H-23

VISUAL ANALYSIS SITE ~ D
HALTON REGION LANDFILL TECHNICAL STUDY

SCHEDULE G ~ D

AUGUST 1986

landplan
landscape architects
environmental scientists

VISUAL ANALYSIS - SITE D

Halton Region Landfill Technical Study
Schedule G-D

August, 1986

The Landplan Collaborative Ltd.
Landscape Architects, Environmental Scientists
319 Woolwich Street
Guelph, Ontario
N1H 3W4

519 824-8664

VISUAL ANALYSIS - SITE D

Table of Contents

List of Maps, Figures and Tables

VISUAL ANALYSIS - SITE D

Halton Region Landfill Technical Study

1.0 Executive Summary - Site D

1.1 Review of Visual Assessment, Phase 2, Stage 2C - Halton's Landfill Envirofnmental Assessment

The object of the Stage 2C report in Halton's Landfill Environmental Assessment was to analyze the visual impact of locating a municipal landfill on each of six candidate sites. The study refined the boundaries of the candidate sites to form site plan areas. The six site plan areas were ranked in order of increasing visual impact.

Background information was reviewed including topographic maps and aerial photographs. Several assumptions relating to the design parameters of the proposed landfill were established after discussions with the project consultants. Field reconnaissance of the six sites was undertaken to characterize the landscape around each site and collect data on features that would be visually affected by the proposed landfill.

The analysis used six factors to rate the site plan areas: degree of visibility, number of residences, length and designation of roadways, designated viewing areas, other land uses, and opportunity for mitigation. An evaluation system was devised that rated the site plan areas relative to one another using high and medium to low impact categories. This comparative evaluation ranked the site plan areas from most visually desirable to least visually desirable as: Site A or B, Site C, Site F, Site E, and Site D. In addition to the ranking, preliminary mitigative measures were suggested for each site that would reduce the visual impact of locating a sanitary landfill at Site D.

1.2 Evaluation of Features

In this detailed technical study an analysis was undertaken to determine the visual impacts associated with locating a sanitary landfill on Site D. The method involved a review of background literature, maps and aerial photographs, construction of cross-sections through the landfill and surrounding landscape, and extensive field reconnaissance in both winter and summer during 1985 and 1986. The field program involved the measurement of viewsheds, identification of residences, roadways, and other land uses potentially affected by the proposed landfill and determination of the intensity of impacts associated with various features.

The five features evaluated to determine the impacts of the landfill are discussed below.

1.2.1 Visual Characteristics

Site D is situated in a predominantly rural landscape, on a flat clay plain. The Niagara Escarpment lies approximately 6 km to the north and west and provides distant views onto the site. The nearest urban centre is the Town of Milton, 3.7 km to the north. To the east lies the Sixteen Mile Creek valley and to the south is a prominent ridge. These four features basically define the 3533 ha viewshed of Site D.

1.2.2 Designated Viewing Areas

There are two provincially recognized viewing areas within the viewshed of Site D. Mount Nemo and Rattlesnake Point are both prominent lookouts on the Niagara Escarpment which offer distant views to the site.

1.2.3 Residences

Approximately 125+ residences were identified in the Site D viewshed, 69 of which are subject to high visual impacts from the proposed landfill. Many of the residences in the medium to low category are situated on the slopes of the Niagara Escarpment and are very distant from the site.

1.2.4 Other Visual Concerns

Four land uses were evaluated in this category, the Milton District Hospital, St. Clair Masonic Temple, Boyne Community Centre, and orchards and "U-Pick-it" farms on the escarpment slopes. All four have very limited and/or distant views of the site.

1.2.5 Roadways

Roadways were divided into major roadways or secondary roadways based on their designation in the Region of Halton Official Plan. The impact of the landfill on roadways was based on the proximity of the road to Site D and the posted travelling speed for the road. (At faster speeds exposure time to the landfill is reduced and greater concentration is required to ensure safe vehicle operation). In total, 39.15 km of roadway is affected by the proposed landfill.

1.3 Evaluation of Impact of Landfill on Features

The landfill can be viewed from an area encompassing approximately 3533 ha of the surrounding rural landscape. Since the site is situated on a flat plain, and assuming the maximum height of the landfill will be about 15 m, the existing visual characteristics of the landscape are altered, creating a visual impact. The impact will be most

noticeable when existing long views across the plain are terminated at the landfill (either by screening vegetation, berms, or the landfill itself).

The impact of the landfill on the two designated viewing areas is slight. The wide expanse of the plain offers a broad vista from the lookouts and existing landscape patterns dissect the view. This combination of fragmented views and a wide vista makes it difficult to discern Site D. For this reason the impact was rated as medium to low, despite the two lookouts being provincially significant.

The 125+ residences which will receive visual impacts were evaluated on the basis of their proximity to the proposed landfill. The percentage of existing views from these residences, if looking towards Site D, that would be occupied by the proposed landfill was also used to quantify visual impacts. The evaluation indicated that 69 houses which fell within 1 km of the site would receive high impacts. All other residences in the viewshed were placed in the medium to low category. The four features which were addressed under "Other Visual Concerns" were all rated in the medium to low category. All four are either distant from the site (e.g. the orchards and "U-pick-it" farms) or

had partially screened views of the site (Milton District Hospital, St. Clair Masonic Temple and Boyne Community Centre).

1.4 Recommended Mitigative Measures

Seven mitigative measures were suggested to ameliorate visual impacts of locating a landfill on Site D. Four of these relating to design recommendations are: limit the height of the landfill to 15 m, reduce side slopes along the west and north sides, move the service area further away from Highway 25, and contour the top of the landfill with topographic variation to help it blend with the surrounding landscape. The other three recommendations all relate to screening views onto the landfill with vegetation.

2.0 Introduction

This report presents the findings of a visual analysis of Site D. The visibility of the site is one of many factors being studied as part of detailed technical studies for a new landfill in the Region of Halton. An earlier report, Technical Report Number 10, Phase 2, Stage 2C, Visual Assessment, Landplan, June 1985, presented findings on the visual characteristics of Site D and five other sites. Since this time additional field work and analyses have been undertaken to further refine the visual impacts associated with constructing a landfill at Site D. As a result of the additional detailed work, some findings in this report have been updated and differ from the Stage 2C Report.

Site D is located in the Town of Milton. It lies between Highway 25 and First Line approximately halfway between Lower Base Line and Britannia Road (see Figure 1).

