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Appendix A

Waste Reduction and Diversion Assessment

THE CORPORATION OF THE TOWN OF ST. MARYS
WASTE REDUCTION & DIVERSION ASSESSMENT

AUGUST 2018



The Corporation of the Town of St. Marys
Public Works Department

August 2018



Disclaimer

This Waste Reduction and Diversion Assessment for the Town of St. Marys has been prepared by the Environmental Services Supervisor and has been reviewed and approved by the Director of Public Works. This document provides an overview of the current waste streams within the Town of St. Marys and identifies potential initiatives for advanced diversion and the impacts additional programs may have on the Town. Information presented within this report is understood to be factual and correct and Town staff shall not be held liable for inaccurate or improper data relied upon herein.

This report has been prepared in support of the Environmental Assessment for Future Solid Waste Management Needs within the Town of St. Marys as per the Terms of Reference Approval from the Ministry of Environment and Climate Change.

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1.0 Introduction

In most Canadian municipalities, the number one challenge is how to do more with less. Departments and Agencies must contend with increasingly tight budgets, yet still strive to deliver frontline programs and services to growing populations (The Corporation of the Town of St. Marys, 2011).

The following assessment was completed with the Resource Recovery and Circular Economy Act, 2016 in mind, which establishes the outcomes-based producer responsibility regime. In establishing waste reduction and diversion initiatives based on the Resource Recovery and Circular Economy Act, 2016, the Town will be better positioned to consider end-of-life materials as resources rather than waste, resulting in fewer raw materials being used and working to maximize the life expectancy of the landfill site. In addition to the Resource Recovery and Circular Economy Act, 2016 is the Waste Diversion Transition Act, 2016, which will facilitate a seamless transition from the current waste diversion programs to the new producer responsibility framework.

Certain steps are encouraged in order to achieve and maintain a zero-waste economy. By the year 2020, it is anticipated to begin transition of existing programs such as the e-waste recycling and Blue Box program. Development as well as implementation of the Food and Organic Waste Action Plan and 3Rs Regulations are also projected to commence during this time period. By 2050, the Circular Economy targets an 80% diversion rate while building towards a zero-waste economy. This coincides with the Town's current plans and strategy for Future Solid Waste Disposal Needs with the anticipated expansion of the existing landfill site into the 2050's.

As the Town positions itself for a long term waste disposal solution, the ability to divert and reduce the volume of waste destined for final disposal will be vital. This assessment looks at the current waste reduction and diversion programs administered by the Town, as well as investigating programs which may be considered to improve waste reduction and diversion as strategies administered from the Provincial Government come to fruition.

2.0 Background

The St. Marys Landfill Site opened in December 1984 and was designed to be constructed and filled in three phases, referred to as Phases I, II and III. Each phase of the original design was to be separated by an earth berm, and each disposal area was anticipated in 1982 to provide approximately 15 to 20 years of landfilling capacity for the Town of St. Marys, depending on population growth rates (Design and Operation Report, Phase II/III, St. Marys Landfill Site, St. Marys, Ontario, Ref. No. 0645(9) prepared by Conestoga Rovers & Associates dated November 1992).

Phase I was designed for a maximum volumetric capacity of 104,000 cubic metres, including daily cover. Phase II/III required the design to be re-assessed and upgraded due to new environmental standards at the time and resulted in a total combined volumetric capacity of 276,000 cubic metres with 140,000 cubic metres for Phase II and 136,000 cubic metres for Phase III. Phase II/III was designed to be developed in eight (8) stages, with each stage supplying approximately 1.5 to 3 years of landfilling capacity. This estimation was based on utilizing a fill rate seen in Phase I of 15,000 cubic metres per year. The design of Phase II/III had an estimated life projection of only 18.5 years.

Phase I of the Site filled up significantly quicker than originally projected, and was full by late 1992, which represented a fill life cycle half that which was originally projected. As a result of the fill rates observed in Phase I, as well as the requirement to re-assess and upgrade the design of Phase II/III, Phase II/III was given a fill life cycle of 18.5 years in 1992 and was projected to close in circa 2011.

As the environmental movement took effect in the late 1990's and early 2000's, the Town of St. Marys evolved its waste management system to begin to incorporate numerous waste diversion programs into normal operation as a way to divert material from final disposal at the landfill, thus extending the life of the landfill site. Currently, the Town administers the following programs related to waste reduction and diversion:

- Automated Curbside Collection
- Municipal Hazardous and Special Waste Depot
- Leaf and Yard Waste Collection
- Scrap Metal Recycling
- Blue Box Recycling
- Electronic Waste
- Concrete and Asphalt Recycling
- Wood and Brush Grinding

Please refer to Appendices A1-A8 for specific details regarding each of the above noted Reduction or Diversion Program, as well as near, mid and long term initiatives for improving waste diversion.

3.0 Waste Disposal Rates

As stated in Section 2.0, the St. Marys landfill site opened in the winter of 1984. Initial estimates were that each Phase of the site would provide approximately 15-20 years' worth of disposal capacity. Unfortunately, Phase I of the Site filled up much more quickly than originally estimated. The average fill rate experienced for Phase I was 16,000 cubic metres per year and this portion of the Site was closed in late 1992.

Environmental requirements changed between the time that Phase I opened and Phase II/III were to open, and as stated in Section 2.0, the design was required to be reassessed. It was at this time that the design for Phase II/III was set for an annual volumetric fill rate of 15,000 cubic metres per year with a site life projection of 18.5 years. Through the time that Phase II/III was in operation, the Town made significant strides in waste reduction and diversion programs aimed at extending the life of the remaining approved landfill. Between 1992 and 2017, the Town has averaged approximately 12,000 cubic metres per year in disposal for Phase II/III, or approximately 3,000 cubic metres less than the original design estimates for the Site.

