

## Food and Organic Waste Update

Presented To:	Operations Committee
Meeting Date:	September 20, 2021
Type:	Correspondence for Information Only
Prepared by:	Aziz Rehman Environmental Services
Recommended by:	General Manager of Growth and Infrastructure

## Report Summary

This report provides information regarding the short term and long term reviews for processing food and organic waste. It also provides an update regarding the draft Food and Organic Waste Policy Statement that sets targets for diverting increased volumes of food and organic waste from landfill.

## Relationship to the Strategic Plan, Health Impact Assessment and Community Energy & Emissions Plan (CEEP)

Asset Management and Service Excellence as well as Climate Change goals as outlined in the 2019-2027 Strategic Plan adopted by City Council, and goal # 6 “Achieve 90% solid waste diversion by 2050. An organics and biosolids anaerobic digestion facility is operational by 2030” as well as goal #18 “Increase the reforestation efforts of the greening program” in the Community Energy & Emissions Plan (CEEP).

## Financial Implications

There are no financial implications associated with this report at this time. As Staff further review the Food and Organic Waste Policy Statement and options for a long term processing system, the cost associated with any changes will be identified and presented to the Operations Committee.

## Background

### Current Organic Processing System and Collection Programs

Two distinct categories of organic wastes are handled and processed in the City of Greater Sudbury. These include leaf & yard trimmings and source separated organic waste (food waste and non-recyclable paper products). The handling and processing of leaf & yard trimmings is permitted and licensed at all three operating landfill and waste diversion sites located in Azilda, Hanmer and Sudbury. Whereas, the handling and processing of organic waste is only permitted and licensed at the Sudbury Landfill and Waste Diversion Site.

Source separated food and organic waste is delivered to the organic composting area located within the waste disposal footprint of the Sudbury landfill site. The material is offloaded in the receiving pen, where it is inspected, documented and pre-processed for approximately one (1) month. The pre-processed material is then moved from the receiving pen to the processing pad. The location of the current organic processing area

is shown on the overall layout of the Sudbury Landfill in Appendix A.

Presently, a conventional aerobic windrow composting system is used to process the food and organic waste. Windrow systems require a large processing area and the time to complete the process is longer (approximately 6 to 8 months) in comparison to other systems but it is a cost efficient method of managing the material. The organic processing facility is situated on a temporary area within the waste disposal footprint of the Sudbury Landfill which will eventually need to be moved in order to fill the area with garbage in compliance with the sequential waste filling plan approved in the design and operation report of the site. The approved fill plan is attached as Appendix B.

Currently, food and organic waste materials are received from the residential sector and from limited programs for the industrial commercial and institutional (IC&I) sector. Residential roadside waste collection programs have undergone several changes between 2016 and 2021. In this period, the garbage limit was decreased from 3 bags to 2 bags weekly, followed by a further reduction to 1 bag weekly and finally, 2 bags every other week. These changes were made to drive participation in waste diversion programs, especially the green cart organics program. As a result, the quantity of organic waste received for processing has increased as detailed in Table 1.

High density residential properties with roadside collection services are permitted to participate in the green cart organics program while those with a centralized collection system (bins or carts) may participate for an additional fee. Although there have been a few inquiries, none of the high density residential properties have registered to take part in the organics collection program.

Several IC&I organic programs have been developed and implemented:

- The Yellow Cart roadside collection program is available for a fee to non-residential units who do not produce more than 3 yellow carts of organic waste every week.
- Elementary and secondary schools as well as colleges and universities may choose to register to participate in the organics program and pay the associated costs.
- Municipal facilities are permitted to participate in the organics program and the associated fees are included in the Environmental Services operating budget.
- Any other establishment from the IC&I sector may apply to participate and pay the associated costs however there is limited availability for participation.

Table 1. Quantity of organic waste received for processing annually

<b>Organic Material Received by Sector</b>	<b>Organic Material Received from the Residential Sector (Tonnes per Year)</b>	<b>Organic Material Received from the IC&amp;I Sector (Tonnes per Year)</b>	<b>Total Organic Material Received (Tonnes per Year)</b>
2015	1,949	146	2,095
2016	2,119	136	2,255
2017	2,309	116	2,425
2018	2,433	149	2,582
2019	3,216	477	3,693
2020	3,771	186	3,957
2021 (Jan 1 to June 30)	2,373	61	2,434

The operating capacity of the current organic processing system is limited and the remaining capacity must be

reserved for the increasing residential materials. IC&I establishments applying to participate in the program are currently being placed on a waiting list until the full scope of the latest residential roadside collection change is realized.