The object of this assessment is to evaluate the visual impact of building a sanitary landfill on Site D. Engineering and design parameters for the landfill were examined and various techniques were used to determine the visual effects on residents, employees and visitors in the area. As a result of the findings, a number of recommendations are made to help mitigate the potentially negative visual impacts.

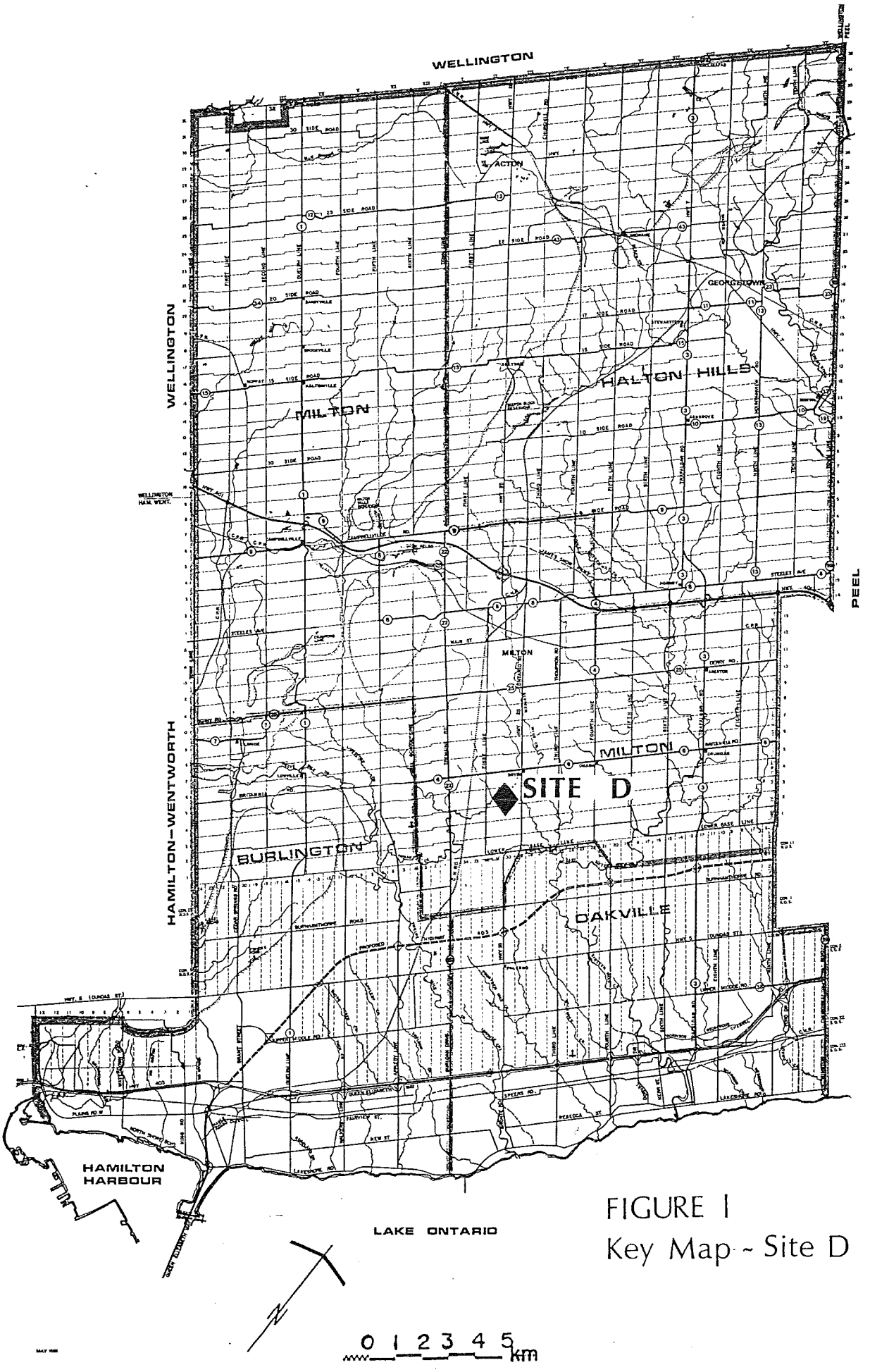


FIGURE 1
Key Map - Site D

3.0 Method

To evaluate the potential visual impacts of the site, some assumptions with respect to the final design were made. The following assumptions resulted from consultation with the project engineers and a review of information gathered during previous studies and are essentially the same as those made in the Stage 2C report (Landplan, 1985).

1) The site has a setback of 100 m from the toe of the slope to the site plan area boundary.
2) The landfill height will not exceed 15 m above existing grade.
3) The maximum slope of the sides of the landfill will be a ratio of 4 horizontal to 1 vertical.
4) Based on points 2 and 3 the landfill would reach its maximum height not less than 160 m from the boundary of the site.
5) Houses within the boundaries of Site D, including the buffer, were not assessed in terms of potential visual impact.
6) Vegetation in the buffer area and woodlots adjacent to the site were considered as screening elements.
7) Vegetation on Site D, but not in buffer areas was not considered a visual screen to that site, since it may be removed as part of the landfilling process.

8) Woodlots on adjacent properties were considered screening elements.

A literature review was undertaken which included relevant background documents produced during the Environmental Assessment for the Regional landfill selection. Among these were technical reports, summary reports and reports on public concerns and issues. Correspondence forwarded to the consultant relating to visual issues was also reviewed, and where appropriate, comments were incorporated into the analyses. A list of these documents is provided in the references.

Included in the review of background documents was an analysis of aerial photographs and maps of the area. Use was made of older aerial photographs to gain an historical impression of the site. Historical photography is very sporadic for Site D, for which only one set of aerial photographs from 1953 was examined. All of these aerial photographs were obtained from the Archives of Ontario, Ministry of Citizenship and Culture. Maps from the Ontario Base Mapping (O.B.M.) series were consulted. These are derived from 1982 aerial photographs and are produced at a scale of 1:10 000 with a 5 m contour interval. Topographic maps at a scale of 1:25 000 were also used.

Sections were constructed for Site D to illustrate the relationship between the proposed landfill and important viewing points. Sections from residences typical of the two levels of impact (high and medium to low) were produced, as well as special or unique situations such as tall apartment buildings, and lookouts on the Niagara Escarpment.

