

**Township of North Frontenac
Integrated Waste Management Plan**

Prepared by:

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Statement of Qualifications and Limitations

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September 11, 2009

Project Number: 113418

Brenda Defosse
Clerk
Township of North Frontenac
Plevna, ON

Dear Ms. Defosse:

Re: North Frontenac Integrated Waste Management Plan

We are pleased to present our final version of the North Frontenac Integrated Waste Management Plan, as approved by council. It has been a pleasure working through this with the Waste Management Plan Committee and we look forward to future collaborations.

Sincerely,
AECOM



Guy Laporte
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GML:ak

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- B. Relevant Reports

1. Introduction

1.1 Purpose

The Township of North Frontenac initiated the creation of the Integrated Waste Management Plan in July 2008. The purpose of this planning exercise is to:

- Better understand and quantify the current solid waste needs of the Township;
- Address and improve system efficiency and environmental impacts
- Plan for future growth and waste management priorities.

AECOM has been retained by the municipality to assist with preparation of this plan. The study has been directed by the Waste Management Committee, a committee of Township Council.

1.2 Study Objectives

Study objectives are a list of criteria against which alternative recommendations can be evaluated. The Waste Management Committee has determined that any waste management system proposed for the Township of North Frontenac should comply with the following:

- Environmentally Sound
- Compliant with Regulations
- Feasible and Easy to Implement
- Cost Effective and Affordable

This plan is a guidance document for the next twenty years that will ensure that the objectives of the Council of North Frontenac will be fulfilled, regardless of staff or Council member turnover.

1.3 Secondary Objectives

The Committee established a number of secondary study objectives that are consistent with, and give more meaning to, the primary objectives.

Topographical surveys of the Township's landfills show that the amount of waste being disposed of is the equivalent of 1.1 kilograms per person per day, suggesting that approximately 25% of the Township's waste stream is already being diverted.

The committee determined that a system that maximizes diversions from waste disposal is best for the environment and most sustainable. In this regard, the Committee has established a diversion target of 50%.

In setting this target the Committee has taken into account the Provincial objective of 60% diversion from waste disposal. The committee has noted that the range of options available to a smaller municipality is

limited due to economies of scale. It notes, for example, that the Township of North Frontenac does not have the resources to implement a full three stream collection system (although it could possibly participate on a Regional level, if such a service were available). 50% diversion is deemed to be a realistic and achievable goal and a significant improvement over current diversion.

The Township of North Frontenac maintains five active waste disposal sites, at least one of which is in each district. Overall, the Township has capacity for 22 years of waste disposal *at current rates* (Note that it is a goal of this plan to improve on current rates). However, the capacity is not well distributed throughout the Township. It is a recommendation of this plan that when capacity has been consumed at one site wastes formerly disposed of at that site be re-directed to other sites in the Township. Domestic wastes generated in North Frontenac that cannot be diverted from landfill should be landfilled in North Frontenac.

The Township of North Frontenac has been assessing and monitoring its waste disposal sites to confirm compliance with current environmental standards. The Township has used different methods to mitigate impacts, such as acquisition of additional buffer or capping of portions of a site. Where impacts cannot be adequately mitigated it may be necessary to close a site. Assessment and monitoring of sites will continue.

Secondary study objectives are summarized below.

- The Township of North Frontenac will endeavour to divert 50% of its waste stream from landfills.
- Domestic wastes generated in North Frontenac that cannot be diverted from landfill should be landfilled in North Frontenac.
- The Township of North Frontenac should continue its ongoing program of assessing, monitoring and managing landfill site impacts.

The North Frontenac Integrated Waste Management Plan is designed to cover all aspects of domestic waste management generated within the Township boundaries, including:

- Domestic solid waste
- Domestic recyclables
- Household hazardous waste
- Solid waste and recyclables generated by Municipal operations
- Waste Electrical & Electronic Equipment (WEEE)
- Composting activities
- Reuse facilities

1.4 Background

The Township of North Frontenac came into being ten years ago, on January 1, 1998. The Township is an amalgamation of the former Townships of Barrie, Clarendon & Miller, and Palmerston, North & North Canoto. The Township is home to 1,909 full-time residents and 3,409 households (Source: Municipal Property Assessment Corporation).

Waste management services are operated on a township-wide basis. Residents are required to bring their wastes to one of five operating landfills or two transfer stations. Any resident may use any site during its regular operating hours.

Recycling collection facilities are provided at each landfill or transfer station. Recycling drop off is free for residents and by bringing a bag of recyclables, residents may also dispose of a bag of household waste free of charge. Household hazardous waste collection will be provided at three waste sites in the Township, one in each ward.

All residents are able to purchase subsidized rear yard compostors from the Township.

A map of North Frontenac indicating the location of each waste disposal site can be found in Figure 1.1.

1.5 Previous Reports

There has been significant study of individual waste disposal sites within the Township. These studies and the resulting reports were referenced in preparation of this report. Additional site traffic and recycling records, provided by the Township, have also been invaluable.

A full listing of relevant reports has been included in Appendix B.

1.6 Recent Initiatives

In 2008, the Township of North Frontenac entered into an agreement with Beauman Recycling in Renfrew to take blue box materials collected at the waste disposal sites. This partnership will replace the existing arrangement with HGC and Gemini Recycling. The Township is always seeking new opportunities in the region for further recycling.

Household hazardous waste collection facilities were constructed at one landfill site in each district in 2008. Waste collected at each site is periodically collected and transported to appropriate recycling or disposal facilities. This program is operated in partnership with Waste Diversion Ontario and Stewardship Ontario.

