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A Review of the Current Canadian Legislative Framework for Wastewater Biosolids

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Executive summary

The primary mandate of the Biosolids Task Group (BTG) of the Canadian Council of Ministers of the Environment (CCME) is to develop a Canada-wide approach for the management of wastewater biosolids focusing on policy and regulatory harmonization. As a first step in this process, BTG undertook a legislative review with the objective of outlining the current federal and provincial regulatory framework for biosolids. This document is a result of this review, and it describes the existing legislative framework for management of wastewater biosolids and septage.

The various steps in biosolids management including production, treatment, sale and end use/disposal are regulated under a multi-faceted regulatory system, involving federal and provincial/territorial legislation of Canada. At the national level, Environment Canada administers the *Canadian Environmental Protection Act, 1999*, and can establish regulatory and non-regulatory instruments to manage many, but not all, of the environmental protection risks on federal and aboriginal lands that would otherwise be addressed by provincial and territorial legislation. The Canadian Food Inspection Agency (CFIA) regulates the sale and import of biosolids intended for use as a fertilizer or supplement, and issues a Letter of No Objection (LONO) for sale of products that meet its standards and requirements under the *Fertilizers Act and Regulations*. Issuance of a LONO does not exempt a product from marketplace monitoring and compliance activities undertaken by the CFIA.

The provinces manage the maintenance and operation of wastewater treatment and/or composting facilities, and also the processing, use and disposal of biosolids including land application, through the provincial/territorial acts and regulations. There are various standards and information requirements that are to be met for obtaining approvals or permits or licences from the provinces. Most provinces have some form of guidance document(s) which outline(s) information requirements for approval/permit/licence.

In addition to the federal and provincial regulations, organizations such as the Canadian Council of Ministers of the Environment (CCME) and the Bureau Normalisation du Québec (BNQ) develop standards and guidelines that jurisdictions can reference when developing policy or reviewing requirements related to biosolids.

The review also explored the standards and parameters used to assess the quality of biosolids in federal and provincial regulations. In Canada, currently, there are few national guidelines relevant to wastewater biosolids; however, there are no national guidelines or recommendations on best management practices for land application of wastewater biosolids. The parameters (trace metals, pathogen and pathogen indicators, organic chemical contaminants, separation requirements and restrictions, etc.) used to assess the quality of biosolids are generally common among most provinces. However, it is challenging to relate and compare the classes of biosolids and their qualities among the provinces, since provinces use different classification/categorization schemes and adopt different nomenclature for various classes of biosolids.

A Review of the Current Canadian Legislative Framework for Wastewater Biosolids

1. Introduction

The purpose of this review is to summarize and document the current status of wastewater biosolids regulation at the federal, provincial and territorial levels in Canada. This report describes the current legislative framework for wastewater biosolids.

This review is based on a survey that gathered information from federal, provincial and territorial representatives. Questions were asked regarding the scope of legislation, the approval process for the use and/or disposal of biosolids, information requirements for approvals, standards, monitoring, compliance, and record-keeping requirements. Information presented in this review is primarily related to land application of sludge/biosolids and not on disposals (landfilling/incineration). Also, it does not include details on enforcement programs undertaken by provincial jurisdictions.

Background

The Canadian Council of Ministers of the Environment (CCME) is composed of the environment ministers from the federal, provincial and territorial governments. CCME is in the process of developing a Canada-wide approach for the management of municipal wastewater biosolids. This biosolids legislative review is one of the projects being undertaken by the Biosolids Task Group of CCME as part of this initiative.

What do we mean by biosolids?

Unless otherwise specified, the term “biosolids” in this document refers to solid or semi-solid material generated from municipal wastewater treatment plants, after the removal of liquid effluent, regardless of the type of treatment.

This review also looks at septage. It does not include biosolids derived from solely industrial sources (e.g. pulp and paper residuals). Although the review focuses on the existing legislative framework for the land application of biosolids, other use and/or disposal scenarios are also covered.

2. Legislative Authority and Regulation of wastewater biosolids

In Canada, wastewater treatment is an important component of the national efforts aimed at protecting public health, water resources and the environment. Biosolids are the by-product of wastewater treatment. The governance of biosolids management involves various government bodies at the federal, provincial/territorial and municipal levels. Through different legislation,

the federal and provincial governments regulate the sale and/or use and/or disposal of biosolids. The acts and regulations and the scope of the regulatory authority of federal and provincial/territorial legislation are described below and in Table 1.

2. A. Federal authorities

2. A. (i) Environment Canada

Canadian Environmental Protection Act, 1999:

The Canadian Environmental Protection Act, 1999 (CEPA 1999) (1) is intended to protect the environment and human health from the risks posed by harmful pollutants and to prevent new ones from entering the Canadian environment. CEPA 1999 applies to all Canadian persons, whether individuals or companies, including federal operations. This means that regulations for “CEPA-toxic” substances, fuels, disposal at sea and other matters apply equally to federal operations.

However, under Canada's Constitution, provincial environmental laws do not generally apply to federal lands. This means that federal operations and land, including aboriginal land, are, for the most part, not subject to provincial regulations or permit systems covering emissions, effluents, environmental emergencies, waste handling and other environmental matters. The non-application of these environmental protection laws creates the so-called "environmental protection regulatory gap" with respect to federal departments, boards, agencies, Crown corporations, federal works and undertakings on federal and aboriginal lands. Under CEPA 1999, Environment Canada can establish regulatory and non-regulatory instruments to manage many, but not all, of the environmental protection risks on federal and aboriginal lands that would otherwise be addressed by provincial and territorial legislation.

An existing instrument is the *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments (1976)* which only applies to effluents discharged from wastewater systems under the direct authority of the federal government listed under Schedules A, B and C of the guidelines (2). The Guidelines cover issues related to the management of wastewater, including the treatment and disposal of wastewater treatment sludge. The Guidelines state that the discharge of untreated sewage sludge to the environment should not be considered an acceptable practice. Also, treated sludge should not be discharged into receiving waters or treatment plant effluents, and ocean dumping of treated sludge should not be permitted. The design, operation and maintenance of sludge treatment and disposal facilities should ensure protection of the receiving environment and the safety of public health. Processes involving the treatment and disposal of sludge should reflect the best practicable technology available as well as integrate uniformly into wastewater treatment systems. The method of disposal of treated sewage sludge should comply with the requirements of municipal and provincial authorities.

Local EC offices should be contacted if technical assistance on selecting and managing sludge disposal systems is required.

In addition, the National Pollutant Release Inventory (NPRI) (3) is Canada's legislated, publicly accessible inventory of pollutant releases and transfers. Under the authority of subsection 46(1) of CEPA 1999, the releases of NPRI substances, some of which are present in sludge and biosolids from wastewater facilities, must be reported to Environment Canada. The Government of Canada uses NPRI data to track progress in pollution prevention, evaluate releases and transfers of substances of concern, identify and take action on environmental priorities, and implement policy initiatives and risk management measures.

2. A. (ii) Canadian Food Inspection Agency (CFIA)

Fertilizers Act and Regulations:

All fertilizers or supplements (non-nutrient soil amendments) sold in or imported into Canada, are regulated under the *Fertilizers Act (FzA) and Regulations (FzR)* administered by the CFIA (4, 5). Pursuant to the *FzA* all regulated products must be safe with respect to human, plant, animal health and the environment, efficacious for the intended purpose and properly labelled to avoid misrepresentation and fraud in the marketplace. Therefore, if biosolids are sold or imported as a fertilizer or supplement, the product must meet prescribed safety, efficacy and labeling standards. Some products require registration (pre-market approval) prior to import or sale, while others are exempt (i.e. may be sold without CFIA approval but must still meet all of the prescribed standards and conform to the *FzR*). For example, products defined in Schedule II (6) of the *FzR* are exempt from registration, including “processed sewage” (dried and screened biosolids), and “compost” (including composted biosolids).

Thus, biosolids that meet the definition of “processed sewage” (see section 2 of this document) are exempt from registration, but must use “processed sewage” in the product name and bear a fertilizer grade on the label. Likewise, composts are exempt from registration. However, if biosolids are used in a product type that requires registration (e.g. fertilizer-pesticide, low analysis farm fertilizer) they will be subject to a mandatory pre-market approval prior to import or sale.

It is important to note that production, use (including land application), disposal or non-sale distribution (eg., given away) of fertilizers and supplements, including biosolids products, do not fall under the purview of the *FzA*. The CFIA only regulates the actual sale or import.

2. B. Provincial and Territorial authorities

The production and use of biosolids is mostly regulated through the provincial/territorial acts and regulations. Most provinces and territories have legislation aimed at protecting water quality, and

biosolids management is captured under this legislation, since processing, handling and disposal of biosolids are closely associated with wastewater systems, and since the end use/disposal of the product (such as land application, landfilling) may have potential impacts on nearby surface water or groundwater. Some of the areas that provincial regulations cover include management of municipal wastewater treatment systems, sewer collection systems, effluent discharge and monitoring, levels of pollutants in untreated wastewater, entry of pollutants into wastewater systems, wastewater solids and sludges, treatment of biosolids, septage, industrial and other non-farm generated wastes, and landfilling, incineration and land application of biosolids

Provincial and territorial regulations and policies may cover one or more aspects of the lifecycle of biosolids: production, handling, storage, transport, land application and disposal methods. In addition to environmental Acts, there are several provincial regulations with different scopes (e.g., sewage disposal, dangerous goods, agricultural operations, nutrient management, organic matter recycling) that may impact biosolids management.

Details of the scope of provincial and territorial acts and regulations are outlined in Table 1.

2. C. Role of Municipalities

In most provinces, the wastewater collection and treatment systems are generally owned and operated by municipalities, while some facilities are also owned by federal, provincial water agencies or private bodies. The municipalities function in accordance with authorities granted by the provincial legislation.

The authority of different municipal governments to regulate wastewater biosolids and/or land application varies across jurisdictions. In some jurisdictions, proponents are required to obtain appropriate approval, permits, or other authorization from the local municipality to generate, use and/or dispose of biosolids and composts (including land application). In many provinces, municipal authorities are empowered to use sewer by-laws to control discharges into municipal sewers and take appropriate measures to control the levels of pollutants at source, and enact by-laws to ensure that federal and provincial legislation is followed.

The municipalities of AB also establish standards for the wastewater entering their facility, and the province regulates the quality of water leaving the facility and any waste disposal practices. In SK, MB, ON, BC and AB, municipal authorities must get a permit/authorization from the province for operating a sewage treatment plant for the disposal of biosolids into landfill. In many jurisdictions, separate approval for biosolids land application sites must be obtained by the generators (e.g. municipalities), land applicators, or land owners.

In ON, municipal sewage treatment plants require approvals for operation under the *Ontario Water Resources Act* and the *Environmental Protection Act*. In addition, currently, sewage treatment plants with a design capacity of more than 45,400 cubic metres per day must also

prepare a Nutrient Management Strategy under the General Nutrient Management Regulation (O. Reg. 267/03), although this will no longer be required as of January 1, 2011. In QC, a Certificate of Authorization (CA) covers construction and, to some extent, further operation of the wastewater plant, but annual CA are required for land application of biosolids (see section 4.B.xi. for details of CA). The municipalities in QC are responsible for developing a Residual Materials Management Plan in accordance with the *Québec Residual Materials Management Policy*, issuing attestations of compliance with municipal regulations for CA, and regulating the spreading prohibition dates in accordance with the *Loi sur les compétences municipales*.

2. D. Other organizations:

In addition to the above-mentioned federal and provincial regulations, organizations that develop norms, standards and guidelines that jurisdictions can reference in developing regulations related to biosolids, include the Canadian Council of Ministers of the Environment (CCME) and the Bureau de Normalisation du Québec (BNQ).

2. D. (i) Canadian Council of Ministers of the Environment (CCME): The Canadian Council of Ministers of the Environment (CCME) (7) serves as a forum for members to develop national strategies, norms, and guidelines that each environment ministry across the country can use. Through the work of ad hoc committees, it promotes effective inter-governmental cooperation and coordinates approaches to address inter-jurisdictional environmental issues including biosolids and compost management.

Previous to the work that is currently being undertaken by the CCME committee on Biosolids, CCME developed Guidelines for Compost Quality (2005) (8). The compost guidelines include two compost categories (A and B), based on four safety criteria: foreign matter, maturity, pathogens and pathogen indicators, and trace elements. The CCME guideline allows for unrestricted use of compost that meets the best compost (Category A) criteria. Compost B category has a restricted use allowance because of the presence of sharp foreign matter or higher trace element content, and may require additional control when deemed necessary by a province or territory.

The CCME Guidelines for Compost Quality (2005) apply to compost produced from any organic feedstock as determined by regulatory agencies. They apply to compost that is sold, given away or used on-site. Due to the diversity of regulatory approaches that exists in Canada, these guidelines generally apply to the quality of compost rather than the composting process. Jurisdictions have developed individual siting and operating guidelines to accommodate jurisdictional needs with which composting facilities must comply.

2. D. (ii) Bureau de Normalisation du Québec (BNQ): The BNQ is a standard setting body that is part of the Standards Council of Canada. It is generally responsible for environmental standards. For example the BNQ has developed national consensus-based standards for compost,

by-product liming materials and granulated biosolids (9). These national standards are the basis for voluntary certification of products, (i.e. they have no legislative authority). The CAN/BNQ Standard 0413-400/2009 Soil amendments – alkaline or dried wastewater biosolids includes maximum acceptable levels of moisture, trace elements, pathogen indicators, and dioxin and furan in alkaline or dried biosolids. The CAN/BNQ Compost Standard (*Organic Soil Conditioners - Composts* 0413-200/2005) addresses five major compost attributes: trace metals levels, pathogen levels, maturity, amount of foreign matter, and organic matter level, based on which three categories of compost are defined: AA, A, and B, with AA being the highest quality compost.

CAN/BNQ standards are used by some provinces to help them regulate biosolids. For example, the Quebec Ministry of the Environment waives the required CA (see section 4.B. xi. for details of CA) if fertilizer residuals or biosolids products are tested by the BNQ and meet the national (CAN/BNQ) standards. In NL, CAN/BNQ standards are applied when reviewing proposals for issuing certificates of approval for biosolids disposal to solid waste disposal sites or composting.

2.E. Regulation of sale and import of biosolids as fertilizers and supplements

As indicated earlier, all biosolids products that are sold or imported as a fertilizer or supplement (e.g. compost), must meet prescribed safety, efficacy and labeling standards of *FzR*. Some products require registration (pre-market approval) by the CFIA prior to import or sale, while others are exempt (i.e. may be sold without CFIA approval but must still meet all of the prescribed standards and conform to the *FzR*).

At the provincial/territorial level, the sale and import of biosolids products intended for land application as a fertilizer or supplement are not explicitly mentioned in most of the provincial regulations. However, the sale and import of biosolids are not exempt from their regulations, unless otherwise stated. In NB, biosolids that are composted to meet the CCME guidelines for Compost Quality are no longer considered as “waste” and therefore would no longer require an approval for use. The trigger here is the quality of the material, and therefore, relates to materials regulated by CFIA only if the standards are the same. Also, in NB, an environmental assessment is required for importation of biosolids that do not meet class A standards (which are qualified as wastes).

In BC, quality criteria for biosolids product that can be sold or given away is covered under its provincial Organic Matter Recycling Regulations (OMRR). Biosolids that are produced in BC and sold in BC are not exempt from BC regulatory requirements for treatment and quality.

In ON, wastes including biosolids could become exempt from Part V and Reg. 347 depending on the situation. The exemption is not related to whether or not CFIA regulates the material. The recycling exemptions provided in Ontario's Regulation 347 made under the Environmental Protection Act could apply to municipal waste, if it is to be promptly packaged for retail sale to

meet a realistic market demand, or is offered for retail sale to meet a realistic market demand. The waste would, however, remain subject to the other relevant parts of the Environmental Protection Act [s]. 14 adverse effect and provincial officer orders, for example].

In QC, biosolids intended to be sold for domestic use (packed in small bags/containers) are exempt from a Certificate of Authorization for spreading of biosolids if they meet the requirements under the *FzA* or are certified by the BNQ, whereas biosolids intended for agricultural use (whether selling or giving away) will require a Certificate of Authorization for products that have not been certified by the BNQ (see section 3.B.x). Also, granulated biosolids that are mixed with mineral fertilizers, where the final product contains less than 15% organic matter are still considered mineral fertilizers and are also exempt from a Certificate of Authorization.

2. F. Regulation of biosolids used in products other than fertilizers

Biosolids and composted biosolids are included in topsoils for various purposes such as horticulture, landscaping and land reclamation. Unless topsoil is represented to contain nutrients or compost, they are not regulated under the *FzA*, therefore the CFIA does not have jurisdiction over most of the sale of topsoil products containing biosolids.