Field work was undertaken to determine the visual characteristics of the area and, where possible, quantify visual parameters of the site. The limits of visibility were established to determine the area from which the proposed landfill could be seen. This was ascertained by extensive reconnaissance of the area around each site. The field portion of this task was largely undertaken by driving on roads. Where the limit of visibility was determined to fall in the land between concession roads, contour information from maps was used to refine its position.

The limits of visibility define the area from which the proposed landfill could be seen. The space encompassed by the limits of visibility is the "area of visibility". The limits were drawn on a 1:10 000 base map and the area within the limits measured using a polar planimeter. Maximum and minimum lengths of view to the landfill were

determined from the map, and an approximate average distance between the limits of visibility and Site D was calculated.

To gain a better impression of the height of the proposed landfill, and to assist in locating the site from distant points, highly visible helium balloons were set up at each site. The balloons were orange in colour and approximately 100 cm in diameter. Two balloons were located at each of several locations at the site, one positioned approximately 30 m high and the other at 15 m. The higher balloon assisted in locating the site from the surrounding landscape while the lower one provided a reference point for the proposed finished height of the landfill (15 m).

The field work also included a review of all residences within the limits of visibility from which the proposed landfill could be viewed. A residence was considered to be within the limit of visibility of the proposed landfill if the proposed landfill could be viewed from any part of the residence or property adjoining the residence (excluding farmland). The visual impact on each residence was evaluated and each was assigned a rating of high, or medium to low.

Since there is no generally accepted way of quantifying

visual impacts of this nature the assigned ratings are relative to each other. Although the ratings are qualitatively determined, guidelines were established to provide consistency in applying the ratings.

High visual impacts result when the proposed landfill occupied a large proportion of an observer's field of vision. High visual impacts generally occur close to the site and are views which cannot easily be screened. Medium to low impacts occur further away from the site.

Low impact sites were easily defined as they were at the extreme limits of visibility and the proposed landfill constituted an extremely small proportion of the total viewshed. Medium impact views were more difficult to define as the line that separates them from low or high impacts is less obvious. In addition, the correlation between visual impact and distance from the proposed landfill is not linear. The impact is significantly higher when in close proximity to the site. Thus there is a much greater difference in impact between the high and medium categories than between the medium and low categories. For these reasons, the medium to low categories were combined.

Included in this evaluation of visual impacts was a

quantitative measurement of the extent of the viewshed from selected areas. The proportion of the viewshed occupied by the landfill was determined at several locations. In this calculation a viewshed was defined as being 180°. The angle of vision occupied by the landfill from each residential area was measured and expressed as a percentage of the viewshed. This measurement provides quantitative information on the degree of impact and was used in conjunction with distance measurements and screening to arrive at an impact rating for each residence.

The proportion of the total viewshed occupied by the landfill was determined at several locations at Site D owing to the relatively flat landscape and the frequent opportunity for viewing over a large area. This was accomplished using a siting compass and the helium balloons.

During field work special attention was also given to designated viewing areas. These are areas that are specially recognized and include parks and conservation areas, which have easy public access.

Roads were divided into two categories based on the roadway classification in the Halton Regional Official Plan. Major roads include provincial highways and primary arterial

roads. Secondary roads include secondary arterial roads and low capacity roads. Although major roads have more traffic, the speeds are much higher than on secondary roads. A major road next to a landfill may affect more people, but the intensity of the impact will be less than that experienced on a secondary road.

4.0 Evaluation

4.1 Visual Characteristics (refer to Maps 1 & 2)

The area of visibility of Site D is 3533 ha and the length of views ranges from 1 km to 6 km, the average being 2.2 km.

The clay plain on which Site D is situated is visually flat and there are few topographic features to screen the landfill, thus creating a large area of visibility. The high elevations of the Niagara Escarpment to the north and west contain several lookouts that provide long views across the plain. Just south of Lower Base Line a high ridge blocks views from the south end of Henderson Road. The only significantly large block of vegetation in the study area is associated with Sixteen Mile Creek, east of Highway 25. This continuous band of vegetation screens views from east of the Creek. The Town of Milton lies north of Site D. Although the site may be visible from the upper floors of a few residences along the north side of Derry Road, and at least one apartment building, the majority of the views from the edge of the Town are screened by a large knoll south of Derry Road.

The land surrounding Site D is a mixture of agricultural land and abandoned farms. The open fields of abandoned land and fields that have been recently ploughed or are sown with low crops (eg. soybeans) allow clear views across the plain. Much of the abandoned land contains secondary growth consisting mainly of hawthorns. This vegetation, which is 3 to 4 metres high, provides a solid screen in both summer and winter in many places, and restricts the views from concession roads and residences. This screening is mainly evident to the west of the site, particularly between Appleby Line and Bell School Line. The scattered small woodlots and hedgerows which visually dissect the landscape assist in screening Site D. From distances approximately 2 km or more from the site boundary the views of the site are fragmented and filtered by various components of the landscape.

4.1.1 Sections (refer to Figure 2)

Three sections have been drawn through Site D and surrounding area. The vertical scale is exagerated by 10 times to show relative relief (see Figure 2).

Section D1 extends from Derry Road to Henderson Road (north to south). It begins at the south end of Milton, passes through the Milton District Hospital, the proposed landfill and terminates at Highway 25. This section

shows the large knoll just south of Milton which restricts views from Derry Road, and the lower floors of residences. The landfill is in a minor depression compared to the surrounding topography which allows visual access from Britannia Road and Lower Base Line Road. Henderson Road and some parts of Highway 25 are raised but scrub and trees in the area allow only intermittent views.

Section D2. This section is drawn from the lookout at Mount Nemo to Highway 25 adjacent the eastern boundary of Site D (west to east). The top of the landfill and some of the side slopes will be visible from the lookout at Mount Nemo. Views from the area between Bronte Creek and Tremaine Road will be restricted due to scrub vegetation and the rise of land between Bell School Line and Tremaine Road. The landfill will restrict views of the Niagara Escarpment from parts of Highway 25.

Section D3 is drawn from Rattlesnake Point Conservation Area to Highway 25 (northeast to southeast). The top of the landfill and some of the sides of the landfill will be visible from the top and upper side slopes of the Niagara Escarpment. A depression around the Bell School Line will restrict views to the landfill from that area. Full views will be available from Tremaine Road which is

on a slight rise. Visual access to the escarpment will be blocked from Highway 25.