In 2017, the Town utilized approximately 13,161 cubic metres of approved landfill space for final disposal of material. Although this is slightly above the average fill rate over the life of these Phases, the Town's population has increased approximately 1,300 individuals, excluding IC&I additions to the waste stream, than that which was originally projected when the Site was designed.

Table 1 details the historical disposal rates experienced at the landfill site for the Town of St. Marys from 1984 through 2017.

4.0 Waste Reduction & Diversion

Waste Reduction and Diversion programs can be found all across the Town of St. Marys, to not only maximize the useful life of existing infrastructure, but while also being mindful of the environment and delivering programs that meet or exceed residential expectations.

Current Waste Reduction and Diversion Programs:

At the current time, the Town administers approximately eight (8) waste reduction and diversion programs consisting of, but not limited to: the Blue Box Program, Leaf and Yard Waste, Municipal Hazardous and Special Waste, etc.

For a complete list of current waste reduction and diversion programs, along with a general program summary, please refer to **Appendix A**.

Over the last three years (2015-2017), the various diversion programs administered by the Town, excluding Concrete and Asphalt recycling, have successfully diverted approximately 5,500 metric tonnes of waste from the landfill site. This equates to a residential diversion rate of approximately 44%.

Please refer to **Table 2** – Historical Waste Reduction & Diversion Rates for a complete summary of program diversion values, and the Towns annual residential diversion rate.

However, there is always the potential to improve existing program, enhance material collection and diversion in an effort to capture as much of the material as possible to reduce the volume that is placed in the landfill for final disposal.

For each program noted in Appendix A, near-term, mid-term and long-term initiatives have been proposed as part of this assessment in an effort to improve existing programs, and maximize waste reduction and diversion.

The following table depicts initiatives which may be found within Appendix A for existing programs and may be found at the bottom of each individual reduction and diversion program summary:

Example - Opportunities for Improved Waste Reduction & Diversion:

<i>Initiatives (Near Term)</i>	<i>Initiatives (Mid Term)</i>	<i>Initiatives (Long Term)</i>
<p><i>Incentive Programs should be considered to promote at home diversion initiatives such as backyard composters and digesters.</i></p> <p><i>Education and Outreach programs should be developed and implemented to ensure residents are aware of reduction and diversion programs for enhanced utilization.</i></p>	<p><i>Consideration should be given to standardizing on a single 35 gallon container size for curbside collection. Such a standardization would promote diversion and reduction by limiting the volume of waste which can be disposed through the program.</i></p>	<p><i>Consideration should be given to an effective implementation of a Food & Organics Collection Program.</i></p>

It is the intent of this Assessment to propose initiatives which can be considered now, to enhance existing programs, while also being mindful of the future by proposing longer-term initiatives that may be considered as the Town grows, demographics change, new technology emerges or regulatory requirements amended.

Potential Waste Reduction and Diversion Programs:

While the Town has positioned itself well based on the implementation of historical waste reduction and diversion programs, new waste streams, and aftermarket uses continue to be developed, which opens up additional diversion programs for consideration.

As part of this Assessment, an additional Eight (8) waste reduction or diversion programs have been identified for consideration by the Town. Programs for consideration include, but are not limited to: Food and Organics Collection, Asphalt Shingles Recycling, textile recycling and landfill optimization.

For a complete list of potential waste reduction and diversion programs, along with a general program summary, please refer to **Appendix B**.

Similar to Appendix A, for each program noted in Appendix B, near-term, mid-term and long-term initiatives have been proposed as part of this assessment in an effort to facilitate discussions surrounding additional waste reduction and diversion programs, considerations for the Town and aligning initiatives with provincial government goals and strategies, as necessary.

As the Town positions itself for a long-term waste disposal facility via the Environmental Assessment for Future Solid Waste Disposal Needs, it will be the opportune time to consider new, modified or expanded waste diversion programs to position the Town to maximize infrastructure now and into the future. The inclusion of diversion programs into the detailed design of the landfill site will be vital to the success of the programs.

5.0 Implementation

Throughout this assessment, various near-term, mid-term and long-term initiatives were documented as a means for consideration in potentially enhancing diversion programs within the Town of St. Marys. Initiatives should be reviewed and investigated prior to any implementation based on the changing landscape of the Town as well as the implementation of strategies, frameworks and goals from the Provincial Government.

Implementation of any waste reduction and / or diversion program should be duly considered by the Town in collaboration with its Strategic Plan and the six (6) key pillars to ensure the overall outcome of positive net effects that benefit the community as a whole.

Due to the recent transition at a Provincial Level to move towards a waste free Ontario and a circular economy in the waste management sector, the long term fate of diversion programs, as well as potentially new initiatives are largely unknown and limit the ability to predict how initiatives will impact waste management practices within the Town. Initiatives detailed herein should be monitored along with broader provincial initiatives to evaluate the effectiveness of any waste reduction or diversion program. However, with the town currently undertaking an Environmental Assessment for Future Solid Waste Disposal Needs, and the identification of the preferred alternative of Landfill expansion, the Town

will be well positioned to incorporate enhanced diversion programs into the long term planning and design of the St. Marys Landfill Site, pending provincial approval.

