

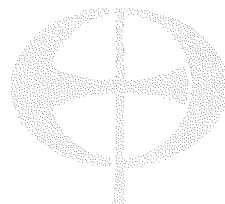
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**HALTON REGION ENVIRONMENTAL ASSESSMENT
LANDFILL COMPONENT OF
SOLID WASTE MANAGEMENT**

**Biophysical Resources Assessment
of Sites D and F**

**Prepared for
The City of Burlington**

March, 1988.



ecoplans
Limited

*Environmental Planners
Consulting Ecologists*

WITNESS STATEMENT
BIOPHYSICAL RESOURCES ASSESSMENT OF SITES D AND F

of

Cameron M. Kitchen, Ph.D., M.C.I.P.

of

Ecoplans Ltd.
544 Conestogo Road West
Waterloo, Ontario
N2L 4E2

In the matter of the Consolidated Hearing for the Environmental Assessment of the proposed Halton Regional Landfill Component of Solid Waste Management.

Role and Responsibility

I am an environmental consultant and professional planner specializing in the environmental area. Since 1979, I have been president of the environmental consulting firm, Ecoplans Ltd. In March, 1970, I was one of the founding members of the Company.

My responsibilities in this project have included the following items for which separate witness statements have been prepared.

1. Review and Comment on the After Uses Proposed for Sites D and F.
2. Review and Comment on the Biophysical Resources Component of the Environmental Assessment.
3. Review and Comment on the Visual Resources Component of the Environmental Assessment.

Ecoplans Ltd. was first retained by the City of Burlington in 1984, and has been involved with the environmental assessment process on a continuous basis from that time. I have been responsible for Ecoplans Ltd.'s work throughout this period.

BIOPHYSICAL RESOURCE ASSESSMENT

The review is based partially on an examination of the Biophysical Analysis Reports prepared by Bird and Hale Limited.

In addition, the biophysical review completed by Ecoplans Ltd. included the following activities:

- . visits to both Sites D and F; Site F was visited on a number of occasions;
- . attendance at the Hearing during periods when biophysical issues were discussed;
- . review of transcripts and exhibits presented at the Hearing;
- . independent biophysical analyses of Site F
- . literature review dealing with environmentally sensitive areas and Carolinian Canada designations.

In general, Ecoplans Ltd. agrees with the Bird and Hale Limited reports as summarized in Ms. Hellas' witness statement (Exhibit H-8A, Tab. 2, page 9) where she states:

"SITE D:

There are minor biological constraints to the development of a landfill site.

*cross on
Site
selection*

SITE F:

With the diversity of vegetation habitat types and the rare plants, the site exhibits major biological constraints to the development of a landfill site."

Our report examines Site F under several headings including:

- . Historical Context
- . Regional Context - Biophysical Resources
- . Status as an Environmentally Significant Area
- . Restoration-Replacement Feasibility

Several conclusions in addition to the major one cited previously were reached. Those pertaining to Site F are:

- . Site F ranks, in terms of criteria met, as a solid ESA candidate particularly when its relatively small size is considered. Environmentally Sensitive Areas constitute a restricted resource base in the Region and face many of the same pressures as agricultural land.
- . Site F is located in proximity to Sassafras Woods, an ESA and a priority unprotected Carolinian Canada site. The Carolinian forest association found at Site F is not well represented in Sassafras Woods or in the local area. The forest association at Site F should be considered as a component of the Sassafras Woods complex.
- . Site F biological communities are the products of a long history of natural and anthropogenic influences. The history of disturbance does not negate its present biological significance.
- . The valued biological communities at Site F cannot be restored following the interim landfill use.
- . The designation and protection of sensitive natural areas should receive the same level of protection as other resource uses including agriculture.

map.

CAMERON M. KITCHEN

Position: President, Ecoplans Ltd.

EDUCATION

1967 B.A. Geography/Biology
(Hons) Queen's University, Kingston, Ontario

1969 M.A. Regional Planning and Resources Development,
University of Waterloo, Waterloo, Ontario

1983 Ph.D. University of Glasgow, Glasgow, Scotland,
Faculty of Science (Geography)

PROFESSIONAL AFFILIATIONS

Member Canadian Institute of Planners
Member Ontario Professional Planners Institute
Member Ontario Society for Environmental Management
(President, 1984-1988)

Member Canadian Association of Geographers
Member Canadian Land Reclamation Association
Member Canadian Society for Landscape Ecology and Management
Member Federation of Ontario Naturalists

EXPERIENCE

1979-present President, Ecoplans Ltd.

1983-1985 Adjunct Associate Professor (sessional appointment), School
of Urban and Regional Planning, University of Waterloo.

1978-1981 Sessional Lecturer, Department of Geography, Wilfrid Laurier
University.

1978-1979 Sessional Lecturer, Land Resources Department, University of
Guelph.

1977-1979 Senior Environmental Planner, Vice-President, Ecoplans Ltd.

1975-1977 Canada Council Fellowship, University of Glasgow, Glasgow,
Scotland.

1972-1975 Assistant Professor, School of Urban and Regional Planning,
University of Waterloo. (Cross Appointment with Geography
Department).

1970-present Director and Co-founder Ecoplans Ltd.

1970-1977 Environmental Planner (part time), Ecoplans Ltd.

1969-1972 Lecturer, School of Urban and Regional Planning, University
of Waterloo.

EXPERIENCE

Dr. Kitchen is President of Ecoplans Ltd., Environmental Planners, Consulting Ecologists. His professional experience derives from acting as a Consultant to both the public sector (local municipality, County and Regional Municipalities, provincial and state governments and the Federal government) and the private sector (individual landowners, developers, major corridor operators). The scale of the projects range from sites less than one hectare to projects involving many thousands of hectares. Consulting services have included environmental studies in the following general areas. In each of the projects listed Dr. Kitchen was either project manager or a major participant.

TYPICAL PROJECT AND PROJECTS TYPES

Urban, Institutional, Industrial Projects

1. Erin Mills New Town: Secondary Plans, Draft Plans of Subdivision, Arborist Reports (17 years).
2. North Pickering Community Project with Plantown Ltd.
3. Townsend New Town Project: Ontario Ministry of Housing
4. Malvern New Town (Urban Tree Management) for Ministry of Housing (Ontario Housing Corporation).
5. Utica University Campus Study (SUNY) for New York State University Construction Fund.
6. Edwardsburgh Industrial Site Appraisal with M. M. Dillon for Ministry of Industry and Tourism.
7. Pelham South New Community Environmental Appraisal and General Impact Analysis.
8. Environmental Impact Statement for E.S.P.A. 59 and Cambridge West Community.
9. Glen Abbey (Oakville) New Community: Secondary and Draft Plans of Subdivision, Arborist Report.
10. Environmental Information Report - Heritage Glen Lands, City of Barrie.

