LANDFILL FEASIBILITY STUDY
(CONCEPTUAL ASSESSMENT)
DEVELOPMENT OF A NEW LANDFILL SITE

Submitted to:

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1.0 INTRODUCTION

1.1 Project Description

AMEC Earth and Environmental, a division of AMEC Americas Ltd. (AMEC), was retained by the City of Temiskaming Shores (the City) to complete a Feasibility Study to assess alternatives for long-term solid waste management (i.e., landfill disposal). The City has two existing landfill sites, the New Liskeard Landfill and the Haileybury Landfill. The New Liskeard Landfill is currently at capacity and landfill activities have ceased as of June 2009. The Haileybury Landfill is currently in operation, but is anticipated to reach capacity in 2016; under the current waste generation rates (see Section 3.3.2). The City initiated the process to identify the most feasible option for establishing new capacity for long-term solid waste disposal. AMEC was retained to assess the feasibility of providing new solid waste disposal capacity by means of a) expansion of one or both of the existing municipal landfill sites; b) the development of a new site; or c) a combination of both strategies.

Once a preferred waste management strategy (i.e., expansion of an existing landfill and/or establishment of a new landfill) is determined to be feasible, the development of this amount of landfill capacity will require a full environmental assessment (EA) under Part II of the Ontario Environmental Assessment Act. The Feasibility Study does not replace such an EA. Instead, it aims at identifying potentially feasible alternatives on the basis of existing information, visual site inspections, and preliminary engineering concepts. It also intends to involve stakeholders and the general public early on in the City's planning process for new solid waste disposal capacity. It is envisaged that a future EA on this subject would build on the results of the Feasibility Study, consider stakeholder and public input obtained during the process and supplement the information base with field surveys, refined engineering concepts and further consultation.

1.2 Project Tasks and Approach

The scope of work for the preparation of the Feasibility Study is arranged into the following key tasks:

Task 1: Project Initiation and Information Gathering (Completed)

- Attend kick-off meeting with the City's Technical Advisory Committee (TAC) to identify waste management/landfill requirements, and possible new landfill sites;
- Secure and review background documentation including landfill operating manuals and annual reports; and,
- Prepare meeting minutes for the project kick-off meeting.

Task 2: Preliminary Assessment of the Feasibility of Expansion of an Existing Landfill (Completed)

- Conduct inspections of existing landfill sites by AMEC's project team and meet with City representatives and landfill operators;
- Prepare a draft Landfill Feasibility Study (Conceptual Assessment) report discussing the feasibility of expansion for the New Liskeard and Haileybury Landfills;
- Submit draft report to the City for review and conduct a conference call with the City to discuss comments; and,
- Finalize the report and submit to the City for reference/use.

Task 3: Preliminary Assessment of the Feasibility of Establishing a New Landfill

- Perform desktop review of three (3) sites outside the City (within 10 kilometers (km) of City boundaries) in areas chosen by City and TAC;
- Perform desktop review of three (3) sites inside the City in areas chosen by City and TAC;
- Prepare a draft Landfill Feasibility (Conceptual Assessment) report discussing the feasibility of establishing four new landfill sites, two (2) sites within, and two (2) sites outside the City Limits and outlining the following:
    - determine remaining site life of existing landfills, projected waste generation quantities during proposed 30-year planning period, and projected disposal capacity for future landfill operations;
    - development of conceptual design alternatives for establishing new landfills;
    - evaluation of conceptual design alternatives and ranking to identify a preferred alternative;
- Submit draft report to the City for review and conduct a conference call with the City to discuss comments; and,
- Finalize the report and submit to the City for their reference/use.

Task 4: Consultation Meeting with the Technical Advisory Committee (TAC) (Completed)

- Prepare TAC presentation outlining findings of Tasks 2 and 3;
- Conduct consultation meeting with TAC and prepare meeting minutes; and
- TAC to select either preferred alternative for landfill expansion or outline new landfill site(s) for detailed assessment.

Task 5: Technical Assessment of Preferred Waste Management Alternative

- Perform technical assessment of preferred alternative site;
- Consultation with relevant stakeholders (land owner, public, City, regulatory agency, etc.);
- Public consultation meeting (i.e., one open house session) introducing preferred landfill alternative;

- Prepare draft Feasibility Study (Preliminary Assessment) report providing technical information as well as a business case for each site;
- Prepare an executive summary of the technical report for Council and the general public; and,
- Submit draft report to City and TAC for review and comment.

Task 6: Consultation Meeting with TAC

- Prepare TAC presentation outlining the results of Task 5
- Conduct consultation meeting with TAC and prepare meeting minutes; and,
- Record TAC comments for incorporation in the final Feasibility Study Report.

Task 7: Draft Feasibility Study (Final Assessment) Report

- Prepare three (3) copies of draft Feasibility Study (Final Assessment) incorporating the findings and comments from the Task 2, Task 3 and Task 5 reports;
- Submit draft Feasibility Study to the TAC review and comment; and,
- Conduct a conference call with the TAC to discuss comments for incorporation in the final report.

Task 8: Final Feasibility Study Submission

- Prepare and conduct final Feasibility Study presentation to Council; and,
- Prepare and submit final Feasibility Study (including executive summary) to the City for reference and use.

The scope of work is structured to allow the review of background information and initial visits at the existing landfill sites (i.e., Task 1) as well as independent preliminary assessments of the feasibility of expanding existing sites and the development a new landfill site, as represented by Tasks 2 and 3. Task 4 represents the TAC's review of the Feasibility Study (Conceptual Assessment) reports, to be submitted as part of, Tasks 2 and 3. The TAC preferred alternative for expansion of an existing Site and/or the development of a new site are compared and evaluated as part of Task 5, in order to establish an overall preferred feasible long-term solid waste management strategy (i.e., landfill disposal). Task 5 also includes the incorporation of a public consultation meeting to introduce the TAC preferred alternatives to relevant internal and external stakeholders and agencies. Further refinement of the preferred strategy will take place as part of Tasks 6 and 7, with the preparation and submission of the final Feasibility Study to the City occurring at the end of Task 8.

This report represents the fulfillment of Task 3 – Conceptual Assessment of the Feasibility of Developing a New Landfill Site.

1.3 Report Objectives

The objectives of this report are as follows:

a) to identify the long-term solid waste management needs of the City of Temiskaming Shores;
b) to provide conceptual alternatives for development of new landfill sites;
c) to assess the feasibility of the development of a new landfill to facilitate long-term waste management (i.e., landfill disposal) needs; and
d) recommend revisions to the scope of work based on the City's TAC review of the Feasibility Study (Conceptual Assessment) reports.

In order to achieve the report objectives, AMEC has outlined the report as follows:

- Section 1 - Outline project and report specific goals;
- Section 2 - Review and evaluate historic/projected waste generation and determine the City's needs for future disposal capacity during the projected 30-year planning period;
- Section 3 – Establish and discuss landfill siting criteria and preliminary feasibility assessment criteria for the proposed development of a new landfill site, including completion a desktop level screening assessment to identify a total of six potential landfill development sites (3 within the municipal boundaries and 3 beyond the municipal boundaries within a 10 km study zone);
- Section 4 – Present four (4) conceptual design alternatives for the development of a new landfill site (2 within the municipality and 2 beyond the municipal boundaries);
- Section 5 – Ranking and evaluation of each landfill development alternative against the preliminary feasibility assessment criteria;
- Section 6 – Selection and presentation of a preferred landfill development alternative; and,
- Section 7 – Outline the report conclusions as well as recommendations for the revisions to the original scope of work.

2.0 HISTORY OF SOLID WASTE MANAGEMENT IN THE CITY OF TEMISKAMING SHORES

AMEC's understanding of the history of solid waste management in the City of Temiskaming Shores is based on the 2 September 2009 project kick-off meeting between AMEC and City representatives, as well as a review of the following background documents, provided to AMEC by the City:

- Provisional Certificate of Approval No. A570402 (Haileybury Landfill Site), dated 10 November 1998, amended 27 April 2005;
- Provisional Certificate of Approval No. A571505 (New Liskeard Landfill Site), dated 9 May 2000, amended 27 April 2005 and 17 April 2007;
- *Corporation of the Town of Haileybury, Landfill Site Approval Report, Project No. E9100*8, revised July 1997, prepared by Sutcliffe Engineers & Surveyors (Sutcliffe, July 1997);
- *Municipal Groundwater Study, Central Temiskaming Area,* dated June 2003, prepared by Knight Piesold Consulting (KPC, June 2003);
- *City of Temiskaming Shores, New Liskeard Landfill, Operation and Maintenance Manual*, dated May 2004, prepared by Sutcliffe Rody Quesnel Inc. (SRQ, May 2004);
- *New Liskeard Landfill Site, Annual Monitoring Report 2004,* dated February 2005, prepared by Sutcliffe Rody Quesnel Inc. (SRQ, February 2005);
- *New Liskeard Landfill Site, 2007 Annual Groundwater Monitoring Report,* dated May 2008, prepared by Jagger Hims Limited (JHL, May 2008);
- *Corporation of the City of Temiskaming Shores, Leachate Plume Delineation and Contaminant Attenuation Zone Calculations, Haileybury Landfill Site,* dated May 2008, prepared by Story Environmental Services (SES, May 2008);
- *City of Temiskaming Shores, Application to Amend Provisional Certificate of Approval Waste Disposal Site No. A570402,* dated June 2008, prepared by Story Environmental Services (SES, June 2008);
- *City of Temiskaming Shores, 2008 Annual Monitoring Report, Haileybury Landfill Site,* dated April 2009, prepared by Story Environmental Services (SES, April 2009); and,
- *Draft Solid Waste Management Master Plan*, dated August 2009, prepared by Earth Tech Canada Inc. (Earth Tech, August 2009).

Certificate Approvals No. A570404 and A571505 are provided in Appendices A and B, respectively.

2.1 Solid Waste Management Facilities

The City of Temiskaming Shores is located in north-eastern Ontario, near the Quebec border, at the head of Lake Temiskaming (Earth Tech, August 2009). The City has a current population of approximately 10,600, and was formed in January 2004 through the amalgamation of the former Town of Haileybury, former Town of New Liskeard and the former Township of Dymond into a single tier municipality (Earth Tech, August 2009). The City has two existing landfill sites: the New Liskeard Landfill (formally the Town of New Liskeard Landfill)

and the Haileybury Landfill (formally the Town of Haileybury Landfill). These sites will be henceforth referred to as the New Liskeard Landfill and the Haileybury Landfill, respectively.

Figure 1 (see Schedule 1) presents the locations of the communities that form the City of Temiskaming Shores. The study area established for the purposes of this report (i.e., the municipal boundary plus a 10 km buffer) is presented on Figure 2 (see Schedule 1).

The Haileybury Landfill, located approximately 9 km southwest of the former Town of Haileybury off of Highway 11 along Dump Road, has been in operation since 1975 (Earth Tech, August 2009). The Haileybury Landfill currently operates under Certificate of Approval (C of A) No. A570420, dated 10 November 1998, as amended, which approves of the use and operation of a 5.8 ha landfilling area within a total property area of 32.4 ha. C of A No. A570402 is provided in Appendix A.

The New Liskeard Landfill, located approximately 3 km west of the former Town of New Liskeard off of Rockley Road, has been used for a landfill site since 1916 (Earth Tech, August 2009). The New Liskeard Landfill currently operates under C of A No. A571505, dated 9 May 2000, as amended, which approves of the use and operation of a 2.02 hectare (ha) landfilling area (i.e., waste footprint) within a total property area of 32 ha. C of A No. A571505 is provided in Appendix B.

The City also administers a recycling program through the operation of a material resource facility (MRF) through the Cochrane Temiskaming Waste Management Board (Earth Tech August 2009). The recycling program includes the collection of paper fibres, aluminium and steel cans, container glass, and No. 1 polyethylene terephthalate (PET) plastic which are deposited at eight drop-off depots located throughout the City (Earth Tech, August 2009).

2.2 Solid Waste Management Practices

For the purposes of this report, the discussion of City's waste management practices will focus on the provision of three main services: 1) solid waste collection; 2) solid waste disposal; and 3) recycling/waste diversion.

2.2.1 Solid Waste Collection

The collection of solid waste within the City is governed by the various policies, by-laws and programs established by the former Towns of Haileybury, New Liskeard and Dymond prior to the January 2004 amalgamation. These policies focus on the collection of waste materials from residential, industrial, commercial and institutional sources. In general, residential waste is collected on a weekly basis in the summer months and bi-weekly in the winter months for all towns located within the City. Industrial, commercial and institutional solid waste is collected on a weekly basis in the summer months and on a bi-weekly basis in the winter months in the former Towns of Haileybury and Dymond, while waste collection in the former Town of New Liskeard occurs twice weekly (Earth Tech, August 2009). Earth Tech reports that the City's

various residential collection by-laws allow for the collection of solid waste with the exception of the following “non-collective wastes”:

- Manufacture waste, including wire;
- Oil/gasoline soaked absorbent material or any explosive or highly combustible material;
- Broken plaster, lumber or other waste or residue resulting from the construction alteration, repair, demolition or removal of any building or structure;
- Sawdust and/or shavings;
- Organic matter not properly drained or wrapped;
- Liquid waste;
- Bandages, poultices, dressings and other such waste;
- Hay, straw, manure;
- Night soil;
- Carcass of any animal;
- Live animals or birds;
- Furniture;
- Stock or any wholesaler which shall be regarded as manufacturing waste;
- Discarded truck and automobile tires;
- Tree branches or roots exceeding three (3) inches in diameter;
- Ashes (except in Haileybury);
- Old corrugated cardboard (OCC); and,
- Other materials may, from time to time, be designated by the City as non-collectible waste.

The City operates various special waste collection programs, such as the annual Christmas tree, Spring Clean-Up and Bulky programs where residents can deposit “non-collective waste” such as furniture, large diameter branches, white goods (i.e., stoves and furnaces), fencing, mattresses, bed springs and other general household items at the curbside for collection. The City also operates a limited Hazardous Waste Program for the collection of old/used paint, oils, propane tanks and batteries. Additionally, residents and contractors are able to bring solid waste to the City’s landfill sites for disposal (Earth Tech, August 2009).

As reported in Draft Solid Waste Management Master Plan, the City’s current reliance on the various solid waste collection policies have resulted in inconsistencies between the collection services offered to the various towns with respect to the schedule/frequency of waste collection, bag limits, bag fees, container sizes, bans on various waste materials, composting, bulk item collection and hazardous waste collection/disposal (Earth Tech, August 2009). As such, the provision of a uniform solid waste collection by-law/policy is identified as the first key objective in developing a more efficient solid waste management program for the City of Temiskaming Shores (Earth Tech, August 2009).

2.2.2 Solid Waste Disposal

Prior to amalgamation, the New Liskeard Landfill received waste only from the former Town of New Liskeard, while the Haileybury Landfill received waste from the former Town of Haileybury, the former Town of Dymond, the Town of Cobalt, and from residents of Firstbrook and Lorrain

Townships (Earth Tech, August 2009). Upon amalgamation, all waste from the various towns comprising the City of Temiskaming Shores was diverted to the New Liskeard Landfill. As such, the New Liskeard Landfill reached its approved landfill capacity in June 2009, and is currently no longer accepting waste. Currently, The Haileybury Landfill accepts landfill waste from the entire City, as well as the Town of Cobalt. It should be noted that based on waste generation projections, as discussed in Section 2.5.2, the Haileybury Landfill is expected to reach its approved landfill capacity by mid-2016. As such, the provision of additional landfill capacity to facilitate long-term waste disposal is identified as the second key objective in establishing a sustainable solid waste management program for the City of Temiskaming Shores (Earth Tech, August 2009). As stated in Section 1.3, this conceptual assessment report will focus on evaluating the feasibility of fulfilling the objective of providing additional landfill capacity through the expansion of a new landfill site.

2.2.3 Recycling/Waste Diversion

As stated in Section 2.1, the City operates an MRF facility for the collection of recyclable materials. Earth Tech reports that the current MRF facility does not have the capacity to accommodate the additional volume of recyclable materials resulting from amalgamation and the location of the MRF limits the possibility of expansion (Earth Tech, August 2009). As such, the City's ability to divert recyclable materials from the waste stream is restricted. Additionally, the City currently is in contract with Phippen Waste Management (Phippen) to manage and operate the Haileybury Landfill (Earth Tech, August 2009). It should be noted that Phippen was also in contract to manage and operate the now closed New Liskeard Landfill. Phippen continues to separate bulk items such as white goods (i.e., disposed appliances), waste tires, glass, inert construction fill and reclaimed asphalt, from the landfilled solid waste at the open Haileybury Landfill. These bulk items are generally stockpiled on-Site for removal on a sporadic, as needed basis. As such, the provision of additional capacity for long-term recycling and waste diversion is identified as the third key objective in establishing a sustainable solid waste management program for the City of Temiskaming Shores (Earth Tech, August 2009).

2.3 Historical Quantity of Disposed Solid Waste

There are currently no weigh scales at either the New Liskeard or Haileybury Landfill sites, therefore amount of waste disposed per year at each site is based on the following:

- visual pre-disposal waste volume estimates recorded by Phippen, as provided to AMEC by the City; and,
- quantities reported in the background documents listed in Section 2.0.

