulatory Structures**

## Appendix E

### Municipal Regulatory Structures

Profiles of municipal wastewater regulatory structures are presented in this appendix sorted first by province or territory and next alphabetically by municipality.

#### Newfoundland and Labrador

**Profile: Corner Brook – Bylaw – Newfoundland 65/03**

##### *Influent (Source) Control*

Discharges to water and sewage in Newfoundland must meet the provincial requirements of provincial regulation 65/03. There is no authority for municipalities to set requirements over and above the provincial requirements for control of industrial or other discharges to the sewer system.

##### *Collection System*

A small municipality (Massey Drive) discharges to Corner Brook's system. Dischargers in this municipality are covered by the same provincial requirements as Corner Brook.

##### *Compliance and Promotion*

Not Applicable (the regulation is provincial and therefore not a municipal issue for enforcement).

#### Prince Edward Island

**Profile: Summerside – Bylaw - Water and Sewer**

##### *Source Controls*

The City of Summerside is responsible for the collection and treatment of sewage within the City's boundaries. PEI Municipal Water and Sewerage Utilities General Rules and Regulations have been approved for application by the PEI Public Utilities Commission.

The Bylaw for Water and Sewer regulates the quality of wastewater entering the sanitary sewer system, specifically from the industrial, commercial and institutional wastes of the municipality, specifically:

- Limits are placed on the concentrations of specific substances and substances with specific characteristics (e.g. flammable, cause obstructions). See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Prohibition on wastes that may harm people, cause damage to sewer works
- Wastes causing odour or public nuisance, including sulphur compounds, ammonia, chlorine, bromine, formaldehyde
- Phenol equivalents are regulated
- Prohibition on stormwater, surface water, groundwater, roof run-off, subsurface drainage, and similar.

##### *Collection System Controls*

No collection system controls specified.

##### *Compliance and Promotion*

The enforcement of the bylaws are done by the engineering department with assistance from the staff of the

treatment facility. Checks are undertaken on businesses that are known to have products that may affect the system. They have inspected a number of industrial plants in the Summerside area to ensure proper discharge practices are being carried out, for example the fish plant, window plants, box plant. In addition, from time to time staff visits plants in the area to identify ways to better dispose of products they have to help in the protection of the collection system.

### ***Imminent Changes Planned***

None planned.

## **Nova Scotia**

### **Profile: Cape Breton Regional Municipality**

#### ***Influent (Source) Control***

The Cape Breton Regional Municipality does not currently have a sewer use bylaw. The Regional Municipality can apply the provincial requirements specified in the provincial *MGA* Section 333 (see Nova Scotia profile) however the RM is primarily residential and commercial with few industrial dischargers.

#### ***Collection System Controls***

The Regional Municipality sewer system is primarily a combined system. The sewer use by law being developed (see *Imminent Changes Planned*, following) will be written for a combined system.

#### ***Compliance and Promotion***

Not applicable for municipal bylaw. Sampling of effluents from 6 aerated settling lagoons (with chlorination) is done periodically to assess concentrations. (An enhanced primary treatment plant is currently being constructed in Sydney with a capacity of 16,000 m<sup>3</sup>/day.)

#### ***Imminent Changes Planned***

The Regional Municipality is in the process of developing a bylaw that will have more stringent requirements than the provincial level requirements through the *MGA*. The objective of the bylaw will be to control sources in order to exceed the provincial requirements for effluent discharge and to meet federal discharge requirements (although these are not currently clear per the *FA*).

### **Profile: Halifax Regional Municipality – Bylaw #W-101**

#### ***Influent (Source) Control***

Bylaw #W-101 regulates the quality of wastewater entering the sanitary sewer system, specifically from the industrial, commercial and institutional wastes of the municipality, specifically:

- Limits are placed on the concentrations of specific substances. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits
- Prohibitions include materials that cause excessive discoloration
- Prohibition on wastes containing herbicides, pesticides, xenobiotics, PCB or radioactive materials not approved for disposal by the Atomic Energy Control Board
- Wastes requiring special treatment or disposal practices by any enactments of Parliament or of the Province
- Compliance by dilution is prohibited
- Prohibition on stormwater, surface water, groundwater, roof run-off, subsurface drainage, cooling water or industrial process waters.

***Compliance and Promotion***

The municipality has four staff authorized to enforce the sewer use bylaw and undertake monitoring to assess compliance. The municipality enters into compliance agreements, surcharge agreements, and negotiations to achieve compliance with the bylaw.

The municipality's pollution prevention program consists of education for the residential and ICI sectors. This includes television, radio and print promotion throughout the municipality.

**New Brunswick**

**Profile: Fredericton** – Bylaw #S-8

***Influent (Source) Control***

Fredericton is responsible for all sewage collection and treatment within the jurisdiction. Bylaw #S-8 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on any materials harmful to the sewer system, operations, treatment process, or which may become hazardous to people, animals, property
- Limits are placed on the concentrations of specific substances. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Prohibitions on substances causing odours include amines, ammonia, specified sulphur compounds
- Prohibition on explosive matter
- General prohibition on stormwater, roof and land drainage, water course or uncontaminated water
- Prohibition on effluent from geothermal heat extraction systems

***Collection System Controls***

No collection system controls specified.

***Compliance and Promotion***

The municipality has two plumbing inspectors and 2 by law enforcement officers as in addition, maintenance staff are aware of the sewer by law compliance and enforcement. Monitoring is undertaken on an as-needed basis when a problem presents itself. Compliance activities of the past few years include inspections, surcharge agreements and compliance agreements, and issuing plumbing permits. Other bylaws (W-2 and W-3 and the plumbing by law) support the sewer use by law.

***Imminent Changes Planned***

The City is considering lowering the BOD and SS limits. It is also looking at increasing the fines.

**Profile: McAdam** – Bylaw #29

***Influent (Source) Control***

Bylaw #29 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on flammable or explosive liquid, solid or gas materials
- Limits are placed on the concentrations of specific substances and on specific characteristics (e.g. corrosive properties, solid or viscous properties). See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.

- Prohibition on water wastes with quantities of toxic or poisonous materials that either singly or through interaction with other wastes, will interfere sewage treatment, be hazardous to humans, animals, be a public nuisance, or create a hazard in the receiving waters of the sewage treatment plant.
- General prohibition on stormwater, surface water, ground water, roof run-off, or cellar drainage.
- No other municipal systems discharge into the village system. The dischargers to the system are residential and, in one case, industrial but domestic flows only.