EXECUTIVE SUMMARY

The commentary on the Biophysical Resource component of the environmental assessment was designed to supplement the biophysical information already presented to the Board. The report is divided into several sections including an overview of the biophysical resource status of Site D. The section dealing with Site F examines the site from an historical and regional perspective. Sections include Historical Context - Site F; Regional Context - Biophysical Resources; Status as an Environmentally Significant Area; and Restoration-Replacement Feasibility.

Ecoplans Ltd. generally agrees with the Region's consultants that for Site D there are minor biological constraints to the development of a landfill site whereas for Site F there are major biological constraints to its development as a landfill site. In addition, Site F is located within a more diverse regional environment and its deterioration may be more significant than the impact at Site D.

Several other conclusions pertaining to Site F include:

- Site F ranks, in terms of criteria met, as a solid ESA candidate particularly when its relatively small size is considered. Environmentally Sensitive Areas constitute a restricted resource base in the Region and face many of the same pressures as agricultural land.
- Site F is located in proximity to Sassafras Woods, an ESA and a priority unprotected Carolinian Canada site. The Carolinian forest association found at Site F is not well represented in Sassafras Woods or in the local area. The valued forest association at Site F should be considered as a component of the Sassafras Woods Complex.
- Site F biological communities are products of a long history of natural and anthropogenic influences. The history of disturbances does not negate its present biological significance.

- . The valued biological communities at Site F cannot be restored following the interim landfill use.
- . The designation and protection of sensitive natural areas should receive the same level of protection as other resource use including agriculture.

Engineering and Servicing Projects

1. Pickering Sewage Treatment Plant Site Analysis for Ontario Ministry of the Environment.
2. York-Durham Sewer (Ajax Pumping Station) for the Ministry of the Environment.
3. Mimico Landfill Environmental Impact Study for Metropolitan Toronto Region Conservation Authority.
4. Windsor Area Resource Recovery Project for the Ministry of the Environment.
5. Environmental Impact Statement for Storm Water Drainage System, Tapscott Industrial District, Scarborough.
6. Environmental Appraisal of Alternative Water Storage Sites for Regional Municipality of Waterloo.
7. Biophysical Inventory of Woodlands Surrounding the Burlington Landfill Site for Region of Halton.
8. Environmental Assessment of Alternative Sewage Treatment Plant Sites for the Town of Kemptville.
9. After Use Plan for Existing Regional Landfill Site for the Region of Waterloo.
10. Biological Inventory of the Proposed Sanitary Landfill Site, Township of Sydenham, for Henderson Paddon Associates.

Landscape Architectural/Restoration Studies

1. Byron Gravel Pit Renovation/Design Project, London, Ontario for Eli Comay and Associates.
2. Nordheimer/Cedarvale Ravine Study (rehabilitation), Toronto for Toronto Transit Commission.
3. Thames River Slope Rehabilitation, Design, Implementation and Monitoring for Union Gas Limited.
4. Pond Mills Station Design (Natural Landscaping) for Union Gas Limited.
5. Rehabilitation of Oakville-Bronte Creek Slopes, 1980, for Trans-Northern Pipe Lines Ltd.

6. Landscape Specifications for Pipeline Facilities for TransCanada PipeLines Ltd.
7. Information Requirements for Pipeline Development and Reclamation Application for Land Reclamation Division, Department of the Environment, Province of Alberta.
8. Rosedale Ravine Slope Rehabilitation Study for Manufacturers Life.

Corridor Studies

1. Environmental Assessment for Oil Pipeline from Nanticoke to Hamilton for Interprovincial Pipe Line Ltd. and Trans-Northern Pipe Line Company (including rehabilitation and tree planting).
2. Environmental Site Supervision, Nanticoke to Hamilton Oil Pipeline for Trans-Northern Pipe Line Company and Interprovincial Pipe Line Limited.
3. Environmental Assessment for Oil Products Pipeline -Clarkson-Oakville Loop. Trans-Northern Pipe Line Company.
4. Environmental Assessment for Oil Products Pipeline - Toronto Airport Junction to North Toronto Pump and Metering Station Loop. Trans-Northern Pipe Line Company.
5. Environmental Assessment for Gas Pipeline - Maple-Lisgar Loop for TransCanada PipeLines Limited.
6. Resource Mapping in North Central Ontario Regions 5, 6, 7A for Ontario Hydro.
7. Highway 8 By-Pass (Cambridge) for Ministry of Transportation and Communications.
8. Highway 11 (Sundridge) for Ontario Ministry of Transportation and Communications.
9. Highway 17 (Sault Ste. Marie section) for Ministry of Transportation and Communications.
10. Queen Elizabeth Way Highway Project (Hamilton section) for Ministry of Transportation and Communications.
11. Highway 406 (St. Catharines) for Ministry of Transportation and Communications.
12. Highway 402 (London) for Ministry of Transportation and Communications.

13. Highway 7 (Stratford Section) for Ministry of Transportation and Communications.
14. Environmental Assessment for Highway 89 Extension, Pickering Design Study for Ministry of Transportation and Communications.
15. Hamilton GO Rail Extension Study Environmental Assessment for Ministry of Transport.
16. Ontario Hydro - Study on the Economic Impact of Electric Transmission Corridor on Rural Property Values.
17. Pipeline Requalification Environmental Inspection and Management in Western Canada for TransCanada Pipelines Ltd.
18. Highway 416 (Region of Ottawa-Carleton) Corridor Study for Ministry of Transportation and Communications.
19. Queen Elizabeth Way (St. Catharines), Preliminary Design from Niagara Road 24 to Highway 405 for Ministry of Transportation and Communications.
20. Highway 6: Joint Utility-Highway Corridor, Environmental Assessment of Water Resources and Woodlots for Ministry of Transportation and Communication.
21. Blackburn Hamlet Bypass Environmental Study for Regional Municipality of Ottawa-Carleton.
22. Highway 8 East-West Arterial (Cambridge) for Regional Municipality of Waterloo.
23. Highway 89 Extension, Reg. Road 12 to Highway 7, Type II Environmental Assessment for Ministry of Transportation and Communications.
24. Highway 89 Extension, Madill Section, Highway 400 to Highway 11 -Environmental Assessment for Ministry of Transportation and Communications.
25. Highway 403 Woodstock, Type II Environmental Assessment for Ministry of Transportation and Communications.
26. Environmental Assessment, Temiscaming Extention for TransCanada PipeLines Ltd.
27. Environmental Assessment, North Line Phase I, Toronto to North Bay for Trans-Northern Pipe Lines Limited.
28. Environmental Assessment, North Line Phase II, Toronto to North Bay for Trans-Northern Pipe Lines Limited.

29. Environmental Assessment, Ottawa Lateral for Trans-Northern Pipe Lines Limited.
30. Environmental Assessment, Kerwood-Caradoc (NPS 42) Trafalgar Line for Union Gas Limited.
31. Environmental Assessment, Caradoc-Lobo (NPS 42) Trafalgar Line for Union Gas Limited.
32. Sydenham River Monitoring Program, Trafalgar System (NPS 42) for Union Gas Limited.
33. Environmental Assessment, Hamilton Reinforcement Line for Union Gas Limited.
34. Environmental Assessment, Propane Transfer Site, Flamborough Township for Interprovincial Pipe Line Limited.
35. Environmental Assessment of Dorval Drive/Upper Middle Road crossing of Sixteen Mile Creek for Town of Oakville.