## Provincial Legislation

In April 2018, the Province released The Food and Organic Waste Framework. On July 9, 2018, staff presented a report entitled "Update – Food and Organic Waste" to the Operation Committee to detail the Food and Organic Waste Framework. The Framework considered a phased approach of banning food and organic waste from being disposed in landfills. Subsequently, the Province developed the Food and Organic Waste Action Plan and the draft Food and Organic Waste Policy Statement.

The Action Plan outlines strategic commitments to be taken by the province to address food and organic waste. The Policy Statement, under the Resource Recovery and Circular Economy Act, 2016, provides direction to the MECP, municipalities, the IC&I sector, owners and operators of resource recovery systems, and others to further the provincial interest in waste reduction and resource recovery as it relates to food and organic waste.

Although there are currently proposed amendments to the Food and Organic Waste Policy Statement, the April 2018 Statement remains in effect and a final Policy Statement is expected to follow.

There are implications from the Food and Organic Waste Policy Statement that may affect future organics programming and processing in Greater Sudbury and steadily increase the quantity of organic waste received for processing.

- **Municipal Targets:** Municipalities who currently provide roadside collection of source separated food and organic waste shall maintain or expand these services to ensure that residents have access to convenient and accessible collection services. These municipalities must meet the target of 70% waste reduction and resources recovery of food and organic waste generated by single family dwellings (low density residential) in urban settlement areas by 2023.
- **High density residential buildings:** Buildings shall provide collection of food and organic waste and meet a 50% waste reduction in food and organic waste generation at the building by 2025.
- **Industrial Commercial and Institutional Sector:** All retail shopping establishments, retail shopping complexes, office buildings, restaurants, hotels and motels and large manufacturing establishments that generate 300 kilograms or more of food and organic waste per week shall source separate food and organic waste and meet a 70% recovery rate by 2025. Those who generate less than 300 kilograms of food and organic waste per week should source separate food and organic waste and meet a 50% recovery rate by 2025.
- **Schools and Hospitals:** Educational institutions and hospitals, subject to O. Reg. 103/94 under the Environmental Protection Act, that generate 150 kilograms or more of food and organic waste per week shall source separate food and organic waste and meet a 70% recovery rate by 2025.

Additional guidance is expected to be provided by the province in the coming months regarding implementation of the final Policy Statement.

With the implementation of every-other-week garbage collection, Greater Sudbury will continue to collect and expand the roadside Green Cart program to low density residential properties, as well as, the residential units within multi-type properties with roadside collection agreement, high density residential properties with agreements for roadside waste collection services and small IC&I properties through the Yellow Cart program. Programming will also continue to focus on encouraging schools and municipal facilities to participate in organic waste diversion while other IC&I establishments will continue to be limited.

The policy statement indicates that high density residential buildings shall provide collection of food and organic

waste. In the future, the possibility of providing organics collection to high density residential properties with agreements for centralized collection (front-end bins or automated carts) will be analyzed by Staff and brought back to the Committee for review.

Keeping organics out of landfills is necessary to help reduce the release of methane gas, a greenhouse gas that is 28 to 36 times more potent than carbon dioxide. In order to continue with these efforts and meet provincial targets in the upcoming years, there is a need to upgrade and replace the existing food and organic waste processing system to process the increasing quantity of organic waste and the anticipated volume that could be generated by sectors not currently participating in food and organic waste diversion. An appropriate long-term organic processing facility will be required to manage anticipated increases of food and organic waste in the future.

## **Analysis**

### **1. Current and Future Quantities of Organic Waste**

Source separated organic waste accepted in City's organic waste program include:

- Food Waste
- Non-recyclable and soiled paper products such as paper towels, tissues, potato bags, coffee filters, parchment and wax paper, disposable paper food & beverage cups containers, plates and trays, etc.

Currently, the City receives approximately 4,000 tonnes of organic waste per year from a combination of both the residential and IC&I sectors. However, the majority is received from the residential sector.

The results of a participation study conducted in 2018 indicated that 27% of residents are participating in the Green Cart program to divert food and organic waste. Based on that data it was estimated that there is a total potential for approximately 9,012 tonnes of food and organic waste per year from existing residential roadside collection programs.

Data provided in 2018 estimates that 14.8% of the IC&I garbage in Greater Sudbury is organic material. This amounts to a total potential of approximately 9,253 tonnes of IC&I organics per year.

Although Staff do not expect that 100% of the total potential available tonnes will be captured, the data suggests that Greater Sudbury has the total potential to generate over 18,000 tonnes of food and organic waste per year, which is more than 77% of the amount being received for processing at this time.

