Prepared By:

Town of South Bruce Peninsula

Long-Term Waste Management Plan

GMBP File: 219015-2

December 9, 2019

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
1260-2ND AVE. E., UNIT 1, OWEN SOUND ON N4K 2J3 P: 519-376-1805
WWW.GMBLUEPLAN.CA

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TOWN OF SOUTH BRUCE PENINSULA

DECEMBER 9, 2019

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1. INTRODUCTION

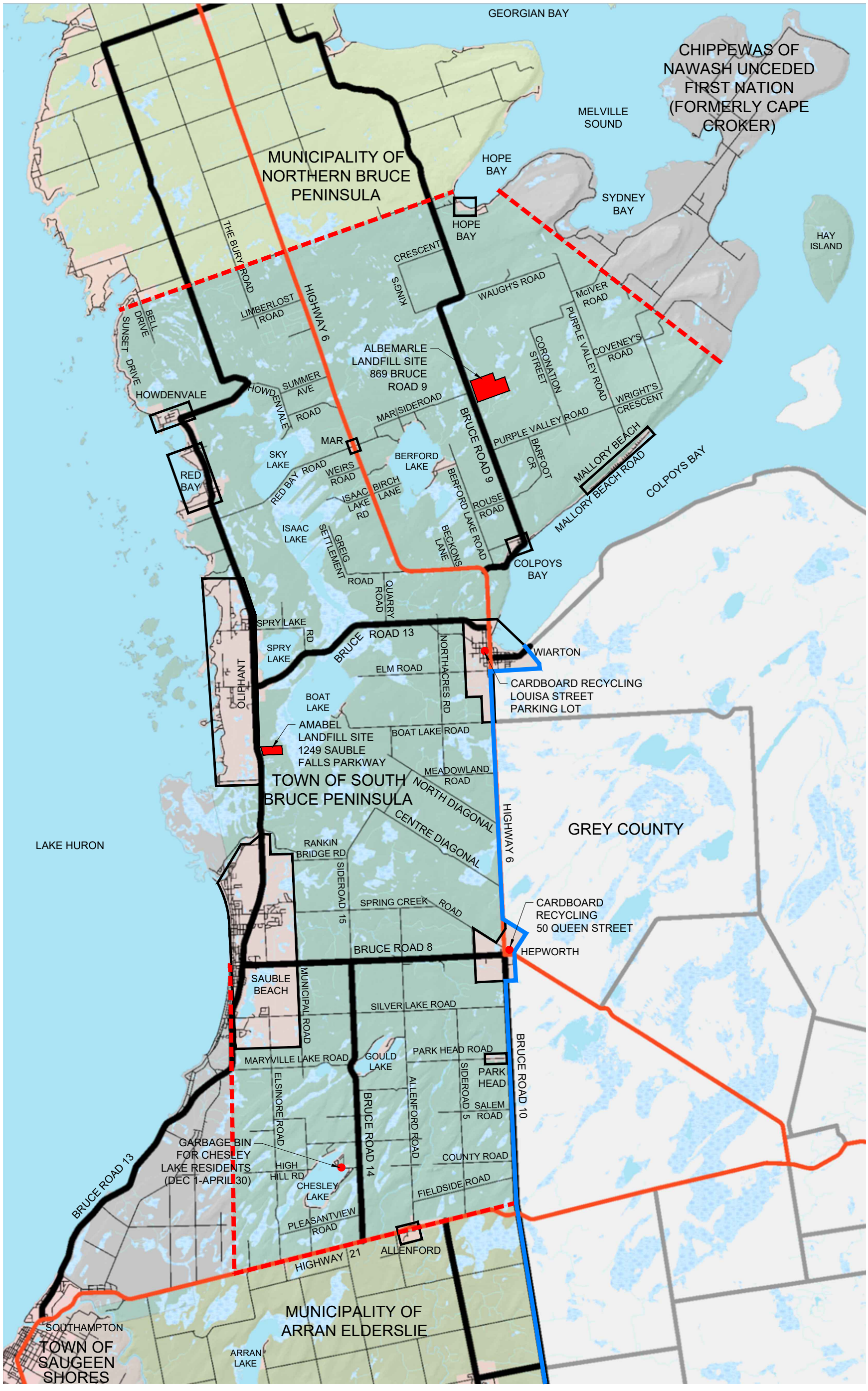
The Town of South Bruce Peninsula (the Town) retained GM BluePlan Engineering Limited (GMBP) to assist in preparing a Long-Term Waste Management Plan (WMP). The Town occupies the southern portion of the Bruce Peninsula, within the geographical region known as the County of Bruce. The Town of South Bruce Peninsula was formed in 1999 as the result of the amalgamation of the former Townships of Amabel and Albemarle, the Town of Wiarton and the Village of Hepworth. The Town covers an area of 532.3 km^2 and, based on the 2016 Census data, has a permanent population of 8,416 persons, not including the relatively high number of seasonal residents and the influx of tourists during the summer months.

The former Townships of Amabel and Albemarle were each previously serviced by landfills, of which the Town assumed ownership of upon amalgamation. As a result, in December 2000 operations at the Albemarle Waste Disposal Site were temporarily suspended (or 'mothballed') with the Amabel Landfill Site servicing the entire Town since that time. The municipal boundaries and the locations of the landfill sites are presented in **Figure 1-1**.

2. PURPOSE AND SCOPE OF STUDY

The purpose of this Waste Management Plan (WMP) is to provide a "holistic" approach to the Town's waste management program that will provide the support for both short-term and long-term waste management planning purposes. In accordance with the Environmental Compliance Approvals (ECA: formerly a Certificate of Approval), the Town's existing landfill sites are only to be used for the disposal of domestic (i.e. residential), commercial and non-hazardous solid industrial wastes. Under current Provincial regulatory and policy requirements, it is the responsibility of the local municipalities to manage the residential solid waste and the industrial, commercial and institutional sector (IC&I) is responsible for managing their own waste. Consequently, this WMP focuses primarily on the residential sector. However, consideration is also given to solid waste generated from the IC&I sector within the Town, including the tourism industry, as it is recognized that solid waste generated by this sector has been, and likely will continue to be, permitted to be disposed of at the Town's Landfill Site.

As of the end of 2018, the Town has an estimated 13 years of service life for residual waste disposal at the Amabel Landfill Site based on the current waste generation rates for the entire Town. Considering the available disposal capacity, the Town is considered to be in a moderate position in terms of residual waste disposal security for the planning period of this WMP. Therefore, the main focus of this WMP is on maximizing the site life of the existing landfill through waste diversion and operational improvement opportunities and to evaluate residual waste disposal options with respect to the long-term waste management plan for the Town.



LEGEND

- COUNTY BOUNDARY
- MUNICIPAL BOUNDARY
- BRUCE COUNTY ROAD
- PROVINCIAL HIGHWAY

BluePlan ENGINEERING

TOWN OF SOUTH BRUCE PENINSULA WASTE MANAGEMENT PLAN

NOVEMBER 2019	PROJECT No. 219015-2
SCALE -1:150,000	Figure No. 1-1

FILE:C:\Civil 3D Projects\219015-2 Figures-K.dwg LAYOUT:Figure 1-1
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As part of this Waste Management Plan, the scope of this Study can be summarized as follows:

1) To assess the performance of the Town's current waste management system, and to develop projections regarding future waste management practices including waste volumes, types, and sources.
2) To establish baseline waste generation and diversion rates for future assessment of the Town's progress towards meeting the Waste Diversion targets set out in the Waste-Free Ontario Act (i.e. Bill 151).
3) To assess the Town's current waste diversion strategies and initiatives, and to identify and assess alternative diversion approaches for potential future consideration, including, but not limited to:
    - Waste management systems and services
    - Expansion of recyclable and reusable materials diversion, as practicable
    - User pay system structure
    - Organics diversion initiatives
    - Landfill entrance enhancements for improved site controls and oversight
    - Public promotion, education and incentives
    - Municipal by-laws
4) To review the technical and financial merits of potential additional diversion initiatives.
5) To evaluate the current operational practices and assess potential areas for improvement, particularly in relation to operational practices that may increase the site life.
6) To review the regulatory framework for the Town's existing landfill sites pertaining specifically to approved volumetric capacities, landfilling areas and design, and options/opportunities for optimizing and/or adding capacity.
7) To evaluate residual waste disposal options with respect to both the short-term and long-term waste management plan that is most suitable to the Town.

Waste management planning covers a series of complex issues that are inter-related. Consequently, the layout of this study is presented in a step-wise fashion that provides a review in the following sequence:

1) Regulatory and Policy Framework.
2) Background information, including a review of the status and performance of the existing waste management practices within the Town, including comparisons to similar Municipalities.
3) An evaluation of residual waste disposal operations.
4) An evaluation of alternative prevention and diversion programs.
5) An evaluation of the option to consolidate and enhance waste management operations via the construction of a waste receiving and transfer area (i.e. a Transfer Station) at the Amabel Landfill Site.
6) Implementation of initiatives, monitoring and continual improvement.

Lastly, the conclusions of the study are presented along with key recommendations.

3. POLICY FRAMEWORK

The federal, provincial/territorial, and municipal governments each share responsibility for waste management in Canada. The following provides a brief overview of each government's policies and strategic initiatives related to waste management, and the Town's role in relation to those policies and strategic initiatives. Information was compiled from various sources. References are listed in **Section 14** of this Report.

3.1 Federal Regulations

The Government of Canada is engaged in waste management issues related to sustainable development, toxic substances, international movement, federal lands and operations, air emissions (including greenhouse gas emissions), and through federal funding. The federal government places the responsibility of municipal solid waste collection, diversion (i.e. recycling, organic waste, etc.) and disposal operations on local municipal governments, while the provinces are responsible for approvals, licensing and monitoring of operations.

3.2 Provincial Regulations and Policy

The Ontario Ministry of the Environment, Conservation and Parks (MECP) and its Waste Management Policy Branch is responsible for the development of policies, regulations and legislation related to waste management in Ontario. The Branch works with municipalities, the private sector and associations to develop regulations, policies and programs for the management of both hazardous and non-hazardous waste, to ensure proper waste handling and disposal and to encourage waste minimization, diversion and recycling activities.

3.2.1 Waste-Free Ontario Act (Bill 151)

Under the previous regulatory framework, more specifically the Waste Diversion Act (WDA, 2002), it is reported that the intent was to encourage producers to adopt or design production practices that were more efficient and products would be designed to produce less (or no) waste. Under the WDA framework, product stewardship agencies were formed for their specific materials (e.g., WEEE) with "eco-fees" placed on products (similar to a tax). Under the stewardships, designated recycling contractors were used, and the recycling fees were largely paid by the consumer. However, this approach resulted in a scenario where innovation and competition between producers to create products with less environmental impact was not encouraged and, as a result, not realized.

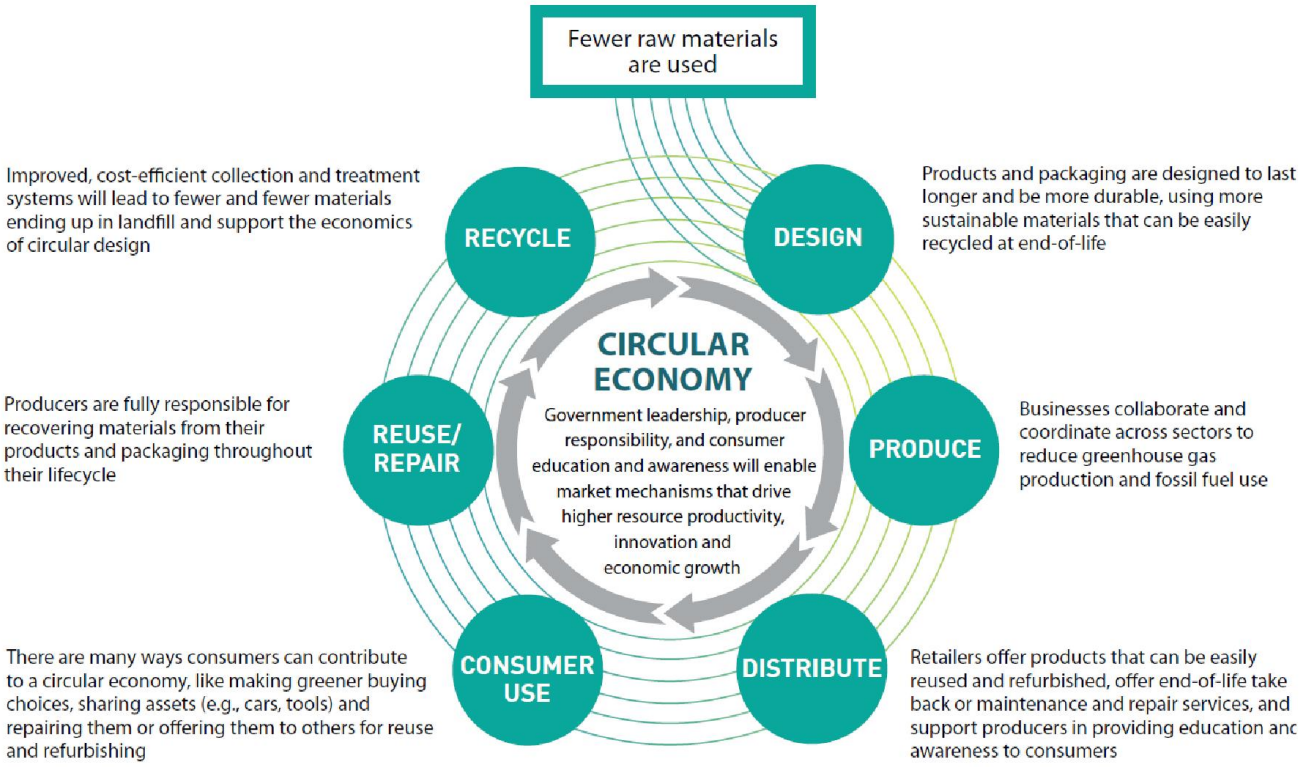
On November 30, 2016 the Waste-Free Ontario Act was proclaimed, with this new waste diversion legislation the Waste Diversion Act (WDA) was repealed. The Waste-Free Ontario Act enacted the:

i. Resource Recovery and Circular Economy Act (RRCEA); and
ii. Waste Diversion Transition Act.

The Waste-Free Ontario Act lays out Ontario's vision for a circular economy and includes goals for a zero-waste Ontario and zero greenhouse gas emissions and is described as *'a visionary goal that provides the guiding principles needed to work toward the elimination of waste'*. The legislation includes a plan to implement legislation, which will work towards systematically avoiding and eliminating the volume of waste, while maximizing the conservation and recovery of resources, with the intention to achieve set interim and long-term waste diversion goals. Reportedly, the first four years of this strategy are dedicated to establishing the foundation for this shift and transforming the existing systems. Further, the province intends to continue to mark its progress towards the interim targets of 30% diversion by 2020, which provincially has already been achieved, 50% by 2030 and 80% diversion by 2050.

As outlined by the Resource Productivity and Recovery Authority (RPRA), *'Ontario is shifting from a linear economy to a circular economy. In a linear economy, natural resources are extracted, manufactured into products, consumed and then thrown away. In a circular economy, products and packaging are designed to minimize waste and then be recovered, reused, recycled and reintegrated back into production'*. In February 2017, the Province approved a plan for resource recovery and waste reduction known as the *Strategy for a Waste-Free Ontario: Building the Circular Economy*, a schematic of the Circular Economy is provided in **Figure 3-1**.

FIGURE 3-1: Resource Recovery and Circular Economy Schematic
(Source: https://www.ontario.ca/page/strategy-waste-free-ontario-building-circular-economy)



A key component of the circular economy is that producers are responsible for collecting and managing their products and packaging, as well as the costs associated with the environmental impact of their products. This responsibility extends throughout the product's life-cycle, including its design, manufacturing, packaging, transportation, product use, and diversion or disposal. This is known as Individual Producer Responsibility (IPR). Initially IPR will be applied to products and packages that have existing mandated recycling programs such as tires, municipal hazardous and special waste (MHSW), electronics and Blue Box materials. Other materials such as carpets, mattresses and furniture will be considered in the future.

In order to transition to full IPR for designated materials in a smooth and orderly way, with no impact on program activities, transitioning of the existing programs will include:

- Winding up existing programs under the Waste Diversion Transition Act (WDTA); and
- Developing and enacting regulations under the Resource Recovery and Circular Economy Act (RRCEA) to make producers fully responsible.

Tires were the first material to move to IPR starting January 1, 2019. Electronics are scheduled to move to IPR in December 2020 and Hazardous and Special Waste in June 2021. In addition, due to the complexity of the transition for the Blue Box program, which is currently municipally managed and co-funded by industry and municipalities, it is anticipated that the transition of the Blue Box program to IPR occur between 2023 and 2025.

A second key proposed action towards a Waste-Free Ontario is the development of the Food and Organic Waste Action Plan to reduce the volume of food and organic waste going to the landfill. Food and organic wastes reportedly make up an estimated one-third of Ontario's waste stream. These organic wastes include residential food waste and leaf and yard waste, and food produced by the IC&I sector, such as food processors, wholesalers, grocery stores and restaurants. As part of the action plan the province has reportedly committed to eventually banning food waste from disposal to increase diversion of these wastes and reduce greenhouse gas emissions. The details and timing of such a ban are unknown.

As shown by the acceptance of the Waste-Free Ontario Act, the Provincial waste management strategies are in a dynamic state, continually changing and evolving. Consequently, with the recent passing of the new legislation it is important that the Town stay abreast of the new regulations and guidelines as they are implemented.

3.2.2 Regulatory Framework

Provided in the following **Table 3-1** are the current acts and regulations governing municipal waste management activities in Ontario that are considered applicable to this study.

TABLE 3.1: Provincial Regulatory Framework

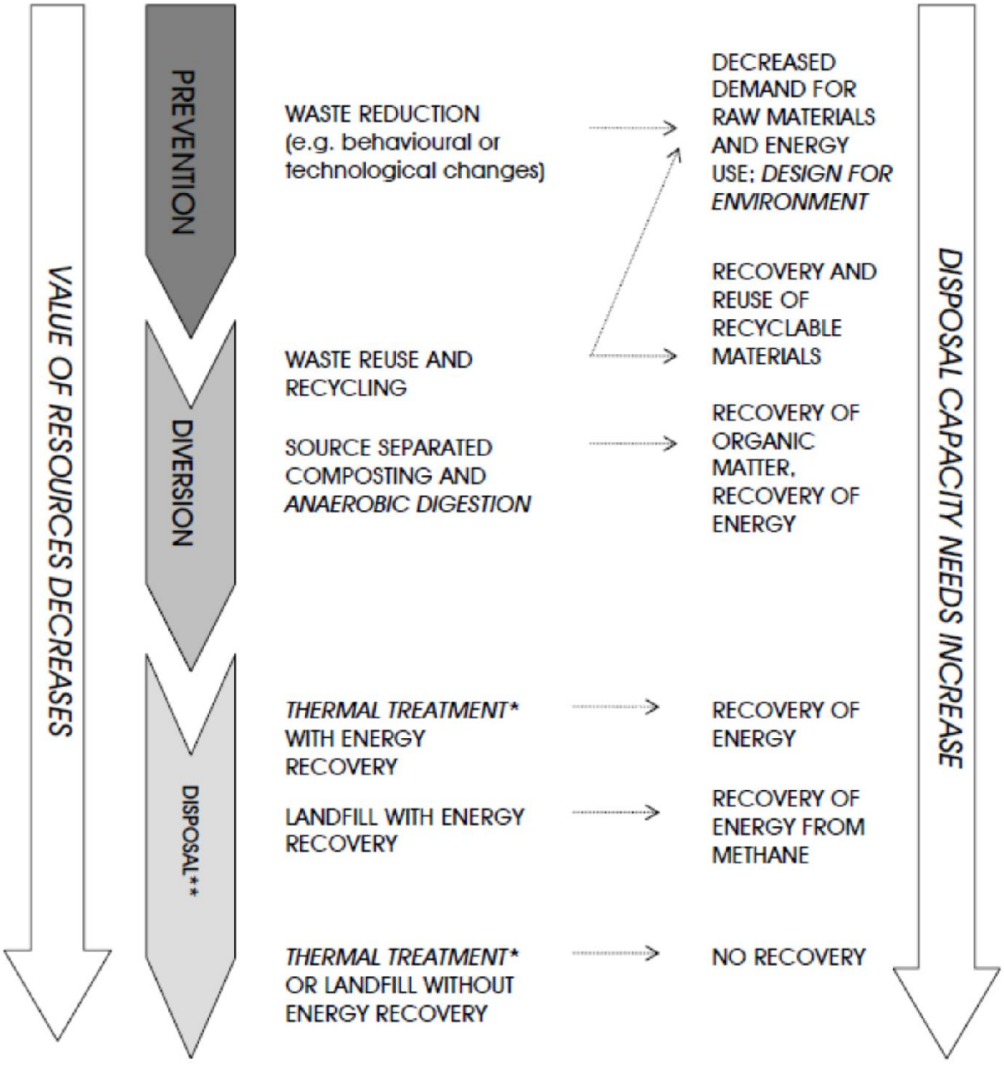
<table>
<tr><td colspan="2">Environmental Protection Act (EPA)
The EPA requires that all waste managers (i.e., those involved in generation, collection, transfer/processing or disposal of waste, unless exempted) obtain approval from the MECP to ensure waste is appropriately managed. The Act also provides authority for the MECP to inspect and enforce the regulated party's compliance with the Province's rules and regulations.</td></tr>
<tr><td colspan="2">Reg. 347 General - Waste Management:
Provides the foundation for waste management in Ontario. Categorizes and sets standards for the management of different types of waste; and provides certain exemptions from approval requirements.</td></tr>
<tr><td>O. Reg. 101/94 Recycling and Composting Municipal Waste:
Requires municipalities with 5,000 or more people to implement and operate curbside recycling programs and to implement programs for home composters. Municipalities with 50,000 or more people must operate a program that collects or accepts leaf and yard waste for diversion.</td><td>O. Reg. 102/94 Waste Audit and Waste Reduction Work Plans:
Requires owners or operators of designated establishments, including schools, retail, construction and demolition projects, hospitals, hotels, motels, office buildings, restaurants, and large manufacturers that meet or exceed specified size thresholds or other criteria to conduct a waste audit, develop and implement a waste reduction work plan and update the audit plan annually.</td></tr>
<tr><td>O. Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs:
Requires owners or operators of establishments listed in Ontario Regulation 102/94 and of multi-unit residential buildings with six or more units to have source separation programs for specified wastes and to make a reasonable effort to ensure that these wastes are reused or recycled.</td><td>O. Reg. 104/94 Packaging Audits and Packaging Reduction Work Plans:
Requires manufacturers, packagers and importers of packaged food, beverage, paper or chemical products above a minimum size threshold to conduct a packaging audit and implement a packaging reduction work plan.</td></tr>
<tr><td colspan="2">O. Reg. 232/98 Landfilling Sites:
Outlines the design and operations requirements for new landfilling sites or the expansion of existing landfilling sites proposed after August 1, 1998.</td></tr>
<tr><td colspan="2">Environmental Assessment Act (EAA)
The EAA established a decision-making process used to promote good environmental planning. It ensures that environmental problems or opportunities and alternatives are considered, and their effects are planned for before development or construction takes place. A number of waste management activities may be subject to the Act, including the siting of new landfills.</td></tr>
<tr><td colspan="2">Ontario Regulation 101/07 Waste Management Projects:
Prescribes the waste management projects to which the EAA applies (e.g. new landfilling sites or expansion of existing sites). Classifies waste management projects based on the type of waste to be used, the size, and in some cases, the ability of the planned facility to recover energy from waste in relation to EA requirements.</td></tr>
<tr><td colspan="2">Waste-Free Ontario Act (Bill 151): November 30, 2016
The WFO Act comprises the Resource Recovery and Circular Economy Act (RRCEA) and the Waste Diversion Transition Act. This legislation aims to reduce waste generation by increasing resource recovery and moving toward a circular economy. A primary concept of the plan is that producers be responsible for the end-of-life management of their products and packaging. Under the Regulation, producers are directly responsible for meeting mandatory collection and recycling targets. The Resource Productivity and Recovery Authority enforces compliance with requirements to register, report, and meet collection and recycling targets.</td></tr>
<tr><td rowspan="2">Stewardship Ontario:
Stewardship Ontario is the not-for-profit, industry funded organization that currently operates the Blue Box and Orange Drop Programs under the authority of the Waste-Free Ontario Act and is accountable to the Resource Productivity and Recovery Authority, which is an oversight, compliance and enforcement organization.</td><td>Blue Box Waste:
The Blue Box program is currently operated by Stewardship Ontario. It is anticipated that the transition of this program to the IPR model will occur between 2023 and 2025.</td></tr>
<tr><td>Municipal Hazardous or Special Waste (MHSW):
Currently materials designated as MHSW are managed and funded by Stewardship Ontario on behalf of industry stewards. The MECP has directed Stewardship Ontario to wind up the MHSW program on June 30, 2021. This will enable the transition of MHSW to IPR under the RRCEA.</td></tr>
<tr><td>Waste Electrical & Electronic Equipment (WEEE):
The Ontario Electronic Stewardship will continue to be the industry funding organization for waste designated as WEEE until December 31st, 2020. The transition of WEEE to IPR under the RRCEA will occur at that time.</td><td>Used Tires:
The Ontario Tire Stewardship was the program responsible for the diversion and re-use/recycling of used tires until December 31, 2018. On January 1, 2019, used tires transitioned to the new IPR framework.</td></tr>
</table>

3.2.3 Provincial Policy

The MECP released its *Policy Statement on Waste Management Planning: Best Practices for Waste Managers* in 2007, which discusses the Provincial direction for waste management planning primarily through the 3R's hierarchy (reducing, reusing and recycling) and achieving an overall 60% waste diversion rate from final residual disposal which was the target set at that time. The 3R's hierarchy is generally in line with the IPR philosophy where waste reduction is the preferred option followed by reuse and recycling.

The MECP Policy Statement outlines a "Waste Value Chain" that illustrates the 3R's hierarchy relative to the decreasing value of resources, and the increasing need for final residual disposal capacity. The schematic of the "Waste Value Chain" as presented in the MECP Policy Statement is provided in the following **Figure 3-2**.

FIGURE 3-2: Waste Value Chain



* With potential use of ash or recovery of metals.

** Waste managers should consider waste reduction as a first priority, followed by diversion. All disposal options have unique environmental concerns and should only be considered as a last option. Where disposal is necessary, waste managers should carefully reflect on these environmental concerns in light of their local circumstances. Recovering energy from landfill or thermal treatment should be considered prior to thermal treatment or landfill without energy recovery.

3.3 Municipal Government Policy and Strategic Initiatives

3.3.1 County of Bruce

The County of Bruce Official Plan (consolidated September 2017) is a document which describes the policy framework for planning and development within the County in order to manage the physical, social and economic development within the County and to protect the natural environment. The Plan recognizes the need for long-term waste management and solid waste disposal as well as the importance of waste diversion, including reduction, reuse and recycling. The County's Waste Management Plan assigns certain waste management responsibilities to the County and certain responsibilities to the Town. Relevant Sections of the Official Plan include the following:

Residual Waste Management (Section 4.7.3.3)

'The residual material remaining after diversion will require disposal. The County's Waste Management Master Plan encourages the use of existing licensed landfill capacity in a shared use system rather than identify new capacity for the few areas that will require space over the next 20 years. The County has the authority to enter into agreements with local municipalities to allow the shared-use of existing sites. When the existing capacity is exhausted, the County has the responsibility to provide new disposal capacity for Bruce County residents. The County also has the responsibility to explore alternative waste disposal technologies, i.e., mixed waste processing and energy from waste incineration'.

Waste Diversion (Section 4.7.3.1)

'*The County's Waste Management Plan assigns certain waste diversion powers to the County and certain responsibilities to the local Municipality. The County-wide diversion activities will be monitored by the County and each year a report will be submitted to the County identifying any unresolved areas of concern with respect to existing diversion programs. The County has the legislative basis to assume further waste diversion responsibilities or delegate back to local municipalities, should the need arise'.*

According to the Official Plan, the County and the municipalities within the County share diversion responsibilities with the intent of taking advantage of the economies of scale and expertise that can be offered by County involvement as well as utilizing local municipal services. The Official Plan also notes that a successful diversion program is dependent on recognizing the common goal of maximizing diversion of waste from landfills and on communication and cooperation between the County and the lower-tier Municipalities.

The County manages the Hazardous Waste Collection Program and assists in education and monitoring of waste diversion and disposal programs to ensure the continued adequacy of the existing municipal landfill sites. Local municipalities currently own and operate their waste management facilities and are responsible for their respective garbage and recycling collection services.

3.3.2 Town of South Bruce Peninsula

The Town of South Bruce Peninsula has their own Official Plan, but for general planning purposes the Town is also committed to support the County's waste management initiatives, including the endorsement and implementation of reasonable waste diversion strategies.

Further, the Town has developed a Community Based Strategic Plan. In general, the Strategic Plan outlines the Town's strategic policies regarding fiscal responsibility, economy, environment, community health, education, and culture and recreation. Strategic initiatives specific to waste management generally consider the encouragement of recycling and waste diversion initiatives to reduce impacts on the environment related to the management of residual waste, including:

- Moving the Town closer to achieving the Provincial waste diversion goals; and
- Defining a system that will allow the Town to achieve a 60% residential waste diversion goal and 40% overall waste diversion goal.

To accomplish this goal, the Town recognizes that additional waste diversion can come from:

- Developing a better understanding of current waste flows;
- Reducing the amount of waste managed;
- Strengthening existing waste diversion programs; and
- Identifying and developing new waste diversion programs.

In the County of Bruce, the recent implementation of several strategic initiatives to address the goal for a Waste-Free Ontario and the intention of the Waste Value Chain continue to be overseen by the County, Bruce Area Solid Waste Recycling and by the Town of South Bruce Peninsula, as discussed in the following Sections.

3.3.3 Bruce Area Solid Waste Recycling (BASWR)

While landfilling operations continue to be managed separately within each municipality, the implementation of a 'centralized global approach' to waste collection and diversion has been recognized by Bruce Area Solid Waste Recycling (BASWR). BASWR is a not-for-profit organization (i.e. partnership) comprised of its member municipalities. Currently BASWR provides integrated waste reduction and environmental services, including collection and processing, to the majority of Bruce County (i.e. all municipalities with the exception of Northern Bruce Peninsula). In recognition of the municipal cooperative approach, the Town's website generally provides links to the BASWR website which includes schedules, publications and handouts on various topics.

BASWR primarily manages blue box collection, on a bi-weekly basis, and subsequent processing at their Materials Recovery Facility in Southampton. In addition to the blue box collection services, recyclables are also accepted at the Amabel Landfill Site with separate transfer of recyclable materials to the BASWR facility arranged on an as needed basis, subject to service availability. Further, BASWR has made available specialized higher volume containers, limited to 65- and 95-gallon capacity, retrofitted for their collection vehicles for use by the Industrial, Commercial and Institutional (ICI) sector and apartment customers. These, along with disposal bins for cardboard, aluminum and plastic, are also used at the Amabel Landfill site. Similarly, pick-up can be arranged on an as needed basis, subject to service availability.

It is our understanding that BASWR does not currently have the capacity to pursue additional waste diversion opportunities and/or provide additional services, such as a curbside cardboard pick-up program (i.e. bi-weekly or monthly), to Town residents. Alternatively, in addition to cardboard acceptance at the Amabel Landfill, two cardboard depots have been set up at other locations within the community.

3.3.4 Existing Waste Prevention (Reduction) and Diversion Policies and Programs

Several waste prevention & diversion policies and programs have been implemented by the Town, either directly or through Bruce Area Solid Waste Recycling, including the following:

- Bag Tag Policy: Curb-side pick-up currently allows for one bag of garbage at no charge, if greater than one bag then one tag per bag of household waste, limited to a maximum of 3 bags;
- The implementation of tipping fees for residual waste at the landfill site, including double the tipping fee for unsorted waste, to deter the disposal of divertible material;
- The availability of a separate disposal area for clean wood, brush, and leaf and yard waste at the landfill site and at the Wiarton Yard;
- A bagged leaf collection service, currently provided once per year in the Fall; and
- Public Education Programs

In addition, several waste diversion depots and programs are available for reusable and recyclable materials either at the local Landfill, at a central location within the Town or through BASWR. As tipping fees do not typically apply, the diversion of these items is encouraged. A list of the various waste diversion streams and depot locations is provided below:

TABLE 3-2: Waste Diversion Initiatives – Managing Authority and Depot Locations

DIVERSION STREAM	MANAGING AUTHORITY	DEPOT LOCATION	TIPPING FEE
Blue Box Recyclables	BASWR (Materials Recovery Facility)	Amabel Landfill Site *Curbside Pick-up (Bi-weekly)*	Free
Cardboard	BASWR	Hepworth: 50 Queen St E Wiarton: Louisa Street Parking Lot Amabel Landfill Site	Free
Electrical & Electronic Equipment (WEEE)	Town of South Bruce Peninsula	Amabel Landfill Site	Free
Used Tires	Town of South Bruce Peninsula	Amabel Landfill Site	Free
Scrap Metal & White Goods	Town of South Bruce Peninsula	Amabel Landfill Site	Charge applied
Municipal Hazardous or Special Waste (MHSW)	Bruce County	Wiarton (SBP Works Garage) Sauble Beach (Amabel Works Yard): 3 times annually	Free
Brush, Clean Wood and Stumps	Town of South Bruce Peninsula	Amabel Landfill Site	Charge applied
Leaf and Yard Waste	Town of South Bruce Peninsula	Amabel Landfill Site Wiarton (SBP Works Garage)	Free
Mattresses and Box Springs	Town of South Bruce Peninsula	Amabel Landfill Site	Charge applied per unit

3.3.5 Summary

The Town is committed to improving its policies and strategic initiatives to continually improve diversion rates. The Town currently provides various recycling programs and opportunities to residents and is actively investigating and prepared to consider additional reduction and reuse opportunities as well as various diversion programs.

4. BACKGROUND INFORMATION

4.1 Information Sources

The intention of the following sections is to provide adequate background information related to the Town of South Bruce Peninsula in order to properly evaluate waste management alternatives and to provide informed recommendations. Background information and data presented and discussed in the following sections of this report were compiled from various sources, as outlined in the References **(Section 14)** of this Report.

For the purpose of this Waste Management Report, data on waste generation diversion rates from 2014 through 2018 for the Town have been included to determine "existing" waste disposal practices, or benchmark values. Only data since 2014 has been included due to recent improvements to the landfill operations, as well as the Town's diversion and monitoring programs. It should also be noted that due to variations in monitoring practices and estimation methods over several years of data collection, reported values may have a degree of error associated with them and are used as general indicators for comparative purposes.

Furthermore, the main data source for waste diversion estimates and comparisons is the RPRA Municipal Datacall. It is important to note that the RPRA data is intended to be specific to the residential portion of the waste stream and to not include the Industrial, Commercial and Institutional sector (IC&I). Therefore, for the purpose of comparing the Town of South Bruce Peninsula with other similar municipalities within the province, only the residential sector is typically considered, where applicable and as specified.

4.2 Geography

The Town of South Bruce Peninsula (the Town) is located in Bruce County between Lake Huron and Georgian Bay. The Municipality formed in 1999 as the result of the amalgamation of the former Townships of Amabel and Albemarle, the Town of Wiarton and the Village of Hepworth. As shown on **Figure 1-1**, the Town is bordered by the Municipality of Northern Bruce Peninsula to the north, in part by the Chippewas of Nawash Unceded First Nation (formerly Cape Croker) to the east, and the Municipality of Arran-Elderslie to the south. The Municipality of Georgian Bluffs, which is in Grey County, also borders the Town to the east between Wiarton and Alvanley. The proximity to various neighboring Municipalities allows for potential service sharing.

Bruce County is itself comprised of a total of eight rural Municipalities. A table summarizing the Municipalities situated within Bruce County and their corresponding populations is provided below:

TABLE 4-1: Municipalities within Bruce County and Population Counts (2016 Census)

MUNICIPALITY	2016 POPULATION
Town of Saugeen Shores	13,715
Municipality of Kincardine	11,389
Municipality of Brockton	9,461
Town of South Bruce Peninsula	8,416
Township of Huron-Kinloss	7,069
Municipality of Arran-Elderslie	6,803
Municipality of South Bruce	5,639
Municipality of Northern Bruce Peninsula	3,999

4.3 Community Profile

The Town of South Bruce Peninsula is a largely rural Municipality with a reported population of 8,416 (2016 Census). The Town covers an area of approximately 532.3 km^2 and has an average population density of 15.8 persons/km^2. The Town of South Bruce Peninsula is unique in that its geography consists of part of the Bruce Peninsula. The Town itself extends approximately 40 km from north ↔ south and is in the range of 10 to 20 kilometers wide (east ↔ west). Further, it is characterized by an estimated 45 to 50 kilometers of shoreline along Lake Huron to the east, including Sauble Beach, a popular tourist destination.

The Town generally consists of low-density rural development with higher density development within the Town of Wiarton, Village of Hepworth and along the shorelines, primarily the shorelines to the west. While the agricultural industry and aggregate quarries are important to the area, tourism, including camping, cottage rentals and associated services, is considered a major industry within the Town, particularly during the summer months.