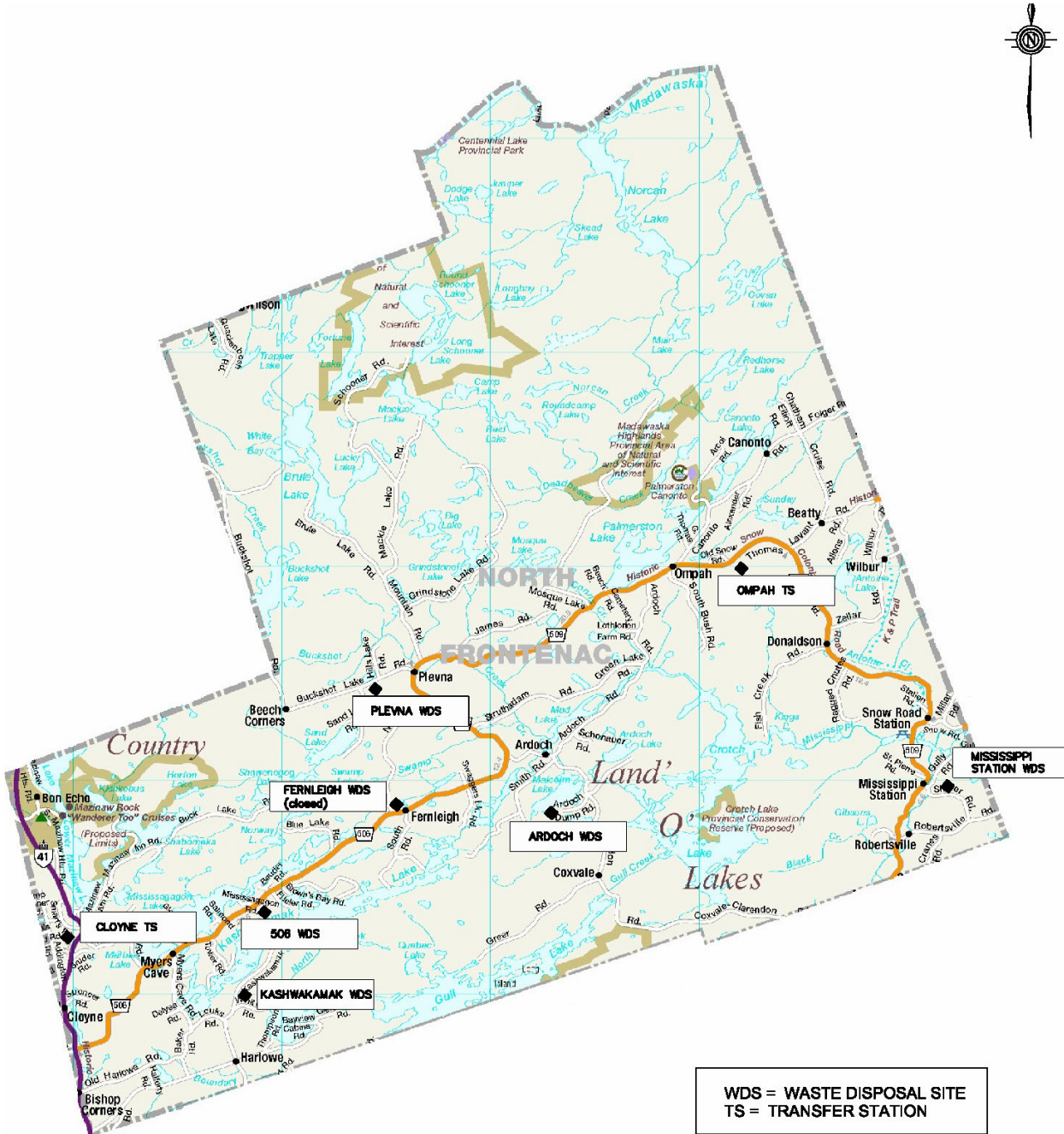


Figure 1.1 - Location Plan

2. Relevant Legislation

2.1 Environmental Protection Act

The Environmental Protection Act (EPA) provides the legislative framework for the establishment of waste management facilities. The establishment, operation, management, alteration, enlargement and/or extension of waste management facilities in the Province of Ontario requires a Certificate of Approval under Part 5, Section 27 of the EPA.

To obtain approval for any new waste management system, transfer facility or landfill site, or for any substantive change to what exists, the Ministry of the Environment will require an application for a Certificate of Approval. To confirm compliance with current regulations, applications must be accompanied by the following documents, as a minimum:

- A legal survey and proof of ownership;
- An Operation Plan to guide operation and eventual decommissioning of the facility, and;
- An impact assessment, which will confirm that the site can operate without significant environmental impacts or nuisance to neighbouring properties.

In some instances the Ministry will require public consultation as part of the application process. For new landfills, or expansions of greater than 100,000 m³, public hearings are mandatory.

2.2 Ontario Regulation 347

Regulation 347 (formerly Regulation 309) under the EPA is the primary regulation for controlling the handling, disposal and management of hazardous and non-hazardous wastes in the Province. Under the regulation, wastes are classified into categories that stipulate handling requirements. The Regulations specify control measures for disposal facilities.

Standards for the location, maintenance and operation of landfill sites are stated in Section 11 of Regulation 347. Section 9 of the Regulation additionally states that the terms and conditions of the Certificate of Approval can, on a site specific basis, over-ride the standards of the Regulation.

2.3 Ontario Regulation 101/94

Ontario Regulation 101/94 is also known as the 3Rs Regulations. It, and accompanying regulations, became law on March 3, 1994. The regulations are an integral part of Ontario's Waste Reduction Action Plan. The plan was aimed at reducing the amount of waste going to disposal by at least 50 per cent by the year 2000 compared to the base year of 1987. The objective was achieved through a strategy based on the 3Rs — reduction, reuse and recycling.

The 3Rs Regulations were designed to ensure that industrial, commercial and institutional (IC&I) sectors, as well as municipalities, developed programs to reduce the amount of valuable resources going to disposal.

Regulation 101/94 requires specified municipalities to implement recycling programs, including collection of Blue Box wastes, home composting of organic wastes, and composting of leaf and yard waste. Municipalities with populations greater than 5,000 are required to establish blue box collection systems. These municipalities must also provide rear yard composters at cost or less, along with educational material. Municipalities of greater than 50,000 people must provide a central leaf and yard waste composting facility.

2.4 Ontario Regulation 299/94

Ontario Regulation 299/94 has significant relevance to the North Frontenac Township. Regulation 299/94 amends Regulation 347 to allow the service area of a landfilling site to be expanded to the boundaries of a (new) municipality without the requirement of compulsory hearings. Compulsory hearings are a normal requirement for applications which affect a population of 1,500 or greater.

Ministry staff has interpreted this regulation to allow changes to a service area, but not to rate of fill. They have allowed that, as a rule of thumb, the service population may increase by 25% without the need for a new approval. This is based on an assumption that waste generation rates have decreased by that amount as a result of waste diversion initiatives. Increases in the population serviced beyond 25% will still require a new application, but hearings are not compulsory.

Regulation 299/94 affords North Frontenac significant flexibility. For example, it may be more convenient for certain residents to attend a landfill outside of their traditional service area, due to the hours of operation. This can be allowed. Similarly, there may be times when the municipality will need to handle an unusual waste stream, such as a clean up program. Again, it would be appropriate to direct this waste stream to the site best able to deal with it.

2.5 Ontario Regulation 232/98

Ontario Regulation 232/98 and its accompanying Guideline specify a comprehensive standard for landfill design, operation, monitoring and closure. O. Reg. 232/98 came into effect on August 1, 1998 and applies to all new or expanding waste disposal sites, or any site of greater than 40,000 m³. Ministry staff relies heavily on the Guidelines associated with this regulation when reviewing Certificate of Approval applications. New Certificates issued since 1998 have generally enforced compliance with this standard.

O. Reg. 232/98 imposes a much higher and more detailed standard on waste site management than did the preceding O. Reg. 347, and, for landfilling sites, O. Reg. 232/98 takes precedence. O. Reg. 347 is still relevant to previously approved sites of less than 40,000 m³ and to waste management facilities that are not landfills.

2.6 Bill 90, Waste Diversion Act

Bill 90, an Act to promote the reduction, reuse and recycling of waste, was given Royal Assent on June 27, 2002. The Act created Waste Diversion Ontario (WDO), a non-crown corporation. WDO was established to develop, implement and operate waste diversion programs for a wide range of materials. The Act empowers the Minister of the Environment to designate a material for which a waste diversion program is to be established.