There are few differences between the visual limits of Site D in winter and summer. Views from most directions are determined by topography, buildings, or distance, none of which are affected by seasons. The only changes occur along Appleby Line, where a very distant view of Site D just south of Britannia Road is available in winter but is screened by scattered hedgerows in summer and along Bell School Line where very filtered views through hawthorns are available in winter but not summer. There is no seasonal variation in the number of residences in the viewing area.

4.2 Designated Viewing Areas (refer to Map 1)

The site can be seen from two provincially designated viewing areas along the Niagara Escarpment. These are Mount Nemo Conservation Area to the west of the site (6 km distant), and Rattlesnake Point Conservation Area (5.5 km distant). Each of these areas have established lookouts which provide views over the site. The Halton Region Conservation Authority estimates that Rattlesnake Point is visited by 30 000 or more visitors per year and that Mount Nemo attracts approximately 10 000 visitors per year.

Although the height of the Niagara Escarpment suggests that views over the plain would be dominated by the landfill, this is not the case. The vista from public lookouts such as Mount Nemo and Rattlesnake Point are so extensive that Site D is only a small portion of the total view. The consultant estimated the total area that can be viewed from Mount Nemo to be 650 km^2. Site D is 1.3 km^2, or 0.2% of the total viewshed. Even if only the foreground is considered (approximated at 100 km^2) Site D occupies only 1.3% of the viewshed.

Although these lookouts are provincially recognized viewing areas the visual impact of Site D was estimated to be medium to low while the landfill was in operation. For these reasons, the visual impact of Site D on these lookouts is considered to be medium to low. Once the landfill has been completed and an after-use is implemented the site can be designed to blend in with the surrounding landscape. The visual impact from Mount Nemo or Rattlesnake Point will then be negligible.

4.3 Residences (Refer to Map 2)

Residences within the visual limits of Site D are subject to visual impacts of varying degrees. The intensity of the

impacts depends on: 1) the residences' proximity to the site, 2) existing screening elements, and 3) the ability to mitigate the visual impacts. In addition, the visual impact on many residences will change when an after-use plan is implemented. Every residence within the limits of visibility is considered to receive visual impacts.

Generally, residences which are within 1 km of Site D will have the highest visual impact while the landfill is operating. The proposed landfill occupies 50% to 80% of the viewshed from these residences. Vegetation, both existing and proposed plantings, around Site D will mitigate the visual intrusion of the landfill to some degree. However, given that the existing views are of a rural landscape and often over large distances, the screening when in close proximity to a residence constitutes an impact by shortening existing viewsheds and changing their character.

Specifically, the residences that are considered to receive high visual impact and the approximate proportion of the total viewshed occupied by the proposed landfill are:

1) Five residences on Highway 25 between Britannia Road and Derry Road; one is to the west side of the highway, four are to the east, (30% of the view).

2) Fourteen residences on Highway 25 between Britannia Road and Lower Base Line, four west of the Highway, ten to the east, (40% of the view).

3) Seventeen residences on Lower Base Line east of First Line, seven on the north side of the road, ten on the south, (30% of the view).

4) Five residences on Henderson Road, two to the west side of the road and three to the east, (25% of the view).

5) Eighteen residences on First Line between Lower Base Line and Britannia Road, twelve to the west side of the road, six to the east, (30% to 80% of the view).

6) Five residences on First Line between Britannia and Derry Road, four on the west side, one on the east, (25% of the view).

7) Five residences on Britannia Road east of Highway 25, (30% of the view).

The other residences within the limits of visibility are in the medium to low impact category. Views of the landfill from these residences are from over 1 km distant and are fragmented and filtered by existing components of the landscape. Solitary trees, hedgerows, woodlots, old farm residence plantings, existing buildings, and topographical relief break up views and prevent direct visual access onto the whole of Site D. When under construction, the

proposed landfill may not integrate well with the surrounding landscape. When an after-use plan is implemented, views of the finished landfill from medium to low impact areas will not seriously detract from the rural nature of the surrounding landscape. Views from the many residences near the edge of the limits of visibility (eg. along Appleby Line or No. 14 Sideroad) are very broad and so distant (approximately 7 km) from the proposed landfill that Site D could be located during field work only with great difficulty.

The residences in the medium to low impact category and the approximate proportion of the viewshed occupied by the landfill are:

1) Ten residences on Highway 25, north of Britannia Road, five on the west side of the highway, and five on the east side, (15% of the view).
2) Five residences on Henderson Road south of Lower Base Line, one on the west side of the road, four on the east side, (20% of the view).
3) Two residences on Lower Base Line west of Henderson Road, (20% of the view).
4) Ten residences on First Line north of Britannia Road, four on the west side and six to the east, (15% of the view).

5) Twenty-three residences on Tremaine Road between Lower Base Line and Derry Road, twelve on the east side of the Road and eleven on the west side, (10% to 25% of the view).

6) Three residences on Tremaine Road south of Lower Base Line, and three residences on the south side of Derry Road east of Appleby Line, (15% of the view).

7) Two residences on Bell School Line, one north of Britannia Road and one south of Britannia Road, (10% of the view).

8) One residence on the south side of No. 2 Sideroad, (10% of the view).

9) North of Derry Road from Highway 25 to the Appleby Line, there are many residences from which the site can be seen due to the higher elevation of the Niagara Escarpment. There are also portions of the Town of Milton from which residents may see the site from second storey residences or from apartments, (10% of the view).

10) On Walkers Line below Mount Nemo there are many residences from which the site can be seen, (5% of the view).

4.4 Other Visual Concerns (see Map 1.)

Several other features within the study area have been

identified as special concerns in the visual assessment: the Milton District Hospital, the St. Clair Masonic Temple, the Boyne Community Centre, and orchards and "U-pick-it" farms on the Niagara Escarpment. All have been assigned to the medium to low category.

Views from the Milton District Hospital at the corner of Derry Road and First Line may be entirely obscured by a rise of land and farm residence between the hospital and Site D. Since the second storey of this building is still under construction the extent of view from the addition could not be accurately assessed. The hospital is 3.5 km from Site D and if there are any views to the proposed landfill, they will be partially screened by the aforementioned knoll and a woodlot on the south side of Britannia Road. With no obstruction it would be a maximum of 12% of the horizontal view.

The St. Clair Masonic Temple is on the east side of Highway 25, 2.1 km north of Site D. There are filtered views of Site D southerly along the highway and across several fields. These views are partially screened by other buildings along the Highway and by scattered vegetation.