### ***Collection System Controls***

No collection system controls are specified.

### ***Compliance and Promotion***

There is staff with bylaw enforcement responsibilities but compliance is typically not an issue. On occasion village staff traces a particular discharge back from the plant into the collection system to identify the source of a prohibited discharge. The most common problem discharge is petroleum from failed containers within residences. A provincial requirement for licensed installers of residential oil tanks has decreased the likelihood of this problem.

Interestingly, a bag limit of 2 garbage bags per residence corresponded with an increase in solids loading to the wastewater facility, possibly as a result of an increased use of garburators. No action is currently planned on this issue but additional maintenance and increased solids disposal needs have been noted by staff. There are waste depots available for household hazardous wastes.

### ***Imminent Changes Planned***

No changes to the bylaw are planned. A study is underway to understand the cause of algae blooms in the receiving lake. The village has voluntarily reduced phosphorus concentrations in the discharge to below the permit requirement.

**Profile: Moncton** – Bylaw #P-2 (NB: this number is a City of Moncton By law)

### ***Influent (Source) Control***

This profile provides an outline of the City of Moncton Sewer Use Bylaw. The Greater Moncton Sewage Commission (GMSC) also has a similar by law. The GMSC by law has been adopted by the two other municipalities (other than the City of Moncton) discharging to the GMSC system. There are a limited number of direct connections to the GMSC system but none of these discharges industrial effluents.

Bylaw #P-2 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Prohibition on ashes, straw, etc. (i.e. matter that can impede sewer flows)
- Prohibition on substances causing odours including ammonia, specified sulphur compounds, others
- Controls on suspended solids concentrations by particle size (greater and less than 1 micron)
- Controls on flammable and combustible matter, including 15 mg/L limit on oil, grease, tar, gasoline, benzene, naphtha, fuel oil, acetone or other solvents
- Prohibition on pesticides and herbicides, radioactive material (except as permitted federally or provincially)
- General prohibition on stormwater, roof and land drainage, water course or unpolluted water except were combined sewers.

Surcharge agreements are not possible since the enhanced primary treatment facility would not be able to remove additional BOD or other parameters (and therefore, dischargers would be paying a surcharge for a service that cannot be provided by the GMSC facility).

The Solid Waste Commission runs a program to take paints, oils and other household hazardous wastes. Communications of the two commissions complement each other and have raised public awareness over the years.

### ***Collection System Controls***

No collection system controls specified.

### ***Compliance and Promotion***

The GMSC staff undertake monitoring of 10 to 15 dischargers per year. Local municipal by laws take precedence over the GMSC by law. GMSC staff do not have by law enforcement in their job descriptions. Although GMSC staff do not have authority to enforce the by law, the GMSC and local municipalities work in cooperation to negotiate compliance with dischargers. In general, industrial dischargers have been in compliance and in at least one case, the discharger proactively contacted the GMSC to assess its compliance.

### ***Imminent Changes Planned***

Over the next two to three years, the GMSC foresees a need for a more formal memorandum of understanding with area municipalities, fully harmonized sewer use by laws, and well-defined roles and responsibilities for enforcement.

## **Ontario**

**Profile:** Cornwall – Bylaw #103-2003

### ***Influent (Source) Control***

Bylaw #103-2003 regulates the quality of wastewater entering the sanitary, combined and storm sewer systems of the municipality, specifically:

- General prohibition on any materials harmful to the sewer system, operations, treatment process, or which may become hazardous to people, animals
- Limits are placed on the concentrations of specific substances; See the Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits (Table 1 of the summary).

Temporary Extra Strength Surcharge Agreements are possible for:

- Biochemical Oxygen Demand
- Phenolics (4AP)
- Solvent Extractables - animal or vegetable in origin
- Kjeldahl Nitrogen, Total
- Phosphorus, Total; or
- Suspended Solids, Total.

Grease, oil and grit interceptors must be maintained by the property owner.

### ***Collection System Controls***

Access for monitoring is required of dischargers where municipal or proponent monitoring is required.

### ***Compliance and Promotion***

Cornwall has staff with compliance and enforcement responsibilities and they undertake monitoring for compliance assessment. The City undertakes inspections and industry discussions/ negotiations to promote compliance. Compliance agreements are possible, for a fixed term; agreements contain reporting requirements and maximum interim limits for parameters out of compliance.

Dischargers are required to monitor and report in accordance with the *Protocol for the Sampling and Analysis for the Municipal Sewer Use Bylaw*. Where the sewer system is combined, stormwater cannot be included as part of the concentration assessment.

### ***Imminent Changes Planned***

No changes are planned within the next year.

## **Profile: Ottawa**

### ***Influent (Source) Control***

The City of Ottawa is responsible for all sewage collection and treatment, where the dischargers have access to sewer services. The Ottawa Bylaw regulates the quality of wastewater entering the sanitary and storm sewer systems of the municipality, specifically:

- General prohibition on matter with potential to harm sewer workers, interfere with infrastructure operation or compliance, or pose hazard to property, animals, water environment
- Limits are placed on the concentrations of specific substances of wastewater discharged to the sewer system and on specific characteristics (e.g. two layers, viscous). See Appendix G for details on the bylaw.
- The Bylaw makes provision for discharge agreements (for BOD, TSS, TKN, TP), compliance programs and best management plans.
- Stormwater, groundwater, roof and land drainage are prohibited from the sanitary system with limited exceptions.
- Interceptors for grease, oil, sand and dental amalgam are required on premises of commercial food preparation, vehicle maintenance, or dentistry practices producing waste amalgam (respectively).

### ***Collection System Controls***

The Bylaw requires access within the collection system for purposes of monitoring regulated effluents.

### ***Compliance and Promotion***

The City has staff assigned to compliance and enforcement of the bylaw and they undertake monitoring of industrial dischargers. The City enters into compliance agreements, surcharge agreements, undertakes inspections, and sector discussions/ negotiations as part of its compliance and promotion program. The City has a Take it Back Program and Household Hazardous Waste Depot that complement sewer use management.

### ***Imminent Changes Planned***

The Bylaw was significantly revised in the Fall of 2003 and no further changes are anticipated in the short term.

