



# Compost Regulation in British Columbia

Regulatory Overview, Best Practices and  
Recommendations for Law Reform

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## GLOSSARY

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ALC - Agricultural Land Commission (formerly the Land Reserve Commission)

ALCA – Agricultural Land Commission Act

ALR – Agricultural Land Reserve

ALRUSPR – Agricultural Land Reserve Use, Subdivision, and Procedure Regulation

AWCR - Agricultural Waste Control Regulation

CRD – Capital Regional District

DCS - District of Central Saanich

DPA – Development Permit Area

EIS – Environmental Impact Study

EMA – Environmental Management Act

EWMC – Edmonton Waste Management Centre

FIRB – Farm Industry Review Board

FPPA – Farm Practices Protection (Right to Farm) Act

LGA - Local Government Act

MOA – Ministry of Agriculture

MOE – Ministry of Environment

OCP – Official Community Plan

OMRR – Organic Matter Recycling Regulation

TCEQ – Texas Commission on Environmental Quality

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## INTRODUCTION

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As populations grow and urban areas expand, communities are faced with significant decisions regarding the procurement and consumption of resources, the management of waste, and the use of land. Composting, the controlled, thermophilic, biological decomposition of organic matter, is an effective means by which communities can address these issues. It allows communities to reclaim an important resource from the municipal waste stream while reducing competition for space at landfills. Indeed, food and yard waste, from both residential and commercial operations, constitute up to 40 percent of the municipal waste stream.<sup>1</sup> This organic waste is often one of the largest categories, by volume, of waste disposed of in landfills. A report prepared for the Capital Regional District (CRD) on

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<sup>1</sup> Environment Canada (2013) *Technical Document on Municipal Solid Waste Organics Processing* (pg i) Accessed 6 April 2015 online: <[http://www.ec.gc.ca/gdd-mw/3E8CF6C7-F214-4BA2-A1A3-163978EE9D6E/13-047-ID-458-PDF\\_accessible\\_ANG\\_R2-reduced%20size.pdf](http://www.ec.gc.ca/gdd-mw/3E8CF6C7-F214-4BA2-A1A3-163978EE9D6E/13-047-ID-458-PDF_accessible_ANG_R2-reduced%20size.pdf)>

Vancouver Island noted that approximately 46,600 tonnes of organic waste were deposited in the CRD regional landfill in 2009-10, over 21,000 tonnes more than the next highest type of waste.<sup>2</sup> As landfills reach their maximum capacity, local governments are searching for means to reduce and divert waste. Not only can composting provide this means, but it can also offer other benefits including the reduction and capture of methane emissions that may be used for energy production, the reduction of harmful landfill leachate, and the provision of a nutrient rich matrix for agricultural operations.

However, composting can be challenging, especially when dealing with the high volumes of organic material that are found within the municipal waste streams. Such quantities require large facilities which, in the process of collecting and treating the organic material and managing the final product, can result in transportation, pollution, odour, and noise issues, and attract disease bearing animals. These issues are particularly pertinent to any neighbours of the facility. If composting is to become an integral and accepted part of community waste management schemes, it is important that compost facilities are operated in harmony with their neighbours. Government regulation must be created and implemented in such a way that attracts and encourages the development and innovation of compost facilities in our communities, while ensuring the continued well-being of the people and environment who live near these facilities.

The purpose this report is to outline the current regulatory scheme as it applies to composting in British Columbia. Part 1 of this report outlines the provincial, regional and municipal laws and regulations that relate to composting and explores the relationships between the enactments of the various levels of government. Part 2 of this report addresses how composting is regulated as a land use on different types of land, specifically, land inside and outside the Agricultural Land Reserve. Part 3 of this report identifies a number of issues with the BC regulatory scheme and makes recommendation as to how each issue might be addressed. In order to support the implementation of each recommendation, this part also reviews the operation of composting facilities in Canada and the world, and highlights best practices from these facilities, both technical and regulatory. The recommendations in this report recognize the costs of implementation and financial difficulties that often face small facilities. However, while these considerations have been taken into account, the protection of human and environmental well-being is foremost. To that end, facilities, regardless of production capacity, must operate in manner that meets these fundamental requirements. Developing a regulatory scheme that meets basic ecological prerequisites will require discussion about the appropriate structure of the waste collection, treatment and application systems and the desired size of compost facilities in BC. This report provides comprehensive law reform proposals to that end.

The intent for this report is to assist compost facility operators, government officials, and community members to ensure that composting is conducted in a way that achieves our waste

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<sup>2</sup> Sperling Hansen Associates. (2010) *CRD Solid Waste Stream Composition Study* Accessed 6 April 2015 online: <<https://www.crd.bc.ca/docs/default-source/recycling-waste-pdf/2009-2010-solid-waste-stream-composition-study-final-report.pdf?sfvrsn=0>>



management objectives and provides benefits to the community and the environment.

hey!  
food isn't garbage  
food scraps  
belong in your  
**green  
bin**



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[metrovancover.org/foodscraps](http://metrovancover.org/foodscraps)



## PART 1 - COMPOST REGULATION IN BRITISH COLUMBIA

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As with many elements of Canadian society, there are multiple levels of government involved in the regulation of composting in BC. The provincial government has the authority to create legislation that regulates waste management and has done so through the *Environmental Management Act* (EMA), the *Public Health Act* (PHA), and the *Agricultural Land Commission Act* (ALCA). From these acts flow regulations that deal with specific elements of waste management, such as compost, including the *Organic Matter Recycling Regulation* (OMRR), the *Agricultural Waste Control Regulation* (AWCR), and the *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* (ALRUSPR), and the *Mushroom Production Facilities Regulation* (MPFR). The provincial acts also give regional and municipal governments the ability to create bylaws that regulate waste management, and composting in particular. While the provinces and municipal governments can regulate the production and application of compost, the federal government has the authority to regulate the trade and sale of compost under the Canadian Food Inspection Agency trade memoranda t-4-120 enacted under the *Fertilizer Act and Regulations*.<sup>3</sup>

Using these laws, the province regulates composting by defining what feedstock materials or inputs can be used in a compost facility, the design and operation of these facilities, how the materials should be treated throughout the various stages of the composting process, and how and where the finished product can be used. The regulatory scheme is designed so that a single regulation applies to all compost operations in BC, with some exceptions. However, there are some situations where this regulation, while still applicable, is subject to other laws depending on the location of the facility, such as on land in the Agricultural Land Reserve (ALR), or the type of material used as a feedstock. An added layer to the regulatory scheme exists at the local government level, to whom the province has delegated the authority to regulate compost facilities through bylaws. However, as explained in the report, the location of the facility can alter the applicability of these bylaws.

This central compost regulation is the OMRR. Enacted under the EMA, the OMRR applies to all aspects of compost operations in BC except agricultural waste composting and some other, more minor, exceptions. Agricultural waste composting is regulated by the AWCR. If the compost facility is located on land in the ALR, the ALCA and ALRUSPR apply to the facility and will indicate what type of composting is permitted. The OMRR still applies to compost facilities permitted on the ALR but is subject to any overriding provisions in the ALCA and ALRUSPR. Regional districts use the OMRR as a foundation and enact bylaws requiring operators to hold a licence to operate a compost facility and can impose requirements on the facility and the use of compost in addition to, but not in conflict with, those found in the OMRR. Facilities on the ALR are protected from certain local government bylaws, such as those

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<sup>3</sup> Canadian Food Inspection Agency (2014) *T-4-120 – Regulation of Compost under the Fertilizers Act and Regulations*. Accessed 6 April 2015 online: <<http://www.inspection.gc.ca/plants/fertilizers/trade-memoranda/t-4-120/eng/1307910204607/1307910352783>>

dealing with nuisances arising from the facility if normal farm practices are used. However, the facility's operations are subject to review by the Farm Industry Review Board and the Agricultural Land Commission.

In practice, the manner in which a compost facility operates is through the enforcement of the EMA, OMRR, ALCA, and ALRUSPR and through compliance with the terms and conditions of the relevant local government bylaws and permits. A person does not need a provincial permit to operate a compost facility but will have to submit plans and information to the Ministry of Environment before the facility can commence and throughout the operation of the facility. However, if a local government does regulate compost facilities, a person will have to obtain a recycler licence from their regional district and a business licence from their municipality before they can operate the facility.

Unfortunately, the major limiting factor of the compost regulatory regime in BC is enforcement. The Ministry of Environment often does not have the resources to enforce the requirements of the OMRR and relies on the regional districts or municipalities to enforce compliance with the OMRR as a condition of their respective licencing schemes. In turn, the regional districts and municipalities may be slow to act against compost operations, which serve a valuable function in reducing the volume of waste entering the landfills, a pressing priority for many local governments. The speed of enforcement is not helped by the complexity of the regulatory scheme, which seeks to engage three levels of government to jointly regulate commercial and agricultural composting operations inside and outside the ALR. As a result, it is unclear who should take the lead on monitoring and enforcement. Otherwise, besides the use of some vague definitions (e.g. "qualified professionals," "proven technologies," "in-vessel," and "normal farm practices"), the existing scheme is relatively comprehensive. However, to be effective, this regulatory scheme needs deciphering for government officials, compost operators, and citizens, and must be applied more rigorously.

## 1.1 Environmental Management Act

The *Environmental Management Act* (EMA) is one of the overarching pieces of environmental legislation in British Columbia. It regulates a wide variety of environmental matters including waste, contaminated sites, mines, air quality, greenhouse gas, and pollution.

Part 3 of the EMA addresses municipal waste management and directs a regional district to prepare a waste management plan and submit the plan to the Minister of Environment for approval.<sup>4</sup> Once approved, the regional district may then enact bylaws for the purpose of implementing the waste management plan.<sup>5</sup> These bylaws regulate the management of municipal solid waste and recyclable materials. This captures compost operations since the definition of "recyclable materials" in the EMA includes organic materials from residential, commercial, and industrial sources that are capable of being

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<sup>4</sup> *Environmental Management Act* SBC 2003, c.53 ("EMA") s.24

<sup>5</sup> EMA s.25(3)

composted.<sup>6</sup>

Under sections 38 and 138 of the EMA, the Lieutenant Governor in Council (provincial Cabinet) may make regulations in general and specifically respecting the development, content, amendment, approval and review of waste management plans and operational certificates and prescribing the criteria for setting fees for the purposes of municipal solid waste disposal fees. This is accomplished through the *Organic Matter Recycling Regulation* (OMRR).

There is no express requirement in the EMA that a compost facility gain a particular permit or approval before it commences operations; however, the facility must comply with the approved waste management plan,<sup>7</sup> which requires compliance with any relevant regional district bylaws enacted to implement the plan as well as all regulations enacted under the EMA, such as the OMRR.<sup>8</sup> In practice, the MOE regional office will coordinate with the facility throughout the design and construction process to ensure that all regulatory requirements are met before the facility commences operations.<sup>9</sup>

## 1.2 Organic Matter Recycling Regulation

The *Organic Matter Recycling Regulation* (OMRR) is the principal regulation concerning composting in BC.<sup>10</sup> The purpose of the regulation is to ensure that composting is carried out in a way that avoids causing pollution to the environment or nuisances to the facility's neighbours. The regulation seeks to avoid adverse effects to the environment and human health by classifying different types of biosolids and compost by the amount of potentially harmful substances they contain and regulating the management and use of these classes as appropriate.

The regulation is divided into various parts, the most important of which reflect the major elements of composting: facility design and operation, storage, and distribution or application to land. Facility design and operation is regulated to ensure that that a facility is constructed in a competent fashion and adequate plans are in place to oversee the operations of the facility to minimize any impact on people or the environment. Storage is regulated so that material does not escape and cause harm to people or the environment. Distribution and land application is regulated so that biosolids and compost are managed in volumes and locations, and with particular requirements, that are appropriate to the particular class of material and the potential harm they can cause. The application of the provisions in the OMRR may depend on the size (i.e. production capacity) of the facility, the class of material in question, and the type of land on which the facility is located. Other parts of the OMRR define key terms, outline the general application of the regulation, and specify the penalties for contravening the act. The regulation also contains various "schedules" that contain highly specific technical information

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<sup>6</sup> EMA s.1

<sup>7</sup> EMA s.25(2)(a)

<sup>8</sup> EMA s.24(2)

<sup>9</sup> Maryam Mofidpoor, Environmental Management Officer, BC Ministry of Environment, Personal Communication November 19, 2013

<sup>10</sup> *Organic Matter Recycling Regulation* BC Reg. 18/2002 ("OMRR") s.2(3)

regarding how the classes of compost or biosolids should be handled and the performance standards that the facility must meet before a particular class of material can be used.

### 1.2.1 Application of the OMRR

The OMRR applies to all composting operations in BC, subject to some exceptions.<sup>11</sup> It does not apply to composting facilities or the land application of managed organic material that have been a) authorized by permit, approval, or operational certificate, or b) required by an order issued under the EMA. These types of authorizations are granted by the director when a facility does not fit within the existing regulations.<sup>12</sup> This may include facilities that want to use a feedstock not listed in the OMRR or a novel type of facility that has not yet been regulated. These authorizations come with their own requirements to ensure human health and safety and to prevent pollution and nuisance, as determined through collaboration between the facility operator and the appropriate regional office of the Ministry of Environment. The conditions regarding permits, approvals and operational certificates can be found in the EMA at sections 14, 15 and 28 respectively.

The OMRR does not apply to agricultural waste composting that is conducted in accordance with Part 5 of the *Agricultural Waste Composting Regulation Code*, backyard composting or the composting of yard waste in quantities less than 100m<sup>3</sup> per year.<sup>13</sup> The management and composting of “agricultural waste” is regulated by the *Agricultural Waste Control Regulation*, though the OMRR may still apply in certain circumstances. This is addressed in [section 1.4](#), below.

### 1.2.2 Definitions

The OMRR provides the following definitions that shall be used in this report. These definitions are important to understand the structure of the compost regulatory scheme.

- **“agricultural waste”** means agricultural waste that is subject to the Code attached to the *Agricultural Waste Control Regulation*, but does not include
  - a) human or animal food waste that is diverted from residential, commercial or institutional sources,
  - b) waste materials derived from non-agricultural operations, or
  - c) wood waste derived from land clearing, construction or demolition;
- **“biosolids”** means stabilized municipal sewage sludge that has been treated to allow the sludge to be beneficially recycled.
- **“compost”** means a product which is

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<sup>11</sup> OMRR s.3(2)

<sup>12</sup> Maryam Mofidpoor, Environmental Management Officer, BC Ministry of Environment, Personal Communication November 19, 2013

<sup>13</sup> OMRR s.3

- a) a stabilized earthy matter having the properties and structure of humus,
  - b) beneficial to plant growth when used as a soil amendment,
  - c) produced by composting, and
  - d) only derived from organic matter
- **‘composting’** means the controlled biological oxidation and decomposition of organic matter in accordance with the time and temperature requirements specified in Schedule 1.
- **“director”** means a person employed by the government and designated in writing by the minister as a director of waste management or as an acting, deputy or assistant director of waste management.<sup>14</sup> This person works for the Ministry of Environment and could be the manager of a Ministry of Environment regional office.
- **"discharger"** means any of the following responsible persons:
  - a) an owner of a composting facility;
  - b) an owner of a facility that produces managed organic matter for land application;
  - c) a registered owner of the land where managed organic matter is applied.
- **“leachate”** means
  - a) effluent originating from organic matter being received, processed, composted, cured or stored at a composting facility;
  - b) effluent originating from managed organic matter being stored or applied to land; or
  - c) precipitation, storm water, equipment wash water or other water which has come into contact with, or mixed with, organic matter or managed organic matter being received, processed, composted, cured or stored.
- **“managed organic matter”** means Class A Biosolids, Class B Biosolids, or Class B Compost
- **“organic matter”** means those materials set out in OMRR Schedule 12 that are suitable for composting into Class A Compost or Class B Compost. These materials include animal bedding, biosolids, brewery and winery waste, domestic septic tank sludge, fish wastes, human food waste, hatchery waste, manure, milk processing waste, fruit, and vegetable material from processing plants, poultry carcasses, red-meat waste, untreated and unprocessed wood residuals, whey, yard waste.
- **"qualified professional"** means a person who
  - a) is registered in British Columbia with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and

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<sup>14</sup> EMA s.1

- b) through suitable education, experience, accreditation and knowledge may be reasonably relied on to provide advice within his or her area of expertise as it relates to this regulation;

It is important to note that while a person may qualify under this definition, there is no requirement that the “qualified professional” have specific experience or education involving the design and operation of compost facilities. The use of a “qualified professional” does not guarantee flawless facility operation, production, and land application of compost. It is unclear to what extent a “qualified professional” would bear the liability for nuisances arising from a compost facility that is in violation of the OMRR.

A “qualified professional” in the context of compost operations typically refers to a professional agronomist or engineer and is required by the OMRR with respect to the compost facility environmental impact study, plans and specifications for facility construction and operation, and land application plans for compost or biosolids. A “qualified professional” is also required by the CRD bylaw: *Compost Facilities Regulation* in respect to the leachate and odour management plans.

- **“retail-grade organic matter”** means Biosolids Growing Medium or Class A Compost
- **“yard waste”** means
  - a) clean and untreated wood waste, or
  - b) non-food vegetative matter resulting from gardening operations, landscaping and land clearing,but does not include wood waste derived from construction or demolition.

### 1.2.3 Compost and Biosolid Materials

The purpose of the OMRR is to regulate the transformation of organic materials from the municipal waste stream into a product known as compost that can be applied to land or distributed for sale. It also deals with agricultural waste that does not fall under Part 5 of AWCR Code and the use of treated human waste, known as biosolids, as a feedstock for compost, or as a product that can be applied to the land or distributed for sale. The OMRR describes different types, or classes, of compost and biosolids, which are materials that can be primarily differentiated by their feedstock (biosolids or organic matter) or by specific performance standards relating to measurable substances within the material. [Table 1](#) in the Appendix below outlines the basic requirements and limitations on the use of the types of compost or biosolids.

Differentiating between the particular classes of compost or biosolids is important because this will determine what feedstock materials can be used in a facility, what treatment methods are employed in the compost operation, how the finished product may be stored, the substances permitted in the finished product, and how the finished product may be applied to land or distributed to retail



vendors:

- **Class A Biosolids:** Comprised of treated human waste and must meet the requirements set out in OMRR s.6. Class A Biosolids have an allowable concentration of heavy metals that is similar to Class B Biosolids, with the exception of a lower allowable mercury content and a relatively low allowable fecal coliform level. As such, it is deemed to be of lesser potential harm and there are fewer restrictions on the land application of Class A Biosolids than Class B Biosolids.
- **Class B Biosolids:** Comprised of treated human waste and must meet the requirements set out in OMRR s.8. Class B Biosolids have a relatively high allowable concentration of metals and fecal coliform levels. As such, it is deemed to be relatively harmful and there are heavy restrictions related to how it can be distributed, where it can be applied, the uses of land to which it is applied, and requirements for public notification of its application.
- **Biosolid Growing Medium:** Comprised of Class A or Class B Biosolids and must meet the requirements set out in OMRR s.10. Biosolid Growing Medium has relatively low potential harm as it has lower allowable heavy metal concentrations than Class A and B Biosolids and Class A and B Compost.
- **Class A Compost:** Comprised of only organic matter from feedstock listed in Schedule 12, though this may include biosolids and Biosolid Growing Medium. Class A Compost must meet the requirements set out in OMRR s.12 and s.13. Different requirements apply to Class A Compost that is produced solely from yard waste and/or untreated and unprocessed wood residuals compared to Class A Compost that is not produced solely from these materials. There is no volume restriction on its distribution and no requirements for the land application of either type of Class A Compost.
- **Class B Compost:** Comprised of only organic matter from feedstock listed in Schedule 12, although this may include biosolids and Biosolid Growing Medium. Class B Compost must meet the requirements set out in OMRR s.14 and s.15. Class B Compost is considered to be potentially harmful and must only be applied to land under the strict requirements that also apply to Class B Biosolids. There are no requirements for the distribution of Class B Compost.

#### 1.2.4 Overview of Schedules

The various schedules of the OMRR contain highly specific technical information that establishes the environmental criteria for different types of compost or biosolids. This information varies depending on the type and class of material and includes the required treatment methods for feedstock to reduce pathogens and the attraction of disease vectors, the acceptable standards of specific constituents in the matter, and the protocol, frequency and recording of sampling and analysis for these materials. These schedules will be referenced in subsequent sections when defining how compost or biosolids must be treated and the performance standards that a facility must meet.

1. **Pathogen Reduction Provisions:** sets out specific treatment methods that dischargers must use in the production of biosolids or compost in order to reduce the pathogens present in the

material.

2. **Vector Attraction Reduction:** sets out specific treatment methods that dischargers must use in the production of biosolids or compost so as not to attract vectors (organisms, animals or insects, that are capable of transmitting disease) to the compost facility.
3. **Pathogen Reduction Limits:** defines the allowable fecal coliform levels and the sampling requirements for compost and biosolids.
4. **Quality criteria:** sets out the allowable concentrations of various substances (heavy metals, foreign materials) in the compost and biosolids.
5. **Sampling and Analysis:** outlines the frequency of sampling of compost and biosolids.
6. **Record Keeping:** outlines the monitoring and recording of temperatures and retention times, and the results of analysis of compost and biosolids.
7. **Land Application Plan for Managed Organic Matter:** outlines the information required in the land application plan for Class A and B Biosolids, and Class B Compost.
8. **Land Application Methods for Managed Organic Matter:** outlines how Class A and B Biosolids and Class B Compost can be applied to the land.
9. **Generic Soil Standards for Cobalt, Molybdenum, Nickel, and Selenium Where Managed Organic Matter Has Been Applied:** outlines allowable levels of these elements in various land types (agricultural, urban park, residential, commercial and industrial).
10. **Matrix Soil Standards for Arsenic, Cadmium, Chromium, Copper, Lead, Mercury (inorganic) and Zinc Where Managed Organic Material Has Been Applied:** provides a table specifying the allowable level for each element with regard to site-specific factors that occur on various land types.
11. **Requirements for Biosolids Growing Medium:** requires that Biosolids Growing Medium must be derived from either Class A or B Biosolids that meet the appropriate pathogen and vector attraction reduction requirements, and outlines the standards for Biosolids Growing Medium.
12. **Organic Matter Suitable for Composting:** lists the types of feedstock that may be composted into Class A Compost or Class B Compost.
13. **Notification:** outlines the information that a discharger must submit to the director 30 days before the intended land application.

These technical standards establish standards for dischargers in the development and operation of compost facilities.

### 1.2.5 Composting Facility Requirements

The compost facility is the epicentre of the compost operation. It is important that a compost facility is designed and constructed appropriately because the facility is the site at which large quantities of materials (both pre and post composting) are gathered and treated and is the point where serious problems may arise or future problems may be prevented. As such, the OMRR requires that a qualified professional conduct an environmental impact study of the facility and provide plans and specifications for the construction and operation of the facility, that a leachate management plan be put into place,

and that the discharger operates the facility within the design capacity of the facility.

Given the importance of the compost facility in the composting process, the Ministry of Environment has prepared the *Compost Facility Requirements Guideline: How to Comply with Part 5 of the Organic Matter Recycling Regulation (“OMRR Part 5 Guidelines”)*.<sup>15</sup> This is a best practices document that emphasizes proactive strategies that should be considered during the construction and operation of the facility.

### **Environmental Impact Study Report**

Depending on the annual production capacity of the facility, the discharger may be required to provide an environmental impact study (EIS) for the facility. Proposed or existing compost facilities with an annual production capacity of 20,000 tonnes or more, or facilities that are expanded to, or beyond, an annual production capacity of 20,000 tonnes, or expanded to increase the production capacity by more than 10% must have a qualified professional complete an EIS before the facility can collect organic matter to be used as feedstock or distribute the compost.<sup>16</sup> Those facilities with an annual production capacity of less than 20,000 tonnes, or that are expanded with an increase of less than 10% in production capacity, do not require an EIS.

Note the requirement that the EIS must be prepared by a “qualified professional” and is subject to the caveat discussed in [section 1.2.2](#) above.

The EIS report must be acceptable to the director and must include the design of the composting facility’s odour, leachate collection and treatment systems, and site preparation for the facility including buffer zones and plans to minimize the impact of the facility on adjacent lands.<sup>17</sup>

The criteria for an “acceptable” EIS report are not set out in the OMRR. It is subject to the discretion of the director and includes, but is not limited to, the information stated above. The director has discretion in granting their approval of the report; they may request additional information that they consider necessary to protect human health and the environment and may specify particular concerns or questions that the EIS report must address. One copy of the EIS report must be retained by the discharger while another a copy must be submitted to the director at least 90 days before construction of the new facility starts or the existing facility is modified.

The EIS report may be made available to the public through a Freedom of Information (FOI) request to the Minister of Environment (MOE).<sup>18</sup> Alternatively, reports may also be found using the

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<sup>15</sup>Forgie, D., Sasser, L., & Neger, M. (2004) *Compost Facility Requirements Guideline: How to Comply with Part 5 of the Organic Matter Recycling Regulation*. Accessed 6 April 2015 online: <<http://www.env.gov.bc.ca/epd/epdpa/mpp/pdfs/compost.pdf>>

<sup>16</sup> OMRR s.23

<sup>17</sup> OMRR s.23(2)

<sup>18</sup> An FOI request may be submitted through this website: <<http://www.gov.bc.ca/citz/iao/foi/submit/general/>>

MOE Environmental Management Authorization Database and the MOE document search engine.<sup>19</sup>

### **Construction and Operation of Composting Facilities**

A qualified professional must also prepare plans and specifications regarding the construction and operation of any new facility (regardless of its annual production capacity) or the modification of an existing facility that results in an increase in the annual production capacity of more than 20,000m<sup>3</sup> or more than 10%.<sup>20</sup> Note that in this instance, the unit of measurement is m<sup>3</sup>, not tonnes, which are different.