The regulation of biosolids used in topsoils varies among provinces. Provinces such as NS, NB and PEI do not regulate biosolids going into topsoils and/or the topsoil manufactured from biosolids. Whereas in other provinces (AB, BC, ON, QC and NL), biosolids used in topsoils are covered by their legislation, and require some approval/permit/authorization for the manufacturing of topsoils using biosolids.

2. G. Regulation of Septage Wastes/Residuals

Septage is defined as the biodegradable waste from septic tanks and similar on-site treatment units, and includes the sediments, water, grease and scum pumped from a septic tank.

According to Environment Canada's *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments (1976)*, untreated sewage sludge includes raw sludge removed from septic tanks and holding tanks, along with unprocessed sludge removed from a municipal sewage treatment plants or treatment systems. At the provincial level, in some jurisdictions such as NL, QC and NS, septage is considered part of sewage sludge, whereas in province like ON, septage is considered a separate category.

In some provinces, land application of untreated septage is permitted. In AB, septage is not treated prior to disposal in wastewater facility or application on land, provided that the hauler has an authorization from Alberta Environment. The authorization will outline the requirements such as setback from water bodies and application rate. In MB, treatment is not required prior to

disposal or land application of septage, however, disposal shall be permitted only onto agricultural land under the control of the owner of the system from which the septage originated.

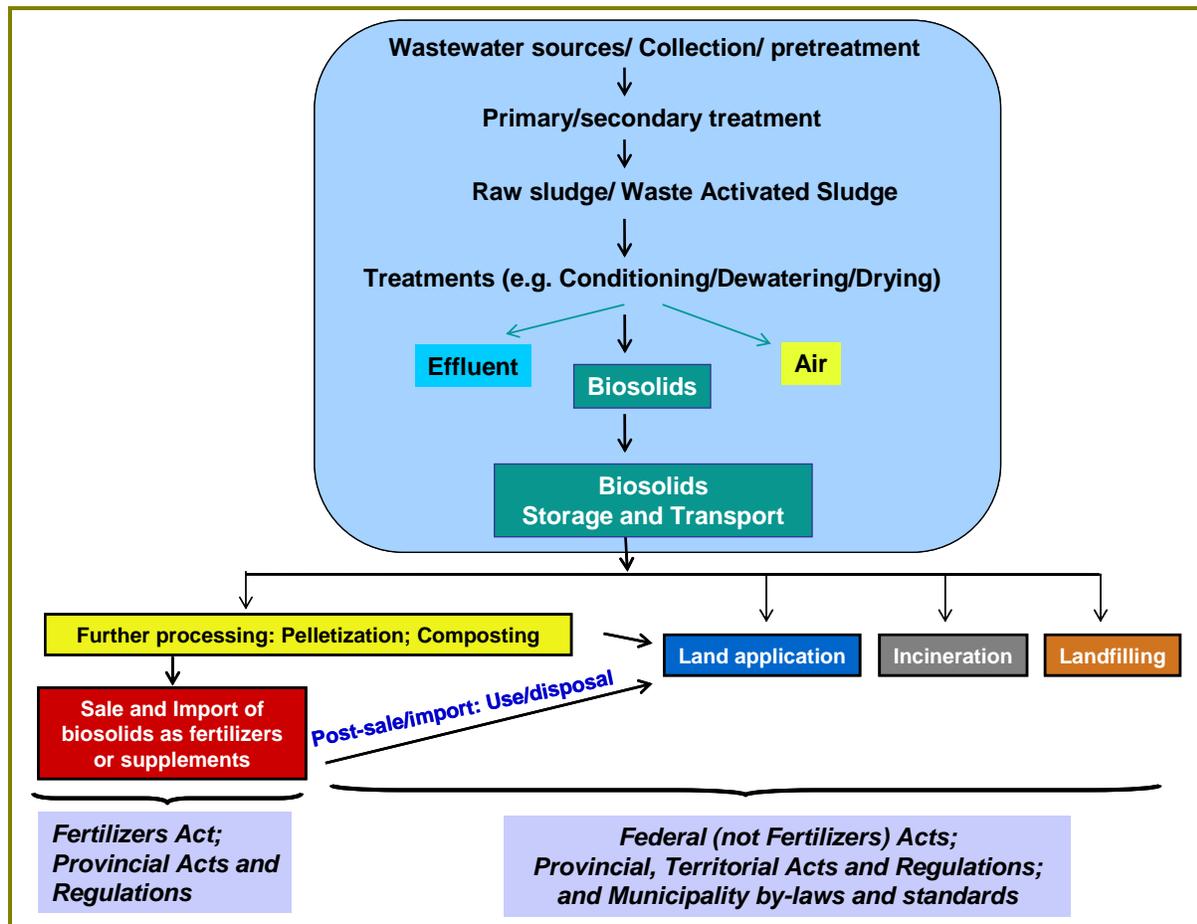
Currently, ON regulations allow untreated septage to be land applied under a Certificate of Approval. That said, ON is committed to ending the land application of untreated septage, but cannot yet do so because of lack of septage treatment capacity. Under Ontario's new NASM Framework, as of January 1, 2011, treated septage may be applied to agricultural land under the General Nutrient Management Regulation as a nutrient.

In all other provinces, untreated septage cannot be applied to land. Most provinces (BC, QC, NS, NL, SK and NB) require septage to be treated, such that it meets the provincial standards, prior to land application or disposal to wastewater facilities in provinces. Information on type and level of septage treatment and the provincial guidelines and standards for processing, use and disposal of septage in various jurisdictions are summarized in Table 2.

In summary, the various steps in biosolids management (production, treatment and end use/disposal) are currently regulated under a multi-faceted regulatory system, involving federal and provincial/ territorial legislation (see Figure 1 for a pictorial representation).

- ***At the national level, Environment Canada, which administers the Canadian Environmental Protection Act, 1999, can establish regulatory and non-regulatory instruments to manage many, but not all, of the environmental protection risks on federal and aboriginal lands that would otherwise be addressed by provincial and territorial legislation.***
- ***The Canadian Food Inspection Agency (CFIA), which administers the Fertilizers Act and Regulations, regulates the sale and import of biosolids intended for use as a fertilizer or supplement.***
- ***The end use of biosolids, including land application, is regulated through provincial/territorial acts and regulations.***
- ***The authority of municipalities to regulate and/or ban land applications depends on the applicable provincial legislation.***

Figure 1: Regulation of biosolids production, use and disposal in Canada



3. Definitions

There is no definition for either “sludge” or “biosolids” in any of the federal Acts or Regulations. Schedule II of the *FzR* defines “processed sewage” as: “*products made from sewage, freed from grit and coarse solids, that are dried, ground and screened*”. Products meeting this definition are categorized as fertilizers and are exempt from registration. Schedule II of the *FzR* defines “compost” as: “*a solid mature product resulting from composting, which is a managed process of bio-oxidation of a solid heterogeneous organic substrate, including a thermophilic phase.*” Products meeting this definition are categorized as supplements and are also exempt from registration.

CCME’s Guidelines for compost quality (2005) (8) have definitions for “compost” and “biosolids”. CCME defines compost as “*a solid mature product resulting from managed process*”

of bio-oxidation of a solid heterogeneous organic substrate including a thermophilic phase". Thus, the definition of compost is comparable between the CCME guidelines and the FzR. However the terms "biosolids" in CCME guidelines and "processed sewage" in FzR, have different descriptions and the scope of material captured in these definitions differs hugely. CCME defines biosolids as "*organic product obtained from the physico-chemical and/or biological treatment of wastewater. Biosolids result from primary wastewater treatment (primary biosolids), or from secondary wastewater treatment (secondary biosolids), and these two types of biosolids are often combined (mixed biosolids). These biosolids can be derived from the treatment of either municipal wastewater or industrial wastewater*". These are not just sewage biosolids; these could be pulp and paper, food processing biosolids or other types of biosolids.

For the purposes of this document, municipal wastewater biosolids is defined as "*organic products produced from the treatment of wastewater sewage sludge and septage to reduce pathogens and vector attraction (odours). Municipal wastewater biosolids may be solid, semi solid or liquid and come primarily from the treatment of domestic wastewater and municipal sludge, although municipal wastewater treatment plants may also treat some commercial and industrial sewer effluents*".

The CAN/BNQ Standard 0413-400/2009 defines "sludge" as "*a mixture of water and solids separated from various types of wastewater as a result of natural or artificial processes*". "Biosolids" is defined as "*material from sludge treatment, which contains organic matter and plant nutrients*". Thus, unlike sludge, biosolids have undergone a treatment to decrease or eliminate pathogenic organisms.

Under provincial regulations, various definitions are used for "municipal wastewater sludge" and "biosolids", depending on the extent of processing or treatment. Some common terms used to define wastewater sludge include: sludge, sewage sludge, unstabilized sewage, and municipal wastewater sludge. Some of the terms used to define processed (i.e. treated) sewage include biosolids, municipal biosolids, fertilizer residuals, processed organic waste, managed organic matter, stabilized sludge etc.

In addition, biosolids are also classified differently based on quality criteria (such as trace elements, heavy metals, pathogen reduction, vector attraction and odour reduction) in different provinces. For example, in BC, depending on the quality of biosolids, they are classified as Biosolids Class A, B or Biosolids growing medium (BGM is a topsoil product that has strict content and quality criteria set out in BC law). In PEI, biosolids are categorized as Exceptional Quality, Class A and Class B groups. In QC, different types of biosolids are distinguished based on the source such as wastewater biosolids, agri-food biosolids, paper mill biosolids, abattoir biosolids etc, but environmental categories depend on contaminant levels. ON's new standards for non-agricultural source material, which take effect January 1, 2011, set out three categories

based on the quality of the material (Categories 1, 2 and 3). Sewage biosolids falls under Category 3.

In most provinces, wastewater sludge refers only to municipal sources, primarily composed of domestically generated organics, but it is recognized that it often includes some limited industrial discharges. In most provinces, sludge generated from industries is treated as separate categories.

4. Information Requirements and Approval Process for Biosolids Production, Use and Sale in Canada

4. A. Requirements of Federal legislation

4. A. (i) Environment Canada:

Under the authority of subsection 46(1) of CEPA 1999, the releases of NPRI substances are required to be reported to Environment Canada. Facilities engaged in waste or sewage sludge incineration, and municipal wastewater collection and treatment, must determine if reporting to the National Pollutant Release Inventory (NPRI) is required. In addition to releases to water, releases with potential importance for NPRI reporting purposes from the treatment system include those to air, to land on site, and transfers for disposal (including sludge and biosolids). Environment Canada's *Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments, 1976 (2)* recommend that processes involving the treatment and disposal of sludge should reflect the best practicable technology available. Information on which facilities must report, and how they should calculate releases to be reported to comply with federal regulations are described in relevant guidance manuals (listed in Table 4).

4. A. (ii) Canadian Food Inspection Agency:

As described in Section 2 A (ii), products containing biosolids and composts that are regulated under the *Fertilizers Act*, but that are exempt from registration, do not require pre-market assessment prior to sale or importation into Canada. However, proponents of these products are encouraged to request an assessment from the CFIA to ensure that their product meets the requirements and standards of the *FzA* and *FzR*. If deemed compliant, the product is issued a Letter of No Objection to Sale (LONO). Due to the inherent variability in inputs, it is recognized that the composition of fertilizers and supplements made from waste-derived materials (including biosolids) may change over time. Therefore as of 2009, LONOs issued for fertilizers and supplements containing waste-derived materials are valid for a period of three years from the date of approval, or until changes are made to the product, its manufacturing process, or the label.

Issuance of a LONO does not exempt a product from marketplace monitoring and compliance activities undertaken by the CFIA. If a non-compliant product is found by the CFIA, enforcement actions including product detention may be taken. Also, LONOs apply only to commercial that are being sold or imported in the marketplace. A LONO cannot be used in support of a product that is no longer being sold, or distributed for non-sale purposes (e.g. given away). LONOs are not to be misconstrued as certification and do not exempt the product from any applicable provincial and/or municipal regulations.

Assessments conducted by the CFIA for the purpose of issuing a LONO or for product registration consist of a safety and efficacy evaluation and a label review. These assessments are carried out on a case-by-case basis, and the specific information requirements may vary depending on the manufacturing process, degree of treatment and inputs. For products containing biosolids, information on the processing method, inputs, and results of analysis for trace metals, pathogens and dioxin and furans must be provided (see Section 5 of this document for standards) by the proponent to support the safety of the product. Efficacy data is typically not required for biosolids products. However, the amounts of major plant nutrients delivered to the crop when the product is used according to directions (application rate and frequency) must satisfy provincial recommendations, and the minimum organic matter and maximum moisture guarantees, where applicable, must meet the requirements of the *FzA*. Product labels are also reviewed to verify that they meet the labelling requirements and ensure that they do not mislead the consumer as to the composition or utility of the product. The CFIA does not take any samples or conduct any analysis as part of the product approval process.

4. B. Provincial/Territorial Requirements

All provinces manage the production, use and disposal of biosolids through regulatory approvals or permits or licences. Approval is required for maintenance and operation of wastewater treatment and/or composting facilities, and for processing, use and disposal of biosolids, including land application. Table 3 provides a synopsis of approvals required at different stages of biosolids management in various provinces.

Requirements for approval vary between provinces, and are set forth independently by provincial regulations and local governments. Most provinces have some form of guidance document(s) which outline(s) information requirements for approval/permit/licence for generation, land application and other uses of biosolids. Details of the guidance and policy documents publicly available are provided in Table 4.

The general process to be undertaken before applying biosolids to land include submission of information pertaining to the biosolids, and, if required, the receiving soil. In most provinces, sewage biosolids applied to agricultural land must be tested to determine the nutrient content to ensure the nutrient concentrations meet provincial guidelines, crop requirements and other

quality criteria (e.g., trace metals, pathogen indicators etc). In some provinces, other site-specific information must be assessed for approval.

Public input to biosolids projects that impact, or are perceived to impact the environment, is generally a provincially-legislated requirement. This can be in the form of public notification of environmental review or environmental impact statements, and/or posting visible signage on-site. Most jurisdictions require public notification or hearing for obtaining approval for land application and/or storage of biosolids (Table 2-A). For example, in AB, a written authorization is required from the land owner and the municipality in which the receiving land is located. In ON, public notification is not required. However, as an operational practice, receiving municipalities are notified by the province when a site is approved.

In addition, land application of biosolids may require a Nutrient Management Plan (for agricultural lands) or a Land Application Plan (for non-agricultural lands, i.e., reclamation sites). A Nutrient Management Plan (NMP) is used for biosolids management, wherein details of crop nutrient requirements, all nutrient and organic matter sources (including biosolids) that will be applied to a farm field as a fertilizer or supplement, and application rate of the biosolids (based on agronomic rate) are developed by the proponent with or without help from a qualified professional (e.g. agrologist). This is then submitted to provinces for assessment. It ensures that the proposed application of biosolids provides nutrients for crop growth and adheres to regulatory requirements and standards (Table 2-A).

The information requirements and the approval process undertaken by various provinces are summarized below. As explained under Section 3 (Definitions), provinces use different terminologies to describe wastewater sludge/biosolids, and the same terms, as described in the pertinent provincial legislation are used below.

4. B. (i) Alberta:

For land application, the generator of biosolids must submit an application to AB Environment containing the land location, application rate and an explanation of how the rate was derived, and written consent from the land owner and municipality. A letter of authorization is issued once it is confirmed that the application practice will be done in accordance with the criteria outlined in the *Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands*. A nutrient management plan or strategy is not required. The approval is issued for one time application on the proposed land, and is valid for one field season and typically expires Dec. 1 of the year it was issued.

For landfilling, no specific approval is required. The biosolids generator must report to AB Environment on quantities of biosolids going to landfill.

4. B. (ii) British Columbia:

Biosolids recycling is regulated under the Organic Matter Recycling Regulation. OMRR is enabled under the Environmental Management Act (administered by the BC Ministry of Environment) and the Health Act (administered by the Ministry of Health). The link to BC Provincial Health Authorities is used as a risk pathway approach. Instead of testing for organic contaminants in all situations in BC, the identified pathways of risk (or possible pathways of risk) can be prevented based on science.

