TOWN OF LAKE COWICHAN

Public Works and Environmental Services Committee

Tuesday, December 6th, 2016 at 5:00 p.m. – Council Chambers

AGENDA

Page #

1. **CALL TO ORDER**

INTRODUCTION OF LATE ITEMS (if applicable)

2. **APPROVAL OF AGENDA**

3. **BUSINESS ARISING AND UNFINISHED BUSINESS**
   - (i) On Street Parking Regulations for the Lake Cowichan Business District. 3

(b) **Ongoing Items Still Being Addressed:**
   - (i) Sidewalks and Walking Trail for North Shore Road – Update.
   - (ii) Water Treatment Plant upgrades - Update.
   - (iii) Composting – Update. (See excerpts from Environment Canada technical documents) 7

4. **DELEGATIONS AND REPRESENTATIONS**

   None.

5. **CORRESPONDENCE**

   None.

6. **REPORTS**

   None.

7. **NEW BUSINESS**

   None.

8. **NOTICES OF MOTION**

9. **PUBLIC RELATIONS ITEMS**

10. **MEDIA/PUBLIC QUESTION PERIOD**

11. **ADJOURNMENT**

Staff Report

Date: November 15, 2016
To: Chief Administrative Officer
From: James van Hemert, Consulting Planner
Re: DRAFT On-Street Parking Recommendation

The three figures in this report map the locations for proposed on street parking standards within downtown, South Shore Road, Cowichan Lake Highway, and Saywell Park.

Special notes:

1. The reconstruction of South Shore Road with new landscaping has reduced space for parking in several areas. The yellow curb painting has not been updated recently. In several cases this creates uncertainty. The maps in figures 1-3 may be used to update painting and signage where parking should be prohibited.
2. The southwest side of Stanley Road is already signed for 2 hour parking.
3. The handicap parking space could better serve disabled citizens if it were moved to a more convenient location near Cowichan Lake Highway.
4. The north side of South Shore Road between Lakeview Ave. and Renfrew Ave. is currently signed for 1 hour parking.
5. The north side of Cowichan Lake Highway has a yellow curb between Macdonald Rd. and Neva Rd, however there is space for parking.
6. Parking hours for streets should be between 9 a.m. and 6 p.m.
7. Parking duration for Saywell Park should be 2 hours during park open hours.

Map Legend:

No parking	━━━━━━
2 hour	▬ ▬
1 hour	■ ■ ■ ■ ■ ■ ■
10 minutes	● ● ● ● ● ● ● ● ●

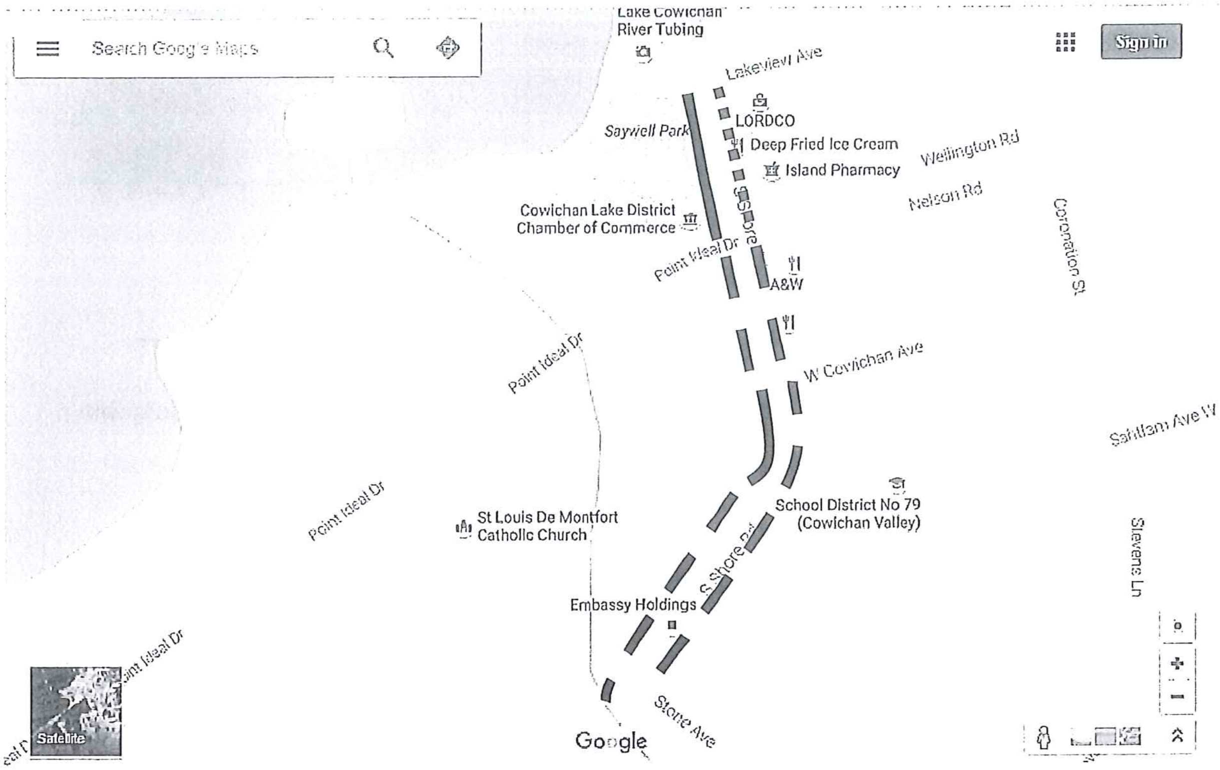

Figure 1 South Shore Road: Stone Ave. to Lakeview Ave.