The qualified professional must affix the plan with their professional seal or signature and make a signed statement certifying that the compost facility has been constructed in accordance with the plan. The same caveat must be employed with regard to “qualified professionals” as stated in [section 1.2.2](#) above.

The plan must include all works to be constructed on the site, the design capacity of the facility, leachate and odour management plans, and operating and closure plans.<sup>21</sup>

The discharger and the director both have duties in relation to the plans and specifications. The discharger must:<sup>22</sup>

- Ensure that the plans are kept at the composting facility at all times and are submitted to the director upon request;
- Ensure that the composting facility is operated in compliance with the plans; and
- If the facility is in the ALR, provide the director and the Agricultural Land Commission with notice in writing 90 days before beginning the operation of the facility. The notification must include:<sup>23</sup>
  - a) the composting facility location and design capacity, name of a contact person, type of waste received, and intended distribution of compost, and
  - b) a copy of a personnel training program plan that addresses the specific training needed to operate the composting facility in compliance with the *OMRR*.

The director may request additional information with respect to the plans and specifications that they consider necessary for the protection of human health and the environment, and may specify

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<sup>19</sup> The BC Ministry of Environment Authorization Database Search is available online at <<http://www2.gov.bc.ca/gov/topic.page?id=5AE55AB514BD4BF2BAA2516992012A2B>>. The BC Ministry of Environment E-Licensing Public System document search engine may be found at <<https://j200.gov.bc.ca/pub/ams/Default.aspx?PossePresentation=DocumentSearch>>. You need to plug in the information from the database in the search engine, though they have proved to be difficult to navigate to find relevant documents.

<sup>20</sup> OMRR s.24(1)(b)

<sup>21</sup> OMRR s. 24(2)

<sup>22</sup> OMRR s.24(3)

<sup>23</sup> OMRR s.25(2)

particular concerns or questions that the plans and specifications must address.<sup>24</sup>

### **Leachate Management for Composting Facilities**

Leachate is a liquid by-product from the compost process and can have a harmful impact on the environment and human health. The OMRR definition of leachate is included in [section 1.2.2](#) above. In order to ensure that the leachate does not escape into the environment, the OMRR has provided for specific requirements for the receiving, processing, and curing areas of the facility.<sup>25</sup> These areas must be located on asphalt, concrete, or other impermeable surface that can withstand wear and tear from normal operations and will prevent the release of leachate into the environment. These areas must have a roof, cover, or a prepared surface that is designed to prevent the collection of water around the base of the organic matter and compost, and to stop run-off from entering into these areas. There must also be a leachate collection system to reuse or remove leachate from these areas.<sup>26</sup> Any leachate that cannot be collected and reused in the composting process must not be discharged in the environment unless authorized under the EMA.

### **Capacity of Composting Facilities**

It is important that dischargers understand and comply with the appropriate design capacity of the compost facility in order to maintain good operations and avoid problems. To this end, the OMRR requires that the amount of organic matter in a composting facility must not exceed the total design capacity of the facility.<sup>27</sup>

To avoid the accumulation of leftover decayed material, beginning in the 3<sup>rd</sup> year of the facility's operation, at least half of the compost stored at the facility must be removed from the facility on an annual basis.<sup>28</sup> There must not be more than 15m<sup>3</sup> of residual material from the compost process stored at the facility at any time. Any residuals must be stored so as not to attract organisms capable of carrying disease and must be disposed of on a regular basis in accordance with the appropriate solid waste management plan.<sup>29</sup> If a compost facility is going to close, before this may occur, all the compost must be applied or distributed in accordance with the OMRR, and all unprocessed organic matter must be removed from the facility and dealt with in accordance with the regional district's solid waste management plan.<sup>30</sup>

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<sup>24</sup> OMRR s.24(4)

<sup>25</sup> OMRR s.26(2). A "curing area" means an area where organic matter which has undergone the rapid initial stage of composting is further matured into a humus-like material

<sup>26</sup> OMRR s.26(3)

<sup>27</sup> OMRR s.27

<sup>28</sup> OMRR s.28

<sup>29</sup> EMA s.32 and s.33 grant the authority to regulate the disposal of municipal solid waste to either the Administration Board of the Greater Vancouver Sewerage and Drainage District (GVSD) or regional districts (outside the GVSD) through the use of regional solid waste management plans.

<sup>30</sup> OMRR s.30

### 1.2.6 Storage Requirements

The proper storage of managed organic matter (Class A & B Biosolids and Class B Compost) before it is applied to land is important because the accumulation of large quantities of this material in one place could result in the concentration of pathogens, leachate, or odours that might escape into the environment. Therefore, if managed organic matter is stored on a farm or at some other site (such as the compost facility or the land application site), the OMRR requires that it must be stored in either a storage facility or at a storage site.<sup>31</sup>

A storage facility is a structure for containing managed organic matter before it is applied to land. The types of structures that can be used include a reservoir, lagoon, cistern, gutter, tank or bermed area, but do not include a vehicle or any mobile equipment used for the transportation of the managed organic matter.<sup>32</sup> The storage facility must be large enough to store all of the managed organic matter, located at least 15m from a watercourse and 30m from any source of water used for domestic purposes, and maintained so as to prevent the escape of the managed organic matter.<sup>33</sup> The OMRR does not limit the length of time that managed organic matter can be stored in a storage facility although if the storage facility is part of the composting facility it would have to comply with the capacity and annual removal requirements for compost facilities described in [section 1.2.5](#), above.

A storage site is a site for the *temporary* storage of managed organic material that is ready for application to land. The OMRR imposes time limits on the storage of managed organic matter at storage sites (unlike at storage facilities). Managed organic matter may be stored at a storage site for up to two weeks if it is used within two weeks and is prevented from escaping, regardless of the site location and the surrounding features.<sup>34</sup> However, it may be stored at a storage site for up to nine months if it is located at least 30m from any watercourse or any source of water used for domestic purposes and is prevented from escaping. Berms (mounds of earth) or other works must be constructed around the storage site if necessary to prevent the escape of the managed organic matter.

Managed organic matter that is stored at a storage site must be covered from October 1 to March 31 if the storage site is situated at a land application site that is on Vancouver Island, in the Fraser Valley or any other area of BC that receives a total average of 600mm of precipitation during the months of October to March (inclusive).<sup>35</sup> The cover is required to prevent the managed organic matter from escaping.

The provisions in this division do not apply to Biosolid Growing Medium or Class A Compost. Since these materials have low pathogen and heavy metal content, they are deemed to be of low risk to

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<sup>31</sup> OMRR s.17

<sup>32</sup> OMRR s.16

<sup>33</sup> OMRR s.18

<sup>34</sup> OMRR s.19

<sup>35</sup> OMRR s.20

human health and the environment and can be stored by any means the discharger deems appropriate as long as the storage does not create conditions that contravene the EMA, OMRR or other laws.

### 1.2.7 Land Application and Distribution Requirements

Due to the potentially harmful substances (heavy metals, pathogens) within managed organic matter (Class A & B Biosolids and Class B Compost), the OMRR regulates the land application and distribution of these materials. The discharger must have a land application plan prepared by a qualified professional, and the compost material must be applied or distributed in accordance with this plan, as well as within certain volume specifications and according to the respective prescriptions under Schedules 8, 9 and 10 of this regulation.<sup>36</sup> The discharger must also give all relevant authorities appropriate notice before the application occurs so that the authorities can ensure the application is conducted correctly.

#### Land Application Plan

A qualified professional must prepare and sign a land application plan before each time and for each place that managed organic matter is applied.<sup>37</sup> This plan must be provided to the registered land owner and made available upon request to the director or an official designated under the ALCA.<sup>38</sup> After each application, a qualified professional must provide a written certification to state that the application was done in accordance with the land application plan.<sup>39</sup>

The information required in the plan is described in OMRR Schedule 7 and must include:

- The specifics of the facilities, land and material involved including:
  - Contact information and description of the compost facility where the managed organic matter is produced and the land where it is to be applied, the name and authorization of the registered owner of the land, the dates of application, the storage and leachate management requirements for managed organic matter at the application site, and a description of the physical components in managed organic matter to be applied.<sup>40</sup>
- The measurement of certain characteristics of the managed organic matter and the soil where the matter will be applied including:
  - Fecal coliform densities, pH, electrical conductivity, certain chemicals and chemical elements (P, K, N, NH<sub>3</sub>, NO<sub>3</sub>) and a list of substances (heavy metal chemical elements and foreign matter) set out in Schedule 4 of the OMRR.<sup>41</sup>

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<sup>36</sup> OMRR sections 7, 9, and 15 for Class A Biosolids, Class B Biosolids, and Class B Compost, respectively.

<sup>37</sup> OMRR s.5(1)

<sup>38</sup> OMRR s.5(4)

<sup>39</sup> OMRR s.5(3)

<sup>40</sup> OMRR Schedule 7 s.1

<sup>41</sup> OMRR Schedule 7 s.2

- The method of application and the management and monitoring of specified substances<sup>42</sup>

It is of note that there is no requirement for a land application plan for Class A Compost or Biosolid Growing Medium. Again, this because these material are deemed to be of low risk due to their low pathogen and heavy metal content.

### **Notification of Land Application of Managed Organic Matter**

Effective communication is important to ensure that proper oversight and enforcement measures are in place and that all aspects of the composting process are carried out in a safe manner. Before the application of managed organic matter (Class A and B Biosolids and Class B Compost) to land can take place, the discharger must provide notice and information to the pertinent authorities.

A discharger must give notification of any proposed land application of managed organic matter in volumes greater than 5m<sup>3</sup> to the persons or entities listed below at least 30 days before the land application.<sup>43</sup> The notification is provided using the standardized form in OMRR Schedule 13.

- **Director** – who may request additional information within 30 days of receipt of notification. If the information provided to, or requested by, the director indicates the need for site-specific standards or management practices respecting the land application of managed organic matter in order to protect human health and the environment, the director may, within 30 days after receipt of the information, require the discharger to meet the site-specific standards or management practices specified by the director.
- **Medical health officer** (who has jurisdiction in the area) – if the managed organic matter is to be applied to agricultural land or in a watershed. This officer, within 30 days of receipt of notification, may provide written directions to the discharger that the application must not proceed, or proceed subject to conditions specified by the officer.
- **Agricultural Land Commission**<sup>44</sup> – if the managed organic matter is to be applied with the agricultural land reserve (ALR)

The discharger and the director or, where appropriate, the medical health officer, may agree to amend the 30-day time limit provided to respond to the notification.

Similar to an EIS report discussed in [section 1.2.5](#) above, the notification may be made available the public upon the submission of a Freedom of Information request or may be found using the MOE Environmental Management Authorization Database and the MOE search engine.<sup>45</sup> Please see footnotes 14 and 15 for more information.

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<sup>42</sup> OMRR Schedule 7 s.3

<sup>43</sup> OMRR s.22 (1)

<sup>44</sup> *Agricultural Land Commission Act*, SBC 2002 c.36 (“ALCA”) s.61. The Land Reserve Commission has become the Agricultural Land Commission. While the OMRR still uses the former name, this report uses the term Agricultural Land Commission.

<sup>45</sup> See footnotes 14 and 15 for FOI website and database/search engine, respectively.



The provisions in this division do not apply to Biosolid Growing Medium or Class A Compost. These materials can be applied to land without notification to the above-listed persons or entities.

### **Land Application & Distribution**

There are differing requirements for land application and distribution of different compost and biosolids materials. Land application is, as the name suggests, the process of applying the processed material, either biosolid or compost, to the land. Distribution has a wide definition and can include the sale or movement away from the facility of the compost or biosolid. For ease of reading, the materials have been grouped together by the common elements of regulation that apply to them.

#### **Class A & B Biosolids, Class B Compost**

Divisions 2, 3 and 6 provide for the land application and distribution of Class A Biosolids, Class B Biosolids, and Class B Compost, respectively.

With respect to land application, each material must be applied in accordance with a corresponding land application plan and the soil substance concentrations specified in Schedules 9 and 10 (or a site-specific criteria approved by the Director). This plan must be made available to the registered owner of the land before the land application occurs. It is not specified how many days before the land application must the plan be made available to the owner.

Further requirements are imposed on the land application of Class B Biosolids and Class B Compost. First, the land application must comply with OMRR Schedule 8. This schedule, depending on the fecal coliform level in the material or extent of processing, sets out requirements for where the material may be applied in relation to water bodies, roads, dwellings, or properties, restricts the use of the land for domestic animal grazing and human food crop production, and may require signage that indicates that biosolids have been applied to the land and warns of health hazards to humans and animals. Second, these materials must not be land applied in a watershed used as a “permitted water supply” under the *Drinking Water Protection Regulation*.

With respect to distribution, Class A Biosolids may only be distributed in volumes that do not exceed 5m<sup>3</sup> per vehicle per day, or in sealed bags for retail purposes, each not to exceed 5m<sup>3</sup>. There are no restrictions on the number of bags distributed per vehicle per day, or to the distribution of volumes greater than 5m<sup>3</sup> to composting facilities or Biosolids Growing Medium facilities.

Class B Biosolids may be distributed to composting facilities with no volume restriction. They may also be distributed to a Biosolids Growing Medium facility with no volume restriction if they meet the pathogen reduction and vector attraction requirements for Class A Biosolids specified in OMRR Schedules 1, 2, and 3.

There are no provisions that stipulate the distribution of Class B Compost. Class B Compost can be distributed without restriction.

## Biosolid Growing Medium & Class A Compost

The land application and distribution of Biosolid Growing Medium and Class A Compost are unregulated. There are no requirements provided for the land application of these materials (regardless of whether the compost is produced from solely untreated and unprocessed wood residuals or not) indicating that these materials can be applied to land without restriction. These materials can also be distributed without any volume restrictions. This is in keeping with the absence of regulation of these materials in other contexts, because these materials are deemed to be of low risk due to their low pathogen and heavy metal content.

### 1.2.8 Enforcement and Offences

In order to ensure compliance with the provisions in this regulation, if a person violates a provision of the OMRR, they will have committed an offence and will be liable on conviction to a fine not exceeding either:<sup>46</sup>

- \$10,000 for all sections, excluding those listed below.
- \$200,000 for the following violations: (the exact sections are footnoted)
  - For the application of managed organic matter in the absence of a land application plan prepared and signed by a qualified professional for each site and occurrence that the managed organic matter is applied.<sup>47</sup>
  - For the application of Class A Biosolids without, or in contravention with, the Class A Biosolids land application plan or in contravention with OMRR Schedules 8, 9 or 10. Or for the distribution of Class A Biosolids in volumes greater than 5m<sup>3</sup>.<sup>48</sup>
  - For the land application of Class B Biosolids applied without or in contravention with a Class B Biosolid land application plan, or in contravention with OMRR Schedules 8, 9 or 10.<sup>49</sup>
  - If Class A compost is derived from feedstock other than organic matter or if the Biosolids used as feedstock for the production of Class A Compost exceed the standards for Class B Biosolids set out in OMRR Schedule 4.<sup>50</sup>
  - If Class B Compost is derived from feedstock other than organic matter.<sup>51</sup>
  - For the land application of Class B Compost without, or in contravention with, a Class B Compost land application plan, in contravention with Schedules OMRR 8, 9 or 10.<sup>52</sup>
  - If managed organic matter is stored in a storage facility or storage site that does not comply with the requirements in s.18 and s.19, respectively. Or if the managed organic

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<sup>46</sup> OMRR s.31

<sup>47</sup> OMRR S.5(1)

<sup>48</sup> OMRR S.7(2) and (4)

<sup>49</sup> OMRR s.9(2)

<sup>50</sup> OMRR s.12(4) and (5)

<sup>51</sup> OMRR s.14(2)

<sup>52</sup> OMRR s.15(1)

- matter is stored on one farm, but used on another.<sup>53</sup>
- If managed organic matter stored at a storage site at the land application site at the specified “rainy” locations (Vancouver Island, Fraser Valley, or where average precipitation is greater than 600mm between October to March, inclusive) is not adequately covered from October 1 to March 31. Or, if managed organic matter escapes from the storage site due to the absence or, inadequacy of, the coverage during this time.<sup>54</sup>
  - If a discharger does not give notification of land application of managed organic matter in volumes of 5m<sup>3</sup> or more at least 30 days before the land application to the director, or if appropriate, the medical health officer (agricultural land or watershed) or the Agricultural Land Commission (if on the ALR).<sup>55</sup>
  - If a discharger collects (distributes) organic matter at (from) a compost facility that does not have an environmental impact study (EIS) completed by a qualified professional. Or if the EIS is not acceptable to the director. Or if the EIS does not include the elements required by s.23(2): design of facilities, odour and leachate collection treatments, and site preparation, buffer zones, and impact mitigation plans. Or s.23(3): the EIS is not submitted to the director at least 90 days before the commencement of a new facility or modification of an existing facility.<sup>56</sup>
  - If a qualified professional has not prepared plans and specifications for the construction and operation of a new facility (regardless of the capacity) or any modification of an existing facility that results in an increase in the annual production capacity of more than 10% or more than 20,000m<sup>3</sup>.<sup>57</sup>
  - If the discharger does not provide notice in writing to the director and the Agricultural Land Commission (if on the ALR) at least 90 days before beginning the operation of a composting facility.<sup>58</sup>
  - If the receiving, storage, processing, or curing areas of the composting facility do not comply with the requirements of s.26(2), including an appropriate impermeable surface, an appropriate roof, cover or prepared surface, or a functioning leachate collection system. Or if leachate that is not collected and reused in the composting process is discharged into the environment without authorization under the EMA.<sup>59</sup>
  - If the amount of organic matter in a composting facility exceeds the total design capacity of the facility.<sup>60</sup>
  - If at least half of the compost stored at the facility is not removed annually from the

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<sup>53</sup> OMRR s.17(1) and (2)

<sup>54</sup> OMRR s.20(2)

<sup>55</sup> OMRR s.22(1)

<sup>56</sup> OMRR s.21(2) and (3)

<sup>57</sup> OMRR s.24(1)

<sup>58</sup> OMRR s.25(1)

<sup>59</sup> OMRR s.26(2) and (3)

<sup>60</sup> OMRR s.27

- facility after the third year of the facility start-up.<sup>61</sup>
- If residuals from the composting process are not stored in a way that prevents vector attraction or are not disposed of on a regular basis in accordance with the EMA. Or if more than 15m<sup>3</sup> of residuals are stored at a composting facility at any time.<sup>62</sup>
  - If, before the closure of a compost facility, any of the remaining compost is applied or distributed in a way that does not comply with the OMRR, and/or any of the unprocessed organic matter is not removed from the facility and dealt with in accordance of the EMA.<sup>63</sup>

It is important to note, however, that all levels of government have discretion in how they enforce laws. They are not required to enforce their own regulations or laws, and can choose the circumstances under and methods by which they enforce the law.

## Summary

By defining different classes of compost and biosolids, the OMRR creates a regime to regulate the production, storage, land application and distribution of compost and biosolids. The OMRR also sets out requirements for the design, construction and operation of compost facilities as well as penalties for violation of the provisions of the regulation. The EMA delegates authority to the regional districts to enact bylaws with respect to municipal waste and recyclable materials, including compost. As discussed in [section 1.3.1](#) below, these bylaws must not only be consistent with relevant provincial enactments, but they often require that a compost facility operator be compliant with those provincial enactments as a condition of holding a business licence to operate a compost facility. This is also true with respect to municipal bylaws created for regulating land use, as discussed in [section 1.3.2](#) below. This ensures that the OMRR remains as the regulatory foundation for all local government waste management bylaws yet maintains the force to stand alone as a regulation that must be adhered to by compost facility operators.

## 1.3 Local Government Regulation

Regional districts have been granted the authority under s.25(3) of the *Environmental Management Act* (EMA) to enact bylaws that regulate compost facilities; however, municipalities do not have any specific jurisdiction do so. Municipalities must rely on their powers to enact bylaws under the *Local Government Act* (LGA) to regulate land use,<sup>64</sup> or their powers to enact bylaws under the *Community Charter* to regulate nuisance.<sup>65</sup>

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<sup>61</sup> OMRR s.28

<sup>62</sup> OMRR s.29(1) and (2)

<sup>63</sup> OMRR s.30

<sup>64</sup> *Local Government Act*, RSBC 1996 c.323 (“LGA”) Part 26 in general, and s.903 in particular

<sup>65</sup> *Community Charter* SBC 2003 c.26 (“Community Charter”) s.8

### 1.3.1 Regional District Bylaws

The EMA enables regional districts to undertake the responsibility for solid waste management within their boundaries.<sup>66</sup> In order to do so, a regional district may develop and submit a waste management plan to the Minister of Environment for approval.<sup>67</sup> There is no express requirement in the EMA that a regional district develop a waste management plan, but it is clear that many activities with respect to waste management cannot be completed without one. Section 25(3) of the EMA delegates authority to a regional district to make bylaws to implement the approved waste management plan and, in doing so, regulate a broad spectrum of aspects in relation to the management of a recyclable material such as compost. This includes bylaws regulating, prohibiting or respecting the handling of recyclable material, the management of compost sites (i.e. facilities), requirements that a facility operator hold a recycler licence, comply with a code of practice, or provide security or insurance, the enforcement of bylaws, and the provision of penalties.<sup>68</sup>

Regional Districts can regulate compost facilities in the region by bylaw and add specificity to the regulation of these facilities as appropriate. It is important to note that the EMA and OMRR take precedence over local bylaws, and regional districts may only act within the limits of this delegated authority.<sup>69</sup> As a general rule, all local government enactments<sup>70</sup> (both regional district and municipal) must comply with provincial laws, unless expressly stated otherwise in the provincial law. If a local government enactment is in conflict or inconsistent with the provincial law, then the enactment has no effect to the extent of the conflict or inconsistency.<sup>71</sup> For the general purposes of this report and for composting, the relevant provincial laws that the local government enactments must comply with are the EMA, OMRR, AWCR, ALCA, ARLUSPR, and orders of the Agricultural Land Commission.

There is no conflict when a local government enactment imposes restrictions or conditions on the compost operation **in addition to** those imposed by the provincial laws, unless, in the case of additions to the requirements of the EMA, OMRR, or ALCA, the Minister of Environment declares that a conflict exists by order.<sup>72</sup> This means that a local government can enact regulations for compost operations that are more stringent than the provincial regulations, though it cannot allow a discharger to operate under less stringent regulations. The local government also cannot enact a land use/zoning bylaw or land use contract that prevents land from being used for a purpose allowed by a permit, approval, order, or approved waste management plan.<sup>73</sup>

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<sup>66</sup> EMA s.24(1), (2), (3)

<sup>67</sup> EMA s.24

<sup>68</sup> EMA s.25(3)

<sup>69</sup> OMRR s.2(3) rests jurisdiction with regulation of composting in the provincial government.

<sup>70</sup> "Local government bylaws" includes municipal bylaws, or a permit, licence, approval or other document issued under the authority of a municipal bylaw as well as regional district bylaws and actions.

<sup>71</sup> EMA s.37(1), ALCA S.46

<sup>72</sup> EMA s.37(5), ALCA s.46(6)

<sup>73</sup> EMA s.37(6)

## *Capital Region District Bylaw No. 2736: Compost Facilities Regulation*

An example of a regional district bylaw and how it interacts with other compost regulations is the Capital Regional District (CRD) *Composting Facilities Regulation Bylaw*.<sup>74</sup> This bylaw requires that a person must obtain a recycler licence before they can operate a compost facility in the region. The licence, in turn, imposes certain terms and conditions on the licence holder, additional to the provincial requirements, in order to ensure that the facility operates under the direction of the regional government. One such condition is that the facility must operate in accordance with all applicable provincial enactments, such as the OMRR. If any of the terms and conditions of the licence are violated, the regional district may cancel or suspend the licence and the discharger will be unable to operate the facility. In this way, the bylaw creates a structure by which the regional district is able to determine who can compost and a mechanism by which they enforce proper compost operations based on the provincial regulation.

This bylaw differentiates between three classes of compostable, or feedstock, materials. The bylaw uses the list of “organic matter used for composting” provided in Schedule 12 of the OMRR and divides the list into Class 1: General Organic Matter, Class 2: Biosolids & General Organic Matter, and Class 3: Restricted Organic Matter. Each class requires a separate licence, can only be processed with specified technology, and is subject to provisions of the bylaw in a particular way. It should be noted that this bylaw uses a front-end input designation to direct its compost regulations based on the type of feedstock materials, compared to the OMRR that uses tail-end performance standards based on testing of the composted product.