Based on the reported population counts provided by Statistics Canada, the population has remained relatively consistent since 2006. A summary of the available census data from 1991 through 2016 is provided in **Table 4-2**. Population counts for 1991 and 1996, prior to amalgamation, are based on the counts for each former jurisdiction. Census data reported for the period prior to amalgamation, which provides a breakdown of the populations within each former jurisdiction, suggests that an estimated 30% (or approximately 2,500 persons) of the Town's population resides within the Town of Wiarton and approximately 6% (or ±500 persons) reside within the Village of Hepworth.

TABLE 4-2: Population Counts (1991 to 2016)

YEAR	JURISDICTION	POPULATION		
		Persons	%	% Change
Town of South Bruce Peninsula (prior to amalgamation)				
1991	Albemarle	1,140	15	
	Amabel	3,815	49	
	Hepworth	453	6	
	Wiarton	2,326	30	
	Total	7,734		
1996	Albemarle	1,217	15	
	Amabel	3,917	49	
	Hepworth	470	6	
	Wiarton	2,400	30	
	Total	8,004		3.5
Town of South Bruce Peninsula (SBP)				
2001	SBP	8,090		1.1
2006	SBP	8,415		4.0
2011	SBP	8,413		0
2016	SBP	8,416		0

As shown in Table 4-3, the dwelling counts reported by Statistics Canada indicate that a significant proportion of the dwellings within the Town of South Bruce Peninsula are seasonal. Consequently, these should be factored into the contributing population for waste management purposes.

TABLE 4-3: Dwelling Counts and Total Equivalent Population (2001 to 2016)

YEAR	POPULATION	DWELLING COUNTS (TOTAL)			POPULATION EQUIVALENT	
	Persons	Private	Permanent	Seasonal	Seasonal	Total (Town)
2001	8,090	6,741	3,385	3,356	1,398	**9,488**
2006	8,415	6,759	3,581	3,178	1,324	**9,739**
2011	8,413	6,959	3,651	3,308	1,378	**9,791**
2016	8,416	6,945	3,741	3,204	1,335	**9,751**

According to Statistics Canada's 2016 census data, the Town of South Bruce Peninsula has a permanent population of 8,416 and a total of 6,945 dwellings, of which 3,741 are occupied by permanent residents. Therefore, for the purposes of waste generation and usage of waste management services, the contributing population is more accurately estimated to be approximately 9,751 persons. This is based on the method adopted by Waste Diversion Ontario (WDO) where 6 seasonal households are equivalent to 1 permanent household with an average of 2.5 persons per permanent household.

4.4 Industrial, Commercial and Institutional Sector

As previously discussed, the main data source for waste diversion estimates is the RPRA Municipal Datacall, which provides information specific to the residential portion of the waste stream and does not include the Industrial, Commercial and Institutional sector (IC&I). The IC&I Sector includes hospitals, office buildings, educational institutions, industrial firms, and businesses, including the services associated with tourism, which is considered a major industry for the Town, such as camping, cottages, hotels and restaurants.

In consideration of the Town's tourism industry, the associated increase in population, particularly during the summer months has been approximated herein using information presented in the *'Explore the Bruce: Economic Impact of Tourism – 2018'* Report. Based on an assessment of the data presented in the Explore the Bruce Report, there is, on average, an estimated 3,134 persons per day that can be considered tourists. Assuming that the majority of visits occur during the peak summer season, and consistent with previous estimates, this is equivalent to the population almost doubling during the peak season (i.e. a period of three to four months). Therefore, it is evident that tourism contributes a relatively significant proportion of waste to the landfill, estimated to be approximately one-quarter (i.e. ±25%) of the residual waste received, with the majority being received during the peak tourist season.

Further, for the purposes of estimating a residential component for the determination of a residential diversion rate for performance evaluation later in this Report, an additional IC&I waste component of 15% has been assigned to account for waste from the remainder of the IC&I sector including, but not limited to, the hospital, seniors home(s), the three schools, and industrial firms in the Town. Therefore, a total IC&I waste component of 40% is considered within this Waste Management Plan (i.e. 25% tourism and 15% other).

It is noted that, consistent with a key recommendation provided in the Town of South Bruce Peninsula Waste Diversion Plan (2cg, October 2011), screening of incoming wastes has been dramatically improved in recent years and the residential, commercial and municipal wastes are monitored separately. However, the use of these records to estimate the proportional contributions of residential versus IC&I waste is inherently challenging. For example, all curbside waste attributable to the tourism industry (i.e. cottages, businesses) would be reported as household residential waste and some categories of waste documented are subject to interpretation (i.e. commercial/household waste). Therefore, for the purposes of establishing baseline data herein, the assumption that 40% of the residual waste received at the landfill can be considered IC&I waste is considered appropriate.

4.5 Existing Services

Prior to 1999, the Townships of Amabel and Albemarle were both serviced by a landfill site, of which the Town assumed ownership upon amalgamation. As a result, the Town owns two landfill sites; the Albemarle Landfill and the Amabel Landfill. Effective December 23, 2000 the Town consolidated its landfill operations to the Amabel landfill, temporarily suspending operations at the Albemarle Landfill. Landfill site locations are shown on **Figure 1-1**. Currently, the Amabel landfill is open to the vehicles hauling waste during the following operating hours:

TABLE 4-4: Landfill Hours

DATE	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
May 1 – June 15	Closed	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	Closed
June 15 – Labour Day	10:00–2:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	1:00 – 5:00*
November 1 – April 30	Closed	8:30 - 12:00 1:00 - 5:00	Closed	Closed	8:30 - 12:00 1:00 - 5:00	8:30 - 12:00 1:00 - 5:00	Closed

* Sunday: Bagged garbage and recycling only (No heavy materials)
** As per Condition 17.3 of the ECA, landfill hours can be amended with written notification to the District Manager.

As of January 2, 2019, waste collection is provided by Waste Management Canada to the majority of residents through weekly curbside collection. As outlined in By-Law 74-2017, Schedule 'F' (Garbage Collection Map and Schedules), there are several roads within the Town that do not receive the weekly garbage collection service. In addition, in the Chesley Lake area weekly curbside collection is limited to the period between May 1 and November 30. In the off-season a disposal bin is placed at the end of Camp Road, where shown on **Figure 1-1**, for the residents of Chesley Lake to place their garbage. In addition to the weekly curbside pick-up service, residual waste can be dropped off at the Amabel Landfill Site.

Blue box recyclable collection services, which are provided on a bi-weekly basis, are contracted out by the Town to Bruce Area Solid Waste Recycling (BASWR). Recyclable materials may also be dropped off at the Amabel Site. In addition, depots for cardboard are available in Hepworth and Wiarton, where shown on **Figure 1-1**. The blue box recyclables collected are shipped directly to BASWR's processing facility which recovers and markets the majority of all materials collected.

The Town has adopted the use of bag tags, at a cost of $3.00 per tag/bag (2019 cost). Each property that receives garbage collection is permitted to place one bag (not to exceed 40 pounds) per week free of charge at the roadside for collection. Each additional bag requires a bag tag. Curbside collection is currently limited to 3 bags of household waste per week, however, additional waste can be dropped off at the Amabel landfill. All vehicles entering the landfill are weighed upon entry. With the exception of residential waste with bag tag stickers, the Town currently charges a tipping fee of $125 per tonne of sorted waste and $250 for unsorted waste.

With respect to waste diversion, in addition to the blue box recycling program, additional waste diversion is currently achieved through the available used tires, electronics, batteries, mattresses, appliances, propane tank, scrap metal and wood and yard waste drop-off areas at the Amabel Landfill. Several of these items can be dropped off at no charge. In addition, non-CFC and CFC- containing white goods can be dropped off at the Site. The majority of the materials diverted are shipped off-site by various collectors for reuse and/or recycling. Yard waste, including brush, and leaf and yard waste, once decomposed, can be used as daily cover material. In addition, grinding of landfill wood waste including construction/household wood waste material, brush and/or tree stumps collected at the Site is periodically ground into a finished chip size of approximately four inches (4"). If suitable, this can be incorporated into the daily cover material used.

5. RESIDUAL WASTE GENERATION AND DISPOSAL

For the purpose of this Report, data on waste generation and waste diversion for the period between 2014 and 2018 have been reviewed to assess the current waste disposal practices and to establish benchmark values for the determination of the Town's progress towards meeting the Province's waste diversion targets set out in the Waste-Free Ontario legislation. Data is limited to the last 5-years due to recent improvements to landfill operations and improved monitoring and record keeping with respect to incoming wastes. In addition, the average waste disposed over a period of five years is considered more accurate relative to the measured volumes and/or tonnages for each individual year due to one-time disposal events such as building demolition or contaminated soil disposal (which may be accepted, subject to soil quality analyses and the Town's discretion), and variations in volumetric topographic survey data relative to coverage of waste disposal areas. It should be noted that due to these variations, reported values may have a degree of error associated with them and are used as general indicators and for comparative purposes.

Waste generation rates for the Town are estimated using (i) weigh scale data, which provides information on the type and quantity (i.e. tonnes) of waste accepted at the Amabel landfill site, and (ii) annual topographic surveys completed by others which determine the volume of landfill capacity used on an annual basis by calculating the difference between annual volumetric surveys of the landfilled area(s). Further, based on the geographic limitations and associated logistics, the acceptance of commercial waste at the Town's landfill has occurred in the past and is likely to continue. Therefore, the commercial contribution is also included in the consideration of waste generation rates, where applicable.

Information from the RPRA Municipal Datacall is used to estimate contributions from the residential sector for the assessment and comparison of residential waste generation rates. However, data from the RPRA Municipal Datacall is intended to be specific to the residential portion of the waste stream and to not include the commercial sector. Therefore, for the purpose of comparing the Town of South Bruce Peninsula with other municipalities within the province, contributions from the residential sector are estimated and considered herein.

The following table presents the total landfilled waste deposited at the Amabel Landfill Site from 2014 through 2018 based on both the volumetric surveys and the weigh scale data.

TABLE 5-1: Total Residual Waste Disposed and Estimated Residential and IC&I Contributions Town of South Bruce Peninsula

YEAR	TOTAL CAPACITY USED			WASTE DISPOSED				
	Total	Interim Cover	Residual Waste	Total	IC&I	Residential		
	m^3	m^3	m^3	Tonnes	Tonnes	Tonnes	m^3/capita*	Kg/capita*
2014	10,269	2,054	8,215	5,029	2,011	3,017	0.51	309
2015	7,990	1,598	6,392	4,650	1,860	2,790	0.39	286
2016	10,409	2,082	8,327	4,523	1,809	2,714	0.51	278
2017	10,573	2,115	8,458	4,213	1,685	2,528	0.52	259
2018	9,544	1,909	7,635	4,335	1,734	2,601	0.47	267
Average	**9,757**	**1,951**	**7,806**	**4,550**	**1,820**	**2,730**	**0.48**	**280**

Notes:

(1) Annual landfilling rates presented are based on information provided by the Town, including Reports, prepared by WSP. The tonnage of residual waste is based on information provided in the Town's weigh scale records.
(2) The volume of residual waste landfilled assumes a proportion of 20% daily cover.
(3) Waste disposal rates per capita are based on the 2016 census population and community profiles which estimate the equivalent population for permanent and seasonal residents to be 9,751 persons.
(4) * Assumes that 60% of the residual waste can be attributed to residential contributions.

The 5-year average rate of total residual waste disposed at the Town's Amabel Landfill site is estimated to be approximately 4,550 tonnes per year. In consideration of the estimated 40% contributions from the IC&I sector (discussed in **Section 4.4**), the average residential disposal rate is estimated to be approximately 280 kilograms per capita (0.28 tonnes).

According to information provided by Statistics Canada, including the Waste Management Industry Survey for Business and Government Sectors prepared by Statistics Canada using the 2008 and 2010 data (reports dated December 2010 and August 2013) and Statistics Canada population counts for Ontario and reported quantity of waste from residential sources, the Town's estimated waste generation rate is similar to Ontario's per capita disposal rate which is estimated to be in the range of 250 kilograms (0.25 tonnes) of residential waste disposed annually.

6. RESIDENTIAL WASTE DIVERSION

6.1 Resource Productivity and Recovery Authority

Each individual Municipality or *'Municipally appointed association'* is responsible for tracking materials diverted from disposal for the residential sector. This information is submitted to the Resource Productivity and Recovery Authority (RPRA: formerly Waste Diversion Ontario) on an annual basis. Based on the information provided to the RPRA, a residential diversion rate is calculated for each Municipality, or association thereof, in Ontario.

The residential diversion rate calculations include the following:

i. An allowance for provincial deposit systems based on the deposit containers returned from the residential sector.
ii. An allowance for residential on-property management (i.e. backyard composting and grass-cycling).
iii. Municipally operated (directly or through contracted services) reuse activities.
iv. Municipally operated (directly or through contracted services) recycling activities including blue box materials, other recyclables (e.g., scrap metal, bale wrap, mattresses, etc.), WEEE and MHSW.
v. Municipally operated (directly or through contracted services) centralized composting activities for household organics, leaves and yard waste.
vi. Residual waste disposed.

The residential diversion rates and related information for the individual municipalities, or associations thereof, are published annually by RPRA. This information can be used to evaluate a Town's performance relative to their municipal grouping and the Province. The municipal groupings are developed by RPRA and consist of municipalities with similar characteristics (e.g., logistics, geography, collection method, population density/size, etc.). It should be noted that at the time this report was prepared the 2018 RPRA Municipal Datacall data had not been published, therefore, the RPRA data up to and including 2017 is provided herein.

6.2 Town of South Bruce Peninsula Waste Diversion Information

The Town of South Bruce Peninsula is reported under an *Association of Municipalities*, referred to as Bruce Area Solid Waste Recycling or BASWR, which is part of the *Rural Regional* municipal grouping. Therefore, RPRA does not publish individual diversion data for the Town. Diversion estimates specific to the Town of South Bruce Peninsula provided herein are based on the following:

i. Information and data provided by the Town related to the diversion streams managed directly by the Town at the Amabel Landfill site (i.e. tires, scrap metal, and mattresses);
ii. Data provided by BASWR (i.e. blue box tonnages for 2014 through 2018);
iii. Data provided from the County of Bruce (i.e. MHSW); and
iv. RPRA allowances, adjusted to reflect the population of the Town of South Bruce Peninsula.

The waste diversion rate is defined as the total amount of divertible content (including waste recycling, reuse, and organics) over the total amount of waste produced (including waste diverted and residual waste disposed), which is expressed as a percent. As previously stated, for the purpose of this report, data on waste generation and diversion from 2014 through 2018 for the Town have been included in the assessment of waste diversion rates. Further, for the purpose of comparing the Town of South Bruce Peninsula with other Municipalities and the Province, estimated waste diversion rates specific to the residential sector are provided.

It is widely recognized that there is a general lack of reliable data for Ontario's (and Canada's) IC&I Sector. However, based on a Discussion Paper issued by the MECP entitled *'Reducing Litter and Waste in Our Communities: MECP ERO# 013-4689'* (April 2019), provincially the IC&I sector achieves an average diversion of 17%. More specifically 6% green waste, 2% construction waste and 9% other divertible materials. As a result, Town specific diversion related to the IC&I sector was estimated assuming that of the total waste generated by the IC&I sector (i.e. 1,820 tonnes annually), an additional 15% of divertible materials is generated, including 6% organics and 9% other waste diversion streams. The Town does not consistently divert construction waste at this time.

TABLE 6-1: Residual Waste Generation and Overall Diversion

YEAR	TOTAL WASTE	RESIDUAL WASTE			WASTE DIVERTED			DIVERSION RATE (%)		
		Total	Household	IC&I	Total	Household	IC&I	Total	Household	IC&I
	Tonnes	Tonnes			Tonnes			% Diverted		
2014	6,668	5,029	3,017	2,011	1,640	1,285	355	24.6	29.9	15.0 (See Note)
2015	6,731	4,650	2,790	1,860	2,081	1,752	328	30.9	38.6	
2016	6,592	4,523	2,714	1,809	2,068	1,749	319	31.4	39.2	
2017	6,358	4,213	2,528	1,685	2,145	1,848	297	33.7	42.2	
2018	6,475	4,335	2,601	1,734	2,140	1,834	306	33.0	41.3	
Average	6,565	4,550	2,730	1,820	2,015	1694	321	30.7	38.3	

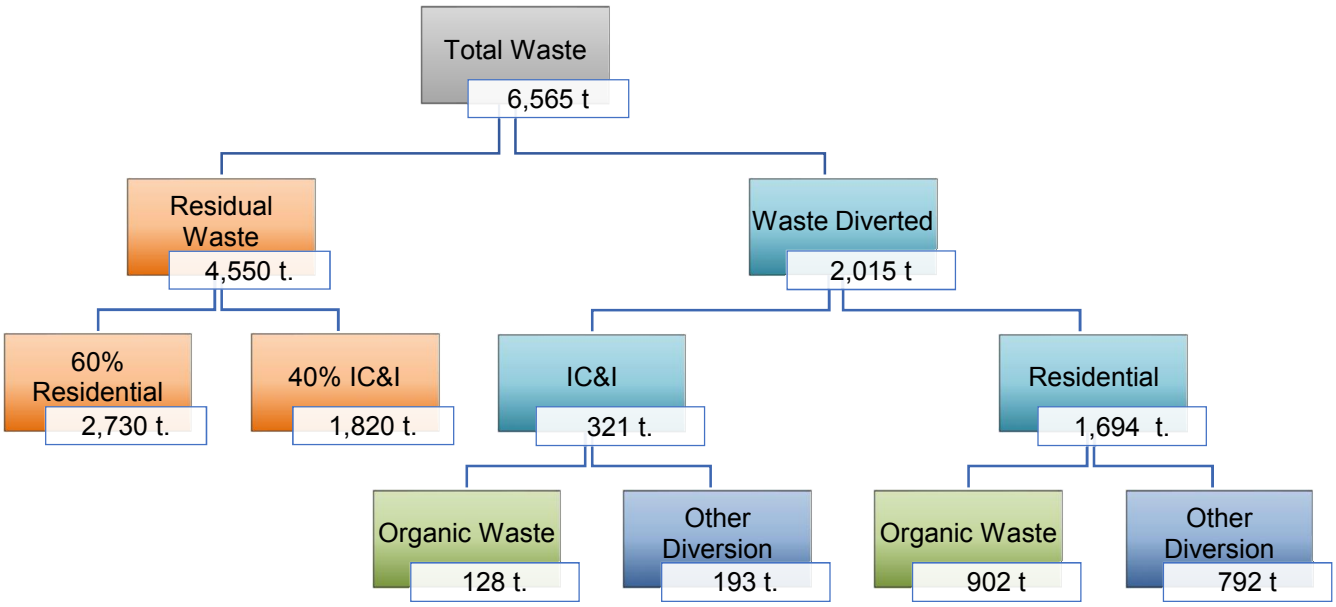
NOTES:

It is assumed that 40% of the total residual waste received at the Amabel Landfill Site is from the IC&I sector. Overall, it is estimated that the IC&I sector diverts ±15% of its waste generated (i.e. 1,820 tonnes residual waste [85%] and 321 tonnes waste diversion [15%]).

Residential diversion rates presented herein assume that the commercial sector contributes 40% of the total residual waste received and, in addition to the residual waste generation that can be attributed to the IC&I sector, the IC&I sector diverts an estimated 15% of the waste generated.

Based on the information available, and using the assumptions outlined herein, the average diversion rate for all waste handled by the Town is 30.7%. In consideration of the IC&I waste accepted at the Amabel Landfill, the residential diversion rate is actually expected to be higher, estimated to be approximately 38%. A summary of the average annual residual waste generation and diversion rates for the Town is provided in **Figure 6-1**.

FIGURE 6-1: Residual Waste Generation and Waste Diversion Estimates (Residential and IC&I)



A detailed breakdown of the waste diversion achieved by the Town, by type of material, is provided in **Table 6-2.** In addition, a breakdown of the relative proportions of residual waste generation versus diversion for the Town overall (i.e. residential + IC&I sector combined) and for the residential and IC&I sector, for each waste diversion category, is provided as follows:

1. Diversion of Subject Waste (IC&I and Residential) Relative to Total Waste Generated =
   Total of Subject Waste Diverted ÷ Total Waste Generated (Residual + Diverted)
2. Diversion of Subject Waste (Residential only) Relative to Total Residential Waste Generated =
   Subject Waste Diverted (Residential) ÷ Total Residential Waste Generated (Residual + Diverted)
3. Diversion of Subject Waste (IC&I only) Relative to Total IC&I Waste Generated =
   Subject Waste Diverted (IC&I) ÷ Total IC&I Waste Generated (Residual + Diverted)
   (Note: Other IC&I waste diverted, equivalent to 9%, was assumed to be from the diversion of blue box recyclables, tires, scrap metal and WEEE)
4. Subject Waste Diverted Relative to Overall Diversion (IC&I and Residential Combined):
   Total of Subject Waste Diverted ÷ Total Waste Diverted
5. Subject Residential Waste Diverted Relative to Residential Diversion Alone:
   Total of Subject Waste (Residential only) ÷ Total Residential Waste Diverted

TABLE 6-2: SOLID WASTE DIVERSION BY TYPE OF MATERIAL (2014 to 2018)

		Units	YEAR					AVERAGE	
			2014	2015	2016	2017	2018		
Total Waste Generated		Tonnes (T)	**6,668**	**6,731**	**6,592**	**6,358**	**6,475**	**6,565**	
Residual Waste									
	Total		5,029	4,650	4,523	4,213	4,335	4,550	
	Residential		3,017	2,790	2,714	2,528	2,601	2,730	
	IC&I		2,011	1,860	1,809	1,685	1,734	1,820	
Waste Diverted		As Noted	*Tonnes*	*Tonnes*	*Tonnes*	*Tonnes*	*Tonnes*	*Tonnes*	***Percent***
	Total		1,640	2,081	2,068	2,145	2,140	2,014.7	**30.69**
	Residential		1,285	1,752	1,749	1,848	1,834	1,693.5	**38.28**
	IC&I		355	328	319	297	306	321.2	**15.0**
DIVERSION (Waste Tonnage and Relative Proportions)									
	Organics Diverted (Total)	(T)	642	1084	1096	1188	1139	1,030	
	Residential	(T)	500	953	968	1069	1017	902	
	IC&I	(T)	142	131	128	119	122	128	
	i. Total Waste	%	9.6	16.1	16.6	18.7	17.6	15.7	
	ii. Residential Waste	%	11.6	21.0	21.7	24.4	22.9	20.4	
	iii. IC&I Waste	%	6.0	6.0	6.0	6.0	6.0	6.0	
	iv. Diversion (Overall)	%	39.2	52.1	53.0	55.4	53.2	51.1	
	v. Residential Diversion	%	38.9	54.4	55.4	57.9	55.4	53.2	
	Blue Box Recyclables	(T)	725.6	714.2	699.3	710.8	749.7	720	
	Residential	(T)	557	559	548	565	599	566	
	IC&I	(T)	169	155	151	146	151	154	
	i. Total Waste	%	10.9	10.6	10.6	11.2	11.6	11.0	
	ii. Residential Waste	%	12.9	12.3	12.3	12.9	13.5	12.8	
	iii. IC&I Waste	%	7.1	7.1	7.1	7.4	7.4	7.2	
	iv. Diversion (Overall)	%	44.3	34.3	33.8	33.1	35.0	35.7	
	v. Residential Diversion	%	43.3	31.9	31.3	30.6	32.7	33.4	
	Tires	(T)	15.35	17.96	11.92	15.08	20.17	16.10	
	Residential	(T)	11.78	14.07	9.35	11.99	16.12	12.66	
	IC&I	(T)	3.57	3.89	2.58	3.10	4.06	3.44	
	i. Total Waste	%	0.23	0.27	0.18	0.24	0.31	0.25	
	ii. Residential Waste	%	0.274	0.310	0.209	0.274	0.363	0.286	
	iii. IC&I Waste	%	0.151	0.178	0.121	0.156	0.199	0.161	
	iv. Diversion (Overall)	%	0.94	0.86	0.58	0.70	0.94	0.80	
	v. Residential Diversion	%	0.92	0.80	0.53	0.65	0.88	0.75	
	Scrap Metal	(T)	147.85	147.72	146.44	119.05	118.96	136.0	
	Residential	(T)	113.44	115.71	114.79	94.61	95.05	106.7	
	IC&I	(T)	34.41	32.01	31.65	24.44	23.91	29.3	
	i. Total Waste	%	2.22	2.19	2.22	1.87	1.84	2.10	
	ii. Residential Waste	%	2.64	2.55	2.57	2.16	2.14	2.41	
	iii. IC&I Waste	%	1.45	1.46	1.49	1.23	1.17	1.37	
	iv. Diversion (Overall)	%	9.02	7.10	7.08	5.55	5.56	6.75	
	v. Residential Diversion	%	8.83	6.60	6.56	5.12	5.18	6.30	
	Electronics (WEEE)	(T)	26.34	28.87	28.82	24.2	24.57	26.56	
	Residential	(T)	20.21	22.61	22.59	19.23	19.63	20.86	
	IC&I	(T)	6.13	6.26	6.23	4.97	4.94	5.70	
	i. Total Waste	%	0.40	0.43	0.44	0.38	0.38	0.41	
	ii. Residential Waste	%	0.47	0.50	0.51	0.44	0.44	0.47	
	iii. IC&I Waste	%	0.26	0.29	0.29	0.25	0.24	0.27	
	iv. Diversion (Overall)	%	1.61	1.39	1.39	1.13	1.15	1.32	
	v. Residential Diversion	%	1.57	1.29	1.29	1.04	1.07	1.23	
	Mattresses/Boxsprings	(T)	13.06	15.71	15.93	15.83	16.64	15.43	
	i. Total Waste	%	0.20	0.23	0.24	0.25	0.26	0.24	
	ii. Residential Waste	%	0.30	0.35	0.36	0.36	0.38	0.35	
	iv. Overall Diversion	%	0.80	0.76	0.77	0.74	0.78	0.77	
	v. Residential Diversion	%	1.02	0.90	0.91	0.86	0.91	0.91	
	MHSW	(T)	15.41	17.91	16.19	17.47	16.96	16.79	
	i. Total Waste	%	0.23	0.27	0.25	0.27	0.26	0.26	
	ii. Residential Waste	%	0.36	0.39	0.36	0.40	0.38	0.38	
	iv. Overall Diversion	%	0.94	0.86	0.78	0.81	0.79	0.83	
	v. Residential Diversion	%	1.20	1.02	0.93	0.95	0.92	0.99	
	Container Return Allowance	(T)	53.7	53.7	53.7	53.7	53.7	53.7	
	i. Total Waste	%	0.81	0.80	0.81	0.84	0.83	0.83	
	ii. Residential Waste	%	1.25	1.18	1.20	1.23	1.21	1.21	
	iv. Overall Diversion	%	3.28	2.58	2.60	2.50	2.51	2.67	
	v. Residential Diversion	%	4.18	3.06	3.07	2.91	2.93	3.17	
	Batteries	(T)	0.00	0.00	0.00	0.90	0.00	0.2	
	i. Total Waste	%	0.00	0.00	0.00	0.01	0.00	0.00	
	ii. Residential Waste	%	0.00	0.00	0.00	0.02	0.00	0.00	
	iv. Overall Diversion	%	0.00	0.00	0.00	0.04	0.00	0.01	
	v. Residential Diversion	%	0.00	0.00	0.00	0.05	0.00	0.01	

6.3 Waste Recycling

6.3.1 Blue Box Materials

Curbside collection of sorted blue box recyclable materials is provided by BASWR on a bi-weekly basis. The current list of items accepted through curbside collection is provided in **Figure 6-2**. Based on the records provided by BASWR, approximately 3,600 tonnes of Blue Box materials were diverted from the Town's landfill between 2014 and 2018, averaging approximately 720 tonnes/year. **Table 6-2** presents the blue box tonnages diverted from the Town's residual waste stream. The five-year average indicates that blue box materials represent approximately 12.8% of residential waste generated, accounting for 35.7% of the total waste diverted and an estimated 33.4% of the residential waste diversion.

FIGURE 6-2 Bruce Area Solid Waste Recycling: Recyclable Blue Box Materials

6.3.2 Ontario Deposit Return Program

Although the Town is not directly involved in the deposit return program for beer and liquor bottles, the RPRA includes an allowance for the program based on the deposit containers returned from the residential sector. As information specific to the Town is not available, a deposit return rate based on previous allowances for deposit returns is estimated. This allowance translates to an estimated 5.5 kg/capita. Given that the Town's population, including seasonal residents, was estimated to be 9,751 (2016 Census data), an estimated 53.7 tonnes of beer and liquor bottles are diverted from the Town's landfill annually. Based on the estimated diversion rates, deposit containers represent approximately 1.2% of the residential waste generated, accounting for 2.7% of the total waste diverted and an estimated 3.2% of the residential waste diversion.

6.3.3 White Goods and Scrap Metal

The Town accepts scrap metal at the Site, including empty propane tanks and both chlorofluorocarbon (CFC)-containing (i.e. air conditioners, dehumidifiers, freezers, refrigerators and water coolers) and non-CFC containing white goods. Tipping fees, as specified by the Town's landfill disposal fees, are applied to the drop-off of scrap metals and white good items. The white goods and scrap metal are collected by a hauler on an as needed basis for salvage. Town records estimate that an average of approximately 136 tonnes of scrap metal is diverted from the Amabel Landfill site annually. Based on the estimated diversion rates, scrap metal represents approximately 2.4% of the residential waste generated, accounting for 6.8% of the total waste diverted and an estimated 6.3% of the residential waste diversion.

The Town also supports the use of "The Great Refrigerator Roundup" sponsored by the Ontario Power Authority (OPA). The program allows residents of Ontario to dispose of refrigerators, freezers and air conditioners free of charge through the OPA.

6.3.4 Used Tires

Tires are the first material to move to the individual producer responsibility (IPR) framework, meaning that under the Resource Recovery and Circular Economy Act tire producers are now directly responsible and accountable for meeting mandatory collection and recycling targets for used tires. Producers can contract with registered Producer Responsibility Organizations (PROs) and service providers and must report data on progress towards meeting targets.

Under the new legislation, municipalities are not required to collect tires. It is recommended that if the Town opts not to operate a tire collection site, residents be directed, either via the Town's website and/or information on the sign posted at the landfill entrance, to a registered collection site.

Municipalities that continue to collect used tires are not required to register with the Authority as a collector or submit reports. However, municipalities that operate collection sites should ensure that their sites are included in the collection systems established by tire producers or PROs. It is thought that since the majority of producers will consult with PROs to establish their collection systems, municipalities should register with a PRO. According to the RRCEA, municipalities that operate collection sites must, at minimum, accept up to 10 passenger and light tires per day from any person and tires with rims. The acceptance of greater than 10 tires per person is subject to the collector's discretion. Used tires from the Site can be used by producers to meet their collection targets, provided they are picked up by a registered hauler. As per Section 68(3) of the RRCEA, any person operating a used tire collection system can not charge for tire collection, including on-rim tires.

The Town continues to collect, and stockpile, used tires at the Amabel Landfill Site. As a tire collector, the Town accepts used tires free of charge from its residents for which the Town will receive a resource recovery stipend from the producer (or PRO). Based on information provided by the Town, an estimated 1,450 tire units are

stockpiled at the Site on an annual basis. This is equivalent to the acceptance of an estimated 16.1 tonnes annually. As shown in **Table 6-2**, used tires represent approximately 0.29% of the residential waste generated, accounting for 0.8% of the total waste diverted and an estimated 0.75% of the residential waste diversion.

6.3.5 Municipal Hazardous or Special Waste (MHSW)

The MHSW program for the Town is operated by Bruce County through the Orange Drop Program. In the Town of South Bruce Peninsula, the County typically provides three collection events per year. Under the Orange Drop program residents can drop-off the following hazardous materials free of charge.

- Paints and coatings, plus their containers
- Cleaning agents: ammonia-based, drain, oven, toilet, tub and tile, and aluminum
- Solvents, such as thinners for paint, lacquer and contact cement, paint strippers and degreasers, nail polish, and their containers
- Transmission fluid, oil filters and brake fluid
- Fuel, motor oil, gasoline and/or oil containers of 30 litres or less
- Single-use batteries and fire extinguishers
- Mercury thermometers
- Fluorescent tubes and bulbs
- Pharmaceuticals
- Furniture polish
- Antifreeze and its containers
- Pressurized containers, such as aerosol containers, propane tanks and cylinders, oxygen and helium tanks
- Lawn fertilizers that contain pesticides
- Pesticides and insect sprays and their containers

Based on the summary of MHSW materials reportedly received by the County, the amount of MHSW collected through the Town's Orange Drop program is estimated to be 16.8 tonnes annually. This is equivalent to an estimated 0.38% of the residential waste received and approximately 1% of the residential waste diverted. Although the proportion of waste diverted through the MHSW is low compared to other diversion streams, diversion and proper disposal of MHSW is critical for environmental security.

6.3.6 Waste Electrical & Electronic Equipment (WEEE)

The Town is currently registered as a collector for WEEE under the Ontario Electronic Stewardship (OES). As part of the Waste-Free-Ontario legislation, the OES will continue operations until December 31, 2020 at which time regulations under the RRCEA will make producers fully responsible. Under the new legislation, batteries will be considered classified as WEEE, therefore will no longer be included in the Municipal Hazardous and Special Waste program.

Currently, the material is recycled through the OES program and the Town is paid an incentive by the OES based on the amount of electronic material collected. In addition to the various OES Service providers and retailers that facilitate WEEE collection in the area, electronic waste can be dropped off at the Amabel Landfill site free of charge. Provided below is the list of electronic items that are accepted by the Town and other WEEE stewards under the WEEE program.

- Display Devices: Monitors, Televisions, All-in-one Computers
- Desktop and Portable Computers
- Computer Peripherals (i.e. Mouses, Keyboards and Modems)
- Printing, Copying and Multifunctional Devices: printers and photocopiers
- Telephone and Telephone Answering Machines

- Cellular Devices and Pagers
- Home Theatre Equipment: Equalizers, Amplifiers, Speakers and Turntables
- Aftermarket Vehicle Audio and Video Devices
- Image, Audio and Video Devices (Personal/Portable and Home/Non-Portable)
- Power Cords and Wires
- Radios and Cameras

The pick-up of WEEE materials typically occurs once annually, at minimum. Based on the records provided, 26.6 tonnes of WEEE is diverted from the Town's waste stream annually. As presented in **Table 6-2**, this equates to an estimated 0.47% of residential waste generated and approximately 1.23% of the residential waste diversion. Similar to MHSW, although the proportion of waste diverted through the OES is low compared to other diversion streams, diversion of WEEE is critical for environmental security.

6.3.7 Automotive Batteries

Batteries are currently accepted at the Town's landfill site in an on-site shed. Batteries are to be stored in a single layer under a roof in order to prevent precipitation from coming into contact with the batteries and in a manner that provides secondary containment in the event of leakage. According to site records, limited waste diversion via the acceptance of this waste stream is achieved. However, currently automotive batteries are also diverted from the residual waste stream under the Orange Drop Program. Under the new legislation, batteries will be classified as WEEE waste rather than MHSW.

6.3.8 Mattresses

Where municipalities operate their own landfills, the recycling of mattresses may be particularly advantageous from an operational standpoint and for the site life of a landfill. The physical properties of mattresses do not allow them to compact well and the metal framing and springs can get caught-up in compaction equipment, potentially creating extra repair and maintenance expenses. Currently, a number of mattress recycling facilities are located in the Greater Toronto Area. Mattresses are either recycled by being stripped down to their base materials, of which up to 95% of the materials can be recycled or reused (depending on market availability), or the mattresses are broken down, with the metal components being recycled and the material components shredded then subsequently landfilled in a more compact manner.

The Town has initiated a mattress recycling program to divert this bulky material from the landfill. Mattresses are stored in a dry storage area, typically a truck trailer to facilitate the subsequent transportation. While there is still a cost to drop-off of mattresses at the landfill, the tipping fee applied by the Town is intended to offset the costs associated with transporting the mattresses to the recycling facility. Based on the records provided, an estimated 900 mattresses and box-springs are diverted from the landfill annually, this is equivalent to an average of 15.4 tonnes per year. As presented in **Table 6-2**, this equates to an estimated 0.35% of residential waste generated and 0.91% of the residential waste diversion.

6.3.9 Plastic Bale Wrap

In the past, plastic bale wrap has been accepted by the Town free of charge, then collected on an as needed basis for recycling/reuse. In recent years, many landfill sites have had difficulty retaining a consistent and reliable contractor to remove the bale wrap from the Site for the purpose of recycling/reuse, however, provided the agricultural land use in the area, the diversion of bale wrap from the residual waste stream should continue to be encouraged.

The diversion of this material is important for conserving landfill capacity as the bale wrap has a relatively low density and does not compact well. Although the Town has discontinued the acceptance of bale wrap at this time, it is recommended that the Town provided a direct link on their website to an alternative means of diversion, as available.