The Boyne Community Centre is on the north side of Britannia Road just east of Highway 25. There are few

windows in the actual hall, thus Site D cannot be viewed from within the building itself. However, there are very fragmented views of Site D from the parking lot.

The orchards and "U-pick-it" farms are very distant from the site (about 5.5 km). As with the viewing areas on the escarpment, Site D becomes difficult to discern because of the extensive views available. Although concern had been expressed at public meetings on this issue, the visual impact on these areas is very small and rated as low.

4.5 Roadways

A landfill at Site D would affect motorists on adjoining roads in two ways: (1) the proposed landfill itself constitutes an altered view, and (2) the proposed landfill blocks views across a rural landscape and will partially screen views of the Niagara Escarpment from Highway 25.

As with residences, views from roadways close to the site are perceived to be affected more than distant roads, and are therefore assigned a higher impact rating. More distant roads are considered to be in the medium to low impact category.

Motorists on the following roads will be able to view the proposed landfill.

4.5.1 High visual impacts

Major roads

1) 3.6 km of Highway 25

Secondary roads

2) 4.3 km of First Line

3) 3.0 km of Britannia Road

4) 1.7 km of Lower Base Line

4.5.2 Medium to low visual impacts

Major roads

1) 1.9 km of Highway 25

2) 4.0 km of Derry Road

Secondary roads

1) 0.7 km of Lower Base Line

2) 0.9 km of Henderson Road

3) 1.9 km of First Line

4) 7.6 km of Tremaine Road

5) 4.8 km of Bell School Line

6) 0.8 km of Appleby Line

7) 0.8 km of Walkers Line

8) 1.6 km of No. 14 Sideroad

9) 1.15 km of Britannia Road

10) 0.4 km of Sideroad No. 2

The three sections of road in the high impact category are all adjacent to the landfill. Motorists using these roads will not have to look aside to notice the landfill as it will be within their field of vision when looking through the windshield. The roads in the medium to low category are generally 1 km to 6 km distant. Motorists using the more distant roads (14 Sideroad, Walkers Line, Bell School Line, Appleby Line, northerly part of Tremaine Road, No. 2 Sideroad and Derry Road) would probably not be able to view the landfill without diverting a considerable amount of attention from driving the car. Even passengers would find it difficult to view the landfill on these distant roads from a moving vehicle. Henderson Road is different from all the others because northbound drivers look directly onto the landfill (see Map 2.). However, it is distant enough that impacts were assigned in the medium to low category.

5.0 Recommendations for Mitigation

The purpose of mitigation from a visual standpoint is to reduce impacts from surrounding land uses such as residences by providing for screening of the site and integrating the landfill after closure with the surrounding landscape. Site D is located in a rural landscape. Longer views to the sites are more difficult to mitigate. The following mitigation measures will help to reduce visual impacts, particularly on residences, and should be considered as part of the final design and after-use. These measures should be implemented as soon as possible in the landfilling process.

1) The landfill should be limited to 15 m above existing contours. As 15 m is the height of most woodlots in the area, maximum screening from existing vegetation is available.
2) Heavy screening will be required adjacent to the site along First Line and Highway 25. This planting should commence as quickly as possible in buffer areas along these roads.
3) To reduce impacts to views from Mt. Nemo and Rattlesnake Point the north and west sides of the landfill should receive heavy planting.

4) Along First Line a reduction in side slopes from 4:1 to 8:1 across from residences will move the top of the landfill back further from houses and help to reduce the "wall" effect of the landfill on residences. Side slopes should be reduced from 4:1 to 5:1 along the north side of the site to reduce visual impact from Britannia Road and southbound vehicles on First Line.

5) Progressive rehabilitation along the side slopes of landfill will help to screen landfilling activities.

6) The service areas along Highway 25 should be moved back as far from the road as possible and screened to reduce the visual impacts of loading and unloading areas.

7) The top of the landfill should be developed with some subtle topographic variation to help the site blend into the surounding landscape.

5.1 After-Use

As part of the final design and after-use process, reduction of visual impacts should be considered. Design alternatives which allow for flexibility in revegetation of the site and location of screening features are the most desirable from this standpoint. Progressive rehabilitation will create the fastest reduction of visual impacts, particularly on residences in close proximity to

the site. After-uses having a mixture of woodlot, hedgerow and open field, (corresponding to existing field patterns) will integrate most successfully with the surrounding agricultural and rural landscape.

6.0 Conclusions

The evaluation of the five factors used to determine the visual impact are presented below in Table 1. The table summarizes the impact on each factor and highlights refinements between the findings of the study and the earlier Stage 2C Report.

Table 1: Summary of Impacts on Visual Factors

Visual Factors	Impact
Visual Characteristics	* - area of visibility is 3533 ha - area is relatively flat with long views (1 to 6 km) to the site
Designated Viewing Areas	- impact on two provincially recognized viewing areas
Residences	* - impacts on 125+ residences, 69 of which are rated high impacts
Other Visual Concerns	* - users of the Milton District Hospital, St. Clair Masonic Temple, Boyne Community Centre and orchards and "U-Pick-It" farms are subject to medium to low visual impacts
Roadways	* - impacts on 39.15 km of roadway

(* denotes revision of Stage 2C findings see following text for discussion)

Several findings differ slightly from the Stage 2C Report. The area of visibility reported here is larger than the

previously reported figure owing to revisions in the limits of visibility. These revisions were a result of additional detailed field work in winter and summer. The overall number of residences receiving impact by the proposed landfill changed for two reasons. Some changes were due to changes in the visual limits. Other changes were owing to the way in which the data was reported. For example the Stage 2C report documents 28+ residences below Mount Nemo. Since the exact number of residences is undetermined (owing to difficulties in gaining access to private property) the figure is reported here as "...many residences from which the site (D) can be seen...". Changes related to the distance of roadway affected by the landfill are a result of more detailed field examination of views from roadways.

Each of the factors was evaluated to determine the degree to which they are affected by visual impacts. The same rating categories, high and medium to low, were used as in previous evaluations. The ratings were applied to reflect the impact on each factor as a whole. For instance, in the "Residences" factor, over half the residences evaluated had high impacts (refer to "Evaluation" section). Because of this, the consultants considered the overall rating for residences to be high also. Table 2 rates the impact on factors considered as a whole. This is different from the "Evaluation" section where degree of impact was assigned to individual features such as a single residence or a single

lookout. For this reason the ratings assigned various factors in Table 2 do not necessarily agree with the ratings assigned features in the "Evaluation" section. A summary of net visual impacts is provided below.