Once the Minister has designated a material through a regulation under the Waste Diversion Act, the Minister asks Waste Diversion Ontario, working co-operatively with stewards, to develop a diversion program. The Minister has designated Blue Box Waste, Used Tires, Used Oil Material, Waste Electronic and Electrical Equipment and Municipal Hazardous or Special Waste under the WDA. The Minister has indicated that the Used Oil Material designation has been set aside and development of a diversion program for Used Tires has been deferred.

The Blue Box Program Plan was approved by the Minister on December 22, 2003 and commenced on February 1, 2004. WDO is currently developing diversion programs for Waste Electronic and Electrical Equipment and Municipal Hazardous or Special Waste.

2.7 Ontario Regulation 101/07

Ontario Regulation 101/07, the Waste Management Project Regulation made under the Environmental Assessment Act, makes it easier for municipalities to find viable solutions for managing waste. The regulation sets out the EA requirements for waste diversion and disposal facilities.

Accompanying regulations under the Environmental Protection Act are intended to streamline the approval process for recycling certain materials. The regulations include the following components:

- Recycling facilities of any size will not have to go through the EA process provided that just 1,000 tonnes per day of residual waste ends up going to disposal.
- Small rural landfills or expansions of between 40,000 and 100,000 cubic metres would go through an environmental screening process, saving municipalities 18 months and thousands of dollars.
- Proponents can pilot new waste technologies without having to undergo an EA providing they are small and can meet the ministry's air emission standards. It will be easier to recycle certain wastes that currently do not meet existing exemption criteria. Included are waste paint, crumb rubber, batteries and electronics.
- Converting certain wastes into alternative fuels will no longer require waste management approvals but still must meet air emission standards.

2.8 MOE Guidelines B-7 and B-9

MOE Guideline B-7 is also known as the “Reasonable Use Concept”. In essence, Guideline B-7 allows a property owner to pollute groundwater that flows off of its property, but only to a pre-defined amount. In no instance is a landowner allowed to pollute the groundwater to an extent that it becomes non-potable.

Guideline B-7 is an important concept for rural waste disposal sites. All wastes disposal sites generate leachate. Rural sites are “naturally attenuated” which means that the leachate is weakened to an acceptable level within the site boundaries. This often involves purchase of additional lands, which become the “leachate attenuation zone”.

Guideline B-9 is titled “Resolution of Groundwater Interference Problems”. Guideline B-9 applies to old, closed waste sites. B-9 is less onerous than B-7 because it allows the polluting property owner to consider probable off-site uses of the groundwater. If the neighbouring property is undevelopable, a wetland for example, then contamination in excess of Ontario’s Drinking Water Standards may be allowed.

Although B-7 and B-9 are guidelines, Ministry staff have successfully defended their enforcement at numerous hearings. For many site owners, the existence of a guideline can be better than no guideline at all.

2.9 Provincial Water Quality Objectives

Leachate generated by a waste disposal site may also impact surface waters. If this occurs, the impact will be compared to Ontario’s Provincial Water Quality Objectives. This can be more onerous than a groundwater impact, as surface water impacts cannot be mitigated by purchasing the impacted lands.

2.10 Provincial Policy Statement, 2005

Section 1.6.8 of the Provincial Policy Statement on land-use planning, issued under the authority of Section 3 of the Planning Act, states that:

“Waste management systems need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage and promote reduction, reuse and recycling objectives.

Waste management systems shall be located and designed in accordance with provincial legislation and standards.”

2.11 Other Regulation

Waste management facilities, particularly new waste landfill sites, may also be subject to approval under the Environmental Assessment Act and the Ontario Water Resources Act.

Operation of waste disposal sites must comply with the Federal Fisheries Act.

2.12 Definition of Waste

Interpretation of the Province's waste management legislation/regulation falls to staff of the Ministry of Environment. The issue of what constitutes a waste is one which has caused much debate. The definition of waste is important because waste must be handled in accordance with all of the legislation pertaining to it. All areas of waste management, including collection, storage, transportation and disposal, are subject to review and approvals.

The interpretation of what is waste is often an area of confusion for the general public. For example, the author has been asked why a municipality could not pick up household hazardous wastes along with garbage and recyclables. While this is technically possible, the special waste handling licenses and specialized equipment required would significantly limit the municipality's options with respect to who can be allowed to pick up garbage. Costs for waste collection would be substantially higher. Accordingly, the process of requiring the householder to transport its household hazardous waste to a central depot (the material is not defined as waste until the householder has disposed of it) has become the norm across Ontario.

3. Problem Definition

The purpose of this Study is to assess the existing waste management system in the Township of North Frontenac and to recommend improvement. The study will consider all wastes generated by residents of North Frontenac, which also includes a small component of commercial and institutional waste (there are no large commercial or industrial waste generators located in the Township). The total volume of waste to be managed can be estimated based on population.

3.1 Service Population

The population of the Township of North Frontenac has been obtained from Statistic Canada census data. Until 2006, the population of each of the former Townships was reported; in 2006 only the amalgamated population was recorded. Using historical rates of growth, the expected population of the Township was calculated to 2030. These calculations also take into account the significant seasonal population within North Frontenac. An 'Equivalent Population' was calculated by assuming the seasonal population was three times the permanent population and used the waste facilities only three months per year.

The projected equivalent population is listed in Table 3.1.

Table 3.1 - Equivalent Population to 2030

| Year | Equivalent Waste Disposal Site Users | | | | |
|------|--------------------------------------|--------|--------|------------------------|-----------|
| | Ward 1 | Ward 2 | Ward 3 | Twp of North Frontenac | |
| 1991 | 1,274 | 828 | 688 | 2,790 | ACTUAL |
| 1996 | 1,439 | 954 | 711 | 3,103 | |
| 2001 | 1,465 | 947 | 740 | 3,152 | |
| 2006 | 1,549 | 1,001 | 783 | 3,332 | |
| 2007 | 1,567 | 1,013 | 792 | 3,372 | PROJECTED |
| 2008 | 1,586 | 1,025 | 801 | 3,412 | |
| 2009 | 1,605 | 1,037 | 811 | 3,453 | |
| 2010 | 1,624 | 1,050 | 821 | 3,495 | |
| ↓ | ↓ | ↓ | ↓ | ↓ | |
| 2030 | 2,062 | 1,333 | 1,042 | 4,436 | |

1) Assumes future population growth at 1.2% annually

2) Ward populations for 2006 and onward are interpolated based on historical trends

Source: Statistics Canada Community Profiles, 1991-2006

By this method of estimation, the equivalent population of the Township will grow to 4,436 people by 2030.

3.2 Estimate of Waste Generation

Studies conducted in Canada and the United States indicate that the amount of waste generated per day varies from 0.55 kg/person in smaller communities to 2.5 kg/person in larger cities. These estimates include a significant institutional and commercial component, and an industrial waste component that can be as high as 40% of total waste in industrialised cities. Previous studies undertaken by AECOM in rural areas, villages and hamlets comparable in size to North Frontenac indicate waste generation rates within the range of 0.75 to 1.9 kilogram per person per day. For purposes of this study the residents of North Frontenac are expected to produce 1.5 kilograms of total waste per person per day.