Recreation, Parks and Open Space Studies

1. Aquatic Park (Toronto Outer Harbour) for Metropolitan Toronto and Region Conservation Authority.
2. Ecological Appraisal of the Metropolitan Toronto Zoo Project Site for Metropolitan Toronto and Region Conservation Authority.
3. Port Aberdeen Recreational Community Impact Analysis for Hedonics Corp.
4. Schneider Creek (Kitchener) Open Space Study (Vegetation and Wildlife) for the City of Kitchener.
5. Kitchener Parks and Open Space Study for the City of Kitchener.
6. Radium Springs, British Columbia. Land Management Study (for 17,000 acres).
7. Gatineau Park Inventory Methodology for National Capital Commission, Ottawa, Ontario.
8. Wetland Vegetation Impact and Management Study for the CJCL Tower rebuilding project on the Toronto Islands (Centre Island) for Telemedia Communications Inc.
9. Steckle's Woods E.S.P.A. 29: Environmental Impact Statement and Restoration Plan for the Regional Municipality of Waterloo.

10. Tommy Thompson Park Master Plan: Biological Model Development for Metropolitan Toronto Region Conservation Authority.
11. Milliken District Park: Master Planting Plan, Buffer Afforestation Area for City of Scarborough.
12. Pine Grove Sector Development Plan, National Capital Commission Greenbelt for National Capital Commission.
13. Riverside Park Interpretive Trail for the Handicapped, for the City of Cambridge.

Others

1. Albert Street Widening Study (Urban Forestry) for City of Waterloo and Downtown Ratepayers Association.
2. Central Ontario Aggregate Study (Ecological Impact) for Ontario Ministry of Natural Resources.
3. Seminar on Environmental Planning for the Urban Development Institute, Toronto (including preparation of background papers).
4. Agriculture in the Niagara Peninsula. A comprehensive report prepared for various landowners in the region as evidence in the O.M.B. hearing on the Regional Official Plan. Expert testimony was also provided.
5. Speyside Gravel Pit Environmental Assessment and N.E.C. Hearings for Standard Aggregates, a Division of Standard Industries Limited.
6. Class Environmental Assessment for Transit, for Ministry of Transportation and Communications and O.U.T.A.

PUBLICATIONS

"An Ecological Approach to Improving Urban Design", unpublished M.A. Thesis, University of Waterloo, 1969.

"Ecological Concepts in Subdivision Design", in A. G. McLellan (ed.) The Waterloo County Area: Selected Geographical Essays, Department of Geography Publication No. 1, University of Waterloo, 1971, pp. 255-265.

"Ecology and Urban Development", in R.R. Krueger and R.C. Bryfogle, Urban Problems: A Canadian Reader, Holt, Rinehart and Winston, Toronto, 1971, pp.282-186.

"The Role of Ecological Appraisal in Urban Development", in R.R. Krueger and R.C. Bryfogle, Urban Problems: A Canadian Reader (revised), Holt, Rinehart and Winston, Toronto, 1975, pp.254-263.

"Ecology and Urban Development: The Theory and Practice of Ecoplanning in Canada", in G.R. McBoyle and E. Sommerville (eds.), Canada's Natural Environment: Essays in Applied Geography, Methuen Press, Toronto, 1976, pp.217-240.

"Environmental Planning and Urban Development", (pp.29-42) and "Urban Development and Environmental Assessment", (pp.79-112), in R.S. Dorney, S.G. Rich and C.M. Kitchen, Environmental Planning, Ecoplans Ltd., Waterloo, Ontario, November, 1978.

"Environmental Management: A Project-Oriented Approach. The Port Aberdeen Recreational Community (Ontario)." Unpublished Ph.D. Thesis, University of Glasgow, Glasgow, Scotland, 1982.

A Tree Saving Manual For Developers, Builders, Designers, Arborists and Landscape Contractors. Working Paper 18, School of Urban and Regional Planning, University of Waterloo. 59 pp., 1984, with R. S. Dorney.

"Effects of Tree Conservation in the Urbanizing Fringe of Southern Ontario". Urban Ecology 9(1986) 289-308, with R. S. Dorney and Brent Evered.

BIOPHYSICAL RESOURCES

1.0 INTRODUCTION

This report has been designed to supplement the Biophysical Information that has already been entered as evidence before the Board. The review is based partially on an examination of the Biophysical Analysis Reports prepared by Bird and Hale Limited. The results of the Regional biophysical surveys are presented in the following reports:

EXHIBIT H-17 Halton Region Landfill Technical Study
Biophysical Analysis Report Site D

EXHIBIT H-18 Halton Region Landfill Technical Study
Biophysical Analysis Report Site F

In addition, the biophysical review completed by Ecoplans Ltd. included the following activities:

- . visits to both Sites D and F; Site F was visited on a number of occasions;
- . attendance at the Hearing during periods when biophysical issues were discussed;
- . review of transcripts and exhibits presented at the Hearing;
- . independent biophysical analyses at Site F
- . literature review dealing with environmentally sensitive areas and Carolinian Canada designations.

In general, Ecoplans Ltd. agrees with the Bird and Hale Limited reports as summarized in Ms. Hellas' witness statement (Exhibit H-8A, Tab. 2, page 9) where she states:

"SITE D:

There are minor biological constraints to the development of a landfill site.

SITE F:

With the diversity of vegetation habitat types and the rare plants, the site exhibits major biological constraints to the development of a landfill site."

The relative biological significance of the two sites is confirmed by studies completed independent of the Halton Region environmental assessment. Site D is included within the Ontario Waste Management Corporation study area PI-1N. The PI-1N site (378 hectares) is larger than the proposed Site D which lies in the southeast sector of the PI-1N site. The proposed acquisition area corresponds to the revised Site D area. The biophysical conditions are reported in Site Selection Process Phase 4A: Technical Appendix PI-1N Existing Biological Conditions (Gartner Lee Associates, September, 1985). The report concludes that:

"...no special vegetation associations or SEU's (Significant Environmental Units) are present. A total of 132 plant species is known from Site PI-1N, two of which are considered rare. Wildlife related data indicate the presence of 34 bird species, nine mammals, and one fish. None of these wildlife species is considered rare." (page [i])

As has been previously reported, Proctor and Redfern completed an Environmental Appraisal of Site F on behalf of N.S.P. in 1982. Excerpts of this report were entered as Exhibit WB-107. The report states that sections of Site F are environmentally significant and that the Site satisfies 5 of 9 criteria used to designate Regional Environmentally Sensitive Areas.

It is our understanding that a further biological study of the N.S.P. property was completed in the 1984 period but was not made public. The conclusions of this report are unknown.

2.0 APPROACH

There is no intention to replicate the detailed analyses that have been completed for both Site D and Site F by other investigators. It is our intention to highlight certain aspects of the biophysical environment that may assist the Board in evaluating the biophysical features of the two sites.