## **Profile: Peel Regional District – Bylaw #90-90**

### ***Influent (Source) Control***

Peel is responsible for all sewage collection and treatment in the region. Bylaw #90-90 regulates the quality of wastewater entering the sanitary sewer and storm sewer systems of the municipality, specifically:

- General prohibition on matter with potential to harm sewer workers, interfere with infrastructure operation or compliance, or pose hazard to property, animals, etc.
- Limits are placed on the concentrations of specific substances and on some characteristics (e.g. temperature, pH) of wastewater discharged to the sewer system. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- The Bylaw makes provision for compliance programs during construction.

- All dischargers must complete a Waste Survey Report (Schedule B-1).
- Businesses storing chemicals outside must have Best Management Practices Plan (Schedule A).

### ***Collection System Controls***

The Bylaw prevents stormwater infrastructure from being connected to sanitary sewer infrastructure:

- Requirement to disconnect stormwater leaders from sanitary systems where in place
- Discharge of stormwater into sanitary sewers is prohibited.

The Bylaw requires access within the collection system for purposes of monitoring regulated effluents.

### ***Compliance and Promotion***

RM Peel has staff with compliance and enforcement responsibilities and they undertake monitoring for compliance assessment. Industries are regularly inspected and monitored. Sampling frequencies vary from grab samples to monthly, automated composite sampling. The industry pays the full cost for these programs.

Currently the RM has a sewer use surcharge agreement for those industries that are over the bylaw limits. Additional fees are charged based on monitored discharges and those companies under agreement are billed based on an executed agreement. Charges are significant and the agreement is an attempt to get them back in compliance utilizing their own site treatment systems. Part of the surcharge fee is returned to them if they build their own treatment facilities. This method is employed to be proactive in getting industries to deal with their own wastewater effluent above the sewer use bylaw. As part of the surcharge agreements, industries are encouraged financially to come into compliance to meet sewer use bylaw limits. Water Efficiency programs encourage water savings and reduced sewer bills as sewage is billed at 85% of water consumption.

Peel's bylaw has the ability to lay charges which is sometimes employed for those companies that exceed the sewer use bylaw and fail to enter into a surcharge agreement. Also, the RM negotiated with the Airport Authority (AA) to reduce Glycol discharges to the treatment facility and for the AA look at onsite recycling instead of treatment (which can cause operational difficulties).

### ***Imminent Changes Planned***

Peel has developed a draft bylaw to replace Bylaw #90-90. Changes mostly pertain to limits and expanding the bylaw to acknowledge that the RM also accepts contaminated storm water run off, as long as it meets the bylaw. Specific changes to limits include:

- Additional parameters addressed for storm sewers that were already covered for sanitary sewers, including phosphorus, nitrogen; chlorides, cyanide, manganese, selenium, arsenic, phenolic compounds, separate liquid layers, industrial waste, industrial process waste, waste with the property of separate layers or film sheen
- Addition of restrictions for both the sanitary and storm sewer systems on additional compounds including benzene compounds, E-coli, Dichloroethylenes, Dichloropropylenes, chloroethanes/ethylenes, Toluene, Xylenes, Di-n-butyl phthalate, Bis (2-ethylhexyl) phthalate, Methyl Ethyl Ketone, Styrene, NP & NPEs
- Removal of sanitary sewer restrictions on bismuth, vanadium, iron
- Provision of 60 days upon notice to report (from 14)
- Addition of prohibition on garbage grinders that connect to sewer system
- Addition of requirement for industrial facilities to install Solvent Extractable Matter Interceptors.

**Profile: Thunder Bay** – Bylaw #373-92

### ***Influent (Source) Control***

Bylaw #373-92 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on any materials harmful to the sewer system, operations, treatment process, or which may become hazardous to people, animals, property or which may cause the sludge to fail to meet Provincial requirements for use on agricultural lands
- Limits are placed on the concentrations of specific substances and on characteristics of sewage (e.g. cause odours or blockages). See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Except where sewers are combined, general prohibition on stormwater, roof and land drainage, water course or uncontaminated water
- Prohibition on dilution to meet concentration limits.

### ***Compliance and Promotion***

The City has one person full-time as a Sewer Use Control Inspector. Monitoring of effluents by sewer users is undertaken to assess compliance. Sewer surcharge agreements are in place for 2 to 4 industries. Sewage haulers (septic tanks) require permits and fill out tracking forms. Presentations have been done for the local dentist association and automotive garage association. Effluent checks are done on restaurants. Waste Surveys and use of Best Management Practices are encouraged on a voluntary basis.

### ***Imminent Changes Planned***

Updates to the current bylaw are planned to add limits for organics, similar to Toronto's sewer use bylaw. Ticketing provisions will also be investigated.

**Profile: Toronto** – Bylaw Chapter 681

### ***Influent (Source) Control***

The Bylaw regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on matter with potential to harm sewer workers, interfere with infrastructure operation or compliance, or pose hazard to property, animals, etc.
- Limits are placed on the concentrations of specific substances and on some characteristics (e.g. temperature, pH) of wastewater discharged to the sewer system. See the summary in Appendix G for details.
- The Bylaw makes provision for industrial waste surcharge agreement for BOD, TSS, TKN, TP; and sanitary discharge agreement for water that has originated from a source other than the City water supply system. Compliance program plans are possible.
- All dischargers must complete a Pollution Prevention Plans and provide plan summaries; every six years, new plans are required
- Prohibition on dilution
- Interceptors required for grease, sediment, dental amalgam
- Garbage grinders prohibited for domestic purposes where the effluent discharges into a storm or combined sewer.

### ***Compliance and Promotion***

Toronto has compliance and enforcement staff that undertake a range of activities including compliance agreements, surcharge agreements, inspections, and sector discussions. In addition, pollution prevention

planning requirements for businesses discharging subject pollutants (as listed in Appendix H of Municipal Code Chapter 681, Article I) to the sewers.

**Profile: Waterloo – Bylaw #1-90**

The Region is currently responsible for all treatment and the collection systems in two of the smaller Townships. In the other municipalities, the City or Township has direct responsibility for the collection system. The Region has the only active sewer use bylaw and enforcement program. Some of the other municipalities still have bylaws related to sewer use.