Topographical surveys of the Township's landfills show that the amount of waste entering the landfills is equivalent of 1.1 kilograms per person per day. This means that approximately 0.4 kilograms per person per day, or 25% of total household solid waste, is already being diverted from landfills by various means.

Table 3.2 is a detailed estimate of waste generation for the Township of North Frontenac until 2030. Over this twenty-two year period the Township is estimated to generate approximately 49,000 tonnes of waste, which equates to 90,000 m³ in the Township's landfills, based on current practices.

The Township of North Frontenac has set for itself a goal of 50% waste diversion. This can be achieved through numerous methods or initiatives, such as reduction, reuse, recycling, composting or conservation incentives, which are discussed in more detail later in this report.

Table 3.2 - Waste Generation Projections

| Year | Equivalent Population | Domestic Waste | | Cover Material (m ³) ⁽³⁾ | Total Volume (m ³) | Cumulative Volume (m ³) |
|------|-----------------------|------------------------|----------------------------------|--|-----------------------------------|--|
| | | (tonne) ⁽¹⁾ | (m ³) ⁽²⁾ | | | |
| 2008 | 3,412 | 1,370 | 2,740 | 685 | 3,425 | 3,425 |
| 2009 | 3,453 | 1,387 | 2,773 | 693 | 3,466 | 6,892 |
| 2010 | 3,495 | 1,403 | 2,806 | 702 | 3,508 | 10,400 |
| ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2028 | 4,332 | 1,739 | 3,478 | 870 | 4,348 | 81,255 |
| 2029 | 4,384 | 1,760 | 3,520 | 880 | 4,400 | 85,655 |
| 2030 | 4,436 | 1,781 | 3,562 | 891 | 4,453 | 90,108 |

1) Assumes 1.1 kg/capita/day (25% diversion)

2) Assumes compaction rate of 500 kg/m³

3) Assumes waste-to-cover ratio of 4:1

3.3 Problem Statement

Approximately 49,000 tonnes of waste will be generated by the residents of North Frontenac by 2030. By current landfill and diversion operations, this is enough to fill all remaining waste disposal site capacity. The

Township requires a strategy to manage the waste stream to their greatest advantage. Reducing the amount of waste generated, increasing recycling opportunities, and efficient operation of existing landfills are all key components of an effective waste management strategy.

The problem statement for this study can be summarized as:

"The Township of North Frontenac requires a long term strategy to effectively manage up to 49,000 tonnes of solid waste by the year 2030."

4. Waste Management Analysis

4.1 Financial Analysis

Statements of Revenue and Expenditures for the 2007 Fiscal Year were analysed to understand how funds were used in the Township's waste management system. The total revenue for both the waste and recycling streams were calculated as well as the net cost for the entire program. These values can be found in Table 4.1.

Table 4.1 - Revenue and Expenditures

| | Waste | Recycling | Total |
|-------------|-----------------|-----------------|-----------------|
| Revenue | 114,823.44 | 56,192.44 | 171,015.88 |
| Expenditure | 286,478.57 | 179,886.63 | 466,365.20 |
| Net | \$ (171,655.13) | \$ (123,694.19) | \$ (295,349.32) |

The financial data was further analysed to determine which costs would be affected by changes to the waste management program. For example, the expenditure of attendant salaries would be affected by changing the number of hours a site is open. Salary expenditures would not be affected, however, if a site was converted to a transfer station with no change to operating hours. Some items are not dependant on any factors and are considered 'fixed costs'. This cost breakdown is presented in Table 4.2.

The cost breakdown shows that over half of the expenditures incurred are 'fixed costs' and would likely not be affected by any modifications to the existing program. Over a quarter of the costs are dependant of the hours of operation and approximately 18% are dependant on the site status as either an active landfill or a transfer station.

Table 4.2 - Expenditure Breakdown

| Fixed Costs | |
|---|---------------------|
| Administration (inc. training, permit fees) | 9,766.58 |
| Consulting | 56,295.30 |
| Composters | 7,666.40 |
| Capital Expenditures | 109,384.82 |
| Contribution to Reserves | 73,600.00 |
| Sub-Total | \$256,713.10 |
| Costs dependent on active vs. transfer station | |
| Contracted Services | 52,613.17 |
| Covering Material | 2,294.04 |
| Equipment Fuel, Repairs & Maintenance | 30,563.78 |
| Transfer Station Expenditures | 746.72 |
| Sub-Total | \$86,217.71 |
| Costs dependent on hours open | |
| Staffing (inc. benefits, etc) | 119,427.82 |
| Other Supplies & Site Maintenance | 4,006.57 |
| Sub-Total | \$123,434.39 |
| Total | \$466,365.20 |

While some of the costs dependant on site status may decrease if an active site is closed and converted into a transfer station, the 'transfer station expenditures' item would increase substantially as waste would have to be frequently transported to another site for disposal. The net effect on expenditure would be minimal.

The largest and most 'flexible' expenditure falls under 'Staffing'. This includes attendant salaries, benefits, sick leave, and other associated expenses. The township currently employs 5 attendants to operate seven sites a total of 138 hours per week in the summer and 76 hours per week in the winter. A more efficient scheduling of site hours and attendants could result in up to a 46% reduction in staffing costs and reduce total expenditure by 18%.

4.2 Site Records

Site attendants keep records of the number of items which are dropped of at a site. The recorded number of bags of waste and recyclables from 2007 are summarized in Table 4.3

Table 4.3 - Summary of Site Records

| | 506 | Kash | Cloyne | Ardoch | Plevna | Miss. Stn. | Ompah | Total |
|--------------------|--------|-------|--------|--------|--------|------------|-------|--------|
| Bags of Waste | 16,164 | 4,663 | 10,331 | 8,366 | 15,325 | 2,882 | 2,665 | 60,395 |
| % | 27% | 8% | 17% | 14% | 25% | 5% | 4% | |
| Bags of Recycling | 9,375 | 3,542 | 9,587 | 8,178 | 15,212 | 2,084 | 2,286 | 50,264 |
| % | 19% | 7% | 19% | 16% | 30% | 4% | 5% | |
| Waste to Recycling | 1.72 | 1.32 | 1.08 | 1.02 | 1.01 | 1.38 | 1.17 | 1.20 |

This data illustrates how waste is currently streamed within the Township. Plevna and 506 Waste Disposal Sites are the busiest, closely followed by Cloyne and Ardoch. This information will be useful in determining necessary site hours and strategies for filling small, under-used sites more quickly.

This data all shows the progress of diversion. The 'waste to recycling' ratio is calculated in Table 4.3 and shows that at every site there is slightly more waste entering the site than recyclables. Note that this table does not take into account other sources of waste, such as bulky items and construction debris. The addition of these items would actually increase the waste-to-recycling ratio. For the Township to achieve 50% diversion – that is, just as much waste is diverted as is disposed of – the waste-to-recycling ratio should be at least at 1.0, township-wide. This ratio, in addition to other diversion programs already operating such as HHW, is an important step towards meeting the diversion goal.