Table 2: Summary of Net Visual Impacts

Visual Factors	Degree of Impact	
	High	Medium to Low
Visual Characteristics	-large area of visibility -long views onto site	
Designated Viewing Areas		-very distant views from two provincially recognized lookouts
Residences	-many (125+) residences affected	
Other Visual Concerns		-distant views from four non-residential features
Roadways		
Major Roadways		-short length of roadway affected
Secondary Roadways	-long length of roadway affected	

The overall level of visual impact of locating a landfill at Site D is considered high. The primary reason for this is the large area from which the site is visible (3533 ha) and the relatively large number of residences affected by

the landfill (125+). In addition 69 of the affected residences are rated as receiving high impacts. Although the two designated viewing areas are of provincial interest, they are distant from the site and the impact of the proposed landfill on viewers is considered to be relatively small. Thus, the two lookouts are rated medium to low.

Secondary roadways were also considered to receive overall high impacts owing to the long (29.65 km) length affected. Features classified as "Other Visual Concerns" and major roadways were both rated as medium to low overall.

7.0 References

Hall, John. Senior Planner, Halton Region Conservation Authority. Personal communication. 1984. Letter concerning visitation levels at Mt. Nemo and Rattlesnake Point Conservation Areas.

Halton Region Conservation Authority. 1983. Interim Watershed Plan.

The Landplan Collaborative Ltd. 1985. Visual Assessment. Final Technical Report No. 10, Phase 2 Stage 2C, Selection of Preferred Site. Environmental Assessment Landfill Component of Solid Waste Management, Halton.

Niagara Escarpment Commission. 1984. The Niagara Escarpment Plan, Volumes 1, 2 and 3. The Provincial Secretariat for Resources Development.

Walker, Wright, Young Ltd. in association with Barman, Coulter, Swallow Associates; Bird and Hale Ltd.; Giffels Associates Ltd.; Ecological Services for Planning Ltd.; Hydrology Consultants; The Landplan Collaborative Ltd.; Museum of Indian Archaeology (London); Myra Schiff Consultants Ltd.; and C. N. Watson and Associates Ltd. 1984a. Consolidation Report. Phase 2, Stage 2B. Selection of Candidate Sites. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.

Ibid. 1984b. Selection of Preferred Site. Phase 2, Stage 2C. Final Work Program. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.

Ibid. 1984c. Analysis of Submissions. Phase 2, Stage 2C. Final Site(s) Evaluation. Environmental Assessment of the Landfill component of Halton's Solid Waste Management System.

Walker Wright Young Associates Ltd., in association with Bird and Hale Ltd.; Giffels Associates Ltd.; Hydrology Consultants; Institute of Environmental Research Inc.; Pollutech Ltd.

and C. N. Watson and Associates Ltd. 1983. Submissions. Phase 2, Stage 2A. General Overview Analysis. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.

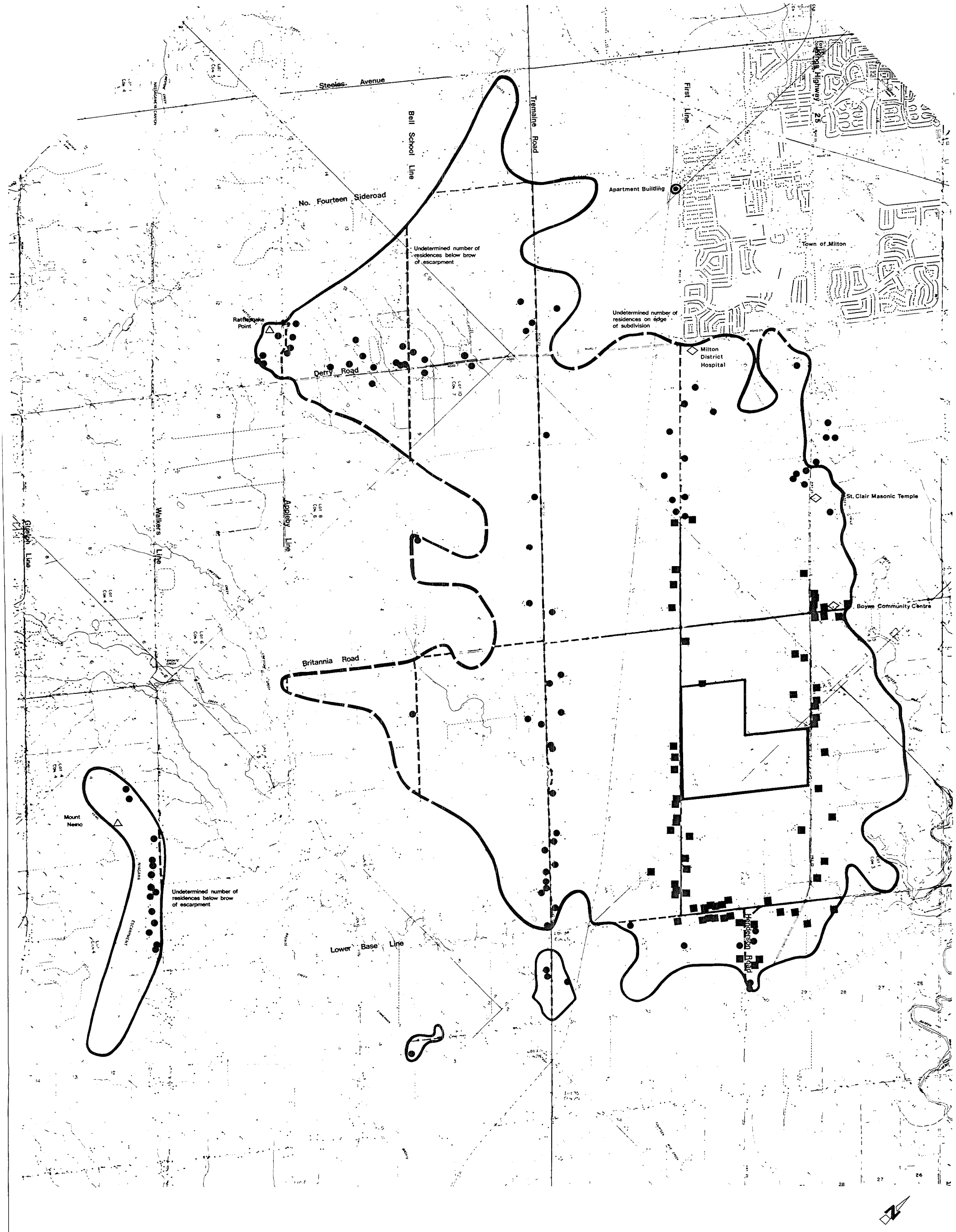
Ibid. 1984a. Final Evaluation Factors. Phase 2, Stage 2B. Selection of Candidate Sites. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.