6.4 Organics

Currently, the Town does not provide a scheduled curbside collection service for source separated organic materials, however a residential curbside pick-up service for leaf and yard waste is provided by the Town once annually in the Fall. As a general rule '*the management of compostable materials as close to the source as possible is usually the best approach from an economic and environmental perspective'*. As a result, a home composting program for wet organics using a backyard composter or a digester is typically promoted by municipalities.

It is noted that Town efforts to establish a home composting program have been hindered by the prevalent fear of attracting bears. Consequently, previous home composting initiatives have had minimal success and the Town does not currently have a such a program. To address this concern, many Municipalities are now promoting the use of Green Cone Digesters in addition to the traditional backyard composter. Green Cone digesters are designed to efficiently breakdown kitchen waste without interference from animals and would, therefore, provide an alternative for those that are concerned about attracting bears. This alternative is discussed further in **Section 9.4.1** of this Report.

6.4.1 Off-Property Organics

Separate areas for organic waste diversion are provided at the Amabel Landfill. Leaf and yard waste is also accepted at the Wiarton Works Yard. Although the Amabel Landfill does not have a prescribed composting area, it is estimated that the Town accepts approximately 450 tonnes per year of leaf and yard waste and brush, of which approximately 70% is leaf and yard waste. In addition, an estimated 405 tonnes of stumps and 'grindable wood' are also diverted. It is our understanding that the Town uses the leaf and yard waste and woodchips as daily cover, as practicable. The use of organic waste as daily cover helps to decrease the residual waste volumes, thereby extending the life of the landfill. Although the Approval for the landfill currently allows for burning of clean wood and brush at the site, the Town does not burn these materials.

Assuming that an estimated 6% of waste generated by the IC&I can be attributed to off-property organics contributions, it is estimated that 16.4% of the residential waste generated is accounted for via the diversion of clean wood, brush, stumps, and leaf and yard waste (limited to off-property). Therefore, off-property organics represent approximately 16.4% of the residential waste generated, accounting for an estimated 43% of the total residential waste diversion.

6.4.2 On-Property Organics

According to Ontario Regulation 101/94, all municipalities with populations of greater than 5,000 persons must establish, operate and maintain 'a leaf and yard waste system'. More specifically, this system should include encouraging home composting and the provision of home composters to residents at cost, or less. It is reported that, due to the purported fear of attracting bears, the promotion and implementation of a successful backyard composting initiative remains challenging for the Town.

RPRA waste diversion estimates provide for an allowance for the diversion of 'on-property' organics. This factors in the cumulative number of backyard composters supplied by the Municipality, or association thereof, and includes an allowance for grass-cycling and evapotranspiration resulting from use of aerated carts for organics

programs. However, residents are currently required to purchase composters at their local hardware store, therefore it is assumed that the diversion estimate provided for on-property organics is underestimated by RPRA. Based on a review of a Statistics Canada article, a separate analysis with reference to the RPRA per unit diversion rate, is provided below. It is noted that RPRA's standard practice to account for the effects of backyard composting is to assume a diversion rate of 100 kg/composter/year (or 100 kg/household/year).

According to Statistics Canada, based on the 2011 census data *'The type of dwelling a household occupied was directly related to the rate of composting. Over 50% of households in detached or single dwellings reported composting their kitchen waste, compared to 22% of households living in apartments'.* (Reference: *Statistics Canada, Article - Composting by Households in Canada* (July 2013)). Provided that the majority of the households in the Town of South Bruce Peninsula (i.e. approximately 90% of the 3,741 permanent households) are considered to be detached or single dwelling households, the on-property diversion rate for residential organics within the Town is estimated to be approximately 175 tonnes per year. This is accounted for in the diversion rates calculated for the Town, provided in **Table 6-2**.

Based on the on-property diversion estimates, on-property organics diverted from the residual waste stream accounts for approximately 4% of residential waste generated and 10.3% of waste diverted from the Town's landfill.

6.5 Waste Reuse

There is currently not a Town directed reuse program available for residents. It is noted that the majority of the Municipalities, or associations thereof, were reported to have 0% diversion for reuse. However, it is recognized that some residents actively reuse materials through kijiji, yard sales, and thrift shops. Consequently, diversion through such avenues is difficult to assess and is not tracked by RPRA. The limited volumes associated with such efforts are not considered to affect the findings of this assessment.

6.6 Summary of Diversion

Figure 6-3 and Figure 6-4 show a breakdown of the solid waste diversion achieved by the Town, by type of material, based on the total waste received (i.e. including IC&I waste) and the estimated residential waste received, respectively, over the 5-year period between 2014 and 2018. The average diversion rate for all waste accepted by the Town is 30.7%. Collectively, when IC&I waste, estimated to account for 40% of the residual waste received at the Site plus an additional 15% attributable to waste diversion, is not included in the waste generation totals, the overall residential diversion is estimated to be approximately 38.3% with greater than an estimated 60% of the total residential waste being landfilled.

FIGURE 6-3: Average Composition of Total Waste Generated (2014 to 2018)

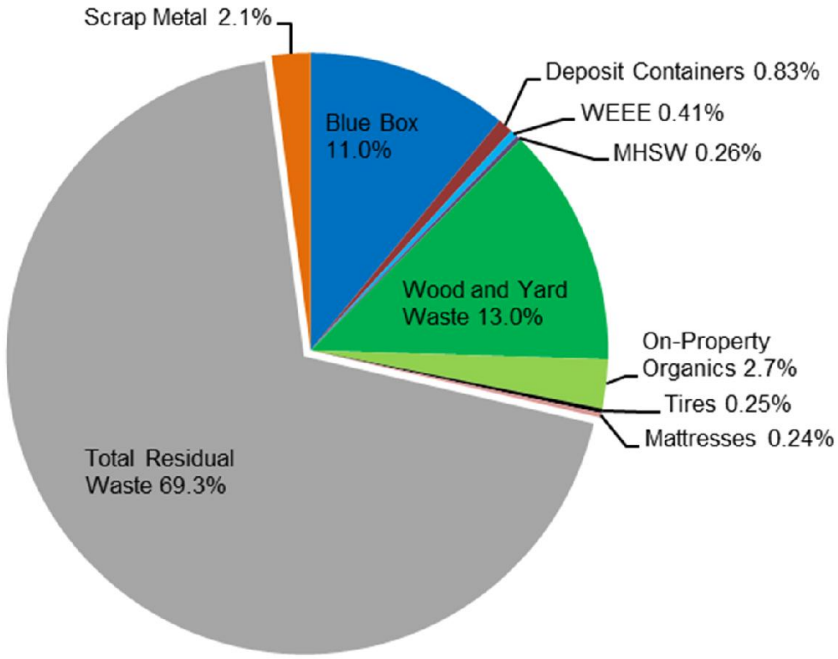
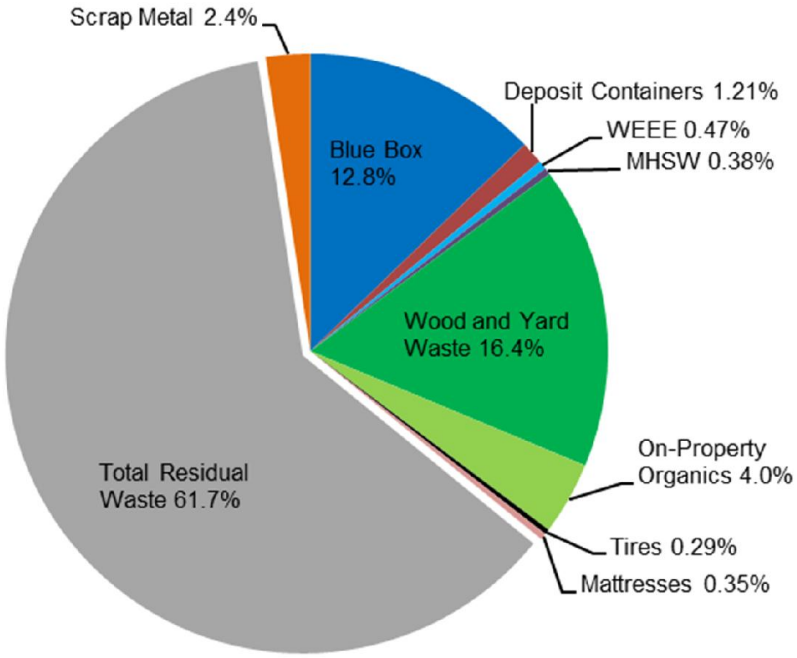
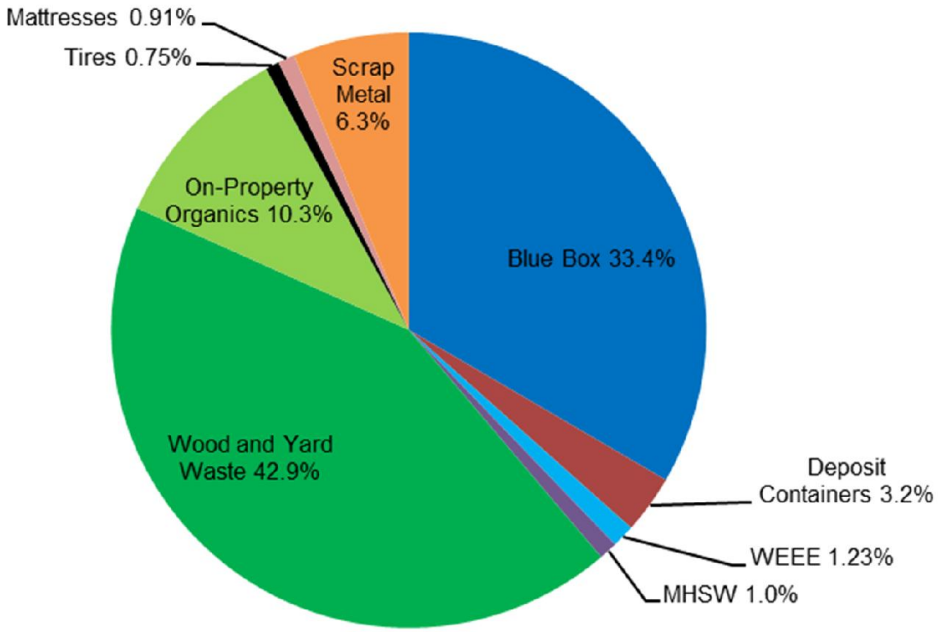


FIGURE 6-4: Average Composition of Total Residential Waste Generated (2014 to 2018)



As illustrated in **Figure 6-5**, organics is the most significant residential diversion program in terms of mass diversion at approximately 53% of the materials diverted (i.e. on- and off-property organics combined). In addition to on-property organics, this includes clean wood, brush, stumps, grindable wood, leaf and yard waste. Blue box materials are estimated to be the second most significant diversion stream at approximately one-third of the materials diverted, followed by scrap metal.

FIGURE 6-5: Average Composition of the Residential Diversion Materials (2014 to 2018)

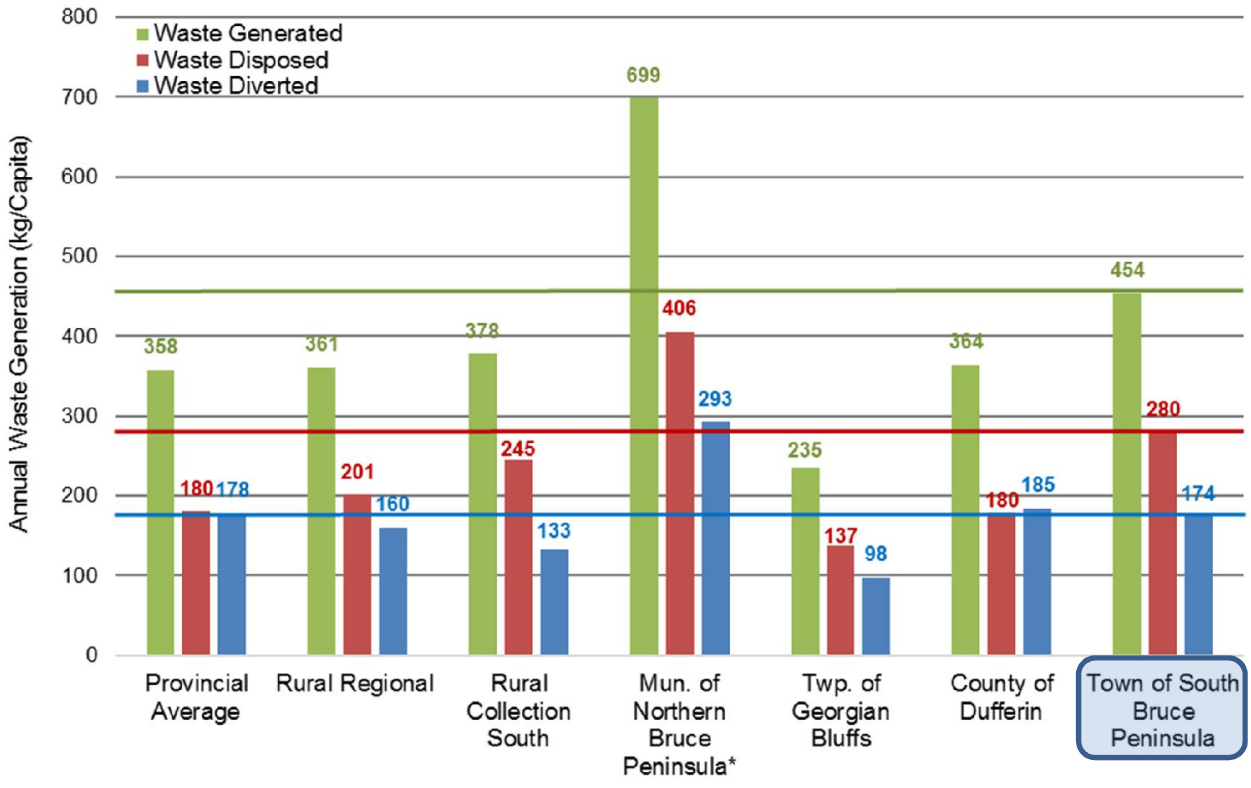


7. COMPARATIVE ANALYSIS: EFFICACY OF EXISTING WASTE PROGRAMS

7.1 Residential Waste Generated and Disposed

A key factor in reducing residual waste is by reduction in generation. Reduction is the first step of the 3 R's (i.e. reduce, re-use, recycle). A good general indicator of a Municipality's performance is the amount of waste that is disposed per capita and the estimated amount that is diverted (i.e., through recycling, MHSW, WEEE, organics, etc.). Illustrated in **Figure 7-1** below is a comparison of the Town's waste generated, residual waste disposed, and waste diverted on a per capita basis (based on the data presented in Section 6 of this Report), to that of several Municipalities in the same *Rural Regional* Grouping, as well as the averages of the *Rural Regional* and *Rural Collection South* groupings, Dufferin County (which has implemented a comparatively broad range of waste diversion initiatives and programs) and the Provincial Average. The comparative data is based on the RPRA Datacall reported for 2017.

FIGURE 7-1: Residential Waste Disposal Comparison



Notes:
1. Town of South Bruce Peninsula residential waste generation and diversion quantities are based on the 2014 through 2018 average.
2. * Waste quantities reported by the Municipaity of Northern Bruce Peninsula likely include contributions from the IC&I Sector. Similar to the Town, the waste quantities are significantly affected by the IC&I Sector, namely tourism. Therefore, the per capita waste generation rates are considered to be highly overestimated.

As shown in **Figure 7-1**, the Town generated an average of an estimated 454 kg/cap of residential waste, of which an estimated 280 kg/capita was considered residual waste (2014 through 2018). The estimated residential waste generation and disposal rates for the Town are higher than both the provincial average and that reported for the Town's Grouping *(i.e. Rural Regional)*. The estimated waste diversion rate of 174 kg/capita for the Town is considered similar to that being achieved provincially, however overall the residential diversion rate of approximately 38.3% remains well below the diversion rate for the Province, which is approaching 50%. A more detailed assessment of the relative success of the various waste diversion programs is provided in **Section 7.3**.

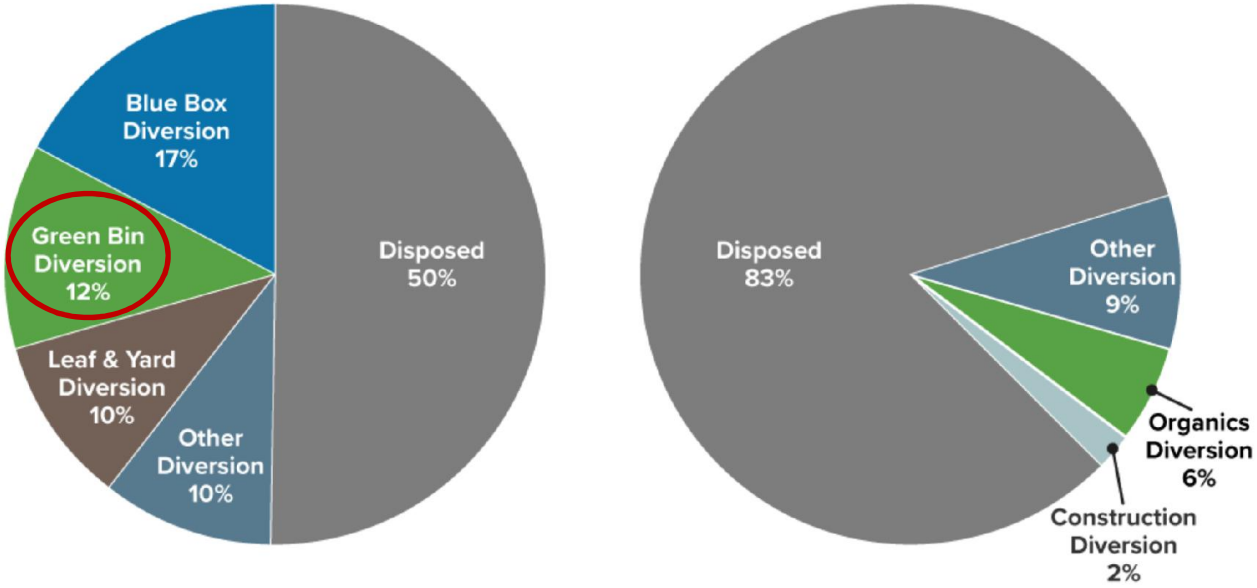
The waste generation rate of 454 kg/capita estimated for the Town does not include the estimated 2,140 tonnes of waste generated by the IC&I sector, of which a large proportion is attributed to the tourism industry. As would be expected, it is evident that the tourism industry is having, and will continue to have, a direct effect on the overall waste generation rate for the Town of South Bruce Peninsula, putting additional strain on its Waste Management systems. The potential effect of tourism is exhibited by the waste generation rates presented for the Municipality of Northern Bruce Peninsula **(Figure 7-1)**, which are interpreted (by GMBP) to realistically reflect the total quantity of waste received, including contributions from the IC&I sector, primarily tourism.

7.2 Provincial Comparison

As shown in **Figure 7-1**, the diversion rate for residential waste being achieved by the Town remains below the Provincial average. In addition, based on the information available, Dufferin County reportedly achieves a residential waste diversion rate of approximately 60%, which is amongst the highest in the Province.

As outlined in the MECP *'Made in Ontario Environment Plan: Reducing Litter and Waste in Our Communities: Discussion Paper'* (April 2019), Ontario generates nearly a tonne of waste per person each year and the overall diversion rate has stalled at about 30% over the past 15 years. Of the 11.6 million tonnes of Ontario's total waste stream, 4.7 tonnes (or 40%) comes from the residential sector and 6.9 million tonnes (or 60%) comes from the IC&I sector. As shown in **Figure 7-2**, it is estimated that the residential sector diverts nearly 50%, while the IC&I sector diverts only 17%.

FIGURE 7-2: Ontario's Residential and IC&I Waste Management
[Source: Reducing Litter and Waste in Our Communities: Discussion Paper (MECP ERO# 013-4689: April 2019)]



Although the waste diversion targets set by the Province have resulted in an overall increase in the diversion of household waste, currently in the range of 50% for the province, the diversion rate for the IC&I sector remains much lower. Under the recently passed Waste-Free Ontario Act, it is anticipated that waste diversion will be further increased by placing additional responsibility on the producers (i.e. the IC&I sector, manufacturing etc.). As previously discussed, the province intends to continue to mark its progress towards the interim targets of 30% diversion by 2020, which provincially has already been achieved, 50% by 2030 and 80% diversion by 2050.

In consideration of the Town's tourism industry, which is estimated to account for approximately 20% of the waste processed by the Town annually (i.e. approximately 63% of the IC&I waste), improved waste diversion rates for the IC&I sector, namely within the tourism industry, would provide a significant opportunity for achieving the targets set out in the Waste-Free Ontario Act.

In addition, comparison of the waste diversion materials for the Province to that of the Town of South Bruce Peninsula suggests that the Green Bin program, which essentially prevents food waste from entering the residual waste stream, would provide another significant opportunity to the Town for achieving the targets set out in the Waste-Free Ontario Act. Review of the *'Long-Term Waste Management Strategy: Executive Summary for Dufferin County' (March 2018)* suggests that Green Bin Organics make up an estimated 25% of the waste diverted from disposal, while an equivalent volume continues to remain within their residual waste stream. Based on this report, Dufferin County suggests that the Green Bin program continues to provide the greatest opportunity for increased waste diversion for their jurisdiction.

7.3 Residential Waste Diversion

To complete an evaluation of the Town's performance, the diversion rates of the Town are compared to other Municipalities and the Provincial average. Provided in **Table 7-1** is a comparison of the Town's average diversion rates (i.e. 2014-2018), based on the quantities provided in the previous Section of this report, to the 2017 diversion data published by RPRA. In order to effectively compare each diversion category, the percentages provided by RPRA, which reflect the proportion of total waste diverted through each specified waste diversion stream, were used to calculate (or estimate) the per capita weight diverted in kilograms.

As shown in **Table 7-1**, variations in the overall diversion of organics has a significant effect of on the waste diversion rate reported for each jurisdiction. Consequently, diversion rates excluding organics are presented in order to more accurately compare the Town's performance relative to other Municipalities. It is noted that the per capita diversion rate, of an estimated 81 kilograms per capita, excluding organics diversion, is generally lower than that reported for other similar municipalities, and the representative municipal association for the Town (i.e. BASWR). Further, for direct comparison purposes; when the *'other recyclables'* reported for the Town are not considered (as is the case with the groupings presented), a per capita diversion rate of 65 kilograms is estimated. This is significantly lower than the comparable per capita diversion rates for the diversion materials considered.

TABLE 7-1: Municipal Diversion Performance Comparison (RPRA, 2017)

Municipality, Municipal Association or Municipal Grouping	Total Residential Waste Diverted (kg/capita)	On-Property Organics	Organics (i.e. leaf and yard waste, SSO, etc.)	Total Residential Waste Diverted (kg/capita) minus organics	Deposit Return Program	Blue Box Recyclables	MHSW	Reuse	Recyclables (Other)	Residential Diversion Rate (excluding organics)
Provincial Average	178	8.4% (15.0kg)	39.5% (70.1kg)	93	3.1% (5.6kg)	47.8% (85.0kg)	0.7% (1.2kg)	0.5% (0.9kg)	0.0% (0.0kg)	34.0%
Bluewater Recycling Association (BRA)	111	11.3% (12.5kg)	2.5% (2.83kg)	96	4.9% (5.4kg)	81.3% (90.5kg)	0.0% (0.0kg)	0.0% (0.0kg)	0.0% (0.0kg)	34.2%
Bruce Area Solid Waste Recycling (BASWR)	113	0.9% (1.1kg)	9.1% (10.2kg)	101	4.7% (5.3kg)	83.5% (94.0kg)	1.8% (2.1kg)	0.0% (0.0kg)	0.0% (0.0kg)	23.8%
Municipality of Northern Bruce Peninsula	293	24.4% (71.4kg)	30.7% (89.8kg)	132	1.4% (4.1kg)	41.0% (120.0kg)	1.0% (3.0kg)	1.5% (4.4kg)	0.0% (0.0kg)	24.5%
Township of Georgian Bluffs	98	31.0% (30.5kg)	1.3% (1.3kg)	67	5.6% (5.5kg)	62.1% (61.1kg)	0.0% (0.0kg)	0.0% (0.0kg)	0.0% (0.0kg)	32.7%
Dufferin County	185	8.6% (15.8kg)	36.1% (66.6kg)	102	3.0% (5.5kg)	51.7% (95.3kg)	0.7% (1.3kg)	0.0% (0.0kg)	0.0% (0.0kg)	36.2%
Town of South Bruce Peninsula	**174**	10.3% (18.0kg)	42.9% (74.5kg)	**81**	3.2% (5.5kg)	33.4% (58.0kg)	1.0% (1.7kg)	0.0% (0.0kg)	9.2% (16.0kg)	22.5%

Increasing this to 80kg/capita, which is in the range of the Provincial average, could increase the Town's residential waste diversion rate by ±5%.

Notes:

(1) Organics are divided into two components: (i) on-property are considered to be the backyard composters and grass-cycling, and (ii) organics collected through curbside collection and/or depots, including leaf and yard waste, brush, clean wood, Christmas trees and source separated organics (SSO, commonly referred to as green bin collection).
(2) (2.2kg) represents kg per capita.
(3) Per capita estimates for the Municipality of Northern Bruce Peninsula are considered high due to the interpreted incorporation of IC&I sector contributions into the totals provided to the RPRA.

7.3.1 Blue Box Diversion

BASWR is the not-for-profit organization (i.e. municipal partnership) responsible for providing integrated blue box collection and processing services in the municipalities it services, including the Town of South Bruce Peninsula. BASWR is reportedly achieving an estimated 94 kg/capita of blue box diversion for the Municipalities it services. This is greater than the Provincial average of 85 kg/capita. Although it is recognized that a small proportion of the estimated per capita amount of blue box materials diverted could potentially be attributed the IC&I sector, the significant difference of greater than 25 kg/capita when compared to the Town's diversion rate suggests that the Town's blue box program could be more effectively managed.

Based on the comparisons provided in **Table 7-1**, it is estimated that a successful blue box program diverts in the range of 80 to 100 kilograms per capita. The 58 kg/capita estimated for the Town of South Bruce Peninsula suggests that increased blue box diversion could likely be achieved. Assuming that the increased diversion would remove blue box materials from the residual waste stream, a target of 80 kg/capita could result in a ±5% increase in the Town's residential diversion rate, or an increase from 38.3% to ±43%. Blue box diversion

strategies that could be implemented by the Town to improve the diversion of blue box recyclables from the residual waste stream are discussed in **Section 9.2** of this Report. However, it is noted that more effective management of blue box materials would require additional collaboration an/or cooperation between the Town and BASWR and could include consideration for an increased level of service during the peak tourist season, the provision for large collection bins, etc.

7.3.2 Organics

It is noted that in rural areas where agricultural activities are considered to be an important land use, the diversion rate of organics from the landfill, on a per capita basis, is typically lower because these organics can remain close to their source (i.e. on-property). Furthermore, the provincial organic diversion rates are generally expected to be higher due to the curbside organics collection programs, including source separated organics (SSO) and more extensive leaf and yard waste curbside pick-up programs, that are in place in densely populated areas where curbside organics collection is more feasible. However, although the Town of South Bruce Peninsula is considered to be rural/agricultural, the segregated organic waste disposal area at the landfill appears to contribute significantly to the Town's waste diversion efforts, with per capita diversion rates estimated to be ±93 kg/capita, which is similar to the Provincial average. It is noted that once composted, organics may be used for landfill operations, such as landfill cover.

Organics waste diversion programs offered by municipalities may include depots for wood, brush and leaf and yard waste, similar to that currently provided by the Town, and an organics curb-side pick-up service, Christmas tree programs, and/or Green Bins. Factors that have been identified to contribute to a successful and effective organics diversion program include, but are not limited to, the following:

i. Subsidized Composters: Backyard composter subsidy programs are used to promote the use of home composters and/or food waste digesters (i.e. the Green Cone), ultimately encouraging on-property organics diversion.

ii. Accessibility (Number of Depots): An increased number of organics depots within a Municipality, minimizes the time and effort required by the residents, thereby promoting the use of this program.

iii. Accepted Materials: Organics are divided into several different streams including (a) leaf and yard waste; (b) brush; (c) clean wood; and (d) Green Bin. As would be expected, the number of organic waste streams accepted generally directly affects the efficacy of the organics waste diversion program.

iv. Pick-up Services: Curb-side pick-up is typically offered in more densely populated areas. However, in some Municipalities where, similar to the Town, there is a mixture of more urban areas interspersed within a rural community, the pick-up of leaf and yard waste may be offered to those in the more densely populated communities.

v. Tipping Fees: In areas where tipping fees apply to all or part of the organics waste stream, the reported diversion rate is typically reduced.

vi. Christmas Tree Programs: The curb-side pick-up of organics is typically provided on a seasonal basis (April to November), and some depot locations are only open in the Spring through to the Fall. While some Municipalities have opted to provide a specific Christmas Tree pick-up date(s), others have opted to open their organics depot locations in late December and early January to encourage Christmas tree diversion.

8. RESIDUAL SOLID WASTE DISPOSAL

8.1 Municipal Disposal Sites: Capacity and Site Life

Following the amalgamation of the Townships of Amabel and Albemarle, the Town of Wiarton and the Village of Hepworth, the Albemarle Landfill was temporarily closed (or 'mothballed') and the Town's waste management and landfill operations were moved to the Amabel Landfill site.

8.1.1 Amabel Landfill Site

The Amabel Landfill Site is located at 1249 Sauble Falls Parkway, between the communities of Oliphant and Sauble Beach, approximately 9.5 kilometers southwest of Wiarton. The Site is situated within Part of Lots 43 and 44, Concession C in the former Township of Amabel, where shown on **Figure 1-1**.

Operations at the site are governed by Environmental Compliance Approval No. A271701 which was issued on February 23, 1983, and amended on September 28, 1992, August 10, 1993, January 10, 1997, and October 25, 1999. A copy of the ECA is provided in **Appendix A**. The ECA recognizes the use and operation of an 8.1 hectare landfilling area within a total site area of 62.78 hectares. A Site Plan of the Amabel Landfill Site is provided as **Figure 8-1**. Conditions 37 and 38 further specify the landfill design constraints including a bottom elevation of 100 meters, a final contour height of 112.25 m for waste and interim cover (113 m including final cover), and a volumetric capacity of 578,000 m^3 for waste, interim and final cover.

Based on the information available (i.e. the Annual Reports prepared by WSP Canada Inc. (WSP)), the approved landfill area is designed to receive 517,250 m^3 of waste and interim cover. Based on the annual fill rates estimated by WSP, as of the end of 2018, a total capacity of 391,600 m^3 had been consumed, and a capacity of 125,650 m^3 remained for waste and interim cover. Based on the average fill rate of ±9,750 m^3/year experienced over the past 5-years at the Amabel Landfill Site, it is estimated that the Landfill has sufficient capacity to service the Town for an additional ±12 years (i.e. circa 2031).

8.1.2 Albemarle Landfill Site

The Albemarle Landfill Site is located approximately 10 kilometers north of the geographic Town of Wiarton within Part of Lots 19 and 20, Concession 8 EBR in the former Township of Albemarle. More specifically 869 County Road 9, where shown on **Figure 1-1**.

Operations at the Site are governed by Environmental Compliance Approval No. A271602 which was issued on March 18, 1981 and approved the use of a 10.1-hectare dump site. The Approval was amended on August 30, 2000, granting the use and operation of a 1.6 hectare landfilling area within the total site area of 102 hectares and was further amended on January 20, 2003 to reflect the interim site closure. Interim closure of the Site was completed in September 2003, as required by Condition 35 of the ECA. A copy of the ECA for the Albemarle Landfill Site is provided in **Appendix B**.

Conditions 27 and 28 of the ECA, as amended, specify the landfill design constraints based on Map 2 provided in the Plan of Development and Operation (Stantec, 1998), including a bottom elevation of 94.5 meters, a final contour height of 102 m (not including final cover), and a volumetric capacity of 60,000 m^3 for waste and interim cover within the 1.6 ha landfill area. Additional capacity may be available in the remaining 8.5-hectare approved area. Clarification with respect to the steps required under the existing ECA to allow future development within the 8.5-hectare area originally recognized in earlier approvals is being sought; pre-consultation with the MECP has been initiated. A Site Plan of the Albemarle Landfill Site is provided in **Figure 8-2**.

The approval, as amended, requires that a revised Design and Operations Plan be submitted to the Director (MECP) one year prior to the re-opening of the site. Site life estimates for the Albemarle Landfill were provided

in the Waste Management Plan (2011) prepared by Pryde Schropp McComb. Based on the information available, the landfill had a remaining approved capacity of 22,000 m^3 upon interim site closure. Based on the average fill rate of 9,750 m^3 recently experienced at the Amabel Landfill, it is estimated that the Albemarle landfill would provide sufficient capacity to service the Town for approximately 2-years.

8.1.3 Potential for Additional Capacity at Existing Landfill Sites

Based on the Conditions outlined within the Approvals, should the Town desire additional capacity at one of its existing waste disposal sites, it is understood that the approval process would be as follows:

Amabel Landfill Site:

Additional development at Amabel Landfill Site would be considered an 'expansion' to the Site. The need for an Environmental Assessment Act (EAA) approval would depend on the desired volume (i.e. landfill capacity) being requested. Landfill expansions requiring less than an additional 40,000 m^3 of capacity are not governed under the EAA. Expansions greater than 40,000 m^3 would require the EAA process to meet the requirements of Ontario Regulation 232/98 for New or Expanding Landfill Sites. These options are discussed in greater detail in **Section 10** of this Waste Management Plan.

Albemarle Landfill Site:

Ministry requirements and process associated with additional development at the Albemarle Landfill Site remain unclear. Pre-consultation with the MECP seeking clarification of the required approach for future landfilling within the remaining approved area at the Albemarle Landfill Site has been initiated via correspondence dated June 12, 2019. A copy of this correspondence is provided in **Appendix C**. However, the process would be one of the following:

If additional development is considered an 'expansion' to the Site, similar to the Amabel Landfill requirements outlined above, an expansion of greater than 40,000 m^3 would require the that the requirements of the EAA process be met.

OR

If the Ministry recognizes the landfill area previously considered in the original approval, additional development would not be considered to be part of a new nor expanding landfill and may not be subject to the EAA process. Under this scenario it is thought that the development of the Albemarle Landfill beyond the currently approved limit of fill (i.e. 1.6-ha landfill area), and within the remaining previously approved 8.5-hectare area, may only require an amendment to the ECA. The application to amend the ECA would require supporting information including an updated hydrogeological report to assess the suitability of the area to support landfill development from a hydrogeological perspective and, pending the findings of the hydrogeological assessment, a revised design and operations plan; all of which would be subject to MECP review and approval.

219015-2

Amabel Waste Disposal Site
Town of South Bruce Peninsula

LEGEND

30 0 20 40 80
1:2000 (m)

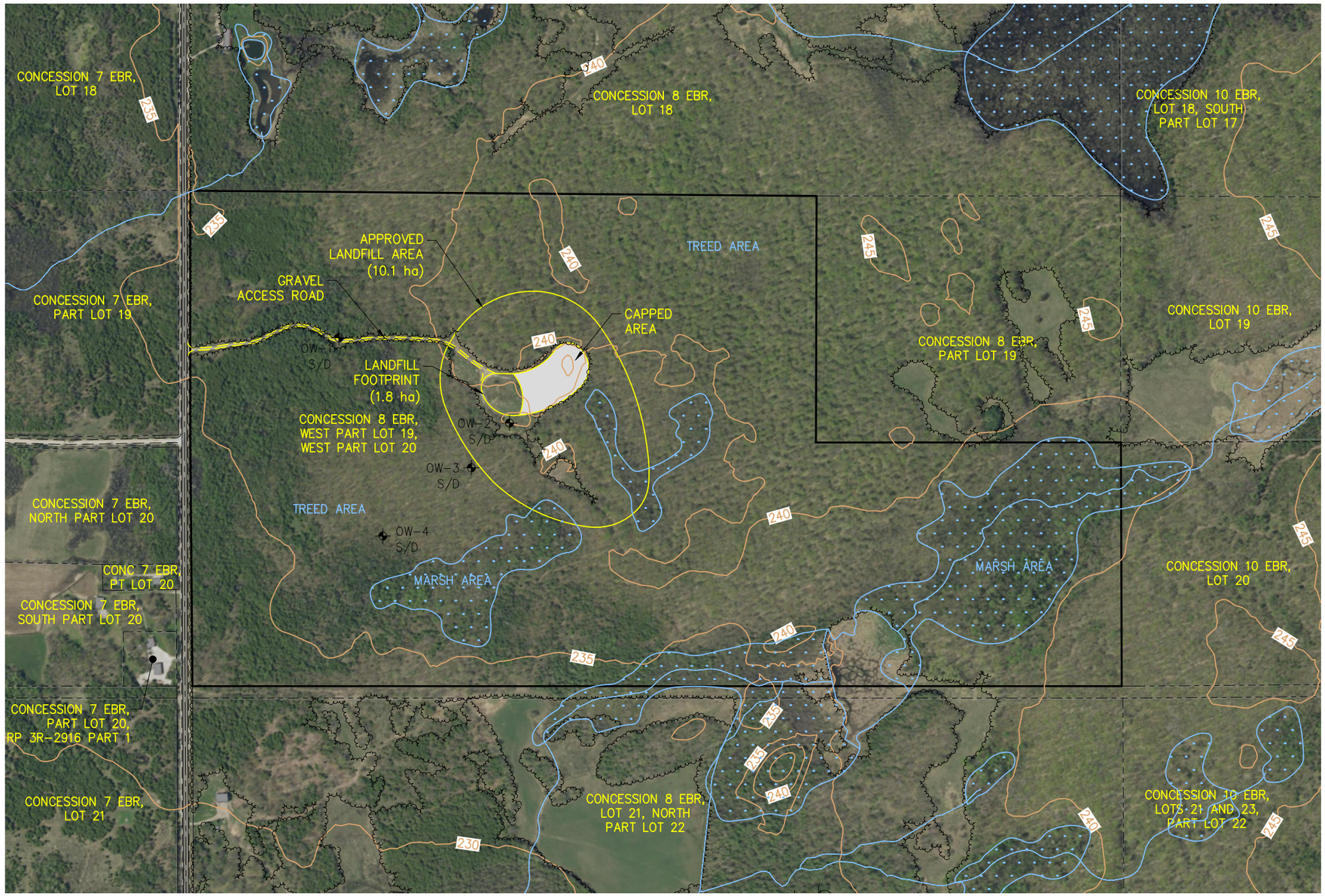
SCALE 1:2,000
NOVEMBER 2019

SITE PLAN

Amabel Waste Disposal Site
1249 Sauble Falls Parkway
Town of South Bruce Peninsula

Figure No. 8-1

BluePlan ENGINEERING



219015-2
Albemarle Waste Disposal Site
Town of South Bruce Peninsula

LEGEND

NOTE:
INFORMATION DERIVED FROM DRAWINGS PROVIDED BY WSP, DATED MAY 2018 AND BRUCE COUNTY MAPPING.