3.0 SITE D: BIOPHYSICAL RESOURCES

Both the O.W.M.C. report (PI-1N) and the Bird and Hale report (Exhibit H-17) conclude that the biophysical conditions at Site D provide relatively minor constraints to the development of the site for landfill purposes. Natural systems are restricted to two woodland areas. One woodland area is located along the western perimeter of the proposed site; the second in the south central section of the site.

The west woodlot will be impacted by the berm proposed for the western edge of the landfill site. A redesign of the berm adjacent to the woodland would permit retention of a significant component of this woodlot. The 6:1 slope condition for the berm was imposed for visual mitigation reasons. If the berm slope is revised to a 2:1 slope, approximately 30 metres of the forest edge could be retained providing a natural visual screen.

A section of the south central woodland will be retained. The relocation of a soil storage site would allow more woodland retention.

Resource use is limited to some fuel wood extraction and limited trapping. The biological community is not a significant component of a larger local or regional biological complex. Breeding bird atlas data indicate that Site D is located in a relatively low diversity area containing few uncommon birds species (i.e. birds with limited distribution).

4.0 SITE F: BIOPHYSICAL RESOURCES

The purpose of this section is to provide an expanded view of Site F in its regional, local and site context. The analysis completed by Bird and Hale was site specific and did not examine how the sites related to adjacent land areas and the regional environment. In order to expand the view we have examined Site F within a historical and regional context.

The report will comment on several subject areas including the following:

- . Historical Context: Site F
- . Regional Context: Biophysical Resources
- . Site F: Status as an Environmentally Significant Site
- . Restoration/Replacement Feasibility

4.1 Historical Context: Site F

The Township of East Flamborough, which then included Site F, was first surveyed in December 1831 by Abraham Tredelle. Several observations are included in the survey records that describe the landscape of the

general area. The following quotation taken from the surveyor's record gives some impression of the landscape as it may have appeared in 1831.

Tredelle states:

"The land on the Indian Line, from the Lake to 3rd Concession is an open White Oak plain to the mountain, the 3rd Concession is one chain on the mountain, on this line oak and pine plain and a level country to the large Creek on Lot 7 where the mountain breaks and trends to the West and intercepts the line again on Lot 12 between Lots 7 and 12, the Country an open White Oak Woods with deep hollows - on the South West line or boundary of the Township from the 3rd Concession to the Creek an open White Oak and Pine Plain from thence to the 5th Concession line." (Notes on Flamborough East: Book of Field Notes, p.177, Vol. 2)

The field notes specifically describing the Site F location were also reviewed, mainly the notations for Concession 1, Lots 2-3 and Concession 2, Lot 3. The notes for Concession 1, Lot 3, which includes the southern section of Site F describes the land at the top of ascent (possibly the Lake Iroquois Lake Shore Bluff) as Broken Land and Land Uneven with a brook Ascending. The notations for the remainder of the site are illegible. The records would indicate that the original forests were predominantly an open oak and pine plain type of forest community. Unlike many original survey records, more complete descriptions of vegetation characteristics at each chainage marker were not included.

The broken land cited in the historical records is caused by the numerous small streams including Falcon and Indian Creeks which have eroded into the bluff (Lake Iroquois Lake Shore Bluff) that runs east-west, north of the Burlington Bay shoreline. The erosion process has created numerous deeply incised stream channels. Due to the natural erosional process and exposed clay shale profiles this area has at times been described as the

Southern Ontario "badlands" or the Aldershots badlands reminiscent of the Alberta badlands associated with the Red Deer River. The upper and lower sections of the Indian Creek valleys on Site F and Falcon Creek are representative of the landscape which may have predated the early periods of shale extraction.

Historical records also indicate that an important post village (Waterdown) in Flamborough East Township on Grindstone Creek was first settled in 1822. Excellent free stone quarries near the banks of Grindstone Creek provided grindstones (which gave the Creek its name) for mills. The quarries were in operation in 1814 (Hamilton City Directory, 1853-1869).

In more recent decades, the general area of Site F was used for market gardens, fruit and vegetable production. The derelict orchards to the north of Site F are evidence of this earlier land use phase.

There has been a relatively long history of shale extraction in the general study area dating back to the mid to late 1800's. A family by the name of Easterbrooks arrived in 1859 and are reported to have operated two brickyards and lumber mills north of Plains Road. A third brickyard was located south of Plains Road and was owned by a William Gibbs.

The extraction of shale has persisted in the area until the present. However the method of extraction pattern has changed over the past decades. It would appear that the early shale clay extraction involved a relatively shallow extraction process involving the upper weathered clay and shale layers. The weathered shale at the bases of the incised valleys was also excavated. The ridge tops were often left unexcavated and forest cover has persisted in these areas.

The plant that processed the shale from the Site F area as well as the adjacent properties was located to the south of Site F in an area now within the Highway 403 right-of-way. Many of the roadways/pathways apparent on Site F date from the shale extraction period.

The most recent shale excavation at Site F would appear to be located in the southwest section of the site in the area currently licenced for shale extraction.

A review of a series of aerial photographs starting in the 1940's (1942, 1948, 1954, 1978) indicates that the shallow shale extraction on Site F occurred predominantly prior to 1940. Many of the woodlands observed on site today survived the early extraction process although they are more extensive today. The oak-hickory forest blocks highlighted in the Bird and Hale Report (Exhibit H-18) and Proctor and Redfern Report (Exhibit WB-107) are apparent in the earliest available set of aerial photographs. The 1942 aerial photographs indicate a fairly open forest canopy generally restricted to the ridge tops and slopes. Although direct evidence is lacking, the oak-hickory forest may have occupied a larger area prior to shale extraction, particularly in the "broken" land zone.

Nevin¹ has traced the evolution of the woodland resources within the Sassafras Woods landscape starting in 1934. Elements of the forest cover at Site F were well developed at the earliest period of analysis.

The 1942 aerial photographs show a dam and pond in the west central section of the site. The dam is of early 20th century construction. It has been suggested that the dam provided cooling water for an early 20th century tile kiln: slag and tile fragments were located in proximity to the structure.

¹ -----
Nevin, Scott Michael. The Ecological Viability of Environmentally Sensitive Areas in the Regional Municipality of Halton, Ontario. Unpublished M.A. Thesis, University of Guelph, December 1987.

The historical record reveals that the Site F landscape is a dynamic one responding to natural forces and man's activity over many decades. The present diverse landscape is the product of these dual influences.

4.2 Regional Context - Biophysical Resources

4.2.1 Vegetation

Proctor and Redfern (1982) examined a total of 55 woodlots in the general area; only two woodlots were found to have a forest community structure similar to that found at Site F. The two forest areas were to the northeast of Site F on the east side of King Road and to the southwest of Site F at the junction of Snake Road and the H.E.P.C. corridor. An additional similar woodland area is reported near Clappison's Corners to the northwest of the site. All of these forest communities occupy undulating slopes of exposed clay. The Proctor and Redfern report indicates that sections of Sassafras Woods, particularly in the south central area, bear some resemblance to the Site F forest communities. However, more recent work by Nevin (1987) indicates that while the oak-hickory component is present, the stand structure is different.