For land application of biosolids, a Land Application Plan (LAP) has to be prepared by a qualified professional, as prescribed in their *Environmental Management Act* and Organic Matter Recycling Regulations (OMRR). A LAP is approved for each site and for each occurrence of land application of managed organic matter, and is approved for that year (implying 1 year). A LAP is not required for Class A compost or Biosolids Growing Medium (Topsoil)

The proponent must give notification to the BC Ministry of Environment Director (before land application of all biosolids other than Class A composts and growing medium), the medical health officer (before land application of the same types of biosolids to agricultural land or in a watershed) and the Provincial Agricultural Land Commission (prior to land application of managed organic matter within an agricultural land reserve). Following review of the information submitted in the LAP, site-specific standards or management practices may be specified by the BC MOE Director; and other conditions may be specified by the medical health officer and Land Reserve Commission. The land application site must have visible signage clearly indicating the source of biosolids with warning to the public not to ingest plant material from the site for specified periods and have domestic animals restrictions.

For landfilling and/or incineration of biosolids, an approval is required from the Environmental Protection Division. The Ministry of Environment has criteria for landfilling and incineration for the landfill owners/operators and incinerators. The “Landfill Criteria for Municipal Solid Wastes” document addresses the siting, design, operation and closure of landfills, and provides specifications on leachate and landfill gas management, prohibited wastes, open-burning restrictions and financial security aspects of landfill closure. The “Emission Criteria for Municipal Solid Waste Incinerators” addresses the contaminant discharge limits, operating parameters and requirements for emission monitoring, facility reporting and operator training.

4. B. (iii) Manitoba:

For land application of biosolids, a licence is required in accordance with the Environment Act. An environmental assessment is done prior to the issuance of a licence. Information of land use, potential environmental impacts of the development and proposed environmental management practices are assessed during this process. Most licences are for a term (one

cropping season). In addition, the Nutrient Management Regulation necessitates providing a Nutrient Management Plan. The term of the validity of the licence varies. Some of the waste water treatment plants have a continuous production system in place to produce biosolids continuously at specified quantity so as to meet the annual needs for land application. Wastewater treatment lagoons have licences for extended periods of time (no expiry), but the land application permit for biosolids generated from the lagoon is generally given for a specified time period. A public notification of the proposal in the local newspaper is required identifying the land that will receive biosolids during the following summer season.

Other uses and/or disposal of biosolids also require licensing or approval under the Environment Act.

4. B. (iv) Newfoundland & Labrador:

Land application of biosolids is not currently permitted in Newfoundland & Labrador. Disposal to landfill is permitted with prior approval from the Pollution Prevention Division.

4. B. (v) New Brunswick:

For land application of biosolids, no special approval is required. However, approval to operate treatment facility requires biosolids to be sent to selected locations. All municipal wastewater treatment facilities producing biosolids need to document where their biosolids are sent for disposal and must submit results of analysis from non-composted biosolids to the Department of Environment.

All biosolids must meet the Category A requirements as outlined in the CCME Guidelines for Compost Quality, 2005 (9) in order to be land applied. There are no further restrictions placed on biosolids that meet these standards and no special approval is required for its use including land application. The practice of the Department of Environment is to reject all applications for the direct land application of wastewater biosolids that do not meet an equivalent standard to the Class A CCME compost quality guidelines. Approved compost facilities must be specifically approved to handle biosolids and must submit analysis of finished compost to the Department of Environment showing that the finished product meets CCME Guidelines (metals, maturity, pathogen and pathogen indicators, and foreign matter). A Nutrient Management Plan or strategy is not required in NB for land application of biosolids or composts.

No public notification is required for the land application or of composted biosolids that meet the CCME standards (Category A compost quality). Special project requests (mine reclamation, highway median rehabilitation, etc.) would require an in-depth environmental assessment and would be considered on a case-by-case basis.

For biosolids that do not meet Class A CCME compost quality, landfilling at an approved sanitary landfill is permitted.

4. B. (vi) Nova Scotia:

Approval is required from the NS Department of Environment for land application of non-livestock generated wastes, wastewater and wastewater sludges. Class B biosolids are classed in this group and therefore requires an approval for land application. Class A biosolids are not considered a waste and no approval for land application is required. Description of source, treatments and quality analysis of biosolids, soil quality analysis, scaled site plan and contingency plans are required during the submission of the application. Though not required as part of the application process, the proponent must have a nutrient management plan or land management plan. An approval may be issued that is valid for up to 10 years.

Public consultation is required prior to submission for approval for land application for Class B biosolids. A summary of the public consultation must be submitted as part of the “application for approval” process, with details on method of consultation, groups/individuals targeted, feedback received and how issues were addressed.

Biosolids are either disposed of on land or used as feedstock for compost in an approved compost facility. Approval is for the activity of composting and is generally granted to a company or individual if it is different than the biosolids generator. No other information is required to be submitted to NS Dept of Environment in these cases.

Landfilling of organic material, including biosolids, are prohibited under the Solid Waste Resource Management Regulations.

4.B. (vii) Nunavut:

A water licence is required from the Nunavut Water Board waste disposal. Biosolids would be covered under terms and conditions for waste disposal. Generally, the proponent would suggest the criteria the biosolids have to meet in order to be disposed off in the manner suggested by the proponent. The Nunavut Water Board uses CCME-Guidelines or other guidance documents as a starting point where applicable. The water licence is valid for a set term (set out in the water licence), no longer than 25 years of length. No public hearing is required prior to the approval process.

4. B. (viii) Ontario:

Currently, a “Waste Management System” Certificate of Approval is required to transfer and apply biosolids on land, while an “Organic Soil Conditioning Site” Certificate of Approval is required for the specific conditioning site (application site). Application forms for “Organic Soil Conditioning Site” Certificate of Approval are submitted to the local MOE District Office for approval. The MOE assesses the information following the standards in the MOE/ Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)’s *Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land* (Guidelines). The MOE

District Office is responsible for conducting a pre-approval site visit to confirm all submitted documentation is correct and can also seek the advice of the Biosolids Utilization Committee (BUC) on the merits of the proposal. In addition, upon issuing a Certificate of Approval, the local MOE District Office notifies municipal clerks where the land application site is located.

A Nutrient Management Plan (NMP) is required by:

- Farm units that generate 300 or more nutrient units (NU),
- Farm units that generate more than 5 NU, that lies within 100m of a municipal well, and that are building or expanding a barn or manure storage, or
- Agricultural operations that receive biosolids

Management requirements include setback distances from surface water and wells as well as maximum application rates. The NMP or Certificate of Approval is generally approved for 5 years.

As of January 1, 2011, MOE will stop issuing “Organic Soil Conditioning Sites” Certificates of Approval for the agricultural land application of non-agricultural source materials (NASM), which includes biosolids on agricultural land. At that time, land application will be managed according to the General Nutrient Management Regulation (O. Reg. 267/03) with a new type of instrument called a NASM Plan, similar in design to the NMA’s existing NMP. Land applicators operating with a valid Certificate of Approval for an “Organic Soil Conditioning Site” on January 1, 2011 will continue to adhere to the Certificate of Approval’s requirements until January 1, 2016, unless it has expired or is revoked or suspended prior to that date. Biosolids which do not meet the quality criteria for a NASM will not be permitted to be applied to agricultural land as a nutrient.

Haulers of biosolids will continue to require a Waste Management System Certificate of Approval under Part V of the *Environmental Protection Act* (EPA) before using, operating, establishing, altering, enlarging or extending a waste management system.

Other uses/disposal methods of biosolids, such as disposal in a landfill site, thermal treatment, anaerobic digestion, rehabilitation of pits and quarries, and other related processes such as pelletization and geomembrane dewatering technologies have separate approval requirements in ON. The Guidelines may continue to assist in the development of Certificates of Approval for other uses of biosolids, including mine remediation, brownfields or in the forest industry.

On November 24, 2009, MOE posted a proposal on the Environmental Bill of Rights Registry to update ON’s compost framework to provide updated best management practices and guidance for compost facility operators, municipal waste managers and ministry staff, as well as new compost standards that support the diversion of a broader range of organic

materials, including sewage biosolids and septage. The new compost standards establish 3 categories (Category AA, A and B).

4. B. (ix) Prince Edward Island:

Currently, all septage and sludge haulers must be licensed with the Department of Environment, Energy and Forestry prior to transport of product and the application of biosolids to land. These haulers are required to follow the requirements of *the Environmental Protection Act* and applicable regulations. The Sewage Disposal Systems Regulations state requirements with setbacks and conditions for land application of Sludge. It is a requirement that all septage be hauled to an approved facility – Charlottetown or Summerside. There are no special requirements for the application of septage or sludge. As well, there are no nutrient management plans required and there is no requirement for the hauler to notify the public prior to or after the application has occurred. There is no time limit for the validity of the approval.

The two largest municipalities have developed capacity during recent upgrades to receive and process septage from all residential properties on PEI serviced with septic systems. As well, these treatment plants have the capacity to treat sludge produced at their treatment plant producing a Class A Biosolids as per the Atlantic Canada Guidelines Manual. Under their operating permits these facilities have been required to submit a Biosolids Management Plan. A component of the plan must state the storage and application requirements. Once details have been confirmed, the utility then must follow the plan.

The smaller wastewater treatment plants and lagoon systems are dealt with on a case-by case basis with approvals obtained from the department for sludge management, Department of Environment, Energy and Forestry. Proposed is to have these facilities meet the Atlantic Canada Wastewater Guidelines. Biosolids from lagoons will be considered to meet Class B Biosolids.

Landfilling of organic material, including biosolids, is prohibited.

4. B. (x) Quebec:

Most uses of biosolids, including land application, require a Certificate of Authorization (C of A), which is issued by the Ministère du Développement durable, de l'Environnement et des Parcs. The plant owners are required to obtain a C of A (permanent) for the plant construction, whereas the C of A for land application is generally issued annually. Wastewater biosolids and composts that have been certified by the BNQ are exempt from a Certificate of Authorization with a few exceptions (rehabilitation of landfills, mines, pits and quarries). However, label warnings and nutrient management plans have to be respected when land applying exempted (CAN/BNQ certified) products. Land application of uncertified biosolids is forbidden on fruits, vegetables and pastureland.

A Nutrient Management Plan (NMP) is also required for every receiving farm. It has to respect agricultural regulations to prevent underground and surface water pollution by nutrients and pathogens. The request for a Certificate of Authorization for biosolids land application includes an updated NMP that also cover provisions to protect soil, air, crop quality and human health. These supplemental parameters are in the guidelines.

The Certificate of Authorization is valid generally for one year (one growing season), except in special cases such as highly foreseeable reclamation activities (little chance of a change in crop or fertilizer residual batch or quality). Notification is through public signage posted on the site. The municipalities and the neighbours are also notified prior to reception and spreading.

In QC, it is forbidden to land apply biosolids to fertilize fruit, vegetables and on pasture land (current season), unless it is certified by the BNQ. This prohibition also applies to home gardens.

Provincial regulation also applies for landfilling and incineration of sludge. Larger landfills are required to capture and treat methane. Landfills are required to receive a Certificate of Authorization. There is a «green tax» of \$19.50 (increased with inflation annually) for each ton of sludge that is landfilled or incinerated in order to promote recovery of municipal residuals.

4. B. (xi) Saskatchewan:

All activities (land application and other uses, or disposal into landfill) related to biosolids are integrated into the ‘Sewage Works permit’ issued to a municipality by Saskatchewan Ministry of Environment. Application with information pertaining to legal description of the land to be used for municipal sewage sludge application; sewage sludge stabilization methods and results of sludge analysis; quantity of sewage sludge that will be applied onto the land and application rate; representative chemical and physical descriptions of the soil that will receive sewage sludge and contingency plans including details about storage facilities, are required to obtain a permit.

Although there is no specific mention of a Nutrient Management Plan, the guidelines specify that nitrogen application rates onto agricultural lands should not exceed the agronomic rate (a rate equivalent to the amount of fertilizer nitrogen required to be applied to the soil for the crop grown). All sludge stabilizing processes including composting requires permit from Saskatchewan Ministry of Environment. The municipalities and land owners have to place a sign board on the land application site. The operating permit issued for sewage works is valid for 5 to 8 years.

The approval of biosolids for land application and/or other disposal primarily falls under provincial jurisdiction. Requirements for approval vary among provinces, and are set forth independently by provincial regulations and local governments

5. Standards/Restrictions

5. A. Federal Standards

The CFIA has standards that apply to all fertilizers and supplements that are intended to be sold in or imported into Canada, including biosolids products. They are described in Section 5.D.

5. B. Provincial Standards

Canadian provinces have their own guidelines and standards for trace elements, pathogens, vector attraction and odours, and overall best management practices for biosolids. Provincial /territorial legislation is not generally applied to federal land or Aboriginal land.

In some provinces such as MB and NB, the standards are based on CCME guidelines. NL uses CAN/BNQ compost standards 0413-200/2005 for composted biosolids and pellets. QC uses the standards of CCME guidelines and CAN/BNQ, while NU uses the standards of NWT, and CCME guidelines for compost quality. Some of the USEPA standards have also been adopted through provincial and national discussions by a few provinces such as BC, QC, MB and SK. In provinces such as AB, NS, and ON, the current standards were developed from pre-existing guidelines, which were developed through provincial consultation with scientists, agrologists and other government bodies.

5. C. Categories of biosolids and composts

Provinces have different classes or categories of biosolids based on various quality criteria such as trace elements, heavy metals, pathogen reduction, vector attraction and odour reduction. In SK and MB, there is a single category of biosolids and thus, one set of standards. In NS, PEI, BC, NB and NU, biosolids are categorized into 2 or 3 categories, depending on quality. For instance, in BC, NS and NWT, biosolids are classified into Biosolids Class A and Class B, whereas in PEI, biosolids are categorized as Exceptional quality (EQ), Class A and Class B biosolids. However, the standards used to qualify these classes of products are not uniform for similarly named categories. For example, BC's Class A standards for Cr, Hg and Zn, are different from Class A standards of NS and NWT. Likewise, BC's Class B standards for Cu and Hg are different from the Class B standards of NS and NWT) (Refer to Table 5-A and 5-B).

In other provinces, such as QC and AB, biosolids are classified into entirely different categories and different naming conventions are adopted. For example, in QC, each fertilizer residual (FR) can be classified by the levels of chemical contaminant (Category C1 and C2), levels of pathogens and indicators (P1 and P2) and odour characteristics (O1, O2 and O3). Thus, a FR will be classified into one of the 12 possible classes (for example, C₁P₁O₁, the best quality

product, or $C_1P_2O_3$ etc). In AB, on the other hand, there are 3 classes based on degree of treatment (digested, wastewater lagoon, undigested) for the purposes of nutrient loading and biosolids application rate. The rates are further divided according to receiving soil properties (Class 1, Class 2 and Class 3). For the purposes of metal loading, only receiving soil properties are considered (Refer to Table 5-B).

As of January 1, 2011, ON will stop issuing “Organic Soil Conditioning Sites” Certificates of Approval for the application of non-agricultural source materials (NASM), which includes biosolids, and will instead issue a new type of approval called a NASM Plan, according to the General Nutrient Management Regulation (O. Reg. 267/03) under the *Nutrient Management Act, 2002* (NMA). The Regulation has been adopted and ON is in the phase-in period now. The new framework categorizes NASM into three categories (1, 2 and 3) based on material quality. Sewage biosolids are a Category 3 material. These categories set requirements for material and soil testing and level of approval. In addition, materials are further subcategorized into metal (CM1 and CM2), pathogen (CP1 and CP2) and odour (OC1, OC2 and OC3) categories. Metal and pathogen categories determine setbacks from wells, surface water, groundwater and bedrock. Setback distances to residential, commercial, community or institutional properties are determined by odour category.

5. D. Specific Standards/Requirements

In Canada, currently, there are few national guidelines relevant to wastewater biosolids. This include: A guide entitled Biosolids Management Programs (12); CCME guidelines for compost quality (8) and the CAN/BNQ Standard 0413-400/2009 Soil amendments – alkaline or dried wastewater biosolids (9). However, there are no national guidelines or recommendations on best management practices for land application of wastewater biosolids. Management of wastewater biosolids is mainly under provincial legislation, and therefore provinces have developed their own standards and parameters to ensure the quality of biosolids produced, used or disposed. The requirements for various parameters used to establish quality criteria at the federal and provincial levels are outlined below.

- (a) **Metals:** The standards for trace metals are provided in Table 5-A and 5-B. As described in CFIA Trade Memorandum T-4-93 - *Standards for metals in fertilizers and supplements*, the current CFIA metal standards are based on the maximum acceptable cumulative metal addition to soil and the application rate of the product. As such, the acceptable levels of trace metals in a product are calculated using the standard maximum addition to soil over a period of 45 years (which are fixed per metal) and the annual application rate of the product. The CFIA’s standards (exception of Cu and Cr standards) have also been incorporated by the CCME Guidelines for Compost Quality, and in the CAN/BNQ Standards. There are no CFIA requirements for metal levels in soils that receive biosolids.