6.0 References

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Strategy for a Waste Free Ontario, Building the Circular Economy, Ministry of the Environment and Climate Change, February 2017

TABLES

Table No.	Description
Table 1	Historical Waste Disposal Rates
Table 2	Waste Diversion Numbers

Table 1

HISTORICAL FINAL WASTE DISPOSAL RATES FOR THE ST. MARYS LANDFILL SITE

Waste Management System - 1984 Through 2017

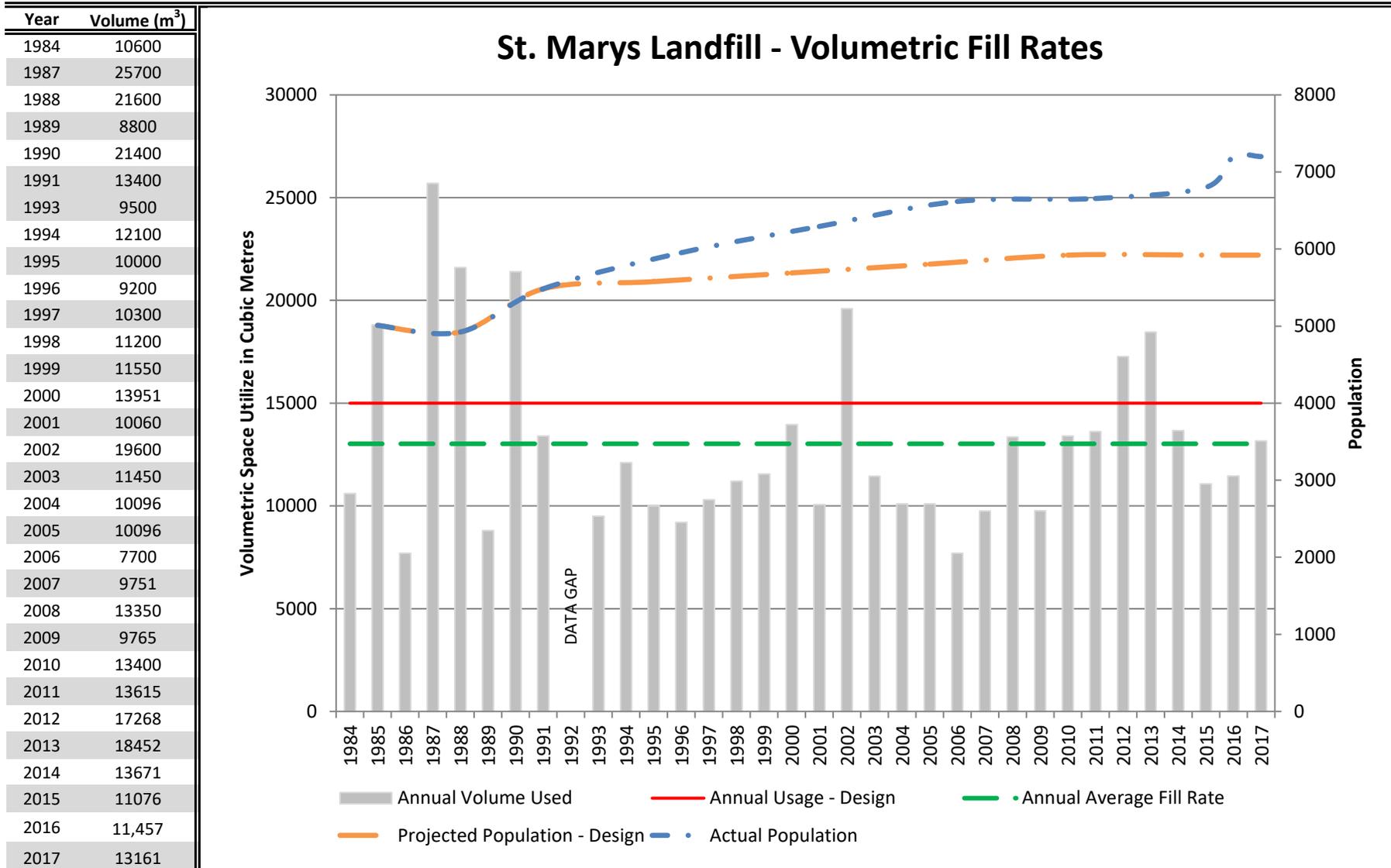


Table 2

HISTORICAL WASTE REDUCTION & DIVERSION RATES

Waste Management System - 2010 through 2017

Material Category	Annual Weight							
	2010 (Tonnes)	2011 (Tonnes)	2012 (Tonnes)	2013 (Tonnes)	2014 (Tonnes)	2015 (Tonnes)	2016 (Tonnes)	2017 (Tonnes)
Curbside Collection - Landfill Disposal	1260	1268	1273	1475	1589.15	1374.8	1290.1	1309.41
Mars Environmental Curbside Collection	NA	NA	NA	212.58	287.55	339.51	421.35	441.7
Public Drop-off - Landfill Disposal	358	360	365	375	388.68	409	376.32	400
Curbside Collection - Blue Box Recycling	884	995.41	1095	1074	1078	1070	1049	1063
Brush Material	380	178	178	178	86.45	196	370.86	69.94
Wood Waste	NA	NA	NA	NA	79.31	85	188.61	114.51
Scrap Metals	NA	NA	NA	NA	6.63	4.29	4.53	1.95
Leaf & Yard Waste	611	419	294.7	229	374.71	444	390.08	400.55
MHSW Materials	12	4	4	2.04	2.47	6.05	9.21	3.71
Batteries	NA	0.5	0.5	0.512	0.407	N/A	N/A	N/A
Electronic Waste	24	20.49	14.16	9.2	9.8	38.54*	5.17	21.65
Total Residential Waste	3529	3245.4	3224.36	3555.332	3903.157	3928.65	4105.23	3826.42
Curbside Collection - Landfill Disposal (exclu. Public Drop-off)	1260	1268	1273	1687.58	1876.7	1714.31	1711.45	1751.11
Total Diverted Waste	1911	1617.4	1586.36	1492.752	1637.777	1805.34	2017.46	1675.31
Diversion Rate	54%	50%	49%	42%	42%	46%	49%	44%

Notes:

NA Not Applicable

Data estimated due to lack of reliable weights

Diverted waste reported above represented residential waste diversion only. IC&I excluded

* 7.88 Tonnes collected at landfill site, 30.66 tonnes collected at PRC site.