The summary quantity of waste disposed of at the New Liskeard Landfill from 2000 through 2006 is reported in the Section 5.1.1. of the Draft Solid Waste Management Master Plan, and is presented on Table 2.1 (embedded below). The quantity of waste disposed in 2007 is currently not known, although the amount of waste disposed in 2008 was provided by the City as approximately 25,447 cubic yards, or 19,456 cubic meters (m^3). Table 1 (see Schedule 2) presents a detailed accounting of the quantity of waste disposed of at the Haileybury Landfill

from 1997 to 2008, based on pre-disposal waste volume estimates provided to AMEC by the City. Although a similar detailed accounting for the waste disposed at the New Liskeard Landfill was not provided to AMEC, a summary of the annual quantity waste disposed at the both the New Liskeard and Haileybury Landfills from 1997 to 2009 is provided on Table 2.1 (embedded below):

Table 2.1
Waste Quantities Disposed of at City Landfills

Year	New Liskeard Landfill (m^3/year)	Haileybury Landfill (m^3/year)
1997	NA	17,309
1998	NA	16,449
1999	NA	15,901
2000	16,806	16,578
2001	14,769	21,009
2002	13,844	22,562
2003	11,667	20,431
2004	10,102	17,982
2005	12,032	17,176
2006	18,554	20,078
2007	20,335	18,217
2008	19,456	18,954

Note:
NA = data not available

It should be noted that these estimates of historical waste volumes were recorded prior to disposal and compaction by the landfill operators.

2.4 Project Needs – Planning Period, Waste Densities and Long-Term Solid Waste Disposal Volume

As stated in Section 1.1., the overall goal of this project is to identify the most feasible option for establishing new landfill capacity for long-term solid waste disposal. Based on AMEC's discussions with the City, a long-term solid waste disposal planning period of 30-years was chosen. For the purposes of this report, the 30-year planning period begins in January 2009 and extends to December 2038. This planning period provides the basis for the calculation of projected long-term waste disposal quantities.

Tables 2a and 2b (see Schedule 2) present estimates of the amount of uncompacted waste projected to be generated by the communities of Haileybury, Dymond, Cobalt and New Liskeard over the 30-year planning period. The projections were based on the following:

- Linear extrapolations of population growth calculated from 1991, 1996, 2001 and 2006 census data, as provided by Statistics Canada for the City of Temiskaming Shores and the Town of Cobalt;

- Uncompacted waste quantity estimates for 2008, as presented above in Section 2.3; and
- Uncompacted waste generation estimates of 2.6 m^3 per capita for the communities of Haileybury, Cobalt and Dymond (combined) and 3.9 m^3 per capita for the former Town of New Liskeard.

Table 2c (see Schedule 2) presents projections for the generation of uncompacted residential solid waste for the City of Temiskaming Shores, representing the sum of the projected waste generation estimates from Tables 2a and 2b (see Schedule 2). McBean, et. al. (1995) indicates that the density of uncompacted residential solid waste generally ranges from 90 kilograms per cubic meter (kg/m^3) to 180 kg/m^3, with a typical value of 150 kg/m^3. For the purposes of this report, it is assumed that the uncompacted residential waste generated by the City will have a density of 150 kg/m^3. As such, Table 2c presents the calculation of the tonnage of projected waste generated per year by multiplying the volume of uncompacted solid waste by a density of 150 kg/m^3 and dividing the result by a factor of 1 tonne = 1,000 kilograms.

As discussed below in Section 3.4.2, AMEC observed that waste disposed at the Haileybury Landfill was subjected to compaction using a HL760 front end loader. Although the actual densities of the compacted waste material at the New Liskeard and Haileybury Landfills are not known, McBean, et. al., (1995) indicates that the density of residential solid waste after landfill compaction generally ranges from 445 kg/m^3 to 505 kg/m^3. For the purposes of this report, the in-place density of residential solid waste after landfilling and compaction will be conservatively estimated at 300 kg/m^3, representing an increase from the uncompacted residential waste density by a factor of two. Thus, on Table 2c the volume of compacted residential waste is calculated by multiplying the tonnage of projected waste generated by a factor of 1,000 kg to 1 tonne and dividing the result by an in-place density of 300 kg/m^3.

The results presented on Table 2c (see Schedule 2) indicate that the City of Temiskaming Shores (including the Township of Cobalt) is projected to cumulatively generate approximately 699,073 m^3 of compacted solid waste during the 30-year planning period. As stated in Section 2.2.3., although the City does administer the operation of an MRF for the management of recyclable waste, the MRF has limited capacity to accommodate the increased volume of recycled material generated by the City due to amalgamation. As such, this report conservatively assumes that, based on the current condition of the MRF, the volume of residential waste diverted by collection of recycle materials will be negligible throughout the planning period. Therefore any long-term solid waste management alternative developed by the City will have to accommodate a long-term solid waste disposal volume of approximately 699,073 m^3 of compacted residential waste.

It should be noted that typically, landfill operations in Ontario require that daily cover soil be applied on solid waste at a ratio of 4:1 (waste to daily cover soil), representing approximately 20% of typical landfill capacity. Given a projected long-term solid waste disposal volume of approximately 699,073 m^3, the total landfill capacity of waste and daily cover soil is calculated as follows:

$$TC = 699{,}073\ m^3 \times R_{TOTAL}/R_{WASTE}$$

= 699,073 m^3 x [(4+1)/4]
= 699,073 m^3 x 5/4
= 873,841 m^3

Where: TC = Total Capacity of projected solid waste generated;
R_{TOTAL} = Total Ratio of solid waste and daily cover soil; and
R_{WASTE} = Ratio of solid waste.

As such, the overall project needs are summarized in Table 2.2 (embedded below):

Table 2.2
Project Needs

Project Planning Criteria	Value
Planning Period	30 years (2009 to 2038)
Uncompacted Waste Density (Typ.)	150 kg/m^3
In-place Compacted Waste Density	300 kg/m^3
Long-term Solid Waste Disposal Volume Requirement	699,073 m^3 (landfilled and compacted)
Long-term Landfill (Waste & Cover Soil) Capacity Requirement	873,841 m^3
Long-term Daily Cover Soil Volume Requirement	174,768 m^3

Therefore any long-term solid waste management alternative developed by the City will be required to accommodate approximately 874,000 m^3 (rounded value) of landfill volume, including waste and daily cover soil quantities.

Descriptions of the existing Haileybury and New Liskeard Landfills including background information, a history of regulatory approvals, adjacent land use, physical setting and geology, and hydrogeology is provided in AMEC's *Landfill Feasibility Study (Conceptual Assessment) Expansion of Existing Landfill Sites*, dated 8 March 2010, prepared on behalf of the City.

2.5 Remaining Site Capacity

2.5.1 New Liskeard Landfill

As stated above in Section 2.1, C of A No. A571501 for the New Liskeard Landfill approves the disposal of waste in a 2.02 ha area (i.e. Fill Area) within a 32 ha Total Site Area. The estimate

of the Total Site Capacity for the New Liskeard Landfill was not provided in any of the background documentation provided to AMEC by the City, although SRQ reports that in 2004 the Remaining Site Capacity of the New Liskeard Landfill Site was approximately 49,580 m^3, including waste and waste cover soil (SRQ, May 2004). It is presumed that this Remaining Site Capacity value refers to the volume remaining within the approved 2.02 ha Fill Area.

The Remaining Site Capacity of waste and cover soil at the New Liskeard Landfill was consumed in 2009, and landfill operations were indefinitely halted in June of that year. The majority of the landfill area outside the approved Fill Area has been graded and capped with cover soils. Observations recorded during the AMEC's September 2009 site inspection indicate that topsoil and vegetated cover has been established on the northern portion of the landfill. Representatives of the City reported to AMEC that the cap material used included foundry sands and excavated construction fill with unknown clay content. The thickness of the cap is unknown, but generally ranges from 150 mm to over 300 mm in some areas. As of September 2009, the most recently deposited landfill material, located within the approved Fill area, was exposed although the City arranged for the progressive deposition and application of excavated construction fill on the exposed face as cover material.

2.5.2 Haileybury Landfill

As stated above in Section 2.1, C of A No. A570402 for the Haileybury Landfill approved the use and operation of a 5.8 ha landfill site within a 32.4 ha Total Site Area. The supporting documentation for the Emergency C of A application indicated that the original Total Site Capacity of the Haileybury Landfill Site (including waste and daily cover soil) was estimated as 475,644 m^3 (Sutcliffe, July 1997). The Total Site Capacity was revised in 1997 Landfill Site Approval Report to 452,221 m^3, based on revised per capita waste projection values.

Based on landfill quantities provided by the City, presented on Table 1 (see Schedule 2), between 1997 and 2008, approximately 222,617 m^3 of waste material was landfilled at the Haileybury Landfill. The 2008 Annual Monitoring Report, prepared in April 2008 by Story Environmental Services (SES), indicates that the volume of compacted solid waste deposited at the Haileybury Landfill through to the 2008 reporting period is approximately 263,530 m^3 (SES, 2009). The more conservative estimate was used to calculate the Remaining Landfill Capacity, although it will be assumed that the volume of 263,530 m^3 consumed includes daily cover as well as landfill waste.

The Remaining Site Capacity of the Haileybury Landfill is presented on Table 2.3 (embedded below):

Table 2.3
Haileybury Landfill
Remaining Site (Waste & Daily Cover Soil) Capacity

Item	Volume
Total Site Capacity	452,221 m^3
Estimated Volume of Landfill Waste Deposited as of 2008	263,530 m^3
Estimated Remaining Landfill Capacity	188,691 m^3

Therefore the Remaining Landfill Capacity at the Site, including waste and daily cover soil, is approximately 188,691 m^3, as of the end of 2008.

The estimated Remaining Landfill Capacity of 188,691 m^3 includes both waste and waste cover soil. SES reports that due to historical site practices and the limited availability of cover soil, approximately 3% to 5% of the consumed landfill capacity consisted of daily cover soils. Typically, landfill operations in Ontario require that daily cover soil be applied in a ratio of 4:1 (waste to daily cover soil), representing approximately 20% of typical landfill capacity. Therefore the Remaining Site Capacity is itemized on Table 2.4 (embedded below) as follows:

Table 2.4
Haileybury Landfill
Remaining Landfill Waste Capacity

Item	Volume
Estimated Remaining Landfill Capacity	188,691 m^3
Estimated Cover Soil Capacity (at a 4:1 ratio)	37,738 m^3
Estimated Remaining Waste Capacity	150,953 m^3

The projections for waste generation by the City of Temiskaming Shores, including the Town of Cobalt, are presented in Table 2c (see Schedule 2). Table 2c (see Schedule 2) also provides a projection of the total volume of compacted waste to be landfilled for each year starting in 2009, based on the assumption that landfill waste generated can be compacted to an in-place density of 300 kg/m^3 (as discussed in Section 2.1). Given the estimate of Remaining Waste Capacity and the projections of the quantity of compacted landfill waste, an estimate of the Remaining Site Life for the Haileybury Landfill is provided on Table 2.5 (embedded below):

Table 2.5
Haileybury Landfill
Remaining Site Life

Year	Annual Volume of Compacted Waste (m^3)	Remaining Waste Capacity (m^3)
		150,953 (as of 2008)
2009	19,373	131,580
2010	19,587	111,993
2011	19,797	92,196
2012	20,010	72,186
2013	20,220	51,966
2014	20,433	31,533
2015	20,647	10,886
2016	20,857	Haileybury Waste Capacity consumed

Based on the conservative estimates presented above it is anticipated that the Remaining Waste Capacity for the Haileybury Landfill will be consumed in mid-2016.

3.0 PRELIMINARY FEASIBILITY ASSESSMENT CRITERIA

The process of assessing the feasibility of the conceptual landfill development alternatives will be conducted in two steps. Step one is a review of the potential opportunities for and constraints to the siting (i.e., location), to determine if development of a new landfill is principally feasible. Step two will be the evaluation and ranking of each conceptual landfill development alternative against a set list of feasibility criteria to determine a preferred new landfill development scenario (i.e., the most feasible alternative). The criteria used for both steps are derived from the following sources:

- Environmental Protection Act, Regulation 347 General-Waste Management (Reg. 347);
- Ontario Regulation 232/98 (O.Reg. 232/98) for new and expanding landfill sites;
- Town of Haileybury Zoning By-law No. 85-27, November 1985;
- Township of Dymond By-law No. 1041, March 1986;
- Official Plan for the Town of Haileybury, March 1989;
- Official Plan for the Town of New Liskeard, March 1989; and
- Town of New Liskeard Zoning By-law No. 2233, June 1989.

The following discussion outlines the criteria to be used for both steps.

3.1 Criteria for Site Constraint/Opportunities Mapping

Site constraint/opportunity mapping is an exercise that is typically applied to the screening of new landfill sites. The exercise involves incorporating a series of setbacks from sensitive areas or land uses, which are determined by provincial regulation or local bylaws, onto a map of the project property generated by Geographical Information System (GIS) software. The pictorial representation of these setbacks on the project site provides a preliminary guideline to determine if the proposed landfill site, will be constrained by the regulatory setbacks, and/or if the location of the project site will present any potential opportunities for the municipality with respect to locations to nearby highways, roads and sources of waste generation.

Table 3.1 (embedded below) presents a summary of the landfill constraints/opportunity mapping criteria used for this report.

Table 3.1
Site Constraint/Opportunity Mapping Criteria

Site Constraint/Opportunity	Criteria
Distance to Existing Infrastructure	Landfill located within 1000 m of an existing roadway.
Distance from Water Supply Wells	Landfill located more than 500 m from an existing water well.
Elevation above Flood Zone	Landfill located above an elevation of 182 meters above sea level.
Distance from Railway	Landfill located more than 50 m from a railway
Limit Preferential Contaminant Pathway	Landfill located more than 60 m from a fault zone.
Distance from Surface Water	Landfill located more than 30 m from a surface water body.
Distance from Existing Roadways	Landfill located more than 50 m from the existing roadway.
Conflicting Land Use	Landfill located outside of agricultural lands, Areas of Natural or Scientific Interest (ANSI), Ministry of Natural Resources (MNR) designated wetlands, and Significant Ecological Areas.

Figure 3 (see Schedule 1) presents the results of the constraint/opportunity mapping for the project study area (i.e., the municipal boundaries including a 10 km study zone), including the following 6 identified potential sites:

- W1 – property located north of Highway 558, east of Ramsey Road;
- W2 – property along the west side of the Highway 11 corridor, approximately 2 km south of Highway 558
- W3 – located west of Highway 11, near the south end of the municipality;
- G1 – property located south of Sharp Lake;
- G5 – property located approximately 2 km northwest of the existing Haileybury Landfill Site, on the west side of Moose Lake Road; and
- G6 – the existing Harley Township Landfill Site.

Although, the development of a new landfill at all 6 locations was considered to be principally feasible following completion of the desktop exercise, further study, such as performing an inventory and monitoring of the water supply wells adjacent to the new proposed sites and/or measuring and assessing the distance of the limits of the landfill waste to the centerline of the adjacent roads, is recommended to determine the overall impact, if any, the location of the proposed landfills may have on the nearby siting features.

During a January 2010 reconnaissance of the 6 potential sites, AMEC reviewed each of the

sites identified via the mapping exercise. The intention of this effort was to refine the number of principally feasible sites to a total of 4 potential sites (2 sites within the limits of the municipality and 2 sites beyond the municipal boundary), by considering site specific issues that were not apparent through the desktop, mapping exercise.

The result of this ground-truthing eliminated one site within the municipality (W2) along the west side of the Highway 11 corridor, approximately 2 km south of Highway 558 and one site outside of the municipality (G1) south of Sharp Lake. Study property W2 was eliminated due to extreme changes in topography across the property as well observed presence of bedrock outcrops, which indicated significant Site preparation required for the proposed establishment of a landfill. Similarly, study property G1 was eliminated based on the extreme changes in topography as well as overall poor accessibility (i.e., no municipal roads leading to property entrance).

3.2 Conceptual Landfill Development Alternative Feasibility Assessment Criteria

AMEC generated a list of key criteria for the assessment of the feasibility of the conceptual landfill expansion alternatives based on a review of the documentation listed in Section 3.0. The purpose of the feasibility criteria is to assess the overall impact of the conceptual landfill expansion alternatives to the members of the community, the surrounding environment and the municipality. The key criteria are:

- Public Health, Safety and Socioeconomic Factors;
- Natural Environment;
- Conceptual Technical Considerations; and,
- Conceptual Cost Estimates.

The following presents a discussion of each of these key criteria as well as the sub-criteria which will be ranked to assess a preferred conceptual landfill development alternative.

3.2.1 Public Health & Safety and Socioeconomic Factors

This key criterion mainly addresses the potential impact the conceptual landfill expansion alternatives will have on the nearby community. The alternatives will be ranked based on the assessment of the following sub-criteria:

- Distance to Residential Areas;
- Distance to Sensitive Land Uses;
- Distance to Drinking Water Supply Wells; and,
- Distance to Waste Generation Source and Road/Transport Access.