***Influent (Source) Control***

Bylaw #1-90 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on any materials harmful to the sewer system, operations, treatment process, or which may become hazardous to people, animals, property or vegetation, cause biosolids to fail to meet Ontario requirements for agricultural use, or cause contraventions of law in Ontario
- Limits are placed on the concentrations of specific substances. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Prohibitions on substances causing odours include amines, ammonia, specified sulphur compounds.
- Prohibition on severely toxic or radioactive waste, other compounds including NDMA.
- General prohibition on stormwater, roof and land drainage, water course or uncontaminated water except where sewers are combined.
- Prohibition on water from a source separate from the water system.
- Waste Survey Report is required (Schedule B-1) of qualifying dischargers.
- Best Management Practices must be in place where chemicals are stored outdoors (stormwater protection provision).
- Surcharge Agreements are possible.

***Compliance and Promotion***

The Region has seven positions directly involved in the enforcement of the sewer use program. Up to one hundred and fifty companies are routinely monitored based on the specific unit processes. Compliance agreements, surcharge agreements, inspections, and sector discussions/ negotiations are routinely undertaken to achieve compliance. Pollution prevention is routinely discussed as part of the sewer use program activities and a Business Water Quality program is in place to assist companies in assessing the potential impacts of spills.

***Imminent Changes Planned***

None at this time.

## Manitoba

**Profile: Hanover (MB)**

***Influent (Source) Control***

The RM is solely responsible for collection and treatment within the RM boundaries. The Rural Municipality of Hanover does have a sewer use bylaw restricting 'clear' water from entering the low pressure system in the town of Mitchell. The RM also has industrial services agreements with two major wastewater contributors that identify the constituent and volume limits that can be accepted into the receiving wastewater treatment lagoons.

***Compliance and Promotion***

Periodic surveys of compliance are undertaken.

***Imminent Changes Planned***

New bylaw proposed to expand the limitation to include the restriction and removal of sump pump & drain tile water that is currently flowing into the sewer systems.

**Profile: Winnipeg – Bylaw #7070/97*****Influent (Source) Control***

Bylaw #7070/97 regulates the quality of wastewater discharged to the sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances and on some characteristics of wastewater (e.g. viscosity, lower explosive limit). See the Envision Compliance Sewer Use Bylaw record [Appendix G] for details on specific substances controlled and their concentration limits.
- Sampling for BOD and TSS may be required by the Sewer Utility.
- The Bylaw makes provision for Overstrength Wastewater Discharge Licenses, subject to additional fees for BOD and TSS in excess of specified limits.
- Interceptors for grease are required on all sinks and dishwasher waste pipes of hotels, restaurants, and institutional and commercial buildings.
- Interceptors are required for oil and sand on waste outlets of mechanical service garages, motor vehicle wash floors, or similar establishments and industrial discharges.
- Part 10 of the bylaw, Wastewater and Land Drainage Discharges, prohibits discharge of wastewater to surface waters or to land drainage works within the city.
- Part 11 prohibits discharge of well water and river water into the sewer system
- Part 12 of the bylaw controls waste discharge from wastewater disposal vehicles.

***Collection System Controls***

None specified in bylaw.

***Compliance and Promotion***

The city has staff for compliance, enforcement, and monitoring for the bylaw. Compliance agreements, industry-specific studies and monitoring have been undertaken recently to assist in discharger compliance. The city assists in promotion of provincial hazardous waste depot days and runs an education campaign to educate residents on disposal restrictions to sewers (“Don’t Throw it Down the Drain”).

***Imminent Changes Planned***

On the basis of provincial public hearings and the public expectation for stricter sewer controls, the city has plans to develop a more stringent bylaw. It has initiated a process to develop options and is considering adoption of the Toronto bylaw practice of establishing P2Plan requirements.

## Saskatchewan

**Profile: La Ronge (SK)*****Influent (Source) Control***

The Town of La Ronge does not have a sewer use bylaw. The town is primarily residential with some commercial establishments.

The Town has a recycling facility that is run in partnership with SARC (Saskatchewan Association for Resource Recovery). The facility accepts all types of oil, including cooking oil and has been functional about three years.

***Compliance and Promotion***

Not applicable.

***Imminent Changes Planned***

The town has no plans to change its current practices. It works closely with the Province for the delivery of wastewater services.

**Profile: Regina – Bylaw #5601*****Influent (Source) Control***

Bylaw #5601 regulates the quality of wastewater discharged to the sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances and on some characteristics of wastewater (e.g. corrosive, explosive). See the Envision Compliance Sewer Use Bylaw record [Appendix G] for details on specific substances controlled and their concentration limits.
- Permits for Discharge of Industrial Waste is required from the City, with appropriate information provided on sewage proposed for discharge.
- Surcharge agreements are possible.

***Collection System Controls***

None specified in bylaw.

***Compliance and Promotion***

The city has staff resources for which compliance and enforcement duties are part of their regular job duties. Monitoring of effluent is undertaken for larger commercial/ industrial/ institutional dischargers and others on an incident or complaint basis. A range of activities is undertaken, including compliance agreements, surcharge agreements, inspections and sector discussions. The city conducts an annual education program to prevent sewer misuse via newspaper advertisements and brochures.

***Imminent Changes Planned***

The city plans to add a provision to prohibit weeping tile drainage to sewage collection systems. It may also add an ammonia criterion, per the (federal) P2Plan requirement.

## Alberta

### **Profile: Alberta Capital Region Wastewater Commission (ACRWC) Bylaw**

#### ***Influent (Source) Control***

ACRWC is responsible for transmission and treatment of sewage. The ACRWC Bylaw regulates the quality of wastewater entering the sanitary sewer system from thirteen municipalities with collection systems serviced by the commission; specific provisions include:

- Prohibition on any listed materials in Schedule A, which include materials harmful to human health, flammable or explosive or supporting combustion, causing blockages, corrosive, form two liquid layers alone or upon contact with water, harmful to the sanitary sewer system, wastewater treatment plant, watercourse. The bylaw specifically prohibits prescription drugs in the list of detrimental prohibited substances.
- Limits are placed on the concentrations of specific substances in four classes: contaminants (BOD, COD, oil and grease, P, SS, TKN); Inorganic constituents (metals, pH); Organic compounds (hydrocarbons, phenols), physical property (temperature).
- Stormwater is permitted, i) from a high potential contaminant release area that is (A) covered by a permanent structure; or (B) uncovered, but only if the area is 250 square meters or less, and (C) where drainage from other outdoors areas does not drain into the high potential contaminant release area; ii) from a snow storage site; or iii) directed to the sanitary sewer by Alberta Environment.
- Disposal of substances that may cause air pollution problems are prohibited; in application, this provision addresses nuisance issues with odours.
- Restrictions on hauled waste are specified.
- Prohibitions on dilution to meet requirements

The ACRWC bylaw was adapted from the City of Edmonton bylaw for regional consistency. No surcharges are currently applied (see *Imminent Changes Planned*, below). In cases of large dischargers, specific limits may be negotiated through member municipalities; for example where concentration limits may exceed plant capacity due to large volume flows special limits will be established.