Existing Waste Reduction and Diversion Program

Appendix No.	Waste Reduction & Diversion Program
Appendix A1	Residential Curbside Collection Program
Appendix A2	Blue Box Recycling Program
Appendix A3	Municipal Hazardous & Special Waste Collection
Appendix A4	Electronic Waste
Appendix A5	Leaf and Yard Waste Collection
Appendix A6	Concrete and Asphalt Crushing
Appendix A7	Scrap Metal Recycling
Appendix A8	Wood and Brush Grinding

APPENDIX **A-1**

Residential Curbside Collection Program

The Town of St. Marys provides all single family residential homes with weekly curbside collection of refuse (garbage). Refuse is subject to non-collectable waste provisions set out in the Town’s By-Law No. 71-2012 which includes various items which are not permitted within the curbside collection program such as but not limited to auto parts, white goods, tires and household hazardous waste.

The curbside collection program within the Town is administered by the Bluewater Recycling Association whom utilizes an automated collection system for waste placement and collection. Through the Association, qualifying properties can select from three (3) container sizes to suit their needs. The three sizes for selection are 35, 65 and 95 gallon containers. An annual fee is paid by the resident based on the size of container selected.

As part of the waste collection program, the Town imposes mandatory recycling, and will not accept refuse for curbside pick-up, or at the landfill which contained more than 5% recyclable material, which is defined as any material which the Town accepts in the curbside recycling program.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Incentive Programs should be considered to promote at home diversion initiatives such as backyard composters and digesters.</p> <p>Education and Outreach programs should be developed and implemented to ensure residents are aware of reduction and diversion programs for enhanced utilization.</p>	<p>Consideration should be given to standardizing on a single container size for curbside collection. Such a standardization could promote diversion and reduction by limiting the volume of waste which can be disposed through the program.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario as well as consideration to “Ontario’s Food and Organic Waste Framework”.</p> <p>Consideration should be given to a Food and Organics Collection program through municipal partnerships or as local third party facilities materialize.</p>

APPENDIX A-2

Blue Box Recycling Program

Prior to October of 2008, the Town of St. Marys recycling program consisted of a dual stream system in which residents were required to sort recyclables in a single blue box. Recycling was collected weekly by Bluewater Recycling Association (BRA).

In 2008, the Town in conjunction with BRA implemented an automated, single stream collection program for recyclables. Curbside collection now occurs on a bi-weekly basis, year-round, for a total of 26 recycling collection days. Residents typically use a 95 gallon container / wheelie-bin to set out their recycling. Residents are not allowed to place overflowing carts at the curbside. Material that will not fit into the carts can be taken to a recycling depot or held onto until the next collection day.

Industrial, Commercial and Institutional (IC&I), as well as multi-residential units are provided with large overhead bins placed in central locations. BRA is also tasked, in some instances with the collection of these containers.

In 2016, the Province of Ontario enacted the Resource Recovery and Circular Economy Act which aims to moves recycling responsibility to producers. As various targets and milestones are achieved and / or implemented through the phase in of this Act, it will be important for the Town and our service provider to meet any new requirements which may be adopted.

For additional information related to the automated program from BRA, please visit the following website:

<http://www.bra.org/recycling/>

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario which may include goals such as but not limited to:</p> <p>Standardize promotional and educational materials</p> <p><i>[Initiative to be developed and driven by the Ontario Government]</i></p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario which may include goals such as but not limited to:</p> <p>Begin designating new materials under producer responsibility regulations.</p> <p><i>[Initiative to be developed and driven by the Ontario Government]</i></p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario which may include goals such as but not limited to:</p> <p>Complete transition of Blue Box program to producer responsibility.</p> <p>Continue to designate additional materials under producer responsibility regulations.</p> <p><i>[Initiative to be developed and driven by the Ontario Government]</i></p>

Municipal Hazardous and Special Waste Collection

Household hazardous materials can be dangerous to people as well as the environment. It is because of this, that the Town of St. Marys administers a Municipal Hazardous and Special Waste Depot for residents of the Town of St. Marys as well as the Municipality of Perth South whereas unwanted or unused household products can be safely diverted from landfill and properly disposed and / or recycled.

The depot is operated at the St. Marys Landfill Site during normal operating hours where residents can dispose of this material at no charge. Material, once inspected and received by landfill staff, is then properly sorted into containers for transportation to a suitable recycling, reuse or disposal facility.

Materials accepted under this program are as follows:

Acids	Bleach	Garden Chemicals	Pool Chemicals
Aerosol Cans	Light Bulbs	Household Cleaners	Propane Tanks
Antifreeze	Fertilizers	Motor Oil	Solvents
Bases	Paints / Stains	Pesticides	Batteries

The depot administered by the Town is currently for residential use only and is not designed or permitted for Industrial, Commercial or Institutional (IC&I) utilization. IC&I properties, whom produce specific waste on regular intervals are required to contract and dispose of their waste properly through third party suppliers.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents of the diversion program, which materials are included, which are not and the requirements for acceptance of material, such as containers, labels, etc.	Follow the "Strategy for a Waste Free Ontario" developed by the Province of Ontario. Program / materials should be reviewed and updated as materials are transitioned or designated to producer responsibility.	Follow the "Strategy for a Waste Free Ontario" developed by the Province of Ontario. Consideration should be given to implementing disposal bans on materials under existing waste diversion programs.

Electronic Waste

In circa 2005, the Town of St. Marys banned the disposal of electronic equipment (E-waste) from the landfill site. The Town currently has an Agreement with Greentec, located in Stratford, Ontario to provide a collection container, and receive e-waste collected at the landfill.

The E-waste depot is located at the landfill site for residents of the Town of St. Marys where qualifying old, unused or damaged electronic equipment can be safely and properly disposed. The depot is open during normal site operations at no charge to residents.

The program accepts a large variety of materials such as, but not limited to:

Computers, printers, pagers, DVD players, radios, etc. For a complete list of materials accepted under the program, please visit the Towns official website at: <http://www.townofstmarys.com/en/living-here/E-waste.aspx>.