Distance to Residential Areas

The distance between a landfill footprint and adjacent residential areas are referenced in several regulatory sources. Section 13 of Reg. 347 requires that a landfill fill area be at least 0.25 mile (400 m) from any existing residence. Section 5.3 of the MOE's *Guideline D-4 Land*

Use On or Near Landfills and Dumps (Guideline D-4), dated April 1994 recommends that a 500 m study area be established around landfill areas to evaluate the presence and impact of any adverse effects or risks to health and safety. However, Sections 5.3 and 4.4 or Guideline D-4 does consider that the actual perimeter distance of the study area may be set at less than or greater than 500 m based on the determination of the limit of the environmental impacts. Section 7, of O. Reg. 232/98 (for new or expanding landfill sites) outlines the requirement of a 100 m buffer area around the waste fill area of the landfill site or a minimum of 30 m at every point of the buffer area if there is adequate space for site access, parking, surface water management facilities structures and that the buffer area is sufficient to ensure that potential impacts of the landfill operation to the outside are minimal.

The various municipal by-laws for the various towns that form the City of Temiskaming Shores also reference distances between waste disposal facilities and residential areas. These references are summarized as follows:

Town of Haileybury, Zoning By-law No. 85-27, November 1985

- Article 2.23 - Setbacks from Waste Disposal Sites requires that no building or structure shall be constructed or expanded closer than 30 meters to the perimeter of an operational waste disposal site.

Town of Haileybury Zoning By-law No. 85-27 Nov 1985

- Article 2.23 requires that no building or structure shall be constructed or expanded closer than 30 m to the perimeter of the area which is to be landfilled on an operational waste disposal site.

Township of Dymond By-law No. 1041, March 1986

- The by-law requires that landfills cannot be located in Environmental Protection (EP) zones.

As a result, each conceptual landfill development alternative will be evaluated based on the distance between the landfill and the closest residence.

Distance to Sensitive Land Uses

Section 13 of Reg. 347 references the following restrictions to locating landfill sites near sensitive land uses:

- Section 13(1) - The fill area shall not be subject to flooding and shall be so located that no direct drainage leads to a watercourse;
- Section 13(2) - The landfill shall be at least one-quarter of a mile (400 m) from the nearest dwelling;
- Section 13(3) - The landfill shall be at least two hundred yards (182 m) from the nearest public road;
- Section 13(4) - The site shall be at least 100 feet (30 m) from any watercourse, lake or pond; and,
- Section 13(5) - The site shall not be on land covered by water.

The following excerpts from the City's municipal by-laws and official plans further define limitations to development of sensitive lands:

Township of Dymond By-law No. 1041, March 1986

- Section 14(1) outlines that the only allowed non-residential uses for EP (Environmental Protection) zones are for an archaeological site; conservation use; farm, other that a building; flood control and erosion use; forestry use; marine facility; and outdoor recreational use, other than a building; a wildlife and fish management use; and
- Section 16(5)(n) requires that where a non-agricultural land use is establishing or expanding in close proximity to existing livestock buildings; or where livestock facilities are being constructed, enlarged or remodeled near an existing non-agricultural use the separation distance between the existing use and proposed use shall be the distance prescribed by the Minimum distance Separation formula of the Agricultural Code of Practice as revised from time to time.

Township of Dymond Official Plan Amendment No. 2, November 1996, Section 1- General Provisions:

- Agriculture 1.4.1 - Class 2 and 3 soils as defined by the Canada Land Inventory of soil Capability for Agriculture are considered to be of prime importance and will be protected. Non-farm development in areas of good agricultural capability will not be permitted; and,
- 1.10 Hazard Land and Sensitive Areas – It is the intent of this Plan to prevent development from occurring on lands having an inherent environmental hazards such as poor drainage, flood susceptibility, erosion, steep slopes or any other physical condition which could endanger human life and property.

In order to evaluate potential conflicts of the proposed landfill development alternative, the feasibility of each alternative will be assessed by the number of residences within 400 m of the center of the landfill, the distance to the nearest agricultural land, distance to the nearest EP Zone, and the distance to hazard lands and sensitive areas.

Distance to Drinking Water Supply

There are no restrictions to water supply well establishing landfill sites in Reg. 347 or O. Reg. 232/98, as groundwater impacts are to be managed within the designed buffer area and attenuation zone. In September 1986, the MOE introduced a policy to assist in the evaluation of groundwater impacts, especially for the case of landfill and/or lagoon operations. The policy was entitled "The Incorporation of the Reasonable Use Concept into MOEE Groundwater Management Activities" and is referred to now as Guideline B-7 (formerly Policy 15-08) or the "Reasonable Use" policy. Simply stated, the policy sets groundwater contaminant discharge criteria for landfills and/or lagoons that may impair local water quality; the criteria are based on maintaining the protection of groundwater resources on the adjacent lands or properties.

Guideline B-7 requires that contaminant discharge criteria, representing the maximum acceptable levels of contaminants that should not be exceeded, be established using a simple mathematical relationship that incorporates background (existing) water quality and the highest

provincial water quality standards for the adjacent land use. Under Guideline B-7, water quality impacts will not be allowed to exceed the maximum calculated discharge criteria at the landfill (or Site) property boundaries.

In order to apply Guideline B-7, the appropriate resource use of the adjacent properties must be selected. At all of the proposed landfill development sites, the highest end use for groundwater on the adjacent properties is for drinking water purposes, for which the Ontario Drinking Water Standards (ODWS) - Table 1 through Table 4 have been established. The purpose of the ODWS is to protect public health through the provision of safe drinking water. Water intended for human consumption shall not contain unsafe concentrations of toxic chemicals (health related parameters). Health related standards are established for parameters that, when present above a certain concentration, have known or suspected adverse health effects. At the same time, water should also be aesthetically acceptable. Colour, odour and turbidity are parameters that, when controlled, result in water that is clear, colourless and without objectionable or unpleasant taste or odour (non-health related parameters). In addition, operational guidelines have been established for non-health related parameters that need to be controlled to ensure efficient and effective treatment and distribution of the water. As well, Guideline B-7 requires the identification of background water quality conditions in the underlying aquifer.

In order to establish the background geochemical profile, the geometric mean of the valid concentrations of each applicable ODWS parameter would have to be calculated, and the resultant values applied along with the ODWS, to complete a Guideline B-7 analysis for any on-site groundwater monitoring wells for various landfill indicator parameters.

As each conceptual landfill development alternative may potentially be developed as a natural attenuation site, the feasibility of the development alternatives will be compared to the water well related criteria, specifically pertaining to the presence of any designated drinking water supply areas (i.e., Wellhead Protection Areas) and distance to the nearest drinking water supply well.

Distance to Waste Generation Source and Road/Transport Access

The Official Plans for the City of Temiskaming Shores do not contain any special provisions to protect rural areas. The rural area covers areas within the City where no further urban development is contemplated by the Plan and where further municipal services will be restricted to those needed to deal with emergencies. Land designated as Rural Use is intended primarily for agriculture, forestry, recreational or conservation purposes. The purpose of the Rural Use designations to prevent uncontrolled and scattered development. Further in order to prevent the conflicts that may result when development occurs in areas that are not adequately supplied with services and other public works and to avoid excessive costs for such works in the future, it is the intent of Council to maintain the rural area at a similar level to the now prevailing and to restrict further development to a minimum.

As such, the distance to waste centroid/waste generation source and the distance to nearest existing road will be used to evaluate the feasibility of future landfilling at each site.

3.2.2 Natural Environment

This key criterion mainly addresses the potential impact the conceptual landfill development alternatives may have on the surrounding natural environment. The alternatives will be ranked based on the assessment of the following sub-criteria:

- Distance to Terrestrial Habitat;
- Distance to Aquatic Habitat;
- Distance to Species at Risk; and,
- Hydrogeological Conditions (i.e. Overall Condition of Site Setting).

Distance to Terrestrial Habitat

Development of a new site may be limited or prevented due to its proximity to certain land use designations; however, there are no specific regulatory requirements or municipal by-laws that outline setbacks from natural areas.

However, in order to avoid potential interference the distance to the nearest wetland (swamp, bog, marsh, and fen) and the distance to the nearest potentially significant terrestrial habitat (e.g., old growth forest) will be used as ranking criteria to evaluate the feasibility of potential landfill development alternatives.

Distance to Aquatic Habitat

Aquatic habitat includes lakes, rivers or other water bodies. As discussed in Section 4.1, Section 13 of Reg. 347 requires that landfill sites be at least 100 feet (30 m) from any watercourse, lake or pond. In addition, the Municipal Bylaws place further restrictions on land use in EP zones, including agricultural, rural areas, hazard land and sensitive areas (as described previously in Section 4.2.1. As a result, the distance to the nearest aquatic habitat will be used to evaluate the new landfill development potential of each of the Sites.

Distance to Species at Risk

Section 14 of the Township of Dymond By-law No. 1041 requires that landfills must not be located in Environmental Protection (EP) zones. There are no regulatory requirements or by-laws for setbacks from Areas of Natural or Scientific Interest (ANSI).

The development of new landfills may be limited due to proximity to species at risk or their potential habitat. through the Natural Heritage Information Centre (NHIC). The NHIC compiles, maintains and distributes information on natural species, plant communities and spaces of conservation concern in Ontario. This information is stored in a spatial database used for tracking this information. The Centre also has a library with conservation-related literature, reports, books, and maps, which are accessible for conservation applications, land use planning, and natural resource management.

The NHIC web-site can be accesses at http://nhic.mnr.gov.on.ca/MNR/nhic/nhic .cfm. Natural heritage information can be checked directly on-line using an interactive map or database

information can be downloaded in GIS file format. Distance to nearest known or potential species at risk or its critical habitat will be used as criteria to evaluate the feasibility of expansion potential at each site.

Hydrogeological Conditions

The environmental impact of a newly established landfill is dependent on the hydrogeological condition of the landfill property. As stated in Section 4.1, Reg. 347 requires that a landfill shall be at least 100 feet (30 m) from any watercourse, lake or pond. The conceptual landfill expansion alternatives will be ranked and evaluated based on distance to the nearest surface water feature.

Although regulations and by-laws do not specifically address the overall hydrogeological condition of the landfill property, for the purposes of this report the conceptual landfill development alternatives will be ranked based on the hydrogeological condition of each site. The ranking will be based on factors such as the presence of a groundwater recharge area near the Site, the degree of existing groundwater contamination, the presence of a significant confining layer, and the number of and distance to potentially impacted aquifers.

3.2.3 Conceptual Technical Considerations

This key criterion addresses recommended technical features of each conceptual landfill expansion alternative. The alternatives will be ranked based on the assessment of the following sub-criteria:

- Site Size;
- Leachate Management Strategy;
- Surface Water Management Strategy; and
- Landfill Gas Management Strategy.

Site Size

The first technical consideration that must be evaluated for each conceptual landfill development alternative is the size of the proposed landfill, and how it relates to the effort required to implement (i.e., construct) the alternative. As discussed in Section 2.4, this study is to evaluate the feasibility of each conceptual landfill development alternative to address the City's long term waste management requirements. It is anticipated that the City will generate approximately 841,000 m^3 of solid waste over a 30-year planning. For the purpose of this study, it is assumed that the Haileybury Landfill Site continue to be used until it reaches capacity (150,953 m^3 of waste to be consumed by 2016, while a new site receives regulatory approvals, permits and is constructed) and the balance of the estimated 30-year planning period waste volume will be disposed of in a newly developed landfill site. As a result, each conceptual landfill development alternative will be assessed to ensure that it can satisfy the required landfill capacity requirements while meeting the MOE design criteria for buffer areas, sideslopes, top elevation and regulatory setbacks (as described earlier). Each alternative will also be assessed on the size of the footprint of the potential development, as that is a key indicator of the required construction effort.

Leachate Management

It is anticipated that the potential new landfill sites will operate as natural attenuation type facilities, where the primary control for minimizing leachate impacts to groundwater is the establishment of a CAZ downgradient of the landfill to protect potential receptors. Although natural attenuation will be considered as the primary leachate management strategy for each conceptual landfill development alternative, the condition of the potential landfill property, as it relates to site setting factors may require alternative methods for leachate management.

As a result, the feasibility of each conceptual landfill development alternative will be evaluated and ranked based on the leachate management strategy. The assessment will consider factors such as the size, complexity and effort required to implement the leachate management strategy. Given the lack of hydrogeological data available at any of the potential sites AMEC has assumed a generic CAZ sizing formula based on the waste footprint (8 times the waste deposit length, including 1 length in the upgradient area and 6 lengths in the downgradient area and 3 waste deposit widths). A visual representation of the generic CAZ area is presented on Figure 4 (see Schedule 1).

Surface Water Management

Typically perimeter drainage systems direct surface water runoff falling on the lands surrounding landfill away from the active tipping face, thus limiting impacts to nearby creeks and surface water bodies. Surface water runoff from within the landfill footprint is managed through the grading of landfill side slopes and top plateaus, and the application of interim cover on inactive landfill areas, and final cover on closed landfill areas. The feasibility of the conceptual landfill development alternatives will be evaluated against the size and complexity of any surface water management features, including length of ditching, number of stormwater ponds, treatment requirements, and water course alteration requirements.

Landfill Gas Management

Landfill gas (LFG) is generated by methanogenic bacteria during decomposition of organic material under anaerobic conditions. The rate of LFG production in a landfill depends on the interrelationship of many factors. The principal factors include waste composition and age, temperature, moisture content, pH, and quantity and quality of available nutrients and microbial populations. The length of time that a landfill may generate LFG can be in excess of 50 years.

Landfill gas is composed of a variety of chemical compounds, which reflects the types of waste that are placed at the landfill site. In general, landfill gas is composed of approximately 50% to 55% methane by volume, 40% to 45% carbon dioxide by volume, and less than 1% other gases such as sulphur species and volatile organic compounds. The concerns with LFG are that the methane gas creates an explosive hazard under certain conditions (between 5% to 15% by volume in air); that LFG will reduce or replace the percentage of the natural atmosphere in enclosed structures, thus creating an oxygen deficient environment; and that there is a potential for health effects depending on the trace gas compounds and levels.

The generated LFG can migrate from a landfill site in two ways. These two methods are emission of the LFG to the atmosphere either under controlled released conditions (designed venting and/or collection structures) or uncontrolled conditions (venting through the landfill cover), and/or the migration of the LFG within the surrounding subsurface until a venting location is encountered.

Gas migration in the subsurface soil is governed by the same general principles as water flow. The subsurface migration of landfill gas is dependent on soil conditions at the landfill site, the landfill gas generation rate, the landfill site design and weather conditions throughout the year. Potential migration of landfill gas will be greatest in the higher permeable soil stratigraphic units that are present around the landfill site. The landfill gas generation rate will govern the amount of gas available to migrate and impact the extent of landfill gas migration, since landfill gas will usually rise. A perched water table or frost layer will influence the distance of landfill gas migration, since the boundary layer will create a reduced exfiltration area for the gas and create the conditions for potential lateral migration.

In June 2008, the Ministry of Environment amended Reg. 347 and O.Reg. 232/98 to present requirements for landfill gas collection and management for new, expanding and operating landfills. The amendments are presented in the MOE's *Landfill Gas Capture: A Guideline on the Regulatory and Approval Requirements for Landfill Gas Capture Facilities*, dated September 2008 (Landfill Gas Guideline). The Landfill Gas Guideline states systems to control the atmospheric emission of landfill gas are required for landfills with capacities larger than 1.5 million cubic meters.

As each landfill development alternative will be evaluated and ranked based on whether the overall landfill capacity is greater than 1.5 million cubic meters, which will require the establishment of a landfill gas collection and management system.

3.2.4 Conceptual Cost Estimates

This key criterion addresses projected cost of each conceptual landfill development alternative, which will be based on conceptual estimates. The alternatives will be ranked based on the assessment of the following sub-criteria:

- Land Acquisition Cost Estimate;
- Capital/Construction Cost Estimate; and,
- Cost Estimate for Regulatory Approvals.

It should be noted that the cost estimates provided in this report are conceptual, based on the conceptual design parameters provided for each landfill development alternative. The costs presented herein are intended to provide an order of magnitude estimate for the purposes of a feasibility assessment. They are not intended to be used for budgetary purposes. It is recommended that after the selection of a preferred long-term solid waste management strategy, that the City commissions a detailed design, upon which one can provide cost estimates suitable for capital budget projections.

Conceptual Land Acquisition Cost Estimate

The acquisition of adjacent land for the development of a new landfill will be required depending on the parameters and scope of each conceptual landfill development alternative. The acquired land may be needed for various reasons, including but not limited to the establishment of proposed contaminant attenuation zones, to facilitate the footprint of the proposed landfill, for the siting of regulatory required buffer zones or to provide sufficient lands for the installation of leachate, surface water and/or landfill gas management facilities.

Each conceptual landfill development alternative will be evaluated and ranked based on the project estimated cost of acquiring new lands adjacent to the existing landfill property. The lower cost estimate will be ranked as the most feasible while the higher cost will be ranked as least feasible.