Before granting a licence, the bylaw prescribes an application process that requires a description of the facility and operations, management plans to deal with the various problems that can arise from composting, the deposit of a performance security to guarantee compliance with the terms of the licence and the bylaw, and certain fees. The bylaw specifies who may enforce the bylaw and the penalties prescribed in OMRR, and also provides for an appeal process for decisions made by the solid waste manager. The bylaw only addresses storage and the composting process in a limited fashion and does not provide regulations for the land application and distribution of compost, or the requirements, design, and operation of a compost facility. Although the bylaw does not explicitly point to the OMRR to fill in these gaps, these missing aspects are impliedly addressed through the licence condition that the facility must operate in accordance with all applicable Provincial enactments, which includes the OMRR.

A more detailed outline of the *CRD Compost Facilities Regulation Bylaw* is reproduced in the [Appendix](#) below.

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<sup>74</sup> *Capital Regional District Bylaw No. 2736: A Bylaw to Regulate the Operation of Composting Facilities in the Capital Regional District* (“CRD Bylaw No. 2736”)

### 1.3.2 Municipal Bylaws

Municipal bylaws enacted under existing municipal jurisdiction can impose further requirements on compost facilities. With respect to compost operations outside the ALR, a municipal government can regulate a compost facility to the extent of the powers granted to it by the *Community Charter* using, for example, its ability to regulate nuisances.<sup>75</sup> A municipality may also use its land use jurisdiction under Part 26, and s.903 in particular, of the *Local Government Act* (LGA) to regulate the use of land through bylaws that impose zoning designations, density requirements, site-specific conditions, and development permit areas.<sup>76</sup> With respect to compost operations in the ALR, a municipality has more limited regulatory powers. A municipality can regulate and prohibit a “permitted use” compost operation, but they cannot prohibit a “farm-use” facility, unless the municipality is the Township of Langley, City of Abbotsford, City of Kelowna, or Corporation of Delta.<sup>77</sup> As discussed in more detail in [section 2.1.1](#) below, these four local governments have been granted the authority to more comprehensively regulate uses and activities on land in the ALR. In addition, municipal nuisance bylaws, regardless of the municipality, do not apply to a “farm use” compost operation if the operation is compliant with the requirements of the *Farm Practices Protection (Right to Farm) Act* (FPPA).<sup>78</sup>

The interaction between municipal bylaws and provincial laws is the same as between regional district bylaws and provincial laws described above in [section 1.3.1](#). That is, municipal enactments (e.g. bylaw or licence) cannot be in conflict or inconsistent with the EMA, OMRR, ACWR, ALCA, ALRUSPR or orders of the Agricultural Land Commission.<sup>79</sup> Otherwise, the municipal enactment is without effect to the extent of the conflict.<sup>80</sup> A conflict or inconsistency does not exist simply because of additional, more stringent, restrictions or conditions that are imposed by the bylaw, unless, in the case of additions to the EMA OMRR, or ALCA, the appropriate Minister declares that a conflict exists.<sup>81</sup> As such, a municipal bylaw can impose more stringent requirements on a compost facility than a provincial enactment.

A municipality may regulate compost operations through a variety of bylaws including zoning and land use, business licencing, and noise bylaws. Bylaws from the District of Central Saanich have been outlined in the [Appendix](#) below to provide a more detailed example of how municipalities may regulate compost operations.

#### *Official Community Plan designation of Development Permit Areas*

The designation of a Development Permit Area (DPA) is another means that a municipality can regulate land use. The *Local Government Act* at sections 919.1 and 920 grants local governments the

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<sup>75</sup> *Community Charter* s.8

<sup>76</sup> LGA s.903 and s.919.1

<sup>77</sup> As per the Right to Farm Regulation BC Reg. 261/97, these municipalities can enact Farm Bylaws specified under LGA s.917

<sup>78</sup> *Farm Practices Protection (Right to Farm) Act*, RSBC 1996 c.131 (“FPPA”) s.2(3)

<sup>79</sup> EMA s.37(1); ALCA s.46(2)

<sup>80</sup> EMA s.37; ALCA s.46(4)

<sup>81</sup> EMA s.37(5); ALCA s.46(6)

authority to use an official community plan (OCP) to designate a DPA within their boundaries. Essentially, the DPA is a means for local governments to impose conditions upon activities that take place within a discrete area of land within their jurisdiction. A DPA may be designated for a variety of purposes including the protection of the natural environment or the protection of farming.<sup>82</sup> Once a DPA has been put in place, a development permit is required for any proposed development within the DPA. This permit specifies certain guidelines and conditions that must be adhered to in order to reach the objectives for which the DPA was designated. A person who wishes to conduct an activity in the DPA must apply for the local government to issue a development permit and may be required to submit a report, certified by a professional engineer with relevant experience, to assist the local government with determining the conditions to be imposed on that development.<sup>83</sup>

A development permit for a DPA designated for the protection of the natural environment may require that certain areas remain free of development, specify natural features to be preserved or enhanced, require natural water courses to be dedicated, require works to be constructed to protect or restore specified natural features of the environment, require protection measures for fish habitat and riparian areas, control drainage, or control erosion.<sup>84</sup> The requirements for a DPA are usually provided in the local government's OCP.

With respect to a proposed compost facility located in a DPA, the owner/operator must apply to their local municipal government for a development permit before development of the facility can proceed. The applicant may be required to provide certain information to assist the local government in determining then conditions or requirements it may impose in the development permit.

## 1.4 Agricultural Waste Control Regulation

Agricultural wastes such as manure, used mushroom medium, and agricultural vegetation waste can quickly accumulate on a farm and must be managed appropriately to prevent pollution and allow the farmer to retain valuable resources.

The management of this waste is so closely tied to general farm operations that the production, storage, and application of compost from agricultural wastes is permitted as a "farm use" on the ALR if the compost is used for farm purposes and the process is in compliance with the Agricultural Waste Control Regulation.<sup>85</sup> As this type of operation is designated as a "farm use" by the ALRUSPR, it is subject to the regulations concerning farm uses described in [part 2.1.1](#) of this report and the protections from nuisance liability and certain local government bylaws.

As per OMRR s.3, agricultural waste composting is not subject to the OMRR if it is conducted in

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<sup>82</sup> LGA s.919(1)

<sup>83</sup> LGA s.920

<sup>84</sup> LGA s.920 (7)

<sup>85</sup> *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* B.C. Reg. 171/2002 ("ALRUSPR") s.2(2)(k)



accordance with Part 5 of the *Code of Agricultural Practice for Waste Management* (Code) made under the AWCR. This Code is described below.

#### 1.4.1 Code of Agricultural Practice for Waste Management

The Code is contained within the AWCR. The Code describes how agricultural wastes, wood waste and mortalities must be collected, stored, handled, used and disposed of in accordance with the Code in a manner that prevents pollution.<sup>86</sup> Amongst its various Parts, the Code describes how and where agricultural waste may be stored and applied to land, provides broad requirements for composting of agricultural waste, and provides for the composting of animal mortalities. The Code does not describe the methods that must be used in the compost process, the facilities in which it must occur, how the compost must be stored, or how the compost must be applied.

##### **Composting of Agricultural Waste**

Agricultural wastes may only be composted on a farm if the material being composted consists only of agricultural wastes that have been produced on that farm or that have been produced elsewhere but will be used on that farm only.<sup>87</sup> The compost site must be located at least 15m from a watercourse and 30m from any source of water used for domestic purposes. The composting must be conducted in a manner that does not cause pollution.

The regulation also provides for the composting of agricultural waste for the production of mushroom medium on a farm. This is allowed if the mushroom medium that is produced is only used on that farm, and, as with a compost operation on a farm, the compost site is located at least 15m from a watercourse and 30m from any source of water used for domestic purposes, and if the composting does not cause pollution.<sup>88</sup>

The composting of livestock, poultry or farmed game that have died on the farm and are unmarketable is permitted if they are composted on the farm where they died, the composting site is located at least 15m from a watercourse and 30m from any source of water used for domestic purposes, and the composting does not cause pollution.<sup>89</sup>

While “farm use” composting operations such as agricultural waste composting are protected from nuisance liability and various government bylaws by the FPPA, this Code further provides that

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<sup>86</sup> *Code of Agricultural Practice for Waste Management* (am. BC Regs. 321/2004, s.2) (“Code”) s.3

<sup>87</sup> Code s.15

<sup>88</sup> Code s.16(2): If the operation and site existed before April 1, 1992, the mushroom medium produced on the farm may be used elsewhere, and the site does may be within 15m and 30m of watercourses and domestic water sources, respectively. However, a report must satisfy to the director that no pollution to watercourse or domestic water supply will occur. The report must be produced by a person with professional qualifications in the field of environmental assessment and licensed to practice in British Columbia, or staff of the ministry of the Minister of Agriculture under a Best Agricultural Waste Management Plan and made available to the director by April 1, 1993.

<sup>89</sup> Code s.24

nothing in the Code is intended to prohibit odours from the operation, as long as the operation is carried out in accordance with the Code.<sup>90</sup>

### **Land Application of Agricultural Waste**

Agricultural waste may only be applied to land as fertilizer or a soil conditioner.<sup>91</sup> It must not be directly discharged into a watercourse or groundwater, and it must not be applied to land if the application causes pollution of a watercourse or groundwater due to meteorological, topographical or soil conditions or the rates of application, runoff or escape of the agricultural waste.<sup>92</sup> There are certain conditions under which agricultural wastes may not be applied if by doing so would result in runoff or escape of the waste causing pollution of a watercourse or groundwater, or goes beyond the farm boundary. These conditions are the application of waste on frozen lands, in diverting winds, on areas having standing water, on saturated soils, or at rates of application that exceed the amount required for crop growth.<sup>93</sup> This regulation does not define when land is considered frozen, what is a diverting wind, when soil is considered saturated, or what rates of application might exceed the amount required for crops.

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<sup>90</sup> Code s.19

<sup>91</sup> Code s.12

<sup>92</sup> Code s.13

<sup>93</sup> Code s.14

hey!  
**food**  
isn't garbage  
food scraps belong  
in your green bin



[metrovancover.org/foodscraps](http://metrovancover.org/foodscraps)



## PART 2 - REGULATION BY LAND TYPE

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In addition to the regulation of compost facilities, storage and land application, the provincial regulatory scheme also differentiates between composting on land in the Agricultural Land Reserve (ALR) and on land outside the ALR.

The provincial *Agricultural Land Commission Act* (ALCA) and the *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* (ALRUSPR) allow the province to control the types of activities that occur in the ALR with the intent to protect farm uses. Whether an activity is a “farm use” not only determines whether an activity can take place on the ALR but, under the *Farm Practices Protection (Right to Farm) Act* (FPPA), may also protect the operator from liability from nuisance claims that arise from the operation of the activity. The EMA and OMRR still apply on land in the ALR, but in some instances, the ALCA, ALRUSPR, and the FPPA may alter the application of some local government bylaws to operations in the ALR.

With respect to the compost operations outside the ALR, the EMA, OMRR and local government bylaws all apply. However, there may be instances of compost operations on land designated as farmland but that is outside the ALR to which the FPPA and its attendant changes to local government bylaws may still apply.

### 2.1 Composting in the Agricultural Land Reserve

The Agricultural Land Reserve (ALR) is a provincial zone in which agriculture is recognized as the primary use. Farming is encouraged on the land while non-agricultural (“non-farm”) uses are controlled. Any legislation, regional or local bylaws and land use plans that may pertain to the ALR land are expected to comply with the *Agricultural Land Commission Act* (ALCA).<sup>94</sup>

The ALCA is a land use law that prescribes what activities can take place on the ALR. The primary regulation under the ALCA is the *Agricultural Land Reserve Use, Subdivision and Procedure Regulation* (ALRUSPR), which permits certain activities in the ALR by designating them as either a “farm use” or a “permitted use.” and specifies conditions that these uses must meet. The ALCA and ALRUSPR are not subject to any other enactments except the *Interpretation Act*, the *Environment and Land Use Act*, and the EMA and its regulations, including the OMRR, or unless specifically stated in the ALCA.<sup>95</sup> This means that all other enactments, such as local government bylaws that seek to regulate or prohibit certain activities on the ALR, can only do so where permitted, or to the extent that they do not conflict with the ALCA and ALRUSPR.

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<sup>94</sup> ALCA s.46

<sup>95</sup> ALCA s.2(1)

As explained in the following sections, the ALRUSPR allows composting in the ALR under certain circumstances and if the compost operation complies with certain enactments, such as the OMRR or AWCR. The OMRR permits the construction and operation of compost facilities and the application of biosolids or compost to land in the ALR so long as the activities are in compliance with all applicable legislation of BC, including the OMRR, ALCA, and ALRUSPR, and that the activities are conducted in accordance with “good agricultural practice.”<sup>96</sup>

Neither the OMRR nor other legislation define a “good agricultural practice.” The BC Ministry of Agriculture (MOA) has developed a reference guide consisting of factsheets that describe different farm practices, including composting.<sup>97</sup> The MOA asserts that the guidelines provided in these factsheets describe current practices used by farmers in BC and are not intended to serve as “best management practices” or formal standards. However, the MOA states that these factsheets describe what the Ministry considers to be normal farm practices for agricultural waste composting in the context of the *Farm Practices Protection (Right to Farm) Act*. Under this Act, the Farm Industry Review Board (FIRB) is granted the power to determine whether an activity is a “normal farm practice” in order to grant a farmer protection from formal nuisance complaints. If the factsheets are considered in a determination of a “normal farm practice,” the factsheets could also be used in a determination of a “good agricultural practice.” Other evidence of industry standards or normal practices can also be considered.

It is important to know whether the compost facility is located in the ALR in order to understand what legislation and regulations apply to the facility and what kind of composting is allowed. In short, if the compost facility is in the ALR, its operations must comply with the ALCA, the ALRUSPR and the OMRR. However, the interaction between this legislation and others can be complicated. The flowchart in [section 2.4](#) may be helpful to clarify this complexity.

### 2.1.1 Farm Uses

As the ALR has been set aside for agricultural purposes, it is important that any activities that occur on this land are for agricultural or farm uses, or do not interfere with the ability of the land to support these uses. To this end, the ALCA states that agricultural land in the ALR must only be used for “farm uses,” and prohibits all non-farm uses, unless they are otherwise permitted by the ALCA or the ALRUSPR.<sup>98</sup> Therefore, for a compost activity to legally operate on land in the ALR it must fit within the descriptions contained in the ALRUSPR of a “farm use” or, alternatively (as discussed in [2.1.3 below](#)), a “permitted use.”<sup>99</sup> Activities designated as “farm uses” include the construction, maintenance and

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<sup>96</sup> OMRR s.2(4)

<sup>97</sup> As of 6 April 2015, the BC Ministry of Agriculture *Reference Guide to Farm Practices* is no longer available online. It was previously found at <[http://www.al.gov.bc.ca/resmgmt/fppa/refguide/activity/870218-29\\_Composting.pdf](http://www.al.gov.bc.ca/resmgmt/fppa/refguide/activity/870218-29_Composting.pdf)>. There is some discussion of what constitutes a “normal farm practice” on the FIRB website, accessed 6 April 2015 at <[http://www.firb.gov.bc.ca/2011\\_farm\\_practices\\_normal\\_farm\\_practice.htm](http://www.firb.gov.bc.ca/2011_farm_practices_normal_farm_practice.htm)>

<sup>98</sup> ALCA s.20(1) *a person may not use agricultural land for a non-farm use unless permitted under the Act*

<sup>99</sup> ALCA s.1: “farm use” means an occupation or use of the land for farm purposes including farming of land, plants and animals and any other similar activity designated as a farm use by regulation, and includes a farm operation as defined in the FPPA.

operation of a building, structure, driveway ancillary service or utility necessary for that farm use.<sup>100</sup>

The following compost activities are designated as “farm uses” and are appropriate on the ALR:<sup>101</sup>

- The production, storage and application of compost from **agricultural wastes** produced on the farm for farm purposes in compliance with the *Agricultural Waste Control Regulation (Code of Agricultural Practice for Waste Management)*.
- The **application of compost and biosolids** produced and applied in compliance with the *Organic Matter Recycling Regulation*.
- The production, storage and application of **Class A Compost** in compliance with the *Organic Matter Recycling Regulation*, if **all** the compost produced is used on the farm. [emphasis added]

These compost activities may be regulated but cannot be prohibited by any local government bylaw, except by a farm bylaw made under s.917 of the *Local Government Act* (LGA) or, if the activity is undertaken on treaty settlement lands, by a law of the applicable treaty First Nation government.<sup>102</sup> This means that “farm uses” on the ALR can be subject to regulation by local governments, just like activities outside the ALR. However, local governments are unable to prohibit these “farm uses,” unless through a farm bylaw made under LGA s.917. To enact a farm bylaw under s.917, a local government requires the permission of the Minister of Agriculture.<sup>103</sup>

To date, only the City of Kelowna, the Township of Langley, the City of Abbotsford, and the Corporation of Delta have been granted the authority to enact s.917 farm bylaws.<sup>104</sup> These local governments may make bylaws in relation to the conduct of farm operations, the types of buildings, structures, machinery, facilities and equipment required for farm operations, siting, and prohibiting specified farm operations.<sup>105</sup> These bylaws may be situation-specific and based on the sizes and types of farms, site conditions, uses of adjoining land, and areas. The Minister of Agriculture must approve the farm bylaws adopted under s.917 and the Minister can also make regulations defining areas and circumstances (along with terms and conditions) not covered by the bylaws. These regulations may be different in different circumstances.

### 2.1.2 Normal Farm Uses Protected by FPPA

Recognizing that farming is important and that farm operations are often accompanied by smells and sounds that may not always be pleasant for neighbours, the BC Legislature enacted the *Farm*

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<sup>100</sup> ALRUSPR s.2(3)

<sup>101</sup> ALRUSPR s.2(2)(k), (m), (l)

<sup>102</sup> ALRUSPR s.2

<sup>103</sup> LGA s.903(5): Despite subsections (1) to (4) but subject to subsection (6), a local government must not exercise the powers under this section to prohibit or restrict the use of land for a farm business in a farming area unless the local government receives the approval of the minister responsible for the administration of the *Farm Practices Protection (Right to Farm) Act*.

<sup>104</sup> *Right to Farm Regulation* BC Reg. 261/97

<sup>105</sup> LGA s.917(1)

*Practices Protection (Right to Farm) Act* (FPPA) to protect farmers from liability for nuisance claims arising from any odour, noise, dust or other disturbance resulting from a farm operation. The Act prohibits the application of certain bylaws, such as nuisance bylaws, enacted under the *Local Government Act* (LGA) or the *Community Charter*. The FPPA also prevents a complainant from lodging an injunction or court order that stops the farm operation.

If a compost facility is part of a farm operation, or is a “farm operation” by virtue of being designated a “farm use” under ALCUSPR s.2(2) then it may be granted protection under the FPPA if it complies with the following requirements:<sup>106</sup>

- a) Be conducted in accordance with normal farm practices;
- b) Be conducted on, in or over land
  - o (i) in the ALR, (ii) on which by the LGA, farm use is allowed, (iii)...*concerning aquaculture...* or (iv) that is Crown land designated as farm land under FPPA ss.(2.1); and
- c) Not be in contravention with the *Public Health Act*, the *Integrated Pest Management Act*, the *Environmental Management Act* and its regulations, or any land use regulation.<sup>107</sup>

Any person who is aggrieved by any odour, noise, dust or other disturbance resulting from a “farm use” compost operation on the ALR can apply in writing to the Farm Industry Review Board (FIRB) for a determination as to whether the disturbance results from a normal farm practice.<sup>108</sup> As outlined in FPPA s.6, upon receiving a complaint, FIRB will convene a panel and hold a hearing. The complaint will be dismissed if the disturbance results from a normal farm practice. If the practice is found not to be a normal farm practice, the panel will order the farmer to cease the practice or modify it to make it consistent with normal farm practice.

A “normal farm practice” is a practice that is conducted by a farm business in a manner consistent with proper and accepted customs and standards as established and followed by similar farm businesses under similar circumstances, and any standards prescribed by the Lieutenant Governor in Council.<sup>109</sup> As mentioned above in [section 2.1](#), the Ministry of Agriculture has provided factsheets for various farm practices, including composting, which may be used by the FIRB for the determination of a “normal farm practice.”

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<sup>106</sup> FPPA s.2(2)

<sup>107</sup> FPPA s.1: **land use regulation** - an enactment that restricts or prescribes the use to which land or premises may be put or the nature of business or activities that may be conducted on land or premises, but does not include the following:

- (a) a bylaw under the following provisions of the *Community Charter*: s.8 (3) (d) [*firecrackers, fireworks and explosives*]; s.8 (3) (e) [*weapons other than firearms*]; s.8 (3) (h) [*nuisances, disturbances and other situations*]; s. 8 (3) (k) [*animals*]; s.8 (5) [*firearms*];
- (b) a bylaw under the following provisions of the *Local Government Act*: s.703 [*animal control authority*]; s.724 [*noise control*]; s.725 [*nuisances and disturbances*]; s.728 [*fireworks*].

<sup>108</sup> FPPA s.3

<sup>109</sup> FPPA s.1

If, in the opinion of the chair of the Board or the panel, the subject matter is trivial, the complaint is frivolous, vexatious or not made in good faith, or the complainant does not have a sufficient personal interest in the subject matter, the complainant may be refused a hearing, the hearing may be discontinued, or the decision withheld.<sup>110</sup>

An example of where the Board refused to continue a hearing on grounds of a vexatious application is found in a recent FIRB decision where a complainant sought a ruling that an operation was not a “farm operation” and therefore should not fall under the jurisdiction of the FIRB.<sup>111</sup> While FIRB had the jurisdiction to make such a ruling, complaints generally proceed under the presumption that the activity in question is a “farm operation” and the decision sought is whether the practice in question is a “normal farm operation.” The Board refused to make a ruling because the Board found that the complainant did not seek the remedies available in FPPA (an order that the farmer cease or modify the practice) but sought the ruling for the purposes of an ulterior legal proceeding.<sup>112</sup>

For a “farm use” compost operation to be granted protection from nuisance complaints under the FPPA, it is essential that all three requirements in FPPA s.2(2) (normal farm practice, conducted on specified land, and compliance with the appropriate enactments) are satisfied. The third requirement demands compliance with (amongst other enactments) the EMA and its regulations, namely the OMRR. If the operation is not compliant with the OMRR, then enforcement, including prohibition, can occur under local government bylaws and provincial laws regardless of the operation being in the ALR. A determination of compliance with the OMRR is different, and separate, from a determination that the operation is consistent with normal farm practices: just because an operation is consistent with “normal farm practices” does not necessarily mean that it is compliant with the OMRR.

“Farm use” compost operations that comply with the above requirements of the FPPA are further exempted from certain local government bylaws made under the *Community Charter* or the LGA.<sup>113</sup> By conducting the compost operation as a “farm use” in accordance with the requirements outlined in FPPA s.2(2) the operator cannot be charged for violation of those bylaws or prevented by injunction or court order from conducting that operation. The bylaws that are most relevant to compost operators are those relating to nuisances, noise and disturbances.

It should be noted that “farm use” compost operations that are conducted on land outside the ALR on which farm use is allowed by the *Local Government Act* are not granted this exemption from the

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<sup>110</sup> FPPA s.6(2)

<sup>111</sup> FIRB Farm Practices Complaints Decisions *Hardy & Bond v Stanhope Farms Ltd* (4 October, 2013) Accessed 6 April 2015 online: <[http://www.firb.gov.bc.ca/complaints/farm\\_practice\\_complaints/hardy\\_and\\_bond\\_v\\_stanhope\\_farms\\_ltd\\_decision\\_oct04\\_13.pdf](http://www.firb.gov.bc.ca/complaints/farm_practice_complaints/hardy_and_bond_v_stanhope_farms_ltd_decision_oct04_13.pdf)>

<sup>112</sup> *Ibid* pp.16

<sup>113</sup> FPPA s.2(3): If the requirements of s.2(2) [except s.2(2) (b) (ii)] are fulfilled, a farmer, by conducting a farm operation, does not contravene a bylaw made under the following provisions of the:

- a) *Community Charter*: s.8 (3) (d) [explosives], (e) [weapons other than firearms]; (h) [nuisances, disturbances]; (k) [animals]; and s.8 (5) [firearms];
- b) *Local Government Act*: s.703 [animal control authority]; s.724 [noise]; s.725 [nuisances and disturbances]; and s.728 [fireworks]



LGA or *Community Charter* bylaws specified in s.2(3) of the FPPA.<sup>114</sup> In addition, “permitted use” compost operations in the ALR do not qualify for this exemption as they are not considered “farm operations.”

### 2.1.3 Permitted Use

A composting operation that does not process agricultural waste or is not designated as a “farm use” under ALRUSPR s.2(2) may be still be permitted on land within the ALR. Section 3 of the ALRUSPR permits various land uses in the ALR and specifies the conditions that accompany these uses. One such land use is:

- S.3(1)(p) the production, storage and application of **Class A compost** in compliance with the *Organic Matter Recycling Regulation*, if at least **50%** of the compost measured by volume is used on the farm. [emphasis added]

These uses can be prohibited by local government bylaws or by a law of the applicable First Nation government if the lands in the ALR are treaty settlement lands. This means that a bylaw, such as the *Central Saanich Land Use Bylaw*, that requires that a compost operation in the agricultural zone (i.e. on the ALR) to use 100% of the compost on the property on which it is produced would, in effect, validly prohibit a “permitted use” compost operation that uses anything less than 100% of the compost of on its property and sells the rest. This ALRUSPR provision is silent on whether a “permitted use” compost operation can be regulated by a local government bylaw.