Ibid. 1984b. Submissions, Evaluation Factors. Phase 2, Stage 2B. Selection of Candidate Sites. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.

Ibid. 1984c. Appendices Phase 2, Stage 2B. Selection of Candidate Sites. Environmental Assessment, Landfill Component of Solid Waste Management, Halton.

Ibid. 1984d. Draft Report. Phase 2, Stage 2B. Selection of Candidate Sites. Environmental Assessment, Landfill Component of Solid Waste Management, Halton.

Walker, Wright Young Associates Ltd. and Myra Schiff Consultants Ltd. 1984. Interim Report on Public Concerns and Issues. Phase 2, Stage 2C. Selection of Preferred Site. Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System.



VISUAL ANALYSIS
Site D

Halton Region Landfill Technical Study

Regional Municipalipality of Halton

MAP 1
RESIDENCES AND ROADWAYS

SCALE 0 500 m 1000 m

LANDPLAN

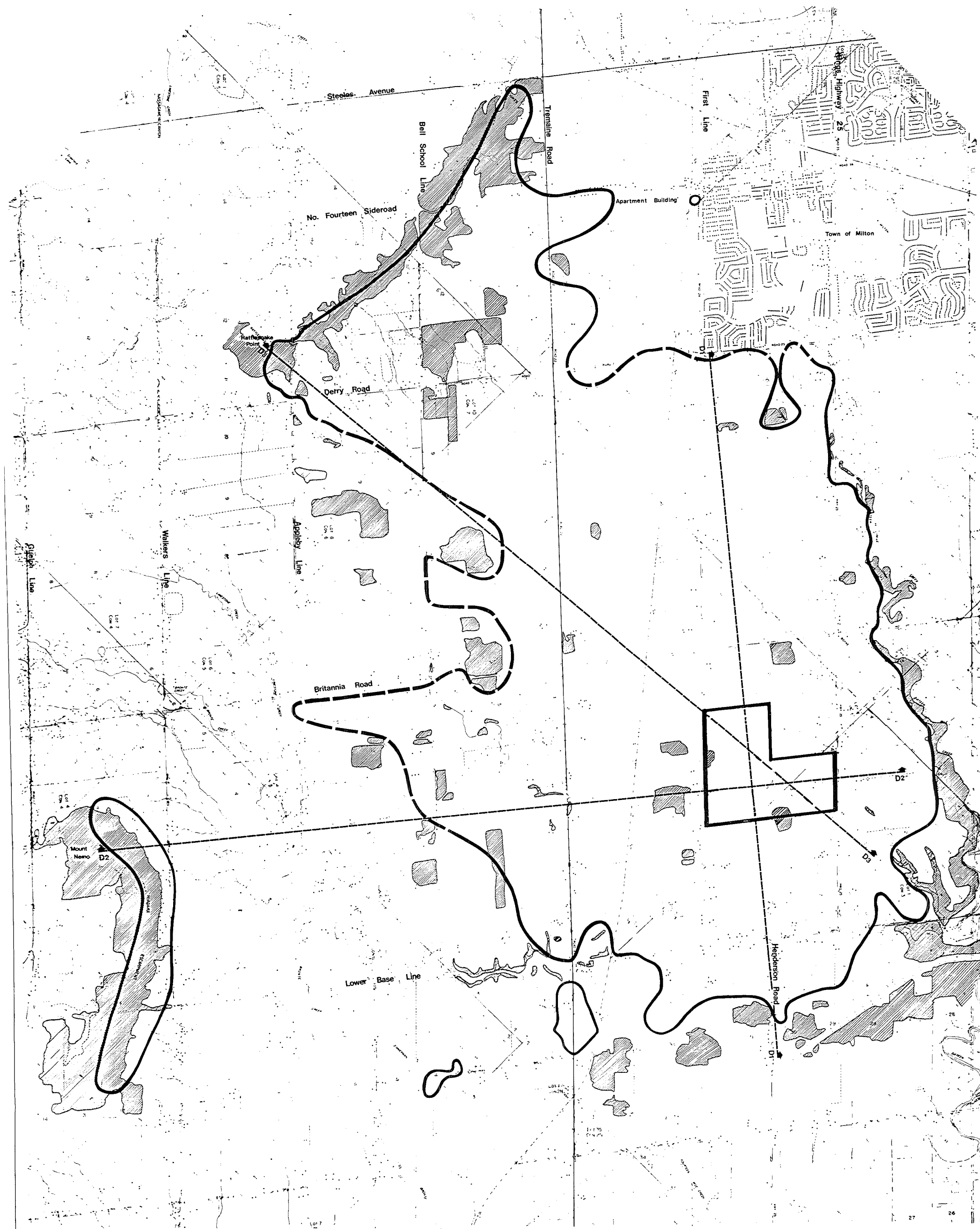
LEGEND

- Site Plan Area
- Limit of Visibility (dotted line indicates intermittant views)