Conceptual Capital/Construction Cost Estimate

The conceptual capital/construction cost estimates presented herein are based on the key features that are identified for each conceptual landfill development alternative. These key features include projected conceptual cost estimates to perform various construction activities such as:

- Excavation and earthworks;
- Installation of a leachate management system;
- Installation of a surface water management system;
- Application of a final cover system; and,
- Installation of a landfill gas management system.

Each conceptual landfill development alternative will be evaluated and ranked based on the projected conceptual estimated capital costs. Lower cost estimates will be ranked as the most feasible while the higher cost will be ranked as least feasible.

Conceptual Cost Estimate for Regulatory Approvals

As discussed in Section 1.0, once a preferred waste management strategy (i.e., expansion of an existing landfill and/or establishment of a new landfill) is determined to be feasible, the development of the required landfill capacity will require a full environmental assessment (EA) under Part II of the Ontario Environmental Assessment Act. Obtaining an operating license for the preferred waste management strategy will require obtaining approval of the landfill design under the Environmental Protection Act and approval of the required leachate/surface water management system under Ontario Water Resources Act. The conceptual costs estimates for Regulatory Approvals presented herein includes the projected engineering/consulting costs and administrative fees anticipated in order to obtain regulatory approval for each of the for each conceptual landfill development alternative. Each development alternative will be compared against the other and the lowest total cost over the planning period would be considered the most feasible and the highest cost would be considered the least.

3.3 Summary of Feasibility Assessment Criteria

Table 3.2 (embedded below) presents a summary of the key criteria and sub-criteria to be employed for the evaluation of each conceptual landfill design alternative, as well as a summary of the indicators which will provide the basis for the ranking.

Table 4.2
Feasibility Assessment Criteria
for the Conceptual Expansion of Existing Landfills

	Criteria	Indicator
1	**Public Health, Safety and Socioeconomic Factors**	
	Residential Areas	Distance to nearest residence
	Sensitive Land Uses	Number of residences within 400 m and 1000 m of landfill Distance to nearest agricultural lands Distance to nearest Environmental Protection (EP) Zone Distance to nearest designated Hazard Lands and Sensitive Areas
	Drinking Water Supply	Distance to nearest designated drinking water supply area Distance to nearest drinking water supply well
	Road Transport	Distance to waste centroid/waste generation source Distance to nearest existing road
2	**Natural Environment**	
	Terrestrial Habitat	Distance to nearest wetland, swamp, bog, marsh or fen Distance to nearest potentially significant terrestrial habitat (e.g., old growth forest)
	Aquatic Habitat	Distance to nearest water course, creek, ponds or lake
	Species at Risk	Distance to nearest known or potential Species At Risk or its critical habitat
	Hydrogeological Conditions	Presence of on-site groundwater recharge area Existing and degree of groundwater contamination Degree of natural containment at site Number of aquifers Distance to aquifer
3	**Technical Considerations**	
	Site Size	Size of conceptual landfill expansion
	Leachate Management	Size of proposed contaminant attenuation zone Complexity of alternative leachate management system
	Surface Water Management	Size and complexity of surface water management features
	Landfill Gas Management	Requirement for landfill gas collection and management
4	**Conceptual Cost Estimate**	
	Land Acquisition	Cost of acquiring new lands adjacent to the existing landfill

Criteria	Indicator
	property
Capital/Construction Cost	Cost estimate to construct the landfill expansion
Cost for Regulatory Approval	Cost to obtain regulatory approvals for landfill expansion

4.0 CONCEPTUAL LANDFILL DEVELOPMENT ALTERNATIVES

This section includes a description of four (4) conceptual design alternatives for the development of a new landfill (i.e., 2 alternatives located within the municipal boundary and 2 alternatives located outside of the municipal boundary within the 10 km study zone) as well as, a discussion on the basis for the conceptual alternatives. It should be noted that for the purposes of this report, the designs for the development of a new landfill are prepared at a preliminary, conceptual level to facilitate evaluation of overall feasibility of the alternatives. The landfill alternatives presented herein are not intended to provide details on the implementation or construction of the new landfill. The preparation of more detailed designs would be initiated subsequent to the submission of the Final Feasibility Study and the preparation and approval of an Environmental Assessment of a preferred long-term solid waste management strategy (i.e., landfill disposal) for the City.

4.1 Conceptual Landfill Development Capacity

The volumetric capacity for the conceptual landfill development is determined by the following two parameters:

1. the total volume of solid waste projected to be generated during the 30-year planning period; and,
2. the available remaining landfill waste capacity at the existing landfill sites.

Section 2.3 presents a discussion of solid waste generation projections for the City during a 30-year planning period (i.e., 2009 to 2038). Based on these projections, it is anticipated that the City will require approximately 874,000 m^3 of landfill volume, including waste and daily cover soil quantities.

It is understood that any long-term solid waste management strategy would include the use of any remaining landfill capacity at the existing landfills. As discussed in Section 2.5.2, the Haileybury Landfill is the only existing site within the City with a remaining landfill capacity. The Remaining Site Capacity at the Haileybury Landfill is estimated as approximately 188,691 m^3, including waste and daily cover soil.

As such the estimated capacity of the required landfill alternative would be calculated by the subtraction of the Remaining Site Capacity at Haileybury Landfill from the Long-term Landfill (Waste & Cover Soil) Volume Requirement. Therefore the Conceptual Landfill Expansion Capacity is 685,309 m^3 (874,000 m^3 - 188,691 m^3), which is rounded to approximately 685,000 m^3 for the purposes of this report.

AMEC has developed four conceptual landfill development alternatives, which are identified as follows:

- Alternative No. 1 is the development of a new landfill site within the municipal boundary at property W1, located north of Highway 558, east of Ramsey Road. This alternative is henceforth designated “Ramsey Road (W1)”;

- Alternative No. 2 is the development of a new landfill site within the municipal boundary at property W3, located west of Highway 11, near the south end of the municipality. This alternative is henceforth designated at “Highway 11 (W3)”;

- Alternative No. 3 is the development of a new landfill site outside of the municipal boundary at property but within the 10 km study zone at property G5, located approximately 2 km northwest of the existing Haileybury Landfill Site, on the west side of Moose Lake Road. This alternative is henceforth designated “Moose Lake Road (G5)”; and

- Alternative No. 4 is the expansion of the existing Harley Township Landfill Site at property G6, which is located along Sale Barn Road. Although, the existing Harley Township Landfill Site is currently operating as a small, trench style landfill, the proposed landfill expansion is considered a new development, for the purposes of this report. This alternative is henceforth designated “Harley Township Landfill (G6)”.

Existing site conditions and surrounding property use for each alternative is depicted on Figures 5 through 8 (see Schedule 1).

Each conceptual landfill expansion alternative is described by the following key conceptual design parameters:

- footprint area;
- base elevation;
- top elevation; and
- volumetric capacity.

As stated above, the landfill expansion alternatives are prepared on a conceptual basis to facilitate the assessment of socioeconomic, environmental, technical, cost and regulatory feasibility. The preparation of refined conceptual design outlining landfill buffer zones, base contours, side slope grades and landfill plateau grades and other design criteria would proceed upon the identification and selection of a preferred feasible conceptual alternative.

4.2 Conceptual Landfill Development Alternatives Inside the City Limits

Alternative No. 1 – Ramsey Road (W1), has been developed for the property located east of Ramsey Road and north of an existing quarry operation with roads and hydro servicing the area. Based on the results of the desktop review and the site reconnaissance, the site is located in an area of low relief and thin overburden deposits. There currently are no residences within 1 km of the proposed site and no wells, surface water bodies or other sensitive land uses

within the setbacks detailed in Section 3.1. The current site conditions for Alternative No. 1 – Ramsey Road (W1) and the surrounding properties are presented on Figure 5 (see Schedule 1).

Alternative No. 2 – Highway 11 (W3), was developed for the property located west of Highway 11, near the south end of the municipality, west of an existing quarry operation and within 250 m of existing infrastructure. Based on the results of the desktop review and the site reconnaissance, the site is located in an area of moderate relief and a thin overburden sequence. There currently are no residences within 1 km of the proposed site and no wells, surface water bodies or other sensitive land uses within the setbacks detailed in Section 3.1. The current site conditions for Alternative No. 2 – Highway 11 (W3) and the surrounding properties are presented on Figure 6 (see Schedule 1_.

Summary descriptions of each of the conceptual landfill development alternative within the municipality are provided below.

4.2.1 Alternative No. 1 – Ramsey Road (W1)

Conceptual Landfill Development Alternative No. 1 – Ramsey Road (W1) involves the construction of a new landfill east of Ramsey Road. Figure 9 (see Schedule 1) presents a schematic of Alternative No. 1 – Ramsey Road (W1), including the generic CAZ. The key parameters of this alternative are presented on Table 4.1 (embedded below):

Table 4.1
Key Parameters
Conceptual Landfill Development Alternative No. 1 – Ramsey Road (W1)

Parameter	Value
Footprint Area	7.07 ha
Base Elevation	259 masl
Top Elevation	285 masl
Landfill Capacity (inc. waste & cover)	685,033 m^3

4.2.2 Alternative No. 2 – Highway 11 (W3)

Conceptual Landfill Expansion Alternative No. 2 – Highway 11 (W3) involves the construction of a new landfill to the west of Highway 11. Figure 10 (see Schedule 1) presents a schematic of Alternative No. 2 – Highway 11 (W3). The key parameters of this alternative are presented on Table 4.2 (embedded below):

Table 4.2
Key Parameters
Conceptual Landfill Development Alternative No. 2 – Highway 11 (W3)

Parameter	Value
Footprint Area	7.59 ha
Base Elevation	305.5 masl
Top Elevation	332 masl
Landfill Capacity (inc. waste & cover)	684,998 m^3

4.3 Conceptual Landfill Development Alternatives Within the 10 km Buffer Surrounding the City Limits

Alternative No. 3 – Moose Lake Road (G5) was developed for the property located west of Moose Lake Road, approximately 2 km northwest of the existing Haileybury Landfill Site. The property is located within 250 m of existing infrastructure (roads and hydro), however, it is anticipated that Moose Lake Road North would require considerable improvements to accommodate the volume of traffic associated with landfill construction and operations. Based on the results of the desktop review and the site reconnaissance, the site is located in an area of high relief and significant, coarse grained, overburden deposits. There is currently 1 residence within 1 km of the proposed site (approximately 500 m) and no wells, surface water bodies or other sensitive land uses within the setbacks detailed in Section 3.1. The current site conditions for Alternative No. 3 – Moose Lake Road (G5) and the surrounding properties are presented in Figure 5 (see Schedule 1).

Alternative No. 4 – Harley Township Landfill (G6) was developed for the property located in Harley Township, on the west side of Sale Barn Road, approximately 2 km east of Highway 11 and is currently operated as a small scale trench style waste disposal site (i.e. the Harley Township Landfill Site). The site has apparently been in use as a landfill site since 1978. The Harley Township Landfill currently operates under C of A No. A571702, dated 6 May 2005, as amended, which approves of the use and operation of 8.1 ha landfilling area within a total property area of 16.2 ha. This C of A specifies the service area and does not contain any conditions pertaining to the management or monitoring of leachate, landfill gas, groundwater or surface water. C of A No. A571702 is provided in Appendix C.

Based on the results of the desktop review and the site reconnaissance, the site is located in an area of moderate relief and a moderate overburden thickness and is located within 250 m of existing infrastructure. There currently are two residences within 1 km of the proposed site (at approximately 600 m) and no wells, surface water bodies or other sensitive land uses within the setbacks detailed in Section 3.1. The current site conditions for Alternative No. 4 – Harley Township Landfill (G6) and the surrounding properties are presented in Figure 6 (see Schedule 1).

Summary descriptions of each of the conceptual landfill development alternative within the 10 km buffer area surrounding the municipality are provided below.

4.3.1 Alternative No. 3 – Moose Lake Road (G5)

Conceptual Landfill Expansion Alternative No. 3 – Moose Lake Road (G5) involves the construction of a new landfill to the west of Moose Lake Road. A schematic of Alternative No. 3 – Moose Lake Road (G5) is presented in Figure 11 (see Schedule 1). The key parameters of this alternative are presented on Table 4.3 (embedded below):

Table 4.3
Key Parameters
Conceptual Landfill Development Alternative No. 3 – Moose Lake Road (G5)

Parameter	Value
Footprint Area	7.97 ha
Base Elevation	300.0 masl
Top Elevation	332 masl
Landfill Capacity (inc. waste & cover)	688,705 m^3

4.3.2 Alternative No. 4 – Harley Township Landfill (G6)

Conceptual Landfill development Alternative No. 4 – Harley Township Landfill (G6) involves the construction of the landfill at the existing Harley Township Landfill Site. A schematic of Alternative No. 4 – Harley Township Landfill (G6) is presented in Figure 12 (see Schedule 1). The key parameters of this alternative are presented on Table 4.4 (embedded below):

Table 4.4
Key Parameters
Conceptual Landfill Development Alternative No. 4 – Harley Township Landfill (G6)

Parameter	Value
Footprint Area	6.07 ha
Base Elevation	250.5 masl
Top Elevation	277 masl
Landfill Capacity (inc. waste & cover)	690,000 m^3

The discussion of the evaluation and selection of the preferred conceptual landfill development option is presented in Sections 5.0 and 6.0, respectively.

Other potential landfill development alternatives may exist but this feasibility assessment focuses on the discussion and evaluation of these four conceptual alternatives. The further refinement of these concepts should be conducted as part of the environmental assessment stage of the solid waste management planning process, which will provide the basis of detailed design alternatives for the implementation of the preferred feasible alternative.

5.0 EVALUATION OF LANDFILL EXPANSION ALTERNATIVES

5.1 Assignment of Ranking Scores

The ranking of each feasibility assessment criteria will be based on the level of concern and/or the potential for adverse impact presented by each conceptual landfill alternative. The determination of the level of concern and potential for adverse impact will be based on how each alternative affects the criteria's indicator. For example, evaluating a conceptual landfill alternative under the criteria for Public Health, Safety and Socioeconomic Factors will include determining the distance of the proposed landfill development to the nearest residence. For the purpose of this feasibility assessment the closer the distance between the proposed development and the nearest residence, the greater the level of concern and/or potential adverse impact to the environment.

The rating of the level of concern and/or potential for adverse environmental effects was determined in consultation with City's Technical Advisory Committee. For those criteria where a concern or potential for environmental effect was identified, one of the following ratings was assigned:

- **High** – Where the expansion may affect the environmental component so as to seriously disturb the integrity, distribution, operation, or abundance of the component and is expected to raise serious concern with government reviewers and / or the public.

- **Medium** - Where the expansion may affect the environmental component so as to bring about a disturbance but does not threaten the integrity, distribution, operation, or abundance of the component as determined by government reviewers and the public. Short-term effects associated with construction and operation of facilities also constitute a potential for moderate effects/concerns.

- **Low** – Where the expansion may affect the environmental component in such a way that only a portion of the component is disturbed for a short period of time.

- **None** – The expansion causes little or no affect to the environmental component and causes no concern among government reviewers and/or the public.

To assist with the identification of the overall most feasible (preferred) alternative the following ranking system was applied:

Table 5.1
Feasibility Assessment Ranking System

Level of Concern/Potential Impact Rating	Ranking Value
None	0
Low	1
Low to medium	2
Medium	3
Medium to high	4
High	5

The scores are introduced to summarize the quantitative and qualitative evaluation using the individual feasibility assessment sub-criteria and indicators into a numeric score. To arrive at an overall score for each of the conceptual landfill alternative, the individual scores for each sub-criterion will be tallied in order to asses the overall feasibility.

The following sections will present discussions on how each conceptual landfill alternative is assessed for each individual feasibility assessment sub-criteria, as well as summary rankings for the main key criteria.

5.2 Public Health and Safety and Socioeconomic Factors

5.2.1 Residential Areas

During the January 2010 Site Inspections, AMEC observed that there are no residences located within a 400 m radius of any of the conceptual landfill development alternatives. As stated in Section 3.2.1, Reg. 347, requires that a landfill be placed at least 400 m from an existing residence, therefore no potential conflict with the applicable regulation regarding this criteria.

There are no existing residences located within 1 km of Alternative No. 2 – Highway 11 (W3). As such, Conceptual Landfill Development Alternative No. 2 – Highway 11 (W3) will be ranked with a level of concern/potential impact rating of 0-none.

Although there are no residences within 400 m of the conceptual landfill development alternatives, there is one residence located between 400 m and 1 km of Alternatives No. 1 – Ramsey Road (W1) and No. 3 – Moose Lake Road (G5). There are two residences located within a 1 km radius of Alternative No. 4 – Harley Township (G6). As a result, for the purposes of this report Conceptual Landfill Development Alternative No. 1 – Ramsey Road (W1) and Alternative No. 3 – Moose Lake Road (G5) will be ranked with a level of concern/potential impact rating of 1-low, and Alternative No. 4 – Harley Township (G6) will be ranked with a level of concern/potential impact rating of 2-low to medium.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Residential Area sub-criterion.