It should be noted that similar to “farm uses,” ancillary activities to these “permitted uses” that are necessary for that use (construction, maintenance and operation of buildings, structures, driveways etc.) are also permitted.<sup>115</sup> However, unlike a “farm use” compost operation, or composting of agricultural wastes, a “permitted use” compost operation on the ALR is not afforded any liability protection under FPPA for nuisances arising from the compost operation. It is also subject to all local government bylaws, such as a noise and nuisance bylaws.

### 2.1.4 Local Government Bylaws & the ALR

As discussed, local governments are granted authority to enact bylaws with respect to activities within their jurisdiction under the *Local Government Act* (LGA), *Community Charter*, and the *Environmental Management Act* (EMA). The LGA permits local governments to enact zoning bylaws, development permit areas, and in some instances, farm bylaws.<sup>116</sup> The *Community Charter* permits municipalities to enact bylaws in relation to a variety of municipal issues, such as nuisances and disturbances.<sup>117</sup> The EMA permits regional districts to make bylaws to regulate the management of

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<sup>114</sup> FPPA s.2(3)

<sup>115</sup> ALRUSPR s.3(5)

<sup>116</sup> LGA s.903, s.920 and s.917, respectively.

<sup>117</sup> *Community Charter* s.8

municipal solid waste or recyclable material in order to implement an approved waste management plan.<sup>118</sup>

However, various enactments refine the application of local government bylaws composting operations on the ALR including the ALCA, the ALRUSPR and the FPPA.

For example, s. 46(3) of the ALCA specifies how local government bylaws and First Nation government laws interact with farm land in the ALR. This section provides that local government bylaws can apply to the use of agricultural land within the ALR, but they must ensure consistency with ALCA, the ALRUSPR and the orders of the Agricultural Land Commission.<sup>119</sup> If the bylaws are inconsistent, they are of no force or effect to the extent of the inconsistency. Examples of inconsistency include allowing the use of the land in the ALR that is not permitted under the ALCA, and if the use of the land impairs or impedes the intent of the ALCA, the ARLUSPR or the orders of the Agricultural Land Commission.<sup>120</sup> The intent of these enactments appears to be to protect and preserve the agricultural land, while encouraging farm uses and controlling other uses on the ALR. Bylaws are not considered to be inconsistent if they impose additional restrictions on “farm uses” on the ALR in addition to those in the ALCA: this allows local governments to enact more stringent regulations on compost facilities than the ALCA or the OMRR might impose.

A good example of the application of a municipal bylaw to compost operations in the ALR is the provision in the District of Central Saanich Land Use Bylaw no. 1309 that requires that compost prepared in the agricultural zone must be applied to land in the same farm business as the land on which the composting occurs and may not be sold or removed from the premises on which it is produced.<sup>121</sup> This would allow a “farm use” compost operation described in ALRUSPR s.2(2)(m) (100% on-farm use) but it would not allow a “permitted use” compost operation described in ALRUSPR s.3(1)(p) which requires that a minimum of 50% of the compost be used on the property on which it is produced, the rest of which can be sold. As such, this bylaw provision effectively prohibits the sale of compost and therefore, the “permitted use” compost operation. However, since ALRUSPR s.3 provides that “permitted uses” may be prohibited by local government bylaws, this bylaw provision is within the authority of the municipality to enact.

In addition, as discussed in [section 2.1.2](#) above, the FPPA restricts the application of certain LGA and *Community Charter* bylaws to “farm uses” on the ALR.

## Summary

Compost operations may be permitted in the ALR if they can be designated as a “farm use” under

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<sup>118</sup> EMA s25(3)

<sup>119</sup> ALCA s.46(3) and (2)

<sup>120</sup> ALCA s.46(5)

<sup>121</sup> *District of Central Saanich (DCS) Land Use Bylaw no. 1309 s.25.A(3)(b)*

ALRUSPR s.2(2) or as a “permitted use” under ALRUSPR s.3(1). “Farm use” compost operations can be subject to regulation by local government bylaws but cannot be prohibited by a local government bylaw unless the bylaw is a Farm Bylaw made under LGA s.917 by a local government given the required authority by the Minister of Agriculture. Only Delta, Abbotsford, Kelowna, and Langley have this power. A “farm use” compost operation is protected from certain local bylaws and nuisance complaints arising from the operation by the FPPA if the operation fulfils certain requirements. These requirements are that the operation is consistent with “normal farm practices,” is conducted on the ALR or designated farm land, and is compliant with various enactments, including the EMA and the OMRR. A determination of what is a “normal farm practice” can be made by the Farm Industry Review Board, though this is no guarantee of compliance with the OMRR. A “permitted use” compost operation may be prohibited or regulated by local government bylaws and is not protected from nuisance claims or local government bylaws by the FPPA.

## 2.2 Non permitted compost facilities on the ALR

In keeping with the intent of the ALCA to encourage farming in the ALR and restrict or control other uses, as a general rule, compost facilities that are not designated as “farm uses” or “permitted uses” are not allowed on the ALR.<sup>122</sup> This is a land use matter within the jurisdiction of the Agricultural Land Commission. If a person contravenes a provision of the ALCA by operating a non-authorized compost facility, the Commission may order that the operation cease entirely, cease to the extent of the contravention, or that a person not take any action that would result in a contravention.<sup>123</sup> An operator of an unauthorized facility or who ignores a stop-work order commits an offence and is liable on conviction to a fine not exceeding \$1 million or imprisonment for not more than 6 months, or both.<sup>124</sup>

Exceptions to this general rule are permitted in some instances. If the owner of agricultural land would like to operate a compost facility that does not qualify as a “farm use” or a “permitted use” on the ALR, they may apply to the Commission to do so.<sup>125</sup> Section 25 of the ALCA outlines the terms by which the Commission may consider the application and the responses they may give. Section 26 of the ALCA allows for the Commission to delegate their power to respond to non-farm use applications to the local government. In subsequent sections (s.27 to s.36), the ALCA outlines the application procedure.

## 2.3 Composting on land outside the ALR

If the compost facility is located outside the ALR, it must still comply with the enactments set out in [Part 1](#) of this report (EMA OMRR, AWCR, Regional District Bylaws and Municipal Bylaws).

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<sup>122</sup> ALCA s.20(1)

<sup>123</sup> ALCA s.50

<sup>124</sup> ALCA s.57(1)

<sup>125</sup> ALCA s.20(3)

In addition, if a non-ALR compost facility is located on land designated for farm use by the *Local Government Act* or on Crown land designated as farm land by the Lieutenant Governor in Council, and fulfills the specified requirements of FPPA (normal farm practice, compliance with applicable enactments such as the OMRR) it is afforded the protections under FPPA from liability for nuisance complaints arising from disturbances resulting from the compost facility and is exempted from the specified local government bylaws.<sup>126</sup>

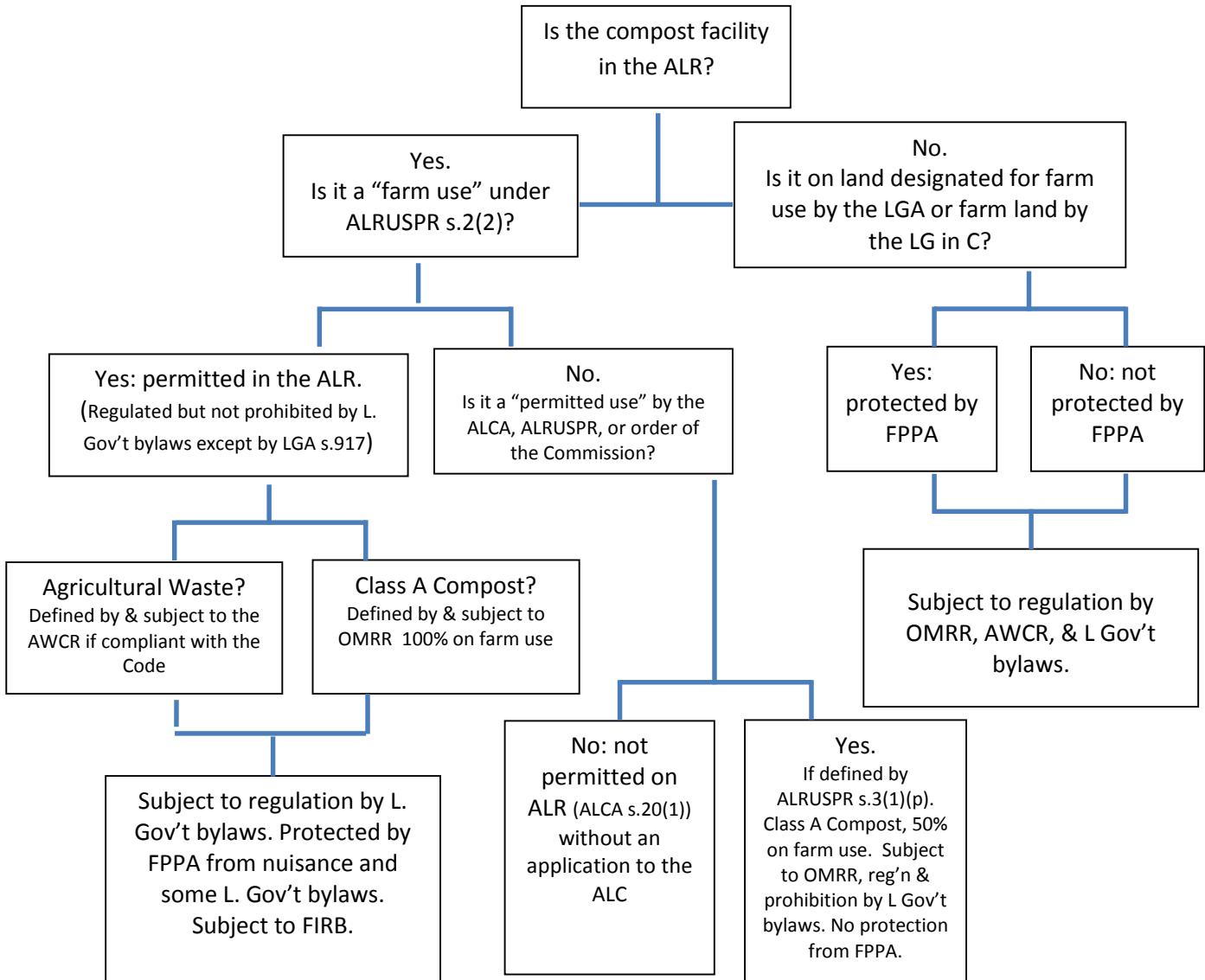
## Summary

Compost operations are permitted in the ALR if the operation deals with agricultural waste or if the operation can be defined as a “farm use” or a “permitted use” under the ALRUSPR. Both types of operations are subject to provincial enactments such as the EMA and OMRR and local government bylaws. The local government bylaws may regulate compost operations beyond the requirements imposed by the OMRR, ALCA and ALRUSPR as long as the bylaws do not conflict with these enactments. However, a “farm use” operation may be granted some exemptions under FPPA from the application of local government bylaws and nuisance claims. Compost operations that do not fit under the designations “farm use” or “permitted use” are not permitted on the ALR, absent a successful application to the ALC for a non-farm use. Compost operations located outside the ALR must comply with all relevant enactments without exception.

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<sup>126</sup> FPPA s.2

## 2.4. Flow Chart: BC Compost Facility Regulatory Framework



hey!  
**food  
scraps**  
belong in your  
green bin **food isn't  
garbage**



[metrovancover.org/foodscraps](http://metrovancover.org/foodscraps)



## PART 3 - RECOMMENDATIONS FOR LAW REFORM IN BRITISH COLUMBIA

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This part identifies issues with the BC compost regime, suggests recommendations for law reform, and where possible, provides examples of practices employed in compost regimes elsewhere that are useful examples for implementing these recommendations. The majority of our recommendations focus on the OMRR because this is the provincial law that applies to compost facilities across BC and acts as the framework for the regional district and municipal compost bylaws.

In the absence of amendments to the OMRR, many of these recommendations could be implemented through local government bylaws. As discussed in sections 1.3.1 and 1.3.2, local governments (both regional districts and municipalities) are able to impose requirements on compost facilities that are additional to and more stringent than provincial laws like the EMA, OMRR, or ALCA, providing that the bylaws are not inconsistent or in conflict with the provincial enactments.<sup>127</sup> [Section 3.4](#) discusses this with respect to the recommendations in more detail below.

In developing recommendations and finding best practices, the Alberta compost regime is used heavily as it provides a very clear and detailed set of regulations. Regimes in BC, Ontario, Texas, and California are also relied upon.

In the course of this process, we did not rely on resources readily available to BC compost operators and local governments, namely the *Compost Facility Requirements Guideline: How to Comply with Part 5 of the Organic Matter Recycling Regulation (“OMRR Part 5 Guidelines”)*. In part this was because the *OMRR Part 5 Guidelines* should be known and available to compost operators and government officials but also because the contents of this guideline are merely for guidance and are not legal requirements. The intent of this Part of our report is to find fresh examples of strong compost regulations that impose legally binding requirements on compost operators. However, the *OMRR Part 5 Guidelines* still contain useful information and any efforts to reform to the OMRR should consider the contents of this document and adopt them into the OMRR where relevant.

As noted in the introduction, the following recommendations recognize the costs of implementation and economies of scale challenges that small facilities face. It will often be the case that smaller facilities are subject to less stringent legal and operational requirements than larger facilities, as appropriate to the relative risks that they pose. However, facilities of all sizes have the capacity to harm human and environmental well-being. These public and environmental health elements must remain the foremost priority in any compost operation. The fundamental basis of compost operations, whatever the size of the facility, is that they cannot have adverse environmental

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<sup>127</sup> EMA s.37(5), ALCA s.46(6)

impacts and significantly disrupt the human enjoyment of the surrounding neighbourhood.

### **3.1 Summary of Recommendations**

In summary, the recommendations address the following issues:

#### ***Design and Construction of the Compost Facility***

The location and structure of the facility, and the types of technology used in the production process are critical components of a successful compost facility. If these elements of the facility are not designed and implemented correctly, the facility can have serious operational issues and a high risk of causing pollution and nuisance.

#### ***Storage***

Both feedstock and finished compost pose a significant risk of causing odour and pollution problems, therefore, the accumulation and storage of these materials must be managed appropriately.

#### ***Personnel***

The people working at the compost facility must ensure the correct operation of the facility and proper management of the feedstock and finished materials. Since they are best placed to avoid and respond to any issues that arise in the course of the operations it is important that they are appropriately qualified for the job.

#### ***Odour Management***

The type and quantity of feedstock materials make unpleasant odours a common cause for concern and the basis of complaints from facility neighbours. However, the use of appropriate composting technologies, and detection and response procedures can reduce odours and mitigate the nuisance that these materials cause.

#### ***Leachate Management***

Feedstock and finish compost materials can release liquid effluent known as “leachate” that has high concentrations of certain substances, some of which can be harmful. It is important to handle this leachate appropriately to ensure that it does not contaminate water sources or the surrounding environment.

#### ***Groundwater monitoring***

Groundwater is often an important source of drinking water, and it can be overlooked when considering the impact of an aboveground activity such as a compost facility. Careful planning and on-going



monitoring is required to protect this important resource.

### **Reporting**

Transparency and accountability are important characteristics of a successful and compliant compost facility. Government officials and the public must have adequate and timely information about a compost facility in order to make informed decisions about the facilities in their communities and to hold facility owners and operators accountable for their actions.

### **Community involvement**

Given the potential impacts of a compost facility on the surrounding community, it is important that a facility operator maintains a social licence from the community as a good neighbour. The community must have an appropriate level of involvement in decisions concerning the facility that may affect them as well as in the on-going monitoring of the facility.

In order to address these areas of compost regulation, it is recommended that:

1. The OMRR require an Environmental Impact Study for compost facilities with a capacity of less than 20,000 tonnes.
2. The OMRR adopt a more specific list of required design elements and technology for buildings, works, and systems within the compost facility.
3. The OMRR adopt mandatory facility siting criteria based on the siting recommendations currently found in the *OMRR Part 5 Guidelines* and require that the eventual site be approved by the Director in all cases.
4. The OMRR adopt a set of requirements for the operation and closure plans to provide clear guidelines for effective operation and closure of the facility.
5. The OMRR adopt a rigorous definition of “qualified professional” that ensures that the design and operation of a compost facility properly falls within the qualified professional’s expertise. The OMRR should also outline the scope of the qualified professional’s liability for problems that arise from the negligent design and operation of compost facilities.
6. The OMRR adopt a certification program for compost facilities operators.
7. The OMRR make the storage requirements for compost consistent throughout the regulation and require an impermeable surface in the storage facility or site. The surface should be defined by a minimum permeability factor, not by the type of material.
8. The storage requirements in the OMRR are expanded to include Class A Compost and Biosolids Growth Medium.
9. The OMRR adopt more rigorous and clearly defined objectives for the protection of the environment, human health and well-being from the impact of odour.
10. The OMRR include a definition of “odour” in the regulation and provide legally enforceable provisions that regulate the release of odours that can cause adverse effects.

11. The OMRR adopt an odour management plan (OMP) for compost facilities of all sizes and require the mandatory implementation of the OMP following a set of specific requirements.
12. The province of BC adopt an odour complaints investigation procedure that can apply to the odours that are released from a broad number of activities, including compost. The OMRR should also require facilities to implement an Odour Contingency Response Plan to minimize and remedy the cause of any offensive odour.
13. The OMRR use a more broad definition of “leachate” in order to capture potentially harmful effluents to the environment and human health that may arise from the full range of materials that may be present at the facility.
14. The OMRR require a leachate management system for all facilities, regardless of their production capacity.
15. That the OMRR provision dealing with leachate be clarified to outline how to properly dispose of the leachate to provide facility operators, neighbours and government officials with specific guidelines as to how the leachate is to be treated and disposed.
16. The OMRR require the implementation of a groundwater monitoring program and groundwater monitoring system for all facilities, regardless of their production capacity.
17. The OMRR require the establishment and maintenance of a comprehensive set of records that captures the entire extent of operations and activities that take place in the facility.
18. The OMRR require that all documents, reports and results relating to the design and operation of the compost facility be submitted (or made available upon request) to the local government for review and comment by the municipal or regional district waste manager and for viewing by the public.
19. The OMRR adopt a mandatory “self-reporting” scheme for contraventions of provincial laws or local government bylaws. Financial penalties for contraventions should be implemented as a last resort and emphasis should be placed on engaging the compost facility owners and operators to voluntarily adhere to regulations and work through operational problems with the Ministry of Environment or local governments.
20. The OMRR require a public consultation process before a facility can be constructed in a community and require that the facility operator engage with the community during the operation of the facility to manage ongoing issues and potential nuisances.
21. The local and provincial governments develop a working relationship to harmonize the various levels of regulation in the regime and to clarify the roles of each entity.
22. The formation of a compost advisory committee composed of local and provincial governments, governmental agencies, industry, community organizations and local landowners in order encourage dialogue and collaboration between all parties with interests regarding compost operations in BC.

### **3.2 Model Regulations and Facilities**

There are a number of jurisdictions in North America that can serve as good models for improving the BC compost regulatory scheme. The jurisdictions that we have used are Alberta, Ontario, Texas, and California.

Alberta has provided the most comprehensive regulatory model and we have drawn examples from their regulations with respect to design and construction, personnel, storage, odour and leachate management, groundwater monitoring, reporting, and community involvement. Ontario has provided a model for incorporating siting requirements, while both Texas and California have provided examples for odour management.

### 3.2.1 Alberta

The province of Alberta has a very comprehensive and robust compost regulatory regime. The province, through the Ministry of Environment and Sustainable Resource Development, oversees the regulatory scheme with very little input from the local governments.

We have used the Alberta regime extensively because it more clearly defines the required elements of compost regulation than the BC regime. While the Alberta regime does not mention the land application and distribution of compost, it has an in-depth focus on the operations of the compost facility itself.<sup>128</sup> This is where the BC regime requires the most improvement. For example, the OMRR requires that the plans and specifications must include “an operating and closure plan for the composting facility” but does not specify what should be included in these plans.<sup>129</sup> In contrast, the Alberta *Code of Practice for Compost Facilities* has six specific requirements for inclusion in an operations plan,<sup>130</sup> and the more recent *Standards for Composting Facilities in Alberta* has 16 specific requirements.<sup>131</sup> This level of detail is present in all the requirements of the Alberta regulations, providing a more clear and consistent set of guidelines for operators, officials and the public. The Alberta regime also contains compost facility requirements that are absent from the OMRR, such as provisions for a groundwater monitoring system.

Since we have used the Alberta regime extensively, we will first outline the structure of the regime below. This will provide some context for understanding our recommendations and best practices. We will not do this for the other jurisdictions used as examples in this Part.

There are several enactments that are relevant in the Alberta regime:

- Environmental Protection and Enhancement Act
- Waste Control Regulation
- Activities Designation Regulation
- Approvals and Registration Procedure Regulation

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<sup>128</sup> The Alberta regime does not address land application of compost because if the compost meets the Canadian Council of Ministers of the Environment quality standards (Alberta’s adopted standard), the risk of causing contamination from application of compost is unlikely. This is a similar rationale to why the OMRR does not regulate the land application and distribution of Class A Compost and Biosolids Growth Medium.

<sup>129</sup> OMRR s.24(2)(e)

<sup>130</sup> Code of Practice for Compost Facilities (Alberta) s.7(1)

<sup>131</sup> Standards for Composting Facilities in Alberta s.1.3

- Code of Practice for Compost Facilities
- Standards for Composting in Alberta (Class II and III)

The *Environmental Protection and Enhancement Act* (EPEA) requires that waste can only be disposed of “at a waste management facility, or in a container the contents of which will be taken to a waste management facility, that is the subject of the appropriate approval, registration or notice required under this Act.”<sup>132</sup>

The *Waste Control Regulation* (WCR), enacted under s.38 of the EPEA, sets out the requirements of waste management facilities including definitions of Class I and Class II compost facilities:<sup>133</sup>

‘Class I compost facility’ means a waste management facility where waste, not including hazardous waste, is decomposed through a controlled bio-oxidation process, including a thermophilic phase, that results in a stable humus-like material, but does not include

- (i) a residential composter,
- (ii) a compost facility that receives only sludge as defined in the *Wastewater and Storm Drainage Regulation*,
- (iii) a Class II compost facility, or
- (iv) a manure storage facility as defined in the *Agricultural Operation Practices Act*.

‘Class II compost facility’ means a waste management facility where only vegetative matter or manure is decomposed through a controlled bio-oxidation process, including a thermophilic phase, that results in a stable humus-like material, but does not include

- (i) a residential composter, or
- (ii) a manure storage facility as defined in the *Agricultural Operation Practices Act*.

Class I compost facilities typically process mixed feedstock such as food scraps or biosolids. Class II compost facilities typically process leaf and yard waste.

The WCR requires that Class I and II compost facilities demonstrate, at a minimum, adherence to the requirements of the WCR and the standards and requirements set out in the *Code of Practice for Compost Facilities*.<sup>134</sup> Furthermore, the WCR requires that Class I and II compost facilities be supervised by a certified operator,<sup>135</sup> and that compost facilities are constructed and operated so that the generation of odours is minimized, the run-on and run-off water is controlled so that surface water and groundwater are not contaminated, and animals and vectors of disease are controlled.<sup>136</sup>

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<sup>132</sup> *Environmental Protection and Enhancement Act*, RSA 2000, c E-12 (EPEA) s.176

<sup>133</sup> *Waste Control Regulation* Alta Reg 192/1996 (WCR) s.1(e) and (f)

<sup>134</sup> WCR s.24

<sup>135</sup> WCR s.25

<sup>136</sup> WCR s.38

The *Activities Designation Regulation* sets out whether an approval, registration or notice is required for a particular activity.<sup>137</sup> An approval is required for the construction, operation, or reclamation of a Class I or Class II compost facility that accepts more than 20,000 tons of waste per year for composting.<sup>138</sup> A registration is required for the construction, operation, or reclamation of a Class I compost facility that accepts not more than 20,000 tons of waste per year for composting.<sup>139</sup> Notice to the Director is required for the construction, operation, or reclamation of a Class II compost facility that accepts less than 20,000 tons per year.<sup>140</sup>

The *Approval and Registration Procedure Regulation* sets out the requirements for an application made to the Director for an approval or a registration.<sup>141</sup> Amongst the comprehensive list of requirements is a requirement for “a description of the public consultation undertaken or proposed by the applicant.” The Director may also request oral information or additional written information from, amongst others, a person who is directly affected and a local authority or government personnel or agency.<sup>142</sup>

The *Code of Practice for Compost Facilities (“Alberta Code”)* is the minimum standard for Class I facilities, regardless of how much waste they accept. It is incorporated by the *Waste Control Regulation* under the authority of s.36 of the EPEA. This means that adherence to the *Alberta Code* is a mandatory legal requirement of holding an approval for a compost facility.<sup>143</sup> The *Alberta Code* sets out comprehensive and highly detailed standards for composting. It addresses design and construction, operating requirements, monitoring, compost quality, reclamation, record keeping, and reporting. Class II composting facilities are not legally bound to follow the *Alberta Code*, but it is recommended that they do so.

Class I and Class II compost facilities that accept **more** than 20,000 tons of waste must apply for an approval. This approval comes with terms and conditions that are additional to and generally more rigorous than the requirements set out in the *Alberta Code*. These conditions are determined on a case-by-case basis through dialogue between the Director and the applicant. The terms and conditions from the Approval (permit) for the Edmonton Waste Management Centre (“*EWMC Approval*”) are used below to provide an example of best practices.