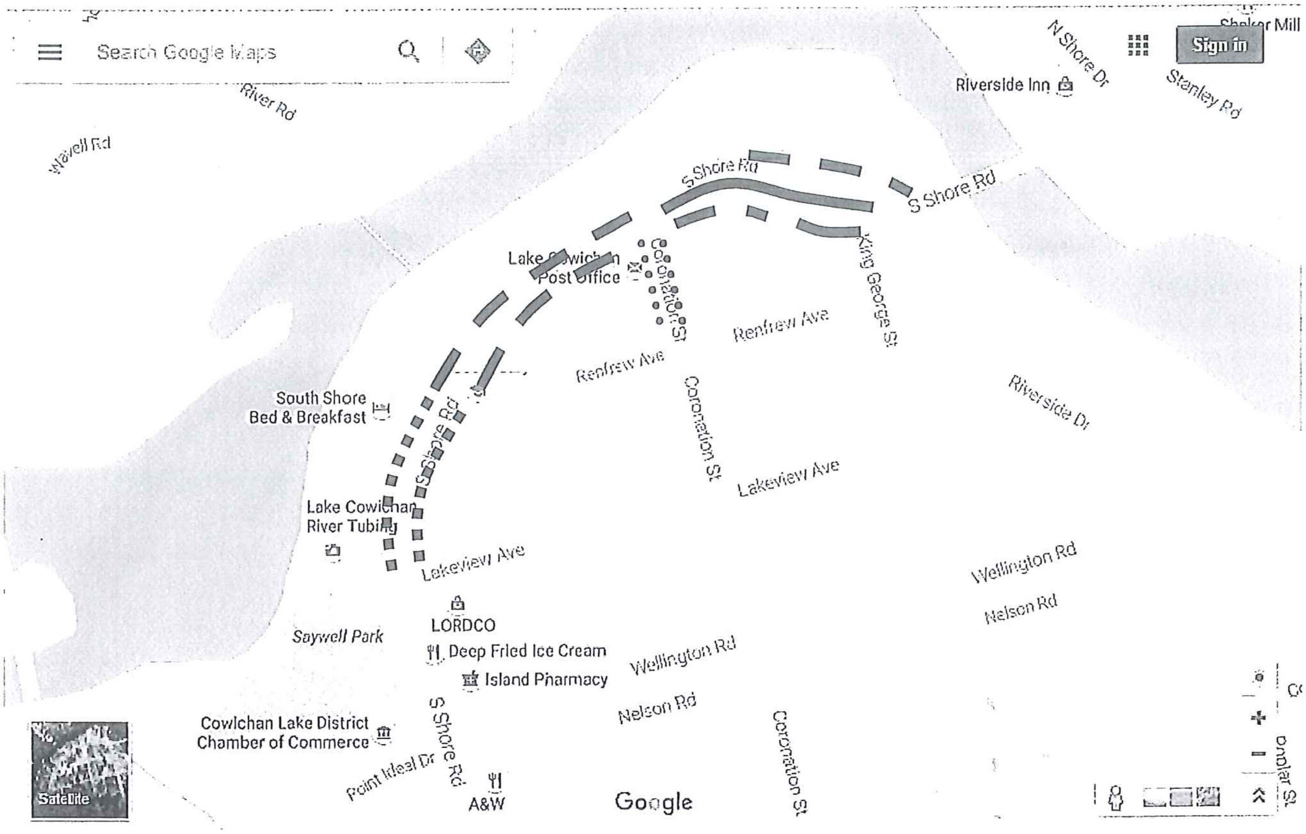

Figure 2 South Shore Road: Lakeview Ave. to North Shore Road

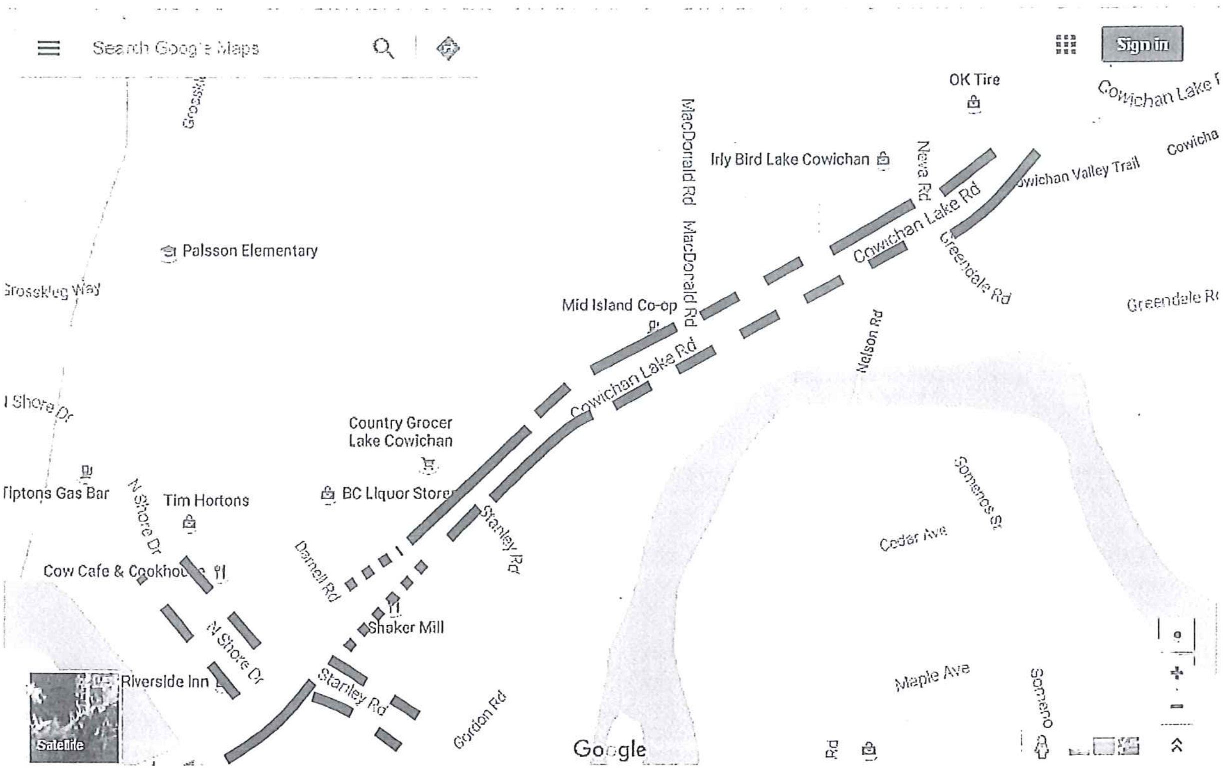

Figure 3 Cowichan Lake Road: North Shore Dr. to Old Cowichan Lake Rd.