The Town receives revenue from the program based on the value of material collected. This revenue is utilized by the Town to assist in funding waste management initiatives and operations.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents of the diversion program, which materials are included and which are not.	Consideration should be given to expanding access to the E-waste depot to ensure a more convenient experience for program users while being mindful of theft and scavenging which can occur at less secure locations.	Follow the "Strategy for a Waste Free Ontario," developed by the Province of Ontario. Modify program as required based on provincial initiatives.

Leaf and Yard Waste Collection

In 2001, the Town of St. Marys introduced the yard waste collection program, which provided curbside collection of yard waste from April until November of each year. Residents were required to place collectibles in compostable paper bags, cardboard boxes, reusable containers or bundled stacks. Acceptable items include organic materials such as: yard plants, weeds, hedge and shrub trimmings, tree limbs (10 cm diameter maximum), lawn cuttings, etc.

Food wastes are not currently accepted.

Additionally, leaf and yard waste could be dropped off at the landfill free of charge. Weekly or twice weekly curbside collection was completed by the Town, depending on weekly needs.

In circa 2013, the Town reduced the leaf and yard waste program, limiting the curbside collection to 5 weeks in the spring and 5 weeks in the fall. Residents could still bring material to the landfill site free of charge. In 2014, the Town again made modifications to this program due to strong public opinion on changes implemented the prior year. The program administered in 2014 included 11 collection days, consisting of weekly collection in the spring and fall, and once per month throughout the summer. In addition to this change, the Town also opened a new convenience depot for Leaf and Yard waste material located at the Municipal Operations Centre, located at 408 James Street South where residents could drop-off acceptable material at their convenience.

In 2017, the Town made additional enhancements to the leaf and yard waste program which consisted of bi-weekly collection from May through November. Yard waste is delivered to the landfill and composted in open windrows.

Compost material derived from the materials collected is stockpiled at the Site to assist in site alterations, soil additives for final cover, etc. Material generated from this program is not transported off-site.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents of the diversion program, which materials are included and which are not. Enhance awareness of collection days to improve program utilization.	Consideration should be given to modifying the program on a year-by-year basis to enable curbside collection of materials based on weather. For instance, an early spring means residents are required to dispose of material on their own, or hold onto material until collection starts later in May. Similarly, an early winter means no material for collection days.	Look for partnerships and economies of scale to enable the addition of materials to the program.

Concrete and Asphalt Crushing

In circa 1993, the Town of St. Marys started separating concrete and asphalt materials. The material is crushed, screened and stockpiled to be re-used as gravel for many different municipal projects. In 2009, an estimated 12,000 tonnes of concrete and asphalt was crushed and stockpiled, which represented approximately 8 years' worth of material. In 2014, the Town replenished the stockpile of this material and crushed, screened and separated years' worth of material again.

This program diverts material from household renovations, construction projects and private demolition and allows the Town to secure an economical source of aggregates. There is no cost for residents or contractors to utilize this program.

Materials which are accepted under this program consist of, but not limited to:

Asphalt (rubble, grindings, millings), bricks and paving stones, concrete, gravel, etc.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents and contractors of the diversion program, which materials are included and which are not.	--	--

APPENDIX **A-7**

Scrap Metal Recycling

The Town of St. Marys has a couple of different scrap metal diversion programs within the Town. Scrap metal can be dropped off at the landfill site, free of charge where it is taken to a recycling facility. Since 2014, the Town has diverted approximately 17.5 tonnes of scrap metal from the landfill through this drop-off depot.

In addition to this program, the volunteer fire department for the Town has undertaken a “spring clean-up” which allows residents to place refuse to the curb for collection. All scrap metal is collected separately by the volunteers and recycled accordingly. In 2010, it is estimated that approximately 13 tonnes of scrap metal was collected and diverted through this program (The Corporation of the Town of St. Marys, 2011).

The Scrap metal drop off depot, as well as the volunteer firefighters collection events allows the Town to properly separate and dispose of scrap metal which is easily diverted from landfill.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents and contractors of the diversion program, which materials are included and which are not.	Consideration should be given to collaborations with local scrap metal recovery centres to promote material separation and drop off.	--

Wood and Brush Grinding

The Town of St. Marys currently administered a scrap wood and brush program aimed at reducing the impact that this material has on landfill capacity. Currently, scrap wood and brush are diverted from landfill operations and stockpiled at the landfill site (or Municipal Operations Centre for Brush). Once stockpiled materials warrant, typically once per year, the material is ground into chips and stockpiled at the St. Marys Landfill Site for use as alternative daily cover during winter operations.

The heat emitted by the chipped material prevents freezing throughout the winter, and allows for the mixing with soil to improve the effective daily covering of waste at the landfill site. The application of wood chips as an alternative daily cover is typically administered from November 15th to April 1st of each year, or as weather conditions warrant.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Develop Education and outreach material to better inform residents and contractors of the diversion program, which materials are included and which are not.	Consideration should be given to relocate the brush pile at the MOC. During landfill site designs consideration to allow for expanded access to wood and brush drop-off to consolidate drop-off areas and limit redundancy.	Consideration should be given to alternative cover solutions instead of wood-chips for winter operations to permanently divert material from landfill / landfill operations.

APPENDIX **B**

Potential Waste Reduction and Diversion Programs

Appendix No.	Waste Reduction & Diversion Program
Appendix B1	Food and Organics Collection
Appendix B2	Cigarette Waste Recycling Program
Appendix B3	Asphalt Shingles Recycling Program
Appendix B4	Mattress & Box Spring Program
Appendix B5	Landfill Optimization
Appendix B6	Backyard Composting Initiatives
Appendix B7	Textile Recycling
Appendix B8	IC&I Diversion

Food and Organic Waste Diversion Program

The Town of St. Marys has many programs aimed at diverting or reducing the volume of waste received at the landfill site for final disposal. However, one program which is not yet implemented, that would have a significant impact on volume utilization and diversion is the use of a Food and Organic Waste diversion program.