The *Alberta Code* is a relatively old requirement and has been unofficially replaced by the *Standards for Composting in Alberta (Class II and III) (“Alberta Standards”)*. The *Alberta Standards* set more detailed and rigorous baseline requirements for all compost facilities across a number of areas, and key changes include more stringent monitoring and protection for groundwater and a more

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<sup>137</sup> *Activities Designation Regulation*, Alta Reg 276/2003 (ADR) s.5

<sup>138</sup> ADR Schedule 1, Division 1(I)

<sup>139</sup> ADR Schedule 2, Division 2(e)

<sup>140</sup> ADR Schedule 3(a)

<sup>141</sup> *Approvals and Registrations Procedure Regulation* (ARPR) Alta 113/1993 (ARPA) s.3(1)(q)

<sup>142</sup> ARPR s.5

<sup>143</sup> Personal communication with Natasha Page, Alberta Environment and Sustainable Resource Development, 22 April 2014.

comprehensive odour management plan. Many of the provisions in the *Alberta Standards* impose requirements that must be carried out by the “registration holder.” The “registration holder” is the person, usually the owner of the facility, who has successfully applied to the Director for a registration to construct and operate a Class II compost facility as per the *Approval and Registration Procedure Regulation*. The *Alberta Standards* have also revised the definition of Class I and Class II composting facilities, and have added another class.<sup>144</sup> The *Alberta Standards* only refer to Class II and III facilities but, as with the *Alberta Code*, are meant to provide a minimum standard for Class I facilities as well. Since the legislation has not yet been amended to replace the *Alberta Code* with the *Alberta Standards*, the *Alberta Code* remains as the required minimum, and the facility operators are encouraged to use the *Alberta Standards* as an additional guideline. The following sections refer to compost facilities using the definition found in the *Alberta Code*; however, the best practices found in the *Alberta Standard* can be applied to facilities of any size.

There are a number of specific best practices that can be taken from the Alberta compost regime that are explored in more detail below. In general, the Alberta regime provides a more comprehensive regime that more fully addresses the public interest aspects of compost regulation than the BC regime because it sets clear and highly detailed requirements for a wider range of elements of compost facility operations. This provides facility operators, government officials, and the public with clear guidelines and standards as to how a compost facility should be operated.

### 3.2.2 Ontario

The Ontario compost regime demonstrates how policy guidelines can be adopted into a legal framework and serves as an example of how the *OMRR Part 5 Guidelines* may be incorporated into the BC regime. The Ontario *Environmental Protection Act* (EPA) requires that the construction and operation of a waste management system, such as a compost facility, must be done in accordance with an environmental compliance approval (ECA) issued by the Director.<sup>145</sup> *Regulation 347, General-Waste Management* made under the EPA incorporates the provisions found in Part II of the *Ontario Compost Quality Standards* into law.<sup>146</sup> As part of the powers of the Director under EPA s.20.3, the Director will refer to the *Guideline for Protection of Compost in Ontario* in his consideration of an ECA, thereby legally incorporating this document into the Ontario compost regime.

### 3.2.3 Texas and California

There are also instructive odour management examples from Texas and California. The Texas Commission on Environmental Quality has developed the “Odour Complaint Investigation Procedures”

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<sup>144</sup> The revised class definitions of compost facilities under the Alberta Standards are as follows:

Class I - accept more than 20,000 tonnes of feedstock per year.

Class II - accept 500 to 20,000 tonnes of leaf and yard waste per year, or up to 20,000 tonnes of feedstock per year.

Class III - accept 100 to 500 tonnes of leaf and yard waste per year.

<sup>145</sup> *Environmental Protection Act* (EPA) s.27(1)(b)

<sup>146</sup> *General-Waste Management, RRO 1990, Reg 347, s.3(2)25*

(OCIP) to help evaluate nuisance odour complaints.<sup>147</sup> The California compost regulation, *Chapter 3.1 - Compostable Materials Handling Operations and Facilities Regulatory Requirements*, outlines an “Odor Impact Minimization Plan” for a similar purpose.<sup>148</sup>

### 3.3 Issues, Recommendations & Best Practices

This section reviews a number of issues across a variety of areas within the BC compost regulatory regime and makes 21 recommendations for reform. It includes examples from the regimes in Alberta, Ontario, Texas and California to demonstrate how the recommendations have been implemented in other jurisdictions.

#### 3.3.1 Design & Construction of Facility

In order to avoid issues with odour, leachate, noise, and pests, it is important that site selection is the result of appropriate study, the plans and specifications for the design of the facility are adequate and comprehensive, and the facility is constructed correctly to handle the desired quantity and type of feedstock materials.

##### *Design Requirements for Smaller Facilities*

**ISSUE:** Compost facilities of all sizes are capable of causing odour, leachate and other nuisance problems, however, compost facilities with a production capacity less than 20,000 tonnes/yr (“smaller facilities”) are not subject to environmental impact assessment under OMRR s.23. They are subject to a lower standard of proof of “leachate management” and are not subject to being acceptable to the Director.

Section 23 of OMRR requires the facility discharger to have a qualified professional conduct an environmental impact study (EIS) before the facility can collect organic matter and distribute compost. The EIS is required to be acceptable to the director and include the following:<sup>149</sup>

- a) Design of the compost facilities, including buildings, works and other appurtenances;
- b) Odour and leachate collection and treatment systems; and
- c) Site preparation for the facility including buffer zones and plans to minimize the impact of the facility on adjacent lands.

Section 24 of the OMRR does require that all new composting facilities and the modification of an existing facility have plans and specifications prepared by a qualified professional. These plans must

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<sup>147</sup> Texas Commission on Environmental Quality (2014) Accessed 6 April 2015 online: <<https://www.tceq.texas.gov>>

<sup>148</sup> CalRecycle (2014) *Chapter 3.1. Compostable Materials Handling Operations and Facilities Regulatory Requirements*

<sup>149</sup> OMRR s.23(2) Accessed 6 April 2015 online: <<http://www.calrecycle.ca.gov/Laws/Regulations/Title14/ch31.htm#17863>>

include:<sup>150</sup>

- a) all works to be constructed on the site,
- b) the design capacity of the composting facility,
- c) a leachate management plan which stipulates how leachate generated from any and all stages of the composting process will be minimized, managed, treated or disposed,
- d) and odour management plan which stipulates how air contaminants from the composting facility will be discharged in a manner that does not cause pollution, and
- e) an operating and closure plan for the composting facility.

Despite the above requirements in the plans and specifications, without the EIS, smaller facilities are not required to demonstrate to the satisfaction of a regulatory official that there are systems in place to deal with odour and leachate. The requirement for treatment systems under s.23 demonstrates a higher degree of preparedness in ensuring the prevention of harm than the provision of plans under s.24. As demonstrated by high profile compost facilities subject to numerous enforcement activities, smaller facilities are quite capable of causing harm through inadequate odour and leachate management systems.

**RECOMMENDATION 1:** That the OMRR extend the application of s.23 to compost facilities with a capacity of less than 20,000 tonnes. The environmental impact statement (EIS) for a smaller facility may be less rigorous than that of a larger facility, but an EIS should nevertheless be included in the requirements for these facilities as their operations can have significant negative impacts on local communities and environments. In particular, siting is a pass/fail issue that must be carefully scrutinized. As a further example of requirements for smaller facilities, the example of the Alberta Code has been included below.

**BEST PRACTICE:** The Alberta compost regulatory scheme requires that smaller facilities (defined as those that accept less than 20,000 tonnes of waste per year) are subject to the *Alberta Code*. The *Alberta Code* more clearly and specifically defines the design requirements for smaller facilities and includes:<sup>151</sup>

- A comprehensive design plan that includes 1) the operating capacity, 2) required structures for operations, and 3) structures, facilities, and equipment for the control of emissions of offensive odour and contaminated liquids,
- A composting pad with requirements for impermeability (0.5m clayey material, permeability of less than  $5 \times 10^{-8}$ m/s or equivalent material) and slope (at least 2%),
- A “run-on” control system that prevents the flow of surface water onto the storage, processing and curing areas,
- A run-off control and management system that provides protection of surface water quality in

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<sup>150</sup> OMRR s.23(2)

<sup>151</sup> Alberta Code of Practice for Compost Facilities s.6(1)(a)



- accordance with particular standards,
- Where the facility is enclosed within a structure or vessels, the facility shall have an air pollution control system to control emission of a) offensive odours, b) airborne microbials, and c) airborne particulates.

The *Alberta Standards* set out an even more detailed list of requirements for smaller facilities as part of the registration application and the facility design plan and specifications.<sup>152</sup>

### *Design Requirements for Larger Facilities*

**ISSUE:** The OMRR has few requirements for the types of buildings and works required in a compost facility. In the s.23 environmental impact study for larger facilities, the OMRR only requires the inclusion of the:

- a) design of the composting facilities, including buildings, works and other appurtenances,
- b) odour and leachate collection and treatment systems, and
- c) site preparation for the compost facilities, buffer zones and plans to minimize the impact on adjacent lands.<sup>153</sup>

The s.24 plans and specifications must include:

- a) all works to be constructed on the site,
- b) the design capacity of the composting facility,
- c) a leachate management plan which stipulates how leachate generated from any and all stages of the composting process will be minimized, managed, treated or disposed,
- d) and odour management plan which stipulates how air contaminants from the composting facility will be discharged in a manner that does not cause pollution, and
- e) an operating and closure plan for the composting facility.<sup>154</sup>

As compared to the more detailed requirements in the *EWMC Approval* below, the OMRR allows the facility owner and the qualified professional more latitude in determining what composting technologies will be present in the facility. This leaves some uncertainty as to what is necessary or required by law for a successful and compliant compost facility.

**RECOMMENDATION 2: That the OMRR adopt a more specific list of required design elements and technology for buildings, works, and systems within the compost facility in order to provide owners, operators, neighbours and government officials with clear guidelines that can be easily enforced. These requirements may apply generally to all larger facilities or may apply specifically to a particular facility as**

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<sup>152</sup> Alberta Standard s.1.2

<sup>153</sup> OMRR s.23(2)

<sup>154</sup> OMRR s.24(2)

deemed necessary by the director.

**BEST PRACTICE:** The Alberta regulatory scheme permits a measure of specificity for larger facilities. Class 1 facilities producing 20,000 tonnes or less must follow the *Alberta Code*. Facilities producing more than 20,000 tonnes (i.e. larger facilities) must also obtain an “approval” under the *Activities Designation Regulation* although they are also encouraged to use the *Alberta Code* as a minimum standard. The regional director may require additional safeguards through the approval process. As an example of the type of specificity possible, the *EWMC Approval* contains a comprehensive and clearly defined set of requirements for larger facilities in addition to the general design requirements listed by the *Alberta Code*. The *EWMC Approval* requires that “the approval holder shall operate and maintain a compost facility which includes all of the following:

- (a) An enclosed composting plant which includes solid waste receiving, transfer and storage areas; rotary mixing drums; aeration hall, finishing circuit building, and air collection and treatment facilities;
- (b) Gore composting facility;<sup>155</sup>
- (c) Windrow/static pile composting facility for yard waste, biosolids and manure;
- (d) Biosolids storage, dewatering, and mixing facilities;
- (e) Compost screening facilities;
- (f) Leachate collection facilities;
- (g) Compost handling and loading facilities;
- (h) Compost curing and storage facilities;
- (i) The required appurtenances for the operation and monitoring of the foregoing; or
- (j) Other features that are equivalent to the above as authorized in writing by the Director.”<sup>156</sup>

### *Facility Siting Requirements*

**ISSUE:** Compost facilities can make for smelly neighbours, which necessitates careful evaluation of facility location. However, the OMRR does not provide any siting guidelines or requirements for compost facilities. The *Compost Facility Requirement Guidelines: How to Comply with Part 5 of the OMRR (“OMRR Part 5 Guidelines”)* contains a useful section on Site and Environmental Conditions, which includes suggested buffer zone distances between a facility and other land types and uses.<sup>157</sup> However, the OMRR Part 5 Guidelines are not legally binding and therefore do not have to be followed in the design of a facility.

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<sup>155</sup> Gore composting is a particular type of composting procedure using a patented technology involving a semi-permeable membrane. More information can be found at <[http://www.gore.com/en\\_xx/products/fabrics/swt/all\\_about\\_waste\\_treatment.html?isAjax=true](http://www.gore.com/en_xx/products/fabrics/swt/all_about_waste_treatment.html?isAjax=true)>. Direction to this website does not represent an endorsement of this product.

<sup>156</sup> Alberta Approval s.4.4.1

<sup>157</sup> Forgie, D., Sasser, L., & Neger, M. (2004) *Compost Facility Requirement Guidelines: How to Comply with Part 5 of the Organic Matter Recycling Regulation*, pp 27. Accessed 6 April 2015 online: <<http://www.env.gov.bc.ca/epd/epdpa/mpp/pdfs/compost.pdf>>

**RECOMMENDATION 3:** That the OMRR adopt mandatory facility siting criteria based on the siting recommendations currently found in the *OMRR Part 5 Guidelines*. Siting should be approved by the Director in all cases.

**BEST PRACTICES:** Like the *OMRR Part 5 Guidelines*, the Ontario compost regime also provides useful siting considerations for determining the location of a compost facility.<sup>158</sup> However, it also provides a good example of how to make these guidelines legally binding. The Ontario compost regime requires the Director to refer to the *Guideline for Protection of Compost in Ontario* (“*Ontario Guideline*”) in their consideration of an environmental compliance approval (ECA), which is a requirement for a compost facility.<sup>159</sup> The inclusion of the *Ontario Guideline* as a condition of the ECA makes the language of the document legally binding on the operator of the composting site. This includes the important site considerations used to determine the location of a compost facility.

While the Ontario regime provides a good example of the adoption of guidelines into law, the siting considerations in the *Ontario Guidelines* do not set mandatory criteria or identify where a compost facility may or may not be permitted. This is understandable given the different economics and site conditions of each facility. However, BC lawmakers must define minimum baseline criteria, such as distance for compost facilities from ecologically sensitive sites and activities in the community. These should be adopted as mandatory criteria in the OMRR. This will clearly outline how and where a compost facility may be located, ensuring that they are not located in areas where nuisance and conflicts with neighbours and the environment are inevitable.

### *Operating Plans*

**ISSUE:** The OMRR requires that the plans and specifications for both large and small facilities must include an operating and closure plan for the composting facility, but does not outline what these plans should include.<sup>160</sup>

**RECOMMENDATION 4:** That the OMRR adopt a set of requirements for the operation and closure plans so that facility owners and operators, neighbours and government officials understand the prerequisites for effective operation and closure.

**BEST PRACTICES:** The *Alberta Standards* contain a detailed list of requirements for both the operations plan<sup>161</sup> and the final closure plan.<sup>162</sup> Please refer to the text of the *Alberta Standards* as the requirements are too extensive to list here.

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<sup>158</sup> Ontario Ministry of Environment (2012) *Guideline for Protection of Compost in Ontario*, s.3.3.1, pp 10. Accessed 6 April 2015 online: <<http://www.ontariocanada.com/registry/view.do?postingId=2304>> (“*Ontario Guidelines*”)

<sup>159</sup> *Ontario Guidelines*, pp 2.

<sup>160</sup> OMRR s.24(2)(e)

<sup>161</sup> Alberta Standard s.1.3

<sup>162</sup> Alberta Standard s.7

### 3.3.2 Personnel

A compost facility cannot be operated in a safe, acceptable, and efficient manner if the people involved in the design and operation of the facility are not able to carry out their responsibilities correctly and according to the law. The following recommendations seek to ensure that the “qualified professional” and the facility operators have the necessary training, expertise, and experience to fulfill their respective roles in the design and operation of the facility. This will better support the proper function of the facility and avoid problems with the local environment and community.

#### *Qualified Professional*

**ISSUE:** The OMRR requires the involvement of a “qualified professional” in certain elements of the compost operation including: land application planning, environmental impact study, facility design plans and specifications, and leachate management.

A “qualified professional,” as defined in OMRR means a person who:

- a. is registered in British Columbia with his or her appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and
- b. through suitable education, experience, accreditation and knowledge may be reasonably relied on to provide advice within his or her area of expertise as it relates to this regulation;

This definition provides an unclear and imprecise standard of a qualified professional (“QP”) for compost facilities.

The broad requirements of part (a) of the definition open the door to professionals from a variety of disciplines, many of whom would not be appropriately skilled to design a compost facility. Part (a) also relies on the relevant professional association to ensure the proper conduct and accountability of the QP. However, a professional association may not provide sufficiently rigorous or transparent oversight of their members to ensure confidence in the QP’s proper conduct.<sup>163</sup> For example, s.140 of the BC Institute of Agrologists (BCIA) bylaws indicates that summaries of the discipline hearing committee decisions may be made available to the public on the BCIA’s website, though a search of this website does not reveal any hearing summaries.<sup>164</sup> As such, it is unclear to what extent agrologists are held accountable by the BCIA for improper conduct. In addition, the OMRR does not indicate to what extent, if any, a QP would be held responsible or bear liability under the regulation for nuisances arising from a compost facility that is in violation of the regulation. This unclear accountability provides

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<sup>163</sup> For more information on issues surrounding professional reliance, refer to *Professional Reliance in British Columbia’s Environmental Regulations* (2014) by Mark Haddock. Accessed 6 April 2015 online:

<<http://www.elc.uvic.ca/documents/LRG2307-ELCProfessionalRelianceReport-9June2014.pdf>>

<sup>164</sup> British Columbia Institute of Agrologists (BCIA) Bylaws s.140 Accessed 6 April 2015 online:

<[http://bcia.com/images/client\\_docs/Section\\_7\\_Bylaws\\_EXTRA\\_NEW\\_Final\\_May\\_2014.pdf](http://bcia.com/images/client_docs/Section_7_Bylaws_EXTRA_NEW_Final_May_2014.pdf)>; BCIA Website: <<http://bcia.com/>>

insufficient oversight of a QP's conduct and limited assurances of adequate compost facility design and operation.

Part (b) of this definition does not define "suitable education, experience, accreditation, and knowledge". There is no explicit requirement that the QP have experience or education specifically relating to the design and operation of compost facilities.

**RECOMMENDATION 5: That the OMRR adopt a rigorous definition of "qualified professional" that more clearly defines the disciplines from which a QP can be chosen, taking into account the transparency of their professional association, and required qualifications, expertise, experience, accreditation and knowledge that are more closely related to the design and operation of a compost facility. As with other professional reliance regimes, the OMRR regime should address QP liability for problems that arise from their negligent design and operation of compost facilities.**

**BEST PRACTICE:** There are a number of examples that the OMRR could follow:

### **Defined Group of Qualified Professionals**

Although currently only an unenforceable guideline document, the *Alberta Standards* requires that: "[u]nless authorized in writing by the Director, the Facility Design Plan and Specifications shall be prepared by a professional registered with the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA)".<sup>165</sup>

This narrows the focus to a single body of professionals that has been deemed most qualified to provide the necessary services required for the design of a successful and compliant composting facility.

### **Establishment of a Roster**

#### ***Contaminated Sites Regulation (BC)***

The BC *Contaminated Sites Regulation (CSR)*, enacted under the *Environmental Management Act (EMA)*, requires the use of an "Approved Professional" for many activities. The EMA defines "approved professional" as a "person who is named on a roster established under section 42(2)".<sup>166</sup> This section permits the director to "designate classes of persons who are qualified to perform classes of activities, prepare classes of reports and other documents or make classes of recommendations that under this Act may be or are required to be performed, prepared or made by an approved professional."<sup>167</sup> The

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<sup>165</sup> Alberta Environment, Environmental Policy Branch (2007) *Standards for Composting Facilities in Alberta* s.1.2(2a) pg 8. Note: this professional body is now referred to as the Association of Professionals of Engineers and Geologists of Alberta. They can be found online at <<http://www.apega.ca/>>

<sup>166</sup> EMA s.39(1)

<sup>167</sup> EMA s.42(1)

director may also establish a roster of persons who are designated in the abovementioned class, as well as make changes to the roster, add and remove names, or suspend a professional from the roster.<sup>168</sup>

The Ministry of Environment has a well-developed system, protocols, and procedures for the administration of contaminated sites approved professionals.<sup>169</sup> The Ministry has granted management of the roster and the regulation and governance of contaminated sites approved professionals to the Society of Contaminated Sites Approved Professionals of BC (CASP).<sup>170</sup>

## **Rigorous & Clear Definition of Qualified Professional**

### ***Records of Site Condition – Part XV.1 of the Act (ON)***

*Records of Site Condition – Part XV.1 of the Act* (RSC), is an Ontario regulation enacted under the *Environmental Protection Act* that provides a comprehensive definition of a “qualified person” for a number of different situations. To use an example relevant to the role required of a QP under the OMRR, the RSC requires that “for the purposes of section 168.1 of the [Environmental Protection] Act in relation to the preparation or supervision of a risk assessment” a “qualified person” must hold particular and well defined qualifications relating to education (university degrees) and years of experience with the conduct and supervision of environmental site assessments or review of assessment of risk.<sup>171</sup> Both “environmental site assessment” and “assessment of risk” are also well defined in this provision.

### ***Mushroom Compost Facilities Regulation (BC)***

The BC *Mushroom Compost Facilities Regulation*, enacted under the EMA, also provide a more clear definition of the types of professionals acceptable under that Regulation. Section 2(1) requires that a “pollution prevention plan for the mushroom compost facility must be:

- b) reviewed and confirmed by an agrologist registered under the *Agrologists Act* or a professional engineer whose area of professional specialty includes the preparation and implementation of these pollution prevention plans.”<sup>172</sup>

## ***Operator Certification***

**ISSUE:** As the persons managing the day-to-day operations of a compost facility are handling materials

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<sup>168</sup> EMA s.42(2), (3), (4)

<sup>169</sup> Ministry of Environment (2011) *Approved Professionals*. Accessed 6 April 2015 online: <<http://www.env.gov.bc.ca/epd/remediation/roster/>> (Accessed on March 12, 2014)

<sup>170</sup> Society of Contaminated Sites Approved Professionals of British Columbia (2014) *Governance*. Accessed 6 April 2015 online: <<http://csapsociety.bc.ca/about/governance/>> (); BC Ministry of Environment (2010) *Facts on Contaminated Sites: The Roster of Approved Professionals*. Accessed 6 April 2015 online: <[http://www.env.gov.bc.ca/epd/remediation/fact\\_sheets/pdf/fs30.pdf](http://www.env.gov.bc.ca/epd/remediation/fact_sheets/pdf/fs30.pdf)>

<sup>171</sup> *Records of Site Condition- Part XV.1 of the Act* O Reg 153/04, s.6(1)

<sup>172</sup> *Mushroom Compost Facilities Regulation* B.C. Reg. 413/98, s.2(1) (Includes amendments up to B.C. Reg. 236/2013, November 28, 2013)

that carry significant potential to harm human and environmental health and create a nuisance, it is important that they have the requisite expertise and knowledge about the correct function of the facility. Section s.25(2)(b) of the OMRR does refer to a “personnel training program plan that addresses the specific training needed to operate the composting facility in compliance with this regulation” but there is no mention what this plan entails or by who it is approved. Outside of the this vague provision, there does not appear to be any other legislative or industry requirement that the persons managing the day to day operations of a compost facility have any particular training on the correct function of the facility.

**RECOMMENDATION 6:** That the OMRR adopt a certification program for compost facilities operators similar to the requirement found in the Alberta *Waste Control Regulation*. There should be at least one person at the facility at all times who has the required certification.

**BEST PRACTICE:** Section 25 of the Alberta *Waste Control Regulation* requires that “[t]he person responsible for a...Class I or Class II compost facility shall ensure that the facility is supervised by a certified operator during its hours of operation”.<sup>173</sup> This applies to operators of both large and small facilities.

To satisfy this requirement, the *EWMC Approval* requires that a Class I compost facility have three “Level 1A certified compost operators” and at least one in charge of each shift or on call at any given time.<sup>174</sup> The Alberta Department of the Environment and Sustainable Resource Development requires landfill and composting facility operators to attend a certification course, pass the exam and take acceptable training to maintain their certification. This course, the *Landfill and Compost Facility Operator Certification*, is administered by the Solid Waste Association of North America (SWANA) – Northern Lights Chapter.<sup>175</sup> The Compost Council of Canada is the certifying partner for compost facility certification. More information about certification can be found at the Alberta Environment and Sustainable Development website.<sup>176</sup>

### 3.3.3 Storage

Both feedstock and finished compost pose a risk of causing odour and pollution problems, therefore, the storage of these materials must be managed appropriately. The following recommendations seek to ensure that storage areas do not allow the release of harmful substances into

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<sup>173</sup> *Waste Control Regulation*, Alta Reg 192/1996, s.25(1)

<sup>174</sup> Alberta Approval s.4.1.2

<sup>175</sup> Solid Waste Association of North America – Northern Lights Chapter (2014) *Alberta Landfill Facility Operator Certification*. Accessed 6 April 2015 online: <[http://www.swananorthernlights.org/training\\_certification\\_exam.html](http://www.swananorthernlights.org/training_certification_exam.html)>

<sup>176</sup> Alberta Environment and Sustainable Resource Development, *Landfill and Composting Facility Operator Certification* (2014) Accessed 6 April 2015 online: <<http://esrd.alberta.ca/waste/waste-management-facilities/landfill-and-composting-facility-operator-certification.aspx>> (Note: this link is best accessed by an internet search of the title)

the environment and that storage requirements apply to all types of compost materials.