SCALE = 1:7,500
NOVEMBER 2019

SITE PLAN

Albemarle Waste Disposal Site
869 Bruce Road 9
Town of South Bruce Peninsula

Figure No. 8-2

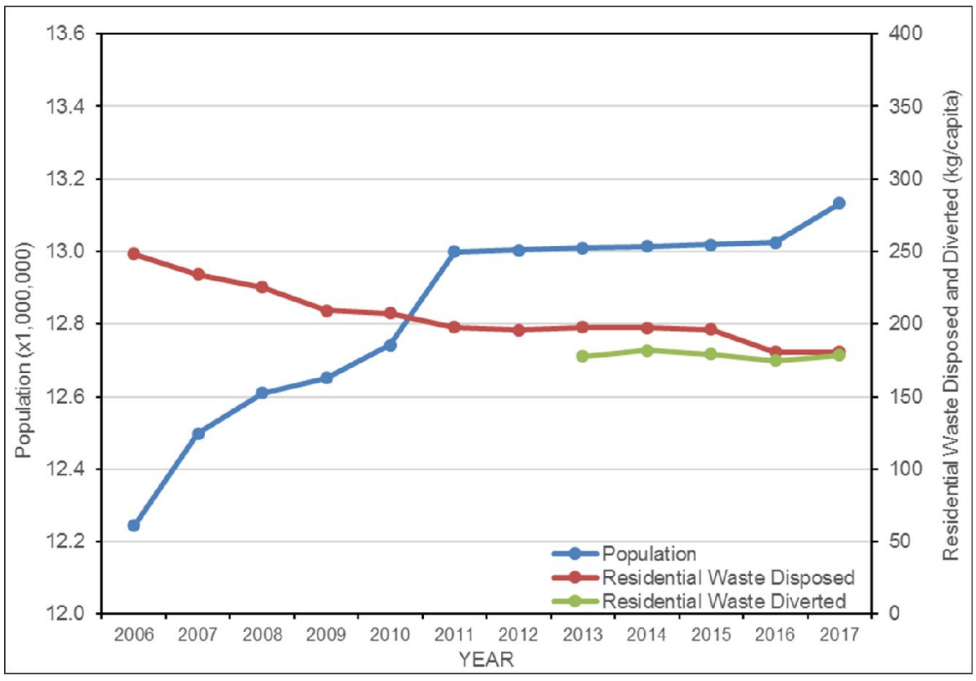
BluePlan ENGINEERING

8.2 Projected Waste Generation

Future generation of waste is difficult to predict with precision due to the uncertainty of many variables that can alter waste generation within a municipality including, but not limited to, the introduction of new regulations (i.e. the recent Waste-Free Ontario Act), consumer habits, population changes, IC&I contributions, and market fluctuations. Presented on the following **Figure 8-3** are the population and the residential waste disposal and diversion trends for the province. It should be noted that this disposal data presented is intended to account for residential waste and not to account for IC&I waste. Further, during non-census years, the reported population is extrapolated. Based on the population data reported for the 2011 and 2016 census years, the population of Ontario remained relatively stable. Therefore, the populations reported by RPRA Datacall between 2012 and 2015 were adjusted to reflect the 2016 census population.

Based on the available population and residential residual waste disposal and diversion data collected by the RPRA for the province from 2006 through 2017, while the population has been increasing to more recently stable, the amount of residential waste disposed, which initially decreased by approximately 15% between 2006 and 2011, currently remains relatively stable, suggesting that provincially the waste diversion efforts have stagnated in recent years. The initial decrease in residential waste disposal rates is likely due to the widespread implementation of the various waste diversion programs during that timeframe. Given the more recent stable trend illustrated in **Figure 8-3**, it is reasonable to believe that future waste generation rates on a per capita basis for the residential sector within the Town would at minimum remain the same or, with further implementation of the Waste-Free-Ontario Act, decrease over the next 25-year planning period.

FIGURE 8-3: Provincial Residential Waste Disposed vs. Population



Conversely, IC&I residual waste generation is more difficult to predict and is highly dependent on economic circumstances. As previously discussed, the IC&I sector currently contributes approximately 60% of Ontario's total waste stream, and only diverts an estimated 17% of the waste generated [MECP Discussion Paper: *Reducing Litter and Waste in Our Communities:* April 2019]. However, based on the Town's community profile, it is estimated that the IC&I contributions to the Town's landfill are considerably lower. As discussed in **Section 4.4**, for the purposes of this Report the proportion of residual waste generated in the Town from the IC&I Sector is estimated to be in the range of 40%. Therefore, potential improvements related to the IC&I residual waste

generation and diversion could have a significant influence on the residual waste generation rates both provincially and locally.

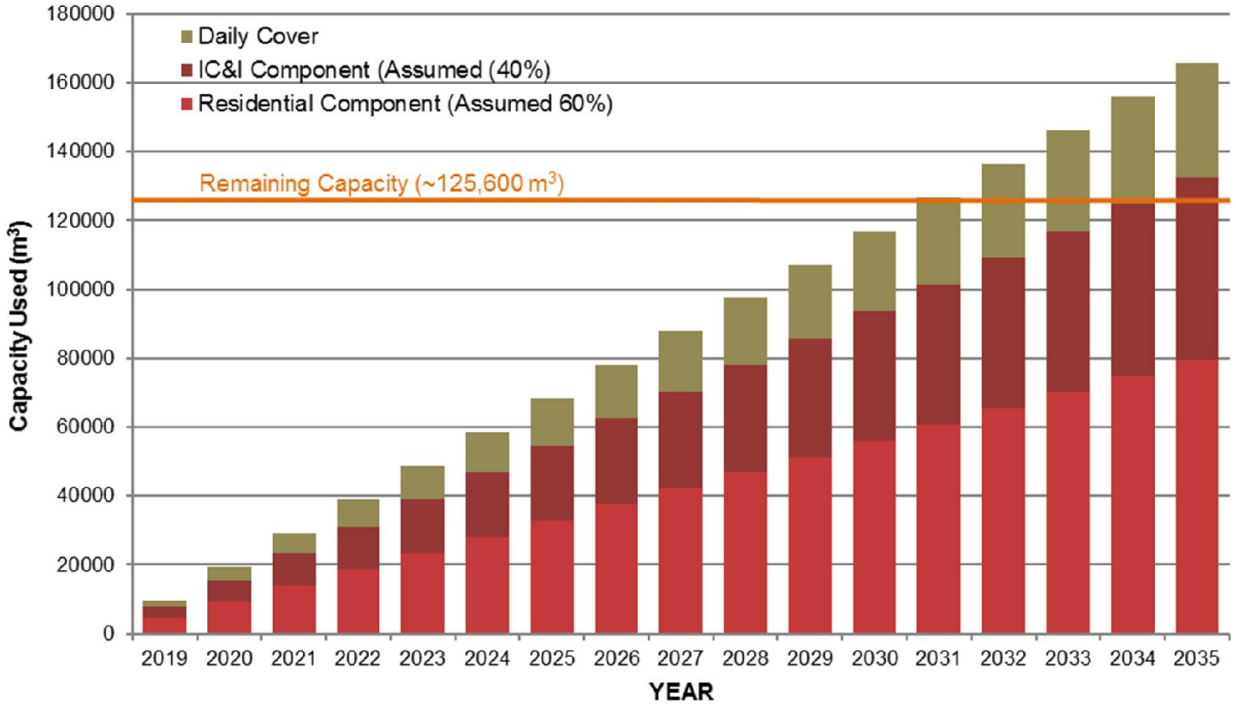
8.3 Projected Population

Based on the most recent census data, and consistent with the stable population trend recently experienced by the province, the Town of South Bruce Peninsula has consistently had a reported population in the range of 8,415 persons since 2006. This represents a very stable population over a 10-year period. In consideration of the seasonal dwellings, the population equivalent is more accurately estimated to be in the range of 9,750 (**Table 4-3**). Therefore, for the purposes of this report, it is assumed that the Town's population will remain relatively constant over the 25 to 30-year planning period.

8.4 Projected Disposal Capacity Required

Provided in the following **Figure 8-4** are the projected waste disposal capacity requirements for the Town of South Bruce Peninsula based on current residual waste generation rates and assuming a constant population equivalent of 9,751 persons and continued contributions from the IC&I sector, including the tourism industry. The projected waste disposal capacity requirements are based on the average fill rate of ±9,750 m^3 experienced over the past 5-years at the Amabel Landfill Site. Further it is assumed that the compaction density, estimated to be in the range of 580 kg/m^3 based on the 5-year average (i.e. weigh scale tonnages/volume of residual waste), will continue to be achieved and that an assumed volume of 20% daily cover material will continue to be required. As shown in **Figure 8-4**, based on these assumptions, the existing approved landfill capacity will be exhausted in the next 12 years (i.e. by 2031).

FIGURE 8-4 Estimated Required Disposal Capacity Assuming a Stable Population Base



8.5 Optimization of Landfill Operations

In consideration of the existing waste management practices, the Town of South Bruce Peninsula is considered to be in a moderate position in terms of long-term residual waste disposal security. As presented in **Figure 8-4**, the Town's Amabel Landfill site has an estimated 12 years (i.e. circa 2031) of disposal capacity remaining based on the average waste disposal rates experienced between 2014 and 2018. Due to the costs associated with expanding or new landfills, or alternative disposal methods (e.g., exporting waste, incineration, etc.), it is important to manage the remaining capacity effectively and efficiently to maximize the Town's waste disposal security and capitalize on the relatively low waste management costs for as long as possible. The most effective methods to maximize and/or extend the life of a landfill are as follows:

i. To ensure full capacity is achieved, the landfill design and operations should be consistent with those outlined in the Design and Operations report;
ii. Make accurate and detailed records of the material entering the landfill (i.e. use of a weigh scale); and
iii. Maximize the residual waste density (i.e. compaction) being achieved to allow for more waste to be deposited within a given volume.

8.5.1 Landfill Design and Operations

Continued development of the remaining landfill capacity in an effective and efficient manner is currently considered to be the Town's most viable waste disposal option. This requires that the Town and Site operators have a clear understanding the landfill limits (i.e. approved fill area), including the top and bottom contours, to ensure that the maximum capacity of the landfill is achieved. The relative costs associated with these efforts is typically minimal and involves site supervisor training with respect to the landfill design and operations. Therefore, it was recommended that the Town consider completing a Landfill Development Plan to determine the existing conditions and to evaluate the most efficient use of the remaining landfill capacity.

The first phase of the landfill development planning process was initiated by GM BluePlan Engineering in June 2019. This involved the completion of an elevation survey of the entire landfill footprint. Using the updated survey information, the existing top of waste contours can be compared to the final approved contours established within the Plan of Development and Operation (PDO: Map 5) to update (or confirm) the remaining capacity at the site. In addition, the survey information can be used to plan an approach to efficiently use the remaining landfill capacity, by identifying the following:

i. Areas that have reached the top of waste elevation (i.e. final contours).
ii. Areas that are approaching final contours. These areas would likely become the focus of residual waste placement in the short-term to support progressive closure.
iii. Areas where significant capacity remains. Residual waste placement in these areas typically would occur once final contours and capping, as practicable, has been achieved in the areas requiring minimal additional waste placement.

As part of the second phase of the 'future landfill development' planning process, it is recommended that a test pit program be competed at the Amabel landfill to confirm the location, extent, and thickness of the base for the access road and residual waste receiving area built within the approved landfill**.** It is our understanding that a significant volume of compacted fill was required to construct the access road and transfer area situated within the landfill footprint. To maximize capacity, the potential volume that can be gained by removing the residual waste transfer area from the surface of the fill area should be considered in the future development plan for the Amabel landfill site. The development plan for the remaining capacity is currently underway and will be provided to the Town under separate cover.

8.5.2 Landfill Monitoring (Operations) and Records

In order to effectively evaluate the performance of the various waste diversion program initiative's, it is important that good baseline data be established. Consistent with the recommendations of the Waste Diversion Plan prepared by 2cg (October 2011), *'that data collection and screening of incoming waste be dramatically improved'* to develop a better understanding of the current waste flows, waste entering the Site is documented on a source (i.e. residential, commercial or municipal), weight and type of material basis. In addition, the quantity (i.e. tonnage) of blue box materials, by waste type, is monitored and reported by BASWR.

However, as previously discussed, due to the inherent limitations of the Town's materials reports (i.e. weigh scale data) related to the origin of waste received at the landfill site, it is difficult to specifically evaluate the residential diversion rate separately from the IC&I sector. Consequently, monitoring the performance of new diversion initiatives requires that, until significant changes to the Town's IC&I sector and associated waste management practices are made, the assumptions outlined herein remain consistent. Therefore, for the purpose of the residential waste diversion estimates provided herein, it has been assumed that 40% of the incoming residual waste is from the IC&I sector and an additional 15% (i.e., 6% organic waste and 9% other diversion materials) can be estimated to represent IC&I waste diverted from the residual waste stream.

For comparative purposes this assumption should continue to be used for future assessments and evaluations until such a time that a better understanding of the relative proportion of residential and IC&I waste can be accomplished. Therefore, it is thought that with the continued application of the assumptions outlined herein, the waste diversion averages presented in this Waste Management Plan can be considered as the baseline for the Town from which to evaluate the Town's progress towards the waste diversion targets set out in the Waste-Free Ontario legislation. Further, this information may be used to provide more insight into potential diversion initiatives to pursue in the future.

In addition to monitoring the tonnage of waste received, the volume of residual waste and interim cover placed within the approved fill area is monitored through annual topographic surveys, which is practical for monitoring the fill rate of the landfill and determining the remaining site life. The combined knowledge of the annual tonnage of residual waste received and the annual volume of landfill capacity utilized provides sufficient baseline data related to monitoring the implementation of operational initiatives, including the efficacy of waste compaction efforts.

8.5.3 Weigh Scale and Enhanced Waste Transfer Area

Weigh scales are used to accurately monitor the tonnage of residual waste being landfilled and the types and quantities of waste being diverted. This type of information allows for a more accurate assessment of the Town's overall diversion rate, which can be used to estimate the Town's residential diversion rate, ultimately providing a better understanding of the operational efficiencies. In addition to the operational advantages associated with a weigh scale, the Town has established tipping fees that reflect the incoming waste quantities, encouraging waste diversion by accepting divertible materials free or charge, or for a nominal fee; further, tipping fees are doubled for unsorted waste.

At this time, the Town has developed a system to effectively track the quantity and types of materials accepted at the Amabel Landfill Site. However, the enhancement of the waste transfer area could be completed to further aid in the oversight, promotion and encouragement of waste segregation. As previously discussed, a portion of the waste transfer and receiving area is currently situated at the top of the approved landfill footprint. In addition to potentially using up valuable waste capacity, this area is separated from other waste receiving areas established at the Site and also provides public access to the landfill area, which is typically discouraged. Therefore, to provide better oversight of the waste receiving and transfer areas at the Town's landfill site, it is recommended that a consolidated Waste Transfer and Receiving Area be established. The use of the transfer area for residual waste disposal in select bins would keep residential deliveries away from the active face of the

landfill. This approach typically results in increased waste segregation and diversion and can be further enhanced by providing staff oversight and support to ensure waste is properly segregated and placed in the appropriate containers.

In essence, it is recommended that the 'front end' of the landfill site be updated to include an improved waste receiving and transfer area. Currently the weigh scale is situated at the entrance to the Site and the Site attendant directs incoming vehicles to the specified area(s) (i.e. residual waste, organic, tires, etc.). However, a waste receiving and transfer area more commonly includes several well marked (i.e. signed) waste disposal bins, designated areas for specified waste, and sheds/buildings, within a defined area and arranged in such a way as to facilitate and encourage the segregation of wastes. The design of the waste transfer area would need to ensure that the requirements of the Approval (i.e. propane tank must be stored in an upright position and in a single layer) and/or the waste processor (i.e. mattresses must be stored in a dry area) are met. An example of a waste receiving and transfer area, at a local rural landfill site, is provided below.

Photo: Example of a waste receiving and transfer area (a part of) at a local municipal landfill site

The development of a transfer area at the Town's landfill site would require a review of the site layout, selection of an area (or areas) that could accommodate the required infrastructure while providing functional, convenient and safe management of the public (i.e. vehicles and persons), including during the peak tourist season when traffic volumes are greater. Due to the volume of traffic experienced during the peak tourist season, the installation of an additional weigh scale for outgoing traffic may need to be considered to avoid congestion. The design would typically include a one-way direction for traffic, with well-marked areas for pulling over, to avoid congestion, within the framework of designated and clearly-marked areas for waste drop-off. This recommended initiative would require the preparation of detailed design drawings, developed in consultation with Town staff, and an application to amend the existing Environmental Compliance Approval.

8.5.4 Landfill Hours and Staffing

At the Amabel Landfill Site, traffic volumes sometimes double during the summer season when the tourism industry is at its peak. At these times, while landfill staff do their best to process everyone in a timely manner, it is reported that individuals regularly become impatient, disrespectful and, at times, 'threatening' to staff. Reportedly, this along with long working hours, including full weekends, has resulted in an overall low staff morale and high staff turnover. Based on staff feedback, a review of the hours of operation offered at the Amabel Landfill Site was completed. A comparison the landfill operating hours to other municipalities within Bruce County is provided in **Table 8-1**.

TABLE 8-1: Comparison of the Town's Hours of Operation to Other Local Municipal Landfill Sites

Effective Dates	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Town of South Bruce Peninsula (Population = ± 8,400)							
Nov 1 to April 30		8:30 - noon 1:00 - 5:00			8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	
May 1 to June 15 LD to Oct 31		8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	
June 15 to Labour Day (LD)	10:00 - 2:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	8:30 - noon 1:00 - 5:00	1:00 – 5:00
Municipality of Northern Bruce Peninsula (Population = ± 4,000)							
Nov 1 to March 31	10:00 - 4:00 Eastnor		10:00 - 4:00 St.Edmunds			10:00 - 4:00 Lindsay	
April 1 to Oct 31	9:00 - 5:00 Eastnor		9:00 - 5:00 St.Edmunds		9:00 - 5:00 Lindsay	9:00 - 5:00 Eastnor & St.Edmunds	9:00 - 5:00 Lindsay
Town of Saugeen Shores (Population = ± 13,700)							
All Year	9:00 - 5:00		9:00 - 5:00		9:00 - 5:00	9:00 - 4:00	
Municipality of Arran-Elderslie (Population = ± 6,800)							
All Year				8:00 - 3:00		8:00 - noon	

Provided that extended landfill hours are offered during the summer months, it is evident that the Town is adjusting its waste management services to accommodate the tourism industry. However, a review of the total hours of operation offered by similar municipalities, including the Town of Saugeen Shores and the Municipality of Northern Bruce Peninsula, which also accommodate a significant influx of tourists during the summer months, suggests that the Town could consider reducing its landfill hours. As it is expected that site attendance varies significantly for different days of the week, the Town could review its records to highlight peak days in its service level review (and adjustment).

The cost savings achieved by reducing the landfill hours could be redirected into augmenting the staffing levels at the site, ultimately putting less strain on existing staff, which currently includes a scale house operator and landfill site operator. Therefore, the Town could consider the provision for one additional site attendant to be present during operating hours, or operating times identified to experience a higher visit frequency (i.e. 'peak' days or time periods). The site attendant could be specifically assigned to the oversight of the proposed waste receiving and transfer area, providing clear direction to the public. Additional staffing, particularly during peak periods, could contribute to improved site operations and more effective sorting of waste. Therefore, although the work times could be adjusted to reflect 'peak' and slow periods and/or seasons, landfill staffing roles could include the following:

1. Scale House Operator

   The scale house operator would continue to be responsible for effectively communicating with those entering and leaving the site, collecting accurate waste type and weight/volume information and communicating with other Town staff.

2. Attendant: Waste Receiving and Transfer Area

   The site attendant would ultimately be responsible for directing traffic to ensure public safety and providing the general public with instruction on the types of materials that can be received, where they should be placed, and ensuring the types of waste materials are acceptable. Oversight of the waste receiving and transfer area would also serve to ensure the following:

   a. While providing clear direction to residents, the general public will also be encouraged to properly segregate their waste, they could simultaneously be made more aware of the importance of doing so (i.e. educated).
   b. That waste is placed in, or moved to, the correct designated area thereby minimizing contamination of the waste diversion streams. This would directly improve the efficacy of the existing waste diversion strategies implemented by the Town and would likely help to increase the Town's residential waste diversion rate.
   c. Waste transfer occurs on an as needed basis so that bins do not overflow. This would help improve the overall site aesthetics. It is likely that the majority of the public would follow the example observed, ultimately increasing the level of consciousness to maintain a more organized and litter-free area.
   d. Consistent oversight may provide for the management of incoming and outgoing wastes by ensuring bins are transferred out of the waste receiving area as they are filled to capacity or preventing the public from placing additional waste into full containers.

3. Landfill Operator (as needed, based on incoming waste volumes)

   Consistent with existing practices, a trained landfill operator is required and, subject to the Town's discretion, may be expected to be responsible for the following:

   a. Have a clear understanding of the landfill development plan and operations specific to the Amabel Landfill site.
   b. Transferring the residual waste collected in designated bins within the waste receiving and transfer area to the landfill footprint.
   c. Safely operate heavy equipment, such as a dozer, and conduct routine equipment inspections and preventative maintenance (if possible).
   d. Adequately distribute and compact residual waste within the approved landfill footprint.
   e. Move, spread and compact daily cover material.
   f. The landfill operator could be expected to perform other duties, such as litter pick-up, as assigned.

In summary, the success of the waste diversion opportunities offered by the Town, and overall landfill operations, are dependent on adequate and trained staff. However, it is recognized that site visits can vary significantly by day and season, consequently staffing levels could be adjusted to reflect anticipated high and low traffic volume periods. Therefore, a review of the number of visits on an hourly basis for each day of the week could be undertaken over time to assess which time periods and/or days could be selected for the reduced days with the least impact to the community. Further, review of the operating hours currently offered suggests that the Town may be in a position to offset the cost of a site attendant, at least in part, with reduced hours of operation.

8.5.5 Landfill Compaction

The current compaction method in practice at the Amabel Landfill site involves placing the refuse and cover material in lifts and compacting the lifts with the use of a compactor. It is our understanding that as of April 2018, the daily operations previously tendered out to a private contractor were cancelled. At that time, the Town added a pay loader and a compactor to their fleet, which already included an excavator, and hired staff to operate the equipment.

Based on the information available, the estimated compaction density being achieved by the private contractor had decreased prior to the Town's decision to oversee its own landfill operations in April 2018. Based on the limited data available, it appears that the compaction density being achieved has improved since that time. The efficacy of the compaction efforts will continue to be evaluated within the framework of the annual monitoring reports for the landfill site. Based on the reported tonnage of residual waste received at the Amabel Landfill Site and the annual estimates of landfill capacity utilized (m^3), the compaction density achieved has averaged approximately 583 kg/m^3 over the last 5-years (i.e. 2014-2018).

Provided in **Table 8-2** are estimated compaction densities based on the compaction method employed. In consideration of the Town's current use of a compactor, it is estimated that a good to excellent compaction density, depending on the number of passes, may be achieved. With optimal compaction techniques, it is documented that compaction densities upwards of 1,000 to 1,200 kg/m^3 can be attained. To achieve these compaction densities, a large steel wheeled compactor and a waste shredder, combined with proper filling techniques, would be required. To achieve a compaction density of up to 800 kg/m^3, only a steel wheeled compactor may be needed.

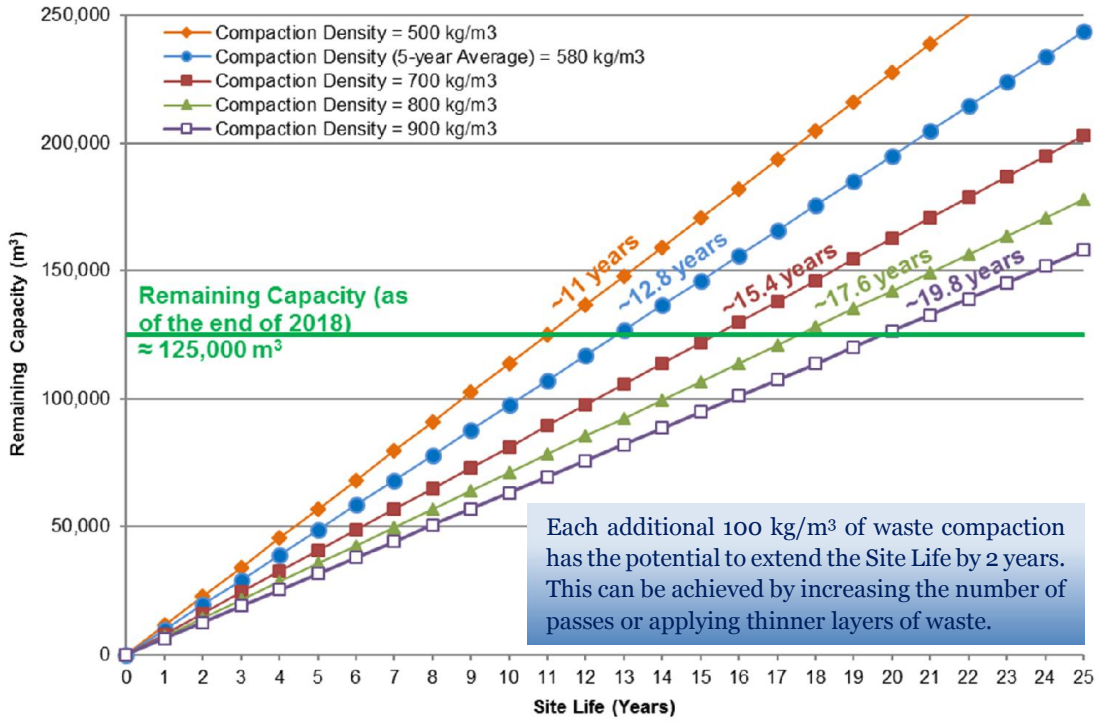
TABLE 8-2: Compaction Density vs. Method

Compaction	Equipment	Method	Density
Poor	None	Wastes dumped into trench	60 to 120 kg/m^3
Minimal	Tracked Machine	Wastes dumped into trench. Equipment compacts the surface of the waste.	120 to 300 kg/m^3
Moderate	Tracked Machine	Wastes spread in layers. Each layer is compacted with one pass of the machine.	300 to 475 kg/m^3
Good	Tracked Machine	Waste spread in thin layers. Each layer compacted with three to five passes of the machine.	475 to 600 kg/m^3
Excellent	Steel Wheeled Compactor	Waste spread in thin layers. Each layer compacted with the machine with up to five passes.	over 600 kg/m^3

Note: The densities indicated are from "Guidelines for the Establishment, Operation, Management, Maintenance, and Closure of Landfilling Sites in Ontario", MECP.

As shown in **Figure 8-5**, the continued, and/or improved, efficient and effective use of compaction equipment (i.e. a sheepsfoot compactor) could extend the life of the Amabel landfill. Increased compaction, allowing for more waste to be deposited within a given volume, could be achieved using the existing equipment at the Amabel Landfill site. This can be achieved by increasing the number of passes over the waste or applying thinner layers of waste and cover being compacted. As shown in **Figure 8-5**, each additional 100 kg of residual waste per cubic meter has the potential to extend the Site Life of the landfill by greater than 2-years. It is noted that the Site Life projections do not account for additional waste diversion initiatives.

FIGURE 8-5: Compaction Density versus Site Life



Note: Increased Site Life accounted for by increased compaction does not account for additional waste diversion initiatives.

Provided in **Table 8-3** are the costs associated with the purchase and operation of a waste shredder in comparison with current operations and the optimization of compaction techniques using the existing equipment.

TABLE 8-3: Equipment vs. Long Term Costs and Site Life

Equipment	Capital Cost	Maintenance Costs Per Year	Total Annual Equipment Costs	Compaction Density (Kg/m^3)	Total Site Life (Years)	Annual Reserves for New Landfill	Total Annual Cost	Annual Cost Savings
Landfill Compactor (status quo)	$250,000	$5,000	$28,625	580	12.8	$390,625	$419,250	$0
Landfill Compactor	$250,000	$10,000	$28,625	700	15.4	$324,675	$353,300	**$65,950**
Landfill Compactor	$250,000	$10,000	$28,625	800	17.6	$284,075	$312,700	**$106,550**
Shredder & Compactor	$550,000	$20,000	$61,725	900	19.8	$252,525	$314,250	**$105,000**

Notes:
1) Total annual equipment costs include 4% interest over 5 years. Estimates are based on replacing the equipment every 10 years.
2) Annual reserves are based on what would be required to raise $5,000,000 for a new landfill over the life of the existing landfill.
3) Figures are based on purchases of lightly used equipment.

Significant cost savings could be realized by the Town via operational improvements aimed at increasing the compaction density being achieved using the existing approach and equipment. In consideration of the economic benefits versus potential complications (i.e. technical difficulties) associated with a shredder, the continued use of a landfill compactor alone is recommended at this time.

Although annual equipment costs (includes capital amortization and maintenance cost) remain the same, with increased compaction the overall annual costs are decreased by the annual contributions to the reserves funds required for a new or expanded landfill site due to the extended site life of the existing landfill. As shown in **Table 8-3**, based on a new or expanded landfill cost of $5,000,000, in addition to extending the site life, the efficient and effective use of the existing equipment (i.e. landfill compactor) could save the Town greater than an estimated $100,000 per year.

In addition, when compared to improved site operations using the existing compactor, the use of a shredder in addition to the compactor would provide limited long-term financial benefit. Further, it is noted that based on anecdotal information, the operation of shredding equipment at several landfills has resulted in operational and/or maintenance issues, often requiring operator expertise and training with respect to feed rates and materials. Such issues may increase operational costs and/or reduce benefits due to limited use. Technological improvements in this sector will likely continue to occur, negating such concerns.

In addition to the above analysis, a simplified and direct cost benefit analysis can be calculated based on the remaining capacity of ±125,000 m^3, or 100,000 m^3 for residual waste and 25,000m^3 for daily cover, using the assumption that each tonne of residual waste accepted at the landfill is valued at $125 per tonne. A comparison is provided in **Table 8-4**:

TABLE 8-4: Cost-Benefit Analysis (Disposal Revenues)

Compaction Density Achieved	Capacity (Tonnes)	Difference Compared to Status Quo	Total Revenue (at $125 per Tonne)	Difference Revenue Compared to Status Quo
580 kg/m^3 (Status quo)	58,000		$7,250,000	
700 kg/m^3	70,000	12,000 tonnes	$8,750,000	$1,500,000
800 kg/m^3	80,000	22,000 tonnes	$10,000,000	$2,750,000
900 kg/m^3	90,000	32,000 tonnes	$11,250,000	$4,000,000

Note: Capacity in tonnes is based on a remaining landfill capacity of 100,000 m^3 for residual waste (with an estimated 25,000 m^3 needed for daily cover)

It is noted that these scenarios do not include the administration costs saved by the Town that would otherwise be incurred to pursue a new or expanded landfill. In addition, there are political, environmental and social benefits to extending the life of an existing landfill that are not factored into the above tables, which makes such an approach even more favourable.

9. EVALUATION OF ALTERNATIVE PREVENTION AND DIVERSION METHODS

Through the background information presented above, it was concluded that, with the exception of organic wastes, not including green bin waste (i.e. food waste), the Town's waste diversion programs are performing at or below average. The residential diversion rate currently being achieved by the Town is estimated to be in the range of 38%. Therefore, the Town is considered to have achieved the province's interim target of 30% diversion by 2020. However, the Town should continue to pursue methods to increase its diversion rate, not only to meet the provincial interim targets of 50% by 2030 and 80% diversion by 2050, but also to extend its environmental security by managing its waste in an efficient and effective manner. To facilitate this goal, alternative prevention (reduction) and diversion (reuse and recycling) methods and improvements to the existing waste collection and diversion methods are evaluated by considering what is feasible and economically viable for the Town.

According to the most recent RPRA data, the current Provincial diversion rate is approaching 50%. However, it is noted that the majority of the municipalities with diversion rates above 40% have household organics and leaf and yard waste collection programs in place. Therefore, under the present circumstances, municipalities with goals of reaching the 50% residential diversion target by 2030 would, on a practicality basis, need to initiate a kitchen organics curbside collection program. However, for many rural municipalities a kitchen organics program is not considered to be feasible under the current regulatory framework. This initiative is typically limited to larger centres where on-property organics diversion is more difficult to achieve or, in certain cases, to municipalities that have limited disposal capacity or higher disposal costs related to exportation of waste.

Comparison of the Town's waste diversion performance to other similar Municipalities, particularly with respect to recyclable materials, suggests that additional diversion could be achieved. Therefore, the Town may consider additional prevention (reduction) and diversion (reuse and recycling) methods and improvements to the existing waste diversion programs, as discussed in the following sections.

9.1 Operational Improvements at Landfill: Enhance Transfer Area

As previously discussed in **Section 8.5.3**, the use of a waste receiving and transfer area for residual waste disposal in select bins would keep residential deliveries away from the active face of the landfill. This approach, particularly when directly overseen by a site attendant, typically results in increased waste segregation and diversion, ultimately reducing the quantity of residual waste landfilled. The transfer area typically includes several well marked (i.e. signed) waste disposal bins, or areas, arranged in such a way as to facilitate and encourage the segregation of waste.

9.2 Recycling and Waste Diversion Initiatives and Opportunities

9.2.1 Existing and Potential Blue Box Recycling Initiatives

Currently, BASWR offers an extensive range of recyclables under the blue box program including printed paper and paper packaging, boxboard, corrugated cardboard, plastic bottles and containers, metal cans, and glass bottles and jars. Ultimately, the types of materials available for recycling are dependent on a market for the materials.

Based on the Town specific tonnages of blue box materials provided by BASWR, the Town of South Bruce Peninsula achieved the diversion of an estimated 58 kg/capita of blue box recyclables. This quantity is below the Provincial average, and below the estimated 94.0 kg/capita being achieved by BASWR, indicating that the Town is not achieving the blue box diversion rates that could potentially be attained. Blue box materials are of

particular importance in terms of recyclable materials and mass of diversion. Strategies to improve the Town's blue box diversion rates should be considered and may include the following:

- **Frequency of Collection:**
  Curb-side pick of blue box materials is currently provided on a bi-weekly basis and curb-side collection of household waste is provided on a weekly basis. The more frequent collection of residual waste likely has a negative impact on the overall success of the Town's blue box program. To promote blue box diversion efforts, the curb-side collection service should, at minimum, be as frequent as the residual waste collection service.

  To move toward a comparable service level for the curb-side collection of residual waste and blue box materials, the Town could either,
  i. Consider more frequent collection of blue box materials, to match the weekly household waste pick-up schedule; or,
  ii. Consistent with recent changes realized in several municipalities, the Town could consider bi-weekly collection services for both waste streams.

  Therefore, the Town may consider reducing the curbside collection service provided for residual waste to bi-weekly or pursuing weekly curbside collection of blue box materials. Providing the same level of service for both waste streams would likely increase the overall success of the blue box program. Ultimately, it is recommended that a similar collection frequency for blue box materials and residual waste be provided, as determined by the Town. It is noted that a bi-weekly collection frequency for residual and blue box materials would be more economical than a weekly collection service, reducing waste collection costs by an estimated 30-40%.