Not only does managing resources efficiently benefit the people of our community, it also aids our environment and economy. Ontario's Food and Organic Waste Framework Action Plan relates back on growing a circular economy, outlining commitments constructed by the province in regards to food and organic waste. The Framework states that food and organic waste must be considered a resource rather than a waste.

The Provincial Framework strives towards the achievement of the following objectives; reduce food waste, recover resources from food and organic waste, support resource recovery infrastructure and promote beneficial uses.

The first and most crucial objective is to prevent and scale down the amount of food that becomes waste. The environment, economy and society of the province will benefit greatly from this step, ensuring that edible food does not end up as waste. Education is one key way in cutting down food and organic waste. Other ways to improve the reduction of food and organic waste is by using web-based platforms (such as social media), incorporating waste reduction within schools and supporting research that aims to reduce organic food waste.

Increasing resource recovery of organic food waste will help towards reaching the goals of zero waste and zero greenhouse gas emissions from the waste sector, more specifically from the Industrial, Commercial and Institutional (IC&I) sector. Amending the 3Rs Regulations will help decrease the amount of wastage created by the IC&I sector, which presents some of the best opportunities to increase resource recovery and build a circular economy. Banning food and organic waste from ending up in disposal sites would also improve the recovery of food and organic waste. Management practises are recommended to support effective use of public waste receptacles, going hand-in-hand with the resource recovery of food and organic waste. This would beneficially impact the landfill, treatment sites and transfer stations.

Another way to recognize the economic profits of a circular economy is by turning food and organic wastes into valuable end-products. It is essential for Ontario to possess a sufficient infrastructure with modernized technology to process food and organic waste into valuable resources. Reviewing present resource recovery systems and updating them will help with this. Training for new or refined technology may be required.

Being able to endorse end-products of food and organic waste is just as critical to possessing a sufficient infrastructure with technology. Soil health, crop growth, renewable natural gas, and carbon storage are some of the examples of end-products to promote. The province is to review regulatory approaches to soil amendments as well as encourage the on and off-farm end-use of soil amendments made from recovered organic resources (ex. Compost, Digestate and Biosolids).

APPENDIX B-1

Benefits and Losses

There are multiple benefits towards Ontario’s Food and Organic Waste Framework, especially for causes that are long-term. One of the more evident benefits being that the Framework will improve greenhouse gas emissions. In 2015, greenhouse gas emissions which originated from the waste sector accounted for 8.6Mt of carbon dioxide. By carrying out the Framework, greenhouse gas emissions will decrease substantially over the long-term. The Framework will save both consumers and businesses money, while improving access to healthy and fresh food for the province. Food and Organic Waste can be turned into compost or Digestate, which helps better the health of the soil, reduce erosions as well as improve water quality.

Although there are a large number of benefits relating to Ontario’s Food and Organic Waste Framework, there are some losses that may arise during the execution phase. Many larger municipalities have implemented Source Separated Organics (SSO) programs as a way to divert food and organic waste from final disposal in landfills. Recycling food waste for compost results in upstream benefits related to the creation of nutrient rich soil supplements, thus reducing the total volume required for final disposal. Unfortunately, SSO programs are extremely costly to administer in smaller communities, however, could have a significant impact on diversion initiatives within the Town. The implementation of an SSO program is not something that could be implemented and administered quickly, however is a program which should be considered in the future for the Town as technologies, general acceptance, and local third party facilities come online.

According to the Food and Organic Waste Policy Statement, municipalities that have a population of over 50,000 and greater than or equal to 300 persons per square kilometre are required to provide a food and organic waste collection. Based on this information, the Town of St. Marys is not required to provide a food and organic waste collection, but does have the option of doing so in the future.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Incentive Programs should be considered to promote at home diversion initiatives such as backyard composters and digesters.</p> <p>Education and Outreach programs should be developed and implemented to ensure residents are aware of reduction and diversion programs for enhanced utilization.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario as well as consideration to “Ontario’s Food and Organic Waste Framework”.</p> <p>Assess Town needs and requirements along with regulatory requirements for potential enhancements to the Leaf and Yard Waste Program.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario as well as consideration to “Ontario’s Food and Organic Waste Framework”.</p> <p>Consideration should be given to a Food and Organics Collection program through municipal partnerships or as local third party facilities materialize.</p>

Cigarette Waste Recycling Program

The Town of St. Marys has been approached about investigating and implementing a Cigarette Waste Recycling program via TerraCycle.

TerraCycle’s cigarette program allows participants to administer the recycling of cigarette waste. Excluding the cardboard packaging of the box, the program accepts every portion of the cigarette. This includes the filter, outer plastic, cigar stubs, inner foil, rolling paper and ash.

After collecting the cigarette waste in canisters’, it must then be shipped out for recycling. The waste is sent in a sturdy plastic container that should be completely dry. Once collected, cigarettes and packaging are separated by composition. The waste is then melted into hard plastic that can be remodeled to create industrial products such as plastic pallets. Ash and tobacco are separated out and composted in a specialized process.

Through the TerraCycle program, points can also be accumulated and redeemed for a variety of charitable gifts or a payment of \$0.01 per point to a non-profit organization or school. Any shipments over 3lbs will receive \$1.00 per pound of waste while anything lower will amount to \$0.00.

Currently, the Town as well as various merchants have grey pedestals which collect cigarette butts located around Town buildings as well as outside various stores. There is no cost to participate in TerraCycle’s cigarette program; however, there is a cost for the receptacles which amounts to \$100.00. In addition, it may prove to be difficult to find locations that are optimal to dispose cigarette waste. Public areas such as municipal buildings, playgrounds, etc. have strict no-smoking policies in place which limit the distance smoking is permitted around areas, or entrances. The placement of a canister near these areas to maximize use may give the impression that smoking is permitted in these locations. In addition to the above, the placement of a canister in an inopportune location would limit the effectiveness of the program, and program utilization.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Consideration should be given to investigating the potential adoption of the Terracycle program. A thorough review of the program as well as review of case studies where the program has been adopted elsewhere should be completed and presented to Council for consideration.	Mid-term and Long-term initiatives to be determined based on completion of program review and recommendation.	Mid-term and Long-term initiatives to be determined based on completion of program review and recommendation.