### *Impermeable Surface*

**ISSUE:** The OMRR requires that the receiving, storage, processing and curing areas of a composting facility must comply with certain conditions, including that it:<sup>177</sup>

Be located on asphalt, concrete or another similar impermeable surface that is capable of withstanding wear and tear from normal operations and that will prevent the release of leachate into the environment.

However, this requirement is inconsistent with the definitions provided in the OMRR for “storage facility” and “storage site,” in which managed organic material must be stored.<sup>178</sup> These definitions make no mention of an impermeable surface and suggest storage options that, at first glance, would not seem to require an impermeable surface similar to asphalt or concrete.

**RECOMMENDATION 7:** That the OMRR makes the storage requirements consistent throughout the regulation and require an impermeable surface in the storage facility with limited exceptions for agricultural in-field storage. To accommodate the various types of storage options, the type of impermeable surface should be defined by a minimum permeability factor, not by the type of material.

**BEST PRACTICE:** One of the design and construction requirements in the *Alberta Code* is that the composting pad be “constructed of at least 0.5m of clayey material having a permeability less than  $5 \times 10^{-8}$  m/s, or an alternative material that provides equivalent protection”. This provides a good example of how an impermeable surface can be defined by the material and a permeability factor in order to ensure a certain level of protection from leachate.<sup>179</sup>

### *Storage of Class A Compost and Biosolids Growth Medium*

**ISSUE:** The OMRR does not outline any requirements for the storage of Class A Compost or Biosolids Growth Medium. The storage provisions only relate to “managed organic matter”, which means Class A Biosolids, Class B Biosolids, and Class B Compost. However, large concentrated volumes of any type of finished compost material or biosolid that is stored uncovered for long periods of time can result in odour, pest, vector, and leachate problems.

**RECOMMENDATION 8:** That the storage requirements in the OMRR are expanded to include Class A Compost and Biosolids Growth Medium.

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<sup>177</sup> OMRR s.26(2)

<sup>178</sup> OMRR s.16; OMRR s.17

<sup>179</sup> Alberta Code s.6(1)(b)(i)



### 3.3.4 Odour Management

The very nature of large-scale compost production engenders the creation of unpleasant odours at compost facilities and often gives rise to complaints from neighbours. However, the use of appropriate composting technologies, and detection and response procedures can reduce odours and mitigate the nuisance that they cause. The following recommendations provide examples of how odours can be avoided and managed appropriately.

#### *Odour & Air Quality Objectives*

**ISSUE:** The OMRR requires that the plans and specifications include “an odour management plan that stipulates how air contaminants from the composting facility will be discharged in a manner that does not cause pollution.”<sup>180</sup> However, the objective “not to cause pollution” does not provide specific odour reduction objectives and ignores the impact that odour can have on human health, property and quality of life.

**RECOMMENDATION 9:** That the OMRR adopt more rigorous and clearly defined objectives for the protection of the environment, human health and well-being from the impact of odour. This will hold compost facilities to a specific standard of operations and ensure that they are better community neighbours. The obligation not to cause pollution should be accompanied by an obligation not to cause “material discomfort, harm or adversely affect the well-being or health of a person” as found in the *EWMC Approval*, below. It is also possible that the OMRR integrate s.15 of the *Public Health Act*, under which the OMRR is enacted, which prohibits a person from causing a health hazard.<sup>181</sup>

**BEST PRACTICE:** The *EWMC Approval* provides for more demanding objectives for odour and air quality and requires that “the approval holder shall not emit an air contaminant...that causes ...any of the following:

- a) impairment, degradation or alteration of the quality of natural resources; or
- b) material discomfort, harm or adversely affect the well-being or health of a person; or
- c) harm to property or plant or animal life.”<sup>182</sup>

#### *Odour & Air Quality Regulation*

**ISSUE:** The OMRR provides for odour management plans and systems, but it does not regulate “odour” itself and treats “odour” as a thing that has ascertainable impacts that can trigger legislated penalties.

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<sup>180</sup> OMRR s.24.2(d)

<sup>181</sup> *Public Health Act* SBC 2008, c 28 (“PHA”) s.15

<sup>182</sup> Alberta Approval s.4.2.6

**RECOMMENDATION 10:** Subject to the FPPA, that the OMRR more directly regulate “odour” by providing for legally enforceable provisions that regulate the release of odours that can cause adverse effects.

**BEST PRACTICE:** The *Ontario Guideline for the Production of Compost* includes a comprehensive section on odour: Part IV Odour Prevention and Control. This section indicates odour is regulated by a number of Ontario enactments including:

- *Environmental Protection Act* - regulates “odour” as a “contaminant” and therefore permits the ministry to inspect and require facilities to take measures to abate the release of odours and use charges and prosecution to ensure compliance.<sup>183</sup> References to “contaminants” can be found throughout the EPA but sections of note include:
  - EPA s. 9 requires that compost facilities obtain an environmental compliance approval (ECA) in order to discharge odours into the natural environment.<sup>184</sup>
  - EPA s.14 prohibits discharges that cause or may cause an adverse effect, even if individual contaminant-specific air standards are met.<sup>185</sup>
- *Ontario Regulation 419/05 – Local Air Quality* - establishes contaminant-specific concentration limits for some odorous contaminants. Compliance with this regulation requires an Emissions Summary and Dispersion Modelling (ESDM) report that includes a summary of total emissions for individual contaminants from a property.
- *Occupational Health and Safety Act* - regulates worker exposure to some odour compounds (ammonia and hydrogen sulphide) normally associated with composting.

### ***Odour & Air Quality Treatment System***

**ISSUE:** The OMRR requires an odour management plan for facilities of all sizes<sup>186</sup> and an odour treatment system for larger facilities,<sup>187</sup> but does not specify what the plan or system should entail. The current provisions are vague and do not establish meaningful standards.

**RECOMMENDATION 11:** That the OMRR adopt an odour management plan for compost facilities of all sizes, require the mandatory implementation of the odour management plan and include specific requirements similar to those found in the Alberta regulatory scheme.

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<sup>183</sup> *Environmental Protection Act*, RSO 1990, c E.19 (EPA) s.1

<sup>184</sup> EPA s.9

<sup>185</sup> EPA s.14

<sup>186</sup> OMRR s.24(2)(d)

<sup>187</sup> OMRR s.23(2)(d)

## **BEST PRACTICE:**

### ***EWMC Approval***

With respect to the management of odour in larger facilities, the *EWMC Approval* requires that larger facilities include:

- Air monitoring: collection and analysis of samples and reporting in accordance with specified guidelines for atmospheric pollutants, monitoring and reporting procedures, and odour concentration.<sup>188</sup> The release of air contaminants may only occur at designated sites within the facility (the Finished Circuit Building and the biofilters) and must be in accordance with a prescribed parameter.<sup>189</sup>
- The operation and maintenance of a “wet air handling system” to remove moisture and odorous compounds and treat air from the enclosed composting plant prior to discharge.<sup>190</sup> This system must include: a negative air pressure, fan, heat exchanger, exhaust air scrubber, and a biofilter system.
- Scheduled monitoring and annual reporting of odour at the facility and downwind at the boundary of the facility.<sup>191</sup>
- The development and implementation of a comprehensive odour management protocol for the facility, and a quality assessment/quality control program for odour measurement for the purpose of monitoring ambient odour levels in the area surrounding the facility.<sup>192</sup>

The *Alberta Code* requires that the person responsible for smaller facilities “shall develop, maintain and implement an operations plan that is consistent with the compost facility design and includes as a minimum...a plan for the management, detection, and mitigation of offensive odours” (along with other requirements).<sup>193</sup> While not as rigorous as the odour requirements found in the *EWMC Approval*, the requirement for “detection and mitigation” as well as the requirement for the implementation of the plan suggests a commitment to effective odour management.

In addition, see the *Alberta Standards* for a detailed list of requirements for an Odour Management Plan.<sup>194</sup>

### ***Ontario Guideline for the Production of Compost***

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<sup>188</sup> Alberta Approval s.2.3.1

<sup>189</sup> Alberta Approval s.4.2.4; Alberta Approval s.4.2.9

<sup>190</sup> Alberta Approval s.4.2.1

<sup>191</sup> Alberta Approval Table 4.2-B

<sup>192</sup> Alberta Approval s.4.1.11-14

<sup>193</sup> Alberta Code s.7(1)(e)

<sup>194</sup> Alberta Standards s.1.4

Part IV of the *Ontario Guideline for the Production of Compost* contains the following subsections that provide useful suggestions for odour control and prevention. While these suggestions are not mandatory requirements, the legal incorporation of this document into the Director's consideration of an environmental compliance approval (ECA) provides a strong indication that they should be followed:

- **Facility Siting and Design for Odour Control:** provides suggestions for how to determine the location and the design of the facility to minimize the odours and issues with neighbours.
- **Odour Impact Assessment (OIA)** – describes the OIA process to estimate the emission of odours from the site and assess whether the proposed facility siting and design can adequately control odours in order to avoid complaints.
- **Odour Control System** – describes the elements of an odour control system: containment, collection, treatment, dilution, and enhanced dispersion.
- **Facility Management for Odour Control** – includes a table of common odour sources and discussion about assessing feedback odour potential, nutrients and moisture, site management, operational controls, monitoring meteorological conditions, and on and off-site odour monitoring

### ***California - Compostable Materials Handling Operations and Facilities Regulatory Requirements (Chapter 3.1.)***

This Californian regulation provides another example of how a regulation can require odour management plans. Section 17863.4 outlines the requirements for an "Odor Impact Minimization Plan" (OIMP), which is required for all compostable material handling operations and facilities. The OIMP must include, at minimum:

- 1) an odor monitoring protocol that describes the proximity of possible odor receptors and a method for assessing odor impacts at the locations of the possible odor receptors;
- 2) a description of meteorological conditions effecting migration of odors and/or transport of odor-causing material off-site. Seasonal variations that effect wind velocity and direction shall also be described;
- 3) a complaint response protocol;
- 4) a description of design considerations and/or projected ranges of optimal operation to be employed in minimizing odor, including method and degree of aeration, moisture content of materials, feedstock characteristics, airborne emission production, process water distribution, pad and site drainage and permeability, equipment reliability, personnel training, weather event impacts, utility service interruptions, and site specific concerns; and,
- 5) a description of operating procedures for minimizing odor, including aeration, moisture management, feedstock quality, drainage controls, pad maintenance, wastewater pond controls, storage practices (e.g., storage time and pile geometry), contingency plans (i.e., equipment, water, power, and personnel), biofiltration, and tarping.

## *Responding to Odour Complaints*

**ISSUE:** Although the production of unpleasant odours is common to many types of facilities, compost facilities are well known for their particular odour issues and warrant specific attention. The OMRR does not establish a procedure for responding to or investigating odour complaints from the public. A municipal government can enact nuisance bylaws to regulate the odour from a compost facility and respond to complaints with respect to a compost facility not on the ALR. For a compost facility on the ALR, a person who is aggrieved by an odour can apply in writing to the Farm Industry Review Board (FIRB) who will determine whether the odour is one that is results from a normal farm practice. However, there are no guidelines provided by the provincial or municipal governments or by FIRB to indicate how an odour complaint will be evaluated.

**RECOMMENDATION 12:** That the province of BC adopt an odour complaints investigation procedure that can apply to the odours that are released from a broad number of activities, including compost. The OMRR should also require an Odour Contingency Response Plan that contains specific and transparent procedures for minimizing and remedying the cause of any offensive odour. As the Farm Industry Review Board (FIRB) already has a procedure for dealing with odour complaints, there should be discussion concerning the interaction between this recommended procedure and that which occurs with farm businesses (“normal farm practices”) on the ALR.

**BEST PRACTICES:** The Texas Commission on Environmental Quality (TCEQ) has specific Odour Complaint Investigation Procedures (OCIP) to help evaluate nuisance odour complaints.<sup>195</sup> These procedures apply to odours emitted from a broad range of activities, including compost. TCEQ staff use an internal procedural document known as the FIDO Chart (Frequency, Intensity, Duration and Offensiveness) to describe the odour.<sup>196</sup> This chart provides a means to log the relevant information of a particular odour, characterize and determine its frequency and duration in order to objectively assess a complaint. This document is no longer published on the TCEQ website but has been reproduced in the Appendix. The TCEQ website also provides an Odor Log for the public to use when they submit an odour complaint.<sup>197</sup>

The *Alberta Standard* includes a provision outlining how to investigate an odour complaint and upon the discovery of an offensive odour requires the implementation of specific procedures in the

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<sup>195</sup> Information on the TCEQ Complaints Reporting process can be found at <[https://www.tceq.texas.gov/complaints/odor\\_complaint.html](https://www.tceq.texas.gov/complaints/odor_complaint.html)> (Accessed 6 April 2015)

<sup>196</sup> As we understand from personal communication with Renee Carlson, the Publishing Manager at TCEQ, this document is scheduled to undergo some changes in March 2015 and will not be posted online after that time. However, for the purposes of this report, the FIDO chart contain in the Appendix below is still a useful model for odour complaint assessment.

<sup>197</sup> Texas Commission on Environmental Quality *Odor Log*. Accessed 6 April 2015 online: <<http://www.tceq.texas.gov/assets/public/compliance/odor-log-public.pdf>>

Odour Contingency Response Plan to minimize or remedy the cause of the offensive odour.<sup>198</sup>

### 3.3.5 Leachate Management

Feedstock and finished compost materials can release liquid effluent known as “leachate” that can have high concentrations of certain substances, some of which can be harmful to human health and the environment. The following recommendations address how to handle this leachate appropriately to ensure that it does not contaminate water sources or the surrounding environment.

#### *Definition of Leachate*

**ISSUE:** The OMRR definition for “leachate” does not include effluent or water that originates from Class A Compost or Biosolids Growth Medium. This omission is due to the low pollution risk that these materials are thought to have. However, having noted the increase of migration of nitrates into the soil from Class A Compost, the Cowichan Valley Regional District has recommended that effluent from all finished compost materials be included in the OMRR definition of leachate.

**RECOMMENDATION 13:** That the OMRR use a more broad definition of “leachate” in order to capture potentially harmful effluents to the environment and human health that may arise from the full range of materials that may be present at the facility.

**BEST PRACTICE:** The *Alberta Code* uses a more broad definition of leachate that captures fluid from all feedstock and composted materials: “a liquid that has percolated through and drained from feedstock or compost and has extracted dissolved or suspended materials”.

#### *Leachate Management Plan*

**ISSUE:** Section 24(2)(c) of the OMRR requires a leachate management plan for both smaller and larger facilities. Section 23(2)(b) of the OMRR requires a leachate collection system for larger facilities. However, s.26(2)(c) requires that the receiving, storage, processing and curing areas of a composting facility, regardless of the production capacity, must have “a leachate collection system designed, constructed, maintained and operated to reuse leachate, or to remove leachate, from the receiving, storage, processing and curing areas.”<sup>199</sup>

**RECOMMENDATION 14:** That the OMRR clarify this inconsistency by requiring a leachate collection system for all facilities.

**BEST PRACTICE:** The *Alberta Standards* refers to leachate as “process water”, which is defined as a “combination of storm water run-on, leachate, equipment wash down water and any other wastewater

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<sup>198</sup> Alberta Standard s.4.7 and 4.8

<sup>199</sup> OMRR s.26(2)(c)

generated on site.”<sup>200</sup> The *Alberta Standards* set out the required components for the management of process water that include:

- Provisions for process water, retention ponds and control of process water in the engineering maps and plans required for the Facility Design Plan and Specifications;<sup>201</sup>
- Process water management procedures within the Operations Plan;<sup>202</sup>
- Requirements for retention ponds;<sup>203</sup> and
- Process water and retention pond sediment disposal procedures.<sup>204</sup>

### *Leachate Disposal*

**ISSUE:** The OMRR requires that “leachate that is not collected and reused in the composting process must not be discharged into the environment unless authorized under the Act”.<sup>205</sup> Section 14 of “the Act”, the *Environmental Management Act*, provides for a permit process authorizing the introduction of waste into the environment. . This process is complicated, and should be streamlined for facility operators to dispose of leachate if they cannot collect and reuse it.

**RECOMMENDATION 15:** That the OMRR provision dealing with leachate be clarified to outline how to properly manage leachate to provide facility operators, neighbours and government officials with specific guidelines as to how the leachate is to be treated and disposed.

**BEST PRACTICE:** The Alberta compost regime provides clear directions as to how to manage leachate. For smaller facilities, the *Alberta Code* prevents the release of leachate or run-off from the composting pad to the surrounding watershed unless it meets the one of the following standards:

- the surface water background quality,
- specific guidelines published by Alberta Environmental Protection, or
- the Canadian Water Quality Guidelines published by the Canadian Council of Ministers of the Environment (CCME).<sup>206</sup>

While the *Alberta Code* requires that there is a “run off control and management system” in place that provides protection for surface water quality in accordance with these standards, it does not indicate what this technical system should consist of.<sup>207</sup>

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<sup>200</sup> Alberta Standards Definitions (rr)

<sup>201</sup> Alberta Standards s.1.2(b)(ii)f, i

<sup>202</sup> Alberta Standards s.1.3(i)

<sup>203</sup> Alberta Standards s.3.3

<sup>204</sup> Alberta Standards s.5.3, s.5.4

<sup>205</sup> OMRR s.26(3)

<sup>206</sup> Alberta Code s.7(4)

<sup>207</sup> Alberta Code s.6(1)(d)

For larger facilities, the *EWMC Approval* requires that the leachate be treated at an approved wastewater treatment facility unless it can be utilized in the compost process or evaporated.<sup>208</sup>

The *Alberta Standard* requires that process water (which includes leachate) shall only be disposed of in the following manner:<sup>209</sup>

- a) at an Alberta Environment approved wastewater treatment facility;
- b) by irrigation in accordance with the safe limits “Guidelines for Municipal Wastewater Irrigation” published by Alberta Environment, as amended; or
- c) as otherwise authorized in writing by the Director

### 3.3.6 Groundwater Monitoring

Groundwater plays an important role in the hydrologic system and can be an important source of water for humans and the environment. However, it is often overlooked when evaluating the impact of an aboveground activity such as a compost facility. The following recommendation addresses the ongoing monitoring of groundwater in order to protect this important resource.

**ISSUE:** The requirements for land application in *Code of Agricultural Practice for Waste Management*,<sup>210</sup> and the requirements for composting materials in the *DCS Zoning Bylaw*,<sup>211</sup> both seek to prevent the pollution of groundwater. However, these are the only references to groundwater in the BC compost regulatory scheme. Although the new BC Water Sustainability Act (currently enacted but not in force) mentions groundwater to a limited degree, given that compost facilities deal with large, concentrated volumes of waste materials, the real risk of pollution to groundwater should be addressed directly in the compost regime.

**RECOMMENDATION 16:** That the OMRR require the implementation of a groundwater monitoring program and groundwater monitoring system for all facilities, regardless of their production capacity. The parameters of this requirement should be tailored to the production capacity of the facility and the environmental sensitivity of the surrounding hydrological system to ensure that the cost of groundwater monitoring program/system is tailored to the risk of harm that the facility poses.

**BEST PRACTICE:** For smaller facilities, the *Alberta Code* permits the Director to require the construction and maintenance of a groundwater monitoring system (GWMS) depending on the type and location of the facility, the volume of feedstock, and vicinity of the water table.<sup>212</sup> The requirements for the GMWS

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<sup>208</sup> Alberta Approval s.4.4.13

<sup>209</sup> Alberta Standards s.5.3

<sup>210</sup> *Agricultural Waste Control Regulation*, s.13

<sup>211</sup> DCS Land Use Bylaw s.25.A (3)(c) and (d)

<sup>212</sup> Alberta Code s.6(3)



and the groundwater quality performance standards are set out in s.8 of the Code.

For larger facilities, the terms and conditions attached to the *EWMC Approval* include a section on groundwater.<sup>213</sup> This section requires the approval holder to operate a groundwater monitoring system (GWMS), the collection and analysis of groundwater samples, and the implementation of remediation or risk management plans based on specific standards. The section describes how the GWMS should be operated and what sampling information should be recorded, and requires the compilation of an Annual Groundwater Monitoring Program Summary Report that must include specified information. The facility operator must submit the Report to the Director annually.

The *Alberta Standards* requires a registration holder to implement and maintain a groundwater monitoring system and a groundwater monitoring program. The provisions for the monitoring system outline the number of monitoring wells required up and down-gradient to the facility.<sup>214</sup> The provisions for the monitoring program require the determination of the background groundwater quality before compost operations start, a detailed program for sample collection and analysis of specific water parameters, requirements for care of the monitoring wells, provisions in the event of groundwater contamination, and groundwater quality standards through operation and closure.<sup>215</sup>

### 3.3.7 Reporting

Transparency and accountability are important characteristics of a successful and compliant compost facility. The following recommendation ensures that government officials and the public have adequate and timely information concerning the activities of a compost facility. This will allow decision-makers to make informed decisions about the facilities in their communities and to hold facility operators accountable for their actions.

#### *Record Keeping*

**ISSUE:** Schedule 6 of the OMRR requires that the registered owner or facility operator retain temperature and retention time records, and results of analysis, land application plan and sampling reports for at least 36 months that can be made available or sent upon request to the Director or other authority. However, there is still a considerable amount of information that should be recorded and retained at the facility and shared with the Director and other relevant persons.

**RECOMMENDATION 17:** That the OMRR require the registered owner or facility operator to establish and maintain a more comprehensive set of records that captures the entire extent of operations and activities that take place in the facility to provide for improved transparency and accountability between the facility,

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<sup>213</sup> EWMC Approval s.4.5

<sup>214</sup> Alberta Standards s.3.4

<sup>215</sup> Alberta Standards s.1.5 and s.5.2

government, and community.

**BEST PRACTICE:** The *Alberta Standards* requires that the registration holder establish and maintain a number of comprehensive records including:

- Operating Record,
- Monitoring Records,
- Tonnage Report,
- Annual Report,
- Final Closure Report (upon closure)

The *Alberta Standards* outlines the minimum and comprehensive list of information that each record or report should contain, the length of time they should be maintained, and the frequency with which they should be provided to the Director.

### *Public Availability of Documents and Records*

**ISSUE:** The OMRR requires that the facility owner or operator submit, or make available upon request, a number of documents to the Director (or other authorities). These include the environmental impact study, facility design plans and specifications, land application plan, notice of land application of managed organic material, daily sampling reports of temperature and retention times, and results of analyses. However, there is no requirement that these documents be made available to the public or the local governments, both being parties who may have a strong interest in having access to the information contained in these documents in order to understand the impact of the facility on their community.

**RECOMMENDATION 18:** That the OMRR require that all documents, reports and results relating to the design and operation of the compost facility be submitted to the local government or be made available at the request of the local government so they are available for review and comment by the municipal or regional government waste manager as well as available to the public. This will improve government's decision-making ability with respect to compost operations and the public understanding of the impact that the facility may have on their community.

### *Self-Reporting, Offences & Penalties*

**ISSUE:** The OMRR lists a number of offences and penalties to which a person may be subject if they contravene a provision of the regulation. This creates an adversarial relationship between the compost facilities and the Ministry of Environment in which there is an expectation that violations will be punished, if the responsible person is caught. Where there are limited resources and capacity for investigation and monitoring by the Ministry of Environment, there may be circumstances under which a cooperative relationship between the compost facilities and the Ministry can result in better compliance and thus environmental health.

**RECOMMENDATION 19:** That the OMRR adopt a mandatory “self-reporting” scheme as found in the Alberta regulatory scheme. While the threat of a financial penalty is an effective deterrent to bad behaviour, this should be used as a last resort if the facility has not reported a contravention, is a repeat offender, or refuses to implement changes to their operations when contraventions have occurred. Emphasis should be placed on engaging the compost facility owners and operators to ensure that they follow best practices and are willing to work through operational problems with the Ministry of Environment or local governments.

This self-reporting scheme must be supported by improved monitoring, record keeping and reporting to the Ministry and local governments, (as per Recommendations 16, 17 and 18), improved community involvement (Recommendation 20) and regular inspections of compost facilities by the Ministry and/or local government. In order to ensure that operators do not take advantage of this scheme, the Ministry must create a regulatory environment where self-reporting of a contravention is met with effective assistance to remedy the problem, while any failure to self-report is penalized in a manner that sends a clear message to facility operators regarding the importance of their cooperation with the Ministry.

**BEST PRACTICE:** The *Alberta Code* requires that the “person responsible” shall immediately report any contraventions of the Code to the Director of Pollution Control Division.<sup>216</sup> The *EWMC Approval* includes a similar provision.<sup>217</sup>

The *Alberta Standards* expand on this requirement and provides for a list of items that must be included in a written report submitted to the Director within 7 days of the contravention.<sup>218</sup>

### 3.3.8 Community Involvement

Given the potential impacts of a compost facility on the surrounding community, it is important that a facility secures and maintains the “social licence” to operate in the community. This recommendation seeks to ensure that the community has an appropriate level of involvement in the decision to construct and operate a facility in the community, and that the community is actively involved in efforts to monitor the impact of the facility on the community and environment.