4.3 Waste Diversion

The Township of North Frontenac has set a waste diversion goal of 50%, which would effectively double the current diversion rate. Achieving this goal will require substantial changes and improvements to current practices.

4.3.1 Domestic Recycling

The most prevalent form of waste diversion in North Frontenac is household 'blue-box' recycling. Residents may bring their recyclables to any municipal waste disposal site free of charge. The Township further encourages recycling by offering one free bag of garbage disposal with every bag of recyclables brought. The size equivalency of each bag is at the discretion of the site operator.

As mentioned previously, the Township should set a goal of receiving equal amounts of garbage and recyclables at each site. The 'waste to recycling' ratio calculated in Table 4.3 should be at least 1.0 for every site. Achieving this may require the following:

- Training of site operators to recognize recyclable materials
- Enforcement of recycling practices by site operators
- Use of clear plastic bags
- Education of the public of the benefits and/or incentives of recycling
- Education of the public of the rules of recycling
- Education of the public of ways to create more recycling and less waste (eg. packaging choices)
- Inclusion of more materials into recycling program
- Increased fees for garbage disposal
- Feedback with site operators about rates achieved

4.3.2 Organics

The Township of North Frontenac does not currently have a centralized organic composting facility and there has been little expressed interest in creating one. The majority of North Frontenac residents have sufficient property to establish a household composter for domestic organics and yard wastes.

Several neighbouring municipalities have established centralized composting or yard-waste facilities, such as the City of Kingston and the Town of Perth. There may be opportunities for partnership in the future.

The Township currently offers home composters at a subsidized price which facilitates 'back-yard' composting within the Township. Such an initiative could be augmented by public education programs about the composting process.

4.3.3 Municipal Hazardous and Special Waste

The disposal of hazardous and special waste can be a difficult and costly process. Such materials are common to most households – such as paint, batteries, and automotive oil – but often require careful handling and must be processed before safe disposal. Items of this nature cannot be allowed in municipal landfills as they pose serious health risks to the environment and drinking water supply. Site attendants must be vigilant in separating hazardous waste from the domestic waste stream and directing this waste to the appropriate collection facility.

The Township established three household hazardous waste collection and transfer facilities in 2008. This was made possible by a grant from Waste Diversion Ontario which has partnered with Stewardship Ontario to reduce the amount of hazardous waste in landfills. The WDO Program assumes responsibility for the waste after the municipality has collected it in a central location. This effectively reduces the total disposal cost to the municipality by up to 80%. North Frontenac Township benefits greatly from such a partnership and should continue to seek other co-operative efforts to reduce the amount of hazardous waste entering the landfills

WDO and Stewardship Ontario are also encouraging retailers of such products to accept waste and used items from consumers and take responsibility for proper disposal.

4.3.4 Waste Electrical & Electronic Equipment

Electrical and electronic equipment disposal is a recent and ever-growing problem. Electronics contain various kinds of heavy metals and synthetic compounds which can be toxic to the environment. Such waste should be kept out of municipal landfills and only disposed of at proper recycling and disposal facilities. The Township should treat electronic waste similar to household hazardous waste and offer collection events for local residents. The waste should then be transferred in bulk to the appropriate facilities. Partnerships or funding opportunities may be available for such a program.

5. Waste Management Practices

Before an integrated waste management plan can be developed, the individual components of the waste management system should be considered individually. Each component has been assessed against study objectives and in conjunction with other components.

For this part of the study a series of worksheets have been developed and reviewed with the Waste Management Committee. The Township's current practices were compared to others' and an analysis was completed to arrive at a recommended course of action. The worksheets are included in Appendix A and summarized in the following chapters.

5.1 Waste Collection

Current Practice

'Curb-side' collection of either garbage or recycling is not offered in North Frontenac. Residents are required to take their waste to one of five active sites or two transfer stations.

Analysis

Other Townships have successfully implemented curb side collection in rural areas similar to North Frontenac. Curb side collection has proven cost effective in some areas as it can allow more efficient landfill operation. Costs are lower per household in more densely populated areas. Private collection by independent contractors is feasible if the proper licensing and equipment is obtained.

In areas like North Frontenac, collection down private lanes and service to weekend-only residents can be problematic.

Very little interest was expressed by the Steering Committee for curb-side collection.

Recommendations

- 1.1 The Township should not initiate 'curb-side' collection of any waste materials.
- 1.2 The Township should support private collectors obtain MOE licensing, where necessary.

5.2 Recycling

Current Practice

Facilities are in place at each waste disposal site for the collection and separation of recyclable materials. Paper products, metals, plastic, and Styrofoam are periodically shipped to Beauman Recycling in Renfrew.

Scrap metal is collected and sold to scrap dealers. Glass is crushed on site and used periodically as a cover material.

Analysis

The Township is currently recycling nearly all possible blue box materials, though should be aware of new recycling opportunities as they emerge.

There has been no expressed interest in 'curb-side' collection of recyclables.

Recommendations

- 2.1 The Township should continue its arrangement with private firms for marketing of recyclable materials.
- 2.2 The Township should investigate new recycling opportunities for further waste diversion
- 2.3 The Township should not initiate 'curb-side' collection of recyclables.

5.3 Composting

Current Practice

The Township of North Frontenac offers rear yard composters to residents at a subsidize rate of \$20 per unit. The Township also provides educational material with the composters. This meets the minimum requirements of O.Reg. 101/94

Analysis

Most residents of North Frontenac have sufficient property to engage in yard-waste composting at home.

A private firm, Earthworx, operates a composting facility near Westport. The operator is currently applying for a license to compost all organic material. While this site would not be convenient to many Township residents for yard waste disposal, the Township will want to monitor Earthworx's progress towards composting of all organics, as this may provide the Township with another option for waste diversion.

Establishment of a central yard waste disposal facility at an existing waste disposal site would be less costly than a stand alone site because it can be supervised by the landfill site attendant. 506 Waste Disposal site is conveniently located on an arterial road and has room for a composting facility, although composting will have to occur on top of the existing waste fill.

Capital costs include preparation of the site and purchase of a wood chipper (\$50,000). Operating costs included periodic turning of the windrows and annual clean outs (\$20,000 per year). Costs may be off set by sale of material and by preservation of landfill capacity.

Recommendations

- 3.1 The Township should continue to offer rear-yard composters at subsidized prices.
- 3.2 The Township should monitor the progress of other municipalities and businesses in establishing central yard waste and/or organics composting facilities for possible cooperative arrangements.

5.4 Household Hazardous Wastes

Current Practice

The Township of North Frontenac constructed household hazardous waste collection facilities at one landfill site in each of its three wards in 2008. At this early time a fee will not be charges to residents to drop off material, which is periodically collected and shipped to the appropriate recycling or disposal centre. The collection program is part of a collaborative agreement with Waste Diversion Ontario and Stewardship Ontario.

Analysis

HHW collection facilities have been very successful in other municipalities and have diverted significant amounts of dangerous waste from the landfill.