APPENDIX B-3

Asphalt Shingles Recycling Program

An asphalt shingles recycling program should be considered by the Town of St. Marys as a means to divert material from the landfill and maximize current and future volume within the landfill site. The Town has historically consulted with various other local municipalities whom currently administered an asphalt shingle recycling program as well as industry leaders in shingles recycling to gain a full and complete understanding of how a program may be implemented and administered within the Town of St. Marys.

Unfortunately, shingles have never been tracked separately at the landfill as to provide accurate annual tonnages, but instead were lumped in with Construction & Demolition waste. As a result, accurate material weights / volumes are not currently known for this material stream.

Additionally, the current design and set-up at the St. Marys Landfill Site is not equipped for a shingles diversion program. Based on discussions with area municipalities and industry leaders, there are two types of transfer stations which could be constructed to accommodate such a program. One being an elevated platform, roll-off bin transfer facility and the other being a bunker style transfer facility which would be similar to the current leaf and yard waste transfer facility located at the Municipal Operations Centre. Both transfer station options would require a significant capital investment.

It is also important to note that the current Environmental Compliance Approval (ECA) for the landfill site does not include provisions for an asphalt shingle recycling program to be administered. Currently, the Transfer facility at the landfill site is limited to: electrical and electronic equipment, cardboard, scrap metal and blue box recycling material and is based on the design and operation of the facility as presented within an ECA application circa 2008. For a shingles program to be administered within the Town of St. Marys, an application would need to be made and subsequently, approved by the Ministry of Environment, Conservation and Parks (MECP), and would require updates to the design and operations material previously submitted.

An Asphalt Shingles recycling program should be considered by the Town as a means to increase diversion from the St. Marys landfill site. With the pending completion of the Environmental Assessment for Future Solid Waste Management Needs, and the identified preferred alternative of Landfill Expansion, the Town will be ideally situated to incorporate such a program, and the capital infrastructure requirements into the future design, and operations of the landfill site. Council for the Town of St. Marys will need to determine if the expenses of implementing and operating such a program are worthwhile for the Town, Businesses and Residents.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Modify waste tracking system to identify asphalt shingles to assist in diversion program cost estimates.</p> <p>Stakeholder consultation with residents, contractors, etc. on the merits of such a program, and its potential development.</p>	<p>Develop an economically viable and sustainable asphalt shingles recycling program, and incorporate its implementation into any future site design and alterations.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario.</p> <p>Consideration should be given to banning shingles from the Landfill Site should a sustainable diversion program be established.</p>

Mattress and Box Spring Recycling

The Town of St. Marys currently accepts mattresses and box spring for final disposal at the Landfill Site, and represents another potential waste stream for diversion. Mattresses and Box Springs are a low density high volume product that are known to cause significant operational difficulties in their waste placement, compaction and covering processes, while also causing significant maintenance and / or damage to compaction equipment due to the metal springs found within the material which can become entangled on equipment.

Diversion programs are available for these materials which could fully redirect them from the landfill site. Various neighbouring municipalities currently offer mattress and box spring recycling programs that redirect the material to third party processors.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Consideration should be given to investigating the merit of a Mattress and Box Spring recycling program for the Town, and how such a program could be delivered.	Develop a cost effective and sustainable Mattress and Box Spring recycling program. Consideration should be given to potential municipal partnerships, or Public Private Partnerships for a cost effective program delivery.	Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario. Consideration should be given to future banning of Mattresses and Box Springs from the St. Marys Landfill.

Landfill Optimization

How a landfill is managed on a daily basis can have a significant impact on the long term utilization of the Site. Optimization activities could be implemented at the St. Marys Landfill Site which would benefit the current Site, as well as any future approved filling capacity.

Along with daily cover material, the Landfill Site is currently operated with compaction equipment utilized to position and place refuse (garbage). In 2013, the Town, in partnership with the Sites Engineering Consultant completed mandatory landfill operator training for all personnel within the Public Works Department. This provided all staff with renewed knowledge of landfill operations, compaction techniques, etc. Over the last several years, in-situ density at the landfill site has ranged from a low of 343 Kg/m³ to as high as 519 Kg/m³, for an average in-situ density over the last three (3) years of 425 Kg/m³. Although this can be seen as a positive increase over historical operations, the in-situ density is still less than that which would be anticipated with the use of compaction equipment.

While improvements have been made, additional work can be completed to further improve Site operations. The in-situ densities referenced above are still less than what would be expected for a landfill that utilizes compaction equipment. Part of this may be related to various IC&I material that does not compact well within the Site. Town staff has been working with local industry on potentially diverting specific waste from the landfill site to assist with in-situ densities. However compaction techniques and filling practices will allow for the most significant optimization at the Site.

Another optimization at the Site would be additional earth moving equipment. Currently all operations are completed by utilizing compaction equipment which includes the placement of daily cover. Compaction equipment is not intended to move earth on and off of material and as such creates operational challenges in both placing cover material, and removing at the start of each working day. Significant volume utilization savings could be realized with the consideration of the purchase or utilization of appropriate earth moving equipment going forward.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Continue to provide refresher training for operators on landfill operations and compaction techniques.</p> <p>Provide front line staff with enhanced direction, guidance and training to maximize operational techniques and waste densities through waste placement strategies and filling plans.</p>	<p>Pending approval for landfill expansion, systematically plan placement of refuse to maximize infrastructure and in-situ density. Consideration should be given to purchase GPS system and software to maximize operations.</p> <p>Consideration should be given to the purchase of a suitable earth moving equipment for daily cover operations.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario related to IC&I diversion initiatives.</p> <p>Investigate the use of alternative cover systems such as tarps to reduce and limit the volume of earth material used at the Site.</p>

APPENDIX B-6

Backyard Composting Initiatives

Backyard composting is a cost-effective tool for waste diversion, but typically results in a smaller percentage of overall diversion. This is attributed to difficulty in getting public involvement and portions of the organics stream which cannot be composted in such a manner for instance, dairy, meats, fish, etc. According to Ontario Regulation 101/94, a local municipality that has a population of at least 5, 000 shall establish, operate and maintain a leaf and yard waste system. That system must include:

- a) The provision of home composters to residents by the municipality at cost or less;
- b) The provision of information to residents;
 - Publicizing the availability of home composters;
 - Explaining the proper installation and use of home composters and the use of compost; and,
 - Encouraging home composting.