Sassafras Woods as a whole tends to be more mesic than the Site F forest community. For example the species composition for 3 woodland units along the east slope of Falcon Creek and 1 ravine woodlot in the north central section of Site F are compositionally different from the oak-hickory stands found on Site F. In each of these woodlots sugar maple is the dominant species, but they do contain white oak, red oak, shagbark and bitternut hickory. The forest communities on Site F are indicative of the more xeric forest community associated with the Carolinian forest system.

The south central woodland area, the oak-hickory forest, is not well represented in the general area, nor is the association well represented in the Sassafras Woodland area to the west. If removed, a distinct forest component of the Carolinian forest community will be lost.

Vegetation tends to form a continuum along environmental gradients. Moisture conditions are one of the most significant environmental factors. Under different moisture conditions, different species combinations tend to be found. Oaks and hickories tend to do well (higher importance value) on dry (xeric) sites; whereas sugar maple and white ash tend to do better on moister (mesic) sites. The oak-hickory forest community found at Site F reflects the drier site conditions which are found on site.

The location of the most significant forest communities on the ridge top and slopes are indicative of relatively dry site conditions. The shale substrate on Site F is porous but can be alternatively very dry or very wet. Only species tolerant of these extremes will persist and become dominant species on such sites.

The fluctuating moisture conditions may also contribute to the appearance of the forest stand, specifically its relatively low (<25 m) and open canopy (60-80% canopy closure). The area has also been cut in the past contributing to the relatively low and open nature of the tree cover. This type of forest community (species composition and physiognomy) while common in the United States, is not common in Ontario.

4.2.2 Wildlife Populations

We have no reason to question the botany or zoology findings in terms of species identified on the sites. The overall conclusion for both Site D and Site F was that the wildlife species in a regional context are "not unusual or unexpected in this region of the province", hence both sites have a "nil" impact rating" (Exhibit H-14, Appendix C, page 15).

In fact using the same Bird Atlas data it can be demonstrated that Site D and F are embedded in very different regional settings. The avian population of the Burlington area is more diverse and includes a component of less common species. Hence in the larger regional context, Site F is part of a richer wildlife zone. Using island biogeographical theory, destruction of a high quality sensitive area with high diversity such as Site F would be more likely to damage a regional ecosystem than removing a low diversity area such as Site D. This is due to colonization potential from a sensitive area acting as a node. We would contend that the loss of Site F resource base would have a more significant impact on the biological resource base.

4.3 SITE F: Status as an Environmentally Significant Site

4.3.1 Regional Environmental Sensitive Area

4.3.1.1 Designation Process

The question has been raised as to why the N.S.P./Site F site, which meets 5 criteria, was not designated as an Environmentally Sensitive Area in the original survey and designation process. The selection process is described in the Environmentally Sensitive Area Study (Regional Municipality of Halton 1978; pages 7-10).

The discussion indicates that candidate ESA's were established based on existing information; no systematic region wide survey was undertaken to identify potential ESA's. If a site had been visited and certain resource features identified, the site might be designated as a candidate site and subsequently evaluated. However, if a site had escaped the notice of the science/naturalist community it was unlikely to be listed as a candidate area. Existing land use, private property, perceived quality or aesthetic appeal all influenced the selection of candidate areas. Site F appears to have been a site that lacked in 1977, the "existing information" base that would have led to its selection and evaluation as a potential ESA.

In the Waterloo Region for example, a reassessment of natural areas in 1984, updating the 1975 work, identified 12 new candidate ESA's in addition to the 69 which had been designated. Another 2 ESA's have deteriorated to a point that warrant removal of their sensitive area status. The Region of Waterloo is now exploring the possibility of designating the 12 new sites

as ESA's. Thus errors of omission are clearly expected. The ESA policy process permits the addition or deletion of ESA's from the list as new information becomes available. One of the original 38 Region of Halton ESA's has been dropped from the list.

4.3.1.2 History of Disturbance

Despite the land use history of the site, Site F retains many qualities that contribute to it being an environmentally significant site. In fact, an argument can be made that the cycle of disturbance has contributed to the diversity of the site. Several of the plants listed as being significant are early succession or disturbance related species that have persisted because of the history of disturbance. There is no qualification or criteria within the Regional Environmental Sensitive Areas policy that would restrict or prevent an area with a history of similar disturbance from being designated as an environmentally sensitive area. The environmentally sensitive area study for the Region states:

"These sensitive areas may or may not have been significantly affected by current or past human activity and they may or may not require some form of management to restore, maintain or improve certain of their natural values." (page 15)

In fact in other jurisdictions, sites with a long history of disturbance are recognized as important Environmentally Sensitive Areas. Examples include the Toronto Brickyards site in the Don Valley, the Toronto Island wet meadow occupied by the CJCL Radio transmitter and the newly created Leslie Street Spit (Tommy Thompson Park). The idea that an ESA must be a pristine or undisturbed site is not supportable theoretically or in principle.

4.3.1.3 Site F: ESA Status

Based on the detailed analyses conducted by other investigators (Proctor and Redfern, 1982; Bird and Hale, 1986), Site F clearly does meet several criteria for designation as a Regional ESA. However, it must be stated that the whole of Site F does not qualify for the ESA designation. The primary area is the oak-hickory forest complex in the south central area of the site. Smaller outlier areas are also distinctive but are separated from the main block (valley/ravine units in north central zone). The most significant area is approximately 20 hectares in size.

As indicated above, various investigators have indicated that Site F meets several of the criteria which would lead to a site being designated as a Regional Environmentally Sensitive Area. Proctor and Redfern (1982, Exhibit WB-107) concluded that the site satisfies 5 out of the 9 criteria established by the Regional Municipality. The nine criteria are listed below; those satisfied by Site F are highlighted.

Criteria for selecting these highly sensitive areas for definition in Regional Official Plans and local zoning by-laws include, but are not necessarily restricted to, any one or combination of the following:

- * 1. The area represents a distinctive and unusual landform within the Region, Ontario or Canada.
- 2. The ecological function of the area contributes significantly to the healthy maintenance of a natural system beyond its boundaries by serving as a water storage, recharge, or discharge area, important wildlife migratory stopover or concentration point, or a linkage of suitable habitat between natural biological communities.
- * 3. The plant and/or animal communities of the area are identified as unusually high quality within the Region, Ontario or Canada.
- * 4. The area is a habitat with limited representation in the Region, Ontario or Canada, or a small remnant of particular habitats which have virtually disappeared within the Region.