5.2.2 Sensitive Land Uses

As discussed in Section 5.2.1, there are no residences located within a 400 m radius of the evaluated alternatives for a new landfill site. Only one residence located within a 1 km radius of Alternatives No. 1 – Ramsey Road (W1) and No. 3 – Moose Lake Road (G5) (at 975 m and 500 m, respectively) and two residences located within a 1 km radius of Alternative No. 4 – Harley Township (G6) (both at 600 m).

None of the potential landfill properties are located adjacent to agricultural properties, and no Environmental Protection (EP) Zones, Hazard Zones or Sensitive Areas are located within 500 m of the evaluated sites. Alternative No. 1 – Ramsey Road (W1) and No. 2 – Highway 11 (W3) are located adjacent to existing industrial land uses, while Alternative No. 4 – Harley Township (G6) is currently operating as an active landfill. Alternative No. 3 – Moose Lake Road (G5) is located in a relatively undeveloped area, but the existing Haileybury Landfill Site and aggregate extraction operations are located within 2 km of the site.

Based on the above noted information Conceptual Landfill Development Alternative No. 2 – Highway 11 (W3) is ranked with a level of concern/potential impact rating of 0-none. Alternative No. 1 – Ramsey Road (W1) and Alternative No. 3 – Moose Lake Road (G5) will be ranked with a rating of 1-low, to address the potential impacts to residences. Alternative No. 4 – Harley Township (G6) will be ranked with a rating of 2-low to medium, to address the potential impacts to the two nearby residences.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Sensitive Land Use sub-criterion.

5.2.3 Drinking Water

Due to the lack of development in the vicinity of the potential development sites of a new landfill, as shown on Figures 5 to 8 (see Schedule 1), there are no drinking water wells within 500 m of the properties proposed for conceptual landfill development alternatives. As such all for conceptual landfill development alternatives will be ranked with a level of concern/potential impact rating of 0-none.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Drinking Water sub-criterion.

5.2.4 Accessibility and Driving Distance

Alternative No. 1 – Ramsey Road (W1) is located approximately 10 km from the Town of New Liskeard and 3 km from Town of Haileybury, the two main areas of waste generation within the City. Alternative No. 2 – Highway 11 (W3) is located approximately 12 km from Town of New

Liskeard and 12 km from Town of Haileybury. Alternative No. 3 – Moose Lake Road (G5) is located approximately 14 km from Town of New Liskeard and 14 km from Town of Haileybury. Alternative No. 4 – Harley Township (G6) is located approximately 10 km from Town of New Liskeard and 18 km from Town of Haileybury, although the majority of the route is along the Highway 11 corridor. As such it is more advantageous to construct a new landfill at Alternative No. 1 – Ramsey Road (W1), since it is closer to both major waste generation centers.

All sites are readily accessed by county roads (at a minimum), although Alternative No. 3 – Moose Lake Road would likely require considerable road improvements to accommodate the volume and types of traffic associated with landfill construction and operation.

Based on the above noted information, Conceptual Landfill Development Alternative No. 1 – Ramsey Road will be ranked with a level of concern/potential impact rating of 0-none, while Alternative No. 2 – Highway 11 will be ranked with a level of concern/potential impact rating of 2-low to medium. Alternative No. 3 – Moose Lake Road (G5) will be ranked with a level of concern/potential impact rating of 3-medium to address both the distance from major waste generation centers and the requirement for road improvements, while Alternative No. 4 – Harley Township (G6) will be ranked with a rating of 1-low.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Accessibility and Driving Distance sub-criterion.

5.3 Natural Environment

5.3.1 Terrestrial Habitat

During the January 2010 Site Inspections, AMEC observed that there were no indicators that a significant terrestrial habitat (i.e., wetlands, old growth forest) in the vicinity of the proposed conceptual landfill development alternative properties. This observation was confirmed during the Site Constraint/Opportunity Mapping exercise, as no significant terrestrial habitats were located within the vicinity of the new landfill development alternatives. In addition to this, the properties for proposed Alternative No. 2 – Highway 11 (W3) and No. 4 – Harley Township (G6) have been cleared of vegetation, an as such are sited in locations in which there are no terrestrial habitats to be impacted.

Based on the above noted information, Conceptual Landfill Development Alternatives No. 1 – Ramsey Road (W1) and No. 3 – Moose Lake Road (G5) will be ranked with a level of concern/potential impact rating of 1-low, while Alternatives No. 2 – Highway 11 (W3) and No. 4 – Harley Township (G6) will be ranked with a rating of 0-none.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Terrestrial Habitat sub-criterion.

5.3.2 Aquatic Habitat

Field observations recorded during the January 2010 Site Inspections indicate that there are no indicators that aquatic habitats are located within the vicinity of the conceptual landfill development alternative properties. These observations were confirmed during the performance of Site Constraint/Opportunities GIS Mapping. As such, all four Conceptual Landfill Development Alternatives will be ranked with a level of concern/potential impact rating of 0-none.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Aquatic Habitat sub-criterion.

5.3.3 Species at Risk

Field observations recorded during the January 2010 Site Inspections indicate that the lands surrounding the potential new landfill site development alternatives are surrounded by natural mixed forests containing flora and fauna species commonly found in Northern Ontario. Site Constraint/Opportunity Mapping indicates that there are not indicators that species at risk (SAR) or Areas on Natural or Scientific Interest (ANSI) located within the vicinity either landfill. As such, Conceptual Landfill Development Alternatives No. 1 through No. 4 will be ranked with a level of concern/potential impact rating of 0-none.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Species at Risk sub-criterion.

5.3.4 Hydrogeological Conditions

Assessing the hydrogeological impact of Conceptual Landfill Development Alternatives is difficult due to the limited historical data of groundwater conditions in the areas of interest. Field observations indicate that the all alternatives are located on topographic highs or plateaus and each are likely groundwater recharge zones. In addition, Alternative No. 1 – Ramsey Road (W1) and No. 2 – Highway 11 (W3) are inferred to have a very thin overburden sequence overlying the site bedrock, while Alternatives No. 3 – Moose Lake Road (G5) and No. 4 – Harley Township (G6) appear to have significant overburden deposits. Furthermore, Alternative No. 3 – Moose Lake Road (G5) has a coarse grained overburden with a high permeability and provides no natural protection to the aquifer and would allow for rapid migration of contaminants. Alternative No. 4 – Harley Township (G6) appears to have a finer grained overburden, with a lower permeability and may provide some degree of protection to the underlying aquifers.

Based on the available information the Conceptual Landfill Development Alternatives are ranked as follows

- Alternative No. 1 – Ramsey Road (W1) = level of concern/potential impact rating of 4-meduim to high;

- Alternative No. 2 – Highway 11 (W3) = level of concern/potential impact rating of 4-medium to high;
- Alternative No. 3 – Moose Lake Road (G5) = level of concern/potential impact rating of 3-medium; and
- Alternative No. 4 – Harley Township (G6) will be ranked with a level of concern/potential impact rating of 2-medium to low.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Hydrogeological Conditions sub-criterion.

5.4 Technical Considerations

5.4.1 Site Size

The key conceptual technical parameters for each of the Conceptual Landfill Expansion Alternatives are presented in Section 4.0 on Tables 4.1 through 4.4 (embedded above), as well as on Figures 9 though 12 (see Schedule 1). Each Conceptual Landfill Development Alternative is ranked as follows, with respect to the level of concern/potential impact based on the area required to facilitate the required landfill capacity:

- Alternative No. 1 – Ramsey Road (W1) Waste Area plus required buffer areas = 6.9 ha (rank = 2-low to medium);
- Alternative No. 2 – Highway 11 (W3) Waste Area plus required buffer areas = 7.4 ha (rank = 3-medium);
- Alternative No. 3 – Moose Lake Road (G5) Waste Area plus required buffer areas = 7.8 ha (rank = 4-medium to high); and,
- Alternative No. 4 – Harley Township (G6) Waste Area plus required buffer areas = 5.5 ha (rank = 1-low).

It should be noted that the proposed waste footprint for Alternative No. 4 – Harley Township would fit within the existing approved landfill footprint (i.e., 8.1 ha). Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Site Size sub-criterion.

5.4.2 Leachate Management

As discussed in Section 3.2.3, it is anticipated that leachate management at any of the new sites would be completed through natural attenuation processes within an established CAZ. Given the current lack of hydrogeological data to support the calculation of a site specific CAZ, the evaluation of each site was based on a generic CAZ sizing formula, the resultant land area and whether the CAZ would intersect typical groundwater receptors [i.e., other uses or groundwater discharge zones (lakes, streams, rivers, wetlands, etc.)]. The generic CAZ and any such interference for each Alternative are presented on Figures 9 to 12 (see Schedule 1) . Alternatives No. 1 – Ramsey Road (W1) and No. 4 – Harley Township (G6) do not have significant interference potential, however, the generic CAZ for Alternatives No. 2 – Highway 11 (W3) and No. 3 – Moose Lake Road (G5) encroach on the adjacent surface water bodies.

Each Conceptual Landfill Development Alternative is ranked as follows, with respect to the level of concern/potential impact based on the generic CAZ and potential interference with downgradient receptors:

- Alternative No. 1 – Ramsey Road (W1) Area of Generic CAZ = 207 ha (rank = 2-low to medium);
- Alternative No. 2 – Highway 11 (W3) Area of Generic CAZ = 218 ha (rank = 3-medium);
- Alternative No. 3 – Moose Lake Road (G5) Area of Generic CAZ = 294 ha (rank = 4-medium to high); and,
- Alternative No. 4 – Harley Township (G6) Area of Generic CAZ = 148 ha (rank = 1-low).

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Leachate Management sub-criterion.

5.4.3 Surface Water Management

The proposed Conceptual Landfill Development Alternatives will include the use of perimeter drainage systems and best management practices as primary components of the surface water management system. Although the extent of the proposed perimeter drainage systems is dependent on the overall configuration of the conceptual landfill development alternative, it is anticipated that the required surface water management for Conceptual Landfill Development Alternatives No. 1 – Ramsey Road (W1) and No. 4 – Harley Township (G6) will be relatively minor due to the limited potential for interference with the CAZ, and thus will have minimal overall impact to the environment. As such, Conceptual Landfill Development Alternatives No. 1 – Ramsey Road (W1) and No. 4 – Harley Township (G6) will be ranked with a level of concern/potential impact rating of 1-low.

A stated above in Section 5.4.2 the generic CAZ for Conceptual Landfill Development Alternatives No. 2 – Highway 11 (W3) and No. 3 – Moose Lake Road (G5) encroach on the adjacent surface water bodies, indicating the need for more sophisticated surface water management systems which may include stormwater management retention/detention ponds. As such, Alternatives No. 2 – Highway 11 (W3) and No. 3 – Moose Lake Road (G5) will be ranked with a level of concern/potential impact rating of 2-low to medium.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Surface Water Management sub-criterion.

5.4.4 Landfill Gas Management

As discussed in Section 3.2.3, MOE amended Reg. 347 and O.Reg. 232/98 to require that landfill gas management systems be installed for landfills with capacities larger than 1.5 million cubic meters. As discussed in Section 4.1, the Total Site Capacity required to serve the 30-year planning period will result in a the development of new landfill with a total volume of 685,000 m^3, which is below the 1.5 million cubic meter requirement. Additionally, as stated in

Section 5.2.1 there are no existing residences located within 1 km of Alternative No. 2 – Highway 11 (W3), one residence located between 400 m and 1 km of Alternatives No. 1 – Ramsey Road (W1) and No. 3 – Moose Lake Road (G5) and two residences located within a 1 km radius of Alternative No. 4 – Harley Township (G6). In order to address the potential impact that landfill gas may have on adjacent land uses, the Conceptual Landfill Development Alternatives are ranked as follows

- Alternative No. 1 – Ramsey Road (W1) = level of concern/potential impact rating of 1-low;
- Alternative No. 2 – Highway 11 (W3) = level of concern/potential impact rating of 0-none;
- Alternative No. 3 – Moose Lake Road (G5) = level of concern/potential impact rating of 1-low; and
- Alternative No. 4 – Harley Township (G6) will be ranked with a level of concern/potential impact rating of 2-medium to low.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Landfill Gas Management sub-criterion.

5.5 Conceptual Cost Estimates

The projected conceptual cost estimates for Conceptual Landfill Alternatives No. 1 – Ramsey Road (W1), No. 2 – Highway 11 (W3), No. 3 – Moose Lake Road (G5) and No. 4 – Harley Township (G6) are presented on Tables 3, 4, 5 and 6 (see Schedule 2), respectively. The conceptual cost estimates are itemized by the following sub-criteria: land acquisition costs, capital/construction costs; and costs to obtain regulatory approval. Discussions on the basis of each estimate are provided below.

5.5.1 Land Acquisition Cost Estimates

As previously mentioned in Section 5.4.2, it is anticipated that the natural attenuation will be primary method of leachate management for Conceptual Landfill Development Alternatives. Each alternative will require the acquisition of adjacent land for the establishment of a new CAZ. Tables 3a, 4a, 5a and 6a (see Schedule 2) present the proposed conceptual costs for land acquisition for Alternatives No. 1 – Ramsey Road (W1), No. 2 – Highway 11 (W3), No. 3 – Moose Lake Road (G5) and No. 4 – Harley Township (G6), respectively. A unit cost of $1,000 per ha is assumed based on typical land prices observed in Northern Ontario.

As discussed in Section 5.4.2, Conceptual Landfill Development Alternative No. 1 – Ramsey Road (W1) will require the acquisition of approximately 207 ha of adjacent land resulting in an estimated conceptual cost of $207,000, Conceptual Landfill Development Alternative No. 2 – Highway 11 (W3) will require the acquisition of approximately 218 ha of adjacent land resulting in an estimated conceptual cost of $218,000, Alternative No. 3 – Moose Lake Road (G5) will require the acquisition of approximately 294 ha of adjacent land resulting in an estimated conceptual cost of $294,000, and Alternative No. 4 – Harley Township (G6) will require the acquisition of approximately 148 ha of adjacent land resulting in an estimated conceptual cost

of $148,000. As such, all Conceptual Landfill Development Alternatives will be ranked with a level of concern/potential impact rating as follows:

- Alternative No. 1 – Ramsey Road (W1) Land Acquisition = $207,000 (rank = 2-low to medium);
- Alternative No. 2 – Highway 11 (W3) Area of Generic CAZ = $218,000 (rank = 3-medium);
- Alternative No. 3 – Moose Lake Road (G5) Area of Generic CAZ = $294,000 (rank = 4-medium to high); and,
- Alternative No. 4 – Harley Township (G6) Area of Generic CAZ = $148,000 (rank = 1-low).

It should be note that these conceptual cost estimates are based on a generic CAZ area and would need to be refined by site specific hydrogeological conditions. It is recommended that an evaluation of these conditions be completed prior to moving forward with the development of the preferred alternative or any land acquisitions.

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Land Acquisition Cost Estimate sub-criterion.

5.5.2 Capital/Construction Cost Estimate

Tables 3b, 4b, 5b and 6b (see Schedule 2) present the projected conceptual capital/construction cost estimates for Conceptual Landfill Expansion Alternatives No. 1 – Ramsey Road (W1), No. 2 – Highway 11 (W3), No. 3 – Moose Lake Road (G5) and No. 4 – Harley Township (G6), respectively. As discussed in Section 3.2.4, the conceptual cost estimates on the following key construction activities

- excavation of the proposed base elevation of the landfill;
- installation of a leachate management system;
- installation of a surface water management system;
- application of a final cover system; and,
- installation of a landfill gas management system.

The unit costs used for Table 3b through 6b (see Schedule 2) are derived from AMEC experience with the construction of municipal landfills in Ontario. They are based on average unit costs for similar construction activities for municipal landfills in Waterloo, Cambridge and Brighton, Ontario. The quantities used for each table are derived from the key expansion parameters for each alternative listed in Section 4.0 and presented on Figures 9 though 12 (see Schedule 1).

Each Conceptual Landfill Development Alternative is ranked with respect to the level of concern/potential impact based on the overall capital/construction cost estimates as follows:

- Alternative No. 1 – Ramsey Road (W1) Capital/Construction Cost Estimate = $2,548,300 (rank = 3-medium);

- Alternative No. 2 – Highway 11 (W3) Capital/Construction Cost Estimate = $2,734,225 (rank = 4-medium to high);
- Alternative No. 3 – Moose Lake Road (G5) Capital/Construction Cost Estimate = $2,868,425 (rank = 5-high); and,
- Alternative No. 4 – Harley Township (G6) Capital/Construction Cost Estimate = $1,480,225 (rank = 2-low to medium).

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Capital/Construction Cost Estimate sub-criterion.

5.5.3 Cost Estimates for Regulatory Approvals

Tables 3c, 4c, 5c and 6c (see Schedule 2) present the projected conceptual cost estimates for obtaining regulatory approval of Conceptual Landfill Development Alternatives No. 1 – Ramsey Road (W1), No. 2 – Highway 11 (W3), No. 3 – Moose Lake Road (G5) and No. 4 – Harley Township (G6), respectively. As discussed in Section 3.2.4, the conceptual cost estimates provided included the engineering, consulting and administrative fees required to obtain approval of each alternative under the Environmental Assessment Act and the Ontario Water Resources Act. The cost estimates also include conceptual projections of the tender/contract administration and construction inspection costs for each conceptual alternative.