Waste Diversion Ontario and Stewardship Ontario pay for the shipping and disposal of all HHW taken from the Township. The remaining program cost to the Township is minimal.

Recommendations

- 4.1 The Township of North Frontenac should continue its arrangement with WDO and Stewardship Ontario to recycle and/or dispose of HHW
- 4.2 The Township should continue to offer HHW collection at one waste disposal site in each district.

5.5 Municipal Operations

Current Practice

Waste produced from municipal operations is disposed of by the same means as household waste. Garbage and recyclables from the Township office, fire station, and community halls are disposed of at one of the five landfills or two transfer stations. Recycling receptacles, such as blue boxes, are provided at all municipally owned locations and recycling is encouraged.

Hazardous and special waste produced by Township equipment, such as used engine oil, is collected and disposed of by a specialized contractor. Small empty containers may periodically be taken to local hazardous waste transfer stations, such as the one at Plevna WDS, if acceptable.

Analysis

Municipal operations currently accommodate all manners of waste disposal and diversion that are available to residents of North Frontenac. The Township should encourage its employees to take advantage of all diversion opportunities in the workplace.

A significant diversion opportunity exists at the Township-owned community halls. There are several throughout the municipality and several offer kitchens for rent. If the Township begins participation in a organics composting program, it should ensure that adequate collection facilities exist at all community halls to accommodate the significant amount of kitchen waste produced there that could be diverted from the landfills.

Recommendations

- 5.1 The Township should continue to divert as much waste as possible from municipal sources through in-office recycling, hazardous or special waste diversion, and other acceptable means.
- 5.2 If the Township participates in an organics composting program, collection facilities should be made available at all community halls.

5.6 Other Waste Diversion

Current Practice

The Township's current practices regarding waste diversion from landfill sites include:

- Yard wastes, such as leaves and grass clippings, are not accepted at waste disposal sites. Clean brush and lumber products, however, are accepted at 506 and Ardoch for burning
- Scrap metals are stored separately and periodically picked up by scrap metal recyclers
- E-waste is stored separately. Stewardship Ontario will reimburse the Township for the cost of pick-up by an appropriate recycling agency.

Analysis

Municipalities have broad powers to set criteria on what can or cannot be accepted at their waste disposal sites.

Informal reuse centres are operated by site attendants at many sites in eastern Ontario, although these are primarily volunteer run operations.

The Township's sites accept bulky waste, such as upholstered furniture and mattresses, which take up significant amounts of landfill volume and are difficult to cover.

Plastic wrap, such as bale wrap and boat wrap, can be recycled. Several firms in Ontario will accept clean, baled plastic wrap at no cost.

Measurements of site usage at the Township's six active waste disposal sites indicate that approximately 25% of the existing waste stream is already being diverted. Achieving the Township's goal of 50% diversion will require significant change to current practices. While the Township has initiated a number of important changes in the past two years, including improvements to recycling programs, HHW and e-waste diversion, more will be required.

Recommendations

- 6.1 The Township of North Frontenac should continue to divert e-waste and HHW from waste disposal sites
- 6.2 The Township should consider participation in any new programs by WDO and Stewardship Ontario for additional waste diversion opportunities.
- 6.3 The Township should investigate ways to divert bulky wastes from sites.
- 6.4 The Township should encourage the development of reuse centres by volunteer groups.

5.7 Waste Disposal

Current Practice

The five active sites and two transfer stations are all open to any resident of the Township of North Frontenac. Table 5.1 on page 22, lists the total capacity and estimated remaining volume and lifespan of each site. Lifespan projections assume no change to the current practice of each district providing its own disposal facility, and no significant change to current waste generation rates and waste disposal practices.

Overall, assuming no changes to current practices or disposal rates, the Township has sufficient capacity to last until approximately 2030

Analysis

The current remaining capacity within the Township is approximately 89,000 m³, which equates to an asset value of nearly \$4.5Million. The value of landfill capacity has to be weighed against the cost of operation and maintenance and the risks associated with perpetual ownership. The cost benefit is higher when sites are filled faster. Costs to maintain sites that have been filled and are closed are much less, and risks are easier to manage, than for active sites.

Wastes collected at transfer stations do not necessarily have to be taken to the closest landfill. These wastes could be used to fill small or near-capacity sites to expedite the closure process.

The steering committee has not expressed any interest in sending waste outside of the Township for disposal.

Recommendations

7.1 Domestic wastes generated within the Township of North Frontenac that cannot be diverted from landfilling should be landfilled within North Frontenac.

7.2 The Township should manage its waste stream such that near-capacity sites are filled first.

Table 5.1 - Site Statistics

| | Active Sites | | | | | Closed Sites | | |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|----------------------|-----------------------|
| | 506 | Ardoch | Kash. | Miss. Str. | Plevna | Cloyne | Fernleigh | Ompah |
| Total Site Area | 10.07 ha | 4.02 ha | 6.6 ha | 5.26 ha | 7.57 ha | 4.0 ha | 40 ha | 18.34 ha |
| Approved Area | 1.04 ha | 0.81 ha | 0.8 ha | 1.0 ha | 0.85 ha | 4.0 ha | -- | -- |
| Current Area | 0.62 ha | 0.39 ha | 0.27 ha | 0.20 ha | 0.43 ha | -- | 0.29 ha | 0.67 ha |
| Proposed Area | 0.93 ha | 0.81 ha | 0.80 ha | 0.87 ha | 0.85 ha | -- | -- | -- |
| Total Capacity | 40,000 m ³ | 30,325 m ³ | 14,400 m ³ | 28,825 m ³ | 39,500 m ³ | 16,800 m ³ * | 7,100 m ³ | 10,040 m ³ |
| Existing Volume | 15,430 m ³ | 11,145 m ³ | 6,500 m ³ | 2,905 m ³ | 9,630 m ³ | 16,800 m ³ * | 7,100 m ³ | 10,040 m ³ |
| Remaining Volume | 24,570 m ³ | 19,180 m ³ | 7,900 m ³ | 25,920 m ³ | 29,870 m ³ | 0 m ³ | 0 m ³ | 0 m ³ |
| Lifespan | 21 | 31 | 10 | 29 | 44 | 0 | 0 | 0 |
| Closure Date | 2029 | 2039 | 2017 | 2036 | 2052 | 2008 | 2002 | 2005 |
| Closure Cost | \$200,000 | \$160,000 | \$160,000 | \$200,000 | \$200,000 | -- | -- | -- |
| Post Closure Costs | \$12,000 | \$8,000 | \$8,000 | \$12,000 | \$8,000 | \$8,000 | \$7,000 | \$8,000 |

5.8 Management of Active Waste Disposal Sites

Current Practice

Recent inspections by Ministry of the Environment abatement officers have resulted in new Certificate of Approvals for four of the Township's waste disposal sites and updated Development and Operation Plans, or Closure Plans, for six. Detailed assessments are ongoing for two others. Data for Municipal Financial Reporting is listed in Table 5.1.

Analysis

Analysis of remaining site life span tends to concentrate on remaining approved capacity; however, it needs to be noted that sites may also close due to unacceptable environmental impacts.