Most provinces have standards for maximum acceptable metal levels in biosolids products. In addition, some provinces have limits for metal content in soils intended for biosolids application. In most provinces, the application rate is dependent on the agronomic and fertilization practices, as well as soil type. Details of application rate are provided on Table 5-C.

- (b) **Pathogens:** Pathogens are disease causing organisms, including bacteria, viruses and nematodes that can be present in all biosolids. The use of selected organisms (e.g. *Salmonella*, *E.coli* and fecal coliforms) as indicators of pathogen contamination and treatment effectiveness is common among several jurisdictions. According to the CFIA's standards for pathogens, *Salmonella* must be absent (non-detectable) and the level of fecal coliforms must not exceed 1000 MPN/g of the total solids (Table 5-D). The CFIA does not prescribe the type of treatment required to achieve these standards.

Not all provinces have standards for pathogens and/or pathogen indicators, some provinces have treatment standards instead. For example, MB requires treatments such as anaerobic digestion or equivalent processing that are known to reduce pathogens. In AB, three levels of treatment (digested, wastewater lagoon and undigested) are used indirectly to define pathogen levels

In QC, based on pathogen standards, there are 2 categories of biosolids, namely P1 and P2. *Salmonella* must be absent (in 10g wet weight of the sample) in P1. For P2, *E. coli* is used as an indicator (< 2 000 000). In addition, there are other requirements based on levels and type of treatment, for both P1 and P2 categories. NB uses CAN/BNQ and USEPA standards for pathogens and pathogen indicators, as outlined in Table 5-D.

Currently, Ontario requires all biosolids be treated in an approved process to reduce pathogens. Under the General Nutrient Management Regulation (O. Reg. 267/03) sewage treatment plants with a designed capacity of 45,400 cubic metres or more per day are required to meet an *E.coli* standard of < 2×10^6 CFU/g of total solids dry weight.

As of January 1, 2011, sewage biosolids applied under Ontario's new NASM framework will be categorized into two sub-categories of Criteria for Pathogens (CP1 and CP2). Sewage biosolids that meet the CP1 standard must meet levels of *E. coli* $\leq 1,000$ colony forming units (CFU)/g dry weight or 100ml, *Salmonella* < 3 CFU or Most Probable Number (MPN)/4g or 100 ml, and *Viable Helminth ova* or total culturable enteric virus < 1 organism per 4g or 100 ml. Sewage biosolids categorized as CP2 have to meet the *E.coli* < 2×10^6 CFU/g of total solids dry weight standard.

In all other provinces, the *Salmonella* standard is < 3 MPN/ 4g, and the standard for fecal coliforms is < 1000 MPN/g of the total solids for the highest quality products (e.g., Class

A in NS). For lower quality products, the standard for fecal coliforms is below 2,000,000 MPN/g.

- (c) **Organic chemical contaminants:** Organic chemicals can enter waste streams from a variety of industrial and domestic sources. The standards for organic contaminants are provided in Table 5-E. The CFIA has an interim standard for dioxins and furans in waste-derived products such as biosolids intended for sale. As with trace metals, the dioxin and furan standard is linked to the application rate of the product and the maximum acceptable cumulative addition to soil which is currently set at 5.4 mg Toxic Equivalent (TEQ)/ha over a 45 years. Therefore, at an application rate of 4400 kg of product per ha this translates into 27 ng TEQ/kg of product. QC and the CAN/BNQ 0413-400/2009 also have a standard for dioxins and furans. NB uses CAN/BNQ and USEPA standards for organic chemical contaminants. BC has a Risk pathway identification and intervention approach for organic chemical contaminants.
- (d) **Restrictions on the frequency of land application:** The use of fertilizer and supplement products including biosolids is not regulated under the *FzA*. However, the directions for use, which must appear on the product label, often include the frequency, timing and rate of application, as well as target crops on which the product is intended to be used, and are reviewed as part of the product approval process. In cases when the proposed application of the product would exceed the allowable standards (e.g. metal loading or dioxin and furan addition to soils), the application rate or application frequency recommended on the label is adjusted to mitigate against the potential environmental risks associated with product use.

Similarly some provincial regulations have restrictions on the frequency of land application of biosolids to protect surface and ground water (Table 5-F). In NB, only Class A compost quality products can be land applied and have no other restrictions or specifications on land application. Currently, in PEI, biosolids are not allowed to be applied in the same calendar year for pasture, forage, food, and feed crops. In QC, wastewater biosolids are not allowed to be spread as a fertilizer on human food crops and on pastures (in the current season) unless certified by the BNQ. For P2, waiting periods have to be observed before harvest of crops (from 30 days to 3 years, depending of the type of crop).

In MB, land application of biosolids is generally permitted only on agricultural land on which one of the following are grown for a period of three years following the application: cereals, forages, oil seeds, field peas or lentils. Cattle are not permitted to pasture on land on which biosolids have been applied for a period of three years from the date of application of the biosolids. In AB, land application is only allowed once every three years on the same piece of land. Land application is not permitted on root crops,

fresh fruit and vegetables, tobacco, and dairy pasture. Direct grazing on biosolids treated pasture is not permitted for three years.

Currently in ON, there are five year biosolids' loading restrictions. As of January 1, 2011, new approvals for land application (NASM Plans) will be subject to a 12 month loading restriction, must meet beneficial use criteria (demonstrate beneficial use for either organic matter content, nutrients, pH balance or irrigation) as well as new maximum application rates for nitrogen, phosphorus, potassium, boron, sodium and fats oils and grease (FOG). ON also has numerous land application requirements that specify waiting periods for harvesting tree fruits and grapes, vegetables, hay and haylage, and sod as well as grazing horses, cattle, swine, sheep and goats. In BC the combination of metals and nutrient management planning control frequency of application and volume of material applied. Application models for different climatic zones were designed in consultation with Agriculture Canada. A qualified Professional (as defined in regulation) must plan to apply no more than the crop requires. In the dry interior of the province, this means very little is applied at one time.

- (e) **Separation requirements for land application:** The separation distances are designed to protect the surface and ground water quality, and human health. Distance from watercourses and soil permeability are major determinants for the separation requirements and standards set by the provinces. The separation requirements for land application of biosolids are listed in Table 5-G. Land application sites for biosolids must meet or exceed the minimum separation distances prescribed in provincial standards.
- (f) **Stability:** The standards for stability of biosolids are listed in Table 5-H. Several indicators of stability are used by provinces including % volatile solids reduction, oxygen uptake rate, vector attraction reduction, pathogen and odour reduction, stabilization method used and quality of biosolids and composted biosolids.

Provinces use different classification/categorization for municipal biosolids and also adopt different naming conventions for the various classes of biosolids. The parameters used to assess the quality of biosolids are generally common among most provinces.

6. Monitoring, Compliance and Record-keeping requirements

6. A. Federal requirements

The CFIA administers a number of marketplace monitoring programs that include compliance verification of biosolids and composted biosolids products that are sold as fertilizers or

supplements. Regulated products are subject to inspection, sampling and analysis (for nutrient, moisture and organic matter guarantees, pathogens and trace metals) as well as label verification, at the point of sale in the marketplace. Non-compliant products are subject to regulatory action, including product detention. It should be noted that the CFIA is not legislated to take action on products after sale has occurred.

6. B. Provincial/Territorial requirements

In most provinces, an Enforcement section is responsible for the enforcement of the respective acts and regulations, and for handling non-compliance issues deemed to be a threat to the environment. In most jurisdictions, the Enforcement section needs to ensure that the facilities hold a valid approval/permit/licence to operate the facility, and also monitor for compliance with the requirements of the respective act and regulations.

The generators of biosolids and/or the licence/approval/permit holders must monitor the quality of the biosolids received from each source. Some provinces require groundwater quality testing from domestic wells located within specified distance of land application and/or storage sites. Also, records are to be submitted at a particular time interval (e.g. annually, or every cropping season), but in most cases, the proponent (permit holder) must collect, record, and have the results of analysis readily available, if required by the inspection authorities.

The frequency of sampling and method of sampling are determined by each province (Table 6-A). As a part of the record keeping requirement, most provinces surveyed have some form of record maintenance for varying periods of time ranging from 1 year to 5 years. In many of the provinces, the results of analysis are to be submitted annually by the facilities directly to the Ministry of Environment and/or maintained on record which is verified during an inspection. Further details on monitoring and compliance and the record keeping requirements of different provinces are outlined in Table 6-B.

7. Conclusion

The legislative review was developed by the CCME-BTG to summarize the current legislative framework for management of wastewater biosolids and septage, in order to support BTG's initiative on development a Canada-wide approach for management of municipal wastewater biosolids.

An array of production/use/disposal systems are involved in wastewater and biosolids management. Federal and provincial/territorial governments have acts and regulations to ensure that biosolids are managed in a safe and environmentally sound manner. The sale and/or import of biosolids represented as fertilizer or supplements are regulated under the federal Fertilizers Act. The end use, including land application and disposal of biosolids is mostly regulated

through various provincial/territorial acts and regulations. There are various standards and information requirements that are to be met for obtaining approvals or permits or licences from the provinces. Most provinces have some form of guidance document(s) which outline(s) information requirements for approval/permit/licence.

Some of the challenges that were identified through this review include some inconsistency in the definitions used to describe sewage sludge and biosolids, and in the approval processes. Furthermore, new research may warrant the revision of some of the federal and provincial regulations and guidelines pertaining to biosolids and biosolids products.

8. References:

- (1) *Canadian Environmental Protection Act, 1999* (1999, c. 33).
<http://laws.justice.gc.ca/en/C-15.31/>
- (2) Environment Canada Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments
http://www.ec.gc.ca/eu-ww/0FB32EFD-73F9-4360-95EE-CB856FB4D971/1976_Guidelines_En.pdf
- (3) National Pollutant Release Inventory (NPRI), Environment Canada.
<http://www.ec.gc.ca/pdb/npri/>
- (4) *Fertilizers Act* (R.S., 1985, c. F-10) <http://laws.justice.gc.ca/en/F-10>
- (5) Fertilizers Regulations (C.R.C., c. 666)
<http://laws.justice.gc.ca/en/showtdm/cr/C.R.C.-c.666/?showtoc=&instrumentnumber=C.R.C.-c.666>
- (6) Schedule II of Fertilizers Regulations (C.R.C., c. 666) - Names and Standards of fertilizers and supplements. <http://laws.justice.gc.ca/en/showdoc/cr/C.R.C.-c.666/sc:2/en#anchorse:2>
- (7) Canadian Council of Ministers for the Environment (CCME) <http://www.ccme.ca/>
- (8) CCME Guidelines for compost quality 2005
www.ccme.ca/assets/pdf/compostgdlns_1340_e.pdf
- (9) Bureau de normalisation du Québec (BNQ) <http://www.bnq.qc.ca/>
- (10) Biosolids Management Program. 2003. Federation of Canadian Municipalities and National Research Council. ISBN 1-897094-34-5.
http://www.communautesviabiles.fcm.ca/_pvw7CE56679/files/Infraguide/storm_and_wastewater/biosolids_managmnt_programs.pdf.

Appendix

Table 1. Biosolids Management in Canada: Legislation and Regulatory authorities

Jurisdictions/ Department	Acts and Regulations	Scope of the regulatory authorities
Federal		
Environment Canada (EC)	<i>Canadian Environmental Protection Act, 1999</i>	Releases of National Pollutant Release Inventory (NPRI) substances are required to be reported to Environment Canada.
Canadian Food Inspection Agency (CFIA)	<i>Fertilizer Act and Regulations</i>	Products when sold or imported into Canada as fertilizers and supplements are regulated under the <i>Fertilizers Act and Regulations</i> . Fertilizer and supplement use, transport, and storage are not regulated under the Act. The Act does not regulate products that are not sold (i.e. given away) or sale of products that do not meet the definition of a fertilizer or supplement (e.g. potting soil)
Provincial/ Territorial		
Alberta (AB) Alberta Environment	<i>Environmental Protection and Enhancement Act;</i> <i>Wastewater and Storm Drainage Regulation;</i> <i>Activities Designation Regulation;</i> <i>Code of Practice for Wastewater Systems Using a Wastewater Lagoon</i>	The Acts and Regulations support and promote the protection, enhancement and wise use of the environment. It includes collecting, treating and disposing of wastewater and includes wastewater sludge treatment and disposal facilities, also includes municipal wastewater collection systems and wastewater systems using wastewater lagoons and land application of biosolids
British Columbia (BC) Ministry of Environment	<i>Environmental Management Act and Health Act;</i> <i>Organic Matter Recycling Regulation, 18/2002; amendments 321/2004</i>	The Regulation governs the production, quality and land application of certain types of organic matter. In the past, this organic matter have been predominantly burnt, buried or otherwise disposed of. It applies to the construction and operation of composting facilities and the production, distribution, storage, sale and use or land application of biosolids and compost. The regulation covers treatment, quality, land application and storage of biosolids. The regulation includes criteria for Biosolids Growing Medium (topsoil)
Manitoba (MB) Manitoba Conservation	<i>The Environment Act, E125, 1998;</i> <i>The Nutrient Management Regulation under the Water Protection Act</i>	The Acts regulate processes or works to abate or control pollution or other environmental damage including but not limited to waste disposal grounds, landfills, sewage collection and treatment, sewage or industrial sludge handling and disposal, incinerators, and recycling systems
Newfoundland and Labrador (NL)	<i>Environmental Protection Act;</i> <i>Reference to Part VIII of the Act on Dangerous Goods is also made.</i>	The EPA deals only with disposal of biosolids. Biosolids and septage are considered as semi hazardous materials and require cartage to be in enclosed truck such as a vacuum sludge truck that is licensed through the Department of Government Services.

New Brunswick (NB) Department of Environment	<i>Water Quality Regulation 82-126 under the Clean Environment Act</i>	Biosolids and/or sewage sludge would be considered a waste under the Act. Regulation only applies to activities that impacts or may impact waters of the province. Therefore, regulation only covers disposal. Sewage sludge or biosolids that are composted to meet CCME Guidelines for Compost Quality or meets equivalent standards would no longer be considered a waste.
Nova Scotia (NS) Nova Scotia Environment	<i>Section 50(2) of the Environment Act, S.N.S. 1994-95;</i> <i>Section 3(1) of the Activities Designation Regulations (O.I.C. 95-286);</i> <i>Section 23 of the Activities Designation Regulations (O.I.C. 95-286);</i> <i>Section 8(2)(b) of the Environment Act, S.N.S. 1994-95,</i>	The Act and Regulations covers the application to land of non-livestock generated wastes, wastewater and wastewater sludges. The only biosolids management option is land application. Source control is addressed via municipal sewer use bylaws, although a model sewer use bylaw was developed by the Province and forms the template used by the municipalities. Exemptions: Biosolids that meet Class A criteria do not require an Approval for land application; Biosolids that do not meet Class A criteria (Class B) require an approval for land application and are restricted from use on agricultural land.
Nunavut (NU)	<i>Water licence from Nunavut Water Board</i>	All water uses in Nunavut require a water licence from the Nunavut Water Board, which sets out criteria for effluent discharge, monitoring etc. Biosolids management may be covered under the water licence.
Ontario (ON) Ministry of the Environment	<i>O. Reg. 267/03 General Regulation under the Nutrient Management Act, 2002;</i> <i>Ontario Regulation 347, under the Environmental Protection Act;</i> <i>Ontario Water Resources Act</i>	Ontario's regulatory authority covers handling, disposal, and storage of biosolids. It does not extend to discharges into sewers; pollutants in wastewater discharge to sewers are controlled through municipal sewer use bylaws or sewer use agreements. Ontario policies on municipal wastewater effluent quality or industrial discharge are implemented through a Certificate of Approval issued under the <i>Ontario Wastewater Resources Act</i> (OWRA). However, accidental discharges or spills into the environment are regulated under Ontario's <i>Environmental Protection Act</i> . An exemption exists under Regulation 347 for a waste that is wholly used in an ongoing commercial process for purposes other than waste management when the process does not involve combustion or land application of the waste.
Quebec (QC) Environment Québec	<i>Articles 20, 22 and 32 of the Environment Quality Act;</i> <i>Regulation respecting agricultural operations;</i> <i>Regulation respecting groundwater catchment</i>	Under this Act, Article 20 stipulates not to pollute. Article 32 stipulates the need for a C of A for wastewater treatment plant construction. The provincial government prohibits disposal of some hazardous wastes in the sewer, like used oil. Municipalities are responsible to implement by-laws for on source control of pollutants discharge in the sewers. Québec has a regulation that covers landfilling and incineration of residuals, which includes solid sludge. Large scale composting of biosolids is covered by Lignes directrices pour l'encadrement des activités de compostage and requires a C of A according to article 22 of the Act... For land application: a C of A is generally required under article 22 of the Act. The Agricultural Operations Regulation and the Groundwater Catchment Regulation also apply to biosolids land application.