Preface

Solid waste management is unquestionably an essential service that local governments provide their citizens. They have an important responsibility to make decisions regarding collection services, disposal infrastructure, waste diversion and recycling programs that are cost-effective and respond to their communities' needs. Even in communities with long-established programs and infrastructure, the management of waste continues to evolve and require informed decisions that take into consideration a complex set of environmental, social, technological, and financial factors. Communities are considering options for processing organic waste and need more detailed, objective technical guidance and reliable information on the available processing technologies.

In recent years, there has been increasing attention to managing the organic fraction of the municipal waste stream. Biodegradable material such as food waste constitutes approximately 40% of the residential waste stream, therefore diversion of organic materials is essential to reach high diversion targets. The environmental benefits of diverting organic materials from landfill include reduced methane emissions (a potent greenhouse gas), and decreased leachate quantities from landfills. From a life-cycle perspective, other benefits, such as the production of valuable compost and renewable energy, can also be derived from the diversion of organic materials from disposal depending on the processing method selected.

While the science of processing leaf and yard waste at open windrow sites is well understood, and facilities are successfully operating at numerous sites across the country, the knowledge and experience of processing food waste in Canada is less well established.

Opinions differ on the effectiveness of various technologies for the processing of organics. Canadian experience has been a mix of successes and setbacks. It is important that lessons learned be shared. Objective and reliable technical information is needed so that local governments choosing an approach to the processing of organics are doing so in a well-informed way that best meets their local needs. Optimization of resource allocation and the economic value of waste materials are important aspects of the sustainability of integrated waste management.

This Technical Document on Municipal Solid Waste Organics Processing was developed to meet this need by providing science-based, objective and user-friendly information on the various aspects of organic waste management planning and operation for organics processing of different capacities and in different locations. The most applicable and relevant proven composting and anaerobic digestion treatment approaches for implementation in Canada and the considerations applicable to their implementation are also discussed. Treatment technologies still at the research level, that are not yet commercially available, or that have not fully demonstrated technical feasibility in the Canadian context are not covered in this Technical Document.

Preface

As many municipalities across Canada are considering options for processing organic wastes, this document can be used as a resource by government officials and stakeholders as they engage with consulting firms and service and technology providers to discuss and assess potential options, prepare tender documents, and evaluate proposals. Users are encouraged to carefully read and interpret the information based on their specific local conditions and regulatory requirements.

This document draws on lessons learned and expert knowledge of professionals, practitioners and academics in the field of organics management across North America. The extensive and varied experience of all contributors and reviewers is brought together in 18 comprehensive chapters describing the technical aspects and key considerations involved in processing organic wastes. The document covers a wide range of topics from the science and principles of composting and anaerobic digestion, to the description of proven processing technologies, biogas utilization, facility design, odor control, and compost quality, as well as other related issues such as procurement approaches and system selection. It is hoped that readers will benefit from this compendium of knowledge and lessons learned to support further efforts to reduce greenhouse gas emissions and optimize the value of municipal solid waste organics under an integrated waste management approach.

1. Introduction to Municipal Solid Waste Organics

Organic waste makes up about 40% of the residential waste in Canada. Municipalities cannot realistically reach diversion targets greater than 50% without instituting some type of residential organics collection program (FCM, 2009). Increasingly, municipalities are collecting source-separated organics (SSO) from residences, and a few municipalities collect SSO from selected businesses, such as restaurants, hotels, and grocery stores.

One of the most important decisions in planning an organics recovery program is the choice of processing technology that will successfully meet the community's diversion needs. Some technologies are more suitable than others, depending on the composition and quantities of organic material to be treated.

The acquisition of a good knowledge of the community's organic waste stream, including composition, quantities and sources, is therefore an essential first step in the planning process.