Ministry of the Environment has inspected all of the sites in North Frontenac and has issued instructions to bring design, operation, and monitoring programs up to current standards.

Recommendations

8.1 Township of North Frontenac should continue its ongoing program of assessing and monitoring landfill site impacts. Measures to minimize site impacts, such as periodic grading and capping of completed areas of waste disposal, should continue.

8.2 The Township should continue to manage its waste disposal sites to ensure optimal use of landfill capacity and to minimize environmental impacts.

5.9 Waste Disposal Site Operations

Current Practice

Waste disposal sites in North Frontenac are typically operated in compliance with O. Reg. 347. Hours of operation are published on the Township's website; sites are secured outside of open hours.

Several sites in North Frontenac have been approved for the use of crushed glass as an alternative cover material. Other municipalities have implemented other techniques to optimize landfill capacity, such as wood chippers, tire shredders, improved security and compaction, and temporary closures.

Compaction

The level of compaction achieved has a huge effect on remaining landfill life span. Compaction efforts vary at each site and none of the sites regularly uses specialized compaction equipment. Heavy compactors have been rented on previous occasions for a few sites.

Sites with no compaction are typically assumed to have achieved 400 kg of waste disposal per cubic meter. Typical compaction rate for a small rural site with infrequent grading and covering is 500 kg/m³.

Compaction of 750 kg/m³ can easily be achieved with the proper equipment. At this level of compaction, the Township would preserve approximately 1,200 m³ of landfill capacity per year, which has an asset value of \$60,000. Additionally, increased compaction would allow the Township's sites to accept waste at least until the year 2040, even if no other diversion initiatives were in place.

Compaction Cost:

- Purchase – 2002 used CAT 816F - \$90,000
10 year pay-off @ 5% interest: \$960 monthly
Operator \$50/hr, float, fuel, & maintenance: \$14,000
Annual Cost: \$25,520
- Tackaberry Rental - \$165/hour, minimum 4 hours, plus \$200 float
8 times per year, 4 hours per site
Annual cost: \$34,400

Temporary Closures

Sites can be temporarily 'moth balled' to allow other sites to fill up quickly and be closed. Moth-balled sites often remain open as transfer stations to continue service to local residents. The collect waste can then be transferred to the appropriate site for landfilling.

Burning / Chipping

The Township of North Frontenac currently burns clean brush and lumber at two sites, Ardoch and 506. Burning of clean brush and lumber is permitted, but is tightly monitored by MOE abatement staff. MOE will withdraw permission for burning if odour complaints occur. Township staff should take extra caution to ensure that burning takes place under controlled conditions.

Chipping is another method that can be used to divert brush from waste disposal. Mulched chips can be reused by Township residents. Acquisition of chipping equipment should be considered if burning proves to be problematic.

Bear Control

In the past the Township has taken advantage of “Bear Wise” funding to protect sites and site users from nuisance bears. The Township should continue to take advantage of this funding.

Recommendations

- 9.1 The Township should continue to seek improvements to landfill site operations to ensure optimal use of landfill capacity.
- 9.2 The Township should continue to seek alternative sources of cover material as a cost savings measure, however, alternative covers should be assessed for their potential environmental impacts prior to use.
- 9.3 The Township of North Frontenac should invest in, or contract for the services of, specialized landfill compaction equipment with the objective of optimizing the remaining landfill capacity. Compaction rates of 750 Kg/m³ are realistic.

5.10 Waste Disposal Site Closures

Current Practice

Fernleigh Waste Disposal Site was closed permanently in 2002. Ompah WDS and Cloyne WDS were closed in 2005 and 2008, respectively, and remain in use as transfer stations. There are no plans in the near future to close any other sites.

Analysis

Remaining landfill lifespan has been estimated for all active waste disposal sites and are listed in Table 5.1.

Waste Disposal Site closures are very expensive and should be planned for. Consideration can be given to converting a site to a waste transfer station to maintain the same level of service to residents.

Recommendations

10.1 The Township should plan for periodic, partial closures at larger waste disposal sites to take advantage of reduced environmental impacts.

5.11 Management of Closed Waste Disposal Sites

Current Practice

The Waste Management Act of 1970 resulted in licensing of waste disposal sites in Ontario (i.e. the issuance of Certificates of Approval). Prior to 1970 there was no requirement to license landfills.

All of North Frontenac's waste disposal sites are licensed and are actively monitored or are in the process of implementing monitoring programs. This includes the three closed sites, Fernleigh, Ompah, and Cloyne.

Analysis

Closed waste disposal sites still have the potential to impact the environment and should be assessed for potential environmental impacts, particularly in advance of any new development within 500 meters.

Recommendations

11.1 The Township should continue to assess the environmental impacts of closed waste disposal sites and implement appropriate mitigation measures.

11.2 The Township should continue to enforce its Official Plan policies regarding development near waste disposal sites.

5.12 Waste Disposal Site Expansions

Current Practice

No new expansions are planned.

Analysis

Recent legislation, O.Reg. 101/07, will permit expansions of up to 100,000 m³ without compulsory hearings. 100,000 m³ is more than the remaining capacity of all the Township's sites combined.

The Township has capacity for at least 20 more years. Predictions of population, waste production, and disposal practices beyond this time frame are considered inaccurate.

Mississippi Station would be the best candidate for expansion. Should the Township choose to pursue this option, planning and property acquisition should proceed several years in advance of need.

Recommendations

12.1 There is no immediate requirement for additional waste disposal capacity in North Frontenac Township. Consumption of available capacity should be monitored. Efforts to establish additional capacity should commence at least five years in advance of existing capacity being consumed.

12.2 Expansion of Mississippi Station WDS may be pursued.

5.13 Emerging Technologies

Current Practice

Township officials have toured the Plasco Energy facility in Ottawa and are monitoring opportunities for participation.

The Province of Ontario is preparing a policy statement on waste management planning.

Analysis

Many of the more promising technologies require significant volumes of waste to be economical. For example, Plasco Energy's solution requires a minimum of 200 tonnes per day, while North Frontenac generates less than 5 tonnes per day. It may be possible, however, for North Frontenac send waste to such a facility as part of a collaborative program.

Earthworx may offer an opportunity to divert organics from the waste stream that is currently being landfilled.

Recommendations

13.1 The Township of North Frontenac should monitor emerging technologies for opportunities to divert, or better manage, its waste stream.

5.14 User Fees

Current Practice

Township residents are required to affix a 'bag tag' to all bags of waste brought to the waste disposal sites. Bag tags can be purchased for \$2 each at most local businesses or the municipal office. If a resident brings a bag or box of recyclable materials, however, they may dispose of a bag of garbage free of charge.

There are additional fees for specific items such as tires and large furniture.

Analysis

Bag tags are used widely across the province as a way of collecting user-fees and as a way to curb waste production. Residents are more aware of the amount of garbage they produce when they are required to pay for each one individually. Loyalist Township saw a substantial reduction (up to 30%) in waste disposal requirements after implementing a pay-as-you-throw system. An established bag-tag system also makes it easy for a municipality to raise or lower user fees if necessary.