<p>Prince Edward Island (PEI)</p> <p>PEI Department Environment, Energy and Forestry</p>	<p><i>PEI Environmental Protection Act; Sewage Disposal Systems Regulations section 22 through 24.</i></p>	<p>Currently, the regulatory authority for biosolids applies only to the disposal including application of the product, separation distances, slope restrictions for land application. http://www.gov.pe.ca/law/regulations/pdf/E&09-15.pdf</p> <p>When dealing with source control (inputs to sewer) the regulatory authority falls within the By laws of Charlottetown, Summerside, Cornwall and Stratford. For the other utilities they follow the Prince Edward Island Municipal Sewerage Utilities, General Rules and Regulations administered by the Island Regulatory and Appeals Commission - http://www.irac.pe.ca/document.asp?file=utilities/srandr.asp#4.8</p> <p>It is the responsibility of the individual utility to enforce their bylaw/regulation. It may be within the authority of the department to suggest or require changes to the bylaws if warranted</p>
<p>Saskatchewan (SK)</p> <p>Saskatchewan Environment</p>	<p><i>Environmental Management Protection Act 2002 (EMPA); Water Regulations, 2002</i></p>	<p>Saskatchewan Ministry of Environment is the sole regulatory agency in the province in regulating biosolids or Municipal Sewage Sludge in the province. The levels of pollutants released in untreated wastewater are covered through the Water Regulations.</p>

Table 2- Septage Management in Canada

	Type and level of septage treatment	Guidelines/Standards/Restrictions for processing, use and disposal of septage
AB	Septage is vacuumed and hauled from private septic tanks and either taken to a municipal wastewater treatment facility to be treated or it is applied on land provided the hauler has an authorization from Alberta Environment. Septage is not treated prior to disposal in wastewater facility or application on land.	<p>(a) The disposer shall only apply domestic wastewater to land between April and October of each year subject to the following provisions: (i) the disposer shall not apply domestic wastewater when ice, snow or frozen conditions exist; (ii) the disposer shall not apply domestic wastewater to stream valleys and intermittent drainage areas; and (iii) the disposer shall only apply domestic wastewater to land that meets the requirements identified in the guidelines (TABLE 4.1)</p> <p>(b) The disposer shall apply domestic wastewater in accordance with the separation distances from specified features set out in TABLE 5.1.The disposer shall only apply domestic wastewater by injection or surface application.</p> <p>(c) If surface application is employed, the disposer shall till the land within 48 hours of the surface application to incorporate the domestic wastewater with the surface soil material.</p> <p>(d) The disposer shall not exceed the application rates for casual and designated application sites as specified in TABLE 7.1.</p> <p>(e)The disposer shall only apply domestic wastewater to land intended for the production of forages, oil seeds, small grains, trees and commercial sod.</p> <p>(f) The disposer shall not apply domestic wastewater to land that is intended to be used for the production of root crops, vegetable and fruit crops, or dairy farming pasturing within three years of the application of the domestic wastewater.</p> <p>(g) The disposer shall obtain written permission from the landowner prior to the application of domestic wastewater.</p> <p>(h) The disposer shall maintain a minimum of the following records: (i) address of all clients; (ii) volume of waste collected from each client; (iii) land location of disposal of the waste collected; (iv) application rate of the waste disposed; and (v) date of application of the waste disposed.</p> <p>(i) All records shall be kept at the business office of the disposer for a minimum of five years from the date of the waste application</p>
BC	Generally, composting and/or other treatment processes would be required for septage to meet Class B biosolids standards thus enabling application to land.	<p>The land application and distribution requirements include:</p> <ul style="list-style-type: none"> - Land application plan - discharger must have a qualified professional prepare a land application plan and obtain written certification from a qualified professional that the land application was carried out in accordance with the plan - Class B biosolids standard – septage must meet defined criteria for: pathogen reduction processes, vector attraction reduction, pathogen reduction limits, quality criteria (less restrictive than for Class A biosolids), sampling and analyses – protocols and frequency, record keeping. - The trace element ceiling limits for biosolids under OMRR are significantly lower than those specified in the scientific, risk-assessment-based U.S. 40 CFR Part 503 rule.
MB	No treatment prior to disposal required pursuant to MR 83/2003 (Onsite	Schedule C MR 83/2003(Onsite Wastewater Management Systems Regulation) sets out the requirements for the disposal of sewage from an onsite wastewater management system onto the ground.

	Wastewater Management Systems Regulation)	- Soils analysis may be required. Disposal shall only be permitted of the septage is distributed onto agricultural land under the control of the owner of the system from which the septage originated. Specific acreage and setback distances required for application.
NL	-Septage is generally collected and treated at two facilities holding a Certificate of approval to operate the Waste Management System. - The waste is collected in vac trucks and transported to facilities where it is dewatered, and the sewage sludge is composted (passive pile-up to 2 years at the Parly's facility in Foxtrap on the Avalon Peninsula).	In some areas, disposal to a Municipal Wastewater Treatment Facility occurs. In other areas of the NL, where collection and treatment facilities do not exist, landfill disposal of sewage sludge (that includes septage) is accepted. - The Government Services Centre conducts annual inspections of these facilities in association with the Department of Environment and Conservation for compliance with the Certificate of Approval issued under the NL Environmental Protection Act and the applicable regulations and guidelines, which include the Environmental Control Water and Sewer Regulations under the NL Water Resources Act and the Canadian Council Ministers of the Environment Water Quality Guidelines for the Protection of Freshwater (and Marine where applicable) Aquatic life.
NB	All septage must be treated to an equivalent level as municipal wastewater.	- Solids from septage treatment facilities must either be composted or landfilled. - All septage handling businesses and septage treatment facilities must be approved by the Department of Environment.
NU	N/A	
NS	Sludge is stabilized in lagoons (365 + days). Depending on the disposal or reuse option chosen, further treatment is required. Acceptable methods of treatment include: - Dewatered; stabilized & land applied. - Dewatered and composted at an approved facility - Incineration at an approved facility - Disposed at a landfill (contaminants present) - Processed into fertilizer under FzA	Guidelines for Handling, Treatment, and Disposal of Septage http://www.gov.ns.ca/nse/water/docs/SeptageGuidelines.pdf - Land application was initially considered by one of the sites; however, due to high costs associated with this method, it was decided to pursue the dewatering/composting option, therefore, no septage lagoon sites in Nova Scotia are currently land applying. - Although incineration is an acceptable means to further treat septage sludge, there is currently no approved incineration site in the province of Nova Scotia. - Once sludges are dewatered and composted, they are considered biosolids and must be classified (Class A, or B) according to the current biosolids guidelines in order to determine their end use.
ON	Septage is either disposed of at sewage treatment plants (STP), landfill sites, dewatering trenches or waste stabilization lagoons or land applied. - In Northern Ontario, dewatering trenches are the primary means of disposal, often on crown land. - Septage may be temporarily stored at a ministry approved waste disposal (transfer) site— generally storage lagoons	The <i>Environmental Protection Act, 1990</i> (EPA) - Septage is a regulated waste under Part V of the EPA and the General Waste Management Regulation, Reg. 347, whether it is treated or untreated. - Under the EPA, septage haulers are required to obtain a Certificate of Approval to apply the materials on land. - The Ministry of the Environment (MOE) imposes standards and conditions on the transport and land application of septage through the Certificate of Approval process. Ontario is committed to ending the spreading of untreated septage on land. In order to successfully end the practice of land applying untreated septage, there must be sufficient capacity to treat septage at municipal

	<p>and tanks. Storage lagoons are most common in Ontario. In these, septage may be stored prior to being land applied. Stabilization lagoons are designed to treat septage solids.</p> <p>- About forty percent of Ontario's septage currently goes to sewage treatment plants (STP) and treatment lagoons.</p>	<p>sewage treatment plants or with other viable treatment options. Government investments in infrastructure, studies of alternative treatment options and development of environmentally protective standards are stimulating development of septage treatment capacity.</p> <p>The <i>Provincial Policy Statement, 2005</i> directs that municipalities no longer approve new development that is dependent on septic systems unless capacity to treat the septage from that development is available.</p> <p>The MOE is working with partners to develop cost-effective septage treatment options and encourages municipalities to adopt a process that best fits their needs. The ministry has been working cooperatively with the septage haulers' association, the University of Guelph and municipalities to develop cost-effective septage treatment and management options since 2004.</p> <p>As of January 1, 2011, treated septage may be applied to agricultural land under the General Nutrient Management Regulation as a nutrient.</p>
PEI	None at Present	<p>Sewage Disposal Systems Regulations – mainly deal with setback requirements from residential homes, wells, natural features such as rivers, streams, etc, and the time of year and type of fields whereby septage can be applied to the land.</p> <p>-The Biosolids Management plan for PEI is to have all septage hauled to the two largest municipalities – Charlottetown and Summerside for treatment. These two facilities will produce Class A Biosolids meeting the Atlantic Canada Wastewater Guidelines Manual's requirements.</p>
QC	<ul style="list-style-type: none"> - Wastewater treatment plant - Alkaline treatment - liquid - Dehydration + Composting - Lagoons 	<p>Exactly the same requirements as for municipal biosolids. (Nutrients, Pathogens, Trace elements, Odours, Foreign matter and Site restrictions)</p> <p>-Treatment is mandatory for foreign matter reduction (screening). Not mandatory for pathogen reduction when immediate injection in soils and prove that E. coli < 2 000 000 /g dwb. However, in practice, most septage undergo a pathogen reduction treatment further to natural pathogen reduction in the tanks</p>
SK	Wastewater Treatment Plant/ Lagoons	Guidelines for hauling and disposal of septage (Liquid domestic waste) are available. The hauler has to get permit from the Ministry for hauling and disposing the septage (Liquid domestic waste).

Table 3- Approval/Authorization/Permission at various stages of biosolids production, use and disposal

	Regulatory Compliance/Approval /Authorization/Permission required for					Nutrient Management Plan or Land Application Plan	Public Consultation		
	Receiving /processing waste water	Operating treatment facilities	Land application	Composting	Other methods of disposal (landfilling; incineration)		Operating/ managing facilities	Land application	Other disposal methods
AB	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes ¹	
BC	Yes	Yes	Yes	Yes	Yes	Yes - LAP	Yes	Yes	Yes
MB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes/No ²
NL	Yes	Yes	Yes					No	
NB	No	Yes	No, if composted	Yes	Yes-landfilling			No, if composted	
NU	Yes	Yes	Yes	No	No	No	No	No	No
NS	Yes	Yes	Class B only	Yes	Banned	Yes	Yes	Yes/No ³	
ON	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes ⁴	Yes
QC	Yes	No permit	Yes	Yes	Yes	Yes			Yes
PEI	Yes	Yes	Yes	Yes	No	No	No	No	No
SK	Yes	Yes	Yes	Yes	Yes			Yes	
If blank, information not available									

¹ limited to landowner permission

² MB-Any disposal method that is considered a major alteration to the development as Licensed would require additional public consultation. If the proposed disposal method is considered to be a minor alteration, no additional public consultation would be required.

³ If the biosolids producer has a LONO to the sale of the product from CFIA, then no approval and no public consultation is required. Land application of class B biosolids must obtain an approval from Environment, which generally includes a requirement for public consultation and posting of the site.

⁴ As an operational practice, Ontario notifies the municipal clerks from lower and single tier municipalities. MOE does not require public notification, which is up to the discretion of the municipalities

Table 4: Guidance and other Policy documents for regulation of biosolids in various provinces and territories

Guidance and other Policy documents	
Federal	
EC	<p><i>Environment Canada Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments. (1976).</i> The purpose of these guidelines is to indicate the degree of treatment and effluent quality that will be applicable to all wastewater discharged from existing and proposed Federal installations. Use of these guidelines is intended to promote a consistent wastewater approach towards the cleanup and prevention of water pollution and ensure that the best practicable control technologies are used. These guidelines apply to all effluents discharged from land based establishments under the direct authority of the Federal Government. http://www.ec.gc.ca/eu-ww/0FB32EFD-73F9-4360-95EE-CB856FB4D971/1976_Guidelines_En.pdf</p> <p><i>National Pollutant Release Inventory Guidance Manual for the Wastewater Sector</i> The purpose of this guidance manual is to provide information on which facilities must report, and how they should calculate releases to be reported. The Guidance manual states that facilities engaged in waste or sewage sludge incineration, municipal waste water collection and treatment, must determine if a report is required. http://www.ec.gc.ca/pdb/NPRI/2002guidance/WW2002/WW_2002_e.cfm</p> <p><i>Guide for Reporting to the National Pollutant Release Inventory 2002, and the CAC Supplementary Guide.</i> This includes guidance related to NPRI reporting for activities such as stationary combustion equipment operations, sewage sludge incineration, non-hazardous solid waste incineration, and hazardous waste incineration. http://www.ec.gc.ca/pdb/npri/2003Guidance/Guide2003/toc_e.cfm http://www.ec.gc.ca/pdb/npri/2002guidance/cac2002/cacs_2002_e.cfm</p>
CFIA	<p>T-4-120- Regulation of Compost under the <i>Fertilizers Act and Regulations</i> The purpose of this document is to provide information on the regulatory requirements for compost under the <i>Fertilizers Act and Regulations</i>, and describe the safety, efficacy and labelling standards that must be met in order to legally sell or import compost into Canada. This document is also designed to assist compost producers, facility operators, importers, and retailers in meeting the regulatory requirements prescribed by the Acts administered by the Canadian Food Inspection Agency (CFIA). http://www.inspection.gc.ca/english/plaveg/fereng/tmemo/t-4-120e.shtml</p> <p>T-4-112- Information Required for the Assessment of By-products and Other "Waste" Materials Sold as Fertilizers or Supplements. This document outlines the information required for the assessment of by-products and other "waste" materials sold as (in) fertilizers or supplements. Once the information is received, CFIA will conduct a preliminary screening of the safety and efficacy of the product. Any additional requirements will then be outlined. http://www.inspection.gc.ca/english/plaveg/fereng/tmemo/t-4-112e.shtml</p>
Provincial/ Territorial	
AB	<p><i>Industrial Release Limits Policy</i> covers Alberta Environment's approach to developing standards and guidelines for the release of substances into the environment. This policy document outlines the approach followed by Alberta Environment (AENV) staff to develop industrial release limits for approvals under the Environmental Protection and Enhancement Act. The policy supports the Alberta Government's "Commitment to Sustainable Resource & Environmental Management" by outlining how pollution prevention/control requirements are established for industrial releases to the</p>

	<p>environment. http://environment.alberta.ca/711.html</p> <p><i>Guidelines for the Application of Municipal Wastewater Sludges to Agricultural Lands, 2001</i></p> <p>The guidelines were intended for the use of municipalities considering or practicing land application as a method of municipal wastewater sludge disposal. After fifteen years since the guidelines were developed, the focus of the program still remains the same, i.e.; land treatment of sludge is agriculturally beneficial and environmentally acceptable. http://environment.gov.ab.ca/info/library/6378.pdf</p> <p><i>Standards and guidelines for municipal waterworks, wastewater and storm drainage systems</i></p> <p>Alberta Environment is responsible for the Drinking Water and Wastewater Programs for large public systems in Alberta. This document sets out the regulated minimum standards and requirements for municipal waterworks in Alberta.</p> <p>http://environment.gov.ab.ca/info/library/6979.pdf</p>
BC	<p>Best Management Practices Guidelines for the Land Application of Managed Organic Matter in British Columbia</p> <p><i>Incineration and Landfilling:</i> http://www.env.gov.bc.ca/epd/epdpa/mpp/incin_landfill.htm#top</p>
MB	<p>The policies are site specific Environment Act licences with limits, terms and conditions which include the nutrient controls as stated in the Nutrient Management Regulation.</p> <p>Information bulletin-guidance document available: http://www.gov.mb.ca/conservation/eal/publs/info_eal.pdf http://www.gov.mb.ca/conservation/eal/publs/info_eap.pdf</p>
NL	<p>The Pollution Prevention Division adopts the requirements established in the USEPA Part 503 Biosolids Rule and BNQ Standard 0413-400-2009 on Soil Amendments – Alkaline or Dried Municipal Biosolids when reviewing proposals and issuing Certificates of Approval for disposal to solid waste disposal sites or composting.</p> <p>Currently no guidance document is available</p>
NB	<p><i>CCME Guidelines for Compost Quality.</i> http://www.ccme.ca/assets/pdf/compostqdlns_1340_e.pdf</p> <p>Guidelines for the Site Selection, Operation and Approval of Composting Facilities in New Brunswick http://www.gnb.ca/0009/0373/0001/0007-e.asp</p> <p><i>Policy: The direct land application of municipal biosolids that do not meet an equivalent standard to the CCME Compost Quality Guidelines requires an approval from the Department. It is the Department's practice to not approve these types of applications as there are available compost facilities to treat this waste to a suitable standard for general use.</i></p>
NS	<p>Guidelines For Land Application and Storage of Municipal Biosolids in Nova Scotia, March 2010 https://gov.ns.ca/nse/water/docs/BiosolidGuidelines.pdf</p> <p>Codes of Practice for the Application of Non-Agricultural Organic Wastes (NAOW) on Agricultural Land. (May 2005)</p>
NU	<p>The Government of Nunavut has an Environmental Guideline for Industrial Waste Discharges that set criteria for landfilling of process residuals such as sludge. The Environmental Guideline for Industrial Waste Discharges is mandated under the (territorial) Environmental Protection Act to prevent contaminants from entering the environment. http://www.gov.nu.ca/env/industrial.pdf</p>