#### ***Collection System Controls***

No collection system controls are specified in the bylaw; some member municipalities have a requirement for chambers and monitoring of industrial dischargers. See *Imminent Changes Planned* for measures to promote inflow/ infiltration management by member municipalities.

#### ***Compliance and Promotion***

There is no mechanism in place for the ACRWC to enforce the bylaw; bylaw enforcement is up to the member municipalities and can only be enforced where municipalities have adopted the ACWRC bylaw within their own regulations. Some member municipalities have bylaws in place; others do not.

#### ***Imminent Changes Planned***

- ACWRC is planning to develop rates based on loading with surcharges for certain constituents, including BOD, SS and possibly ammonia and phosphorus.
- The ACWRC is mandated to provide service as required and must set rates that are fully self-supporting. A Level of Service (LOS) agreement is being drafted by ACWRC for service to member municipalities. The LOS will set limitations on the flows the ACWRC is obliged to treat. This will encourage reduction of I/I flows where these are high in member collection systems.
- Over a longer term, ACWRC is planning a communications program for area municipalities regarding the bylaw and enforcement.

**Profile: Banff** – Bylaw #17-2.

### ***Influent (Source) Control***

Bylaw #17-2 empowers the Director to require grease, oil and sand interceptors:

- On commercial properties including restaurants, hotels, motels, garages, gasoline service stations, vehicle and equipment washing locations
- On other businesses where excessive grease, flammable wastes, sand and other harmful ingredients
- The type and capacity of interceptor is subject to the Director's approval
- Interceptors must be accessible for maintenance (by owner) and inspection
- Interceptors will not be required on private living quarters or dwellings.

There is a general prohibition on placing injurious, noxious or offensive matter in the vicinity of the intake to the sewer system.

### ***Collection System Controls***

No collection system controls specified.

### ***Compliance and Promotion***

Banff has compliance and promotion staff. Monitoring of discharges is not undertaken by the municipality. Grease trap inspections and daily WWTP testing are undertaken to assess compliance.

A "Yellow Fish" program and water conservation measures complement wastewater management.

### ***Imminent Changes Planned***

None planned.

**Profile: Calgary** – Bylaw #24M96

Calgary collects and treats all sewage within its jurisdiction. It also provides treatment for:

- The City of Airdrie
- The Town of Chestermere
- The Town of Cochrane
- The T'suu Tina Nation; and
- the subdivisions of Elbow Valley and Pinebrook.

The towns have bylaws but the other areas do not, as these are residential areas.

### ***Influent (Source) Control***

Bylaw #24M96 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances (BOD, TSS, oil and grease, other) and on some characteristics (e.g. viscous substances, corrosive materials) of wastewater discharged to the sewer system. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits. Note that the bylaw does distinguish between synthetic and natural oil and grease. The test for "hydrocarbons" captures only synthetic oils and greases and, thus, they are limited to 50 mg/L.
- General prohibition on stormwater and subsurface drainage.
- Prohibition on other materials, including those that cause taste and odour in drinking water, those that colour

effluent, biological wastes, pesticides and herbicides, materials that will interfere with biosolids disposal, grit from commercial or industrial premises including car washing, automobile garages, and restaurant sumps.

- Interceptors required for facilities discharging oil, grit, grease, sand or inflammable material.
- Wastewater pre-treatment may be required by the Director where required to ensure compliance with the Bylaw.
- Where wastewater is discharged into the wastewater collection system in highly variable or unusual volumes, the Director may require flows to be equalized into the collection system.
- Sewer surcharges apply to BOD, COD, TSS, oil and grease in excess of specified limits; Over-strength agreements are possible.

### ***Collection System Controls***

- Access for testing/ monitoring required for industrial and commercial dischargers
- Collection system connections require approval of the Director.

### ***Compliance and Promotion***

- Calgary has bylaw enforcement staff and staff does undertake monitoring of effluents to assess compliance. In terms of recent compliance activities:
- Corrective actions have been specified as part of a penalty or as an alternative to a penalty.
- Customer facility inspections are conducted for situations which may create risk to a customer's effluent quality.
- There are no custom surcharge agreements. The requirements in the bylaw are followed and some overstrength situations are allowed passively if no adverse effects are caused and the customer pays the appropriate surcharge.
- There has been only one sector discussion/negotiation.
- An education communications effort has been directed at one sector.
- A number of enforcement actions have been initiated as a result of a regular compliance monitoring program.
- Actions to date have been largely reactive to problem situations or sectors. The intent is to continue the programs and deal with other sectors once problem areas have been improved.

### ***Imminent Changes***

A bylaw review is just beginning, but it is unclear whether significant revisions will be necessary.

### **Profile: Camrose – Bylaw #1905/94**

#### ***Influent (Source) Control***

Bylaw #1905/94 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances and on some characteristics (e.g. viscous substances, explosive liquids) of wastewater discharged to the sewer system. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- General prohibition on stormwater, watercourse water, uncontaminated water
- Prohibition on water that has not originated from the water distribution system of the City, unless approved
- Restrictions on other materials, including biological wastes, materials that will interfere with biosolids application to agricultural land.
- Disposal of hauled wastewater and waste

#### ***Collection System Controls***

No collection system controls specified. New service station facilities require on site treatment.

### ***Compliance and Promotion***

The City has two staff that will be involved in the compliance and enforcement of the Wastewater Bylaw (see imminent changes following). They include a Plumbing Inspector and a Bylaw Enforcement Officer. With upgrading the Bylaw, the City is enhancing the education program to assist with the implementation of the revised Bylaw to encourage compliance and cooperation before requiring enforcement measures. Its goal is to encourage industries and businesses to follow the requirements of the new Bylaw and use enforcement as a last resort.