### **2. Processing Options**

Greater Sudbury is currently processing food and organic waste with a temporary short term system and Staff are reviewing alternate options for short term and long term organic processing.

#### **2.1 Short Term and Alternate Options**

##### **a) Temporary Windrow Composting within the Waste Disposal Footprint**

The City will continue processing food and organic waste with the current windrow composting system. This system is temporary because the processing area must remain within the waste disposal footprint, processing capacity of the available area is limited and the operation will have to be shifted multiple times as the occupied area is required for landfilling. A new temporary organics processing pad is currently being constructed in the northwest corner of the waste disposal footprint because the current processing pad area in southwest corner is required for landfilling within the coming years.

Regardless of its location within the waste disposal footprint, this system poses operational challenges such as naturally occurring settlement of the pad area, pooling of water, and leachate seepage that require on-going maintenance. In addition, during the relocation process, significant costs are incurred for construction of new

pad and pen areas.

Without additional short term options to complement the current processing system, acceptance of additional food and organic waste material from the IC&I and high density sectors will continue to be limited until a long term solution is implemented.

#### **b) Municipal Industry Partnership for Regreening**

A pilot partnership has been created with Vale in the City's regreening program. Ground leaf and yard waste from the Sudbury Landfill and Waste Diversion Site is shipped to Vale's tailing area. The semi processed material is mixed with other organic material obtained by Vale to be applied to the tailings area for soil reclamation. To date, the pilot project is considered a great success and Vale has expressed interest in expanding the pilot to include food and organic waste material.

Staff are working with Vale to consider the addition of food and organic waste to the pilot project. If implemented, semi processed food and organic waste could be shipped to Vale's facility where it would be mixed with other compostable materials and then finally used in soil remediation activities on tailing lands. If the partnership continues to be successful, the City could consider expanding the organics program to receive and divert additional quantities of food and organic waste from the IC&I sector.

Regreening activities result in carbon sequestration and supports CEEP goal #18 by storing carbon through revegetation of barren lands. By keeping the final product of the processed organics within Greater Sudbury, the community will benefit from a healthier environment.

#### **c) Shipping to Off-Site Processing Facilities**

As an alternate option, Staff reviewed the possibility of shipping food and organic waste to an offsite processing facilities within Ontario. Estimates for tipping fees and freight costs for shipping the material to six organic processing facilities were reviewed. The estimated cost ranged from \$176 to \$210 per tonne. This excludes the cost of on-site storage and handling of the food and organic waste until the material is transferred off-site.

In 2020, a pilot project was negotiated with *Convertus* who has an organic processing facility in Ottawa. Three truck loads of organic waste were sent to this off-site location at an approximate cost of \$150 per tonne. Shipping the organics to an off-site processing facility is considered an expensive option that would require additional operating funds. Furthermore, it provides no added value to the City or community in terms of local soil reclamation and carbon sequestration. For these reasons, shipping food and organic waste off-site should only be considered as a contingency plan.

## **2.2 Long Term Options**

There are generally two approaches for processing organic materials: aerobic composting and anaerobic digestion. Aerobic composting uses oxygen in which biological decomposition of organic materials produces carbon dioxide, water and a stabilized residue called finished compost. Anaerobic digestion is the biological decompositions of organic materials in the absence of oxygen, which produces biogas containing methane and carbon dioxide. This biogas can be used as a fuel to generate energy. After digestion, the remaining material can be further processed aerobically to produce compost.

Aerobic composting of organic materials is the predominant means of processing organic materials in the province, while anaerobic digestion of organic materials in Ontario has been relatively limited and strongly dependent on energy pricing.

#### **a) Anaerobic Digestion – 2018 Pre-feasibility Study with Greater Sudbury Utilities**

Greater Sudbury Utilities (GSU) undertook a pre-feasibility study for an anaerobic digestion systems in 2018. The model assumed importing approximately 75% of the feedstock from outside the Greater Sudbury area (within a 350 km radius). Under the suggested anaerobic digestion model, GSU would own the facility and contract the operation to a service provider. The City and other users would be required to pay a tip fee for organic material delivered to the site.

Several systems were reviewed and two systems were eventually shortlisted. The costs for the systems ranged from \$26.85 to \$27.80 million and an estimated operating cost of \$120 to \$125 per tonne. Both systems involved energy production and the energy revenues were integrated in the estimates.

At the time, the conditions did not support moving forward with an anaerobic digestion system. However, GSU did indicate that they would continue to monitor market conditions in anticipation that the project may one day be viable.