In circa 2008, the Town in association with BRA, distributed backyard digesters to residents. This partnership turned out to be largely successful, so much so that the original 100 composters were sold out within 30 minutes. The Town funded approximately 50% of the cost of the digester.

The Green Cone is an at-home composting system which offers an alternative means of disposing of organic kitchen waste to Anaerobic Digestion (AD) and In-Vessel Composting (IVC). The advantage to the Green Cone over traditional techniques is that it takes all types of food waste (meat, dairy, bones, vegetables and even animal feces). Essentially, it allows residents to take everything from the kitchen table and dump it directly in. Advantages to this system are that it does not need to be turned or emptied more than once every few years. In addition, as an enclosed system, it does not attract vermin or other animals.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Continue to publicize and encourage at home diversion via composting and digestion. Develop educational material to promote such programs.	Consideration should be given to developing a long term, sustainable incentive program for composters and/ or digesters. Seek assistance in funding for at home programs such as grants, sponsors and or donations.	Follow the "Strategy for a Waste Free Ontario" developed by the Province of Ontario as well as consideration to "Ontario's Food and Organic Waste Framework". Consideration should be given to a Food and Organics Collection program through municipal partnerships or as local third party facilities materialize.

Textile Recycling

According to Value Village, approximately 85% of textiles are disposed into the landfill. Most of these textiles that are disposed of could avoid the landfill entirely by being recycled or reused by industries and consumers.

There are already multiple locations within the Town of St. Marys where one can donate their clothing for reuse. Places include the downtown Thrift Store in association with the Salvation Army as well as red bins which are provided by the Canadian Diabetes Association. In addition, the Canadian Diabetes Association periodically contacts the residents of the Town to ask for any unwanted or used clothing. Donating clothing is at no cost to residents and textiles will be picked up at their doorstep within a few days.

Through these donation programs, various textiles, such as but not limited to the following can be donated:

Accessories and bags, clothing, curtains, blankets, towels, sheets, shoes, sleeping bags, etc.

However, donating material is only addressing one stream of textile waste, and the question becomes what to do with material that is not in a condition to be donated. A recently launched program in the neighbouring City of Stratford aims to tackle the textile material that is not in a condition for donation. The Town should consider such a program for its own waste management programs for increased diversion.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
Education and Outreach programs should be developed and implemented to ensure residents are aware of reduction and diversion programs for enhanced utilization.	<p>Consideration should be given to developing a textile diversion program to collect and divert material that is not suitable for donation.</p> <p>The Town should seek municipal partnerships and or Public Private Partnerships for an economically sustainable program delivery.</p>	<p>Consideration should be given to banning the disposal of textiles at the landfill.</p> <p>Look for and implement more programs to recycle textiles.</p>

Increase Industrial, Commercial & Institutional (IC&I) Diversion

In order to strive for a zero-waste economy, the industrial, commercial and institutional (IC&I) sector must increase its diversion rates. According to the Ontario’s Food and Organic Waste Framework Action Plan, the IC&I sector is accounted for approximately 45% of all food and organic waste in Ontario, which opens a large potential for improvement. Additionally, only 25% of the food and organic waste created by the IC&I sector is diverted.

Based on the Provincial goal of establishing a circular economy, the IC&I sector will be required to focus on the following procedures to drive higher resource productivity, innovation and economic growth;

1. **Fewer Materials** - Using fewer raw materials in the beginning will decrease the amount of extra wastage.
2. **Design** - Products and packaging should be designed to be more durable which will make it last longer. They should also be able to be recycled once its lifecycle terminates. New materials should be designated to ensure that the producers are entirely responsible for recovering more materials from products and packaging.
3. **Produce** - Businesses should collaborate and coordinate across sectors to reduce greenhouse gas production and fossil fuel use.
4. **Reuse, Repair and Recycle** - Implement programs for the collection of products in order to reuse repair or recycle them.

The above targets for developing a circular economy, and a zero waste footprint in Ontario will be largely driven by regulations and requirements from the Provincial Government, which will in turn have beneficial impacts on the waste reduction and diversion efforts of the Town. In addition to provincial goals and objectives, the Town can also work with local industrial partners at reducing or redirecting waste from the landfill site by sourcing alternative disposal or recovery options.

Opportunities for Improved Waste Reduction & Diversion:

Initiatives (Near Term)	Initiatives (Mid Term)	Initiatives (Long Term)
<p>Consideration should be given to working with the local IC&I section to reducing or diverting low weight, high volume material which may have alternative uses, or recovery options.</p> <p>Develop Education and Outreach material to promote IC&I diversion initiatives.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario as well as consideration to “Ontario’s Food and Organic Waste Framework”.</p> <p>Assess Town needs and requirements along with regulatory requirements for potential enhancements to IC&I waste diversion.</p>	<p>Follow the “Strategy for a Waste Free Ontario” developed by the Province of Ontario as well as consideration to “Ontario’s Food and Organic Waste Framework”.</p>

ENVIRONMENTALLY SUSTAINABLE SOLUTIONS FOR WASTE REDUCTION & DIVERSION FOR TODAY, TOMORROW AND FUTURE GENERATIONS

AUGUST 2018



The Corporation of the Town of St. Marys
Public Works Department

August 2018