Currently no specific monitoring is in place to assess compliance. Monitoring is completed on an incident basis and will be reviewed with the implementation of the new Bylaw. Following an inspection of a questionable discharge situation, next steps vary depending on what type of action would be justified for the situation. A Wastewater Policy is being developed simultaneously with the Bylaw to guide sewer management.

### ***Imminent Changes Planned***

The city is in the process of updating the Sewer Use Bylaw and it will be called the Wastewater Bylaw when passed by City Council. The upgrade is part of a proactive approach to management of sanitary and storm sewer effluent. Additions include sections on hauled waste and wastewater, releases, sewer connections, and best management practices. Existing sections that are being revised include penalties for offences, changes to some of the limit requirements for discharges to the sanitary and storm sewers. The new Bylaw allows for use of Best Management Practices and the City is also looking at potential pollution prevention programs. Changes were made based on comparison with other municipalities' bylaws and literature review. The city found bylaw upgrade was challenging since there are significant differences in municipal bylaws and limited standards provincially or federally on what should be included for Sewer Use Bylaws.

## **British Columbia**

### **Profile: Victoria Capital Regional District – Bylaw 2922**

#### ***Influent (Source) Control***

Capital Regional District operates sewage treatment facilities and trunk sewers within the district's boundaries. These facilities and sewers receive sewage from municipal collection systems within CRD boundaries. The CRD Sewer Use Bylaw regulates all discharges to these sanitary sewers, whether they are municipally or regionally owned. The CRD Sewer Use Bylaw No. 5, 2001 (Bylaw 2922) regulates the quality of wastewater entering the sanitary sewer systems of the regional district, specifically:

- General prohibition on the discharge of substances with potential to harm the environment, sewer workers, sewage collection and treatment systems, biosolids quality, or pose a hazard to people, animals, property or vegetation. This group constitutes Prohibited Wastes as defined in the bylaw.
- Limits are placed on the concentrations of specific substances (conventional, organic and inorganic contaminants) and on some characteristics (e.g. pH, food waste, radioactive waste) of wastewater discharged to the sewer system. This group constitutes Restricted wastes as defined in the bylaw.
- Waste discharge permits are issued to industries, businesses or other operations that discharge significant non-domestic wastewater flows (greater than 10 cubic metres per day) or wastewater containing high loads of specified chemical contaminants into the sanitary sewer.
- Regional Source Control program codes of practice (Schedule D of the Bylaw), which are defined as “regulatory documents containing mandatory sanitary sewer discharge standards for specific industrial, institutional or commercial sectors”, have been developed with input from sector stakeholders and they generally include requirements for registration, waste treatment, inspection, maintenance and record keeping for facilities that discharge wastes to sanitary sewer. As of December 2003, eleven codes of practice had been adopted under the Sewer Use Bylaw, including: Food Services; Dry Cleaning; Photographic Imaging; Dental Operations; Automotive Repair; Vehicle Wash; Carpet Cleaning; Fermentation (breweries & wineries);

Printing; Recreation Facilities; Laboratories

- Schedule F provides details on the fees applicable to permittees and businesses operating under codes of practice.

Other bylaws of the regional district that are significant in terms of management of wastewater effluent include:

- Source Control Local Service Establishment Bylaw (CRD Bylaws 2834, 2402) – This bylaw establishes the boundaries, participating areas, cost recovery and maximum requisition for the CRD's source control local service area.
- Sewer Local Service Area Sewer Regulation Bylaw (CRD Bylaw 2490). This bylaw defines the requirements for connection, fees and use of sanitary sewers in specific CRD local service areas and electoral districts.
- CRD Septage Disposal Bylaw (CRD Bylaw 2827) - regulates the discharge of septic tank contents and other wastes at CRD septage disposal facilities.
- Hartland Landfill Tipping Fee and Regulation Bylaw (CRD Bylaw 3117) – regulates the disposal of wastes at the CRD's Hartland Road sanitary landfill.

### ***Collection System Controls***

- Requirements for treatment works and monitoring points are established in permits and codes. Monitoring points are generally considered to be the points of compliance with bylaw, permit or code requirements.

### ***Compliance and Promotion***

The CRD Regional Source Control program (RSCP) applies, monitors and enforces the requirements of the bylaw and educates dischargers regarding the proper use of the sewer system. There are currently 7.5 full time equivalent positions working within the RSCP on inspections, monitoring, enforcement, education and outreach, data management and planning and development.

All dischargers operating under waste discharge permits are required to regularly monitor (self-monitor) their effluent and report results to RSCP permit managers for compliance assessment. RSCP monitoring staff collect regular audit samples of effluent from these facilities and submit the results to the permit managers to compare with, and validate, the self-monitoring results.

Over the past four years, some of the main activities undertaken regarding bylaw compliance, inspections, sector outreach, enforcement, fees and fines are as follows:

- The RSCP was enhanced in 2001 to accelerate the development of codes of practice, increase code of practice inspections and accelerate outreach and promotion of the program. By the end of 2003, 11 codes of practice had been adopted under the Sewer Use Bylaw and the outreach program had made significant progress within all code sectors. Stakeholder task forces played a major role in all code development and amendment over this period. In addition, a residential education component was initiated in 2002 to increase public awareness of the program and participation in source control activities. All sectors operating under codes of practice have inspection and sampling targets set each year. The number of RSCP code inspectors was recently increased to help achieve or maintain these targets. A review of operations under waste discharge permits was carried out from 2002 – 2004. Several new permits were added and others were transferred to authorizations. Each permittee is inspected and sampled for audit purposes at least twice per year.
- A cost recovery fee structure for codes of practice was developed and adopted in 2000 in co-operation with stakeholders from a wide range of sectors. The fee structure for permits was adopted in 1997.
- Amendments to the CRD's Municipal Ticket Authorization bylaw in 2001 allowed tickets to be issued for specific code of practice infractions.
- In 2000, RSCP staff developed the framework for a database to track business registration, self-assessment, inspection, compliance and other information associated with the management of codes of practice. This database was further modified in 2003 and currently stores information on all operations identified within the 11 existing code sectors. Verification of business information through registration and inspection is ongoing. The database was expanded to include storage of waste discharge permit, authorization and enforcement data in 2003.