This chapter discusses:

- Section 1.1: Composition of MSW Organics
- Section 1.2: Estimating the Quantities of MSW Organics
- Section 1.3: Common Issues and Challenges

1.1 Composition of MSW Organics

The municipal solid waste (MSW) stream is diverse and contains a variety of organic and inorganic materials. Typically, the identifiable organic fractions include food waste and leaf and yard waste (L&YW).

SSO waste is a commonly used term that refers to the combination of the MSW organic fraction from residences and the industrial, commercial, and institutional (ICI) sector.

1.1.1 Food Waste

Food waste represents a significant proportion of organic material found in residential waste. It is generated primarily by the residential and ICI sectors, and can be either postconsumer, originating from residential and commercial kitchens (i.e., restaurants and hospitals), or preconsumer, coming from distribution and retail agents (i.e., transporters and supermarkets). Food waste has a high moisture content, which can lead to the generation of leachate and odours during handling and processing.

Specific Organic Wastes Typically Targeted for Diversion

- Grass and leaves
- Garden debris and weeds
- Tree prunings and brush
- Bones
- Bread, muffins, cake, cookies, pies, and dough
- Coffee grounds and tea bags
- Eggs and egg shells
- Fruit and vegetable peelings
- Meat, chicken, and fish
- Nut shells
- Pasta and rice
- Sauces and gravy
- Solid dairy products
- Table scraps and plate scrapings

In this Technical Document, soiled paper products are included as part of the food waste discussion. Soiled paper products that cannot be recycled (e.g., paper towels, napkins, soiled or waxed cardboard, soiled newspaper, and tissues) are often included in organic waste diversion programs. These materials are readily degradable, so including them in diversion programs can be beneficial, since they act as an absorbent for other liquids during collection.

1.1.2 Leaf and Yard Waste

L&YW consists of green grass clippings and thatch, leaves, weeds, brush, and small tree prunings. L&YW is generally small enough that it does not require grinding or shredding before being processed through composting or anaerobic digestion.

More than any other component of the solid waste stream, L&YW generation rates vary widely during the course of the year. Figure 1-1 shows the magnitude of this variation, with the typical month-by-month quantities. L&YW quantities can also vary from year to year within the same area. Intuitively, these fluctuations can be attributed mainly to climatic changes that directly affect grass and tree growth rates, including variations in temperature, precipitation, and hours of sunlight.

L&YW is generally a very clean and contaminant-free feedstock. Some of the common contaminants found in L&YW include plastic bags, pet wastes, dirt, rocks, and fertilizer containers.

Brush, tree limbs, and to a lesser extent tree trunks and stumps, can also be found in the MSW stream and are often considered when evaluating L&YW diversion programs. These wood wastes are sometimes referred to as "green wood" to differentiate them from dimensional lumber and other processed wood products that can be found in the MSW stream. Green wood should be ground or chipped before it is mixed with other organic waste materials.

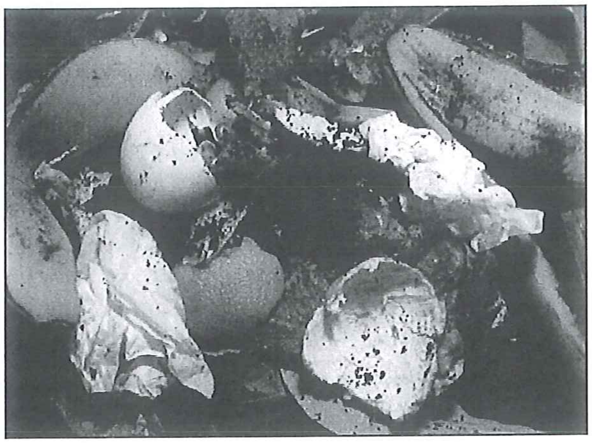

Photo 1-1: Source-separated food waste © *Environment Canada, 2012. Photo: Alain David*

Photo 1-2: Preconsumer food waste tends to be relatively free of contaminants © *CH2M HILL*

Photo 1-3: L&YW is the most common feedstock at organic processing facilities in Canada © *CH2M HILL*

2. Benefits of Organic Waste Diversion

Organic matter is an essential component of soils and plays a fundamental role in soil conservation, crop production, and fertility maintenance. Recycling organic matter to the soil is a part of carbon cycling, an emerging and important environmental issue. Organic waste is recognized as an important organic matter resource and has numerous beneficial attributes. However, when sent to landfills, organic waste generates greenhouse gas (GHG) emissions and can create nuisances and health issues. Therefore, it is important to turn this valuable resource into a soil amendment and fertilizer through sound and efficient collection, transportation, treatment, and management practices.