**ISSUE:** There is no requirement in the OMRR that a prospective compost facility owner consult with the public when a facility is first proposed, or engage with the community during the operation of the facility to ensure that the facility is operating in compliance with regulations, bylaws and community norms, and that the community understands the facilities operations and its regulation. The *OMRR Part 5 Guidelines* do stress the importance of public participation in selecting a site, but again, these guidelines

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<sup>216</sup> Alberta Code s.12

<sup>217</sup> Alberta Approval 2.1.1

<sup>218</sup> Alberta Standard 6.4

are not legally binding.<sup>219</sup>

**RECOMMENDATION 20:** That the OMRR require a public consultation process before a facility can be constructed in a community. This will allow the public to provide comment on the location, design and operations of the facility and provide the owner with relevant information concerning the environmental, social and economic impacts of the facility. It is also recommended that the OMRR require that the facility operator engage with the community during the operation of the facility in order to manage ongoing issues and potential nuisances such as odour and noise.

#### **BEST PRACTICES:**

##### ***Public Consultation***

The Alberta *Approvals and Registrations Procedure Regulation* (ARPR) requires that applications for an approval or registration (required for Class I and Class II compost facilities, respectively), must include “a description of the public consultation undertaken or proposed by the applicant”.<sup>220</sup> This provision allows the Director to determine the appropriate level of community consultation required for a particular activity. For activities like composting that can have a significant impact on nearby communities and the surrounding environment, the public consultation process is an important way to gauge the sentiment of the community and receive their input regarding the location and operation of the facility.

##### ***Odour Management***

The Edmonton Waste Management Centre (EWMC) has a number of programs and operational strategies in place to reduce odour at their compost facility.<sup>221</sup> They have developed an Odour Control Matrix that outlines activities at the EWMC that may be potential sources of odour, when these activities take place, the means used to assess the presence of meteorological conditions that create high or low potential for odour, and an outline of how these activities will take place in high and low potential odour conditions.<sup>222</sup> This matrix provides the community with an understanding of how and when odours may be created and how the facility will operate in high and low odour potential conditions.

The City of Edmonton has established a Community Liaison Committee to identify and address odours emanating from the EWMC. This is not required by law, but has been developed due to the size

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<sup>219</sup> *OMRR Part 5 Guidelines*, pg 4-3

<sup>220</sup> ARPR s.3(1)(q)

<sup>221</sup> The City of Edmonton (2014) *Odour Control at the Edmonton Waste Management Centre*. Accessed 6 April 2015 online: <[http://www.edmonton.ca/programs\\_services/garbage\\_waste/odour-control.aspx](http://www.edmonton.ca/programs_services/garbage_waste/odour-control.aspx) >

<sup>222</sup> The City of Edmonton (2014) *Odour Control Matrix*. Accessed 6 April 2015 online: <[http://www.edmonton.ca/programs\\_services/documents/PDF/EWMC\\_Odour\\_Matrix.pdf](http://www.edmonton.ca/programs_services/documents/PDF/EWMC_Odour_Matrix.pdf)>

of the facility and volume of material, as well as the need to gain the acceptance of the community to operate the facility. The committee consists of citizen volunteers who live in northeast Edmonton (in the vicinity of the facility) and who meet regularly with City staff to share information about the impacts of odours in their neighbourhoods and learn about operation activities at the EWMC that are addressing odours. The City offers Nasal Ranger training to committee members to teach them how to identify and monitor odours. The City also offers a 24 hour Odour Hotline to report concerns about odours from the EWMC. More than one call from an area within a day will require a consultant to visit the neighbourhood and the EWMC to investigate and log information on the odour, wind and weather conditions.

### 3.3.9 Community Collaboration

No government regulation works in isolation and it is important that a regime that involves multiple levels of government and numerous stakeholders also involves a healthy working relationship between these parties in order to achieve a coordinated and consistent regulatory regime.

**ISSUE:** In discussing the topic of compost regulation in BC with citizens who are dealing with issues with compost facilities, there is an apparent (or perceived) jurisdictional void between the different levels of government and the relevant authorities. This includes the provincial bodies such as the Ministry of Environment (MOE), the Agricultural Land Commission (ALC), and the Farm Industry Review Board (FIRB), regional district governments, and municipal governments. There appears to be a lack of understanding as to the responsibilities of each level of government and how, and in what order, these bodies should act.

**RECOMMENDATION 21:** That there is the development of a working relationship between the local and provincial governments in each region to streamline the compost regime and clarify the roles of each entity. In particular, there should be collaboration in the enforcement process so that local governments can understand what is required in specific permits and to create harmony between municipal licensing conditions and provincial requirements. This could take the form of a regional working group with periodic meetings to review broad issues and specific facilities in each region.

**ISSUE:** In addition to local and provincial governments and government agencies, there are a number of other parties who have an interest regarding compost operations in BC. These parties include local landowners, community organizations, and the compost industry. Unfortunately, there is currently no forum for all parties to meet and discuss the issues that may arise with specific compost operations and the implementation of the compost regime.

**RECOMMENDATION 22:** That there be the formation of a provincial or regional composting advisory committees composed of local and provincial governments, industry, community organizations, and local landowners to address issues that arise

at compost facilities and regarding the implementation of the compost regime. Such committees will permit relevant discussion between parties, delineate the role of each party in the compost regime, and avoid impacts to environmental and social well-being that may arise from compost operations.

### 3.4 Local Government Implementation

In the absence of amendments to the OMRR, local governments can still implement many of these recommendations through bylaws, licencing, and land use regulation.

#### Regional District Bylaws

As discussed in section 1.3.1, regional district governments can impose bylaws to implement approved waste management plans and regulate the management of recyclable materials such as compost. This permits the enactment of bylaws regulating, prohibiting or respecting the handling of compost, the management of compost sites (ie. facilities), requirements that a facility operator hold a recycler licence, comply with a code of practice, or provide security or insurance, the enforcement of bylaws, and the provision of penalties.<sup>223</sup> These bylaws can impose requirements that are additional to, and more stringent than, those contained in the provincial enactments like the EMA, OMRR, ALCA, providing that these bylaws are not inconsistent or in conflict with the provincial enactments.<sup>224</sup>

The Capital Regional District (CRD) has implemented the *Composting Facilities Regulation Bylaw* that requires a person to obtain a recycler licence before they can operate a compost facility in the region. The licence imposes certain terms and conditions on the licence holder that are additional to the requirements in the provincial enactments. These terms and conditions already contain requirements for the operation of the facility, odour and leachate management plans, qualified professionals, storage, and offences, penalties and enforcement - the areas of the BC regime for which reforms are recommended in this report. Without amendments to the OMRR, the CRD could consider amending the terms and conditions of existing licences to include the above recommendations.

#### Municipal Government Bylaws

As discussed in section 1.3.2, municipal governments can also regulate compost facilities through various bylaws. These bylaws fall within existing municipal jurisdiction to regulate nuisances,<sup>225</sup> business licences,<sup>226</sup> or land use.<sup>227</sup> As with regional district bylaws, municipalities can impose requirements that are additional to, and more stringent than, those contained in the provincial enactments like the EMA,

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<sup>223</sup> EMA s.25(3)

<sup>224</sup> EMA s.37(5), ALCA s.46(6)

<sup>225</sup> *Community Charter* s.8

<sup>226</sup> *Community Charter* s.8(3)

<sup>227</sup> LGA s.903 and s.919.1

OMRR, ALCA, providing that these bylaws are not inconsistent or in conflict with the provincial enactments.<sup>228</sup>

A municipality could use their authority under the *Local Government Act* to implement a Development Permit Area (DPA) in order to impose conditions on activities that take place in discrete areas of land within their jurisdiction.<sup>229</sup> The DPA might be designed in such a way that outlines where a facility can be located so as to avoid conflicts with other land uses, such as residences or the environment. This could be a way for the municipality to mandate the siting considerations suggested in the *OMRR Part 5 Guidelines* or the *Ontario Guideline*.

A municipality could also use their zoning/land use bylaws to regulate a compost operation. As outlined in the Appendix, the District of Central Saanich (DCS) *Land Use Bylaw* permits agricultural composting on certain zones and commercial composting in other zones. The bylaw imposes conditions for facility siting and design, the appropriate technologies, facility operations, storage of feedstock, and leachate and odour management. There is also a requirement that leachate is collected to avoid the contamination of groundwater. Given that these conditions already touch upon the areas that this report recommends for law reform, bylaws could be amended to reflect the recommendations.

The DCS *Business Licencing Bylaw*, also in the Appendix, also imposes certain requirements on compost facilities including the imposition of covenant by which the facility owner promises (subject to a fine) that odours generated in the composting or curing process are not detectable by humans off the premises. This reflects the concern that the municipality has for odours, and demonstrates that the municipality can go further than the provincial enactments in regulating compost operations.

### 3.5 Summary

While all levels of government can implement these recommendations, it is important that the regulations imposed at each level are not only compliant with the provincial enactments and their enabling legal authority, but also work together to provide a clearly defined and harmonious regulatory regime. The different parts of the regime must work together to cover all aspects of a compost operation while avoiding unnecessary overlap.

It is also important that all actors in compost industry: the operators and facility owners, government officials, entities such as the ALC and FIRB, and local citizens have a clear and consistent understanding of the regime and their role within it.

This speaks to the importance of Recommendations 20 and 21, that there is the development of an on-going working relationship between the different levels of government, the compost industry and

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<sup>228</sup> EMA s.37(5), ALCA s.46(6)

<sup>229</sup> LGA 919.1 and 920

the community. It this relationship is particularly important in the design, monitoring, and enforcement aspects of the compost operations. As good as a compost regime, the regulations are rendered ineffective if compost operations are not designed appropriately, monitored regularly, and held to high standards.

Ultimately the aim of this report, containing an outline of the BC compost regime and law reform recommendations, is to contribute to the development of a comprehensive and effective compost regime that achieves the waste management goals of communities in B.C. while promoting an economically viable compost industry, ensuring environmental protection, and maintaining community wellness.



# APPENDIX

Table 1

| MATERIAL  |  | PATHOGEN REDUCTION PROCESSES   | VECTOR ATTRACTION REDUCTION                                       | PATHOGEN REDUCTION LIMITS   | QUALITY CRITERIA  | SAMPLING & ANALYSIS  | RECORD KEEPING  | LAND APPLICATION & DISTRIBUTION  |
|---|--|--|---|---|---|--|---|--|
| Class A Biosolid (CAB)  |  | Sch 1: identifies PR methods or processes that must be used in production, and | Sch 2: identifies VAR methods that must be used in the production | Sch 3: specifies the fecal coliform levels particular to each type of matter, outlines sampling protocol. | Section 3 of Sch 4 no [elements] above those specified in Trade Memo T-4-93, Stds for Metals in Fertilizers & Supplements | Sch 5 Req'd analysis carried out every 1000T dry weight or 1/year (whichever is 1 <sup>st</sup> ). Director may increase frequency of sampling | Sch 6 Temp & retention times: recorded Mon-Fri during production. Results of analysis. Both kept at facility for ≤ 36mo, available on request to specified persons. | App to land – Ss.2<br>App of >5m <sup>3</sup> /year per parcel req's LAP for CAB and soil [sub] in sch 9&10<br>Dist – ss.4<br>Restrictions on dist: ≤5m <sup>3</sup> /vehicle per day, sealed bag of ≤5m <sup>3</sup> for retail, >5m <sup>3</sup> to CFs or BGMFs |
| Class B Biosolid (CBB)  |  | Sch 1  | Sch 2   | Sch 3   | Column 3 of Sch 4: highest allowable levels of substances (heavy metals)  | Sch 5  | Sch 6   | LAP for CBB<br>Sch 8<br>Soil [sub] in sch 9&10<br>Distrib to CF – no vol restriction<br>No vol restriction in distrib to BGMF if meet CAB PR and VA req's<br>No land app in watershed used as permitted water supply under DWPR                                    |
| Biosolid Growing Medium (Biosolids that meet the criteria to the left & Sch 11) |  | Derived from CAB or CBB that meet CAB req's in Sch 1                           | Derived from CAB or CBB that meet CAB req's in Sch 2              | Derived from CAB or CBB that meet CAB req's in Sch 3  | Column 2 of Sch 4: lowest allowable levels of heavy metal substances  | Sch 5  | Sch 6   | Distribution with no volume restriction<br>Sch 11: specifies TKN, C:N >15:1, organic matter content <15% dw  |
| Class A Compost (CAC) organic matter only                                       | Yard waste &/or untreated & unprocessed wood residuals | Sch 1  | Sch 2   |   | Column 1 of Sch 4<br>Low allowable levels of heavy metal substance  | No analysis req'd  | No record keeping required  | Distributed with no volume restriction<br>Biosolids used as feedstock must not exceed stds for CBB in Col. 3 of Sch 4<br>No land application provisions- why??   |
|   | Not solely from above                                  | Sch 1  | Sch 2   | Sch 3   | Column 1 of Sch 4   | Sch 5  | Sch 6   |  |
| Class B Compost (CBC) organic matter only                                       |  | Sch 1  | Sch 2   | Sch 3   | Col 3 of Sch 4: highest allowable levels of substances (heavy metals)   | Sch 5  | Sch 6   | Application<br>LAP for CBC req'd<br>See sch 8<br>Soil [sub] in sch 9 & 10<br>No app to land in watershed used as permitted water supply under DWPR   |

## Regional District Bylaws

### Capital Region District Bylaw No. 2736: Compost Facilities Regulation

#### Definitions

The bylaw provides a list of definitions relating to compost activities, but also incorporates the definitions listed in the EMA and OMRR.

The definitions of particular classes of composting facilities are particularly important because they determine what feedstock type of technology can be used in a facility. The class of compost facility also determines what Recycler Licences is appropriate for an operator. The feedstock materials are derived from the list of “organic matter for use in composting” in Schedule 12 of the OMRR and are divided into three classes.

- **Class 1 composting facility** means a facility composting general organic matter on an impermeable surface or in-vessel.<sup>230</sup> Feedstock materials that comprise “general organic matter” include: animal bedding, brewery & winery waste, Class A food waste, manure, plant matter derived from processing plants, untreated and unprocessed wood residuals, yard waste, and whey.<sup>231</sup> A person operating a Class 1 facility does not need a Class 1 Recycler Licence unless they have contravened the bylaw.
- **Class 2 composting facility** means a facility composting biosolids with general organic matter on an impermeable surface or in-vessel.<sup>232</sup> Feedstock materials that comprise “biosolids with general organic matter” include: biosolids and the materials listed under “General Organic Matter”, above.<sup>233</sup> A person operating a Class 2 facility requires a Class 2 recycler licence.
- **Class 3 composting facility** means a facility composting restricted organic matter with either or both general organic matter or biosolids with general organic matter and using in-vessel technology.<sup>234</sup> Feedstock materials that comprise “restricted organic matter” include: Class B food waste, fish wastes, hatchery waste, milk processing waste, poultry carcasses, sewage sludge, domestic septic tank sludge, and whey.<sup>235</sup> (Sewage sludge can only be composted with written authorization from the Ministry of Environment). A person operating a Class 3 facility requires a Class 3 recycler licence.

It is also important to highlight the required technology specified for each class of compost facility.

- **"impermeable surface"** means a surface which:
  - a) has a permeability rating of no greater than  $1 \times 10^{-7}$  cm per second; and
  - b) has been designed and sealed by a professional engineer to ensure that there is no onsite discharge of leachate to the environment.

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<sup>230</sup> Capital Regional District Bylaw No. 2736: A Bylaw to Regulate the Operation of Composting Facilities in the Capital Regional District (“CRD Bylaw No. 2736”) s.1.2

<sup>231</sup> CRD Bylaw No. 2736 Schedule E Table 1

<sup>232</sup> CRD Bylaw No. 2736 s.1.2

<sup>233</sup> CRD Bylaw No. 2736 Schedule F Table 2

<sup>234</sup> CRD Bylaw No. 2736 s.1.2

<sup>235</sup> CRD Bylaw No. 2736 Schedule G Table 3

- **"in-vessel,"** in relation to composting, means any composting method where composting materials are contained in a closed reactor or vessel:
  - a) in which conditions such as moisture, temperature and oxygen levels can be closely monitored and controlled; and
  - b) which has been designed and sealed by a professional engineer to ensure that there is no discharge of leachate to the environment or nuisance created.

There are a variety of persons named in the bylaw who are responsible for the regulation and operation of the compost facility. It is important to understand to whom these terms refer in a practical sense in order that the appropriate people understand their roles and can be held accountable.

A "licensee" is a person who holds a recycler licence. A "discharger" is the owner or operator of the compost facility, or a licensee. The "licensee" and a "discharger" could refer to the same person, but they could also refer to different people.

The "solid waste manager" is the person who administrates the management of solid waste, and therefore, the compost regulations at CRD office. The solid waste manager is appointed by the general manager of the CRD Environmental Services department. The bylaw also refers to the "solid waste officer" (an officer appointed by the general manager) and the "bylaw enforcement officer" who have more limited roles, described below. This person is separate from the "director" who is specified in the OMRR as the person to whom various applications, plans, specifications, and reports should be sent. The "director" is a person working at the Ministry of Environment,<sup>236</sup> usually at a regional office.

## Application and Exemption

The bylaw regulates the operation of all composting facilities within the Capital Region unless otherwise exempted by the bylaw or another enactment. Similar to the OMRR, the bylaw does not apply to agricultural waste composting, backyard composting, topsoil producers, or the composting of organic matter that originates at the site of the composting operation. For example, this final exemption applies to composting of agricultural wastes on farms where the waste originates or where the waste will be used, as described in a below in section 2.1.1.

## Recycler Licence

Any person who operates a compost facility needs a recycler licence that corresponds to the appropriate class of facility. However, there is an exemption for an owner or operator of a Class 1 facility who does not need a Class 1 recycler licence unless the discharger of the facility has been convicted of an offence under the bylaw.<sup>237</sup>

The solid waste manager will only issue the recycler licence for a compost facility that complies with the bylaw, local applicable land use, zoning and other bylaws or Federal and Provincial enactments (including the EMA, OMRR, ALCA, and ALRUSPR) applicable to the operation of the composting facility.<sup>238</sup> The solid waste manager will refuse to issue a licence if the facility does not comply with the above enactments.<sup>239</sup> The solid waste manager will suspend or cancel a

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<sup>236</sup> EMA s.1 **director**" means a person employed by the government and designated in writing by the minister as a director of waste management or as an acting, deputy or assistant director of waste management

<sup>237</sup> CRD Bylaw No. 2736 s.6.3

<sup>238</sup> CRD Bylaw No 2736 s.4.3

<sup>239</sup> CRD Bylaw No 2736 s.4.3

recycler licence for any violation of, or non-compliance with, the terms and conditions of the recycler licence, the bylaw, or any other applicable enactments.<sup>240</sup> The issuance of a recycler licence by the CRD does not provide any guarantee that the composting facility is in compliance with the bylaw or any other enactment or that the discharger will not cause harm to the environment.<sup>241</sup>

Upon the initial licence application, certain information must be provided to the solid waste manager, including:<sup>242</sup>

- the types and quantities of organic matter to be composted each year;
- an odour management plan;
- a leachate management plan;
- a vector, litter and dust management plan;
- the maximum tonnage of feedstock and compost to be stored at any one time; and
- municipal/electoral area approval.

This information is set out in Schedule A to the bylaw. The application fee for any type of recycler licence is \$1000.<sup>243</sup>

Any applicants who want to use something other than proven technology<sup>244</sup> must apply for a provisional licence and must supply the information listed above.<sup>245</sup> The term of a provisional licence is one year, after which (though prior to the expiry of the licence) the provisional recycler licensee may apply for a one-time, one-year renewal.<sup>246</sup> The fees for a provisional licence are the same as the other classes of recycler licence, except for the annual administration/monitoring fee, which is \$2000.<sup>247</sup>

Before any operational changes can be made to the compost facility the licensee must apply for, and obtain, an amendment to the recycler licence using the form and required information in Schedule A of the bylaw. The licence amendment fee for all types of licence is \$500. Operational changes include any change to:<sup>248</sup>

- Method of composting (change in class of licence);
- Odour management plan;
- Leachate management plan;
- Vector, litter, and dust management plan;
- Method of receiving and storing [organic materials];
- Estimated quantities of feedstock materials per year;
- Maximum quantity of feedstock and compost to be stored at any one time;
- A site plan and layout of facilities; and

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<sup>240</sup> CRD Bylaw No 2736 s.4.4

<sup>241</sup> CRD Bylaw No 2736 s.4.6

<sup>242</sup> CRD Bylaw No 2736 s.3.4

<sup>243</sup> CRD Bylaw No 2736 Schedule C Column 2

<sup>244</sup> The term “proven technology” is defined in the bylaw as “any in-vessel composting technology in use at an appropriate scale for at least two years which is capable of meeting the requirements of this bylaw.”

<sup>245</sup> CRD Bylaw No 2736 s.3.5

<sup>246</sup> CRD Bylaw No 2736 s.4.2.4

<sup>247</sup> CRD Bylaw No 2736 Schedule C Table

<sup>248</sup> CRD Bylaw No 2736 Schedule C s.1.3

- Municipal/electoral area approval.

The term of the recycler licence is five years from the date of issuance, after which the licensee must apply to the solid waste manager to renew the licence if they want to continue operating a compost facility.<sup>249</sup> If a Class 1 discharger who violated the bylaw and had to obtain a Class 1 recycler licence is not convicted of another offence under the bylaw for five years after obtaining the licence, they will not be required to renew the recycler licence.<sup>250</sup> The renewal fee for all types of recycler licences is \$500.

Licence application, renewal, and amendment fees are payable on submission of a completed application form (as provided in Schedule A of the bylaw) to the solid waste manager, must be paid before the application can be processed, and are non-refundable regardless of the actions of the solid waste manager in response the application.<sup>251</sup>

A licensee must also pay an annual administration/monitoring fee, the first of which must be paid upon the issuance of the recycler licence. Subsequent administration/monitoring fees will be invoiced on the anniversary date of the issuance of the licence. This must be paid within 60 days of the anniversary date or the CRD may suspend or cancel the licence. The administration/monitoring fee for Class 1, 2 and 3 licences is \$1000. The fee for a provisional licence is \$2000.

A recycler licence may not be transferred or assigned without the solid waste manager's written consent. This consent may be withheld if there is an on-going violation of the bylaw or any applicable enactment.

## Management Plans

The leachate management plan must indicate how any and all leachate from the composting process will be minimized, managed, treated and disposed of.<sup>252</sup> The odour management plan must show how the facility intends to prevent the generation of odours that can be detected beyond the boundary of the property on which the facility is located.<sup>253</sup> There is no description of how or by whom odours will be monitored or detected and to what limit odours will be tolerated, though this is usually based on complaints from the neighbourhood.

Both plans must be prepared and sealed by a qualified professional who has experience with the appropriate (leachate or odour) management system. The definition of qualified professional used in the bylaw is the same as in the OMRR, with the added requirement that the professional have experience with the appropriate management system. There is no explanation of what constitutes "experience" and no proof of experience is required.

The applicant must also provide vector, litter and dust (VLD) management plan to show how they will control vectors,<sup>254</sup> keep the site free of litter and garbage, and prevent the emission of dust from the site.<sup>255</sup> A qualified professional is not required to prepare or give their seal to the VLD management plan.

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<sup>249</sup> CRD Bylaw No 2736 s.4.2,

<sup>250</sup> CRD Bylaw No 2736 s.6.4

<sup>251</sup> CRD Bylaw No 2736 Schedule C s.1.1, s.1.2, s.1.3, s.1.5

<sup>252</sup> CRD Bylaw No. 2736 s.3.7

<sup>253</sup> CRD Bylaw No. 2736 s.3.8

<sup>254</sup> CRD Bylaw No. 2736 s.1.2 "**vector**" means a rodent, bird, fly or mosquito or other animal or insect carrier that ingests or conveys garbage, odour, micro-organisms and/or pathogens from one location to another.

<sup>255</sup> CRD Bylaw No. 2736 s.3.9

The solid waste manager may require additional information respecting management plans that they consider necessary for the protection of human health and the environment, and may specify particular concerns or questions that the management plans must address.

## **Security<sup>256</sup>**

When an application is filed, the applicant must provide security, an amount of money that is promised via either an irrevocable letter of credit, or a combination of an irrevocable letter of credit and surety bond, that can be used by the CRD in case the licensee fails to comply with the terms of their licence or the bylaw or in the event of the closure of the facility. The amount of security is calculated in Schedule B of the bylaw. The security is subject to certain requirements, and the failure of the licensee to comply with these requirements could result in the suspension or cancellation of the recycler licence.

Security, again in the form of an irrevocable letter of credit and surety bond, is also required for the storage of compostable materials. This security may be used by the CRD if the discharger fails to comply with the bylaw or the recycler licence, has not commenced processing, has stored the materials for longer than the specified time limits, the feedstock is stored contrary to the bylaw, or the facility is abandoned.<sup>257</sup> The amount required is calculated per tonne of stored material and based on the estimated costs to clean up, remove and process the material as determined by the solid waste manager.