- **Full Pay per Use Cost Structure:**
  The Town has previously adopted the use of bag tags, at a cost of $3.00 per tag/bag. Each property that receives garbage collection is permitted to place one bag (not to exceed 40 pounds) per week free of charge at the roadside for collection. Each additional bag requires a bag tag. To further encourage waste reduction, a full pay-per-use system, in other words requiring that a bag tag be affixed to all bags of curb-side waste, is recommended. Numerous studies have shown that a full pay per use system will increase blue box diversion. This would also serve to minimize the additional administrative efforts associated with garbage collection (i.e. decrease the number of calls associated with bag collection issues – specifically the collection of free versus tagged bags).

- **Public Education and Promotion Programs:**
  Public education and promotion programs are crucial for ensuring the success of local recycling programs. The benefits of public education and promotion programs include:
  - Greater participation levels and community involvement;
  - Higher diversion rates;
  - Less contamination in recovered materials, potentially leading to higher revenues; and
  - Lower residue rates at recycling facilities.

  In recognition of the Town's website updates, which are being currently completed under contract, it is recommended that the Town provide specific input into the development of a useful platform from which to promote its waste diversion programs and further educate the public on its initiatives, such as composting.

- **Implementation/Enhancement of Recycling Depots:**
  Recycling depots provide an inexpensive means for municipalities to divert recyclable materials from disposal. To improve public access and convenience the Town could consider providing recycling depots at various locations throughout the community (i.e. the Albemarle landfill, recreational facilities, the Works Yard, etc.) or expanding the types of recyclable materials accepted at the existing depots. This

would also provide an additional waste diversion option to the IC&I Sector. The collection bins and collection requirements could be arranged with BASWR or arranged under separate contract with an alternate waste management provider.

It is noted that BASWR has made available specialized higher volume containers, limited to 65- and 95-gallon capacity, retrofitted for their collection vehicles for use by the IC&I sector and apartment buildings. These are also used at the Amabel Landfill site for glass, paper and boxboard. It is reported that the limited capacity of these containers commonly results in overflow, leading to litter issues, ultimately making it difficult for local businesses to pursue this diversion option. Disposal bins are provided at the cardboard collection depots and at the landfill site for the collection of cardboard, aluminum and plastic.

Due to the limitations on bin capacity, it is recommended that the Town investigate opportunities to encourage its businesses and service industries to pursue opportunities to make larger disposal bins more accessible (i.e. campgrounds cottage resorts), as appropriate. This would require collaboration between the business community and the Town.

- **Provision of Free Blue Boxes:**
  Blue boxes ensure that residents have a separate location for the storage and transfer of recyclables. Blue boxes could be provided at no charge to Town residents.

- **Expansion of Recyclable Blue Box Materials:**
  For maximum diversion a wide variety of recyclable materials is required. Deciding on which recyclable materials to include in the blue box program typically depends on the availability, collection costs, and market viability for the respective material. As markets are constantly changing, it is important for municipalities, or associations thereof, to stay abreast of material markets (i.e. polystyrene, bale wrap).

- **Corrugated Cardboard:**
  At this time, the Town offers limited opportunities for the diversion of cardboard. It is our understanding that BASWR does not provide the option for the Town to offer curb-side pick-up of corrugated cardboard. Alternatively, cardboard drop-off stations are provided in Hepworth, Wiarton and at the Amabel landfill site.

  The Town could consider augmenting their existing service by providing cardboard collection on a monthly basis as part of their existing contracts with BASWR or Waste Management. Alternately, the Town could explore options that would include a greater range of acceptable blue box materials, such as contract options with other service providers to augment, or replace, the existing level of service. For example, several municipalities are permitted to include cardboard in their blue box collection bins.

- **Polystyrene Foam Recycling:**
  A recyclable material that may be suitable to consider adding to the blue box program is polystyrene packing material. Should segregation of this waste stream from the blue box materials be preferred, another option some municipalities have implemented is to provide a separate bin for the disposal of polystyrene foam at their waste receiving and transfer areas (or stations). The recycling of polystyrene may be particularly advantageous to the Town due to the low density and bulkiness of the material, which results in poor landfill compaction, thereby consuming landfill capacity. Further, it is noted that in May 2019 Brockton and Hanover acquired a polystyrene densifier, which compacts collected materials into condensed polystyrene bricks. These can then be recycled into new products. In time, it is anticipated that access to this foam collection service may be extended to the nearby communities. It is recommended that the Town stay abreast of this opportunity.

9.2.2 IC&I Recycling and Waste Diversion Initiatives

Reportedly, on a Provincial level the IC&I sector diverts only approximately 17% of its waste from the residual waste stream. As a result, it is recognized that increasing the IC&I sectors success of its waste diversion program(s) is integral to the Province's success in achieving the waste diversion targets outlined in the Waste-Free Ontario Act.

Ontario Regulation 103/94 Source Separation Programs apply to the IC&I sector, including construction and demolition projects, as well as multi-unit residential buildings. O.Reg.103/94 also stipulates specific IC&I sector source separation programs for facilities that exceed the following thresholds:

- Retail shopping establishments and complexes: Total floor space of greater than 10,000 m^3
- Large construction and demolition projects: Total floor space greater than 2,000 m^3
- Office Buildings: Total floor space greater than 10,000 m^3
- Restaurants: Gross sales greater than $3,000,000
- Hotels and motels: Greater than 75 units
- Hospitals: Class A, B or F
- Educational Institutions: Enrolment greater than 350 students
- Large manufacturing establishments: Greater than 16,000 hours of employment per month

In general, multi-residential buildings are required to have a blue box program. Commercial and multi-use facilities in the Town have the option to recycle using blue boxes and either placing them at the curb for pick-up, transporting them to the transfer station at the Amabel Landfill site, or arranging for pick-up by BASWR or another Materials Recycling Facility. Although not quantified, many businesses and institutions are not likely in compliance with these requirements. Therefore, education and enforcement are a key component to the success of waste diversion programs associated with the IC&I sector.

Further, in principle, BASWR delivers containers and has agreed to schedule collections *'suitable to specific requirements'*. However, based on feedback provided to the Town from the community, at times it is difficult for BASWR to meet the demands of its member municipalities, particularly during the peak tourist season. Consequently, some businesses have had to arrange for the pick-up of recyclable materials with alternative waste management contractors. Further, as previously discussed, the recycling totes provided and considered acceptable for use by BASWR have limited capacity. Higher capacity containers are not accepted. These factors affect the overall success of the waste diversion program(s) offered by the Town.

Although the Town is not responsible for the management of IC&I waste, it is likely that for various reasons the majority of IC&I waste generated within the Town is disposed of in the municipal landfill. It is recognized that certain businesses can generate a relatively high volume of recyclables, and by providing added convenience (such as larger collection bins for recycling, curb-side pick-up, or local depots), there is the potential to increase capture rates and diversion.

Collaboration between the Town and local businesses creates the opportunity to divert more waste from the landfill through recycling while still meeting the needs of the business community. Therefore, the Town could consider pursuing the establishment of a community group, or group of business representatives (i.e. restaurant, campground, etc.), to spearhead a program aimed at implementing waste diversion initiatives with the goal of increasing the diversion rates achieved by the IC&I sector.

9.2.3 Existing Recycling and Waste Diversion Programs and Initiatives

The following summarizes the additional recycling programs that have been implemented by the Town:

- Used tires and electronics can be dropped-off at the Amabel Landfill Site free of charge. With respect to WEEE, several other drop-off locations are available through local retailers.
- Scrap metal and empty propane tanks are collected by the Town for salvage (including CFC-containing appliances).
- The County provides a total of three MHSW drop-off events per year, in Wiarton and Sauble Beach.
- Mattresses can be dropped of at the Amabel Landfill Site for a 'nominal' fee (i.e. less than the tipping fee that would be applied if paying per tonne).
- The Town accepts leaf and yard waste free of charge at the Amabel Site and the Wiarton Works Yard.
- Clean wood, brush and stumps are stockpiled separately and periodically ground into woodchips.
- The Town has a separate area for blue box recyclables at the Amabel landfill.
- In addition to the Amabel Landfill, cardboard depots are provided at two separate different locations within the Town, including Wiarton and Hepworth.

9.2.4 Additional Recycling and Waste Diversion Opportunities

As discussed below, several additional recycling and waste diversion opportunities could be implemented by the Town.

Construction and Demolition Debris (C&D):

It is estimated that C&D waste accounts for a significant proportion of commercial waste received at the landfill and a limited portion of residential waste delivered to the Site by residents. Overall, C&D waste is composed mainly of wood products, asphalt shingles, drywall, and masonry materials. Based on the Town's waste summaries, it is estimated that drywall and shingles alone account for approximately 10.5% (or 57 tonnes drywall and 423 tonnes of shingles, annually) of the total residual waste received at the Amabel Landfill Site. It is recognized that C&D debris is often commingled when dropped-off at the landfill, which makes it difficult to sort for diversion. To encourage sorting prior to disposal, the Town has imposed higher fees for unsorted C&D waste.

A number of diversion options are available for C&D materials. For example, asphalt shingles and tar and gravel roofing can be used for asphalt mixes used in road construction and clean drywall can be reprocessed into new products (e.g. soil stabilizer or pet litter). Masonry material such as concrete (without steel reinforcement) can be recycled into aggregates for fill material. Concrete is typically processed by construction contractors and pit operators as part of operations. Masonry material containing steel reinforcement would require additional processing before final use.

Based on our review, the diversion of such materials has been relatively limited in more rural settings, where volumes received limit accumulation timeframes and transportation costs limit economic viability. Additionally, the recycling of C&D waste typically requires sorting and separation of specific components, not regularly achieved during building demolition activities. For example, only 'clean', unpainted drywall is typically considered acceptable for recycling.

More commonly recycled are asphalt shingles, since these are commonly produced as a separate source. With respect to diversion, the cost-benefit for recycling of shingles can be limited since shingles are very dense (have a low volume per unit mass), which results in relatively low landfill capacity reductions at a relatively higher cost.

Should a C&D recycling program be considered an option, it is recommended that collection requirements, shipping, and tipping fees be confirmed with actual contractors. Furthermore, as with many other diversion

streams, options associated with C&D waste diversion are regularly developing. Therefore, it is recommended that the Town continue to stay abreast of such opportunities.

Additional Scrap Metal Diversion Initiatives:

Although the Town currently encourages the diversion of scrap metal from the landfill site by permitting the drop-off of scrap metals and white goods in separate disposal areas, a tipping fee equivalent to $125/tonne is charged. In addition, as per Ontario Regulation 463/10, CFC-containing white goods are to be properly drained by a certified technician and then tagged to indicate that the CFC's have been removed, prior to the removal of the white goods from the Amabel Landfill. For CFC-containing white goods that are not tagged the Town applies an additional fee of $40. In order to encourage the diversion of scrap metal, a lower tipping fee relative to residual waste could be considered. Further, the Town could consider accepting and subsidizing part of the cost associated with tagging CFC-containing white goods.

9.3 Waste Reduction and Reuse Opportunities

Ultimately reducing the amount of waste generated through reduction and reuse initiatives is most ideal as it reduces the amount of energy and resources that are required to transport, process or dispose of the wastes (refer to Figure 3-1: Waste Value Chain).

9.3.1 Residual Waste Reduction Initiatives

The primary channel where the Town can influence additional waste reduction in residents is by implementing a full pay-per-use system, reduced 'bag' limits, reduced pick-up frequency and tipping fee adjustments. A review of the existing service level and fee system in other municipalities within Bruce County was completed to inform this assessment and is summarized in **Table 9-1**.

TABLE 9-1: Residual Waste Management – Service Level and Tipping Fee Comparison

Municipality	Year	Service Level		Bag Tag Fee	Landfill Tipping Fees		
		Pick-up	Bag Limit		Minimum	Sorted (per tonne)	Unsorted (per tonne)
Town of Saugeen Shores	2019	Weekly	No Limit	$2.00	$5.00	$108.77	$217.55
Municipality of Kincardine	2019	Weekly	No Limit	$2.50	$25.00	$105	$210
Municipality of Brockton	2020	Weekly	No Limit	$2.00	$10.00	$125	$250
Town of South Bruce Peninsula	2019	Weekly	3 (1st free)	$3.00	$9.00	$125	$250
Township of Huron-Kinloss	2019	Weekly	No Limit	$2.00	$20.00	$100	$200
Municipality of Arran-Elderslie	2019	Weekly	2	$3.00	$5.00	$105	$214
Municipality of South Bruce	2019	Weekly*	No Limit	$2.50	$10.00	$100	$200
Municipality of Northern Bruce Peninsula	2019	Weekly	2	Free	$5.00	$100	$200

*Urban Areas Only

The following residual waste management strategies are recommended for consideration by the Town:

Full Pay-Per-Use System and Reduced 'Bag' Limit:

In terms of waste reduction, the user pay system has been proven to reduce the amount of residual waste generation by encouraging users to become more conscious of the amount of waste they generate. At this time, residents are permitted to place one bag of residual waste at the curb free of charge, then are required to pay $3.00 per bag of household waste to a maximum of 3 bags per week. It is recommended that a full pay-per-use system be implemented by the Town. Further, in consideration of the weekly curb-side pick-up service currently provided, it is recommended that the bag limit be reduced to two bags.

Reduced Pick-up Frequency:

A reduced pick-up frequency for residual waste from weekly to bi-weekly has the potential to increase waste diversion. However, in consideration of the Town's transient population and tourism industry, this strategy may have some additional challenges, particularly during the summer months. Therefore, it is recommended that the Town, at minimum, consider implementing a waste management system in which the curb-side pick-up frequency for blue box materials and residual waste is the same, either weekly or bi-weekly.

Increased Minimum Tipping Fee at Landfill:

A fee of $3.00 per bag, to a maximum of three bags, is currently charged at the Landfill. For waste quantities greater than 3 bags, a minimum tipping fee of $9.00 or a fee of $125/$250 per tonne (sorted/unsorted) is applied. It is recommended that the bag limit at the landfill be the same as that applied to curb-side pick-up. Therefore, a reduction in the bag limit to 2 bags at the landfill site is recommended. Further, it is recommended that the minimum tipping fee be increased to $15 (or otherwise, as determined by the Town). The purpose of this increase is to create a larger cost 'gap' between the weekly bag limit and the minimum tipping fee.

9.3.2 Additional Options and Opportunities

Currently, the primary channel where the Town can influence additional waste reduction in residents, aside from the full pay-per-use system, reduced 'bag' limits and reduced pick-up frequency is through education and or behavioural encouragement. Options for improvement include investigating additional educational or encouragement programs (such as those that focus on community challenges and public notices of residual waste rates). This is discussed further in **Section 9.6**. Furthermore, the Town could consider the implementation of several other waste reduction/reuse options that could be achieved at a fairly low cost relative to the waste reduction achieved. Other waste reduction and reuse opportunities include the following:

- **Establish a Reuse Building:** The Town could consider the construction of a building or the placement of an enclosed storage trailer or walk-in storage bin at the landfill site for the storage of reusable items. In concept, the reuse building/enclosure would be open to the public for drop-off or pick-up of reusable items that would otherwise be landfilled. Re-use could also be encouraged through a partnership with other re-use organizations and/or businesses (i.e. Habitat for Humanity, Timeless Materials) by promoting the drop-off of reuse materials at their locations on the Town's website.
- **Clothing Donations:** The Town could encourage reuse through a partnership with the local thrift shops or other re-use organizations/charities (e.g. Ontario Federation of Cerebral Palsy, Salvation Army, etc.). A clothing donation bin could be set-up at a convenient location(s), such as the landfill site or public parking lot(s) (i.e. arenas, grocery stores, works yard, etc.).
- **Implementation of Mandatory Recycling and Leaf and Yard Waste Diversion:** Some Municipalities have established By-Laws that discourage the disposal of select waste diversion streams (i.e. Materials Disposal Ban at the Landfill). In order to effectively implement such a ban, enforcement is required. In order to adequately enforce by-laws, a '*Clear Bag Policy'* is typically required.
- **Clear Bag Policy:** The clear bag policy is typically thought to encourage recycling and waste diversion, as well as to educate residents, on what items can be recycled so less potentially divertible or toxic materials enter the landfill. In addition, clear bags aid the collectors in identifying materials that are banned from disposal. To conceal private material, some Municipalities allow for one small opaque bag, such as a grocery bag, to be used and placed inside the clear bag. The privacy bag is meant to conceal items from public view. Concealment can also be achieved by placing clear bags inside a garbage can.

9.4 Organics Diversion Initiatives

9.4.1 Backyard Composting

The Town encourages residents to manage suitable organic materials through backyard composting. Backyard composting is ideal for a municipality such as the Town of South Bruce Peninsula due to the high percentage of rural properties and single detached homes which have the capacity and increased convenience for composting.

It is recognized that there seems to be a general misconception that backyard composting will attract bears, limiting the success of this diversion opportunity. Due to the fear of attracting bears, the promotion and implementation of a successful backyard composting initiative remains challenging. However, through proper management of the composting activities (i.e. keep aerated, compost only plant-based materials, etc.) and/or the use of alternative composting systems, the likelihood of bears becoming a nuisance is low.

The Green Cone Digester is being increasingly promoted by Municipalities as an alternative way to promote backyard composting that avoids animals. According to the designers *'the goal was to sustainably and efficiently get rid of kitchen waste without interference from animals'* (compostec.ca). It is designed as a completely enclosed system capable of handling the full spectrum of kitchen waste, such as fruit and vegetable waste, meat scraps, dairy, oil, seafood scraps, and pet waste. According to the information available, it can manage up to an estimated 10 pounds of kitchen waste per week. Therefore, the onsite use by households of a Green Cone digester for kitchen waste in combination with traditional composters for yard waste (and fruit/vegetable waste as needed) is considered to be a viable alternative to a centralized green bin system.

Consistent with O.Reg 101/94, the Town should consider the implementation of a program for home composters. The Town could consider subsidizing both traditional and/or Green Cone composting units as a way to encourage and promote home composting. Additional information and educational materials would likely be required to support this initiative, this could be provided on the Town's website. Further, continued public education through local media and newsletters should be considered to educate residents on the benefits of backyard composting and methods to avoid attracting bears.

9.4.2 Leaf and Yard Waste Diversion

Although difficult to quantify, it is anticipated that a significant volume of leaf and yard waste is diverted from the landfill through on-property management (i.e. grass-cycling, backyard composting, burning of brush at rural properties). For residents who choose to dispose of brush and leaf and yard waste, the Town offers the option to drop-off of these organics at its landfill site. There, the brush and leaf and yard waste (including clean wood) is segregated from the residual waste and is eventually used as interim cover.

9.4.3 Source Separated Organics Collection and Processing

Increased diversion of organics can be achieved under an extended 'Source Separated Organics Collection' scenario. Depending on the processing method, SSO waste can include dairy products, plants and flowers, food scraps, vegetables, fruits, grain products, meat, and paper that is not recyclable. Hygiene products (e.g. diapers) and pet waste can also be considered SSO, however are only accepted at a limited number of facilities. Generally, these wastes are processed at a central processing facility via windrows, aerated static piles and in-vessel composting, or anaerobic digestion. These processing facilities generally require a large and somewhat consistent volume of organic material to be economically feasible and are more common to jurisdictions with greater population bases.

An effective and extended source separated organics program has the potential to significantly reduce waste disposal in landfills. Based on information from other municipalities who have implemented such programs, an

additional waste diversion of 10% to 20% has been achieved with this option. Further, it is thought that the eventual implementation of SSO programs will be required for municipalities to meet the waste diversion targets set out in the Waste-Free Ontario legislation. However, as noted above, this system is dependent on economies of scale. Provided in the **Table 9-2** are the cost estimates associated with an SSO program.

TABLE 9-2: SSO Program Cost Estimates

Process	Set-up Requirement	Planning Period	Budgetary Cost Estimates	Total Cost
Municipal Processing Facility				
Approvals	- Design and Operations Plan - Hydrogeological Assessment - Drainage Study - Odour Impact Assessment and Management and Control Plan	> 5 years	$150,000 - $200,000	**Per Household:** $55 - $95(1) /yr **Town (Annually):** $400,000 to $650,000 **Cost per Tonne:** $650 to $1,600
Development	- Construction and engineering of processing facility		$600,000 - $900,000	
Equipment	- Purchase of processing equipment		$200,000 - $400,000	
Operation of Facility	- Salaries, compost quality monitoring, utilities, equipment maintenance, etc. - Environmental monitoring and reporting		$150,000 - $300,000/year	
Curbside collection	- Agreement with waste collection contractor		$25 - $35 per household (2)	
External Processing Facility				
Curbside Collection	- Agreement with waste collection contractor	±6 months	$35 - $50 per household (2)	**Per Household:** $40 - $65(3) /yr **Town (Annually):** $280,000 to $440,000 **Cost per Tonne:** $475 to $1,100
Processing (Tipping Fees)	- Agreement with external processing facility (i.e. GFL, Guelph Organic Waste Processing Facility, All Treat Farms in Arthur)	±6 months	$110 to $140 per Tonne	

Notes:
(1) Applies capital costs amortized over 25 years at 5% interest per year.
(2) Assumes a single stream collection method for the Towns 6,945 households. Costs can vary significantly based on the Town's proximity to the SSO Facility and contract terms (i.e. weekly or bi-weekly pick-up).
(3) Assumes an organics collection rate of 400 to 600 tonnes per year with full curbside garbage collection.

As shown in **Table 9-2**, the development of a municipally owned organics processing facility is estimated to cost between $950,000 and $1,500,000 with annual operating costs estimated to be between $150,000 and $300,000. Including collection costs and amortizing the capital costs over 25 years, the estimated cost to the Town for a municipal processing facility would be in the range of $55 and $95 per household, annually. Assuming an organic collection rate of 400 to 600 tonnes annually, this would be equivalent to greater than $600 per tonne. Based on the limited population of the Town and the scale requirements for the effectiveness of such a facility, a Town-owned organics processing facility is not considered to be a viable option. However, a partnership with other Municipalities or the formation of a cooperative similar to BASWR but aimed at SSO diversion, would serve to increase the economy of scale thereby improving the economic viability of an SSO Program.

An agreement with an external processing facility may be a more economical option for the Town considering the potential access to, and use of, the waste processing facilities in the City of Guelph, the Orgaworld London composting facility, and the All Treat Farms composting facility in Arthur. Costs associated with using an external

organic waste processing facility would include the collection and transportation of the SSO and disposal fees (tipping fees). Based on cost estimates obtained (per tonne), the total cost associated with this alternative is estimated to be between $40 and $65 per household annually, or greater than $475 per tonne. However, costs associated with collection and transportation are highly variable and would be dependent on the proximity to the facility and the level of service desired (i.e. weekly versus bi-weekly). Further, it is assumed that the collection and transportation of this material to an approved facility would be completed in a single stream truck contracted out to another provider (i.e. GFL, Miller Waste, Waste Management etc.).

With respect to the implementation of an SSO program in the Town of South Bruce Peninsula, it is noted that a significant proportion of the costs are associated with the collection and transportation expenses which are typically higher in rural areas characterized by low density populations. Furthermore, the diversion rates accomplished with the SSO program are typically lower in rural areas, particularly in agricultural areas, where on-property organics diversion can be easily achieved with the use of backyard composting or via the use of this material as feed for the animals.

As previously discussed, a key proposed action towards a Waste-Free Ontario is the development of the Food and Organic Waste Action Plan to reduce the volume of food and organic waste going to the landfill. As part of the action plan the province has reportedly committed to eventually banning food waste from disposal to increase diversion of these organic wastes and reduce greenhouse gas emissions. Therefore, although it is likely that consideration for a Green Bin program will eventually be necessary for the Town to meet the Provinces waste diversion targets, the Town could consider further promoting backyard composting until such a time that the Green Bin Program becomes a more viable option.

9.5 Education, Oversight, and Enforcement

It should be recognized that waste reduction, re-use, and recycling relies largely on behavioural changes. Behavioural changes are typically established through educational programs, policy changes, and/or enforcement. Several provincial organizations have completed studies on best practices in municipal recycling programs. One of the key findings is that a sustained promotion and education program is essential to inform residents of program changes and to remind them continuously of what's recyclable and how to prepare materials. The investment in promotion and education generally results in increased diversion of re-usable and recyclable items from the residual waste stream.

9.5.1 Educational Initiatives

Educational materials can be supplied to Town residents to strengthen commitment from the community with respect to waste diversion. As noted in the previous section, the Town currently provides residents with waste management program information and diversion initiatives through mail and through the Town website. As well, the Town website provides a direct link to the BASWR website. These methods of informing residents of the waste diversion programs available and any changes to the waste management practices in the community are considered to be relatively cost effective and reach a broad audience.

However, it is thought that additional informative materials (or links) could be provided on the Town's website to further educate the public and promote other waste diversion efforts (i.e. re-use depots, backyard composting, etc.). Further, some municipalities have partnered with bale wrap processing companies which collect agricultural film, including bale wrap, silage bags, net wrap and silage tarp, directly from the farmer. These municipalities ensure the contact information and requirements are easily available to their agricultural community via a direct link to the providers included on their website. The Town may consider adopting a similar approach.

It is recommended that any new and existing waste reduction, reuse, recycling and/or composting initiatives undertaken by the Town be relayed to the local residents in a similar manner. As the use of web-based media and communication (such as email, twitter, facebook, etc.) continues to become more popular, it is recommended that the Town continually investigate such alternative options for communication and notification. Some municipalities have initiated a notification system for residents that actively register. We recommend that such programs be considered supplementary until it can be confirmed that a sufficient audience is included through such programs.

Increased education and promotion of new and existing programs would help to increase the community's commitment to the waste diversion programs made available to the residents and help ensure that the programs are used effectively. Therefore, increased encouragement of diversion is recommended in future communications. In addition, provided the limited capacity of the landfill, in terms of site life, educating the broader public about the landfill and the cost implications for alternative disposal may help to encourage the waste diversion and reuse initiatives.

9.5.2 Information Distribution

Information regarding the Town's waste management practices and educational materials pertaining to the Town's waste diversion initiatives has involved the distribution of pamphlets to all its residents via mail, and the placement of information on the Town's website. The combination of these two methods is considered to be an adequate means to ensure information and educational materials are reaching the Town's population base, providing that the information is presented in a clear and concise manner.

It is recommended that the Town continue to provide diversion and general waste management program information with the annual waste collection calendars and through the Town website. The Town could consider including program information within, or with, the annual calendars and on the municipal website including the following, at minimum:

- Recyclable blue box materials list and sorting guide (BASWR Handout)
- Promotion of other Waste Diversion Options (i.e. appliances, scrap metal, tires)
- Household hazardous waste collection events and acceptable wastes
- A map of the landfill location and hours of operation and name, address and materials accepted at recycling depots
- Promotion of reuse options and locations (i.e. clothing donations, Habitat for Humanity etc.)
- Composting options including home composting tips and leaf and yard waste diversion options

The information should be presented in a way that is easy to read and follow, including pictures. This will help to achieve a higher level of public education related to the diversion options currently provided to municipal residents and should be used to inform (i.e. highlight) the residents of any changes.

9.5.3 Oversight and Enforcement

The success of a waste diversion program relies on compliance and commitment from the community. To ensure more widespread participation and compliance in waste diversion programs, the implementation of policies and/or By-laws requiring that residual, recyclable and reusable waste be properly sorted by residents for diversion and disposal can be effective provided they can be properly enforced (i.e. clear bags). Some municipalities impose a fine for multiple offences.

At this time, the Town has a By-law in place that discourages residents from mixing recyclables with residual waste by imposing a surcharge of 100%. This is intended to encourage residents and businesses to recycle. However, the Town does not have a By-Law in place that prevents the inclusion of MHSW or WEEE along with the household waste. While the implementation of such By-laws does not require many operational/service adjustments, in order to assist with the monitoring and enforcement programs the contracted curbside collector

would be required to keep a record of infractions of the policy at the curb and the landfill attendants would be required to keep a record of the occurrences where banned materials are brought to the landfill site for disposal.

9.5.4 Measurement of Program Success (Audits)

Promotion may also take the form of waste diversion status and/or challenges for achieving waste diversion/disposal goals. The success of a municipalities waste reduction/diversion programs and strategies can be measured on a regular basis (i.e. every year or two) and used to further encourage and promote waste diversion within the community. Many municipalities have conducted audits to determine what is in household garbage bags/bins in order to assess the success of the established waste diversion programs and evaluate how to best improve the waste management practices (i.e. establish short-term and long-term goals). Additional educational programs and further enforcement (i.e. bylaws) could be used to help remove these wastes from the residual waste stream. In addition, results of the regular audits could be used to inform the residents of their waste diversion status and promote further diversion through challenges for achieving set waste diversion/disposal goals.

9.6 Summary of Alternative Waste Prevention and Diversion Options

Summarized in **Table 9-3** are the prevention and diversion options available to the Town with the associated estimated costs and gain in diversion rates. It should be noted that the SSO options are considered to be medium-term initiatives and may be considered cost-prohibitive at this time. It is recommended that the Town continue to stay informed of new RPRA program plan initiatives, provincial policy, and funding opportunities that may become available.

TABLE 9-3: Options for Improved Waste Reduction and Waste Diversion

Option and Description	Set-Up Requirements	Requires Promotion [1]	Estimated Bugetary Cost	Potential Additional Diversion Estimates
Recycling Initiatives				
Blue Box Collection Service:				5% to 10% (May encourage additional diversion from the IC&I sector)
Provision of Free Blue Boxes/Bins	Included in Service	X	Nominal	
Addition of Recycling Depots	Included in Service	X		
Investigate opportunity to provide and use larger disposal bins	Included in Service	X		
Offer an increased level of service, aimed at the tourism industry, during the peak tourist season	Would require consultation and cooperation with BASWR	X	$15,000 - $25,000	
Augment existing service by including a broader range of acceptable materials	Would require consultation and cooperation with BASWR	X	Nominal	
Frequency of curbside pickup: Should be at the same frequency as the residual waste pick-up service	Would require an update to the contract(s) for waste collection, cost would be dependent on service provider.		Weekly: $20,000 - $100,000	
			Biweekly: Savings wold be achieved	
Consolidated and Enhanced Waste Receiving and Transfer Area	ECA Approval for amendment (MECP), Planning, Design Drawings and Construction	X	$40,000 to $100,000 depending on Design	5% to 15%
Additional Waste Diversion Opportunities:				
* Additional Scrap Metal Diversion Initiatives	Staff Training and Oversight Agreements with external Processing Facilities Preparation and distribution of promotional materials	X	Less than $1,000	Less than 1%
* Creation of a separate waste diversion stream for C&D waste		X	$50 to $100 per tonne	5 to 10%
* Expansion of a separate waste stream for polystyrene		X	$50 to $100 per tonne	Less than 1%
* Promotion of bale wrap diversion alternatives on Town's website		X	Less than $1,000	Less than 1%
IC&I Outreach and Collaboration	Promotion & Agreements with local businesses/waste collection providers	X	≥ $5,000	5% to 10%
Waste Reduction Initiatives and Reuse Opportunities				
Construct/Promote reuse building (or storage container)	Construct or purchase a storage facility	X	$10,000 to $50,000	1 to 2%
Clothing donation bin	Bin placement/partnership	X	$2,000	1 to 2%
Adjust tipping fees at landfill from a $9 minimum to $15 (or fee increase as determined by Town)	Education	X	Increased Revenue	2 to 5%
Implement a FULL pay-per-use fee system	Promotion and education	X	Increased Revenue	
Reduced Bag Limit for curb-side waste and at landfill (from 3 bags to 2 bags)	Promotion and Education	X	N/A	
Implement Clear Bag Policy (with or withour provision for a 'privacy' bag)	Promotion and education	X	Increased Revenue	
Organics Diversion Initiatives				
Further encourage the use of backyard composters and/or digesters	Promotion and education (Cost would be dependent on subsidy level)	X	$2000 to $10,000	2 to 5%
Leaf and Yard Waste Diversion	Promotion and education	X	Less than $1,000	
Leaf and Yard Waste Curbside Collection Service (once or twice annually)	Agreement with waste collection provider	X	$5,000 to $15,000	
Source Separated Organics (SSO) with external processing facility (medium to long term)	Agreement with external processing facility, collection contract		$40 to $95 per household annually Greater than $475 per tonne	10% to 20%
Education, Oversight and Enforcement				
Information distribution including collection schedules and detailed information on new and existing waste diversion programs	Promotion and education: Preparation and distribution of relevant materials.	X	$10,000 to $20,000	Success of programs is dependent on participation. Education increases participation.
Educational initiatives that provide information to residents regarding waste diversion initiatives and details, such as acceptable and unacceptable materials, depot locations and website links.	Promotion and education: Preparation and distribution of relevant materials.	X		
Update website to include information on additional waste diversion opportunities, including links to pertinent websites and life of landfill	Set-up by Township Staff or contracted out. Promotion of website.	X	$5,000 to $10,000	
Establish By-Laws (i.e. mandatory diversion of leaf and yard waste, MHSW etc.)	Policy, oversight, and enforcement (i.e. Clear Bags and/or random waste inspections)		$2,000 to $5,000	2-4%
Impose a mandatory recycling By-law for residents and businesses				
Additional policies and or by-laws may need to be considered as additional waste diversion initiatives are implemented	As required		N/A	N/A

Note:
(1) Several initiatives require that information be posted on the Town's website as well as the preparation and distribution of promotional materials. The estimated cost for these efforts is provided in the educational heading.

10. EVALUATION OF RESIDUAL WASTE MANAGEMENT OPTIONS

Under current operational practices and residual waste disposal rates, it is estimated that the Amabel landfill will reach capacity in approximately 12 years (i.e. circa 2031). Provided that one of the goals of Waste Management planning is to ensure the efficient use of the resources available and to continually strive towards an economically and environmentally sustainable community, consideration should be given to optimizing the existing disposal capacity available. Adjustments to the current landfill operations could result in an additional site life of up to 5-years (i.e. circa 2036).

Due to the costs associated with new or expanding landfills, or alternative disposal methods (e.g., exporting waste, incineration, etc.), it is important to manage the remaining capacity efficiently to ensure the Town's waste disposal security and relatively low waste management costs in the near future. As previously discussed, the most effective operational methods to extend the life of a landfill are as follows:

- To improve site operations, such as the efficient use of interim cover (i.e. no greater than 20%) and the efficient use of the existing compactor in order to more effectively compact the waste. Increased compaction would allow for more waste to be deposited within a given volume. This can be achieved by increasing the number of passes over the waste and spreading waste and cover in thinner layers;
- Consolidate the waste receiving area to a specified 'waste receiving and transfer' area. This area could be designed to include the weigh scale and an enhanced waste receiving area, including bins for residual waste transfer. Keeping residential deliveries from the active face typically increases waste separation and diversion; and
- Ensure proper oversight of the waste receiving area, including adequate and trained staff.

It is recommended that these measures be implemented in the short-term in order to maximize on the benefits that can be achieved. Once the Town's current approved capacity is exhausted, the Town will require further waste disposal capacity or alternative disposal options to meet their needs. The following section of the report evaluates potential residual waste disposal options available to the Town for future consideration.

Currently, there are two general approaches to residual waste disposal: incineration/thermal or landfilling. This Study separates the discussion based on these two general approaches. Within each approach, municipally owned and out-sourced facilities (i.e., third party) have been reviewed at a conceptual level. A summary of the evaluations discussed herein is presented in **Table 10-1**.

10.1 Evaluation Criteria

As part of this Study, residual waste disposal options are reviewed at a conceptual level since there are many unknowns that cannot be accounted for. Several of the waste disposal options include the involvement of third parties, and require political and regulatory support, which cannot be estimated with certainty. Additionally, the estimated costs for many of the approaches cannot be known until such a project is complete. Therefore, each approach provides for an evaluation of the advantages and disadvantages based on the following issues:

1. **Security of Disposal Option**
   - Municipal control of management and operations;
   - Control of costs; and
   - Long-term availability of disposal option.
2. **Certainty of Approval**
   - Environmental Assessment requirements;
   - Use of existing approvals; and/or
   - Infrastructure, proven technology in Ontario.

3. **Applicability**
   - Requirement of third-party partnership(s);
   - Waste generation requirements; and
   - Operational scale requirements.

4. **Environmental Security**
   - Waste transport requirements;
   - Potential environmental impact;
   - Engineered versus natural attenuation landfill; and
   - Amount of residual waste at end of process.

Each of these factors has been assigned a low, medium or high designation based on a qualitative evaluation of factors, which are generally discussed for each option specified. A low designation is considered to be a negative weighting and high designation is considered to be favourable.

10.1.1 Cost Evaluation

Since there are many variables with respect to cost, a range of budgetary costs are provided for each approach. Additionally, these costs are provided for comparative purposes only. More detailed costs would require conceptual design and initial site selection considerations. The costs include capital requirements and estimated long-term requirements in 2019 values. The long-term cost estimates include annual operational costs and capital costs amortized over 25 years. Since this is a comparative exercise, valuation of costs is not conducted as part of this Study.

It should be noted that the estimate of long-term costs is considered conservative. For example, it is considered possible to obtain approval for the development of a considerably larger volume of waste (i.e., greater than 500,000 m^3) at a similar cost range depending on the site conditions. Likewise, the lifespan of a thermal facility may be greater than 25-years with potential refurbishment costs.