ON	<p>MOE/OMAFRA's <i>Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land, 1996</i>, provide guidance to establish requirements for Certificates of Approval in order to ensure that the biosolids and their application are safe. http://www.ene.gov.on.ca/envision/gp/3425e.pdf</p> <p>The <i>NASM Odour Guide</i> sets out an odour classification system for NASM that are applied to agricultural land. http://www.omafra.gov.on.ca/english/nm/regs/nmpro/odourtoc_09.htm</p> <p>The <i>Sampling and Analysis Protocol</i> sets out the proper sampling and analytical techniques that are critical to accurately determine the nutrient content and other properties of materials applied to the land for the purpose of improving the growing of agricultural crops. http://www.omafra.gov.on.ca/english/nm/regs/sampro/samprotc_09.htm</p> <p>The <i>Nutrient Management Protocol</i> provides technical and scientific details and standards that are complementary to and in addition to those set out in the Regulation. http://www.omafra.gov.on.ca/english/nm/regs/nmpro/nmprotc_09.htm</p> <p><u>Septage</u> The <i>Provincial Policy Statement, 2005</i> directs that municipalities no longer approve new development that is dependent on septic systems unless capacity to treat the septage from that development is available.</p> <p>The factsheet on the <i>Provincial Policy Statement, 2005: Reserve Sewage System Capacity for Hauled Sewage</i>. The <i>Provincial Policy Statement</i> directs that municipalities no longer approve new development that is dependent on septic systems unless capacity to treat the septage from that development is available. http://www.ene.gov.on.ca/en/publications/forms/6316e.php</p>
PEI	<p>Sewage Disposal Systems Regulations This regulation deals with the requirements for human waste. It is used to regulate the septic and sludge haulers working in PEI. http://www.gov.pe.ca/law/regulations/index.php3</p> <p>Atlantic Canada Wastewater Guidelines Manual for Collection, Treatment and Disposal, 2006. This manual is used by engineers for design guidance of wastewater systems including the design of sludge treatment and dewatering processes. As well, this manual is referenced for the design and land application of Biosolids for facilities that put in place Class A or Class B Biosolids treatment systems as the current Sewage Disposal Systems Regulations do not define the treated sludge to this level.</p> <p>The guidelines document is used for human and industrial waste treatment systems design. http://gov.ns.ca/nse/water/docs/AtlCanStdGuideSewage.pdf</p>
QC	<p><u>Guidelines for the beneficial use of fertilizing residuals</u> The Guidelines for the Beneficial Use of Fertilizing Residuals includes the applicable standards and criteria. This Guide is used to prepare a request for a certificate of authorization when required http://www.mddep.gouv.qc.ca/matieres/mat_res-en/fertilisantes/critere/index.</p> <p>The Guide covers most types of beneficial use as soil amendment/fertilizer, with the exception of use on degraded sites (high rates). This activity is covered by another guide (French only) http://www.mddep.gouv.qc.ca/matieres/mat_res/fertilisantes/vegetal/index.htm</p> <p>Other French and English documents are available on MDDEP web-site (Statistics, factsheets, questions and answers, scientific studies, etc.) http://www.mddep.gouv.qc.ca/matieres/mat_res-en/fertilisantes/index.htm</p>

	<p>Policy: Politique québécoise de gestion des matières résiduelles 1998-2008 http://www.recyc-quebec.gouv.qc.ca/upload/Publications/politique_quebecoise_sur_la_gestion_des.pdf</p> <p>This policy states that eventually no sludge should be landfilled unless its beneficial use is economically non viable. Following this policy, a regulation established a \$19.50 tax for each ton of sludge landfilled/incinerated. This is an incentive for beneficial use.</p>
SK	<p>Guideline for Sewage Works Design, EPB 203: This guideline doc contains information on permit requirements for wastewater works, design parameters for wastewater treatment units, sludge generated from various units and sludge treatment. http://www.saskh2o.ca/DWBinder/EPB203GuidelinesSewageWorksDesign.pdf</p> <p>Land application of Municipal Sewage Sludge Guidelines, EPB 296 - This guideline document is useful for the municipalities who intend to apply their treated sewage sludge onto lands for beneficial use. The guideline doc has details like sludge treatment, sludge quality, buffer zones, MAC levels in sludge and soil, and monitoring requirements. http://www.saskh2o.ca/DWBinder/EPB296LandApplication_of_MunicipalSewageSludge.pdf</p>

Table 5 - Standards and requirements of biosolids under federal, provincial and territorial jurisdictions

Table 5-A: Standards for Metals in Biosolids in Canada

Jurisdictions	Concentration in Biosolids (mg/kg DM)										
	Cd	Cr	Cu	Hg	Ni	Pb	Zn	As	Se	Mb	Co
NL	Currently uses USEPA Part 503 Biosolids Rule and BNQ standard 0413-400/2009 on Soil amendments										
NS (Class A)	3	210	400	0.8	62	150	700	13	2	5	34
NS (Class B)	20	1060	760	5	180	500	1850	75	14	20	150
PEI (EQ)	39	1200	1500	17	420	300	2800	41	100	-	-
PEI (A&B)	85	-	4,300	57	420	840	7,500	75	100	75	-
NB	3	210	400	0.8	62	150	700	13	2	5	34
QC (Category C1)	3	210	400	0.8	62	150	700	13	2	5	34
QC (Category C2)	10 Note: Liming materials with a NV:Zn ratio > 0.027 or a NV:Cd ratio > 2.5 (% CCE/mg metal/kg) are also considered C2, according to the criteria in the BNQ standard (2005) on liming materials.	1060	1000 Note: The maximum limit is raised to 1500 mg Cu/kg for residuals > 2.5 % P2O5, d.w., and for biosolids from municipal lagoons.	4.0	180	300	1850 Note: Liming materials with a NV:Zn ratio > 0.027 or a NV:Cd ratio > 2.5 (% CCE/mg metal/kg) are also considered C2, according to the criteria in the BNQ standard (2005) on liming materials.	41	14	20	150
Ontario ¹ (NMA: 22 tonnes/ha/5 years)	20	1060	760	5	180	500	1850	75	14	20	150

Ontario ¹ (Under valid CofA and current NMA: 8 tonnes/ha/5 years)	34	2800	1700	11	420	1100	4200	170	34	94	340
Ontario (CM1, as of January 1, 2011)	3	210	100	0.8	62	150	500	13	2	5	34
Ontario (CM2, as of January 1, 2011)	34	2800	1700	11	420	1100	4200	170	34	94	340
MB	Metal limits are based on the cumulative weight per hectare of each heavy metal in the soil, as calculated by adding the amount of each heavy metal in the biosolids applied to the background level of the same metal in the soil to which biosolids are applied. Metal limits are specified as kg/hectare for cadmium, copper, nickel, lead, zinc, mercury, chromium (total and VI) and arsenic.										
SK	20	1060	760	5	180	500	1850	75	14	20	150
AB	1500/600	20/8	15/6	3000/1100	100/40	20/8	10/4	NB: metal levels are as ratio to nitrogen & phosphorous, respectively			
BC (Class A)	3	100	400	2	62	150	500	13	2	5	34
BC (Class B)	20	1060	2200	15	180	500	1850	75	14	20	150
NWT (Class A)	3	210	400	0.8	62	150	700	13	2	5	34
NWT (Class B)	20	1060	760	5	180	500	1850	75	14	20	150
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines										
CFIA ³	20	1060 (interim)	757 (interim)	5	180	500	1850	75	14	20	150
BNQ 0413-400/2009 - biosolids	15	1000	1500	4	180	300	1850	41	25	20	150
BNQ 0413-200/2005 - Compost	20			5	180	500	1850	75	14	20	150
USEPA-EQ biosolids	39		1500	17	420	300	2800	41	100	75	

1 The application rate can be increased to 22 dry tonne/ha/5 years, if material meets more stringent metal concentration under NM regs. Maximum permissible metal addition to soil also exists.
2 -NWT uses CCME Guidelines for Compost Quality for composted manures
3 CFIA – The CFIA criteria are based on cumulative addition and therefore depend on application rate. These values assume an annual application rate of 4400 kg/ha of dry product

Table 5-B: Standards for Allowable metal concentrations in soil in Canada

Jurisdictions	Concentration in Soils (mg/kg DM)										
	Cd	Cr	Cu	Hg	Ni	Pb	Zn	As	Se	Mb	Co
NL	1.6	120	100	0.5	32	60	220	14	1.6	4	20
NS	1.4	64	63	0.5	32	60	200	12	1.6	4	20
PEI ⁴	1.6	120	100	0.5	32	60	220	14	1.6	4	20
NB											
QC	For agricultural land application, Québec MDDEP considers bioavailable metal as better indicator of risk than total metals. Québec Ministry of agriculture has developed criteria for bio-available metals that may be used by agronomists, especially to monitor Cu and Zn build-up in soils.										
ON	1.6	120	100	0.5	32	60	220	14	1.6	4	20
MB (kg/ha) ¹	2.5	115	113	11.9	90	126	360	22	N/A	N/A	N/A
SK	1.4	64	63	6.6	50	70	200	12	1	5	40
AB - Class 1 (kg/ha) ²	1.5	100	200	0.5	25	100	300				
AB - Class 2 (kg/ha)	1.1	75	150	0.4	19	75	200				
AB - Class 3 (kg/ha)	0.8	50	100	0.2	12	50	150				
BC	See Contaminated Sites Regulation (B.C. Reg. 375/96) for soil standards										
NWT (kg/ha) ³	4			1	36	100	370	15	2.8	4	30
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines										
CCME	4	210 (interim)	150 (interim)	1	36	100	370	15	2.8	4	30
<p>1 Based upon soil bulk density of 1200 kg/m³ and soil depth 15cm</p> <p>2 Class 1 soil - slope 2% or less, > 5 m to water table, soil texture CL,SiCL, SiL,Si,SiC,L,SCL,SC Class 2 - slope 2-5%, 3-5m to water table, soil texture C, HC</p> <p>Class 3 - slope 5-9%, 2-3 m to water table, LS,Si all soil pH > 6.5</p> <p>3 Based upon CCME Guidelines for Compost Quality & NWT Guideline for Agricultural Waste Management</p> <p>4 PEI does not have requirements currently, but propose to move forward with plan consistent with the Atlantic Canada Guidelines Manual in May 2009</p>											

Table 5-C: Requirements on Application rate for land application of Biosolids

Jurisdictions	Application Rate
NL	N/A
NS	Agronomic rate, otherwise not specified
PEI	Currently - none, proposed - Agronomic Rate based on nitrogen content
NB	No net degradation
QC	Agronomic rate, on basis of N & P, however, for forestry use the limit is 200 kg available N/ha/yr. C2 residuals= max 22 tonnes dry weight/ha/5 years.
ON	As of January 1, 2011 new approvals are limited to an application rate of a maximum of 22t/ha dry weight per 5 years as well as restricted by the most restrictive parameter for metals (CM1 or CM2 levels), the agronomic rate for nutrients (N, P, K) and maximums of: boron - 1kg/ha/yr; fats oils and grease - 5000kg/ha/yr (hydrological soil groups A or B) and 2500kg/ha/yr (hydrological soil group C or D); and sodium - 200kg/ha/yr (hydrological soil group A or B) and 500kg/ha/yr (for hydrological soil group C or D).
MB	Agronomic rates for N and P, assuming metals concentrations are not limiting. The nitrate nitrogen, prior to the application of biosolids must be less than the applicable nitrogen limit (157.1 kg/ha for Zone N1, 101 kg/ha for Zone N2, or 33.6 kg/ha for Zone N3) in the upper 60 cm of soil and the sodium extractable bicarbonate phosphorus, as P, must be less than 60 ppm in the upper 15 cm of soil.
SK	agronomic rate based upon nitrogen content
AB	Digested - 10-25 t solids/ha/ 3 yrs, Wastewater lagoon 5-10 t solids/ha/ 3yrs, undigested 2.5-5 t/ha/ 3 yrs - dependent on soil type and slope. Testing biosolids is not specified, however, the soil has to be tested and meet specified criteria prior to reapplication every 3 years.
BC	agronomic rate
NWT	agronomic rate, based upon Nitrogen content
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines

Table 5-D: Standards for Pathogen and pathogen indicators in Biosolids in Canada

Jurisdictions	Pathogen	Pathogen indicators			Comments
	<i>Salmonella</i> MPN / 4 g	Fecal coliforms MPN / g	<i>E. coli</i> CFU/g TS dw	Other	
NL	Currently uses USEPA Part 503 Biosolids Rule and BNQ standard 0413-400/2009 on Soil amendments, if applicable				
NS (Class A)	< 3	< 1000			
NS (Class B)		< 2,000,000			
PEI- Current					No sampling required currently
PEI -EQ -Proposed	< 3	<1000			Required to meet either Salmonella or Fecal requirement. There are no current restrictions. Numbers given are for the proposed program
PEI- Class A - Proposed	< 3	<1000			
PEI- Class B- Proposed		<2,000,000			
NB	< 3	< 1000			New Brunswick biosolids must meet CCME Compost Standards prior to use.
QC (Category P1)	For residuals contaminated with human fecal matter 1) Thermal drying: - Salmonella not detected in 10 g wet weight for residuals with dryness greater or equal to 15% (or in 50 g wet weight for other residuals) - AND drying temperature of at least 80 °C - AND final dryness greater or equal to 92% 2) Any other equivalent combination according to the USEPA to satisfy the class A requirements for pathogen reduction (including mandatory salmonella analysis) and vector attraction reduction.				
QC (Category P2)	a) Lime to pH \geq 12 for at least 2 hours and maintain at pH \geq 11.5 for at least 22 hours b) <i>E. coli</i> < 2 000 000 MPN/g (d.w.) and aerobic biological treatment and O ₂ uptake rate of \leq 1 500 mg O ₂ /kg organic matter/hour. c) <i>E. coli</i> < 2 000 000 MPN/g (d.w.) and incorporation of residual into soil in less than 6 hours. d) <i>E. coli</i> < 2 000 000 MPN/g (d.w.) and biological treatment with sludge age \geq 20 days old. e) <i>E. coli</i> < 2 000 000 MPN/g (d.w.) and and biosolids from a lagoon not emptied since \geq 4 years ago. f) Salmonella not detected in 10 g wet weight, for residuals with a dryness \geq 15% (or in 50 g wet weight for other residuals) and O ₁ or O ₂ odour category g) Any other USEPA-approved combination that meets Class B requirements for the reduction of pathogens and vector attraction. <i>E. coli</i> : geometric mean				
ON*			< 2,000,000		The 1996 Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land require that pathogens be stabilized.
Ontario (CP1: as of January 1, 2011)	<3		<1000		Also requires testing of Viable Helminth Ova and total culturable enteric virus of not detectable in 4g TS dw or in 100ml for materials containing human body waste.
Ontario (CP2: as of January 1, 2011)			< 2,000,000		

MB					Pathogen level is not specified - anaerobic digestion (30 days retention, temperature >20C) or equivalent processing (e.g., isolated storage for 1 year, effective composting) is required.
SK	< 3	< 1000			
AB					Pathogen levels are not specified - three levels of treatment - digested, wastewater lagoon, undigested
BC (Class A)		< 1000			Acceptable methods - Thermophilic anaerobic digestion at 55°C for more than 30 minutes, thermophilic anaerobic at no less than 50°C for at least 10 days, heat treatment processes depending on total solids content, alkaliine stabilization with pH > 12 for 72 hrs with the temperature in excess of 52oC for at least 12 hrs, or composting to produce class A compost
BC (Class B)		< 2,000,000			Acceptable methods - aerobic digestion were residence time and temperature must be between 40 days at 20°C & 60 days at 15°C, air drying for a minimum of 3 months , anaerobic digestion were residence time and temperature must be between 15 days at 35°C to 55°C and 60 days at 20°C, composting to produce Class B compost, or lime stabilized by raising pH to 12 after 2 hrs
NWT	< 3	< 1000			NWT has no standard for biosolids, however, composted manure requires approval and must comply with CCME Guidelines for Compost Quality.
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines				
CFIA	Not detectable	1000 MPN/ g			
BNQ 0413-400/2009 - biosolids	Not detectable	Thermal Drying: Drying temperature of at least 80 °C Alkaline treatment: pH ≥12 for at least 72 consecutive hours; and/or maintained at 52 °C for at least 12 consecutive hours			
USEPA- Class A	< 3	<1000			
USEPA- Class B		< 2,000,000			
MPN - most probable number; MPCN - most probable cytophatic number					
* NOTE – Currently new, expanding and phased-in farms must follow the Nutrient Management Regulation 267/03 as amended; all other applications of biosolids and septage are regulated under Certificates of Approval and follow the Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land.					
*NOTE - Current <i>E.coli</i> limit only applies to wastewater treatment plants with design capacity greater than 45,400 cubic meters per day.					