Historically, organic wastes, along with other components of the waste stream collected from residential and industrial, commercial, and institutional (ICI) sectors, have been disposed in landfills. It is now widely acknowledged that organic waste contributes significantly to the issues associated with landfills. Anaerobic decay of these materials in a landfill leads to the generation of methane, which in turn can be released to the atmosphere if there are no controls in place. Decay of organic waste also increases the production of leachate and putrid odours. In addition to decreasing landfill nuisances, several other environmental and social benefits are associated with landfill diversion.

Biological treatment technologies have been developed to capture the full potential of organic waste diverted from landfills. Composting and anaerobic digestion (AD) technologies were adapted to the specific characteristics of the organic fraction of the municipal solid waste (MSW) stream. Numerous techniques are available to transform organic wastes into valuable products that can be beneficially used in agriculture, horticulture, landscaping, land reclamation, erosion control, and for other purposes. AD technologies in enclosed bioreactors provide new opportunities to capture energy from organic wastes. This energy can further contribute to reducing GHG emissions by displacing fossil fuel use.

When all of the advantages of sound MSW organics management are taken into account, significant benefits occur. This chapter discusses the following three categories of benefits in further detail:

- Section 2.1, Environmental Benefits
- Section 2.2, Social Benefits
- Section 2.3, Economic Benefits

2.1 Environmental Benefits

2.1.1 Greenhouse Gas Reduction

GHG reductions can be realized when organic waste is diverted from landfills to composting and AD facilities and processed under controlled conditions. MSW organics buried in a landfill break down

GHG Reduction

In Canada, diverting one tonne of food waste through composting or anaerobic digestion reduces GHG emissions by approximately one tonne of CO_2 equivalent compared to landfilling.

anaerobically and produce landfill gas that consists primarily of methane (CH_4). Methane is a potent GHG, with approximately 25 times the global warming potential of carbon dioxide (CO_2), making landfills a significant contributor to GHG emissions. Methane also has a relatively short atmospheric lifetime (of about a decade), as compared to carbon dioxide (which remains in the atmosphere for centuries). Due to this short atmospheric lifetime, reducing emissions of methane and other "short-lived climate forcers" has the ability to slow the rate of near-term climate change. Through capture, combustion, or utilization of landfill gas, some landfills are able to recover a significant percentage of the methane generated. However, landfill gas capture systems are not 100% efficient, and many landfills are not equipped with such systems. Diverting organics to composting and AD facilities reduces the methane emissions from landfills.

GHG Reduction Factors

- Level of landfill gas capture
- Carbon content of compost recycled to soil
- Quantity and type of energy generated from biogas
- Quantity of fertilizer replaced

Other activities associated with composting and AD also contribute to GHG reductions, although to a lesser extent. Recycling of organic matter (OM) to soil provides carbon restoration and humus formation (ICF, 2005). Reductions in chemical fertilizer use as a result of compost applications also provide energy savings.

Additional reductions can be obtained when AD is used. Biogas produced during the AD process is captured and can be used to produce electricity that displaces the electricity produced from burning fossil fuels. Biogas can also be refined into a fuel that displaces fossil fuels in heating and vehicles, which further contributes to GHG reductions.

Many factors, such as the level of landfill gas capture, the carbon content in the compost recycled to soil, the quantity and type of energy displaced by the energy created from biogas, and the replacement of fertilizer, all influence the level of GHG reductions associated with organics processing and use.