10.1.2 Planning Period

An estimate of the planning period for each approach is provided for within **Table 10-1**. The planning period is based on the establishment of the infrastructure and the potential approval process. Where an EA is required, a planning period of a minimum of 5 years has been selected based on the approval period for waste disposal systems in Ontario.

10.2 Landfilling

Landfilling provides the most traditional and established method of residual waste disposal in Ontario and continues to be the most widely used residual waste disposal option. Historically, it has been shown to be the most cost-effective manner to dispose of residual waste. However, based on the Waste Value Chain (**Figure 3-1**), landfilling without energy capture is considered to be the least preferred alternative.

10.2.1 Development of Additional Capacity at Existing Landfill Site (Less than 40,000 m^3)

The Town has historically been serviced by the Amabel and Albemarle Landfill Sites. Although there is additional approved capacity potentially available under the historic Approval for the Albemarle landfill site (pre-consultation with the MECP has been initiated), subject to the findings of the Hydrogeological Assessment and Ministry approval, there is no additional development potential under the historic approval for the Amabel Landfill. However, landfill expansions limited to 40,000 m^3 are not subject to the requirements of the Environmental Assessment Act (EAA), therefore landfill expansion at the Amabel Landfill site is considered to be a viable short-term option for the Town, should it be considered advantageous as this landfill site approaches its maximum capacity (i.e. to provide additional time for the implementation of the desired future waste disposal option). Based on our experience, this approach would only be applicable as the landfill approaches full capacity and would be subject to the results of the on-going monitoring programs/impact assessment.

It is estimated that an additional capacity of up to 40,000 m^3 would provide for an additional ±4 years of landfill capacity for the Town. Provided that the footprint of the Amabel Landfill site, based on the existing design, encompasses the entire approved 8.1 hectares, this additional capacity could likely be achieved by raising the approved top contours. Preliminary estimates suggest that the previously approved top contour elevation of 113 m above the assumed elevation datum would need to be adjusted to 114.5 m to accommodate 40,000 m^3, an increase of as estimated 1.5 meters. It is reasonable to expect that the request for additional capacity at the Amabel Landfill, to be placed on top of the existing landfilled area within the previously approved area, would be cost effective, would have a high probability of approval, and is considered to have a high level of security – albeit in the short-term.

The development of the additional landfill capacity requires approval from the MECP, which is dependent on the successful completion of the application process. To support the application process, it is anticipated that a Plan of Development and Operations (PDO) would be required. Since the additional capacity could be placed within the previously approved 8.5-hectare footprint, it is our understanding that an updated Hydrogeological Assessment would not be required, however, this would be subject to MECP clarification and approval. Further regulatory consultation and/or investigation would provide more certainty regarding these options. It should be noted that there is the possibility of not succeeding with the application or the conditions imposed by the MECP may not be economically feasible to proceed with the expansion. The success of the application or economic feasibility of developing the short-term additional capacity is dependent on a number of variables, including the proposed type and amount of waste to be landfilled, the geologic conditions of the site, environmental sensitivity, etc.

Together with the minor increase in capacity of the Amabel Landfill site for municipal waste, for less than 40,000 m^3, the Town would still be required to consider alternative waste disposal options, as outlined further below. The landfill expansion process for the Amabel Landfill, limited to municipal non-hazardous waste, is estimated take 2 to 4 years to complete.

Security of Option:	High (albeit, not a long-term solution)
Certainty of Approval:	Medium
Applicability:	Dependent of other options
Environmental Security:	Medium
<u>Comparative Cost Range:</u>	
Capital Costs:	$150 to $250 K
Long-term Costs:	$70 to $100/tonne (limited to additional 4-year site life extension)
Lifespan:	Up to 4 years

10.2.2 Development of Approved Capacity at Existing Landfill Site (Albemarle)

Following a review of the Approval for the Albemarle Landfill, it was identified that the ECA may not have fully considered potential future development of the approved 10.1-hectare waste disposal site. With respect to the 'Site', which is defined as the 1.60 hectare landfilling area, Conditions 27 and 28 of the Approval states that:

- *The total approved Site capacity air space volume is 60,000 m^3 (waste and interim cover);*
- *The maximum height for the refuse and final cover shall not exceed 102.75 meters above the assumed elevation datum; and*
- *No waste shall be deposited at the Site after the final contours have been attained.*

These Conditions are based on the area outlined and designed within the Hydrogeological Assessment and Plan of Development and Operation prepared by Stantec Consulting Limited (March 1998), which excluded 8.5 hectares of the previously approved waste disposal area. Consistent with other Approvals issued around that time, the approved site capacity and landfill contours are based on those for which design plans for the development and use of the landfill were received and reviewed by the Ministry, rather than the total approved area for waste disposal.

Ministry requirements and process associated with additional development at the Albemarle Landfill Site remain unclear. Pre-consultation with the MECP seeking clarification of the required approach for future landfilling within the remaining approved area at the Albemarle Landfill Site has been initiated via correspondence dated June 12, 2019. A copy of this correspondence is provided in **Appendix C**. However, if the Ministry recognizes the landfill area previously considered in the original approval, additional development would not be considered to be part of a new nor expanding landfill and may not be subject to the EAA process.

Under this scenario it is thought that the development of the Albemarle Landfill beyond the currently approved limit of fill (i.e. 1.6-ha landfill area), and within the remaining previously approved 8.5-hectare area, may only require an amendment to the ECA. The application to amend the ECA would require supporting information including an updated hydrogeological report to assess the suitability of the area to support landfill development from a hydrogeological perspective and, pending the findings of the hydrogeological assessment, a revised design and operations plan; all of which would be subject to MECP review and a decision to grant the amendment would be determined based upon the merits of the submission.

While the original ECA identified an approved 10.1-hectare landfill area, the associated volumetric capacity was not defined. In such a scenario, in which there is insufficient information within the original documentation for the site with respect to the landfill limits and final elevations, the theoretical maximum capacity can be used as an initial reference. The theoretical maximum capacity for a specified area can be estimated using the methodology described in the document entitled "Landfill Capacity Determination" issued by the MECP in December 1993. Using this methodology, the theoretical maximum air-space capacity for the Site is calculated to be approximately 1,337,000 m^3 for waste and interim cover. In consideration of the site capacity used, the remaining theoretical capacity is estimated to be 1,300,000 m^3. It is noted that the maximum theoretical capacity calculated may not be achievable due to various physical (i.e. fill height) and environmental constraints at the Site. However, it is thought that this area could provided the Town with an estimated 30 to 60 years of capacity, depending on the site constraints and landfill design.

Capital costs to utilize the remaining 8.5-hectare approved area at the Albemarle landfill site are estimated to be in the range of $3 to $8 million. Annual operating costs, such as the operation of a leachate capture and treatment system, general operations and oversight, monitoring, reporting, and contingency costs, are estimated to be approximately $70 to $110/tonne and the resultant long-term costs are estimated to be in the range of $100 to $180/tonne, possibly higher based on changing Provincial regulations.

Security of Option:	High
Certainty of Approval:	Low to Medium (No EA process, but shallow bedrock may limit development)
Applicability:	Low to Medium
Environmental Security:	Low
Comparative Cost Range:	
Capital Costs (Expansion):	$3 to $8 Million
Long-term Costs:	$100 to $180/tonne
Lifespan:	30 to 60 year site life (depending on site constraints and landfill design)

10.2.3 Landfill Expansion (Greater than 40,000 m^3) or Development of New Municipal Landfill

The expansion of the existing Amabel Landfill Site or the development of a new landfill, should an appropriate location be established, requires the completion of several studies to support development, including a detailed hydrogeological assessment, completing the Environmental Assessment (EA) process, and completing the landfill design, which may be required to be an engineered site (i.e., require leachate collection, etc.). Based on the requirement for the EA process, which includes extensive public and agency consultation, ultimate approval of the site cannot be guaranteed. In consideration of the EA process, the processing time for the expansion of the Amabel Landfill site or development of a new landfill is estimated to be in the range of 5 to 10 years. Landfill expansion options and costs are discussed below.

Amabel Landfill Site Expansion (Expansion to Previously Identified Area):

The option to expand the Amabel Landfill site was investigated as part of the Waste Management Plan prepared by Pryde Schropp McComb (PSMI, August 2011). The preliminary assessment of the site identified an area encompassing approximately 5.0 hectares to the east of the existing approved landfill. This area was determined to represent the most feasible location that would provide the greatest area for potential landfill expansion based on PSMI's interpretation of the overburden and bedrock geology, the location of the existing surface water features within and surrounding the site, the groundwater flow direction and proximity to the property limits/compliance boundaries (i.e. buffer areas). According to PSMI, assuming the *'same landfilling limits of height and depth were in effect for this expansion zone the air space available for expansion would be approximately 400,000 m^3'*. Further, it is noted that the additional capacity could be greater if adjustments to the final contour height were also considered as part of the design for the entire 13.1-hectare area (i.e. existing approved area and 5.0-hectare potential fill area combined).

Capital costs, including the EA Process requirements, are estimated to be approximately $4 to $8 million for landfill expansion. Annual operating costs, such as the operation of a leachate capture and treatment system, general operations and oversight, monitoring, reporting, and contingency costs, are estimated to be approximately $70 to $110/tonne. The resultant long-term costs are estimated to be in the range of $105 to $180/tonne, possibly higher based on changing Provincial regulations.

Security of Option:	High
Certainty of Approval:	Low to Medium
Applicability:	Medium
Environmental Security:	Low
Comparative Cost Range:	
Capital Costs (Expansion):	$4 to $8 Million
Long-term Costs:	$105 to $180/tonne
Lifespan:	Greater than 25 years (depending on site constraints and landfill design)

Amabel Landfill Site Expansion (Optimize Capacity - Raise Top Contours):

Additional landfill capacity could also be acquired by increasing the approved top contours, rather than increasing the approved area. From an impact assessment perspective, increasing the waste thickness would have less of an impact on the surrounding environment when compared to increasing the fill area. Preliminary estimates suggest that an additional capacity in the range of 150,000 m^3 to 180,000 m^3 could be achieved by increasing the top contours by 6 to 8 meters in height, or to a total maximum thickness in the range of 19 to 21 meters.

Capital costs are estimated to be approximately $1.5 to $5 million. Costs associated with raising the top contours of the landfill would be less due to the elimination of costs associated with site preparation and construction (i.e. placement of a liner). Although, most of the landfill infrastructure, such as the stormwater management system, may already be developed, the development of a leachate treatment system may still be required. Similar to other landfill expansion options, annual operating costs are estimated to be approximately $70 to $110/tonne, possibly higher based on changing Provincial regulations. However, due to the lower capital costs, the long-term costs are estimated to be lower than expanding the landfill footprint or the development of a new landfill site.

Security of Option:	High
Certainty of Approval:	Medium
Applicability:	Medium
Environmental Security:	Medium

Comparative Cost Range:

Capital Costs (Expansion):	$1.5 to $5 Million
Long-term Costs:	$85 to $155/tonne
Site Life:	10 to 20 years of capacity (depending on site constraints and landfill design)

New Landfill Site:

A new landfill site could be considered in a location thought to provide convenient access to the majority of residents in the Town of South Bruce Peninsula provided that the site characteristics, such as the overburden and bedrock geology and hydrogeology could support it. In general, the cost for a new landfill would be expected to be greater than expanding the existing approved waste disposal sites, with capital costs estimated to be in the range of $6 to $10 million. However, annual operating costs would be expected to be similar to that of an expanded site and would ultimately be dependent on Provincial regulations.

Security of Option:	High
Certainty of Approval:	Low
Applicability:	Low
Environmental Security:	Low

Comparative Cost Range:

Capital Costs (New Landfill):	$6 to $10 Million
Long-term Costs:	$120 to $200/tonne
Site Life:	Greater than 25 years (depending on site constraints and landfill design)

It is noted that landfill costs are greatly affected by the daily volume of material received, in other words *'volume significantly impacts feasibility'* (Eilrich, Doeksen and Van Fleet, 2002). Therefore, in sparsely populated rural areas where small daily generation rates are expected, regional landfills may be a more economical option, such as a County-wide approach to landfilling. Increased rates of disposal generally decrease the average cost per tonne due the numerous fixed costs, including site selection, supporting documentation, approvals, equipment, labour and required post-closure monitoring and oversight.

10.2.4 Landfill Mining

Landfill mining and reclamation is a process in which solid wastes that have been previously landfilled are excavated, sieved and sorted. Using an excavator or front-end loader, materials are placed or conveyed to a series of trommels (i.e. sieves/sorting machinery) which separate materials by size. Landfill mining and processing has the potential to recover materials such as appliances, wood, tires, metals, plastics and fabrics, ultimately in an effort to reduce the landfill mass and recover landfill capacity. Following processing, the waste streams that can be diverted and/or sold are loaded onto trucks and hauled off-site. In general, with the exception of aluminum and steel, the quality of the materials reclaimed for recycling and reprocessing purposes is not as high as initially recycled materials. Once the landfill mining process is completed the remaining materials must be landfilled and the landfill area re-graded, re-shaped and closed.

Several factors can affect the cost of landfill mining including the volume, soil conditions, climate, regulatory approval process, equipment requirements, excavation and screening costs, labor rates and contracting fees, and the revenue from the sale of the processed materials (i.e. tires, WEEE, and scrap metal). As part of the approval process, odour controls and leachate management would need to be addressed. It is thought that the operational costs associated with landfill mining and reclamation would likely far outweigh the benefits related to the capacity gained and the sale of the reclaimed commodities. As with many technologies, the limited scale of the Landfill Mining for the Town would limit applicability. Further, since a large portion of waste has been buried for over 20 years, it is likely that portions of the landfill will include wastes that have been burned prior to burial as well has highly variable degrees of degradation and amounts of cover material.

The costs provided indicate the cost per tonne of volume created through the process. Since the recovery rate can vary significantly, the cost also varies significantly.

Security of Option:	High
Certainty of Approval:	Medium
Applicability:	Low
Environmental Security:	Low

<u>Comparative Cost Range:</u>	
Capital Costs:	1.5M to 3M
Long-term (Overall) Costs:	$70 to $130/tonne, or greater (ultimately dependent upon capacity gain achieved)
Lifespan:	Unknown, dependent on airspace capacity gain achieved

10.2.5 Municipal Partnership at Existing Landfill (or Agreement)

This option involves either developing a partnership with another Municipality in order to consolidate landfill services or the development of an agreement with a nearby Municipality to accept the Town's waste at an existing approved landfill identified to have significant capacity.

For example, the Municipality of Northern Bruce Peninsula was noted to have significant capacity available. When comparing the relative contributing populations, should the Municipality of Northern Bruce Peninsula permit additional residual waste disposal from the Town, the site life for their primary landfill site (i.e. Eastnor) would likely decrease by 60% to 70%. Although there are operational and financial benefits that can be achieved by another nearby municipality accepting the Town's residual waste, the receiving Municipality will need to consider the resulting decreased site life and the higher disposal costs typically associated with the alternative waste disposal methods.

Without a service/benefit to offer a neighbouring municipality, there would be little to no incentive for an outside municipality to accept the Town's waste. Therefore, the applicability of this option is considered to be low.

Security of Option:	Low to Medium
Certainty of Approval:	Medium to High (receiving Municipality may need to amend their Approval)
Applicability:	Low
Environmental Security:	Medium
<u>Comparative Cost Range:</u>	
Capital Costs:	Less than $500,000
Long-term Costs:	$100 to $150/tonne depending on type of agreement (i.e. partnership or contract)
Lifespan:	Dependent on terms of agreement (i.e. contract)

10.2.6 County-Wide Approach to Landfilling

Several jurisdictions have identified opportunities for shared service arrangements as a means to achieve potential cost reductions, such as implementing a County-wide approach to waste management services, including collection, transfer and disposal (i.e. Oxford, Wellington and Waterloo). Focusing disposal to one landfill at a time has additional environmental and long-term regulatory advantages in that impacts are typically greatest during a landfill sites' operational years, and the contaminating life-span is typically limited to a site-specific timeframe (e.g. 25-years post closure). Therefore, achieving site closure at the smaller capacity landfills within a shorter timeframe would likely reduce the long-term regulatory oversight requirements and associated costs (i.e. monitoring and reporting) at some landfill sites.

Although the relative availability of approved landfill capacity for each municipality within the County of Bruce is highly variable, the benefits associated with consolidating the landfill operations and services may take advantage of economy of scale and result in cost savings for the municipalities involved. However, it is recognized that additional complexities may arise due to the involvement of multiple parties/stakeholders. In particular, interest from member municipalities with significant capacity may not wish to "share", or forfeit, approved volume.

Given that there is a significant amount of landfill capacity within the County, it is recommended that the County of Bruce, and its Municipalities, continue to investigate the potential for a County Managed Waste Management System.

Security of Option:	Low to Medium
Certainty of Approval:	Medium to High (receiving Municipality may need to amend their Approval(s))
Applicability:	Low: Requires Political Co-operation
Environmental Security:	Low to Medium
Comparative Cost Range:	
Capital Costs:	$500,000 to $1.5 Million (Primarily administrative and legal)
Long-term Costs:	$100 to $150/tonne depending on how compensation is provided to Municipalities with significantly greater approved capacities.
Lifespan:	Greater than 25 years (depending on site constraints and landfill design)

10.2.7 Municipal Partnership for Development of New Landfill

Based on the information available, the Town of Saugeen Shores has capacity for an additional ±10 years, which, assuming the Town implements the operational improvements outlined herein, is estimated to be similar to the remaining site life of the Amabel landfill. Based on the similar long-term waste management needs, the Town could explore the possibility of a partnership for the development of a new landfill. In order to more efficiently align the landfill closures, the Town may need to consider applying for the landfill expansion (i.e. for less than 40,000 m^3), previously discussed.

Once a suitable site has been selected, the process and site development would be the same as for the Town with the same estimated planning period of 5 to 10 years. It is recognized that additional complexities, particularly with site selection, may arise due to the involvement of multiple parties/stakeholders. However, the development of a new landfill with municipal partners can take advantage of economy of scale and result in cost savings for the municipalities involved.

Security of Option:	High
Certainty of Approval:	Medium
Applicability:	Low
Environmental Security:	Medium
Comparative Cost Range:	
Capital Costs:	$6 to $12 Million, split between partners
Long-term Costs:	$70 to $140 /tonne estimated: would depend on partnership details
Lifespan:	Greater than 25 years (depending on site constraints and landfill design)

10.3 Thermal and Incineration Waste Disposal Options

Thermal and incineration technologies involve the breakdown of waste and production of energy through gasification or combustion. These technologies typically provide a reduction of residual waste in the range of 60% to 95%, depending on the technology. Thermal and incineration technologies are typically effective only at large-scale operations where sufficient feed-stock material (i.e., waste) is available and the feed-stock quality is relatively consistent. This approach is capital intensive since it requires relatively complex infrastructure to conduct operations. Additionally, operation typically requires a greater level of operational expertise and maintenance (relative to landfilling).

This approach is generally considered more environmentally sustainable because of the capture of energy from the waste and the potential reduction of impacts to the environment compared to landfilling. Depending on the specific technology selected, the remaining residual waste may contain high concentrations of metals and require disposal as a designated or hazardous substance. It is important to note that this technology is relatively

unproven in Ontario at the full-scale and public debate continues regarding air quality issues from several of the technologies. However, it is noted that the Durham York Energy Centre, which began operations in February 2015, can provide a provincial example of this technology implemented a 'local' level. It is noted that this facility cannot accept waste from other municipalities or haulers.

The technologies that that were identified as part of this Study include:

- Incineration (starved air, rotary kiln),
- Fluidized bed/gasification,
- Pyrolysis,
- Plasma gasification,
- Thermo-chemical reduction, and
- Gasification/composting.

Typically, these technologies require a consistent and large amount of waste of (>100,000 tonnes/year) in order to be economically feasible. Based on the waste production of the Town (i.e., less than 5,000 tonnes/year), only the use of an established third-party facility or a partnership with other parties would be a viable option to the Town. It is difficult to assess either of these options since there are limited 'local' operations that could potentially accept the Town's waste and political commitment from potential partners would be required. This area of waste management in Ontario is dynamic with multiple parties involved and concept plans for incineration/thermal facilities on-going.

The planning period for a thermal/incineration system is estimated to be greater than 5 to 10 years.

Security of Option:	High
Certainty of Approval:	Medium
Applicability:	Low
Environmental Security:	High
Comparative Cost Range:	
Capital Costs:	$200 to $400 Million Note: Capital costs for the Durham York Energy Centre (DYEC) were reportedly $284.2 Million ($255 Million for construction and $29 Million for the EA). Construction was completed in 2014. This facility can process up to 140,000 tonnes of residual waste per year.
Long-term Costs:	Operational costs are estimated to be in the range of $130/tonne to $150/tonne for a Municipal System, applicable to large-scale operations only. However, operational costs could be offset by the price of third-party wastes accepted and revenues from the sale of electricity and covered metals. The DYEC reportedly recovers an estimated 60% of its annual operating costs from the sale of electricity and metals alone.
Lifespan:	Greater than 25 years

As discussed, this technology is not considered to be a viable option for the Town alone or in partnership with multiple parties. However, opportunities may exist for the Town to contract its residual waste disposal to a 3rd party system. The development of these waste management technologies are ever evolving and should continue to be reviewed as information becomes available. Should a third-party option become available in the future, the feasibility of the option could be evaluated at that time.

10.4 Third Party Disposal of Residual Waste

Third party disposal typically involves exporting waste out of the Town through a contractor. Under this system, the waste that a municipality produces is shipped to a transfer facility located within the municipality, waste is then transported and disposed at a third-party facility. As an alternative, waste that a municipality produces can be collected and shipped directly to a third-party facility.

Since this is a third-party system, there is low security with respect to long-term costs and operational controls. However, limited to nil capital costs would be required under this scenario. Costs incurred by the Town would only be for those wastes requiring disposal (i.e. would not have base overhead costs). Based on current rates, it is estimated that this type of system would cost the Township $110 to $160 per tonne at this time. However, as the long-term waste disposal capacity in Ontario continues to decrease, providing fewer residual waste disposal options and increasing the demand, the cost of third-party systems is expected to increase.

The Environmental Security rating to the Town, specifically, would be considered low since there is no waste being placed on municipal lands. However, based on the environmental "footprint" of the waste trucking and general landfill disposal, the Environmental Security rating is considered Low to Medium.

Security of Option:	Low
Certainty of Approval:	High
Applicability:	High
Environmental Security:	Low to Medium
<u>Comparative Cost Range:</u>	
Capital Costs:	Minor
Long-term Costs:	$110 to $160/tonne
Lifespan:	Dependent on terms of agreement (i.e. contract)

Within the Southern Ontario region, KMS Peel EFW Facility and the Emerald EFW facility are both operational and are located in Brampton, Ontario, a distance of approximately 200 km from the Town.

10.5 Residual Waste Disposal Options Summary

Summarized in **Table 10-1** are the disposal options available to the Town with the estimated costs, and advantages and disadvantages of each option.

TABLE 10-1: Residual Waste Disposal Options

Option		Description		Pros	Cons	Planning Period	Budgetary Cost Estimates (2019 Funds)		
							Capital	Annual Operating[3] (per tonne)	"Long-Term"[1] (per tonne)
Landfill	Town Managed and Operated	Development of Additional Capacity at Existing Landfill Sites (<40,000 m^3)	Landfill expansions limited to 40,000 m^3 are not subject to the requirements of the Environmental Assessment Act (EAA), therefore landfill expansion at the Amabel Landfill is considered to be a viable short term option for the Town.	- Control of Operation and Management - Low Transport Requirements for Waste - Existing Property with Existing Background Studies - No Municipal Environmental Assessment Required - Relatively Good Environmental Security	- At minimum, requires an updated Plan of Development and Operations. - Requires completion of ECA Application and processing fees. - Application not guaranteed to succeed. - Depending on compaction provides only limited additional capacity	2 - 4 years	$150,000 to $250,000	$65 - $90	$70 - $100 (for the ±4 years of additional capacity achieved)
		Landfill Mining	Landfill mining and processing has the potential to recover materials such as appliances, wood, tires, metals, plastics and fabrics, ultimately in an effort to recover landfill capacity.	- Recovers landfill capacity and reduces landfill mass - Low Transport Requirements for Waste	- Requires ECA approval: odour and leachate management would need to be addressed - Once the landfill mining process is completed the remaining materials must be landfilled and the landfill area re-graded, re-shaped and closed	2 - 4 years	1.5M to 3.0M	$40 to $70	$70 to $130 per tonne of additional capacity achieved[5]
		Development of Existing Municipal Landfill within Previously Approved Area (Albemarle)	The Albemarle Landfill has an additional approved waste disposal area of 8.5 hectares, subject to Approval. Pre-consultation with the MECP has been initiated.	- Control of Operation and Management - Low Transport Requirements for Waste - Existing Property with Existing Background Studies	- Requires Numerous Studies to Support Development - May Require Engineered Design and Leachate Treatment Facility - Possibility of Not "Succeeding" with Application Process - May be subject to the Municipal EA Process	5 - 10 years	$3M to $8M	$70 to $110	$100 to $180
		Landfill Expansion (> 40,000 m^3) or Development of New Municipal Landfill	The expansion of the existing Amabel Landfill Site or the development of a new landfill, should an appropriate location be established.	- Control of Operation and Management - Low Transport Requirements for Waste - Existing Property with Existing Studies - Existing Property with Existing Studies	- Requires Numerous Studies to Support Development * Would Require Engineered Design and Leachate Treatment Facility **Would likely still require leachate treatment depending on Approval requirements. Provisions for leachate treatment would increase the capital cost. - Possibility of Not "Succeeding" with Application Process - Subject to the Municipal EA Process	5 - 10 years	**Expansion (top) $1.5M to $5M *Expansion (area) $4M to $8 M *New Landfill $6M to $10 M	$70 to $110	$85 to $155 $105 to $180 $120 to $200
	Partnerships	Municipal Partnership at Existing Landfill (or Agreement)	Develop a partnership with another Municipality in order to consolidate landfill services or develop an agreement with a nearby Municipality to accept the Town's waste at an existing approved landfill.	- Potential for Low Transport Requirements for Waste - Existing Property with Existing Studies - Consolidation of Operational Costs - No Municipal EA Required - Relatively Good Environmental Security	- Receiving landfill may require ECA Amendment - Potential Loss of Control for Acceptance of Waste - Receiving Municipality may significantly decrease their landfills Site Life	2 - 5 years	Less than $500,000	$100 to $150 depending on whether services are consolidated or provided under agreement (i.e. cost per tonne)	
		County Wide Approach to Landfilling at Existing Sites	Explore a 'County-wide' approach to landfill operations in order to achieve potential cost reductions (i.e. landfill operational costs).	- Potential for Low Transport Requirements for Waste - Existing Property with Existing Studies - Consolidation of Operational Costs - No Municipal EA Required - Relatively Good Environmental Security	- Receiving landfills may require ECA Amendments - Loss of Control for Acceptance of Waste - Receiving Municipalities would significantly decrease their landfills Site Life - Possibility of Not "Succeeding" with Agreement Process	4 - 7 years	$500K to $1.5 M	$100 to $150 depending on how compensation is provided to Municipalities with significantly greater approved capacities.	
		Municipal Partnership or County Wide Approach for the Development of a New Landfill	Planning, Design and Construction of a Landfill Site at a New Location within the County.	- Control of Operation and Management - Potential for Low Transport Requirements for Waste	- Need to locate appropriate site - Requires Numerous Studies to Support Development - Would Likely Require Engineered Design - Requires Commitment From Potential Partners - Requires EA process - Possibility of Not "Succeeding" with Agreement or Application Process	5 - 10 years	$6M to $12M Split between Partners	$70 to $140 depending on partnership details.	
	Third-Party - Export Residual Waste		Delivery waste to a 3rd Party Landfill in Ontario	- Existing Approvals - Existing "Infrastructure"	- Low Security for Long-Term Disposal due to dependence on third-party provider Low security for long term cost of residual waste disposal (per tonne)	± 6 months	Minimal	$110 - $160	
Thermal/Incineration Energy from Waste		Municipal System	Selection, Construction, and Operation of Thermal/Incineration Technology by the Town	- Low Residual Waste Production - Energy Capture - Control of Operation and Management - Low Transport Costs	- Only Applicable to Larger Scale Operations - Approvals Potentially Difficult	> 5 years	$200M to $400M	$40 - $80[2]	Greater than $150[2]
		Municipal Partnership	Partner with other Municipalities to Select, Construct and Operate a Thermal/Incineration Plant	- Low Residual Waste Production - Energy Capture - Control of Operation and Management - Low Transport Costs - Reduced Capital and Operating Due to Partnership	- Requires Large Volumes of Waste to be Cost-Effective Therefore, may require acceptance of waste from other municipalities - Approvals Potentially Difficult - Requires Commitment From Potential Partners	> 5 years	$200M to $400M Split between Partners	$40 - $80 [2]	Greater than $150 [2]
		Third Party System	1) Existing EFW Facilities in Brampton 2) Proposed Thermal Technology Option - Region of Waterloo	- Low Residual Waste Production - Energy Capture - Potential low transportation costs (i.e. Waterloo)	- Loss of Control for Acceptance of Waste - Low Security for Long-Term Disposal - Proposed Local Facility Only at This Time - Existing Facilities in Brampton (200 kilometer transportation)	> 5 Years	Minimal	$110 - $160*	$110 - $160*

Notes:
1. Long-term costs apply capital to 25 years or total volume of approved landfill at fill rate of 4,500 tonnes per year.
2. Applicable to large-scale operations only. Cost would be dependent on price of third party wastes accepted and revenues from the sale of electricity.
3. Annual tipping fees are not included where Municipality owns the facility. Therefore, tipping fees could help recover the costs.
4. * Costs include collection and transportation and are variable depending on the Town's proximity to the receiving waste facility.
5. Additional capacity assumes waste compaction would be improved.
6. The gross capital costs for the Durham York Energy Centre project amounted to $284.2 million,this included $255 million for construction of the facility and approximately $29 million for the Environmental Assessment, permitting and approvals, site servicing, consulting fees and economic development activities in the host community of Clarington (Ref: https://www.durhamyorkwaste.ca/FAQ/FAQ.aspx#cost).

10.6 Residual Waste Disposal Recommendations

In the short-term the Town is considered to be in a relatively good position in terms of landfill capacity and residual waste disposal options at the Amabel Landfill. Based on the current operational practices, the Town has sufficient capacity to provide landfill services for an additional 12 years (i.e. until 2031) at the Amabel Landfill site. However, with the implementation of improved site controls and operational practices, the Amabel landfill may have sufficient capacity for up to 16 years (i.e. circa 2035). This does not include the potential to expand the capacity by a volume of 40,000 m^3, or an additional ±4 years, pending approval. Therefore, at this time it is recommended that to maximize the remaining site life of the landfill, the Town focus efforts on waste diversion and improved operational practices aimed at developing the remainder of the landfill in an effective and efficient manner.

Further, it is recommended that the Town re-evaluate the estimated site life of the landfill as it approaches its maximum approved capacity in order to confirm the remaining site life and ensure that a sufficient planning period is maintained. An interim landfill development review and planning process has been initiated. Depending on both the efficacy of the on-going operations at the Amabel Landfill and the Town's preferred residual waste disposal option(s), the Town may need to initiate the negotiation, application and/or site selection process within the next couple years.

Once capacity at the Amabel Landfill is reached, the continued use of the Town's existing landfill sites would provide the Town with the most 'secure' waste management option, as no partnership's or reliance on a third-party would be involved. Under the existing Approvals, the Albemarle landfill site may have capacity available within the previously approved 8.5-hectare area. Consultation with the MECP regarding the requirements for future landfill development within this area have been initiated, including the potential applicability of the EA process.

Further, additional capacity at the Amabel Landfill Site may be achieved via expansion of the fill area to the east and/or increasing the height of the landfill. However, this would be considered a landfill 'expansion' and would be subject to the EA process, which includes extensive public and agency consultation, therefore ultimate approval of the site cannot be guaranteed. In addition, as part of the approval process further assessment of the geological and hydrogeological conditions would be required and would need to support the development. The hydrogeological assessment(s) would need to be submitted to the Director for review and a decision to grant the amendment would be determined based upon the merits of the submission. Based on a preliminary overview of the hydrogeological conditions at both landfill sites and the potential outcome of EA process, there is a level of uncertainty associated with the ultimate approval of these options.

Due to the relatively low population base, the Town is limited by its incoming revenues. As the population has been relatively stable, revenues collected by the Town through municipal taxes are not likely to increase significantly. Therefore, based on the limited scale of waste production, the development of a new landfill or an Energy for Waste (i.e. incineration and thermal technologies) are not considered to be economically feasible for the Town unless completed in partnership with another Municipality, or group of Municipalities. Negotiations associated with such a partnership are typically time consuming and difficult and are not guaranteed to be successful. However, other municipalities in the area may be in the same position in terms of landfill capacity and residual waste disposal options. As a result, opportunities for the successful development of a new landfill in partnership with one or more local municipalities may exist.

Should the continued use of the Amabel or Albemarle Landfill be determined to be an undesirable or infeasible long-term solution, the Town could investigate opportunities for the development of a new landfill (or the expansion of an existing municipal landfill) in partnership with one or more local municipalities. While we have included the Municipal and County partnership options in this plan, it is recognized that the development of an agreement could be difficult. However, based on the long-term security and potential costs associated with these

programs, we recommend that such options be considered at least in a preliminary manner, and be revisited when opportunity arises, such as other area municipalities require waste disposal capacity.

Alternatively, it appears that a 3rd party residual waste disposal option may be the most certain and feasible and would require the least effort. However, as the long-term waste disposal capacity in Ontario continues to decline, providing fewer residual waste disposal options and increasing the demand, the cost of third-party systems is expected to increase. Third-party residual waste disposal options could also be used as a short-term solution should the planning period for a given waste disposal option extend beyond the site life of the Amabel Landfill site. It is understood that the Region of Waterloo is currently investigating the potential to construct its own Thermal Treatment facility. Based on the Waste Management Report for Waterloo, if the Thermal Treatment facility is built the Region would be open to importing waste from other communities. It is recommended that the Township stay abreast of developments within the waste management sector and the applicability of a third-party system, should one become available.

A summary of the Town's residual waste disposal options and the associated planning process(es) is outlined in **Figure 10-1**.

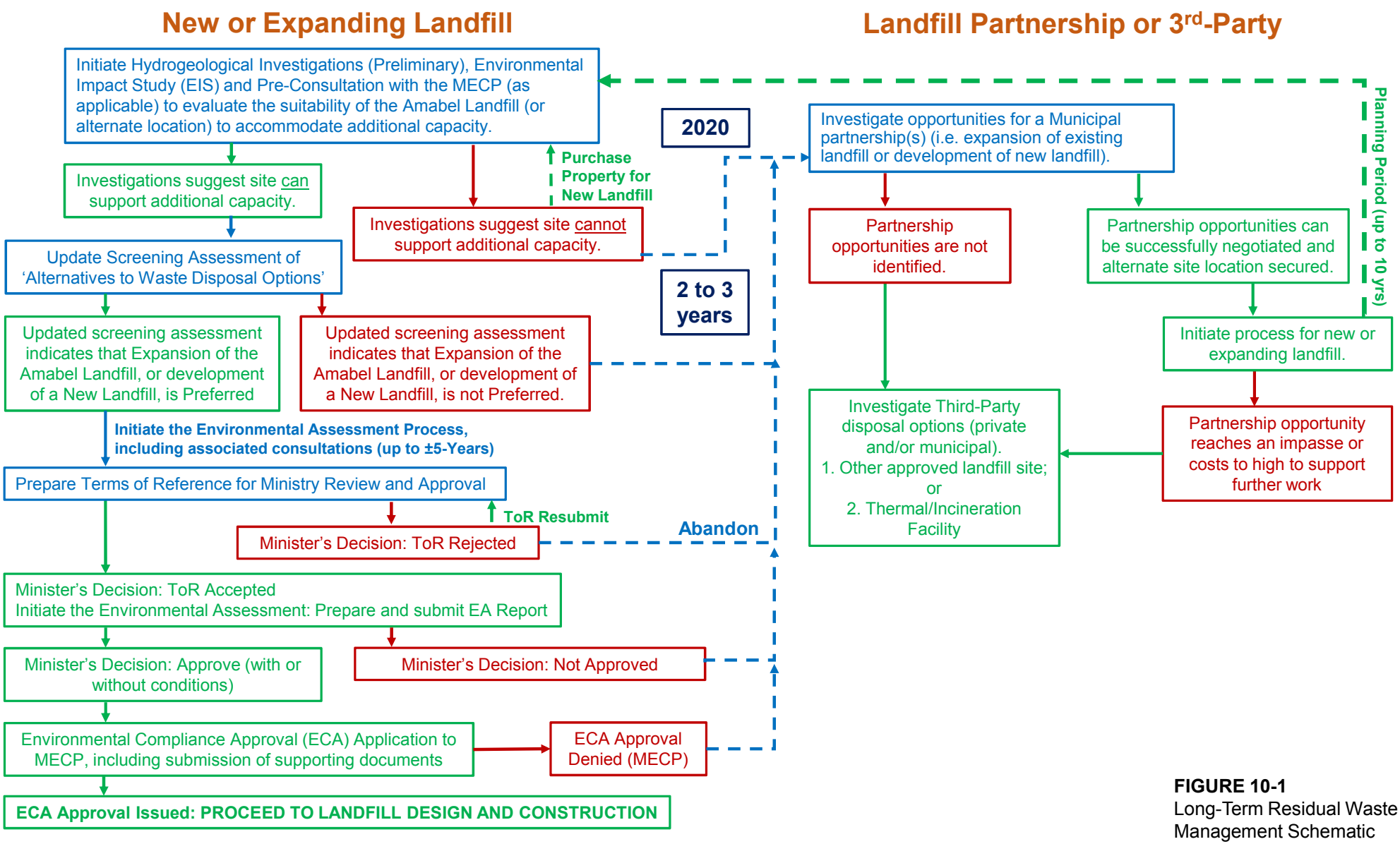


FIGURE 10-1
Long-Term Residual Waste Management Schematic

11. PRESENTATION TO COUNCIL

Following the completion of this Long-Term Waste Management Plan (DRAFT), dated November 26, 2019, the findings of the Study and the proposed recommendations outlined in the Report were presented to Town Staff and Council on December 3rd, 2019. Following the discussion of the findings and comments from Council (and Town Staff), the Waste Management Report was finalized.