For the purposes of this feasibility assessment, the projected approval cost estimates are derived as a percentage of the conceptual capital/construction estimates. The percentages are developed based on AMEC experience with preparing budgets to obtain approval of various landfills sites across Southern and Northern Ontario. As such, the conceptual cost estimate for regulatory approval of Conceptual Landfill Development Alternatives are based on the following:

- Approval under the Environmental Assessment Act = 15% of Capital/Construction Costs;
- Approval under the Environmental Protection Act and Ontario Water Resources Act = 15% of Capital/Construction Costs; and
- Tender/Contract Administration and Construction Inspection = 15% of Capital/Construction Costs.

Each Conceptual Landfill Development Alternative is ranked with respect to the level of concern/potential impact based on the overall cost estimate to obtain regulatory approval as follows:

- Alternative No. 1 – Ramsey Road Cost Estimate for Regulatory Approval = $1,140,000 (rank = 2-low to medium);
- Alternative No. 2 – Highway 11 Cost Estimate for Regulatory Approval = $1, 230,000 (rank = 3-medium);
- Alternative No. 3 – Moose Lake Road Cost Estimate for Regulatory Approval = $1,290,000 (rank = 4-medium to high); and,

- Alternative No. 4 – Harley Township Cost Estimate for Regulatory Approval = $660,000 (rank = 1-low).

Table 7 (see Schedule 2) presents a summary of the ranking and scores with respect to the Regulatory Approval Cost Estimate sub-criterion.

5.6 Evaluation & Ranking

Table 7 (see Schedule 2) presents the detailed ranking of each criteria to assess the overall feasibility of the Conceptual Landfill Development Alternatives. The ranking for each sub-criterion was tallied in order to calculate the score for each feasibility assessment criteria. The score for each criterion was then totaled in order to calculate the overall score for each Conceptual Landfill Development Alternative. A summary of the feasibility assessment scores are presented on Table 5.2 (embedded below):

Table 5.2
Summary of Feasibility Assessment Evaluation
Ranking Scores for the Conceptual Landfill Development Alternatives

Feasibility Assessment Criteria	Inside the Municipality		Outside the Municipality	
	Alternative No. 1-Ramsey Road (W1)	Alternative No. 2-Higway 11 (W3)	Alternative No. 3-Moose Lake Road (G5)	Alternative No. 4-Harley Township Landfill (G6)
Public Health, Safety and Socioeconomic Factors	2	2	5	5
Natural Environment	5	4	4	2
Conceptual Technical Considerations	5	8	10	3
Conceptual Cost Estimates	7	10	13	4
TOTAL	**19**	**24**	**32**	**14**

6.0 CONCLUSION

Based on the results of the discussion and ranking provided above in Section 5.0 and on Table 7 (see Schedule 2), the preferred Conceptual Landfill Development Alternative for the development of a new landfill site is Alternative No. 4, the construction of landfill expansion cell at the existing Harley Township Landfill Site (G6). Conceptual Landfill Development Alternative No. 4 – Harley Township (G6) includes the following features:

- Footprint Area =6.07 ha;
- Base Elevation = 250.5 masl;
- Top Elevation = 277 masl;
- Landfill Capacity = 690,000 m^3;
- Leachate Management Strategy = Natural Attenuation;
- Size of Generic CAZ = 148 ha to the northeast;
- Surface Water Management Strategy = approximately 845 linear meter of perimeter ditching;
- Landfill Gas Management Strategy = none; and,
- Preliminary Total Cost Estimate (including Land Acquisition, Capital/Construction and Regulator Approvals = $2,288,225.

The solid waste management strategy proposed herein includes the continued operation Haileybury Landfill through 2016 until the landfill has reached its proposed final contours and has achieved its approved Total Site Capacity of 452,221 m^3. Once the Haileybury Landfill is closed, the City can subsequently implement its long-term waste management strategy, which may include the development of a new site in accordance with Conceptual Landfill Development Alternative No. 4.

7.0 RECOMMENDATIONS

On 18 February 2010, a consultation meeting was conducted between AMEC and the City's TAC to review the draft Landfill Feasibility Study (Conceptual Assessment) Reports for the Expansion of the Existing Landfill Sites and Development of a New Landfill Site. At that meeting, the City informed AMEC of its intention to enter into an Agreement in Principle to acquire the Harley Township Landfill Site for its long-term (30-year) solid waste management (i.e., landfill disposal) needs. AMEC and the City understood that this new solid waste management strategy would require a change in the scope of work in order to assess the feasibility of using the Harley Township Landfill for long-term landfill disposal. As such, it is recommended that the City of Temiskaming Shores undertake the following steps in order to continue and finalize the feasibility assessment process:

1. Secure background documentation from Harley Township regarding landfill operations, including but not limited to the Certificate of Approval, legal property plans, design and operation reports, environmental monitoring reports and landfill waste volume data for the existing Harley Township Landfill;

2. Conduct a preliminary hydrogeological assessment of the Harley Township Landfill. The assessment would include conducting on-Site baseline environmental studies, hydrogeological investigations (borehole drilling, soil sampling, water quality monitoring), land surveying and engineering assessments, as required, to support the development of a conceptual hydrogeological Site model and to refine the conceptual landfill design of the Harley Township Landfill expansion;

3. Prepare a draft Landfill Feasibility Study (Preliminary Assessment) report of the Harley Township Landfill expansion, including the preliminary hydrogeological assessment and conceptual design and submit for review by the City's TAC;

4. Schedule a Consultation Meeting with the City's TAC to present the findings of the draft Landfill Feasibility Study (Preliminary Assessment) report and to solicit comments from the TAC;

5. Finalize the Landfill Feasibility Study (Preliminary Assessment) by incorporating the TAC's comments and providing recommendations regarding the landfill's regulatory approvals process; and,

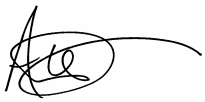
6. Provide technical assistance to the City's TAC for the development of a Memorandum of Understanding between the City and Harley Township, as well as to review the regulatory requirements of the expansion, use and closure of the City's existing landfills (i.e., New Liskeard and Haileybury Landfills).

8.0 CLOSURE

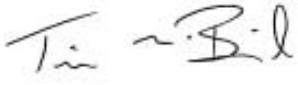
This report was prepared exclusively for the City of Temiskaming Shores for specific application to the conceptual assessment of the feasibility of the development of new landfill site. The conceptual feasibility assessment provided herein was completed in accordance with the verbal and written requests from the City of Temiskaming Shores and generally accepted engineering practices. No other warranty, express or implied, is made. The limitations of this report are presented in Appendix D.

Respectfully submitted,
AMEC Earth & Environmental,
A Division of AMEC Americas Limited

Prepared By:



Ali Williams, B.Sc. (ENG), P.Eng.
Landfill Engineer



Tim McBride, B.Sc., P.Geo.
Project Manager/Staff Hydrogeologist

Reviewed By:

Wayne Cooley, B.Sc., P.Eng.
Senior Landfill Engineer

9.0 REFERENCES

Town of Haileybury Zoning By-law No. 85-27, November 1985.

Township of Dymond By-law No. 1041, March 1986.

Official Plan for the Town of Haileybury, March 1989.

Official Plan for the Town of New Liskeard, March 1989.

Town of New Liskeard Zoning By-law No. 2233, June 1989.

Solid Waste Landfill Engineering and Design, © 1995 Prentice Hall PTR, E.A. McBean, F.A. Rovers and G.J. Farquhar. (McBean, et. al.)

Corporation of the Town of Haileybury, Landfill Site Approval Report, Project No. E91008, revised July 1997, prepared by Sutcliffe Engineers & Surveyors. (Sutcliffe, July 1997)

Municipal Groundwater Study, Central Temiskaming Area, dated June 2003, prepared by Knight Piesold Consulting. (KPC, June 2003)

City of Temiskaming Shores, New Liskeard Landfill, Operation and Maintenance Manual, dated May 2004, prepared by Sutcliffe Rody Quesnel Inc. (SRQ, May 2004)

New Liskeard Landfill Site, Annual Monitoring Report 2004, dated February 2005, prepared by Sutcliffe Rody Quesnel Inc. (SRQ, February 2005)

New Liskeard Landfill Site, 2007 Annual Groundwater Monitoring Report, dated May 2008, prepared by Jagger Hims Limited. (JHL, May 2008)

Corporation of the City of Temiskaming Shores, Leachate Plume Delineation and Contaminant Attenuation Zone Calculations, Haileybury Landfill Site, dated May 2008, prepared by Story Environmental Services. (SES, May 2008)

City of Temiskaming Shores, Application to Amend Provisional Certificate of Approval Waste Disposal Site No. A570402, dated June 2008, prepared by Story Environmental Services. (SES, June 2008)

City of Temiskaming Shores, 2008 Annual Monitoring Report, Haileybury Landfill Site, dated April 2009, prepared by Story Environmental Services. (SES, April 2009)

Draft Solid Waste Management Master Plan, dated August 2009, prepared by Earth Tech Canada Inc. (August 2009)

SCHEDULE 1

FIGURES

SCHEDULE 2

TABLES

APPENDIX A

CERTIFICATE OF APPROVAL NO. A570402
HAILEYBURY LANDFILL
DATED NOVEMBER 10, 1998
AMENDED APRIL 27, 2005

Location: HAIL. LANDFILL
C of A #: A570402 Issue Date: NOV 10/98
Revokes/Repeals: A570402 (MAR 5/92)

Ministry of the Environment
250 Davisville Avenue
Toronto ON M4S 1H2

Ministère de l'Environnement
250, avenue Davisville
Toronto ON M4S 1H2

Ontario

ENVIRONMENTAL ASSESSMENT AND APPROVALS BRANCH
3RD FLOOR
Tel. (416) 314-7967
Fax (416) 314-8452

November 10, 1998

Mr. G. Douglas Walsh, CET
Director of Public Works
Town of Haileybury
Postal Bag "D", 451 Meridian Avenue
Haileybury, Ontario
P0J 1K0

Dear Mr. Walsh:

Re: Amended Provisional Certificate of Approval for a Waste Disposal Site No. A 570402 for a Landfill Site Located on S ½ Lot 1, Concession 2, in the Town of Haileybury

Please find attached the Amended Provisional Certificate of Approval for a Waste Disposal Site No. A 570402.

The draft Certificate of Approval presented to the Environmental Assessment Board, (Board), during the hearing under Part V of the Environmental Assessment Act, has been adopted by the Board with a number of conditions added upon the request from the Board. In addition, we have made some clarifying changes to the wording. All of the changes from the draft dated April 24, 1998, (Exhibit No.11) are listed below:

1. Definition No. 1(3) has been changed to correct the name of the local district office.

2. Definition No. 1(4) has been added to define the Drainage Act, since its use is required in the condition required by the Board. The remaining definitions have been re-numbered.

3. Definition No. 1(6) has been expanded to clarify the extend of the Fill Area.

4. Condition No. 4(1) has been changed to fully define the Pesticides Act.

5. Condition No. 6 has been changed to incorporate the recommendation from the Board, to require a construction of the stormwater management works within a 12-month time frame.

.../2

6. Condition No. 11 has been added to incorporate the recommendation from the Board, to require an installation of a perimeter fence. The remaining conditions have been re-numbered.

7. Condition No.15 has been changed to clarify the units used to describe the depth of the cover material.

8. Condition No. 17 has been changed to clarify the units used to describe the depth of the cover material.

9. Condition No. 18 has been added to require a submission of a clean wood handling plan, to further investigate the need for an installation of a pit incinerator suggested by the Board.

10. Sub-condition No. 22(2) has been changed to incorporate the recommendation from the Board, by adding lead to the groundwater testing parameters.

11. Sub-condition No. 22(3) has been changed to incorporate the recommendation from the Board, by adding suspended solids to the surface water testing parameters and by requiring another surface water testing location.

12. Sub-condition No. 22(4) has been added to describe the location of the additional monitoring station required by the Board. The remaining sub-conditions have been re-numbered.

13. Condition No. 23 has been changed to incorporate the recommendation from the Board, to require an installation of methane monitors at the garage, operator's office and other permanent structures at the site within a 3-month deadline.

14. Condition No. 27 has been changed, by replacing "Item 2" to "Item 3", to correct a typographical error.

15. Condition No. 27 has been changed, to correct the title of Guideline B-7.

16. Document No. 5 has been added to Schedule "A", since it provided clarification to the definition of the Fill Area. The remaining documents have been re-numbered.

If you have any questions on the above, please call Margaret Wojcik, P.Eng., Senior Review Engineer, Waste Section, at (416) 314-7993.

Yours truly,

A. Dominski, P. Eng.
Manager, Waste Section

MW/st
Encls.
cc: District Manager, Timmins District Office
Isabelle O'Connor, Legal Services Branch
Robert M. Fishlock, Blake, Cassels & Graydon

You are hereby notified that Provisional Certificate of Approval No. A 570402 for a Waste Disposal Site (Landfill), dated March 5, 1992, is hereby revoked in its entirety and the following substituted therefor:

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

Town of Haileybury
Postal Bag "D", 451 Meridian Avenue
Haileybury, Ontario
P0J 1K0

for the use and operation of a 5.8 hectare Landfill Site within a 32.4 hectare total Site area;

all in accordance with the following plans and specifications:

listed in Schedule "A";

Located: S ½ Lot 1, Concession 2
Town of Haileybury
District of Timiskaming

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)* municipal waste;

and subject to the following conditions:

DEFINITIONS

1. In this Provisional Certificate of Approval:

   (1) "Certificate" means this Amended Certificate of Approval No. A 570402, as amended from time to time, including all Schedules attached to and forming part of this Certificate;

(2) "Director" means the one or more persons who, from time to time, are so designated for the purpose of Part V of the *Environmental Protection Act*, R.S.O. 1990, c.E.19;

(3) "District Manager" means the District Manager of the Timmins District Office of MOE;

(4) "Drainage Act" means the *Drainage Act*, R.S.O. 1990, c.D. 17;

(5) "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E. 19;

(6) "Fill Area" means the portion of the Site where waste may be disposed as delineated by the "Limit of Sanitary Landfill Fill Area" shown on Sheet 10 of Item 2 in Schedule "A" and described in Item 5 in Schedule "A";

(7) "MOE" means the Ministry of the Environment;

(8) "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c.O. 40;

(9) "Regional Director" means the Director, Northern Region, Ministry of the Environment;

(10) "Town" means the Corporation of the Town of Haileybury; and

(11) "Site" means the 32.4 hectare landfill site including the Fill Area and buffer zone on Lot 1, Concession 2, in the Township of Bucke, District of Timiskaming as shown on the Plan of Survey, Sheet No. 2 of Item 2 in Schedule "A".

GENERAL REQUIREMENTS

2. This Certificate revokes all previously issued Provisional Certificates of Approval issued under Part V, EPA, for this Site. The approval given herein, including the Terms and Conditions set out, replaces all previously issued approvals and related Terms and Conditions under Part V, EPA for this Site.

3. The requirements of this Certificate are severable. If any requirement of this Certificate to any circumstance is held invalid, the application of such requirement to other circumstance and the remainder of this Certificate shall not be affected thereby.

4. The Town shall allow MOE personnel, or a MOE authorized representative(s), upon presentation of credentials, to:

(1) carry out any and all inspections authorized by the EPA, OWRA, or the *Pesticides Act*, R.S.O. 1990, c.P. 11, as amended from time to time, of any place to which this Certificate relates, and without restricting the generality of the foregoing, to:

a. enter upon the premises or the location where the records required by the conditions of this Certificate are kept;

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

c. inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices or operations required by the conditions of this Certificate; and

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

5. (1) The Site shall be developed, operated and maintained by the Town in accordance with the Terms and Conditions herein and items 1 to 4 listed in Schedule "A" of this Certificate.

(2) Should there be any discrepancies between any of items 1 to 4 of Schedule "A" and the conditions in this Certificate, the conditions shall take precedence. Should there be discrepancies between items 1 to 4 listed in Schedule "A", the document bearing the most recent date shall take precedence.

STORMWATER MANAGEMENT WORKS APPROVALS

6. (1) This Certificate does not provide an approval for any works subject to approval under the OWRA, the Drainage Act, or any other legislation that may be applicable.

(2) The Town shall complete the construction of the swale ditches, the sedimentation ponds, and the diversion ditch as outlined in Section 3.2 of Item 3 of Schedule "A", within 12 months from the issuance of this Certificate. Town Completed

(3) Within six months of the date of issuance of this Certificate, the Town shall submit to the Director an application for approval under the OWRA of the on-site stormwater management works. The Town shall fulfill the requirements under the Drainage Act, or any other legislation that may be applicable. HSL

CONTAMINANT ATTENUATION ZONE

7. Within twelve months from the date of issuance of this Certificate, the Town shall either acquire or obtain an easement and all of the water rights to the land described as: Town HSL

Parcel 904 NND
Part of the South Half of Lot 1
Concession 2
Township of Firstbrook
District of Timiskaming

CERTIFICATE OF PROHIBITION

8. (1) For the purpose of this condition "Property" means the Site and, effective on the date of acquisition of the land or acquisition of the easement and water rights by the Town, the parcel of land referred to in Condition No. 7, above.