### **b) Aerobic Composting Review - 2018**

A review was conducted by City Staff in 2018 and focused on the feasibility of an aerobic composting system. The study comprised of a comparative review of proven technologies, criteria for preferred sites and existing facilities. A phased approach with an initial design capacity to process 7,500 tonnes of food and organic waste per year and the option of future expansions was evaluated. Under the aerobic composting system model, the City would own the facility and contract the operation to a service provider.

The pros and cons of several composting technologies were reviewed. The four systems reviewed in detail included: Turned Windrows, Aerated Windrows, Aerated in vessel Bay and Rotating Drum composting technologies. A broad level assessment was made for the estimated capital and operating costs for the shortlisted systems.

Although these options were initially explored, the preference has shifted to focus on considering anaerobic digestion as a long term food and organic waste processing system solution.

### **c) Anaerobic Digestion – 2021 Feasibility Study with Greater Sudbury Utilities**

In May 2019, Greater Sudbury declared a climate emergency, made climate action a priority, and set a path for a plan to reduce carbon emissions to net zero by 2050. A Community Energy and Emissions Plan (CEEP) was developed and approved by Council in 2020.

Goal #6 of the CEEP sets a target to achieve 90% solid waste diversion by 2050 and have an organics and biosolids anaerobic digestion facility operational by 2030.

In pursuance of CEEP, Staff is currently collaborating with GSU to conduct a feasibility study for implementing an anaerobic digester capable of producing renewable natural gas. This study will consider a processing system option that is scaled to the current volumes of food and organic waste generated within Greater Sudbury with the ability to expand to accommodate additional future volumes. The details of the scope of work for the study are currently under review. The study will be conducted to produce a final report with options for consideration.

The Province, through the Food and Organic Waste Policy Statement, supports these types of initiatives. The provincial government recognizes the need to develop new technologies for the processing of organic materials and encourages municipalities and owners of processing systems to examine the feasibility of updating processing technology to maximize diversion and support a low-carbon economy. It also recognizes that creating additional capacity to support these initiatives will require investment in infrastructure and that the province must support and foster these needs.

Options for provincial support to invest in new infrastructure for organic processing will be explored as part of the review and analysis of potential anaerobic digestion systems.

## Conclusion and Next Steps

A steady increase in the quantity of food and organic waste requiring processing is anticipated due to changes made in the residential roadside collection programs and policy statements from the Province. Staff are reviewing alternate options for temporary short term and permanent long term processing of food and organic waste received at the landfill and waste diversion site. While reviewing and implementing the short term temporary options, staff will continue pursuing goal #6 of the CEEP for implementing an anaerobic digestion system as a long term solution. At this time staff is working in partnership with GSU to conduct a feasibility study to provide options to attain this goal.

Staff will report the findings of the feasibility study to the Committee for direction and continue to provide updates on the Provincial Food and Organics Policy Statement.

## Resources Cited

Ontario's Food and Organic Waste Framework

Accessed online:

<https://www.ontario.ca/page/food-and-organic-waste-framework>

Food and Organic Waste Policy Statement

Accessed online:

<https://www.ontario.ca/page/food-and-organic-waste-policy-statement#section-11>

Food and Organic Waste Policy Statement with proposed amendments

Accessed online:

<https://prod-environmental-registry.s3.amazonaws.com/2020-09/Proposed%20Amendments%20ENGLISH.pdf>

City of Greater Sudbury, Operations Committee, Manager's Report, Processing Organic Material and Options to Expand the Program – September 18, 2017

Accessed online:

<https://pub-greatersudbury.escribemeetings.com/filestream.ashx?documentid=7805>

City of Greater Sudbury, Operations Committee, Manager's Report, Update – Food & Organic Waste – July 9, 2018

Accessed online:

<https://pub-greatersudbury.escribemeetings.com/filestream.ashx?documentid=5116>

City of Greater Sudbury, City Council Resolution CC2019-151–Climate Emergency Declaration – May 28, 2019

Accessed online:

<https://pub-greatersudbury.escribemeetings.com/FileStream.ashx?DocumentId=30307#page=3>

City of Greater Sudbury Community Energy & Emissions Plan (CEEP) – December 2019 (revised March 2021)

Accessed online:

<https://www.greatersudbury.ca/live/environment-and-sustainability1/net-zero-2050/community-energy-and-emissions-plan-ceep-march-2021-pdf/>

City of Greater Sudbury – 2019-2027 Strategic Plan

Accessed online:

<https://www.greatersudbury.ca/city-hall/reports-studies-policies-and-plans/report-pdfs/2019-2027-strategic->

[plan/](#)