Over the past four years, some of the main activities undertaken regarding bylaws compliance and enforcement include:

- Codes of Practice (11 developed as of 2003, as mentioned above) and an outreach program have made significant progress within all code sectors. In addition, a residential education component was initiated in 2002 to increase public awareness of the program and participation in source control activities
- All sectors operating under codes of practice have inspection and sampling targets set each year.
- A review of operations under waste discharge permits was carried out from 2002 to 2004
- A cost recovery fee structure for codes of practice was developed and adopted in 2000 in cooperation with stakeholders from a wide range of sectors.
- Amendments to the CRD Municipal Ticket Authorization bylaw in 2001 allowed tickets to be issued for specific code of practice infractions.
- A database has been developed to track business registration, self-assessment, inspection, compliance and other information associated with the management of codes of practice.

### ***Imminent Changes Planned***

A bylaw consolidation is expected to be undertaken in 2005. This will not change the current structure of the bylaw significantly, but will make minor additions to some sections, update and/or modify current requirements and make other minor adjustments.

### **Profile: Fort Nelson – Bylaw #207**

#### ***Influent (Source) Control***

Bylaw #207 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on industrial wastes
- General prohibition on flammable liquids, explosive substances, or other corrosive or clogging discharges
- Prohibition on steam exhaust and heated water without written approval of the Superintendent of Works and Utilities; requirement for cooling or neutralizing prior to discharge may be set,

There are private industrial and residential systems in the regional district for which the municipality is not responsible to their knowledge. Up until 2000 industry was allowed to dump into the municipal system; these are now serviced by 1 or 2 private industrial waste sites.

#### ***Collection System Controls***

No collection system controls specified.

#### ***Compliance and Promotion***

Fort Nelson does not have sewer by law enforcement staff. Compliance monitoring is done by the municipality. Other compliance activities (such as agreements or promotion) are not undertaken.

#### ***Imminent Changes Planned***

None planned.

**Profile: Greater Vancouver Regional District – Bylaw #164*****Influent (Source) Control***

Bylaw #164 regulates the quality of wastewater entering the *sanitary* sewer and *storm* sewer systems of the municipality, specifically:

- General prohibition on matter with potential to harm sewer workers, interfere with infrastructure operation or compliance, or pose hazard to property, or any life form, or the environment.
- Limits are placed on the concentrations of specific substances and on some characteristics of wastewater discharged to the sewer system. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Prohibition on stormwater, groundwater, uncontaminated water.
- Prohibition on dilution.
- Waste Discharge Permits required for Category 1 (in revised bylaw, High Volume) dischargers; record-keeping may be requested
- Code of Practice developed for the food sector (Schedule D).

Industrial dischargers that exceed the bylaw limits are expected to contact the region for Waste Discharge Permits. The GVRD Industrial Pricing Strategy establishes a fee for service for BOD, TSS. This is not a surcharge based on a threshold limit, but rather a fee based on the concentration in the discharge to the sewer. The use of cost-based incentives has been a successful measure to improve the quality of discharges to sewers by industry. In addition, the GVRD has an education program to inform the public of the Product Care Program by the province. Under the Regional Development Cost Bylaw, revenues are collected from new development to fund upgrades to the treatment plant. This bylaw is administered by local municipalities on behalf of the GVRD.

***Collection System***

The Bylaw requires access within the collection system for purposes of monitoring regulated effluents.

GVRD is responsible for quality of wastewater but local municipalities are responsible for local sewer collection systems. Most local municipalities in the region discharge to the GVRD system. Some of these municipalities also have sewer bylaws, but these typically control new connections and set sewer rates. The City of Vancouver bylaw (the Sewer and Watercourse Bylaw) predates the GVRD bylaw and this local bylaw does specify quality limits. This overlap does not pose practical problems because the City of Vancouver administers the GVRD sewer use bylaw within the City and the quality provisions of the GVRD bylaw are applied. Jurisdictional issues in this area may not be clear to industrial dischargers in all cases, however the local and regional municipalities are clear on their respective responsibilities. Local municipalities may specify more stringent quality requirements where they see the need.

***Compliance and Promotion***

The GVRD has a permitting and enforcement group that administers all bylaws for air, water and solid waste. Audit sampling is done in addition to review of self-monitoring and reporting by dischargers. Reports are submitted to the GVRD quarterly and industry is asked to notify the region of discharges that are out of compliance.

The Industrial Enforcement Strategy is integrated with other media and sets out well-defined steps to assess compliance. This strategy has been successful in achieving compliance by industry. The region publishes a non-compliance list, which provides a strong incentive to industry to comply. Compliance programs specify steps to compliance and reporting expectations. The GVRD also uses its delegated authority under the provincial *Environment Management Act* to issue control orders where required.

***Imminent Changes Planned***

No significant changes are planned to the bylaw, although some minor changes are planned in 2005. These changes include the addition of PAHs and BTEX concentration limits and removal of the BOD threshold limit

(BOD is assessed on a fee for service basis; see the Industrial Pricing Strategy above). Also, provisions to control reductions in uncontaminated runoff flows to sanitary sewers, such as stormwater from industrial sites, will be strengthened and definitions clarified.

## Nunavut

**Profile: Cape Dorset (NU)**

### *Influent (Source) Control*

Sewage is collected by the Municipality and disposed of in Lagoons managed by the Municipality. Cape Dorset does not have a sewer use bylaw. Usage is reported quarterly and annually to the Nunavut Water Board as required under its Municipal Services Bylaw.

### *Compliance and Promotion*

Not applicable.

### *Imminent Changes Planned*

The community has no immediate plans to develop a by law.

## Northwest Territories

**Profile: Yellowknife – Bylaw #3529**

### *Influent (Source) Control*

Bylaw #3529 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- General prohibition on any materials harmful to the sewer system, operations, treatment process, or which may become hazardous to people, animals, property. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- Empowers the senior administrative officer to require pre-treatment works for any trade, industrial, or manufacturing waste or other unacceptable waste
- Grease, oil and sand interceptors required on hotel, restaurant, laundry, garage, and other places designated by the senior administrative officer.
- Over-strength agreements are possible.

Yellowknife is generally residential. There is no current requirements for over-strength agreements with dischargers.

### *Collection System Controls*

No collection system controls specified in the bylaw. Sewer overflows must be reported to the MacKenzie Valley Land and Water Board.

### *Compliance and Promotion*

Yellowknife has staff with bylaw enforcement duties but there is no need currently for monitoring or enforcement since sewer users are typically residential. Yellowknife does run a “blue fish” program to remind sewer users that stormwater discharges directly to lakes.

***Imminent Changes Planned***

No changes to the bylaw are planned in the immediate future.