(2) Pursuant to Section 197 of the EPA, neither the Town nor any person having an interest in the Property shall deal with the Property in any way without first giving a copy of this Certificate to each person acquiring an interest in the Property as a result of the dealing.

(3) The Town shall,

a. within 60 days of the date of the date that the Town obtains the easement and water rights required under Condition No. 7, submit to the Director for the Director's signature two copies of a completed Certificate of Prohibition containing a registrable description of the Property, in accordance with Form 1 of O. Reg. 14/92; and Town

b. within 10 calendar days of receiving the Certificates of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office and submit to the Director immediately following registration the duplicate registered copy. Town

LIMITS OF WASTE

9. (1) Waste disposal shall be limited to the Fill Area.

(2) Waste may only be placed above ground level to the final contour elevations shown on Sheet No. 10 of Item 2 of Schedule "A".

(3) Waste may only be placed below ground level in trenches as shown on Sheet No. 4 of Item 2 of Schedule "A" and to depths of approximately 3 metres below ground level but not exceeding 3.66 metres.

(4) There shall be no further final disposal of waste in the Bulk Material Storage Area shown on Sheet No. 10 of Item 2 of Schedule "A".

WASTE TYPE

10. Only municipal waste, as defined in Ontario Regulation 347, R.R.O. 1990 (as amended), may be disposed of at the Site.

SITE SECURITY AND OPERATING HOURS

11. The Town shall install a complete perimeter fence within 18 months from the issuance of this Certificate.

12. (1) The Site shall not be operated outside of the hours of 9:00 a.m. to 5:00 p.m., Monday to Friday, and from 9:00 a.m. to 12:00 noon on Saturday. The Site will be closed on Sundays and statutory holidays. These operating hours may be varied with the approval of the Regional Director.

(2) During non-operating hours, the Site entrance gate shall be kept locked.

(3) Except for waste deposited in the after-hours dumping bin located outside of the Site gate, waste shall only be received under the supervision of a Site attendant.

13. The Town shall ensure that all Site attendants are adequately trained with respect to the following:

(1) terms, conditions and operating requirements of this Certificate;

(2) the operation and management of the Site;

(3) relevant waste management regulations and legislation;

(4) environmental concerns related to the waste being handled at the Site; and

(5) occupational health and safety concerns pertaining to the management of waste at the Site.

OPERATIONAL REQUIREMENTS

14. The Town shall ensure that waste is deposited in a manner that minimizes the size of the Fill Area working face and that the waste is compacted before cover material is applied.

15. (1) All exposed waste shall be covered by a minimum of 15 centimetres of cover material at the end of each working day.

(2) A cover material layer of at least 30 centimetre-depth shall be applied as soon as reasonably possible on all areas of waste disposal where no final cover has been applied and where no additional waste or final cover is to be placed for six months or more.

16. Alternative materials to clean soil may be used as daily cover only if approval is obtained in accordance with the "Procedure for Gaining Approval to use Alternative Materials to Soil as Daily Cover in Landfills that Receive Only Municipal and Non-Hazardous Solid Wastes" (May, 1994) released by the Science and Technology Branch of the MOE or if approval is obtained in accordance with subsequent MOE procedures, guidelines or regulations.

17. (1) Where final waste contours have been reached for a given cell of the Site, final cover application and seeding shall be completed as soon as practical but not later than nine months from the completion of cover application.

(2) Except where Phase II development is scheduled to begin above a trench within one year of filling the trench, a 30 centimetre-thick layer of interim cover shall be placed above each trench as soon as practicable once it is filled and in any case within nine months of being filled. The interim cover shall be removed, to the extent practicable, and scarified prior to commencement of Phase II development.

18. The Town shall submit to the Director for approval, within three months from the issuance of this Certificate, a plan outlining the options for handling of clean wood at the Site. The plan shall contain the analysis of the environmental impacts of each option, and it shall identify the option preferred by the Town.

done

HSL complete

MONITORING WELLS

19. (1) Within three months of the issuance of this Certificate, a monitoring well to replace TW 7/94 and a monitoring well in the vicinity of Test Pit 14 shall be constructed and incorporated into the Site monitoring program.

done

Completed

(2) Any monitoring wells which are no longer needed or are operational shall be properly abandoned in accordance with Ontario Regulation 903, R.R.O. 1990 or rehabilitated within 3 months of such a determination being made.

(3) A report on the abandonment or rehabilitation of any monitoring well shall be included in the applicable Annual Report prepared in accordance with Condition No. 24 of this Certificate.

done

(4) The well development procedures and data for any new monitoring wells constructed at the Site shall be reported in the applicable Annual Report prepared in accordance with Condition No. ~~24~~ 25 of this Certificate.

Town

LITTER

20. (1) A visual inspection shall be made at least once each week of the public roadways immediately adjacent to the site and any litter

which may have originated from the Site or from vehicles hauling to the Site which is observed on the inspections, shall be retrieved forthwith.

(2) A visual inspection of the buffer zone shall be made at least once each month from April to October. Any litter present shall be retrieved and disposed of in the Fill Area.

SITE GRADING

21. Site grading and contours shall be maintained such that all surface water run-off from the buffer zone and areas capped with final cover is directed away from the working face of the Site.

SITE MONITORING

22. (1) Ground water shall be monitored three times per year in April/May, August/September and November/December at each of the following monitoring wells:

Replacement well for MW No. 2
TW 1/91(D)
TW 1/91(S)
TW 3/91
TW 4/91
TW 5/91
TW 6/94
TW 8/94
Replacement well for TW 7/94 as required by Condition No. 19(1)
Well to be constructed in the vicinity of Test Pit 14 as required by Condition No. 19(1).

(2) Each sample taken under Condition No. 22(1) shall be analysed for the following parameters:

Metals:	aluminium, arsenic, boron, barium, calcium, cadmium, chromium, copper, iron, potassium, magnesium, lead, manganese, sodium, selenium, strontium, mercury, zinc
Anions:	fluoride, chloride, nitrate, nitrite, phosphate, sulphate
Other Parameters:	(hardness) alkalinity, total Kjeldhal nitrogen (TKN), ammonia, total dissolved solids (TDS), biochemical oxygen demand (BOD), chemical oxygen demand (COD), dissolved organic carbon (DOC), phenols
Field Parameters:	static level, temperature, conductance, pH

(3) Surface water samples shall be taken from monitoring stations SW1, SW2, SW3, SW4 and SW5 twice per year in April/May and August/September. For each sample, an analysis or determination shall be done for the following parameters:

Metals:	aluminium, boron, cadmium, chromium, cobalt, copper, iron, lead, nickel, potassium, sodium, zinc
Other Parameters:	alkalinity, ammonia, chloride, COD, DOC, phenols, TDS, turbidity, suspended solids
Field Parameters:	temperature, conductance, pH, dissolved oxygen, estimated streamflow

(4) The monitoring station SW5 shall be located at the outlet of a beaver dam just upstream of SW4.

(5) Changes to the monitoring requirements shall be made on the basis of recommendations made in the Annual Report and only with the Regional Director's written approval.

23. The Town shall install battery-operated methane gas monitors in the garage, operator's office and any other structure at the landfill, within 3 months from the issuance of this Certificate.

DAILY RECORDS

24. Daily records of Site operations shall be made and shall be kept at the Site for a period of at least two years from the date of the record. The daily records shall include the following:

(1) The type, hauler, vehicle license number and time of arrival for all waste received at the Site;

(2) All complaints from the public received by the Town and an indication of the action taken in response by the Town; and

(3) A record of litter collection activities, Site inspections and application of interim and daily cover.

ANNUAL REPORTS

25. Beginning with the 1998 calendar year, an Annual Report addressing water quality monitoring and Site operations shall be submitted to the Regional Director no later than April 30th following the calendar year being reported upon. The Annual Report shall include the following:

(1) tables outlining analytical parameters sampled and frequency of sampling for each monitoring location;

(2) summary data tables for key analytical parameters and locations;

(3) an analysis and interpretation of the groundwater monitoring results including a discussion of groundwater monitoring data in relation to compliance with the boundary criteria;

(4) a drawing of the Site and neighbouring land showing all monitoring locations;

(5) review of the current monitoring program and a recommendation for any changes;

(6) review of the sampling and analytical procedures, including the QA/QC programs;

(7) a summary of monthly and total annual waste loads received at the Site;

(8) drawings showing existing conditions, completed Fill Areas, buffer area, current Fill Area contours and maximum final Site contours;

(9) calculation of the volume of available space utilized, the remaining Site capacity, the volume of cover material applied and the waste compaction density;

(10) an estimate of the remaining Site life;

(11) an update of changes in Site operations, equipment, procedures and any operating difficulties encountered;

(12) a summary of any complaints made regarding Site operation and the Town's response and action taken; and

(13) recommendations respecting any proposed changes in the operation of the Site.

CLOSURE AND END USE PLANS

26. (1) Within five years of the commencement of landfilling in Phase II of Areas B, C & D of the Site, the Town shall submit a final Site closure and end use plan to the Director for approval.

(2) The Site closure and end use plans shall include, but not be limited to, details regarding the following:

a. proposed end use;

b. any adjustments to the final contour plan that may be recommended;

c. fencing and access control;

d. additional vegetative plantings planned;

e. the sequence and schedule for final cover installation;

f. plans and schedules for the management and continued monitoring;

g. plans and schedules for the routine monitoring and maintenance of the final cover and stormwater management works; and

h. notification procedures related to the Site closure.

CONTINGENCY PLANS

27. (1) Contingency plans as outlined in Section 4.15.2 of Item 3 of Schedule "A" shall be implemented in accordance with the criteria and procedures outlined in Section 4.0 of Item 6 of Schedule "A".

(2) Contingency plans as outlined in Section 4.15.2 of Item 3 of Schedule "A" shall be implemented if groundwater monitoring indicates that leachate migration has or will result in exceedance of the boundary criteria as determined from MOE Guideline B-7, "Incorporation of the Reasonable Use Concept into MOEE Groundwater Management Activities", as amended.

SCHEDULE "A"

This Schedule "A" forms part of Provisional Certificate of Approval No. A 570402:

1. Application for a Certificate of Approval for a Waste Disposal Site (Landfill), signed by Alexander L. Herbert, Town of Haileybury, dated October 27, 1986.

2. Set of Plans entitled "Haileybury Landfill Site - Development, Operational and Closure Plans, Project No. E91008", prepared by H. Sutcliffe Limited, dated October 1992.

3. Report entitled, "Corporation of the Town of Haileybury, Landfill Site Approval Report, Project No. E91008", prepared by H. Sutcliffe Limited, revised July 1997.

4. Report entitled, "Supplemental Hydrogeological Investigation, Town of Haileybury Landfill Site, Haileybury, Ontario", prepared by International Water Consultants Ltd., dated April 3, 1995.

5. Letter dated November 19, 1996 from H.J. Hawken, H. Sutcliffe Ltd., to J. Connelly, Ministry of Environment and Energy, providing responses to Ministry's concerns from August 16, 1996.

6. Letter dated July 28, 1997 from H.J. Hawken, H. Sutcliffe Ltd., to J. Connelly, Ministry of Environment and Energy, providing responses to Ministry's concerns.

7. Report entitled, "Investigation of Proposed Leachate Attenuation Zone, Town of Haileybury Landfill Site, Haileybury, Ontario, 1997", dated February 18, 1997; prepared by International Water Consultants Ltd.

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

1. Conditions No. 1 through 27 have been included to adopt the decision of the Environmental Assessment Board. EP-97-05, dated October 2, 1998.

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

<u>AND</u>

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

DATED AT TORONTO this 10th *day of* November, 1998.

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

MW/st
cc: District Manager, Timmins

600 - 20 - 08

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A570402
Notice No. 1

RECEIVED
MAY - 9 2005

The Corporation of the City of Temiskaming Shores
PO Box 2050
Haileybury, Ontario
P0J 1K0

cc: Dan Harvey
Ken P. Zerby
Dave Treen

Site Location: Haileybury Landfill
Lot 1, Concession 2
Haileybury Town, District of Timiskaming
P0J 1K0

You are hereby notified that I have amended Provisional Certificate of Approval No. A570402 issued on November 10, 1998 and amended November 10, 1999 for a waste disposal site (landfill), as follows:

I. The name of the Owner has changed:

From: **The Corporation of the Municipality of Haileybury**

To: **The Corporation of the City of Temiskaming Shores**

II. The service area for this site is hereby changed to the municipal boundary of the City of Temiskaming Shores.

III. The hours of operation are hereby changed to 1:00pm-5:00pm, Tuesday through Saturday.

All in accordance with the Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 19, 2004, signed by Dan Harvey, Director of Public Works, City of Temiskaming Shores, including all supporting documentation.

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

1. To approve the Owner's requests.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A570402 dated November 10, 1998

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
2300 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 27th day of April, 2005

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

AN/

c: District Manager, MOE North Bay
H. James Hawken, P.Eng., Sutcliffe Rody Quesnel Inc.

APPENDIX B

CERTIFICATE OF APPROVAL NO. A571505
NEW LISKEARD LANDFILL
DATED NOVEMBER 10, 1998
AMENDED APRIL 27, 2005

Location: N.L. LANDFILL
C of A #: A571505 Issue Date: MAY 9/00
Revokes/Repeals: _____

Ministry of the Environment

Environmental Assessment and Approvals Branch
2 St. Clair Ave. W., 12A Floor
Toronto ON M4V 1L5

Ministère de l'Environnement

Direction des évaluations environnementales et des autorisations
2, avenue St. Clair W., 12A étage
Toronto ON M4V 1L5

Tel/Tél (416) 314-6979
Fax/Téléc (416) 314-8452

Ontario

1

May 9, 2000

1) ACCESS TO SITE ?
2) NO BURNING OF WASTE ?
3) NO HAZARDOUS WASTE ?
4) HYDROGEOLOGICAL REPORT
5) O/M PLAN
6) CLOSURE PLAN
7) ANNUAL REPORT

Mr. Kenneth D.N. Boal, AMCT, CMC
Chief Administrative Officer
The Corporation of the Town of New Liskeard
P.O. Box 730, 90 Whitewood Avenue
New Liskeard, Ontario
P0J 1P0

Dear Sir:

Re: Certificate of Approval No. A 571505
Corporation of the Town of New Liskeard

Please find enclosed the new Provisional Certificate of Approval for the New Liskeard Landfill Site.

If you have any questions regarding this matter, please call Mr. E. Zaltsberg of my staff at (416)314-8342.

Sincerely,

A. Dominski, P. Eng.
Supervisor, Waste Unit

Encl.
EZ/nb
c.: District Manager, Timmins

Copied to Dan.
June 9/00

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

The Corporation of the Town of New Liskeard
P.O. Box 730, 90 Whitewood Avenue
New Liskeard, Ontario
P0J 1P0

for the use and operation of a 2.02 hectare landfilling area within a 32 hectare total site area.

all in accordance with the following plans and specifications:

as listed in Schedule "A"

Located: West ½ of Lot 5, Concession 2
Corporation of the Town of New Liskeard

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

and subject to the following conditions:

For the purpose of this Provisional Certificate of Approval:

(a) "Certificate" means this Provisional Certificate of Approval including its schedules, if any, issued in accordance with the Environmental Protection Act;

(b) "Director" means a Director of the Environmental Assessment and Approvals Branch of the Ministry;

(c) "Regoinal Director" means the Director, Thunder Bay Regional Office of the Northern Region of the Ministry;

(d) "District Manager" means the District Manager of the Timmins District Office of the Northern Region of the Ministry;

(d) "Ministry" means the Ontario Ministry of the Environment, unless specific reference is made to another Ministry;

(e) "Town" means the Corporation of the Town of New Liskeard;

(g) "Provincial Officer" means a person who is designated by the Ministry of Environment as a Provincial Officer for the purposes of the Environmental Protection Act, the Ontario Water Resources Act, the Pesticides Act, and their respective regulations;

(h) "Site" means the facility described in the application for this Provisional Certificate of Approval and in the supporting documentation referred to herein;

(i) "ODWO" means the Ontario Drinking Water Objectives; and

(j) "RUP" means the Ministry's Reasonable Use Policy (Policy 15-08).

GENERAL

(1) Except as otherwise provided by these conditions, the Site shall be designed, developed, used, maintained and operated, and all facilities, equipment and fixtures shall be built and installed, in accordance with the Application for a Certificate Approval for a Waste Disposal Site dated April 12, 2000 and supporting documentation, and plans and specifications listed in Schedule "A".

(2) The requirements specified in this Provisional Certificate of Approval are the requirements under the Environmental Protection Act, R.S.O. 1990. The issuance of this Provisional Certificate of Approval in no way abrogates the Town's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

(3) The requirements of this Provisional Certificate of Approval are severable. If any requirement of this Provisional Certificate of Approval, or the application of any requirement of this Provisional Certificate of Approval to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Provisional Certificate of Approval shall not be affected in any way.

(4) The Town shall ensure compliance with all the terms and conditions of this Provisional Certificate of Approval. Any non-compliance constitutes a violation of the Environmental Protection Act, R.S.O. 1990 and is grounds for enforcement.