2.1.2 Compost Products Uses

One of the primary outcomes of most organic waste diversion programs is the production of a stable, mature, and pathogen-free finished compost product: a dark, friable, and earthy-smelling material that resembles soil and is high in humus and valuable plant nutrients. Compost is extremely beneficial in a variety of applications.

Benefits of Compost Use

- Improves any soil to which it is applied, increasing productivity
- Suppresses soil-borne disease organisms
- Prevents topsoil loss
- Provides erosion control
- Degrades some petroleum-based contaminants and reduces the bioavailability of heavy metals

As a ***soil amendment*** for agriculture, landscaping, and horticultural applications, compost improves any soil to which it is applied. Dense clay soils benefit from the inclusion of compost, as it makes them more friable, improving root penetration and drainage. Porous, sandy soils gain better water-holding capacity with the addition of compost, and nutrients are more readily retained. Agricultural soils with depleted OM and that are subjected to extensive cultivation practices improve water conservation through better fertilizer retention in soil, less compaction due to improved structure, and increased productivity. Horticultural soils are improved with the addition of compost for these same reasons, as well as the fact that compost also contains bioavailable nutrients that are released over several growing seasons. Research projects over the past decade have proven that using compost can also suppress soil-borne disease organisms.

Compost can also be used for ***erosion control*** and to ***prevent further loss of topsoil*** in disturbed areas. Compost blankets absorb moisture, moderating the effect of rain on otherwise bare areas, so they are useful in disturbed areas, such as construction sites, capped landfill areas, and restored watercourse banks. One can plant directly into compost, which stays in place indefinitely to enhance the soil.

Compost can both improve the physical, chemical, and biological characteristics of soils, as well as provide a biological method to degrade specific petroleum-based contaminants and reduce the bioavailability of heavy metals. Reclamation and restoration uses for industrial lands are also well acknowledged.

Environmental Benefits of Diverting Organics from Landfills

- Preserves landfill capacity
- Reduces landfill leachate quantities and management costs
- Passively treats landfill gas emissions in landfill closure projects
- During the active life of a landfill, provides erosion prevention, sediment control, and surface water treatment

Use of compost products from organic waste collection and processing provides several environmental benefits that also translate into cost savings. Soil improvement and the decreased need for general fertility maintenance and fertilizer use and production provide measurable benefits. As well, compost helps reduce the humus extraction from soils (peat and black earth) and produces associated benefits.

Compost can be integrated into landfill cover systems and has successfully been used as part of methane-oxidation cover systems that passively treat landfill gas emissions.

2.2 Social Benefits

All of the environmental benefits associated with landfill diversion and compost use also provide social benefits. Reducing the GHG and other pollutant emissions (e.g., particulates and air pollutants) help protect human health and prevent degradation of natural ecosystems.

Methane generated by burying organic wastes in landfills can also present a safety risk. Landfill gas can migrate underground and accumulate in and around structures that are close to the landfill site. If significant quantities accumulate, there is a risk of explosion. Reducing the quantity of organics in landfills helps to reduce the amount of landfill gas generated and the associated safety risks.

Extended landfill life contributes to land preservation; diverting organics from landfills preserves space for those wastes that cannot be diverted or reused. As well, compost can be incorporated into bioswales, engineered wetlands, and other biological systems for treating surface water runoff and reversing the negative impacts of industrialization.

Social Benefits of Diverting Organicsfrom Landfills

- Protects human and environmental health
- Reduces landfill safety risks
- Contributes to land preservation
- Produces compost, which can be used for reforestation, wetlands restoration, and habitat revitalization to reverse industrialization impacts
- Decreases nuisances for neighbours
- Allows creation of compost and biogas, reducing reliance on nonrenewable resources (peat and fossil fuels)
- Provides opportunities for teaching, training, and employment
- Contributes to healthy soils vital to sustaining the agricultural industry

Removing organics from landfills reduces leachate and odours nuisances; therefore, decreasing the social negative impacts for surrounding communities and society. The development of organic processing facilities and the end-use of compost and energy derived from organics processing also lead to numerous social benefits. Developing facilities closer to the communities in which the organic wastes are generated can encourage better community participation. Facilities that are close to waste sources also reduce transportation requirements, which can also provide environmental health benefits through the reduction of GHG emissions.