12. STUDY SUMMARY AND RECOMMENDATIONS

12.1 Study Purpose

The purpose of this Waste Management Plan (WMP) is to provide a "holistic" approach to the Town's waste management program that will provide the support for both short-term and long-term waste management planning purposes. As of the end of 2018, the Town has an estimated 13 years of service life for residual waste disposal at the Amabel Landfill Site based on the current waste generation rates for the entire Town. Considering the available disposal capacity, the Town is considered to be in a moderate position in terms of residual waste disposal security for the planning period of this WMP. Therefore, the main focus of this WMP is on maximizing the site life of the existing landfill through waste diversion and operational improvement opportunities and to evaluate residual waste disposal options with respect to the long-term waste management plan that is most suitable to the Town.

As part of this Study, a review of the performance of the Town's current waste management system, operational practices, and waste diversion initiatives was completed. This information was used to establish baseline waste generation and diversion rates for future assessment of the Town's progress towards meeting the Waste Diversion targets set out in the Waste-Free Ontario Act (i.e. Bill 151). The performance review was also used to develop projections regarding future waste management practices including waste volumes, types, and sources and to identify and assess the technical and financial merits of alternative diversion approaches.

The options investigated as part of this study are presented to the Town to assist in developing a long-term waste management program in consideration of existing policy, legislation, status of waste management practice in Ontario, and the Town-specific waste management practices and production characteristics. Ultimate selection of the options is to be made by the Town with consideration of social, environmental, technical and economic applicability of the options. Presented in the following sections is a summary of the findings, which have been described in more detail within the report.

Where the potential applicability of specific options are considered uncertain, further study may be warranted. Additionally, where waste management options rely on third-parties, further agreements and commitments may be sought to establish applicability. Prior to the selection of any one option, we recommend that continued study and review of the applicability of the option be completed as further information becomes available.

12.2 Summary and Recommendations

12.2.1 Performance Summary: Waste Generation and Diversion Rates

Based on a detailed breakdown of the waste received and diverted by the Town over a 5-year period (i.e. 2014-2018), the average overall diversion rate currently being achieved is estimated to be about 30.7%. Based on estimates provided herein, it is evident that the tourist industry is having, and will continue to have, a direct effect on the overall waste generation rate for the Town, putting additional strain on its waste management systems particularly during the summer months. Collectively, when the IC&I sector is considered, including tourism, the overall residential diversion is estimated to be approximately 38.3%, with greater than 60% of the total residential waste being landfilled. Therefore, to achieve the waste diversion targets set out in the Waste-Free Ontario legislation (i.e. 50% by 2030 and 80% by 2050) the Town will be required to make changes to its current waste management systems.

12.2.2 Recycling and Waste Diversion Opportunities

To increase the overall success of its existing waste diversion programs, changes to the existing systems and/or greater efforts to encourage, promote and enforce waste diversion could be implemented by the Town. For example, greater diversion from the existing blue box program could be realized in several ways, including accepting a greater range of materials (i.e. cardboard), removing the requirement for the separation of materials (i.e. paper, plastic, glass, etc.) and/or ensuring that the curbside pick up frequency is equivalent to that offered by the Town for residual waste. In addition, additional waste diversion opportunities could be explored, ultimately diverting a broader range of materials, such as textiles, bale wrap, and household items by using the existing and/or Town-organized recycling and reuse initiatives.

The preparation of informative materials aimed at promoting and educating the public could be completed to increase the success of the existing diversion programs and/or ensure the success of new diversion strategies and programs, as they become available. This can be implemented through various public relations strategies including, but not limited to, kiosks in high traffic areas, pamphlets, mail-outs, website updates and various web-based applications. For example, backyard composting has not been widely accepted within the community for fear of attracting bears. In conjunction with the recommended implementation of a program for home composters, including subsidizing both traditional and/or Green Cone composting units, educational materials would need to be made available to further support this initiative.

The Town would benefit from making changes to the existing waste management and collection systems. Key recommendations include the implementation of a full pay-per-use fee system, a reduced bag limit (from 3 bags weekly to 2 bags) and consideration for the use of a clear bag system (with or without a ‘privacy’ bag). Further, it is recommended that the bag limit at the landfill be the same as that applied to curb-side pick-up. Therefore, a reduction in the bag limit to 2 bags at the landfill site is recommended. To create a larger cost ‘gap’ between the weekly bag limit and the minimum tipping fee, it is also recommended that the minimum tipping fee be increased to $15 (or otherwise, as determined by the Town).

In addition, curb-side pick of blue box materials is currently provided on a bi-weekly basis and curb-side collection of household waste is provided on a weekly basis. To increase the effectiveness of the blue box program, the curb-side collection service for blue box materials should, at minimum, be provided as frequently as the residual waste collection service. Therefore, it is recommended that the Town explore opportunities to offer a curbside pickup service that can be provided at the same frequency for both waste streams. In other words, either offer weekly or bi-weekly collection for both the residual waste and blue box materials.

Comparisons of the estimated diversion of blue box materials being achieved by the Town to other similar municipalities suggests that the Town’s blue box program could be more effectively managed. This was identified as having the potential to affect a significant increase in the Town’s residential waste diversion rate,

estimated to be ±5%. While it is recognized that changing the established blue box program would require collaboration and cooperation between the Town and BASWR, several changes to the service level and collection system could be considered to improve the overall success of this waste diversion initiative. In addition to the aforementioned curbside pick up services provided, service level and collection system changes could also include one, or several, of the following strategies:

i. During the peak tourist season (i.e. during the summer months), an increased service level particularly for waste from the IC&I sector (i.e. campgrounds, cottages, restaurants etc.) would provide a significant opportunity for achieving increased waste diversion. This could be recognized within the agreement between the Town and the waste collection service provider(s), currently BASWR and Waste Management.

ii. In municipalities where the tourism industry contributes significantly to the economy, additional strain on the waste management systems is experienced. Since blue box programs offered can vary significantly, in terms of the range of materials accepted (i.e. cardboard) and the collection requirements (i.e. mixed versus separated), the blue box program offered by the Town may benefit from a simplified approach. For example, the inclusion of a greater range of blue box materials (i.e. cardboard) and allowance for the materials to be mixed rather than separated.

iii. The recycling totes provided to businesses and the Town's service industry, currently provided by BASWR, are reportedly limited in capacity. It is recommended that the collection vessels provided by the service provider (i.e. BASWR or other) reflect the anticipated volumes. In other words, large campgrounds should ensure that they have the option to collect recyclables in disposal bins rather than 95-gallon containers.

12.2.3 Organics Diversion

In general, an effective and extended 'Source Separated Organics Collection' program (aka. Green Bin) has the potential to significantly reduce waste disposal in landfills. Based on the information available, it is estimated that an additional 10% to 20% waste diversion can be achieved with this option. Therefore, it is thought that the eventual implementation of SSO programs will be required for Municipalities to meet the waste diversion targets set out in the Waste-Free Ontario legislation. Accordingly, the province has reportedly committed to eventually banning food waste from disposal to increase diversion of organic waste and decrease greenhouse gas emissions. Based on the cost estimates completed as part of the Study, the collection, transportation and disposal fees for SSO would be in the range of $40 to $100 annually per household or the equivalent of greater than $475 per tonne. Ultimately, the actual cost would be dependent on the desired level of service, the type of facility and the potential for cooperation with other municipalities. Therefore, although it is likely that consideration for a Green Bin program will eventually be necessary for the Town to meet the Provinces waste diversion targets, the Town may consider further promoting backyard composting until such a time that the Green Bin Program becomes a more viable and/or necessary option. At this time, the pursuit of this collection service by the Town would require an increased level of investment and community support.

12.2.4 Operational Practices

Due to the costs associated with expanding or new landfills, or alternative disposal methods (e.g., exporting waste, incineration, etc.), it is important to manage the remaining capacity at the Amabel Landfill effectively and efficiently to maximize the Town's waste disposal security and capitalize on the relatively low waste management costs for as long as possible. The most effective methods to maximize and/or extend the life of a landfill and associated recommendations for the Town include the following:

1. Landfill Development Planning:

   To ensure full capacity is achieved, landfill design and operations should be consistent with that outlined in the Design and Operations report. As a site approaches capacity, it is typically recommended that an interim review of the landfill development plan be completed to update (or confirm) the remaining capacity at the Site and to plan an approach to efficiently use the remaining landfill capacity. The development plan for the remaining capacity has been initiated and will be issued to the Town upon completion.

2. Landfill Records and Oversight:

   In order to effectively evaluate the performance of the Town's waste management system and waste diversion initiative's, it is important that good records be collected documenting incoming and outgoing waste volumes and materials. At this time, the Town has successfully developed a system to effectively track the quantity and types of materials accepted at the Amabel Landfill Site.

   However, it is recommended that the development of a consolidated and enhanced waste receiving and transfer area be considered to further aid in the oversight, promotion and encouragement of waste disposal and segregation. In addition, due to the volume of traffic experienced during the peak tourist season, the installation of an additional weigh scale for outgoing traffic may need to be considered to avoid congestion.

   In essence, the 'front end' of the landfill site could be updated to include select bins for residual waste, keeping residential deliveries away from the active face of the landfill, as well as well marked bins, designated areas for specified wastes, and sheds/building within a defined area. This approach typically results in increased waste segregation and diversion, ultimately reducing the quantity of residual waste landfilled. The development of a waste receiving and transfer area would require the preparation of design drawings and an application to Amend the existing Approval for the site.

3. Staffing and Landfill Hours of Operation:
   The success of the waste diversion opportunities offered by the Town, and overall landfill operations, is dependent on adequate and trained staff. The proposed waste receiving and transfer area would benefit from having a trained attendant, particularly at peak times, assigned to the oversight of the area, providing clear direction to the public and ensuring waste is properly segregated. A review of the landfill hours currently offered by the Town, compared to other comparable Municipalities, suggests that the Town may be in a position to offset the cost of additional staffing (as required), at least in part, with reduced hours of operation.

4. Landfill Compaction:
   Continued, and/or improved, effective use of compaction equipment could extend the life of the Amabel Landfill site. Increased compaction, allowing for more waste to be deposited in a given volume, can potentially be realized using the existing equipment at the Amabel Landfill Site. This can be achieved by increasing the number of passes over the waste or applying thinner layers of waste and cover material being compacted.

12.2.5 Residual Waste Management Options

In terms of the management of the Town's residual waste, in consideration of the landfill capacity and residual waste disposal options at the Amabel Landfill, the Town is considered to be in a relatively good position in the short-term. Based on the current operational practices, the Town has sufficient capacity to provide landfill services for an additional 12 years (i.e. until 2031). However, with the implementation of improved site controls, such as the development of a waste receiving and transfer area, improved landfill operations and increased waste diversion, the site life of the landfill may be extended. The maximization of the existing capacity will defer the requirement to assess alternative waste disposal options (i.e. the planning period is typically 5 to 10 years prior to Site closure for most options).

Once capacity at the Amabel Landfill is reached, the continued use of the Town's existing landfill sites could provide the Town with the most 'secure' waste management option, as no partnership's or reliance on a third-party would be involved. Under the existing Approvals, the Albemarle landfill site may have capacity available within the previously approved 8.5-hectare area. Pre-consultation with the MECP has been initiated. Further, additional capacity at the Amabel Landfill Site may be achieved via expansion of the fill area to the east and/or increasing the height of the landfill. As part of the approval process, the continued use of the existing landfill(s) would require further assessment of the geological and hydrogeological conditions. The hydrogeological assessment(s) would need to support further development and would be submitted to the MECP for review and approval. Based on a preliminary overview of the hydrogeological conditions at the Towns landfills and the potential outcome of EA process, there is a level of uncertainty associated with the ultimate approval of this residual waste disposal option, more specifically the expansion of the existing landfill sites.

Should the continued use of the Amabel or Albemarle Landfill be determined to be undesirable or infeasible, the Town could investigate opportunities for the development of a new landfill (or the expansion of an existing municipal landfill) in partnership with one or more local municipalities. While we have included the Municipal and County partnership options in this plan, it is recognized that the development of an agreement could be difficult. However, based on the long-term security and potential costs associated with these programs, we recommend that such options be considered at least in a preliminary manner, and be revisited when opportunity arises, such as other area municipalities require waste disposal capacity.

Alternatively, it appears that a 3rd party residual waste disposal option may be the most certain and feasible and would require the least effort. However, as the long-term waste disposal capacity in Ontario continues to decline, providing fewer residual waste disposal options and increasing the demand, the cost of third-party systems is expected to increase. Third-party residual waste disposal options could also be used as a short-term solution should the planning period for a given waste disposal option extend beyond the site life of the Amabel Landfill site. It is recommended that the Town stay abreast of developments within the waste management sector and the applicability of a third-party system, should one become available.

12.2.6 Summary of Recommendations

In light of the information provided in this study, we recommend that the Town review their diversion targets, implementation timeframe, and budget to select the options they wish to pursue. Although recommendations have been provided herein, only the Town can decide what programs they wish to implement and what level of resources are available to implement the programs. Based on the review of the information collected as part of this study, the recommendations that are considered to be most applicable to the Town at this time have been summarized in **Table 12-1**. Specific information regarding each recommendation and other options available are provided within the body of this report.

TABLE 12-1: Summary of Recommendations

CATEGORY	Implementation Timeframe	RECOMMENDATION
Waste Collection / Reduction / Diversion and Waste Reduction Strategy	Annually	Evaluate Residual Waste Collection Options and Incentive Programs, Identify Potential Areas for Improvement and Develop a Plan for Implementation
		Update Promotion and Public Education Programs based on Implemented and/or Approved Changes
		Training of Key Program Staff
		Explore Additional Waste Diversion Streams
	Short-term	☆ Implement a curbside pickup service that is offered at the same frequency for both waste streams. In other words, either weekly or bi-weekly collection of residual waste and blue box recyclables. ☆ Implement a full pay-per-use system for curb-side waste (i.e. bag tags for all waste). ☆ Consider reducing the bag limit from 3 bags per week to 2 bags. ☆ Consider the implementation of a Clear Bag policy (with or without a 'privacy' bag). ☆ Explore opportunities to expand the blue box materials accepted. ☆ Implement a program for home composters and/or digesters (made easily available at cost, or less). ☆ The Town may consider providing a direct link on their website to a bale wrap pick-up service directly from the source, when available. ☆ Tires have transitioned to the IPR framework. The Town has registered with a PRO for tires. However, the Town will need to register for other diversion items as they are transitioned. ☆ As the tourism industry is estimated to account for 20% of the waste currently processed by the Town, opportunities to improve diversion from this industry should be explored (i.e. blue box initiatives). ☆ Consider additional waste diversion opportunities, such as the provision for a reuse area or clothing donation bin at the landfill.
	Long-term	Evaluate SSO Collection System
Residual Waste	Short-term	☆ Operational Practices at Amabel Landfill ☆ Increase Compaction ☆ Review and Understand the Landfill Design ☆ Development of 'Future Development Plan' to most efficiently use the remaining capacity at the Amabel Site ☆ Review landfill hours of operation and evaluate the potential to reduce the operational hours of the site ☆ Evaluate Staffing Needs ☆ Staff Training
		☆ Update Tipping Fee Schedule at the Amabel Landfill: Bag limit reduction to 2 bags and minimum tipping fee of $15.00 (or otherwise, as determined by the Town)
		☆ **Initiate planning of a consolidated and enhanced Waste Receiving and Transfer Area at the Amabel Landfill (i.e. Design and Drawings).**
		☆ Confirm Town's preferred long-term residual waste disposal option for post landfill closure and initiate studies and/or negotiations.
	Within 2 Years	☆ Complete Construction of the Waste Receiving and Transfer Area at Amabel Landfill ☆ Continue to review and update tipping fee schedule ☆ Re-evaluate residual waste options for post landfill closure, starting at approximately 10 years prior to the anticipated site closure (Figure 12.1).

CATEGORY	Implementation Timeframe	RECOMMENDATION
Residual Waste	Every 5 to 7 Years	Complete a detailed topographic survey of the entire landfill area to help evaluate the effectiveness of the changes to operational practices (i.e. compaction) and waste diversion efforts. Detailed survey data can also be used to update the Site Life estimate and provide the needed accuracy to ensure that the evaluation of the 'Long-Term' residual waste management options is initiated within the recommended time-frame.
Monitoring and Continual Improvement	On-going	Monitor Programs to Compare Benchmarks to Targets/Goals
		Review Program Initiatives and Update Based on Results of Monitoring
		Stay Abreast of Diversion and Waste Disposal Options, including those with Neighbouring Communities

13. IMPLEMENTATION, MONITORING AND CONTINUAL IMPROVEMENT

Once program initiatives have been implemented and established, it is important to monitor the performance of the initiatives against the established base line performance of the current system provided herein. This information is gathered through the weigh scale data collected by the Town, recycling tonnages reported by BASWR, tonnages reported by various contractors (i.e. scrap metal, WEEE, Tires, etc.) and waste manifests. In order to effectively review and evaluate the Town's landfilling rate, waste diversion rates and the Town's progress towards meeting the Waste Diversion targets set out in the Waste-Free Ontario Act, weigh scale data should continue to be accurately recorded and other diversion quantities should also be monitored and recorded. In addition, it is recommended that the residual waste generation rate and landfill capacity continue to be measured annually through the comparative topographic surveys. Additional diversion initiatives would also need to be monitored and incorporated into the performance evaluations, as they become available.

As indicated by the acceptance of the Waste-Free Ontario Act (2016), which includes a plan to implement legislation that will work towards systematically reducing the volume of waste with the intention to achieve short-term and long-term diversion goals, the Provincial waste management strategies are currently in a dynamic state, continually changing and evolving. Consequently, it is important for the Town to stay abreast of the new regulations and guidelines related to waste diversion and waste disposal, as they are implemented. Several factors including, but not limited to, the transitioning of existing waste diversion programs and the availability of third-party systems may influence some of the longer-term residual waste management recommendations provided herein. Therefore, it is recommended that a review of the findings of this Waste Management Plan be completed at least every 5-years.

Respectfully submitted,

GM BLUEPLAN ENGINEERING LIMITED

Per:

Alen Bringleson, B.E.S, C.E.T.
Project Manager, Partner

14. REFERENCES

Government of Canada

- Environment Canada
- Statistics Canada EnviroStats Article: Composting by Households in Canada (by Iman Mustapha, July 2013)
- Statistics Canada Census Profiles (1996, 2001, 2006, 2011 and 2016)

Province of Ontario

- Ministry of the Environment, Conservation and Parks (MECP)
  - Environmental Protection Act (EPA)
  - Environmental Assessment Act (EAA)
  - Waste Diversion Act (WDA)
  - Waste-Free Ontario Act (WFO): Proclaimed on November 30, 2016 and consisting of two key pieces of legislation:
    - Resource Recovery and Circular Economy Act (RRCEA)
    - Waste Diversion and Transition Act (WDTA)
  - Policy Statement on Waste Management Planning: Best Practices for Waste Managers (June 12, 2007)
  - A Guide to Source Separation of Recyclable Materials for Industrial, Commercial and Institutional Sectors and Multi-Unit Residential Buildings (November 8, 2007)
  - Made in Ontario Environment Plan: Reducing Litter and Waste in Our Communities: Discussion Paper (April 2019)
- Office of the Auditor General of Ontario: 2010 Annual Report
- Other
  - Residential 'Generally Accepted Principles' (GAP)
  - Blue Box Program Enhancement and Best Practices Assessment Project Vol. 1 and Vol. 2 (July 2007)
  - Waste Electrical & Electronic Equipment Program Plan (July 10, 2009)
  - Municipal Hazardous or Special Waste Program Plan (November 26, 2007)
- Resource Productivity and Recovery Authority (RPRA)
  - Information on Website, including Municipal Datacall
  - https://www.ontario.ca/page/strategy-waste-free-ontario-building-circular-economy

County of Bruce

- Official Plan
- Website and Staff Input
- Bruce County Committee Report (March 21, 2019)
- Bruce County Status of Waste Management Reports (2016 and 2017)
- Explore the Bruce: Economic Impact of Tourism 2018

Township of South Bruce Peninsula

- Town of South Bruce Peninsula: Official Plan (Consolidated January 2019)
- Town of South Bruce Peninsula: Annual Materials Reports and Diversion and Disposal Records (2014 to 2018)
- Landfill Reports for the Amabel Landfill Site and the Albemarle Landfill Site, including Development and Operations Plans and Annual Reports
- Town of South Bruce Peninsula: Community Based Strategic Plan (DPRA Canada, 2012, updated December 2016)
- Town Website and Staff Input
- Town of South Bruce Peninsula: Waste Diversion Plan (2cg Waste Management Consulting Services, July 2011)
- Town of South Bruce Peninsula: Waste Management Plan (Pryde, Schropp McComb, August 2011)

Surrounding Municipalities

- Municipal Websites and Staff Input
- Information Available on Various Websites
- Region of Waterloo Waste Management Master Plan: Final Master Plan Report (Golder Associates: November 2013)

Bruce Area Solid Waste Recycling

- Town specific blue box diversion tonnages
- Various handouts provided on the website

Other

- Eilrich, Doeksen and VanFleet, 2002. An Economic Analysis of Landfill Costs to Demonstrate the Economies of Size and Determine the Feasibility of a Community Owned Landfill in Rural Oklahoma.
- Long Term Waste Management Strategy and Executive Summary for Dufferin County (March 2018): https://www.dufferincounty.ca/sites/default/files/waste/LTWMS-Executive-Summary-final.pdf
- Durham York Region Energy Centre Website: https://www.durhamyorkwaste.ca/

APPENDIX A:
ENVIRONMENTAL COMPLIANCE APPROVALS
(AMABEL WASTE DISPOSAL SITE)

Ministry of the Environment
Ontario

Provisional Certificate No. REVISED A 271701

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

Under the Environmental Protection Act and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Amabel,
R.R. #2,
Hepworth, Ontario.
N0H 1P0

for the use and operation of an 8.1 hectare landfilling site.

all in accordance with the following plans and specifications:

1. Application and Supporting Information Forms dated October 10, 1972 and the supplementary application form dated December 17, 1982.
2. Site Plan entitled "Amabel Township, Waste Disposal Site, Lot 43, Concession C, Amabel Township".

Located: Part of Lot 43, Concession "C"
Township of Amabel,
County of Bruce.

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic, commercial and 2% "other" (limited to brush & lumber) wastes.

and subject to the following conditions:

1. In accordance with the letter dated January 18th, 1983 from the Clerk-Administrator of the Township of Amabel to the Ministry of the Environment (attached), a suitably designed operating and development plan is to be submitted to the Director of the Environmental Approvals and Project Engineering Branch of the Ministry of the Environment by December 31st, 1983 for approval.

Dated this 14th day of February 1983

Director, Section 46
Environmental Protection Act

Ministry of the Environment
Ontario

Ministère de l'Environnement

APPROVALS BRANCH
3rd Floor
Tel. (416) 440-3544
Fax. (416) 440-6973

250 Davisville Avenue
Toronto, Ontario
M4S 1H2

250, avenue Davisville
Toronto (Ontario)
M4S 1H2

September 17, 1992

Township of Amabel,
R. R. #2,
Hepworth, Ontario.
N0H 1P0

Dear Mr. Johnston:

Re: Township of Amabel
Waste Disposal Site A271701

Please find enclosed a Notice to amend the Certificate of Approval No. A 271701 dated February 14, 1983 for the Township of Amabel waste disposal site.

It is suggested that this Notice be carefully read in order to ensure that all conditions are met.

Should you have any questions, please call either Mr. Bill Hutchison of the Owen Sound District Office at (519) 371-2901 or myself at (416) 440-3544 at any time.

Yours truly,

A. Dominski, P. Eng.
Acting Supervisor
Waste Sites & Systems Approvals Unit
Industrial Approvals Section

WA/sg
082608
Encl.
c.c. D. A. McTavish, Southwest Region
W. Page, Owen Sound

TO: Township of Amabel
R.R. #2
Hepworth, Ontario
N0H 1P0

You are hereby notified that the terms and conditions of Provisional Certificate of Approval No. A 271701 dated February 14, 1983 *which has been issued to you, are being amended as follows:*

The following conditions are added to the Provisional Certificate of Approval.

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director of the Environmental Approvals and Project Engineering Branch of the Ministry of the Environment.

2. Monitoring of the ground and surface water is to take place under the direction of a professional consultant as detailed in Section 6 of the report "Township of Amabel Waste Disposal Site Hydrogeologic Assessment Plan of Operation and Development" dated June 26, 1989.

3. Cover material shall be applied such that no waste deposited is left exposed to the atmosphere at the end of the covering operations. Covering operations shall be carried out on a daily basis from June 1 through August 31. Covering operations shall be carried out not less than once per week from September 1 through May 31.

4. An annual report must be submitted to the Owen Sound District Officer by May 1 of each year. The annual report will address but not necessarily be limited to, the following:

   (i) the results of the monitoring program for groundwater and surface water and an interpretation of the results by a professional consultant;

   (ii) the areas of the waste site which are being and have been landfilled;

(iii) the estimated remaining capacity and life of the site;

(iv) the availability of suitable cell and cover material for the next year;

(v) comments on the general conformance of the site with final mapping provided in the development plan;

(vi) comments on the general operation of the site with suggestions for improvements where deemed appropriate.

5) No waste other than segregated lumber and clean wood is to be burned at the site.

6) Access to the burning area by the public and other unauthorized personnel is prohibited when burning is being carried out.

7) No burning is to be carried out unless supervision is being provided by the operating authority.

The reasons for the imposition of these conditions are as follows:

1. The reason for Condition 1 is that Section 46 of the Environmental Protection Act, prohibits any use being made of the lands after they cease to be used for waste disposal purposes within a period of twenty-five years from the year in which such land ceased to be used unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

2. The reason for Conditions 2, 3, and 4 is to ensure that the site is operated as designed, that contaminants do not find access to the environment resulting in a hazard to the health and safety of any person, and that the site operator has a good understanding of the impact of ongoing operations on the environment and that all necessary mitigating measures are being taken.

3. The reason for Condition 5 is that no waste other than segregated brush, lumber and clean wood is to be burned at the site and only under conditions that prevent off site impact.

4. The reason for Condition 6 is that access to the waste disposal site by the public and other unauthorized personnel is prohibited when burning is carried out.

5. The reason for Condition 7 is that no burning is to be carried out unless supervision is being provided by the operating authority at all times.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, R.S.O. 1990 c. E-19, provides that the Notice requiring the hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.*

In addition to these legal requirements the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
112 St. Clair Avenue West,
Suite 502,
Toronto, Ontario,
M4V 1N3

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of the Environment,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 17th *day of* September, 1992.

T.D. Armstrong, P. Eng.
Director
Section 39
Environmental Protection Act

WP

APPROVALS BRANCH
3rd Floor
Tel. (416) 440-3544
Fax (416) 440-6973

4 August 1993

Mr. Patrick A. Stock, Treasurer
The Corporation of the Township of Amabel
R. R. # 2
Hepworth, Ontario
N0H 1P0

Dear Mr. Stock:

Re: Township of Amabel Waste Disposal Site
Certificate of Approval No. A 271701

Please find enclosed a Notice to amend the Provisional Certificate of Approval No. A 271701 dated February 14, 1983 for the Township of Amabel waste disposal site.

This Notice of Amendment has been issued to authorize the incorporation of part of Lot 44, Concession C as a buffer to the existing waste disposal site.

Please note that you must register this Notice against the title to the site and forward a duplicate registered copy thereof to the Director. Also, note that disposal of waste outside the approved limits of the waste fill area or the expansion of the approved landfill site volume require approval under Part V of the Environmental Protection Act.

All other terms and conditions as outlined in the original Certificate of Approval and Notices remain unchanged. Should you have any questions regarding the above, please contact Mr. O. Ibrahim, Waste Sites and Systems Unit, at (416) 440-3717.

Yours truly,

A. Dominski, P. Eng., Acting Supervisor
Waste Sites and Systems Unit
Industrial Approvals Section

Encl.
OI/nb
c.c.: D.A. McTavish, Southwestern Region
W. Page, Owen Sound

The Corporation of the Township of Amabel
R. R. # 2
Hepworth, Ontario
N0H 1P0

You are hereby notified that the Provisional Certificate of Approval No. A 271701 *dated* February 14, 1983 *and amended by Notice dated* September 17, 1992, *is amended as follows:*

i. The Provisional Certificate of Approval No. A 271701 is amended by deleting "for the use and operation of an 8.1 hectare landfilling site" and replacing it with **"for the use and operation of an 8.1 hectare landfilling site within a total area of 62.78 hectares".**

ii. The addition of the following to the list of the plans and specifications:

3. Application and supporting information dated March 23, 1993.

iii. The description of the landfill site location is amended by deleting "Part of Lot 43, Concession "C" Township of Amabel, County of Bruce" and replacing it with **"Part of Lots 43 and 44, Concession C, Township of Amabel, County of Bruce".**

iv. The addition of the following condition:

8. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the site and a duplicate registered copy thereof has been returned by the applicant to the Director of the Approvals and Project Engineering Branch of the Ministry of the Environment.

The reason for these amendments are as follows:

i. The reasons for the amendments (i, ii, and iii) is to add the parcel of buffer land to the north of the site to the total site area.

ii. The reason for condition 8 is that Section 46 of the Environmental Protection Act, prohibits any use being made of the lands after they cease to be used for waste disposal purposes within a period of twenty-five years from the year in which such land ceased to be used unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, R.S.O. 1990 c. E-19, provides that the Notice requiring the hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.*

In addition to these legal requirements the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
112 St. Clair Avenue West,
Suite 502,
Toronto, Ontario,
M4V 1N3

<u>AND</u>

The Director,
Section 39, Environmental Protection Act,
Ministry of Environment and Energy,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 4th *day of* August, 1993.

THIS IS A TRUE COPY OF
THE ORIGINAL CERTIFICATE
SIGNED BY

P. DeAngelis, P. ENG.

MAILED ON Aug 10/93

BY _____

Ontario

Ministry of Environment and Energy

Ministère de l'Environnement et de l'Énergie

NOTICE
Page 1 of 2

The Corporation of the Township of Amabel
R. R. No. 2
Hepworth, Ontario
NOH 1PO

You are hereby notified that the Provisional Certificate of Approval No. A 271701 dated February 14, 1983, is amended as follows:

The following conditions are added.

9.0 **The Village of Tara with a population of 753 persons is deleted from the service area agreement under the Provisional Certificate of Approval No. 271701, dated February 14, 1983.**

10.0 **The waste from the Village of Hepworth with a population of 391 persons shall be added to the service area under the Provisional Certificate of Approval No. 271701 for the Township of Amabel Landfill Site. The amendments shall be effective from the date of the issuance of this Notice.**

The reasons for the impositions of the terms and conditions for the amendments are as follows:

i. The reasons for the conditions 9 and 10 are to delete the Village of Tara and to add the Village of Hepworth to the service area for the Township of Amabel Landfill Site. The amendments represent a net decrease in waste accepted and fill rate for the Landfill Site.

Ontario

Ministry of Environment and Energy

Ministère de l'Environnement et de l'Énergie

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990 c. E-19, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a hearing shall state:

1. *The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;*
2. *The grounds on which you intend to rely at the hearing in relation to each portion appealed.*

In addition to these legal requirements the Notice should also include:

3. *The name of the appellant;*
4. *The address of the appellant;*
5. *The Certificate of Approval number;*
6. *The date of the Certificate of Approval;*
7. *The name of the Director;*
8. *The municipality within which the waste disposal site is located;*

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
112 St. Clair Avenue West,
Suite 502,
Toronto, Ontario,
M4V 1N3

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of Environment and Energy,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

DATED AT TORONTO this 15th *day of* January 1997.

A. Dominski, P. Eng.
Director
Section 39
Environmental Protection Act

SE/am

Ministry
of the
Environment

2 St. Clair Ave. West
Toronto ON M4V 1L5

Ministère
de
l'Environnement

2, avenue St. Clair Ouest
Toronto ON M4V 1L5

Ontario

M.O.E.
NOV 0 1 1999
Owen Sound

October 27, 1999

Town of South Bruce Peninsula
315 George Street , Box 310
Wairton, Ontario
NOH 2TO

Attention: Mrs. Ruthann Carson, CAO

Dear Mrs Carson,

Re: Notice for the Provisional Certificate of Approval No. A 271701 for the Town of South Bruce Peninsula, Amabel Township waste disposal site, Parts lots 43 and 44 Concession C, Township of Amabel.

Please find attached a copy of Notice for the Provisional Certificate no. A 271701 for the waste disposal site. We have circulated a draft copy of the Notice to Mr. B. Pryde of Stantec Consulting Limited. His comments where appropriate were incorporated in the final Notice. If you have any questions concerning the terms and conditions in the Notice for the Provisional Certificate of Approval please feel free to contact Mr. S. Essop at telephone no. (416) 314- 8274.

Yours truly,

ORIGINAL SIGNED BY:

A. Dominski P. Eng.
Supervisor Waste

cc. J. Earl, Owen Sound District office

Town of South Bruce Peninsula
315 George Street
Box 310
Wiarton, Ontario
NOH 2GO

You are hereby notified that the terms and conditions of the Provisional Certificate of Approval No. A 271701, dated February 14, 1983, and Notices dated September 28, 1992, August 10, 1993 and January 10, 1997, are amended by this Notice and approval is granted for the use and operation of 8.10 hectares landfilling area within a total site area of 62.78 hectares;

all in accordance with the following plans and specifications: as listed in Schedule "A",

Located: Parts of Lots 43 and 44
Concession C
Township of Amabel
County of Bruce

which includes the use of the site only for the disposal *of the following categories of waste* (*Note: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval*) domestic, commercial and non-hazardous solid industrial wastes;

and subject to the following conditions:

A. The terms and conditions for numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and10 listed in the Provisional Certificate of Approval dated February 23, 1983 and Notices dated September 28, 1992, August 10, 1993 and January 10, 1997 are hereby revoked and replaced by the new conditions listed below.

B. The Township of Amabel waste disposal site shall receive waste from the newly formed amalgamated municipality of the Town of South Bruce Peninsula which includes the Township of Amabel, Township of Albermarle, Town of Wiarton and Village of Hepworth as outlined in Item no. 4 of Schedule "A".

11.0 DEFINITIONS

For the purpose of this Provisional Certificate of Approval:

11.1 "Certificate" means Provisional Certificate of Approval A 271701 dated February 14, 1983, as amended from time to time, including all Schedules attached to and forming part of this Certificate;

11.2 "District Manager" means the District Manager of the Barrie District Office, Southwestern Region of the Ministry of Environment;

11.3 "Regional Director" means the Director, MOE, Southwestern Region and one or more persons who from time to time are appointed under Section 9 of the Environmental Protection Act;

11.4 "Owner" means the Town of South Bruce Peninsula;

11.5 "Site" means 8.10 hectares landfilling area within a total Site area of 62.78 hectares as shown in Map 2 of Item no. 3, Schedule "A";

11.6 "ODWO" means the Ontario Drinking Water Objectives dated February, 1994 (and as amended);

11.7 "RUPO" means the Ministry of Environment Reasonable Use Policy Objectives (Policy no. B-7; and

11.8 "PWQO" means the Provincial Water Quality Objectives dated July, 1994 (and as amended).

GENERAL CONDITIONS

12. Pursuant to Section 197 of the Environmental Protection Act, neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.

12.1 The Owner shall:

Within 60 days of the date of this Certificate submit to the Director for the Director's signature two copies of a complete Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92.

12.2 Within 10 calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

13. Should there be any discrepancies between any of the Schedules and conditions in this Certificate, the conditions shall take precedence. Should there be discrepancies between the documents listed in Schedule "A" of the Provisional Certificate of Approval dated February 23, 1983. The documents bearing the most recent date listed in this Certificate shall take precedence.

14. The Owner shall be bound by the conditions of this Certificate. The conditions of this Certificate shall extend to and bind any successor and/or subsequent Owner(s) of this Site subject to the approval of MOE.