- * 5. The area has an unusually high diversity of biological communities and associated plants and animals due to a variety of geomorphological features, soils, water, sunlight and associated vegetation and microclimatic effects.
- * 6. The area provides habitat for rare or endangered species that are endangered Regionally, Provincially, or Nationally rare.
- 7. The area is large, affording a habitat for species that require extensive blocks of suitable habitat.
- 8. The location of the area, combined with its natural features, make it particularly suitable for scientific research and conservation education purposes.
- 9. The combination of landforms and habitats is identified as having high aesthetic value in the context of the surrounding landscape.

Currently there are 37 areas designated as Regional ESA's. Table 1 provides a list of the ESA's, and indicates the approximate size and the number of criteria that each ESA meets. For the purpose of this report Site F has been added to the list. Of the 37 ESA's in the Region of Halton which meet the varying criteria, the frequency distribution is as follows:

One Criteria	- 1 site
Two Criteria	- 5 sites
Three Criteria	- 8 sites
Four Criteria	- 8 sites
Five Criteria	- 9 sites
Six Criteria	- 2 sites
Seven Criteria	- 3 sites
Eight Criteria	- 1 site
Nine Criteria	- none

It is apparent from this comparison that Site F, satisfying 5 criteria, is above the mid-point in terms of criteria met; it does not just "scrape by" but has solid E.S.A. potential in terms of number of criteria satisfied.

An examination of Table 1 indicates that many of the ESA's that satisfy several criteria are relatively large blocks of land, several in the 500 hectare or greater size range. The most significant section of

Table 1. Environmentally Sensitive Area's Criteria Summary

ESA No.	Name of E.S.A.	Approx. Area-Hectares	ESA Criteria Fulfilled (by Criteria #)									Total # Criteria Met
			1	2	3	4	5	6	7	8	9	
1.	Clappison Escarpment Woods	40.5	x					x		x	x	4
2.	Bridgeview Valley	44.5				x		x				2
3.	Grindstone Creek Valley	290	x	x			x	x				4
4.	Sassafras Woods	99				x		x				2
5.	Waterdown Escarpment Woods	138		x	x			x		x	x	5
6.	Nelson Escarpment Woods	91	x		x		x	x				4
7.	Lake Medad and Medad Valley	229	x	x	x		x	x				5
8.	Mount Nemo Escarpment Woods	215	x	x		x		x			x	5
9.	Lowville-Bronte Creek Escarpment Valley	350		x	x		x	x			x	5
11.	Bronte Creek Valley	526		x	x		x	x	x	x	x	7
12.	Fourteen Mile Creek Valley	44.5		x			x	x				3
13.	Iroquois Shoreline Woods	73	x		x		x	x			x	5
14.	Wildflower Woods	30				x	x	x				3
15.	Joshua Creek Valley	45	x		x	x	x	x				5
16.	Sixteen Mile Creek Valley	973		x	x		x	x	x			5
17.	Milton Heights	130	x	x							x	3
18.	Crawford Lake-Rattlesnake Point Escarpment Woods	593	x	x	x		x	x		x	x	7
19.	Calcium Pits	290	x				x	x		x	x	5
20.	Guelph Junction Woods	411		x		x	x	x	x			5
21.	Moffat Swamp	138		x	x			x				3
22.	Brookville Swamp	152		x				x				2
23.	Knatchbull Swamp	243		x				x				2
24.	Blue Springs Swamp	183		x	x			x				3
25.	Hilton Falls Complex	2818	x	x	x	x	x	x	x		x	8
26.	Blue Springs Creek Valley	395		x	x			x			x	4
27.	Fairy Lake Marsh				x	x		x				3
28.	Acton Swamp	144		x				x				2
29.	Speyside Escarpment Woods	498	x	x	x		x	x	x		x	7
30.	Waterfall Woods	320	x					x			x	3
31.	Limehouse Cliffs and Woods	152	x		x	x		x				4
32.	Silvercreek Valley	527	x	x			x	x	x		x	6
33.	Ballinafad Pond	16	x			x	x	x				4
34.	Snow's Creek Woods	122		x			x	x				3
35.	Terra Cotta Woods	304	x	x				x		x		4
36.	Georgetown Credit River Valley	230		x	x		x	x		x	x	6
37.	Hungry Hollow Ravine	212			x		x	x			x	4
38.	Ballinafad Esker	26	x									1
	Site F/NSP (Potential)	20	x		x	x	x	x				5
	TOTAL AREA	11,073*										

ADAPTED FROM: Environmentally Sensitive Area Study.
Regional Municipality of Halton, 1978

* Does not include Site F.

Site F where most of the criteria are met is relatively small (approximately 20 hectares). This could lead to the conclusion that the section of Site F that has the greatest potential for ESA candidacy is very rich in biological and physical resources.

The designation of Site F as a candidate Environmentally Sensitive Area could have occurred as early as 1982 when Proctor and Redfern in their Environmental Appraisal for N.S.P. identified "plant communities which are unique in Canada" (p.IV, Executive Summary) on the site.

Based on these interesting perceptions of independent groups of experts, an obvious critical question was bypassed: Since Site F had ESA-like quality, why was the site not excluded early in the site selection process? In the 1984 Summary Phase 2, Stage 2B - Selection of Candidate Sites the authors state that the selection was based on "the avoidance of designated Environmentally Sensitive Areas." In reality, a site is or is not of a quality to merit designation as an ESA. The designation process can incur errors of two types - errors of omission (information not known) and errors of commission (inappropriate designation). For Site F, however, as early as 1982 it was apparent the site met the quality criteria to merit designation.

The Environmental Impact Assessment designation process should be iterative, going back to its original criteria as new information is developed. This would not appear to have been done explicitly within the present process. Rather the "mitigation" proposed devastates the potential E.S.A. without eliminating explicitly the original selection criteria. Hence, we think that a serious conceptual error has occurred: an E.S.A. exists in fact or it does not. The designation process is not cast in stone. Hence once Site F was known to meet the stated criteria it should have been dropped from consideration, or the site selection rules should

have been changed. Had the rules been changed, perhaps new sites would have been found as 11,073 additional hectares comprising the 37 environmentally sensitive areas could have been added to the land area available for the study of candidate sites.

Also the biophysical components of the ESA should not be viewed in a reductionist manner whereby each species or criteria is assessed individually; at Site F it is the biophysical complex that is significant. Also the proximity of the Site F priority area to Sassafras Woods, a Regional ESA (#4) and an area that has been assigned priority status under the Carolinian Canada program, cannot be ignored. The two areas are complementary environmental areas.

The Halton Region Conservation Authority (January 13, 1987) report to the Region states (p.26):

"The bio-physical environment of Site F fulfills sufficient criteria to warrant designating it as an Environmentally Sensitive Area... The Environmentally Sensitive Areas are the most significant natural areas in Halton. However, the agricultural component of Site D is represented at a number of locations in Halton and cannot be regarded as one of the most significant of Halton's cultivated lands. ...A weighted ranking system would have more accurately emphasized the differences between the bio-physical and agricultural factors."