Residences - Visual Impact
- HIGH
- MED. - LOW

- Other Visual Concerns
- Designated Viewing Areas

Roadways - Visual Impact
Major: High, Low
Secondary: High, Low



VISUAL ANALYSIS
Site D

Halton Region Landfill Technical Study

Regional Municipality of Halton

MAP 2

SCREENING VEGETATION AND SECTION LOCATIONS

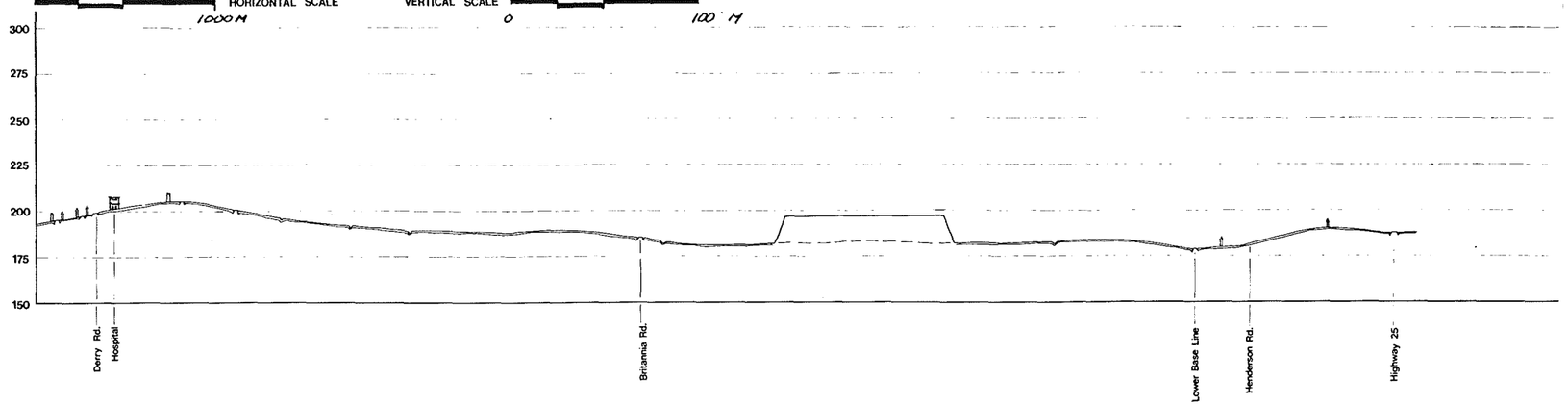
SCALE 0 500m 1000m

LANDPLAN

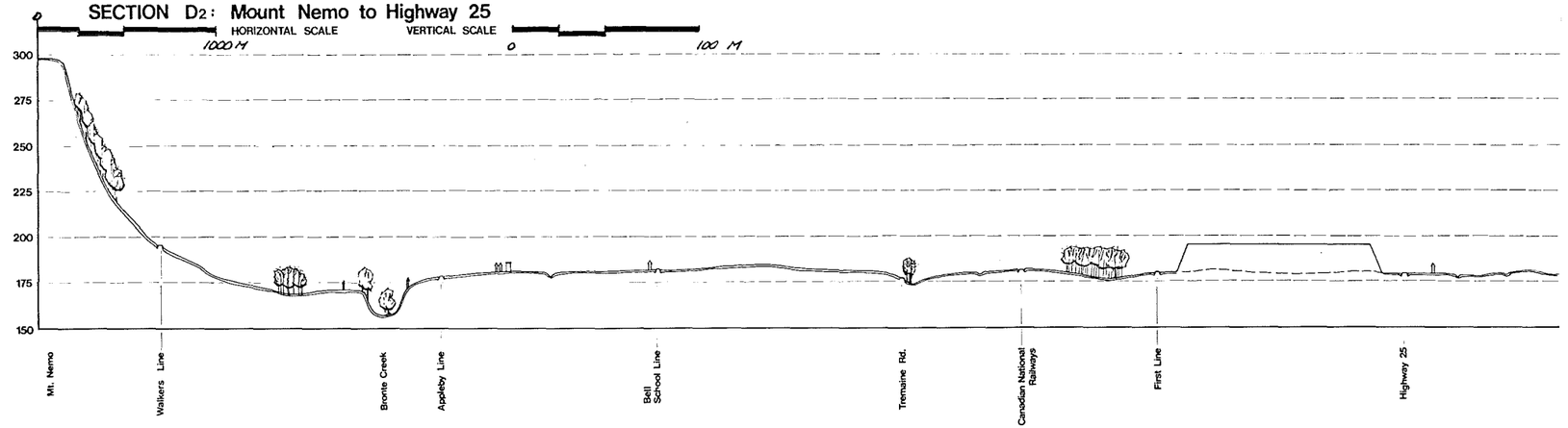
LEGEND

- Site Plan Area
- Limit of Visibility (dotted line indicates intermittent views)
- Screening Vegetation
- Section Lines

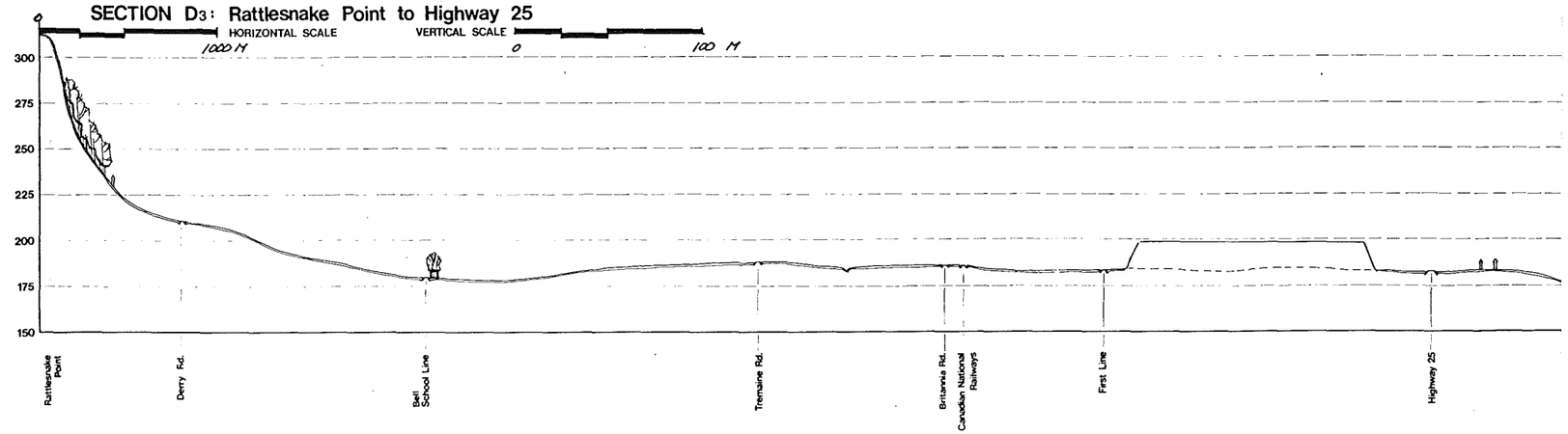
SECTION D1: Derry Road to Henderson Road



SECTION D2: Mount Nemo to Highway 25



SECTION D3: Rattlesnake Point to Highway 25



VISUAL ANALYSIS

Section lines through Site D (Refer to Map 2)

LEGEND

- Proposed Landfill
- Residence
- Building
- Roadway

FIGURE 2

LANDPLAN