Such pay-as-you-throw programs have also shown to increase the quantities of recycling collected. The North Frontenac program actually rewards residents for recycling by discounting the cost of waste disposal.

Municipalities often find themselves in competition with neighbouring municipalities for resident's 'waste management business'. Municipalities with low user fees may find that waste from neighbouring municipalities is finding its way into their waste stream.

Recommendations

- 14.1 The Township of North Frontenac should continue to require residents to purchase bag tags to be put on all bags of garbage.
- 14.2 The Township should continue incentivizing recycling by allowing one free bag of garbage with one container of recyclables.

5.15 Funding

Current Practice

The Township recovers a small fraction of the cost of their waste management system, between 10% and 15%, through user fees. Federal and Provincial grants between \$1,000 and \$26,000 also contribute, as well as approximately \$25,000 in fees from 'Joint Services' with other municipalities. The remaining costs are covered by the general tax levy.

The Township does not offer a tax discount to property owners who reside in the township seasonally or part-time.

Recommendations

- 15.1 The Township may consider changes to its funding model to assign a larger portion of costs to users, via user fees. This will help to keep property tax rates down, while at the same time encouraging diversion.

5.16 Public Consultation / Education

Current Practice

The Township does a good job of advising residents of changes to the waste management system through advertising, web sites and inserts in the tax bill.

Analysis

Public consultation is an excellent way to inform the public regarding proposed changes to a waste management system. It can increase the “buy in” to a waste management change, improving the potential for success.

Public consultation works best when the participants feel like their input matters. It is important that Council not implement key recommendations until after public input is received.

Recommendations

16.1 Public consultation regarding this waste management plan is recommended. Township Council should be asked to authorize staff to seek public input. Implementation of key recommendations should be deferred until after the Public has had opportunity for input.

5.17 Waste Management Program Review

Current Practice

The Township is currently reviewing all aspects of waste management within the municipality. The goal of this review is the creating of an Integrated Waste Management Plan to guide practices for the next twenty years.

Analysis

The needs, opportunities, and priorities of the Township will continue to change and evolve following the creation of the Plan and its implementation. The Plan should be re-evaluated on a regular basis to ensure it still reflects the goals and best interests of the Township

Recommendations

17.1 A comprehensive review of the Integrated Waste Management Plan should be conducted every five years.

6. Conclusions and Recommendations

6.1 Conclusions

The purpose of this report is to better understand the current condition of the waste management system in North Frontenac and to advise Council on how to best manage this important and costly responsibility. This study has been guided by the Sustainability Committee with significant public input. This report has considered and made recommendations on fifteen areas of waste management. These fifteen areas are not independent of each other and each recommendation should be considered both on its own merits and as part of a larger, integrated waste management plan.

6.2 Summary of Recommendations

Waste Collection

- 1.1 The Township should not initiate 'curb-side' collection of any waste materials.
- 1.2 The Township should support private collectors obtaining MOE licensing, where necessary.

Recycling

- 2.1 The Township should continue its arrangement with private firms for marketing of recyclable materials.
- 2.2 The Township should investigate new recycling opportunities for further waste diversion.
- 2.3 The Township should not initiate 'curb-side' collection of recyclables.

Composting

- 3.1 The Township should continue to offer rear-yard composters at subsidized prices.
- 3.2 The Township should monitor the progress of other municipalities and businesses in establishing central yard waste and/or organics composting facilities for possible cooperative arrangements.

Household Hazardous Waste

- 4.1 The Township of North Frontenac should continue its arrangement with WDO and Stewardship Ontario to recycle and enter into an agreement with WDO to dispose of HHW
- 4.2 The Township will offer HHW depots at one waste disposal site in each ward.

Municipal Operations

- 5.3 The Township should continue to divert as much waste as possible from municipal sources through in-office recycling, hazardous or special waste diversion, and other acceptable means.
- 5.4 If the Township participates in an organics composting program, collection facilities should be made available at all community halls.

Other Waste Diversion

- 6.1 The Township of North Frontenac should institute opportunities, such as Event Days, to divert e-waste from waste disposal sites.
- 6.2 The Township should consider participation in any new programs by WDO and Stewardship Ontario for additional waste diversion opportunities.
- 6.3 The Township should investigate ways to divert bulky wastes from sites.
- 6.4 The Township should encourage the development of reuse centres by volunteer groups.

Waste Disposal

- 7.1 Wastes generated within the Township of North Frontenac that cannot be diverted from landfilling should be landfilled within North Frontenac.
- 7.2 The Township should manage its waste stream such that near-capacity sites are filled first.

Management of Active Waste Disposal Sites

- 8.1 Township of North Frontenac should continue its ongoing program of assessing and monitoring landfill site impacts. Measures to minimize site impacts, such as periodic grading and capping of completed areas of waste disposal, should continue.
- 8.2 The Township should continue to manage its waste disposal sites to ensure optimal use of landfill capacity and to minimize environmental impacts.

Waste Disposal Site Operations

- 9.1 The Township should continue to seek improvements to landfill site operations to ensure optimal use of landfill capacity.
- 9.2 The Township should continue to seek alternative sources of cover material as a cost savings measure, however, alternative covers should be assessed for their potential environmental impacts prior to use.
- 9.3 The Township of North Frontenac should invest in, or contract for the services of, specialized landfill compaction equipment with the objective of optimizing the remaining landfill capacity. Compaction rates of 750 kg/m³ are realistic.

Waste Disposal Site Closures

- 10.1 The Township should plan for periodic, partial closures at larger waste disposal sites to take advantage of reduced environmental impacts.

Management of Closed Waste Disposal Sites

- 11.1 The Township should continue to assess the environmental impacts of closed waste disposal sites and implement appropriate mitigation measures.
- 11.2 The Township should continue to enforce its Official Plan policies regarding development near waste disposal sites.

Waste Disposal Site Expansions

- 12.1 There is no immediate requirement for additional waste disposal capacity in North Frontenac Township. Consumption of available capacity should be monitored. Efforts to establish additional capacity should commence at least five years in advance of existing capacity being consumed.
- 12.2 Expansion of Mississippi Station WDS may be pursued.

Emerging Technologies

- 13.1 The Township of North Frontenac should monitor emerging technologies for opportunities to divert, or better manage, its waste stream.

User Fees

- 14.1 The Township of North Frontenac should continue to require residents to purchase bag tags to be put on all bags of garbage.
- 14.2 The Township should continue incentivizing recycling by allowing one free bag of garbage with one container of recyclables.

Funding

- 15.1 The Township may consider changes to its funding model to assign a larger portion of costs to users, via user fees. This will help to keep property tax rates down, while at the same time encouraging diversion.

Public Consultation / Education

- 16.1 Public consultation regarding this waste management plan is recommended. Township Council should be asked to authorize staff to seek public input. Implementation of key recommendations should be deferred until after the Public has had opportunity for input.

Waste Management Program Review

- 17.1 A comprehensive review of the Integrated Waste Management Plan should be conducted every five years.