In addition, the Regional Ecological and Environmental Advisory Committee stated:

"The subcommittee finds it difficult to accept the conclusion reached by the consultants that there are no biological conditions that warrant precluding Option 3, as landfill site. On the contrary the considerable evidence presented in the Biophysical Reports, not only supports the preservation of this area but reinforces its candidacy as a potential Environmentally Sensitive Area." (Regional Municipality of Halton 1986/11/12 Report CA0 295/86 Receiving Comments from Ecological and Environmental Advisory Committee Halton Landfill Site Selection Subcommittee

There appears to be a consensus of opinion that Site F does have the qualities that qualify it as a candidate Regional Environmentally Sensitive Area.

4.3 Carolinian Canada

The Carolinian life zone is located in extreme southern Ontario. It has long been recognized as an area unique in Canada. Many species of plants and animals occur here and nowhere else in the country. The inherent significance of the remaining natural areas, combined with the continued loss of habitat to agriculture and urban development has led to the development of the Carolinian Canada program sponsored by The Nature Conservancy of Canada, Ontario Heritage Foundation and World Wildlife Fund Canada. The objective of the program is to develop an overall conservation strategy for the Carolinian life zone.

Part of the overall Carolinian Canada program is the identification of critical natural areas which are presently unprotected. The Identification Subcommittee of Carolinian Canada identified from an extensive list of potential sites , 36 sites which are considered the most significant unprotected sites in the Carolinian life zone. Sassafras Woods is included as one of the critical unprotected areas. The final selection report states:

"The September 6, 1984 committee meeting selected the Sassafras Woods and adjacent areas for inclusion in this report. At this time the exact number and boundaries of these adjacent forests have not been clearly determined. It is the Chairman and Vice-Chairman's view that this work should be undertaken as additional information becomes available for these forests but is not available publicly, as of yet."

Carolinian Canada (1985) Critical Unprotected Natural Areas in the Carolinian Life Zone of Canada. Carolinian Canada (page 325).

Background data for Sassafras Woods complex is included as Appendix A.

The oak-hickory forest association on Site F is clearly Carolinian in nature. Bird and Hale states:

"Many of the forest habitat areas are typical of the Deciduous Forest Region and the Carolinian Floristic Zone. In particular areas support associations of oak and hickory. Although hickory is a common component of the deciduous forest stands in southwest Ontario, this association is reaching the northern limits of its range in Halton." Exhibit H-18

The oak-hickory association found on Site F is not well represented in the Sassafras Woods area to the west and at a more regional scale. Oak and hickory species are present within the Sassafras Woods Complex but the particular association is not. The Site F forest complex may in fact be one of the adjacent forest areas being considered for inclusion in the priority unprotected natural areas.

4.4 Restoration/Replacement Feasibility

There are many competing demands for both agricultural lands and the lands supporting the Environmental Sensitive Areas. The Ministry of Agriculture and Food strongly advocates the return of lands to agriculture following an interim use such as aggregate extraction or sanitary landfill. In many cases this is a difficult process and rehabilitation technology is still developing. However, some level of success has been achieved in rehabilitation of disturbed land to agricultural uses. A body of experience is developing that will help guide the return of such lands to agriculture.

However, we do not have the same body of experience in restoring or recreating natural areas following some interim use. There is a fundamental question as to whether a "natural" area can be recreated. In any case, the biological community will not be the same as the one lost

because the site conditions are so drastically changed. It is possible to rehabilitate an area to vegetation but it is not possible to restore a site to Environmentally Sensitive Area status.

Many rehabilitation undertakings involve "plant community restoration". This term may be defined in a number of ways. In essence the term refers to the active creation or re-creation of a group of species that resembles a natural community. There are two basic ways by which this process can be evaluated. The first approach emphasizes community structure and species composition and judges the success of a restoration effort by asking how closely the end community resembles the original or a model community. This assumes that if one can accurately reproduce a species grouping (model) then the dynamics and functions of the community will also resemble those of the model community. Fundamental questions are whether we understand the ecological dynamics of plant communities in great enough detail to reproduce the "model" community that we presently have on Site F, or whether we know how long it will take to achieve the replication of the "model" community.

The second and more common approach emphasizes ecological function often with little or no reference to species composition. The presence or absence of a particular species or grouping of species is less significant than the provision of functional characteristics such as nutrient cycling, erosion control or simply greening of the landscape. I would suggest that the after-use proposed for Site F follows the second approach. The second approach is much less demanding because it is not necessary for the rehabilitated community to resemble the model community.

The restoration of a landscape to a model community is complex and takes time. Whereas a prairie restoration may begin to resemble a natural prairie within a few years, woodlands take much longer to mature. The ultimate success of the restoration program cannot be assessed for many years.

At this point in time, it is reasonable to state that the replacement or restoration of the model community (the oak-hickory forest) on the completed landfill site is not possible given our present state of knowledge. At best what can be achieved is a simplified replacement of the original ecosystem.

Given the present attitude of society, the potential loss of a major component of the Site F sensitive area could be considered as significant as the loss of agricultural land. The Environmentally Sensitive Areas are the most sensitive natural areas in Halton. The Environmentally Sensitive Areas constitute a restricted resource base with much less potential for restoration or replacement following the interim landfill period. The Regional ESA land resource base contains 11,073 hectares or approximately 11.5% of the land base of the Region of Halton (total area: 98,305 hectares).

Much of this land is located along the Niagara Escarpment or along major river valleys. For example, the Hilton Falls Complex (ESA 25) contains 2,828 hectares and the Crawford Lake Rattlesnake Point Escarpment Woods contain a further 593 hectares; both are located on the Niagara Escarpment.

In 1986, Halton Region reported approximately 48,000 hectares of farmland or 50% of the total land area. The agricultural component of Site D is represented at a number of locations in Halton and may not be the

most significant of Halton's cultivated lands. In terms of the Regional land base it would appear that the ESA's are relatively more scarce than agricultural lands in the Region of Halton and I would expect throughout much of Ontario. They face many of the same pressures faced by farm land.

During the Hearing, arguments were presented that it was not possible to return all of Site D to agricultural use and that there would be some loss of productivity for a period of time for those areas returned to agriculture. A similar but stronger argument can be made for Site F; it is not possible to restore the sensitive area to a condition that will resemble the model community we have today. At best, we can rehabilitate the Site to a simplified forest community which will have little resemblance to the existing valued biological community.

Many local and Regional municipalities throughout Ontario have included natural areas or sensitive area policies within their Official Plans. The Region of Halton has designated 37 areas as ESA's; however, it should not be interpreted that these 37 areas are the only areas which meet the criteria or should be protected. For example, when the natural areas in the Regional Municipality of Waterloo were investigated in greater detail in 1984, twelve additional areas were identified as meeting the criteria for designation as ESA's and are now being considered as candidate sites. In fact in terms of the number of criteria met, several of the new candidate areas are superior in quality to several of the designated sites such as is the case with Site F in the context of the Regional Municipality of Halton.

Recent government announcements would indicate that provincial policies for the protection of natural landscapes are developing and may eventually parallel the level of concern given to agricultural lands. Several announcements by the Minister of Natural Resources (Vince Kerrio,

May 29, 1987) regarding the designation and possible purchase of 36 priority Carolinian forest areas is an example of this increased level of concern. The provincial government pledged \$1.8 million to assist the Carolinian Canada program.