(5) (a) The Town shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Provisional Certificate of Approval, including but not limited to, any records required to be kept under this Provisional Certificate of Approval; and

(b) In the event the Town provides the Ministry with information, records, documentation or notification in accordance with this Provisional Certificate of Approval (for the purposes of this condition referred to as "Information"),

(i) the receipt of Information by the Ministry;
(ii) the acceptance by the Ministry of the Information's completeness or accuracy; or
(iii) the failure of the Ministry to prosecute the Town, or to require the Town to take any action, under this Provisional Certificate of Approval or any statute or regulation in relation to the Information

shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Town relating to the Information, amounting to non-compliance with this Provisional Certificate of Approval or any statute or regulation.

(6) The Town shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

(a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Environmental Protection Act, R.S.O. 1990, Section 15, 16 or 17 of the Ontario Water Resources Act, R.S.O. 1990, or Section 19 or 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this Provisional Certificate of Approval relates; and,

without restricting the generality of the foregoing, to:

(b) (i) enter upon the premises where the records required by the conditions of this Provisional Certificate of Approval are kept;
(ii) have access to and copy, at reasonable times, any records required by the conditions of this Provisional Certificate of Approval;
(iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Provisional Certificate of Approval; and
(iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Provisional Certificate of Approval.

(7) (a) Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Provisional Certificate of Approval, the conditions in this Provisional Certificate of Approval shall take precedence; and

(b) Where there is a conflict between documents listed in Schedule "A", the document bearing the most recent date shall prevail.

(8) The Town shall ensure that all communications/correspondence made pursuant to this Provisional Certificate of Approval includes reference to the Provisional Certificate of Approval No. A 571505.

(9) The Town shall notify the Director in writing of any of the following changes within thirty (30) days of the change occurring:

(a) change of Town or Owner of the Site or both;
(b) change of address or address of the new Town;
(c) change of partners where the Operator or Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, 1991 shall be included in the notification to the Director;

(d) any change of name of the corporation where the Operator or Owner is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (form 1 or 2 of O. Reg. 182, Chapter C-39, R.R.O. 1990 as amended from time to time), filed under the Corporations Information Act shall be included in the notification to the Director; and

(e) change in directors or officers of the corporation where the Operator or Owner is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" as referred to in 9(d), supra.

(10) In the event of any change in ownership of the Site, the Town shall notify, in writing, the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.

(11) Any information relating to this Provisional Certificate of Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, C. F-31.

(12) All records and monitoring data required by the conditions of this Provisional Certificate of Approval must be kept on the Town's premises for a minimum period of two (2) years from the date of their creation.

OPERATIONAL

(13) This Certificate revokes all previously issued Certificates for this Site.

(14) The Town shall ensure that the Site is operated by trained personnel in a safe and secure manner, and that the wastes are properly handled, so as not to pose any threat to the general public, Site personnel or the environment, and that access to the Site is limited to the Town and his staff.

(15) Within ninety (90) days of the issuance of this Certificate, the Town shall mark the Site boundaries, as identified in the site plan included with the application and supporting documents, with permanent markers, that shall be erected so as to be visible throughout the year for the life of the Site.

(16) The Town shall ensure that no burning of waste shall take place at the Site.

(17) All waste received at the Site under the authority of this Certificate shall be deposited within a 2.02 hectare landfilling area shown on Sheets A and B, provided with the Application for the Certificate.

(18) The Site shall be closed when final contours shown on Sheet B and reduced by 0.9m for final cover, have been reached.

(19) Liquid industrial waste or hazardous waste as defined in Ont. Reg. 347 shall not be received or deposited at the Site.

(20) The Town shall operate a litter maintenance program, which will include the collection and proper disposal of any wind blown or vector borne litter, from off-site deposition locations and from those areas of the Site that are not being actively landfilled.

(21) (a) The Town shall:

i) Within 60 days of the date of this Certificate, submit to the Director, for the Director's signature, two copies of a completed Certificate of Prohibition containing a registrable description of the Property, in accordance with Forms 4 & 5 of O. Reg. 14/92; and

ii) Within 10 calendar days of receiving the Certificates of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Property and submit to the Director the duplicate registered copy immediately following registration; and

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

(22) Within 18 (eighteen) months of the issuance of this Certificate, the Town shall submit for the Director's approval a hydrogeological report. This report shall include but not limited to the following issues:

(a) groundwater regime evaluation (hydraulic gradients, direction of groundwater flow, groundwater flow velocity);
(b) the extent of the existing groundwater contaminant plume;
(c) monitoring requirements; and
(d) contaminant attenuation zone requirements.

(23) Within two years of the issuance of this Certificate, the Town shall submit for the Director's approval an Operation and Maintenance Plan. This Plan shall include but not be limited to the following issues:

(a) the Site capacity approved in accordance with the Ministry's protocol;
(b) total in situ waste volume;
(c) the remaining life of the Site;
(d) new final contours reflecting the capacity defined in (a);
(e) the final cover installation in the Fill Beyond Approved Limit (FBAL) areas and its schedule;
(f) Site operations including daily and final cover;
(g) the groundwater monitoring program; and
(h) the closure plan.

(24) The Site shall be operated, maintained and monitored in accordance with the approved Operation & Maintenance Plan required by Condition 23.

(25) Two years before the Site is expected to stop receiving waste, the Town shall submit for the Director's approval an updated Closure Plan. This Plan shall include, but not be limited to the following issues:

(a) the choice of final cover material;
(b) changes to the final contour plan that may be previously identified in the annual reports, or recommended in the Closure Plan;
(c) the sequence and schedule for final cover installation;
(d) post-closure and end-use plans which reflect an after-use of conservation and passive recreation;
(e) schedules for Site inspections;
(f) plans and schedules for post-closure groundwater and surface water monitoring programs; and
(g) plans and schedules for the routine monitoring and maintenance of the final cover.

(26) The Town shall prepare and submit an annual report to the Regional Director by June 1st of the year following the calendar year covered by the report which shall include as a minimum, the following:

(a) a summary of total annual quantities of waste received at the Site;
(b) a drawing(s) of the Site indicating all groundwater monitoring locations;
(c) tables outlining monitor locations, analytical parameters sampled, and frequency of sampling;
(d) an analysis and interpretation of groundwater monitoring data; a review of the adequacy of the monitoring program; conclusions of the monitoring data; and recommendations for any changes in monitoring program that may be necessary;
(e) an assessment of groundwater quality in relation to the RUP and ODWO;
(f) an assessment of the efficiency of the Contaminant Attenuation Zone established;
(g) an update of changes in operations, equipment, or procedures made or produced at the Site, and any operating difficulties encountered;
(h) drawings showing areas of fill, buffer areas, current Site contours, maximum final Site contours, any recommended changes of the final contours of the Site, percentage of available space utilized, and an estimate of the remaining disposal capacity and Site life;
(i) a statement as to compliance with all Conditions and with the inspection and reporting requirements of the Conditions;
(j) summary of any complaints made regarding Site operation and the Town's response and action taken; and
(k) recommendations respecting any proposed changes in the operation of the Site.

COMPLAINT PROCEDURES

(27) If at any time, the Town receives complaints regarding the operation of the Site, the Town shall respond to these complaints according to the following procedures:

(a) The Town shall record each complaint on a formal complaint form entered in a sequentially numbered log book. The information recorded shall include the nature of the complaint, the name, address and the telephone number of the complainant and the time and date of the complaint;

(b) The Town, upon notification of the complaint shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The Town shall retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the re-occurrence of similar incidents.

SCHEDULE "A"

This Schedule "A" forms part of this Provisional Certificate of Approval:

1. The updated Application for a Certificate of Approval for a Waste Disposal Site dated April 12, 2000;
2. Letters from Sutcliffe Rody Quesnel Inc. to the MOE dated February 4, 2000, March 14, 2000 and April 12, 2000;
3. Site Plan Approved Area (Sheet A) and Site Plan Final Contours (Sheet B) prepared by Sutcliffe Rody Quesnel Inc. and dated February 2000;

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

(1) The reason for Condition (1) is to ensure that the Site is operated in accordance with the application and supporting documentation submitted by the Town, and not in a manner which the Director has not been asked to consider.

(2) The reason for Conditions (2), (3), (4), (5), (7), (8), (9), (10), (11) and (12) is to clarify the legal rights and responsibilities of the Town.

(3) The reason for Condition (6) is to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site which are approved under this Provisional Certificate of Approval. Condition (6) is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Environmental Protection Act, the Ontario Water Resources Act, and the Pesticides Act, as amended.

(4) The reason for Condition (13) is to ensure that this Certificate revokes all previously issued Certificates for this Site.

(5) The reason for Conditions (14) and (20) is to ensure that the Site is operated in an environmentally safe manner.

(6) The reason for Condition (15) is to allow a viable on-site inspection to realize the limits of the Site during any season.

(7) The reason for Condition (16) is to reduce potential damage and environmental effects due to fire.

(8) The reason for Conditions (17), (18), (19) and (24) is to ensure that this Site is operated in accordance with the application and submitted documentation listed in Schedule A.

(9) The reason for Condition (21) requiring registration of the Provisional Certificate of Approval is that Section 46 of the Environmental Protection Act, R.S.O. 1990, 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 for waste disposal, unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future users 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 users of the Site by the Provisional Certificate of Approval being registered on title.

(10) Condition (22) is to ensure that the Town shall conduct and submit for the Director's approval a hydrogeological report.

(11) The reason for Condition (23) is to ensure that the Town shall develop and submit for the Director's approval an Operation and Maintenance Plan.

(12) The reason for Condition (25) is to ensure that two years before the Site is closed, the Town shall submit for the Director's approval an updated Closure Plan.

(13) The reason for Condition (26) is to ensure that the Town shall prepare and submit an annual report to the Regional Director by June 1st of the year following the calendar year covered by the report.

(14) The reason for Condition (27) is to ensure that the complaints are responded to in a systematic manner to protect the health and safety of the public and the environment.

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, as amended, 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.

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,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

*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 9th *day of* May, 2000.

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

EZ/nb
c.: District Manager, Timmins District Office

Location: N.L. LANDFILL
C of A #: A571505 Issue Date: APR 25/05
Revokes/Repeals: AMENDS A571505

600-20-07

Ministry of the Environment / Ministère de l'Environnement

Ontario

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A571505
Notice No. 1

cc: [redacted]
Ken P. Burley
Dave Treen

The Corporation of the City of Temiskaming Shores
PO Box 2050
Haileybury, Ontario
P0J 1K0

Site Location: New Liskeard Landfill
West 1/2 of Lot 5, Concession 2, Dymond Twp
Temiskaming Shores City, District of Timiskaming

You are hereby notified that I have amended Provisional Certificate of Approval No. A571505 issued on May 9, 2000 for a waste disposal site (landfill), as follows:

I. The name of the Owner has changed:

From: **The Corporation of the Municipality of New Liskeard**

To: **The Corporation of the City of Temiskaming Shores**

II. The service area for this site is hereby changed to the municipal boundary of the City of Temiskaming Shores.

III. The hours of operation are hereby changed to 8:00am-12:00pm, Tuesday through Saturday.

All in accordance with the Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 19, 2004, signed by Dan Harvey, Director of Public Works, City of Temiskaming Shores, including all supporting documentation.

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

1. To approve the Owner's requests.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A571505 dated May 9, 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
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

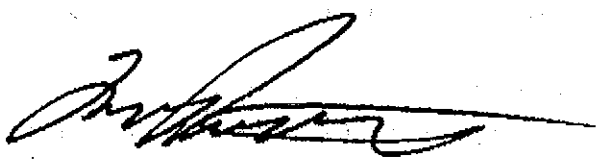
AND

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 27th day of April, 2005



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

AN/

c: District Manager, MOE North Bay
H. James Hawken, P.Eng., Sutcliffe Rody Quesnel Inc.

Location: N.L. LANDFILL
C of A #: A571505 Issue Date: APR 17/07
Revokes/Repeals: NOTICE #2

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A571505
Notice No. 2
Issue Date: April 17, 2007

APR 2 6 2007

To: Dave Treen.
April 30, 2007.
CWQ

The Corporation of the City of Temiskaming Shores
PO Box 2050
Haileybury, Ontario
P0J 1K0

Site Location: New Liskeard Landfill
West 1/2 of Lot 5, Concession 2, Dymond Twp
Temiskaming Shores City, District of Temiskaming

You are hereby notified that I have amended Provisional Certificate of Approval No. A571505 issued on May 9, 2000 and amended April 27, 2005 for a waste disposal site (landfill), as follows:

I. This Certificate is hereby amended to recognize the addition of a contaminant attenuation zone.

II. The following Item is hereby added to Schedule "A":

4. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 14, 2005 and signed by Dave Treen, Manager of Environmental Services, City of Temiskaming Shores, including the attached drawing entitled "New Liskeard Landfill Site Figure 1" showing the attenuation zone.

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

1. To recognize the addition of the contaminant attenuation zone as required by Provincial Officer's Order No. 7026-6GQLJY.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A571505 dated May 9, 2000, as amended.

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 eachportion 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
2300 Yonge St., Suite 1700
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 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 17th day of April, 2007

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

AN/

c: District Manager, MOE North Bay
H. James Hawken, Sutcliffe Rody Quesnel Inc.

APPENDIX C

CERTIFICATE OF APPROVAL NO. A571702
HARLEY TOWNSHIP LANDFILL
DATED NOVEMBER 23, 1980
AMENDED MAY 6, 2005

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A571702
Notice No. 1

The Corporation of the Township of Harley
Rural Route, No. 2
New Liskeard, Ontario
P0J 1P0

Site Location: Harley Township Waste Disposal Site
119114 Sale Barn Road
Harley Township, District of Timiskaming

You are hereby notified that I have amended Provisional Certificate of Approval No. A571702 issued on August 16, 1978 for the use, operation and establishment of a 8.1 hectare landfilling site, as follows:

- The District of Casey is added to the service area.

all in accordance with the application for a Certificate of Approval for a Waste Disposal Site dated December 16, 2004, signed by Michel Lachapelle, Township of Harley, and all supporting documentation associated with the application.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A571702 dated August 16, 1978

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 toeach 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;

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 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 6th day of May, 2005

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

RM/

c: District Manager, MOE Timmins
Michel Lachapelle, The Corporation of the Township of Harley

MITCHS.

REVISED

Provisional Certificate No. A 571702

C.C. J Hatton
D. Kemp
C - File in Book.

MP-13-02
Harley Tsp

Ministry of the Environment
Ontario

M.O.E.
NORTHEASTERN
JUL 23 1991
RECEIVED
TIMMINS

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 Harley
R.R. #2
New Liskeard, Ontario
P0J 1P0

for the use and operation of a 16.2 hectare landfilling site, 8.1 hectares to be used for landfilling

ENVIRONMENTAL APPROVALS BRANCH
RECEIVED
NOV 6 1980
MUNICIPAL & PRIVATE APPROVALS SECTION

all in accordance with the following plans and specifications:

As listed in Appendix A attached.

Located: S. Part of N.E.1/4 Lot 12, Concession 1
Township of Harley
District of Timiskaming

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 and commercial wastes.

and subject to the following conditions:

Dated this 23rd day of October, 1980.

Director, Section 39,
The Environmental Protection Act, 1971

APPENDIX "A"

1. The letter by Chester H. Edwards of the Township of Harley to the Ministry of the Environment dated July 12, 1978.

2. The drawing entitled "Sketch of Waste Disposal Site, E.½ of N.½ Lot 12, Concession 1, Township of Harley".

3. Site location Plan "A" dated July 19, 1978.

4. Site location Plan "B" dated July 19, 1978.

APPENDIX "A"

1. The letter by Chester H. Edwards of the Township of Harley to the Ministry of the Environment dated July 12, 1978.

2. The drawing entitled "Sketch of Waste Disposal Site, E.1/2 of N.1/2 Lot 12, Concession 1, Township of Harley".

3. Site location Plan "A" dated July 19, 1978.

4. Site location Plan "B" dated July 19, 1978.

APPENDIX D

PROJECT LIMITATIONS

Limitations

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:

   (a) The Standard Terms and Conditions which form a part of our Contract;
   (b) The Scope of Services;
   (c) Time and Budgetary limitations as described in our Contract; and,
   (d) The Limitations stated herein.

2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.

3. The conclusions presented in this report were based, in part, on visual observations of the site and attendant structures. Our conclusions cannot and are not extended to include those portions of the site or structures, which were not reasonably available, in AMEC's opinion, for direct observation.

4. The environmental conditions at the site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the site with any applicable local, provincial or federal by-laws, orders-in-council, legislative enactments and regulations was not performed.

5. The site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.

6. Where testing was performed it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on site and may be revealed by different or other testing not provided for in our contract.

7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, AMEC must be notified in order that it may determine if modifications to the conclusions in the report are necessary.

8. The utilization of AMEC's services during the implementation of any remedial measures will allow AMEC to observe compliance with the conclusions and recommendations contained in the report. AMEC's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.

9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or in part, or any reliance thereon or decisions made based on any information or conclusions in the report, is the sole responsibility of such third party. AMEC accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.

10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of AMEC.