Source separation, conversion, and reintroduction of organics into the carbon cycling system also promote the Reduce-Reuse-Recycle (3R) hierarchy by modelling the importance of sound resource management. Distributing compost for residential, commercial, agricultural, and industrial uses demonstrates practical and positive outcomes for organic cycling, which in turn encourages participation at all levels of the waste-resource system.

Compost end-use also stimulates employment and a new, environment-based economy. Processing facilities create new jobs during both the construction and operation phases. Compost management supports economic development through employment: handling, marketing, research, demonstration, and education. By reducing fertilizer needs and providing soil improvement, organics recycling helps sustain agriculture and food production.

2.3 Economic Benefits

At first glance, MSW organics collection and processing, and subsequent use as a soil amendment, leads to additional MSW management system costs associated with:

- Operating and amortized capital costs for new processing infrastructure
- Re-engineering collection programs
- Communications to promote participation
- Administration of stewardship programs to support the organics recycling strategy
- Research, demonstration, and education to develop markets and social acceptance

Economic Benefits of Diverting Organics from Landfills

- Extends landfill life
- Reduces harmful emissions
- Provides new, environmental-based, direct and indirect employment opportunities
- Provides costs savings by reducing fossil fuel and fertilizer use
- Generates potential revenue if GHG reductions sold as offsets
- Provides costs and energy savings from chemical fertilizer replacement

Traditional accounting methods would normally estimate that these modifications may represent an additional cost to each household within the system. However, these supplemental costs depend on the specific analysis context. For example, when conducting a life-cycle analysis of an organics diversion program, supplemental costs to the environmental and social benefits gained would be considered to estimate the net cost impact to society. Positive impacts of organic diversion programs that would also be considered include:

- Extended landfill life
- Reductions in GHG emissions and air pollutants (versus landfilling)
- Direct and indirect employment benefits

- Energy and costs savings from chemical fertilizer replacement
- Potential revenues from energy produced from anaerobic digestion
- Lower cost for leachate management

Organic waste diversion programs typically provide net benefits when a life-cycle accounting procedure is used to measure the cost of capital and operations, taking into account the social and environmental benefits.

Landfill space has become a valuable commodity in many parts of Canada. Diverting organic materials with viable management options away from landfills, and preserving that space in the landfill for materials that have no other alternative, makes good business sense. With less waste coming in, the lifespan of existing landfills can be extended significantly, which defers the costs associated with finding and constructing new landfill sites. Siting new landfills is normally a challenging task as many, often opposing, factors need to be taken into account. For instance, a desirable proximity to the waste source is in direct opposition to the selection of a site with no nearby neighbours who might be negatively impacted. From an economic standpoint, extending the lifespan of an existing site is always preferable to seeking a new property to replace a landfill nearing capacity.

In jurisdictions where landfills are located hundreds of kilometres (km) from the point of waste generation, the costs of transferring waste to landfills can be significant. Since organic waste processing facilities do not preclude future redevelopment and land use, it may be possible to locate these facilities closer to the point of generation; thus, reducing transfer and management costs for municipalities, as well as GHG emissions.

As discussed in the previous section, the compost production and distribution cycle provides employment and other resultant benefits to local communities.

As well, the AD process produces both electricity and a substitution for fossil fuel. With the increasing cost of energy and a better understanding of climate change's negative impacts, it has become more obvious that diverting organics from landfills provides a logical and practical choice for the future.

In addition to cost savings, revenues can be obtained from byproducts, such as compost that can be marketed and sold. AD facilities may also be able to convert biogas into heat and various grades of fuel for electrical generation, district heating, and powering vehicles. The economic benefits of selling these products, or using them to offset internal consumption of fossil fuels, can be significant.

Diverting organic materials from landfills reduces the cost of landfill leachate management. Less organic waste means there is less moisture going into the landfill to contribute to leachate generation. Collecting and managing landfill leachate can be costly, particularly if offsite treatment or disposal is required.