## **Storage Regulations**

Compostable feedstock materials for use in a compost facility may only be stored in accordance with Schedule B of this bylaw. This schedule sets maximum limits, defined by tonnage, volume, and time, for which the different types of compostable material can be stored.<sup>258</sup> These limits are:

- General Organic Matter: up to a maximum of 500 tonnes (1000m<sup>3</sup>) may be stored for up to 2 weeks;
- Biosolids: up to a maximum of 50 tonnes (75m<sup>3</sup>) may be stored for up to 36 hours;
- Restricted Organic Matter: up to a maximum of 50 tonnes (75m<sup>3</sup>) may be stored for up to 36 hours.

Feedstock material shall not be stored in excess of these maximum limits. However, these materials can be stored past the maximum limits if the storage is carried out in self-contained unit that does not allow the escape of organic matter, odours, leachate, or attracts vectors.<sup>259</sup> The bylaw does not specify what constitutes an appropriate self-contained unit. The total amount of feedstock and compost in a facility at any time must not exceed the amount provided by the licensee in the information contained in their licence application to the CRD.<sup>260</sup>

## **Composting Regulations**

A licensee must operate a compost facility in accordance with the terms and conditions of the recycler licence, the regulations set out in Schedule D of the bylaw, and with the leachate, odour, and VLD management plans submitted to

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<sup>256</sup> CRD Bylaw No. 2736 s.3.11

<sup>257</sup> CRD Bylaw No 2736 Schedule B s.2

<sup>258</sup> CRD Bylaw No. 2736 Schedule B

<sup>259</sup> CRD Bylaw No. 2763 Schedule B s.1

<sup>260</sup> CRD Bylaw No. 2763 Schedule D s.2

the solid waste manager.<sup>261</sup> If any provision of these plans conflicts with Schedule D, that provision of the plan does not apply.

A licensee shall not receive any materials other than those set out in the licence.

Restricted organic matter is treated differently than the other compostable materials. Phase 1 of the process (receiving and blending, grinding, mixing and initial rapid phase composting) of all restricted organic matter must be conducted “in-vessel”. Phase 2 (curing for a minimum of 21 days) of restricted organic matter compost must be conducted in-vessel or on an impermeable surface.<sup>262</sup>

The receiving and blending, grinding, mixing, composting and storage of general organic matter and biosolids), must at least be conducted on an impermeable surface, though it can occur in-vessel. There is no reference to Phase 2 composting for general organic matter and biosolids.

With respect to disturbances, a discharger may not operate any class of facility in a manner than causes litter, dust, odours, or vectors to pose a risk to public health or the environment, or constitute a public nuisance. This implies that the facility may cause some litter, dust, odours or vectors, so long as they do not pose a risk to public health or environment or cause a public nuisance. This is a subjective standard that may require proof and adjudication before a court, board or tribunal.

With respect to leachate, a discharger may not operate any class of facility in a manner that causes the discharge of leachate. The bylaw implies zero tolerance for the discharge of leachate, regardless of whether the discharge causes any risk to public health or the environment, or an impermeable surface. This is an objective standard that only requires proof of the discharge.

The licensee must give notice in writing to the solid waste manager at least 90 days before beginning the operation of a composting facility. The notification must include the composting facility location and design capacity, name of a contact person, type of waste received, intended distribution of compost, and a copy of a personnel training program plan that addresses the specific training needed to operate the composting facility in compliance with the bylaw.<sup>263</sup> There is no prescription in the bylaw (or in other enactments) of what should be included in a personnel training program.

## **Enforcement**

The general manager, the solid waste manager, a solid waste officer, or a bylaw enforcement officer may enforce the provisions of the bylaw. Any of these enforcement agents, with the exception of the general manager, may enter the premises of a compost facility to determine if the terms of a recycler licence are being complied with or if the regulations of the bylaw are being observed.<sup>264</sup> This includes compliance with the OMRR and EMA, and where applicable, the ALCA, and ALRUSPR. Since compliance with all applicable provincial enactments is a condition of holding a licence, to operate in violation of these enactments could result in the cancellation or suspension of the recycler licence or a fine.<sup>265</sup> The entry

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<sup>261</sup> CRD Bylaw No 2736 s.6.5 and s.5.2

<sup>262</sup> Both “in-vessel” and “impermeable surface” have been defined in this bylaw, and are reproduced in this section (1.3.1), above. However, there is wide latitude as to what may constitute “in-vessel”; not all “in-vessel” operations are made equal.

<sup>263</sup> CRD Bylaw No 2736 Schedule D s.3

<sup>264</sup> CRD Bylaw No 2736 s.7.2

<sup>265</sup> CRD Bylaw No 2736 s.4.4 and s.9.2

of these enforcement agents onto the facility premises may occur at any reasonable time, without prior notice, and with the presentation of proof of their identity. No person shall hinder or prevent these enforcement agents from entering the premises and carrying out their duties with respect to the administration of the bylaw.<sup>266</sup>

Where the regional district has the authority to direct a person to take a certain action, and if the person fails to take the required action, the action shall be done at the expense of the person under LGA s.269(1).<sup>267</sup> The Board may recover the expense from the person. If the Board/staff of the regional district were required to remedy inaction in default.<sup>268</sup> This means that where a licensee fails to remedy a problem with the compost facility the regional district may remedy the problem and charge the licensee for the cost of remedying the problem.

### **Offences and Penalties<sup>269</sup>**

A person who violates the terms and conditions of the bylaw is guilty of an offence and is liable to a fine up to a maximum of \$200000. If the violation extends over multiple days, the person will be considered to have committed a separate offence upon each day the violation occurs or continues. The fine is in addition to any other penalty imposed by the bylaw, or another statute, law or regulation. This means that a person could be fined both under the bylaw and under the OMRR. The CRD may also pursue other remedies available to it at law, such as criminal conviction (if appropriate).

### **Appeal<sup>270</sup>**

A person affected by a decision of the solid waste manager may write to the general manager to appeal the decision. The written notice of appeal must advise the general manager of the order or requirement being appealed from, set out the reason for the appeal, and include any relevant documents. This notice must be delivered to the general manager within 30 days of the decision from which the appeal is made.

The general manager will review the matter under appeal and will confirm, reverse or vary the decision under appeal and may make any decision that they consider appropriate. An appeal does not stay or suspend the operation of the decision under review unless the general manager orders otherwise.

### **Schedules**

The schedules set out at the end of the bylaw detail the specific information required by certain provisions of the bylaw. In summary, these schedules are:

- A. Recycler Licence Application:** dictates the form required to be submitted to the solid waste manager for licence applications, renewals, and amendments.
- B. Regulations Regarding Storage of Feedstock Materials, Calculation and Use of Security:** prescribes the requirements for storage of compostable materials and the determination of security for the different types

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<sup>266</sup> CRD Bylaw No 2736 s.11.1

<sup>267</sup> LGA s.269 (1) The authority of a board under this or another Act to require that something be done includes the authority to direct that, if a person subject to the requirement fails to take the required action, the regional district may a) fulfill the requirement at the expense of the person, and (b) recover the costs incurred from that person as a debt.

<sup>268</sup> CRD Bylaw No 2736 s.11.2

<sup>269</sup> CRD Bylaw No 2736 s.9

<sup>270</sup> CRD Bylaw No 2736 s.10



of compostable materials.

- C. **Fees:** sets out a table and requirements outlining the fees required for licence application, renewal, amendment, and administration and monitoring.
- D. **Composting Regulations:** prescribes how compostable materials should be received, handled, processed, composted, and stored. Prescribes the requirement for notification of a new compost facility.
- E. **Table 1. Feedstock Processing: General Organic Material:** Sets out a list and description of feedstock materials that may be composted on an impermeable surface or in-vessel and will not require a licence unless the operation contravenes subsection 6.3 of this bylaw.
- F. **Table 2. Feedstock Processing: Biosolids with General Organic Matter:** Sets out a list and description of feedstock materials that may be composted on an impermeable surface or in-vessel and will require a Class 2 recycler licence
- G. **Table 3. Feedstock Processing: Restricted Organic Matter:** Sets out a list and description of feedstock materials that may be composted in-vessel only and will require a Class 3 recycler licence.

## Municipal Bylaws

### Zoning/ Land Use Bylaw

#### District of Central Saanich Land Use Bylaw no. 1309

Zoning bylaws prescribe what types of activities can take place on land within a municipality.<sup>271</sup> The Central Saanich Land Use bylaw has a specific section that addresses compost.

In the District of Central Saanich, composting is permitted only in A1, I-1 and I-2 zones. Backyard composting is permitted in every zone in which residential uses are permitted, but it may not be sold from the premises or produced as a home occupation. The bylaw distinguishes between agricultural composting in the A1 zone and commercial composting in the I-1 and I-2 zones. As it happens, the vast majority of the land in the Central Saanich that has been set aside as ALR land is also designated as the A1 zone although there small areas of A1 land outside the ALR and some ALR lands that are not zoned as A1.<sup>272</sup> I-1 and I-2 refer to Light Industrial and Extraction Industrial, respectively. In Central Saanich any land designated I-1 or I-2 is found outside the ALR. As such, it is a relatively straightforward process to

#### ***Agricultural Composting***

Agricultural composting is permitted in the A1 zone as long as it is part of and used for the purposes of the farm operation on the same lot. It is defined in the bylaw as the “production and storage of compost from agricultural wastes produced on the farm for farm purposes in accordance with the *Agricultural Waste Control Regulation* or the production and storage of Class A compost in compliance with the *Organic Matter Recycling Regulation*”.<sup>273</sup> Composting in the A1 is subject to the following requirements:

1. The compost process must not occur within 30m of any parcel boundary or domestic water supply intake, or within 15m of any natural watercourse or constructed ditch. Where a farm business comprises more than one parcel, the

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<sup>271</sup> LGA s.903

<sup>272</sup> A map of zoning designations and the ALR in Central Saanich may be found at <<http://www.centalsaanich.ca/Assets/Central+Saanich/Maps/Zoning+and+ALR.pdf>>. Accessed on Dec 20, 2013

<sup>273</sup> DCS Land Use Bylaw No 1309 s.1

siting requirement does not apply in relation to any interior parcel boundary. This subsection does not prohibit the application of finished compost to land.<sup>274</sup>

2. Compost that is prepared in the agricultural zone must be applied to land in the same farm business as the land on which the composting occurs. The compost may not be sold or removed from the premises on which it is produced. Bagged manure may still be sold from farm roadside stands.<sup>275</sup> This provision requires that all compost must be used on the same property on which it is produced, regardless of the feedstock material.

3. Certain feedstock materials must undergo initial decomposition contained in a closed reactor or vessel in which conditions such as moisture, temperature and oxygen levels can be closely monitored and controlled, and from which odours detectable by humans cannot escape.<sup>276</sup> When these feedstock materials undergo secondary curing or are stored before initial decomposition, they must be stored on an impermeable surface. Any leachate must be collected, so that there is no contamination of groundwater.<sup>277</sup> This provision refines the regulation of odours to the extent that the bylaw is violated if a person can smell odours from these materials outside of the reactor or vessel.

### **Commercial Composting**

Commercial composting is permitted as a principal use in the I-1 and I-2 zones. There are no I-1 or I-2 zones in the ALR in Central Saanich. Commercial composting is subject to the following regulations:<sup>278</sup>

1. Composting materials undergoing initial decomposition must be contained in a closed reactor or vessel in which conditions such as moisture, temperature and oxygen levels can be closely monitored and controlled, and from which odours detectable by humans cannot escape.

2. Composting materials undergoing secondary curing or being stored prior to initial decomposition must be stored on an impermeable surface and any leachate must be collected, so that contaminants leaching from the materials cannot enter the groundwater table.

3. Processing equipment may be operated only between the hours of 8 a.m. and 5 p.m. Monday to Saturday, excluding statutory holidays.

4. Equipment for the shredding or grinding of materials must be located within a structure having solid walls and a roof so that any noise generated by the equipment is attenuated.

5. Every composting operation permitted by this Bylaw must comply with the Organic Matter Recycling Regulation under the *Waste Management Act* and any Bylaw of the Capital Regional District dealing with the operation of composting facilities.

6. Nothing in s.25A of this Bylaw restricts the nature of compost or other materials that may be applied to land in

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<sup>274</sup> DCS Land Use Bylaw No. 1309 s.25.A (3)(a)

<sup>275</sup> DCS Land Use Bylaw No. 1309 s.25.A s 3(b)

<sup>276</sup> These feedstock materials include food waste, sludge, septage, fats, oils and grease, brewery waste, plant matter derived from processing plants, hatchery waste, poultry carcasses, fish wastes, whey, milk processing waste and contaminated fibres

<sup>277</sup> DCS Land Use Bylaw s.25.A (3)(c) and (d)

<sup>278</sup> DCS Land Use Bylaws No.1309 s.25.(4)

the Agricultural Land Reserve as a soil conditioner.

### **Business Licencing Bylaw (DCS Business Licence Bylaw no. 1610)**

The regulation of business through licencing is a power exercised regularly by municipal governments as granted by the *Community Charter*.<sup>279</sup> Generally, a business licencing bylaw imposes certain terms and conditions upon businesses as a requirement of holding a licence and operating a business. The bylaw can also impose requirements on businesses in general, or on specific businesses if it falls within the power of the municipality to do so.<sup>280</sup>

The Central Saanich bylaw determines who requires a business licence, the regulations that a business must satisfy to obtain a licence, the reasons for which the licence may be revoked, suspended or cancelled, the enforcement of provisions in the bylaw, and the fees for certain types of business licences. Similar to the CRD bylaw, the Central Saanich bylaw permits a licence inspector to only grant a licence when satisfied that the applicant has complied with the municipality's bylaws that regulate business, building, zoning and land use, and applicable federal, provincial and regional legislation.<sup>281</sup> This means that in order to be a valid licence-holder, a compost operator must comply with the requirements of the OMRR, ALCA, ALRUSPR and CRD Bylaw No. 2736.

This bylaw, although applying to businesses in general, also specifically addresses compost operations and imposes certain requirements on compost operators who wish to hold a licence.

Similar to the DCS Land Use Bylaw, above, this bylaw distinguishes between an "agricultural composting operation" and a "commercial compost operation". These requirements include:

- a) That a person conducting an agricultural composting operation must not allow the wheels of transport vehicles used in the operation to deposit soil onto District highways, and if this does happen, to remove the soil from the highway (and not into the ditch).
- b) Before a licence is granted, a person conducting a commercial compost operation must grant a covenant to the District by which the owner of the land on which the operation is located promises that odours generated in the composting or curing process are not detectable by humans off the premises. If this covenant is breached, the owner of the land must pay \$1000 per day to the District.
- c) Processing equipment in a commercial compost operation may be operated only between the hours of 8am to 5pm Monday to Saturday. The use of this equipment cannot occur on Sundays or on statutory holidays.
- d) A requirement that the operator compensate the District for costs incurred to repair District highways damaged by commercial or farm vehicle traffic associated with the compost operation. This is a condition of the licence that may be imposed by the licence inspector at his discretion on agricultural compost operations or commercial compost operations. The cost is estimated by the District Engineer and the licence is breached if the cost is not paid within 30 days of mailing of the District's account for the repairs.

### **Noise Bylaw (DCS Noise Bylaw No.933)**

This bylaw generally prohibits the production of any noise or sound in the municipality that disturbs the quiet, peace, rest, enjoyment, comfort or convenience of the neighbourhood or of persons in the vicinity. It also holds that,

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<sup>279</sup> Community Charter s.8(3)

<sup>280</sup> Community Charter s.8(3)

<sup>281</sup> DCS Bylaw No. 1610 s.7

between the hours of 9:00pm to 7:00am, no person shall make any continuous, persistent or constantly repeated sound that disturbs the neighbourhood or persons in the vicinity. No person shall carry on an industrial operation located within the Light Industrial Zone (I-1) in such a manner that emits any continuous, persistent or constantly repeating sounds in excess of 60 decibels.<sup>282</sup> These prohibitions apply to persons who own or occupy property and who make noise or sound on that property.

The bylaw exempts certain activities from the noise prohibition. Those relevant to composting include:

- (h) Any delivery or collection services between the hours of 6:00am and 9:00pm on each day except Sunday and any Statutory Holiday in any commercial industrial and public utility district, as defined in the Zoning Bylaws of the Municipality and between the hours of 7:00am and 8:00pm on any day except Sunday and any Statutory Holiday in all other districts in the Zoning Bylaw
- (j) Any sound or noise caused by a farming activity carried out in a reasonable manner on farmland between the hours of 10:00pm and 6:00am if:
  - i) In the circumstances it is essential that the activity take place during such hours or
  - ii) The activity must, in accordance with sound farming practice, take place between such hours

The noise exemptions for farm activities are provided in this bylaw to ensure compliance with the *Farm Practices Protection (Right to Farm) Act* (FPPA) which protects farmers from liability for nuisance claims arising from disturbances, such as noise, arising from a farm operation. This protection is explained in section 2.1.1 above.

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<sup>282</sup> A map of zoning designations and the ALR in Central Saanich may be found at <http://www.centrialsaanich.ca/Assets/Central+Saanich/Maps/Zoning+and+ALR.pdf>. Accessed on Dec 20, 2013

## TCEQ - Odor Complaint Investigation Procedures: FIDO Chart<sup>283</sup>

### ODORS CHARACTERIZED AS **HIGHLY OFFENSIVE**

|                                 |            | FREQUENCY         |           |         |        |       |
|---------------------------------|------------|-------------------|-----------|---------|--------|-------|
|                                 |            | Single Occurrence | Quarterly | Monthly | Weekly | Daily |
| D<br>U<br>R<br>A<br>T<br>I<br>O | 1 minute   | NA                | NA        | VS      | S      | M     |
|                                 | 10 minutes | NA                | VS        | S       | M      | L     |
|                                 | 1 hour     | VS                | S         | M       | L      | VL    |
|                                 | 4 hours    | S                 | M         | L       | VL     | VL    |
|                                 | 12 hours+  | M                 | L         | VL      | VL     | VL    |

### ODORS CHARACTERIZED AS **OFFENSIVE**

|                                 |            | FREQUENCY         |           |         |        |       |
|---------------------------------|------------|-------------------|-----------|---------|--------|-------|
|                                 |            | Single Occurrence | Quarterly | Monthly | Weekly | Daily |
| D<br>U<br>R<br>A<br>T<br>I<br>O | 1 minute   | NA                | NA        | NA      | VS     | S     |
|                                 | 10 minutes | NA                | NA        | VS      | S      | M     |
|                                 | 1 hour     | NA                | VS        | S       | M      | L     |
|                                 | 4 hours    | VS                | S         | M       | L      | VL    |
|                                 | 12 hours+  | S                 | M         | L       | VL     | VL    |

### ODORS CHARACTERIZED AS **UNPLEASANT**

|                                 |            | FREQUENCY         |           |         |        |       |
|---------------------------------|------------|-------------------|-----------|---------|--------|-------|
|                                 |            | Single Occurrence | Quarterly | Monthly | Weekly | Daily |
| D<br>U<br>R<br>A<br>T<br>I<br>O | 1 minute   | NA                | NA        | NA      | NA     | VS    |
|                                 | 10 minutes | NA                | NA        | NA      | VS     | S     |
|                                 | 1 hour     | NA                | NA        | VS      | S      | M     |
|                                 | 4 hours    | NA                | VS        | S       | M      | L     |
|                                 | 12 hours+  | VS                | S         | M       | L      | VL    |

### ODORS CHARACTERIZED AS **NOT UNPLEASANT**

|                                 |            | FREQUENCY         |           |         |        |       |
|---------------------------------|------------|-------------------|-----------|---------|--------|-------|
|                                 |            | Single Occurrence | Quarterly | Monthly | Weekly | Daily |
| D<br>U<br>R<br>A<br>T<br>I<br>O | 1 minute   | NA                | NA        | NA      | NA     | NA    |
|                                 | 10 minutes | NA                | NA        | NA      | NA     | NA    |
|                                 | 1 hour     | NA                | NA        | NA      | NA     | VS    |
|                                 | 4 hours    | NA                | NA        | NA      | VS     | S     |
|                                 | 12 hours+  | NA                | NA        | VS      | S      | M     |

| INTENSITY   |
|-------------|
| LEGEND      |
| VS          |
| Very Strong |
| S           |
| M           |
| Moderate    |
| L           |
| Light       |
| VL          |
| Very Light  |



September 2007

<sup>283</sup> This chart and related information is part of a larger TCEQ document concerning odour complaints procedures found at: [http://www.tceq.state.tx.us/complaints/protocols/odor\\_protodpdf.html](http://www.tceq.state.tx.us/complaints/protocols/odor_protodpdf.html)

## *Odor Characterization Examples*

The character of an odor is a unique, innate quality of an odor that does not vary with intensity. Under normal circumstances the following types/sources/processes may be characterized as indicated below, however, these examples should only be used as a guide; characterization should be based on the investigator's experience and training.

### Highly Offensive

- \* Blood drying operations
- \* Sewage treatment primary sludge
- \* Putrefying animals/fish
- \* Hide processing
- \* Rancid grease
- \* H<sub>2</sub>S (Landfill gas, leachate, paper mill black liquor, etc.)
- \* Mercaptans (natural gas odorant)

### Offensive

- \* Landfill garbage/waste
- \* Cattle lagoon cleanout
- \* Confined hog/poultry operations under best management practices
- \* Decaying silage/composting
- \* Unprocessed rendering plant material and wastewater
- \* Typical grease trap odor
- \* Waste burning (rubber, plastic, tires, other non- wood materials)
- \* Failing or improperly operated septic systems
- \* Organic products like auto-body paint & styrene (fiber-glass, cultured marble mfg)<sup>1</sup>

### Unpleasant

- \* Well digested or chemically-treated sludge
- \* Cattle operation under best management practices
- \* Waste-activated sludge processes
- \* Water-based painting
- \* Gasoline, diesel fuel
- \* Diesel exhaust
- \* Asphalt odors
- \* Burned coffee/food
- \* Brush/wood burning
- \* Ammonia
- \* Chlorine

### Not Unpleasant

- \* Ketones, esters, alcohols
- \* Fresh-cut grass or hay
- \* Normal coffee roasting
- \* Normal food preparation
- \* Bakery
- \* Perfume
- \* Spice packaging
- \* Winery

<sup>1</sup>At low concentrations, organic products such as autobody paint and styrene used in fiberglass and cultured marble operations would not normally be considered to have offensive odors. However, because of a person's potential physical response to these products at higher concentrations (where most complaints concerning these products occur), we generally consider them to have offensive characteristics.

## *Determining Frequency/Duration*

You are attempting to determine the frequency and duration that the complainant experiences over time. The frequency and duration observed during a single investigation may not accurately represent what the complainant is experiencing. You may have to use information gathered from multiple investigations (investigator observations as well as any information gathered on plant processes, weather, terrain, or complainant information) to make this determination. Consider the following:

### Plant Processes

- \* Constant, seasonal, intermittent processes/activities (e.g., reactor top opened)
- \* Upset conditions, maintenance, startup & shutdown, etc.
- \* Plant records, sampling data, CEM data, etc.

### Weather

- \* Wind rose from source to receptor
- \* Temperature or other meteorological data that could affect intensity or duration.
- \* Wind speed day, night, summer, winter
- \* CAMS Station/NWS data

### Terrain

- \* Low areas/channels/valleys where odors can funnel
- \* Changes that could affect local wind patterns

### Complainant Information

- \* Statements as to frequency and duration
- \* Logs - time, effects, source operations, weather conditions
- \* Knowledge of source operations - times, processes
- \* Neighbor and/or visitor corroboration

### How to use the FIDO Chart

Each of the four tables on this FIDO Chart represents a different level of offensiveness (Highly Offensive, Offensive, Unpleasant, and Not Unpleasant). The intensity of the observed odor is documented using the legend on the right side of the chart--with “VS” for Very Strong odors, “S” for Strong, “M” for Moderate, “L” for Light, and “VL” for Very Light. Once the overall frequency and duration have been determined (based on one or more investigations), they are then plotted on the horizontal and vertical axes of the appropriate table. If the odor situation is at least as intense as the colored block in which it is plotted for the corresponding duration and frequency, it is considered a nuisance odor. If the plot falls outside the colored area of the table (NA), the odor does not represent a nuisance.

To summarize, you should analyze the information obtained from all investigations and document the following information in the FIDO Odor Log:

### FIDO Odor Log

- 1 Characterize the odor to determine which **O**ffensiveness table to use (Not Unpleasant to Highly Offensive)
- 2 Assess the **I**ntensity of odor (Very Light to Very Strong)
- 3 Determine the total **D**uration of the odor(s) (1 minute to 24 hours)
- 4 Evaluate the **F**requency of odor occurrence (Single Occurrence to Daily)
- 5 Identify the block on the chart that corresponds to the information from Steps 1-4 and determine if a nuisance condition exists.

| Date | Time(s) | How long did the odor last? | Was the odor intermittent? (Y/N) | Weather Conditions |            |                  | Odor Intensity |       |          |        |             | Odor Characteristics |            |           |                  | Effects/Comments/Concerns |  |
|------|---------|-----------------------------|----------------------------------|--------------------|------------|------------------|----------------|-------|----------|--------|-------------|----------------------|------------|-----------|------------------|---------------------------|--|
|      |         |                             |                                  | Wind direction     | Rain (Y/N) | Temperature (EF) | Very Light     | Light | Moderate | Strong | Very Strong | Not Unpleasant       | Unpleasant | Offensive | Highly Offensive |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |
|      |         |                             |                                  |                    |            |                  |                |       |          |        |             |                      |            |           |                  |                           |  |