Table 5-E: Standards for Organic Contaminants in Biosolids in Canada

Jurisdictions	Contaminant				Comments
	Dioxins & Furans (ng TEQ/kg)	PCB	PAH	Other organic chemicals	
NL	Currently uses USEPA Part 503 Biosolids Rule and BNQ standard 0413-400/2009 on Soil amendments, if applicable				
NS (Class A)	17	Levels of contaminants not specified			
NS (Class B)	50	Levels of contaminants not specified			
PEI	Levels of contaminants not specified				
NB	Levels of contaminants not specified				
QC (Class C1)	17	rarely detected - not deemed of concern	rarely detected - not deemed of concern		
QC (Class C2) ¹	50				
ON	Levels of contaminants not specified				
MB	Levels of contaminants not specified				
SK	Levels of contaminants not specified				
AB	Levels of contaminants not specified				
BC	Risk is managed by site specific review by medical health officers				
Yukon	Not Available				
NWT	Levels of contaminants not specified				
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines , if available				
CFIA	27 (interim)				
BNQ 0413-400/2009 - Biosolids	27				
1 For fertilizing residuals with dioxin / furan content of 51 - 100 ng TWQ/kg is allowed for non agricultural use					
2 - CFIA - The CFIA criterion is based on cumulative addition and therefore depends on application rate. This value assumes an annual application rate of 4400 kg/ha of dry product					
3- CAN/BNQ standard has an appendix on organic contaminants that explains why no criteria has been set, except for dioxins and furans.					

Table 5-F: Waiting Periods and Other Requirements for Land Application of Biosolids in Canada

	Pasture	Forage	Livestock Feed	Food Crops (below soil)	Food Crops (above soil) ¹	Sod	Silviculture	Reclamation	Green Areas	Application Rate (tonnes DM/ ha)	Comments
NL	Currently uses USEPA Part 503 Biosolids Rule and BNQ standard 0413-400/2009 on Soil amendments, if applicable										
NS (class A)	No restrictions					recom-mend: 12 mo.		recommend: 2 mo. for public lands, 6 mo. forest, 2 mo. construction sites, 2 mo. recreational lands			
NS (class b)	Not permitted					12 mo.		2 mo. for public lands, 6 mo. forest, 2 mo. construction sites, 2 mo. recreational lands			
NB	No Restrictions Class A Compost Only - No net degradation from the use of Class A Compost										
PEI current	not same calendar year					not specified				Proposed: To be developed - possibly consistent with Table G-6 Atlantic Canada Wastewater Guidelines	
QC	No municipal biosolids on pastures, unless certified by the BNQ.	all classes permitted, but for P2 > 30 days wait before harvest	No municipal biosolids allowed to be spread for fertilizer for human food crops (current season), unless certified by the BNQ.			P2: 12 month wait until harvest	All classes (Cx-Px-Ox) can't exceed 200 kg of available nitrogen / ha/ yr.	All classes C1/C2, P1/P2, O1/ O2/O3	Cx-P1-Ox for landscaping (no P2). No public access >=12	Mainly limited by P needs of crops. Maximum 22 tonnes dry weight / ha /	Restrictions vary according to the risk as expressed by the CxPyOz classification (C=contaminants. P=pathogens,

				For previous applications of P2 biosolids on the same soil, wait 36 months before harvesting.	For previous applications of P2 biosolids on the same soil, wait 14 months before harvesting.		Restrictions on picking edible products (e.g. fruits and mushrooms)		months for P2.	5 years for C2.	O=odours).
ON	<p>3 weeks for CM1 and CP1 and 2 months for CM2 and/or CP2 for horse, beef or dairy cattle</p> <p>3 weeks for CM1 and CP1 and 6 months for CM2 and/or CP2 for swine, sheep or goats</p>		3 weeks for hay and haylage	<p>3 weeks for CM1 and CP1 and 3 months for CM2 and/or CP2 for tree fruits & grapes</p> <p>3 weeks for CM1 and CP1 and 15 months for CM2 and/or CP2 for small fruits</p> <p>3 weeks for CM1 and CP1 and 12 months for CM2 and/or CP2 for tobacco</p>	<p>3 weeks for CM1 and CP1 and 12 months for CM2 and/or CP2 for vegetables</p> <p>3 weeks for CM1 and CP1 and 15 months for CM2 and/or CP2 for vegetables</p>		not specified		Requires MOE review and Certificate of Approval/ No application of biosolids on established golf courses under the NMA.	<p>Under Certificate of Approval:</p> <ul style="list-style-type: none"> - anaerobically digested - 135 kg N/ha/5years - aerobically digested or stabilized - max 8 t/ha/5 years dry weight; - dewatered or dried - max 8t/ha per 5 years dry weight, <p>Currently, under the Nutrient Management Regulation: 22t/ha/5yrs dry weight or 8t/ha/5yrs dry weight based on regulated metals content and subject to maximum permissible metal addition to soils per hectare over a five year period.</p> <p>As of January 1, 2011 under the Nutrient Management Regulation application of sewage biosolids cannot exceed 22t/ha/5yrs dry weight. Maximum application rates may also be restricted by other parameters such as metals, PAN and PAP (or boron, sodium, and fats, oils and grease upon Director request). The most restrictive rate will govern.</p>	

MB	Application is limited to lands with the following crops grown for three years following the application of biosolids: cereals, forages, oil seeds, field peas, and lentils. There is no restriction on frequency of application assuming all biosolids and soil quality limits would be met.									An Environment Act Licence is required prior to application of biosolids to land. Site-specific restrictions are imposed through the conditions of the Licence, which may or may not include an expiry date or restrictions on frequency of application.
SK	30 days	60 days	60 days	38 months	18 months/ 60 days if food crop not in contact with biosolids/ soil	not specified	60 days (fibre production)	not specified		
AB	3 years	3 years - forage land can't be pastured for 3 years	3 years - forage land can't be pastured for 3 years	not permitted		3 years	3 years	not likely, must be incorporat ed	Dependent upon level of treatment (undigested - wastewater lagoon - digested), soil classification (silt, sand, loam, clay), & slope. Between 2.5 & 25 t/ha dry weight	
BC	60 days	not specified	not specified	38 months	18 months	not specified				These restrictions apply to Class B biosolids with fecal coliforms level in excess of 1000 MPN/g.
NWT	NWT within their Guidelines for Agricultural Wastes does not impose any restrictions on manure or composted manure, advises on avoiding areas prone to flooding, steep slopes								Agronomic loading based upon Nitrogen	Does not have biosolids standard, however, composted manure requires permission for land application
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines, if applicable									
CFIA	Not applicable as it does not regulate use									

Table 5-G: Separation Requirements for land application of biosolids in Canada

	Distance (m) From					Comments
	Residential/ Institutional/ Commercial/ Uninhabited Structures (barns)	Schools/ Parks and playgrounds	Surface Water/ Water Table/ Wells	Bedrock Outcrop/ Ditches or Swales/ Roads/ Property Line	Other	
NL: Distance would depend on the location of the facility and surrounding activities and developments that will be established in development of biosolids management regulatory requirements.						
NS	Residential – 90 m Institutional – 200 m Commercial – 90 m Uninhabited Structures (barns)- 30 m	Schools – 200 m Parks/playgrounds – 90 m	Surface Water- 90 m (perennial) / 60 m (intermittent) - slope less than 3%, 125 (slope 3-6%), 180 (6-8% slope), not permitted (slope > 8% Wells – 150 m (public) / 90 m (private)	Bedrock Outcrop- 10 m Ditches or Swales- 15 m Roads- 30 m (primary / secondary) / 10 m (unimproved) Property Line- 10 m		
PEI- Current	Business - 300 m. From any Dwelling 300 m	Schools - 300 m	Surface Water- 15 m less than 2 % 37 m 2 to 5 % 107 m 5 to 10 % 213 m >10 % Wells- 500 m	Provincial Highway Right of Way- 15 m		Proposed: To be developed - possibly consistent with Table G-6 Atlantic Canada Wastewater Guidelines Proposed to have no restrictions for Biosolids that meet EQ standards
NB	No setbacks for composted biosolids meeting class A CCME Compost Quality					

<p>QC (see tables 10.2 and 10.3 of the FR Guide for spreading restrictions)</p>	<p>Residential-Dwelling: P2=50m, O2=75 m, O3=500 m (for O2 & O3; restriction lifted if immediate incorporation)</p> <p>Institutional- Protected immovable: P2=100 m Urbanization perimeter of a municipality: P2=250 m.</p> <p>See the glossary of the FR Guideline for a definition of protected immovable</p> <p>Commercial – Protected immovable: P2=100 m Urbanization perimeter of a municipality: P2=250 m</p>	<p>Schools- Protected immovable: P2=100 m</p> <p>Urbanization perimeter of a municipality: P2=250 m</p> <p>Parks and playgrounds: Protected immovable: P2=100 m Urbanization perimeter of a municipality: P2=250 m</p>	<p>Surface Water- Agricultural ditch: 1 m Non-agricultural ditch: P1=1 m, P2=10 m Watercourse, lake, swamp >10 000 m2 or pond: 3m Soils in flood zone: P2=prohibited</p> <p>Wells: 100 m (30m for products certified by the BNQ. Field stockpiling: 300 m</p> <p>Wells - There are other restrictions for collective groundwater catchment works</p>	<p>Bedrock Outcrop- 100 m during storage in heaps in field.</p> <p>Ditches or Swales- Agricultural ditch: 1 m Non-agricultural ditch: 1 m, P2=10 m</p> <p>Roads- P2=5 m</p> <p>Property Line - P2=5m</p>	<p>- Incorporation in the soil < 48 hours if the spreading is done on bare soil</p> <p>- Maximum hydraulic load for liquid residuals: < 100 m3/day</p> <p>- Spreading equipment (liquid residuals): Specialized equipment that minimizes soil compaction if a post-harvest spreading operation is involved.</p> <p>- Frozen or snow-covered soil: Land application prohibited (standard in the RRAO).</p> <p>- Ground slope: < 9% (< 5% if the residual is liquid).</p>	<p>For temporary storage in heaps, see tables 9.1 and 9.2 of the FR Guide.</p> <p>For a list of all the spreading requirements, see tables 10.2 and 10.3 of the FR Guide.</p>
<p>ON (Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land)</p>	<p>450 m (residential area) 90 m (individual residence)</p> <p>Institutional- No specification Commercial –No specification Uninhabited Structures (barns)- No specification</p>		<p>Surface Water - 0-3% slope - 50 m for rapid to moderately soils and 100 m for moderate to slow soils 3-6% slope - 100 m for rapid to moderately soils and 200 m for moderate to slow soils 6-9% slope - 150 m for rapid to moderately soils and not permitted for moderate to slow soils slope > 9% all soil</p>	<p>Bed Rock Outcrop – 1.5 m (depth to bedrock)</p>	<p>Prohibition on land application when the ground is frozen, snow covered and in winter (between Dec 1 and March 31st of the following year)</p>	

			permeabilities not permitted Water table- 0.9 m Well- 15 m (drilled greater than 15m) / 90 m (all other wells)			
Ontario (as of January 1, 2011)	Residential (single dwelling): - OC1 – no application <25m - OC2 – no application <25m, 25-90m injection or spreading & incorporation within 6 hours, >90m no restriction - OC3 – no application <100m, 100-450m injection or if injection not possible spreading & incorporation within 6 hours, >450m injection & incorporation within 24 hours. Uninhabited Structures (barns): no specification.	Residential areas, commercial, community or institutional uses: - OC1 - <50m no application - OC2 – no application <50m, 50-450m injection or spreading and incorporation within 6 hours, >450m no restriction -OC3 – no application <200m, 200-900m injection or spreading and incorporation within 6 hours, >900m injection or spreading and incorporation within 24 hours	Surface Water: -CM1 and CP1 - 13m or up to 3 m vegetated buffer if injected, incorporated within 24 hours or applied to a living crop or on a field with at least 30% crop residue. 20m if no vegetated buffer. - CM2 and/or CP2 – 20m Water Table: -CM1 and CP1 – no application <30cm - CM2 and/or CP2 – no application <30 cm, 30-90cm based on risk of groundwater contamination Wells: CM1 and CP1- Municipal – 100 m Drilled (6m water tight casing & ≥ 15m well depth) – 15m Other – 30m	15 m (field drainage tile). Ditches and swale are not defined in NMA. It is either surface water or not. Some ditches and swale are not surface water as defined in NMA.	Prohibition on land application anytime when the ground is frozen, snow covered and in winter (between Dec 1 and March 31st of the following year)	

			<p>CM2 and/or CP2 – Municipal – 100m Drilled (6m watertight casing & ≥ 15m well depth) – 15 m Other – 90m</p> <p>Depth to Bedrock: <30cm no application 30-100cm based on material quality and state (solid vs liquid) >100cm no restriction based on bedrock</p>		
MB (Separation distances are specified in a site- specific Licence)	300 m (from occupied residences) and 1 km (from residential areas)		<ul style="list-style-type: none"> - 15 m from first order waterways - 30 m from 2nd and higher order waterways - 100 m from the identifiable boundary of an aquifer which is exposed to the ground surface 	Other land restrictions include: <ul style="list-style-type: none"> - lands cannot be subject to flooding - depth of clay or clay till must be at least 1.5 m between the soil surface and the water table - pH of the soil must be greater than 6.0 slope of the soil surface must not be greater than 5% 	
MB (Additionally, a Nutrient Management Regulation under the Water Protection Act, prohibits application of nutrients (including biosolids) within the Nutrient Buffer Zone)			<ul style="list-style-type: none"> - 15 m of the edge of a groundwater feature (20 m if the area is not covered with vegetation) - Land within a roadside ditch or an Order 1 or 2 drain - Land between the water's edge and the high water mark of a wetland, bog, marsh or swamp - Land adjacent to a listed water body (distances vary based on type of water body and presence/absence of vegetation) but maximum distance is 35 m from a lake or reservoir designated as vulnerable with no permanent vegetative cover. 	The Nutrient Management Regulation prohibits application of a substance containing nitrogen or phosphorus to land between November 10 of one year and April 10 of the following year (i.e., no winter application). An exception may be granted for application of wastewater sludge or biosolids from a municipality in unusual circumstances.	