**Yukon Territory****Profile: Carmacks (YU)*****Influent (Source) Control***

Carmacks does not have a sewer use bylaw. Dischargers to the Carmacks system are residential, with no industrial connections. There are no problems experienced with discharges to the sewer system. Under Carmacks' licence to operate (from the Water Board) discharge limits include 5 mg/L for oils and grease and pH between 6 and 8; also included are TSS (60 mg/L), BOD (45 mg/L), Fecal Coliforms (100,000 counts per ml), TRC (0.05).

***Imminent Changes Planned***

There are no plans to develop a sewer use bylaw.

**Profile: Whitehorse – Bylaw #99-02*****Influent (Source) Control***

Bylaw #99-02 regulates the quality of wastewater entering the sanitary sewer system of the municipality, specifically:

- Limits are placed on the concentrations of specific substances and on some characteristics (e.g. temperature, pH) of wastewater discharged to the sewer system. See the Envision Compliance Sewer Use Bylaw record in Appendix G for details on specific substances controlled and their concentration limits.
- General prohibition on stormwater, sub-surface or foundation drainage, clear water waste.
- General prohibition on matter with potential to harm human health that cannot be effectively treated, pose hazard to the environment, cause adverse effect to the sanitary sewer system.
- Dilution is prohibited to meet the concentration limits.
- The Bylaw makes provision for over-strength agreements through Permit to Discharge by a Designated Officer; surcharges for over-strength discharges apply.

***Collection System Controls***

No collection system controls specified.

***Compliance and Promotion***

The municipality has Bylaw Officers to enforce the sewer use bylaw. The city monitors effluent from its facility but does not directly monitor sewer users to assess compliance. If unauthorized releases are suspected, the municipality requests information and monitoring data from the party potentially releasing the material. Where it is known that a user is discharging a substance into the sanitary system that may not meet bylaw criteria, the City will either accept or reject the discharge. If accepted, it may require a permit if it is assessed to be acceptable on an isolated basis. Often these agreements are developed through negotiation of the discharger with the City.

***Imminent Changes Planned***

The bylaw may be reviewed after the CCME harmonized strategy is available.



## Appendix F

### Questionnaire for Information Collection on Municipal Regulatory Structures

## Appendix F

### Questionnaire for Information Collection on Municipal Regulatory Structures

The following letter and questionnaire is one of four similar letters sent to municipal representatives. The introductory information was the same in all four letters. Variation in letters arose based on whether preliminary research indicated the municipality had a bylaw or not, and whether the municipality was identified for an interview or was requested to return written information.

*Dear Sir/ Madam,*

*The Canadian Council of Ministers of Environment requests your participation in a study of regulations in Canada for the municipal wastewater sector. Specifically, we are interested in information on regulations established through the authority of municipalities/communities regarding wastewater. We will contact you within the next week to request a telephone interview to discuss the information on page two of this letter. We will endeavour to schedule the interview at your convenience.*

#### Introduction

At present, Municipal Wastewater Effluent (MWWE) is managed through a variety of policies, bylaws and legislation at the federal, provincial/territorial and municipal levels. Such governance often creates confusion and complex situations for regulators, system owners and operators. To address this issue, in November 2003, the Canadian Council of Ministers of the Environment (CCME) agreed to engage in the development of a Canada-wide Strategy for MWWE. One cornerstone of the Canada-wide Strategy is the harmonization of the regulatory framework for MWWE. As part of the harmonization process, the Canada-wide Strategy will examine all requirements for MWWE at the municipal, provincial, territorial, and federal levels, and recommend a one-window approach for management.

CCME has established a Development Committee (DC) to develop a Canada-wide Strategy for the management of MWWE by November 2006. An integral part of the development of the Strategy will be to consult with a wide variety of stakeholders to ensure that the strategy incorporates stakeholder interests, expertise and vision.

#### Request for Information

Marbek Resource Consultants has been engaged by the CCME to document the current regulations pertaining to management of MWWE. To this end, we have developed regulatory profiles of federal, provincial, territorial, First Nations and municipal MWWE regulations.

Attached please find a one-page profile of the regulatory regime for your municipality as we understand it, and questions we would like to ask of you. Marbek will be contacting you to set up a telephone interview to discuss the following:

- Confirmation or revisions to the attached municipal bylaw Profile
- Discuss compliance and enforcement activities for the sewer use bylaw and significant changes planned within approximately the next 12 months to the bylaw (see next page)

- Obtain your input on regulatory issues facing the municipal wastewater sector (see questions on page 3 of this letter).

In the meantime, if you have any questions, please contact Mary Trudeau by e-mail at [trudeau@marbek.ca](mailto:trudeau@marbek.ca) or by phone at 613-523-0784. Thank you for your time and response!

**For More Information**

For more information on the CCME Canada-wide Strategy on MWWE, please visit [http://www.ccme.ca/initiatives/water.html?category\\_id=81](http://www.ccme.ca/initiatives/water.html?category_id=81). Alternatively, you may contact the provincial or territorial representative on the CCME Development Committee. Names of representatives are identified on the CCME website.

**INFORMATION SHEET**

**MUNICIPALITY NAME**

**1. Profile:** *Municipal bylaw profile attached.* Please advise whether this summary captures the key aspects of the bylaw or provide additions / corrections.

**2. Collection and Treatment Responsibilities:** Is your organization responsible for all sewage collection and treatment within your jurisdiction? Alternatively, is sewage collection undertaken by jurisdictions (e.g. local government) separate from that responsible for treatment (e.g. a regional municipal government)? Which jurisdiction(s) have sewer use bylaws?

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**3. Compliance and Enforcement Activities**

For your Sewer Use Bylaw:

- Does your municipality have staff resources for which compliance and enforcement duties are part of their regular job duties? Yes\_\_\_\_ No\_\_\_\_  
Comments:

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- Do you undertake monitoring of effluent by sewer users to assess compliance? Yes\_\_\_\_ No\_\_\_\_  
Comments:

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- What compliance activities have you undertaken over the past two to four years: compliance agreements, surcharge agreements, inspections, sector discussions/negotiations, other?  
Comments:

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- Does your organization have plans to make significant changes to the Sewer Use ByLaw within the next 12 months? Yes\_\_\_\_ No\_\_\_\_





## Appendix G

Envision Database for Municipal Sewer Use Bylaws