15. The Site shall be operated and maintained by the Owner in accordance with all documents listed in the Schedule "A" of this Certificate.

16. The Owner shall place a sign at the main entrance to the Site on which is displayed in prominent letters the following information:

    16.1 the name of the Site and the Certificate of Approval number for the Site;

    16.2 the operating authority, telephone number and mailing address;

    16.3 the hours the Site is open to accept waste from the public;

    16.4 the telephone number for reporting emergency situations occurring at the Site during non-operating hours; and

    16.5 the waste acceptable for disposal at the Site; and tipping fee rates.

17. The Site shall be permitted to operate;

    17.1 May 1 to October 31, Tuesday to Saturday: 8:30 a.m. to 5 p.m. and Saturday 10:00 a.m. to 5 p.m.;

    17.2 November 1 to April 30, Tuesday, Thursday and Saturday: 8:00 a.m. to 5:30 p.m.;

    17.3 The time of operation can be amended from time to time in writing to the District Manager for approval.

18. The Owner shall maintain daily records with monthly summary of the quantity and types of waste disposed of at the Site.

19. The following information shall be recorded on loads refused access to the Site for disposal purposes:

    19.1 date;
    19.2 name of persons;
    19.3 company name on vehicle;
    19.4 vehicle description;
    19.5 description of waste refused; and
    19.6 reasons for refusals

20. During non-operating hours of the Site, the entrance shall be locked..

21. No waste shall be received at the Site or removed from the Site, unless a Site Supervisor or his/her alternate (s) and/or designated person (s) are present to supervise the operation.

22. The Owner shall ensure that the Site Supervisor and/or designated alternative person (s) have been adequately trained with respect to the following procedures without limitations:

    22.1 conditions and Schedules of this Certificate;

    22.2 the operation and maintenance of this Site;

    22.3 relevant waste management regulations and legislation;

    22.4 environmental conditions and concerns related to waste handling operations at the Site;

    22.5 occupational health and safety activities pertaining to the workplace and waste handling operations at the Site.

23. The Owner shall keep a copy of this Certificate and Schedule "A" at the Site;

Site inspection

24. The Owner shall allow Ministry personnel, or a Ministry authorized representatives(s), upon presentation of credentials, to carry out any and all inspections authorized by the *Environmental Protection Act*, *Ontario Water Resources Act*, and the *Pesticide Act*, as amended from time to time, of any place to which this Certificate relates and without restricting the generality of the foregoing to:

    24.1 enter upon the premises or the location where the records required by the condition of this Certificate are kept;

    24.2 have access to and copy, at reasonable time, any records required by the conditions of this Certificate;

    24.3 inspect at reasonable times any facility, equipment, practices or operations required by the conditions of this Certificate; and

    24.4 sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Certificate.

Litter Control

25. Litter Control shall be carried out by the Owner in accordance with procedures described in Item no.3 of Schedule "A".

Dust Control

26. The Owner shall take all necessary mitigative actions for dust control.

    26.1 A dust suppressant shall be applied to the on-site roads, when dust becomes a problem during the dry periods of the year.

Pest Control

27. The Owner shall ensure that there are no pests that shall pose a hazard to the health and safety of persons.

Scavenging

28. The Owner shall ensure that there is no scavenging of waste at the Site.

Odour Control

29. The Owner shall operate the Site in such a manner to control off-Site impact of odours at all times.

Noise Control

30. The Owner shall operate the Site in such a manner to so as ensure minimum noise impact from haulage trucks and operating equipment on the natural environment and persons.

Burning of Waste

31. The Owner shall ensure that there is no burning of waste at the Site.

32. The burning of brush, trees and clean wood piles shall be conducted at the Site and shall be confined to a limited area as indicated in Item no. 3 Schedule "A" and in Section 4.21 of the MOE document entitled:"Guidance Manual for Landfill Sites Receiving Municipal Waste," dated November, 1992.

Methane Gas Control

33. The Owner shall conduct methane gas monitoring at the Site based on the annual monitoring report recommendations. The Owner shall ensure that methane gas does not pose a threat to the health and safety of persons and does not create an impact off-Site.

Surface Water Management

34. The Owner shall provide to the MOE regional office storm water management plan for the Site within 12 months of the issuance of this Notice. The trigger levels for the surface water monitoring program for the intermittent creek, wetlands and drainage system shall be established in consultation with the Regional staff and shall be subject to their approval.

Leachate Management

35. The landfill Site shall be inspected every month for leachate seepages. In the event leachate seepages are identified the Owner shall take the appropriate measures to mitigate the leachate problem within 5 working days weather permitting.

Daily and Interim Cover

36. The Owner shall provide an estimate for the next year's annual daily/ interim cover material required at the Site based on the annual fill rate as indicated in the annual monitoring report and logs for waste received at the Site. The soil borrow area extraction for cover material for the Phase two operation and development shall at all times be a minimum of one (1) metre vertical separation distance above the seasonal high watertable condition as identified in Item 3 and in Maps 3 and 4 of Schedule "A".

Final Cover

37. The maximum height for the refuse and final cover shall not exceed 113.0 metres above the assumed elevation datum as indicated in Drawing no. 5 of Item no.3, Schedule "A".

    37.1. No waste shall be deposited at the Site after the final contours have been attained as shown in Drawing no. 5 of Item no.3, Schedule "A". The final completed contours as noted in Condition 37, shall include 0.750 metre of final cover. The cover material shall include clean top soils and seed.

38. The Site capacity air space volume is 578,000 cubic metres or 260,000 tonnes (based on a compaction density rate of 0.45). Volumetric site capacity is calculated from the bottom elevation of 100.0 metres and top elevation of 113.0 metres above the assumed elevation data indicated in Drawing nos. 3, 4, 5 and 6 of Item no. 3 in Schedule "A".

Groundwater Monitoring

39. The groundwater monitoring program shall be undertaken by the Owner in accordance with Item nos.1

and 3 in Schedule "A ". The Owner shall provide with the annual report an evaluation of the groundwater condition for long term monitoring purposes and the number of wells required on Site to provide an accurate configuration of the hydrogeochemical conditions at the Site and proposed changes to the monitoring program shall be subject to the approval of the Regional Director.

40. Groundwater RUPO for the chemical parameters are identified in Table no. 7, Item no.3 in Schedule "A". The trigger levels for these parameters shall be 75% (seventy five percent) of the RUPO value. The trigger levels for the parameters for the groundwater monitoring program shall be established in consultation with the Regional staff and shall be subject to their approval. In the event, that the groundwater quality deteriorates and exceeds the RUPO trigger value at the property boundary and it is attributable to contamination originating from the Site, then the Owner shall provide to the Regional Director a contingency and remediation implementation Schedule plan to address the off-Site contamination. The financial cost for implementing the remedial action plan and abatement program shall be the responsibility of the Owner. The Contingency plan shall be implemented upon approval of the Director.

Surface water Monitoring

41. The surface water monitoring program shall be conducted is indicated in Items no.3, Schedule "A". Proposed changes to the monitoring program shall be subject to the approval of the Regional Director.

Closure Plan Landfill Site

42. One year before the Site is expected to close and stop receiving waste, as determined by Conditions 37 and 38, the Owner shall develop and submit an updated Closure Plan. The Closure Plan shall be submitted for the Director's approval and should outline the post-closure maintenance and monitoring program. The plan shall include, but not be limited to the following:

    42.1 Changes to the final contour plan that have occurred and have been previously identified in the annual reports or recommended in the development of the detailed closure plan;

    42.2 fencing and access control;

    42.3 details of any vegetative planting planned;

    42.4 the sequence and schedules for the final cover installation;

    42.5 post-closure and end-use plans;

    42.6 plans and schedules for the management and continued monitoring of the surface water and groundwater;

42.7 plans and schedules for routine monitoring and maintenance of stormwater facilities; and

42.8 plans and schedules for the routine monitoring of leachate seeps, the final cover and Site settlement.

Annual Report

43. The Owner shall prepare and submit an annual report to the Regional Director by May 30th of the year following the calendar year covered by the report which shall include as a minimum, but not limited to the following:

43.1 a survey of the Landfill Site waste disposal area to be conducted every three years and a map illustrating the existing contours.

43.2 a summary of the total annual quantities of waste received on a quarterly basis for the Site;

43.3 a drawing(s) indicating all groundwater and surface water monitoring locations;

43.4 tables outlining monitoring locations, analytical parameters sampled and the frequency of sampling;

43.5 an interpretation of the surface water, groundwater and leachate monitoring data; a review of the adequacy of the monitoring programs; provide conclusions and recommendations for changes made in the monitoring programs;

43.6 an assessment of the groundwater quality as it relates to the RUPO and ODWO;

43.7 an assessment of the surface water quality with respect to the PWQO/Guidelines;

43.8 an update of any changes made in the operations, equipment, or procedures at the Site and operating difficulties encountered;

43.9 drawings showing the areas of fill, buffer areas, current landfill contours, percentages of available space utilized, and an estimate of the remaining disposal capacity and the landfill life span;

43.10 a summary discussion of landfill daily cover requirements and erosion protection;

43.11 a statement of compliance with all the conditions with respect to the inspection and reporting requirements as indicated in the Certificate;

43.12 a summary of any complaints made regarding the landfill Site operations and response from the

Owner and the necessary actions taken to address these complaints;

43.13 recommendations with respect to any proposed changes made in the operation and monitoring programs for the Site; and

43.14 proposed changes made in the operation and monitoring program for the Site shall be subject to the approval of the Regional Director.

SCHEDULE "A"

This Schedule "A" forms part of the Provisional Certificate of Approval no. A 271701 and contains an application along with documentation submitted in support to this application:

1. "Township of Amabel Waste Disposal Site, Hydrogeological Assessment Plan of Operation and Development" prepared by Paragon Engineering Limited dated June, 1989.

2. Application to amend the Certificate of Approval no. 271701 submitted by the Township of Amabel dated June 25, 1998.

3. "Township of Amabel Waste Disposal Site, Plan of Development and Operation Phases 1 and 2" prepared by Stanley Consulting Group Ltd. dated June, 1998.

4. Letters dated August 12 and August 23, 1999 from the consulting company Stantec, Brad. R. Pryde, P.Eng., to A. Dominski, MOE, outlining the change in service area and the name change for the amalgamated municipalities.

The reasons for the imposition of these conditions are as follows:

6. Conditions A, B,11,12, 13, 14,15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, and 38 are to ensure the Site is operated in compliance and in accordance with the Provisional Certificate of Approval, EPA and other supporting documents submitted in Schedule "A".

7. Conditions 39, 40 and 41 are to ensure that the surface water and groundwater monitoring programs are conducted so that the Site is operated in compliance with the *Ontario Water Resources Act*, *Environmental Protection Act* and conditions in this Certificate.

8. Condition 42 provides guidance to ensure that the Site is closed in accordance with the Certificate. The Site shall be maintained and inspected so that it causes no impact on the natural environment does not create a nuisance and poses no threat to the health and safety of persons. The long term maintenance of the Site shall be such that, at all times, it shall be in compliance with the *Ontario Water Resources Act*, *Environmental Protection Act* and Conditions in this Certificate.

9. Condition 43 provides and outlines the requirements for the annual report that must be submitted to the Ministry. The annual report shall provide an update of all surface water and groundwater monitoring programs, waste placements, Site plans and all other operational development activities on the Site as set out in the Certificate.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990 c. E-19, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to <u>each</u> portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,*
Environmental Appeal Board,
2300 Yonge St., 12th Floor,
P.O. Box 2382
Toronto, Ontario.
M4P 1E4

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of the Environment,
2 St. Clair Avenue W., Floor 12A,
Toronto, Ontario.
M4V 1L5

*Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board by: Tel: (416) 314-4600, Fax: (416) 314-4506 or e-mail: www.ert.gov.on.ca.

DATED AT TORONTO this 25th *day of* October, 1999.

THIS IS A TRUE COPY OF
THE ORIGINAL CERTIFICATE
SIGNED BY: A. Dominski, P. Eng.
MAILED ON: OCT 27/99
BY: _____

SE/st
c: District Manager, Barrie

APPENDIX B:
ENVIRONMENTAL COMPLIANCE APPROVAL
(ALBEMARLE WASTE DISPOSAL SITE)

Ministry of the Environment
Ontario

Provisional Certificate No. A 271602

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

Under The Environmental Protection Act, 1971 and the regulations and subject to the limitations thereof, this Provisional Certificate of Approval is issued to:

Township of Albemarle
R. R. # 6
Wiarton, Ontario
N0H 2T0

for the use and operation of a 10.1 hectare dump site

all in accordance with the following plans and specifications:

Located: Parts of Lots 19 and 20, Concession 8, E.B.R.
Township of Albemarle
County of Bruce

which includes the use of the site only for the disposal of the following categories of waste (NOTE: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) Domestic, commercial and 5% other, limited to brush, wire and lumber.

and subject to the following conditions:

1. No operation shall be carried out at the site after sixty days from this condition becoming enforceable unless this Certificate including the reasons for this condition has been registered by the applicant as an instrument in the appropriate Land Registry Office against title to the sit and a duplicate registered copy thereof has been returned by the applicant to the Director.

Dated this 18th day of March, 1981

Director, Section 38,
The Environmental Protection Act, 1971

Ministry of the Environment
Ministère de l'Environnement

2 St. Clair Ave. West
Toronto ON M4V 1L5

2, avenue St. Clair Ouest
Toronto ON M4V 1L5

ENVIRONMENTAL ASSESSMENT AND APPROVALS BRANCH
Tel: (416) 314-8001
Fax: (416) 314-8452

Ontario

August 30, 2000

Ruthann Carson
Chief Administration Officer
Town of South Bruce Peninsula
315 George Street,
Box 310
Wiarton, Ontario, NOH 2TO

Dear Mrs Carson,

Re: Notice for the Provisional Certificate of Approval no. A 271602 for the Town of South Bruce Peninsula, Township of Albemarle waste disposal site, Parts of Lots 19 and 20, Concession 8 EBR, Township of Albemarle, County of Bruce.

Please find attached a copy of Notice for the Provisional Certificate of Approval no. A 271602 for the Township of Albemarle waste disposal site. We have circulated a draft copy of this Notice for appropriate co ments to you. The Ministry have received your comments and have taken them into consideration and have finalised this Notice. In our discussion with Mr Brad Pride your consultant from Stantec Consulting Ltd., he reportedly have outlined the following four options to Council;

1. Mothball the site and direct all waste to Amabel Landfill.
2. Maintain status quo and operate under the provisio of the amended C of A.
3. Convert Landfill to a transfer station.
4. Maintain statu quo of operations of the landfill utilizing the present C of A for the site.

Council must recognise when selecting any one of the above option certain terms and condition shall remain in place and enforceable such as the groundwater and surface water monitoring programs at the site and other appropriate conditions that ensure that the site is in compliance with the EPA regulations. However, Council can make an application in writing with supporting evidence to the Director requesting that certain conditions should be exempted from the Notice and/or held in abeyance until such time when they become rele ant and enforceable a the site.

If you have any questions concerning the terms and conditions in the Notice for the Provisional Certificate of Approval please feel free to contact me at telephone no. (416) 314-8274.

Yours truly,

S. Essop.
Senior Waste Evaluator.

cc. J .Earl, MOE, SWR.Owen Sound Area Office
B. Pride, Stantec Consulting Ltd.

Town of South Bruce Peninsula
315 George Street
Box 310
Wiarton, Ontario
N0H 2G0

You are hereby notified that the terms and conditions of the Provisional Certificate of Approval no. A 271602, March 18, 1981 are amended by this Notice and approval is granted for the use and operation of 1.60 hectares landfilling area within a total site area of 102.0 hectares;

all in accordance with the following plans and specifications: as listed in Schedule "A",

Located: Parts of Lots 19 and 20
Concession 8 EBR
Township of Albemarle
County of Bruce

which includes the use of the site only for the disposal of the following categories of waste (Note: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval) domestic, commercial and non-hazardous solid industrial wastes;

and subject to the following conditions:

The Township of Albemarle waste disposal site shall receive non hazardous domestic waste from only the Township of Albemarle, within the newly formed amalgamated municipality of the Town of South Bruce Peninsula.

0 **DEFINITIONS**

For the purpose of this Provisional Certificate of Approval:

2.1 "Certificate" means Provisional Certificate of Approval A 271602 dated March 18.1981, as amended from time to time, including all Schedules attached to and forming part of this Certificate;

2.2 "District Manager" means the District Manager of the Barrie District Office, Southwestern Region of the Ministry of Environment;

2.3 "Regional Director" means the Director, MOE, Southwestern Region and one or more persons who from time to time are appointed under Section 5 of the Environmental Protection Act;

2.4 "Owner" means the Town of South Bruce Peninsula;

2.5 "Site" means 1.60 hectares landfilling area within a total Site area of 102.0 hectares as shown in Map 1 of Item no.1, Schedule "A":

2.6 "ODWO" means the Ontario Drinking Water Objectives dated February, 1994 (and as amended);

2.7 "RUPO" means the Ministry of Environment Reasonable Use Policy Objectives (Policy no. B-7; and

2.8 "PWQO" means the Provincial Water Quality Objectives dated July, 1994 (and as amended).

GENERAL CONDITIONS

Pursuant to Section 197 of the Environmental Protection Act, neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.

3.1 The Owner shall:

Within 60 days of the date of this Certificate submit to the Director for the Director's signature two copies of a complete Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Reg. 14/92.

3.2 Within 10 calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

Should there be any discrepancies between any of the Schedules and conditions in this Certificate, the conditions shall take precedence. Should there be discrepancies between the documents listed in Schedule "A" of the Provisional Certificate of Approval dated March 18, 1981. The documents bearing the most recent date listed in this Certificate shall take precedence.

The Owner shall be bound by the conditions of this Certificate. The conditions of this Certificate shall extend to and bind any successor and/or subsequent Owner(s) of this Site subject to the approval of MOE.

The Site shall be operated and maintained by the Owner in accordance with all documents listed in the Schedule "A" of this Certificate.

The Owner shall place a sign at the main entrance to the Site on which is displayed in prominent letters the following information:

7.1 the name of the Site and the Certificate of Approval number for the Site;

7.2 the operating authority, telephone number and mailing address;

7.3 the hours the Site is open to accept waste from the public;

7.4 the telephone number for reporting emergency situations occurring at the Site during non-operating hours;

7.5 the waste acceptable for disposal at the Site; and tipping fee rates.

The Site shall be permitted to operate;

8.1 November 1 to April 30, Monday to Saturday: 8:00 am to 5 pm ;

8.2 May 1, to October 30, Monday, Wednesday and Saturday: 8:00 am to 5:00 pm.

8.3 The time of operation can be amended from time to time in writing to the District Manager for approval.

The Owner shall maintain daily records with monthly summary of the quantity and types of waste disposed of at the Site.

Information shall be recorded on loads refused access to the Site for disposal purposes:

10.1 date;
10.2 name of persons;
10.3 company name on vehicle;
10.4 vehicle description;
10.5 description of waste refused; and
10.6 reasons for refusals

During non-operating hours of the Site, the entrance shall be locked..

No waste shall be received at the Site or removed from the Site, unless a Site Supervisor or his/her alternate (s) and/or designated person (s) are present to supervise the operation.

The Owner shall ensure that the Site Supervisor and/or designated alternative person (s) have been adequately trained with respect to the following procedures without limitations:

13.1 conditions and Schedules of this Certificate;

13.2 the operation and maintenance of this Site;

13.3 relevant waste management regulations and legislation;

13.4 environmental conditions and concerns related to waste handling operations at the Site; and

13.5 occupational health and safety activities pertaining to the workplace and waste handling operations at the Site.

4 The Owner shall keep a copy of this Certificate and Schedule "A" at the Site;

Site Inspection

5 The Owner shall allow Ministry personnel, or a Ministry authorized representatives(s), upon presentation of credentials, to carry out any and all inspections authorized by the Environmental Protection Act, Ontario Water Resources Act, and the Pesticide Act as amended from time to time, of any place to which this Certificate relates and without restricting the generality of the foregoing to:

15.1 enter upon the premises or the location where the records required by the condition of this Certificate are kept;

15.2 have access to and copy, at reasonable time, any records required by the conditions of this Certificate;

15.3 inspect at reasonable times any facility, equipment, practices or operations required by the conditions of this Certificate; and

15.4 sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Certificate.

Litter Control

Litter Control shall be carried out by the Owner in accordance with procedures described in Item no.1 of Schedule "A".

Dust Control

The Owner shall take all necessary mitigative actions for dust control.

17.1 A dust suppressant shall be applied to the on-site roads, when dust becomes a problem during the dry periods of the year.

Pest Control

The Owner shall ensure that there are no pests that shall pose a hazard to the health and safety of persons.

Scavenging

The Owner shall ensure that there is no scavenging of waste at the Site.

Odour Control

0. The Owner shall operate the Site in such a manner to control off-Site impact of odours at all times.

Noise Control

1. The Owner shall operate the Site in such a manner to so as ensure minimum noise impact from haulage trucks and operating equipment on the natural environment and persons.

Burning of Waste

2. The Owner shall ensure that there is no burning of waste at the Site.

3. The burning of brush, trees and clean wood piles shall be conducted at the Site and shall be confined to a limited area as indicated in Item no.1, Schedule "A" and in Section 4.21 of the MOE document entitled:"Guidance Manual for Landfill Sites Receiving Municipal Waste," dated November, 1992.

Surface Water Management

The Owner shall provide to the MOE regional office a surface/storm water management plan for the Site within 12 months of the issuance of this Notice. The trigger levels for the surface water monitoring program for the intermittent creek, wetlands and surface waters that drain toward Berford Lake and Colpoy's Creek, shall be established in consultation with the Regional staff and shall be subject to their approval.

Leachate Management

The landfill Site shall be inspected every month for leachate seepages. In the event leachate seepages are identified the Owner shall take the appropriate measures to mitigate the leachate problem within 5 working days weather permitting.

Daily Waste Cover

The Owner shall provide an estimate for the next year's annual daily/ interim cover material required at the Site based on the annual fill rate as indicated in the annual monitoring report and logs for waste received at the Site. The owner shall ensure that daily cover material is applied weekly, weather permitting. The averaged thickness of the daily cover when soil is used shall be 15 cm . The use of other alternative daily cover material shall be subject to the approval of the Regional Director.

Final Cover

The maximum height for the refuse and final cover shall not exceed 102..75 metres above the assumed elevation datum as indicated in Section 4.0 and shown on Map 2 of Item no.1, Schedule "A".

27.1. No waste shall be deposited at the Site after the final contours have been attained. Pursuant to

Condition 27, the final completed contours shall include 0.750 metre of final cover. The cover material shall include clean top soils and seed.

28. The Site capacity air space volume is 60,000 cubic metres or 27,000 tonnes (based on a compaction density rate of 0.45) for landfill areas A and B. The volumetric site capacity is based and calculated on the bottom elevation of 94.5 metres and top elevation of 102.0 metres above the assumed elevation data indicated in Map 2 of Item no.1 in Schedule "A". The Owner shall provide within 12 months of the issuance of this Notice an updated Site survey map showing final contours for Site closure plan, and an updated site capacity calculation based on the Site survey data.

Groundwater Monitoring

29. The Owner shall within 12 months of the issuance of this Notice provide a ground- water monitoring program and implementation schedule to the Regional hydrogeologist staff for approval. As part of the groundwater baseline monitoring program, the Owner shall install one (1) leachate monitoring well and a minimum of three (3) monitoring wells but shall not be limited to this number. The monitors shall be used to assess the hydrogeological conditions at the Site.

29.1 The Owner shall provide with the annual report an evaluation of the groundwater condition for the long term monitoring purposes of the Site. At any time additional monitoring wells are required on Site to provide a more accurate configuration of the groundwater hydrogeochemical conditions, these proposed changes to the monitoring program shall be subject to the approval of the Regional Director.

30. Groundwater RUPO for the chemical parameters are identified in Table no.2, Item no.1 in Schedule "A" The trigger levels for parameters shall be 75% (seventy five percent) of the RUPO value. The Owner shall provide revised trigger levels for the parameters for the groundwater monitoring program upon installation of the monitoring wells and the completion of the water sampling and chemical analyses program. The revised trigger levels shall be established in consultation with the Regional hydrogeologist and shall be subject to his/her approval.

31. In the event, that the groundwater quality deteriorates and exceeds the RUPO value at the property boundary and it is attributable to contamination originating from the Site, then the Owner shall provide to the Regional Director a contingency and remediation implementation Schedule plan to address the off-Site contamination. The financial cost for implementing the remedial action plan and abatement program shall be the responsibility of the Owner. The Contingency plan shall be implemented upon approval of the Regional Director.

Surface water Monitoring

The Owner pursuant to Condition 24 shall provide for the approval of the Regional Director a surface water monitoring program and an implementation schedule.

Closure Plan Landfill Site

33. One year before the Site is expected to close and stop receiving waste, as determined by Conditions 27 and 28 the Owner shall develop and submit an updated Closure Plan. The Closure Plan shall be submitted for the Regional Director's approval and should outline the post-closure maintenance and monitoring program. The plan shall include, but not be limited to the following:

33.1 Changes to the final contour plan that have occurred and have been previously identified in the annual reports or recommended in the development of the detailed closure plan;

33.2 fencing and access control;

33.3 details of any vegetative planting planned;

33.4 the sequence and schedules for the final cover installation;

33.5 post-closure and end-use plans;

33.6 plans and schedules for the management and continued monitoring of the surface water and groundwater;

33.7 plans and schedules for routine monitoring and maintenance of stormwater facilities; and

33.8 plans and schedules for the routine monitoring of leachate seeps, the final cover and Site settlement.

nnual Report

34. The Owner shall prepare and submit an annual report to the Regional Director by May 30, of the year following the calendar year covered by the report which shall include as a minimum, but not limited to the following:

34.1 a survey of the Landfill Site waste disposal area to be conducted every five years and a map illustrating the existing contours.

34.2 a summary of the total annual quantities of waste received on a quarterly basis for the Site;

34.3 a drawing(s) indicating all groundwater and surface water monitoring locations;

34.4 tables outlining monitoring locations, analytical parameters sampled and the frequency of sampling;

34.5 an interpretation of the surface water, groundwater and leachate monitoring data; a review of the adequacy of the monitoring programs; provide conclusions and recommendations for changes made in the monitoring programs;

34.6 an assessment of the groundwater quality as it relates to the RUPO and ODWO;

34.7 an assessment of the surface water quality with respect to the PWQO/Guidelines;

34.8 an update of any changes made in the operations, equipment, or procedures at the Site and operating difficulties encountered;

34.9 drawings showing the areas of fill, buffer areas, current landfill contours, percentages of available space utilized, and an estimate of the remaining disposal capacity and the landfill life span;

34.10 a summary discussion of landfill daily cover requirements and erosion protection;

34.11 a statement of compliance with all the conditions with respect to the inspection and reporting requirements as indicated in the Certificate;

34.12 a summary of any complaints made regarding the landfill Site operations and response from the Owner and the necessary actions taken to address these complaints;

34.13 recommendations with respect to any proposed changes made in the operation and monitoring programs for the Site; and

34.14 proposed changes made in the operation and monitoring program for the Site shall be subject to the approval of the Regional Director.

The reasons for the imposition of these conditions are as follows:

Conditions A 2, 3, 4, 5 6, 7, 8, 9 10, 11 12, 13, 14,15, 16, 17, 18, 19, 20, 21. 22, 23, 24, 25, 26 27 and 28 are to ensure the Site is operated in compliance and in accordance with the Provisional Certificate of Approval, EPA and other supporting documents submitted in Schedule "A".

Conditions 29, 30, 31 and 32 are to ensure that the surface water and groundwater monitoring programs are conducted so that the Site is operated in compliance with the Ontario Water Resources Act, Environmental Protection Act and the conditions in this Certificate.

Condition 33 provides guidance to ensure that the Site is closed in accordance with the Certificate. The Site shall be maintained and inspected so that it causes no impact on the natural environment does not create a nuisance and poses no threat to the health and safety of persons. The long term maintenance of the Site shall be such that, at all times it shall be in compliance with the Ontario Water Resources Act, Environmental Protection Act and Conditions in this Certificate.

Condition 34 provides and outlines the requirements for the annual report that must be submitted to the Ministry. The annual report shall provide an update of all surface water and groundwater monitoring programs, waste placements, Site plans and all other operational development activities on the Site as set out in the Certificate.

SCHEDULE "A"

This Schedule "A" forms part of the Provisional Certificate of Approval no. A 271602 and contains an application along with documentation submitted in support to this application:

1. **"Township of Albemarle Waste Disposal Site, Hydrogeological Assessment and Plan of Operation and Development," prepared by Stantec Consulting Ltd. (Stanley Consulting Group Ltd) dated March, 199**

2. **Letter Application from B. Pryde, Stantec to A. Dominski, EAAB, MOE to amend the Certificate of Approval no. 271602 to allow for name change and service area, for the amalgamated municipalities, dated August 12, 1999.**

3. **Letter from B. Pryde, Stantec to L. Struthers, MOE , Owen Sound Area Office, providing supporting information for service area and name change, dated August 23, 1999.**

4. **Application from The Town of South Bruce Peninsula to amend the Certificate for the Township of Albemarle, prepared by Stantec ,dated November 23, 1999.**

5. **Letter from T. Beukeboom, MOE, London to L. Struthers MOE, Area Office, recommending ground water monitoring and installation of water well monitors for the Site, dated February 24, 2000.**

6. **Letter from B. Pryde, Stantec to S. Essop, EAAB, MOE , providing comments on long term options for the landfill operations, dated May 9, 2000.**

7. **Letter from B. Pryde, Stantec to L. Struthers, MOE , Owen Sound Area Office, providing comments on draft Notice, dated May 17, 2000.**

8. **Letter from B. Pryde, Stantec to S. Essop, EAAB, MOE , providing comments on long term options and discussion for the landfill operations, dated July 24, 2000.**

9. **Letter from B. Pryde, Stantec to S. Essop, EAAB, MOE , providing comments on long term options and discussion for the landfill operations at Council meeting, dated July 24, 2000.**

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990 c. E-19, you may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a hearing shall state:

The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

The name of the appellant;
The address of the appellant;
The Certificate of Approval number;
The date of the Certificate of Approval;
The name of the Director;
The municipality within which the waste disposal site is located:

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary,*
Environmental Appeal Board,
2300 Yonge St., 12th Floor,
P.O. Box 2382
Toronto, Ontario.
M4P 1E4

AND

The Director,
Section 39, Environmental Protection Act,
Ministry of the Environment,
2 St-Clair Avenue West, Floor 12A
Toronto, Ontario.
M4V 1L6

Further information on the Environmental Appeal Board's requirements for an appeal can be obtained directly from the Board by: Tel: (416) 314-4600, Fax: (416) 314-4506 or e-mail: www.ert.gov.on.ca.

DATED AT TORONTO this 30th *day of* August, 2000.

A. Dominski, P. Eng.
Director
Section 39
Environmental Protection Act

c: dl

District Manager, Owen Sound Area Office
B. Pride, Jantec Consulting Ltd.

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVA
WASTE DISPOSAL SIT
NUMBER A27160

The Corporation of the Town of South Bruce Peninsula
PO Box 310
Wiarton, Ontario
N0H 2T0

Site Location: Albemarle Waste Disposal Site
Part of Lots 19 & 20, Concession 8 EBR
South Bruce Peninsula Town, County of Bruce

You are hereby notified that I have amended Provisional Certificate of Approval No. A271602 issued on March 18, 1981, and amended on August 30, 2000 for use and operation of a 1.6 hectares landfilling area within a total site area of 102.0 hectares, as follows:

A. Conditions Number 23 and 25 are hereby revoked.

B. The following Conditions are added to the Certificate:

Interim Site Closure

35. The interim closure of the Site, including grading, cover material application and hydroseeding, shall be carried out, all in accordance with Item Number 10 of Schedule A of this Certificate. Grading and cover material application at the Site shall be completed by September 30, 2003

35.1 The interim final cover shall be inspected twice per year for signs of leachate seepage, erosion, ponding of water, quality of vegetative cover, settlement, cracks and exposed waste. Any problems or deficiencies discovered shall be repaired as soon as possible.

35.2 Surface and ground water monitoring programs and submission of the annual monitoring reporting shall continue as outlined in Section 6.0 of Item Number 10 of Schedule "A".

6. The swing pole gate across the entrance road to the Site shall be kept locked at all times.

ite Re-Opening

7. One year prior to the re-opening of the Site, the Owner shall submit to the Director for approval, an updated and revised Design and Operation plan, including an updated groundwater monitoring and

surface water monitoring and management plan and obtain written approval prior to any waste being accepted at the Site.

The following item is added to Schedule "A" of the Certificate:

10. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated February 14, 2002, and Plan of Development and Operation Addendum prepared by Mr. Brad R. Pryde, Pryde Schropp McComb Inc., dated January 2002.

The reason for this amendment to the Certificate of Approval is as follows:

1. Conditions 35, 35.1, 35.2, 36 and 37 are added to ensure that the Site is closed and monitored properly in an environmentally sound and safe manner with no adverse impacts to the environment.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A271602 dated March 18, 1981, and amended on August 30, 2000.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act

DATED AT TORONTO this 20th day of January, 2003

THIS CERTIFICATE WAS MAILED
ON Jan. 27, 2003
QC
(Signed)

Ian Parrott, P.Eng.
Director
Section 39, *Environmental Protection Act*

NP/
c: District Manager, MOE Barrie
Brad R. Pryde, P.Eng., Pryde Schropp McComb Inc.

APPENDIX C:
MECP PRE-CONSULTATION CORRESPONDENCE

June 12, 2019
Our File: 219015-1

Ministry of the Environment, Conservation and Parks
Environmental Assessment and Permissions Branch
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5

Attention: Ranjani Munasinghe

Re: Albemarle Waste Disposal Site
ECA No. A271602 Clarification
Landfill Area, Volume and Capacity

Dear Ranjani:

Environmental Compliance Approval No. A271602 (formerly a Certificate of Approval), which was issued on March 18, 1981, approved the use of a *'10.1 hectare dump site'* at the Albemarle Landfill. The Albemarle Landfill Site is located approximately 10 kilometers north of the geographic Town of Wiarton within Part of Lots 19 and 20, Concession 8 EBR, former Township of Albemarle in the Town of South Bruce Peninsula.

Following a review of the subject ECA, as amended on August 30, 2000, it appears that Conditions 27 and 28 have not considered the future development of the approved 10.1 hectare waste disposal site. With respect to the 'Site', which is defined as the 1.60 hectare landfilling area within the total site area of 102.0 hectares, these Conditions state that:

- *The total approved Site capacity air space volume is 60,000 m³;*
- *The maximum height for the refuse and final cover shall not exceed 102.75 meters above the assumed elevation datum; and*
- *No waste shall be deposited at the Site after the final contours have been attained.*

As defined in the ECA (March 1981), the site has a total approved area of 10.1 hectares for waste disposal, a final site capacity is not specified. However, Condition 28 only defines an approved volume of 60,000m³ for waste and interim cover representing a 1.6 ha area. Therefore, Condition 28 excludes 8.5 hectares of previously approved waste disposal area. It is our understanding that Condition 28 is only referring to the area outlined in the Hydrogeological Assessment and Plan of Development and Operation prepared by Stantec Consulting Limited (March 1998). Consistent with other Approvals issued around that time, the approved site capacity and landfill contours are based on those for which design plans for the development and use of the landfill were received and reviewed by the Ministry, rather than the total approved area for waste disposal.

The estimated site life of the existing landfill currently operated by the Town (i.e. the Amabel Site) is estimated to be in the range of 10 to 15 years. Upon completion of that area, the Town may consider the use of the remaining approved 8.5 hectares at the Albemarle Landfill Site. We are seeking clarification and/or confirmation with respect to the steps required under the existing ECA to allow future development in this area.

It is our understanding that if the Town wishes to develop the landfill beyond the currently approved 1.6 ha limit of fill, an application to amend the ECA, an updated Hydrogeological Assessment and an updated Plan of Development and Operation, supporting the development, would need to be submitted to the *Director* for review and a decision to grant the amendment would be determined based upon the merits of the submission. Further, since the waste disposal area has already been approved, future development would not be considered a new nor expanding landfill. Therefore, additional waste disposal, limited to the previously approved 10.1 hectare area, would not be subject to the Environmental Assessment process.

As part of this review, the Township has been unable to locate several key pieces of information referenced by the ECA, including the *'Township of Albemarle Waste Disposal Site, Hydrogeological Assessment and Plan of Operation and Development'* (March 1998) and associated Maps, prepared by Stantec Consulting Limited (March 1998). The local MECP office has also indicated that they do not have the relevant report and site plans.

We kindly request your interpretation of the Approval regarding the landfill area, volume and capacity of the Albemarle Waste Disposal Site and any pertinent information you may have.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED
Per:

Alen Bringleson, B.E.S, C.E.T.
AHN/mz

cc: Chris Cornfield, Town of South Bruce Peninsula
Ian Mitchell, MECP Owen Sound
File No. 219015-1

APPENDIX D:
TERMS OF REFERENCE AND EA PROCESS SCHEMATICS

Appendix A Environmental Assessment Process Timelines