SK	450 m (residential area) 90 m (individual residence) 200 m (hospitals) 90 m (Commercial)	Schools- 200 m Parks and playgrounds- 90 m	Surface Water- 90 m (0-3% slope) 200 m (3-8% slope) Wells- 90 m (0-3% slope) 200 m (3-8% slope)	Roads- 30 m		
AB ²	500 / 165 m (zoned residential areas) 60 / 20 m (occupied dwelling) 10 / 3 m (public building perimeter) 60 / 20 m (public Building)	Schools- 200 / 66 m (in session) 20 / 7 m (out of session) Parks and playgrounds 200 /66 m	Surface Water- 30 / 10 m Water Table- potable aquifer must be >2 m, application rates depend in part on depth to potable aquifer Wells-20 / 20 m		No application on ice or snow covered or frozen ground	Minimum distance for surface application and subsurface injection respectively
BC	Residential ≥ 30m		Water Table- ≥1 metre of the surface Wells- ≥ 30m	Roads- ≥ 20 m to major arterial roads or highways and ≥10 m to minor public roads excluding logging roads Property Line-≥ 30m		Theses restrictions apply to Class B biosolids with fecal coliforms level in excess of 1000 MPN/g.
NWT	Currently uses CCME guidelines, if applicable					
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines, if applicable					
1 separation from water courses based upon soil permeability						
2 surface application / subsurface application						

Table 5-H: Stability Requirements and application rate for land application of Biosolids

Jurisdictions	Indicators of Stability
NL	N/A
NS	Volatile solids reduction of 38%, specific oxygen uptake rate < 1.5 Of/hr/g, pH > 12 for 2 hrs
PEI	Currently - Minimum sludge > 30 days held can be applied to land. Proposed - Sludge Volatile solids reduction of 38%, specific oxygen uptake rate < 1.5 Of/hr/g, pH > 12 for 2 hrs or other approved method meeting Atlantic Wastewater Guidelines.
NB	Must be Category A Compost Quality or equivalent with respect to stability to be land applied.
QC	The biosolids must meet criteria for P1 or P2, which include parameters for vector attraction reduction (related to odours). The biosolids must also meet specific odour criteria(O categories) which are also linked to stability/VAR.
ON	Only biosolids stabilized through the MOE approved process can be applied, but method of testing for stabilization not specified. As of January 1, 2011, new approvals for the land application of biosolids under the Nutrient Management Regulation will have to meet one of the following minimum beneficial quality standards: organic matter content of 15% of the total weight of the NASM, NASM used to increase the soil pH, total concentration of plant available nitrogen, plant available phosphorus and plant available potassium is more than 13,000 mg/kg of NASM (for solids) or more than 140mg per L of NASM (liquids), or to be used as irrigate crops between June 15 and September 30, where the NASM is more than 99% water by weight. Pathogen levels as specified in pathogen comment section.
MB	Must be stabilized by anaerobic digestion for a period of 30 days at a minimum temperature of 20°C or equivalent process (e.g., isolated storage of sludge solids for a period of 1 year; effective composting) before being land applied.
SK	Volatile solids reduction of 38%, specific oxygen uptake rate < 1.5 Of/hr/g, pH > 12 for 2 hrs, additional bench scale anaerobic digestion demonstrates that the volatile solids reduction of the anaerobically digested sludge is < 17%, additional bench scale aerobic digestion demonstrates that the volatile solids reduction of the aerobically digested sludge is < 15%, or aerobically composted for 14 days
AB	Three differing degrees of stabilization - digested, wastewater lagoon, and undigested. Testing biosolids is not specified.
BC	Stabilization achieved by pathogen & vector attraction reduction. Pathogen levels as specified in pathogen comment section , vector reduction by volatile solids reduction of 38%, SOUR uptake of less than 1.5 mgO2/hr/g, pH of 12 or higher for 2 hours and then at 11.5 or higher for an additional 22 hours.
NWT	Would have to meet CCME Guidelines for Compost Quality with respect to stability
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines

Table 6-A: Frequency of sampling of biosolids in Canada

Jurisdictions	Frequency of sampling (indicate units) for				Comments
	Metals	Pathogens	Organic Pollutants	Dioxins	
NL					No requirements
NS	2000 tonnes	2000 tonnes			Biosolids must be sampled from each source and every 2000 tonnes for each source
PEI -current					No requirements
PEI -Proposed	none	none			Currently there are no requirements for sampling. Proposed 290 to 1500 tonnes/yr - quarterly or rep samples, 1500 to 15000 tonnes/yr – 6 times per year for metals and pathogens
NB	Treatment plants are required to sample 3/yr.				All finished compost must be shown to meet CCME Guidelines
QC	Other parameters ⁽²⁾	Salmonella or E. coli ^(2,3)		Dioxins and furans ^(4,5)	Quantity produced annually or accumulated by type of residual and production place (tonnes, dry weight) ⁽¹⁾
QC (0-300 tonnes)	2	2		1	Please see the notes at the bottom of the table.
QC (301- 1500 tonnes)	4.	4		2	
QC (1501 - 15000 tonnes)	6.	6		3	
QC (> 15000 tonnes)	12.	12		4	
ON	Materials sampling frequency set out in approval issued under the <i>Environmental Protection Act</i> or <i>Ontario Water Resources Act</i> or in Nutrient Management Regulation whichever is most restrictive. Under the Regulation, sewage treatment plants with design capacity > 45,400 m ³ sample twice per month and sewage treatment plants with design	Pathogen sampling frequency set out in approval issued under the <i>Environmental Protection Act</i> or <i>Ontario Water Resources Act</i>			Nutrient Management Regulation applies if sewage treatment plant is phased-in.

	capacity < 45,400 m ³ sample once per month. As of January 1, 2011, soil sampling required for the preparation of a NASM Plan must be taken within 5 years from when the material is applied.				
MB	Set out in an Environment Act Licence. For lagoons, an approved sampling program is required prior to each application event. Samples are required from each lagoon cell and from each field onto which biosolids will be applied.				
SK	prior to application to the field, tonnage not specified				Sampling frequency not specified.
AB					Sampling frequency not specified. Guideline states that a sample must be collected that is representative of the material to be land applied.
BC	1 per 1000 tonnes	7 per 1000 tonnes			also can sample at least once a year, whichever comes first
NWT					
NU	Currently uses Guidelines, Regulations and Acts of NWT and the CCME guidelines, if available				
CFIA	Random sampling of fertilizers and supplements sold in Canada				
(1) Amount produced by the wastewater treatment plant. See table 6.2 of the FR Guide for more details. Minimum number of composite samples over the 12 months preceding the CA application.					
(2)For biosolids from lagoons, the frequency is reduced by half. Otherwise, the older analyses are acceptable (up to 3 years) to complete an analysis made over the last 12 months. For other FR, the frequency may be reduced by 50% if over the last 24 months, the alleged category has not been exceeded (C1 or C2), and if the procedure has not been modified during this period. Notwithstanding what precedes, at 2 analyses are always required to determine the category of any residuals, except for D&F.					
(3)For E. coli and salmonella analyses, a grab sample (continuous process) or a spot sample (static environments) is substituted for the composite sample. Spot sampling involves taking a set of samples representative of a particular sector or batch during a time period generally of less than 15 minutes. The number of samples may vary in these particular cases (see Section 8.3.2).					
(4)For municipal biosolids, the D&F analysis is not necessary if the residual is already in the C2 category due to levels of another trace metal, or if we assume C2 levels of D&F to avoid having to analyse for D&F. The number of analyses for D&F may be reduced to once every two years if over the last 36 months the analysis results are always lower than the category stated in the CA application (C1 or C2).					
(5)For the year prior to land application, dioxin/ furan sampling may be reduced to 1 every two years if below C1 or C2 standard.					

Table 6-B: Monitoring, Compliance and Record-Keeping requirements in federal, provincial and territorial jurisdictions

Jurisdiction	Monitoring and compliance	Record-keeping requirements
Federal		
CFIA	The Fertilizers Program has market place monitoring programs in place for ensuring compliance of biosolids and composted products that are sold as a fertilizer or supplement.	Not applicable
Provincial/Territorial		
AB	<p>Follow-up sampling is not required. If a review of post- disposal rate reveals a discrepancy with the application, the applicant will be contacted.</p> <p>The letter of authorization requires reporting of any spills into water courses or onto land not authorized to receive biosolids. Alberta Environment would follow up any reports with an investigation. In addition, the letter of authorization requires the applicant to submit a summary report on the year's biosolids spreading program. The report is typically required by Feb. 28 of the following year. These reports are not routinely reviewed when they come in, but they are reviewed prior to periodic inspections that are carried out by our compliance inspectors. If problems are identified in the report (e.g. wrong disposal rate, biosolids applied to wrong location, complaints noted, etc.) these would be followed up during the compliance inspection and forwarded to our enforcement staff for enforcement action if necessary.</p>	<p>The <i>Wastewater and Storm Drainage Regulation</i> requires the operator to keep a copy of the land application annual report for 5 years.</p> <p>Under the Code of Practice, the operator must retain a copy of the application for authorization to land apply and the written authorization. No time period for maintaining the records is specified.</p> <p>Under operating approvals, the operator is required to prepare monthly and annual reports that include the volume of biosolids going to landfill. There are no requirements for retaining these reports.</p>

BC	<p>All required analyses must be carried out at intervals of at least every 1000 tonnes dry weight of organic matter, or once per year, whichever occurs first. The director may increase the frequency of sampling required based on provincial organic matter sampling guidelines. Analyses must be in accordance with the procedures described in A British Columbia Laboratory Methods Manual: 2003 for the Analysis of Water, Wastewater, Sediment, Biological Materials and Discrete Ambient Air Samples, (2003, Ministry of Water, Land and Air Protection), or by suitable alternate procedures authorized by a director.</p>	<p>Temperatures and retention times must be monitored and recorded each working day during the production of Class A biosolids. The results of analysis required by this regulation must be kept at the facility for at least 36 months after the production of Class A biosolids, Class B biosolids and biosolids growing medium. Besides this data, the land application plan signed by a qualified professional as required by Division 1 of Part 3 of the regulation must be kept at the facility, or kept by the registered owner of the land application site, for at least 36 months after application must be made available for inspection by an officer, or sent to a director or an inspector or officer authorized under the <i>Agricultural Land Commission Act</i>, or the <i>Soil Conservation Act</i>, upon request.</p> <p>A director may request a sampling report from the facility operators or the registered owner of the land for at least 36 months after application of managed organic matter.</p> <p>The "discharger" is responsible for complying with the OMRR including reviewing sampling results. The OMRR Schedule 6 indicates that sampling results must be kept at the facility for inspection for at least 36 months after land application and sent to the director upon request; the director may also request a sampling report. Environmental Protection staff may also conduct compliance and enforcement activities consistent with the inspection policy http://www.env.gov.bc.ca/epd/policy/manual/compliance/pdf/70106.pdf and compliance and enforcement policy/procedure http://www.env.gov.bc.ca/main/prgs/docs/ce_policy_and_procedure.pdf</p>
MB	<p>Pre and post application testing is required and must be undertaken by the licensee. The licensee is required to control the cropping practice on the land that has received the sludge for a period of 3 years and to maintain appropriate records.</p>	<p>Record keeping requirements are listed in each licence. Records that must be kept are legal description of land, background levels of macro-nutrients and metal content of soils, nutrients applied to lands, residual metal content of soil, and crops grown on lands receiving biosolids for a 3 year period.</p>
NL	<p>Regulatory inspections are conducted by the Agency issuing Permit B DOEC</p>	<p>Record keeping requirements are as per requirements of the Permit.</p>
NB	<p>Inorganic parameters are monitored regularly and the Municipal wastewater treatment facilities are required to submit this information to the Department annually. Facilities are audited periodically (~every 2 yrs) for compliance with their Approval. Compost facilities have approvals to operate and must submit analyses of the finished compost to the department.</p>	<p>Wastewater treatment facilities need to record biosolids analytical results and the location where all biosolids are sent for disposal. Compost facilities must demonstrate and record that all finished compost meets CCME Guidelines for Compost Quality.</p>

NS	<p>The Inspection staff designated Under the Environment Act of Nova Scotia Environment, have the ability and authority to sample, verify and enforce any condition of the Approval to ensure compliance.</p> <p>The approval holder must submit an annual report with respect to the biosolids they accepted during the year including: date of receipt, the source of the biosolids, biosolids analysis, stabilization methods, location of application, volumes applied, soil sampling, water sampling, and a copy of the nutrient management plan.</p> <p>Department staff also undertakes a site visit as part of the review of the annual report. Staff will visit the application and storage sites in response to complaints by the public.</p>	<p>Records must be kept for a minimum of 5 years and shall include: Biosolids, soil, and water analysis, sampling procedures, dates biosolids received including amount and generator information, Land application details, Site plans, Cropping information, Records of complaints and how they were addressed.</p>
NU	<p>Water licences are enforced by the Department of Indian Affairs and Northern Development Canada (DIAND) through on-site inspections and sampling is by Land and Water Inspectors.</p>	<p>No other record keeping requirements indicated. The Nunavut Water Board uses CCME-Guidelines or other guidance documents as a starting point where applicable</p>

<p>ON</p>	<p>The MOE is responsible for compliance and enforcement under the EPA and the NMA (e.g. MOE is responsible for the potential impacts of farm activities on drinking water sources and has the responsibility for conducting inspection of farms for compliance with the NMA).</p> <p>MOE staff undertake compliance and enforcement activities such as: Reviewing applications for site and hauler approvals; Conducting pre-approval site assessments (this is a standard practice in the site approval process); Conducting inspections once sites have been approved to assess compliance with conditions on the approval; and Responding to reports of pollution or other incidents resulting from the storage, transport, and land application of NASM and septage.</p> <p>MOE will maintain its compliance and enforcement role under the new system of approvals, beginning January 1, 2011.</p>	<p><u>Biosolids Guidelines</u></p> <p>Currently, the person who holds the Organic Soil Conditioning Site Certificate of Approval is required to keep permanent records of:</p> <ul style="list-style-type: none"> - The location of all fields receiving biosolids or other wastes. - The amount of biosolids or other wastes applied to each field. - Biosolids or other waste analyses. <p>A report is to be provided to the hauler. The report shall include data on the waste material's average nutrient content per cubic metre. A copy of this report is to be held by the waste generator. The generator must supply the farmer with information on the annual average quantities of metals per cubic metre (ppm, g/tonne, mg/kg) of biosolids or other waste, if requested. (<i>Biosolids Guidelines</i>, section 8.1.1)</p> <p>Detailed records must be kept for each agricultural field that receives sewage biosolids. The farmer needs this information to make appropriate nutrient management planning decisions. It must also be available to MOE staff during a site inspection.</p> <p>As of January 1, 2011, approvals will no longer be issued for "Organic Soil Conditioning Site" Certificate of Approvals and all record keeping requirements for NASM Plans will be under the NMA.</p> <p><u>NMA</u>: Currently, operators of sewage treatment plants with a designed capacity of more than 45,400 cubic metres per day are required to create and maintain (for 2 years) a record of the NMS and prepare yearly updates as necessary to ensure that it accurately reflects the anticipated operation on the farm unit during the following year.</p> <p>If phased-in, brokers are required to keep a four year record of the type and quantity of prescribed materials transferred and the date of transfer, a description of the operation to which the materials are transferred, the operation identifier for the operation or for the farm unit where the operation is carried out and the approval or registration number assigned by the Director to the NMP for the farm unit or operation.</p> <p>As of January 1, 2011, operators of sewage treatment plants will no longer require a NMS and brokers will no longer need a Broker's Certificate or to keep records under the NMA. Brokers will continue to follow requirements stipulated in their Waste Management System Certificate of Approval for the transportation of sewage biosolids. Under the NMA, for land application of material, copies of the NASM Plan, annual update and summary, site characterization, and records of the NASM application area, quantity applied, source of material, dates on which it was applied and sampling and analysis results must be kept for 2 years.</p>
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PEI	<p>The enforcement is dealt with as defined in the Sewage Disposal Systems Regulations. Typical, enforcement actions are setbacks B wells, property, water course, etc - application without licence, application of specific crop, etc. Charlottetown and Summerside are required through their management plans to sample the Biosolids.</p>	<p>Currently, there are no requirements for record keeping. In future, proponents may require public reporting of the quality of the biosolids. As well, recently, there was a Nitrate Commission assembled in PEI to provide recommendations on the current status and future trends for PEI. In this report one focus issue was nutrient management plans. It is proposed that this will be incorporated with the biosolids in the future.</p>
QC	<p>The Québec Ministère du Développement durable et de l'Environnement et des Parcs is responsible for enforcement.</p> <p>All requests for C of A are registered in a database with specific information targeted to site control and statistics. Spreading and storage sites may be inspected by MDDEP staff, as part of regular inspection routine or following complaints. Biosolids that are claimed to be virtually pathogen free (category P1) must also be counter-verified once a year by an organization accredited organization to fertilizer residue sampling.</p> <p>Biosolids certified by BNQ are sampled twice a year by this organization.</p>	<p>For Biosolids generators, analysis results are needed for the last 12 months for chemical contaminants and pathogens (C categories and P categories), whereas for farm application, the nutrient management plan of the farm must be up-to-date and made available anytime and records retained for at least 3 years.</p>
SK	<p>The guideline document for land application has monitoring requirements that is included in the permit. The municipality has to do monitoring as per permit and furnish the results periodically to respective Environmental protection Officers. The officers will verify the results and inspect the facility once a year.</p> <p>Environmental Protection Officers and Drinking water Enforcement Specialist are responsible for the enforcement.</p>	<p>The municipalities are responsible for record keeping related to biosolids production and/or use.</p>