The wetlands policy and the protection of M.N.R.-ANSI (Areas of Natural and Scientific Interest) areas would also appear to reflect increased concern for natural areas in Ontario. The Minister pledged that the government would bring in tough new guidelines to protect the 564 Areas of Natural and Scientific Interest in Ontario and that it would create an Ecological Reserve Act to "afford unprecedented legal protection (to) ecological areas in Ontario".

5.0 CONCLUSION

The preceding discussion has attempted to view the proposed landfill sites in a more regional perspective. The following conclusions about the two sites are presented.

- . Site D has minor biophysical constraints to proposed development of a landfill site. With slight modifications to the design of the landfill (berms, spoil piles), large components of the existing woodland area can be retained.
- . Site D is located in an area with relatively low biological significance measured in terms of avian diversity and rarity.

- . Site F has major biophysical constraints to the development of a landfill site. On site resources - the Carolinian forest associations, the diversity of habitats, the relatively rich flora and the presence of provincially and regionally significant species - combine to produce a valued biological resource base.
- . Site F is located in an area of considerable biological significance in terms of wildlife and birds.
- . Site F is located in close proximity to Sassafras Woods, a priority unprotected Carolinian Canada site. The Carolinian forest association found at Site F is not well represented in Sassafras Woods nor in the general area. Site F should be considered for inclusion in the Sassafras Woods complex.
- . Site F woodlands are the result of a long history of natural and man-made influences. The influence of man has helped create the current diverse landscape. Past disturbance does not negate the biological value.
- . In terms of the Regional land base, Environmentally Sensitive Areas constitute a small restricted resource base and face many of the same pressures as agricultural lands.
- . Site F ranks, in terms of criteria met, as a solid ESA candidate particularly when its small size is considered.

- . The valued ecosystem at Site F cannot be restored following the interim landfill period. The proposed mitigation results in the loss of the higher quality biological areas.
- . Sensitive natural areas should receive the same level of designation and protection as agricultural land.

APPENDIX

APPENDIX

SASSAFRAS WOODS

The September 6, 1984 committee meeting selected the Sassafras Woods and adjacent areas for inclusion in this report. At this time the exact number and boundaries of these adjacent forests have not been clearly determined. It is the Chairman and Vice-Chairman's view that this work should be undertaken as additional information becomes available in the medium term. Considerable amounts of field information is available for these forests but is not available publicly, as of yet,

**SASSAFRAS WOODS**

E.S.A. NO 4



Photo Courtesy of Royal Botanical Gardens

General Description

Sassafras Woods supports a secondary growth hardwood forest overstoryed with mature White Pine on a gentle south-facing slope. This is one of the few remaining sizeable woodlots typical of the woodland that once covered most of the Region south of the Escarpment (W. Crins, Pers. comm. 1976). Five small valley systems extend into the area along a north-south axis producing a profile of plateaus alternating with shallow depressions. Soils are deep red clay. The forests of the plateau are quite immature but become more mature in the depressions. Sugar Maple is dominant, with Shagbark Hickory, Witch Hazel, American Hornbeam, and Red Oak well represented. This relatively large woodlot is transected by three hydro lines.

E.S.A. NO 4



HALTON REGION

E.E.A.C.

ENVIRONMENTALLY SENSITIVE AREA STUDY

E.S.A. NO 4

Criteria Fulfilled

Criterion Four:

The long growing season and the immaturity of sections of Sassafras Woods provide suitable conditions for Carolinian species such as Sassafras (Sassafras albidum), Eastern Flowering Dogwood (Cornus florida), and Common Hoptree (Ptelea trifoliata). This woods contains the largest number and best quality of Sassafras and Flowering Dogwood in Halton Region. These Carolinian species are near the northern limit of their range in Ontario. Thus their presence indicates a very unusual habitat for Halton Region. (P. Maycock, Pers. comm. 1976).

Criterion Six:

The most significant plant species found is Common Hoptree (Ptelea trifoliata). Not only is this tree considered nationally rare and provincially rare, but it may be the only known spontaneous specimen in Halton Region (P.F. Rice, Pers. comm.)

A number of other nationally and provincially rare plants are found:

American Columbo (Swertia caroliniensis)
 Eastern Flowering Dogwood (Cornus florida)
 Large-bracted Tick Trefoil (Desmodium cuspidatum)
 Honey Locust (Gleditsia triacanthos)
 Red Hickory (Carya ovalis)

Sassafras albidum, a nationally significant species is represented by a healthy colony of about 25 trees reaching heights of 35 feet. Also found in the area is Yellow Ladies' Slipper (Cypripedium calceolus) and Three-leaved False Solomon's Seal (Smilacina trifolia), both regionally rare.

Uncommon birds include Whip Poor-will (Caprimulgus vociferus), Golden-crowned Kinglet (Regulus satrapa), and Ruby-crowned Kinglet (Regulus calendula). (M. Ilyniak, Pers. comm. 1977).

E.S.A. NO 4



HALTON REGION

E.E.A.C.

ENVIRONMENTALLY SENSITIVE AREA STUDY

E.S.A. NO 4

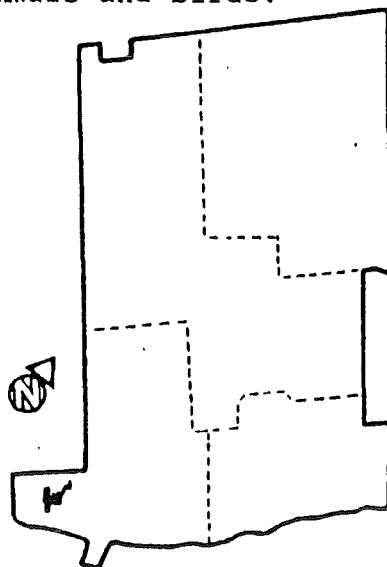
General Comments

At present the major impact on the area is noise. Traffic from Highway #403 and North Service Road, as well as trail bikes in the eastern section of the woodlot are major contributors. The trail bikes have also created local soil disturbances and trampled vegetation especially on the east side of the western valley. This unnecessary destruction of habitat is a continuing problem and may seriously deface the woodlot if it is not curtailed.

Another impact may come from residential development which currently is concentrated along the western valley.

Sassafras Woods may not be well protected because of its private ownership, proximity to a major traffic artery, and its "Complementary Use" designation within the Parkway Belt West Plan. The Ontario Land Inventory has classified the most easterly valley as hazard land.

One of the last remaining sizeable woodlots below the Escarpment, this part of the Region should be protected from the adverse affects of development and from abuse by trail bikes. The eastern-most valley with its fairly mature sugar maple forest extending to connect Sassafras Woods to the Waterdown Escarpment Woods provides a good linkage between the two areas. The only separation between them is a large hydro corridor, which should be revegetated to reduce the obstacle for mammals and birds.



E.S.A. NO 4



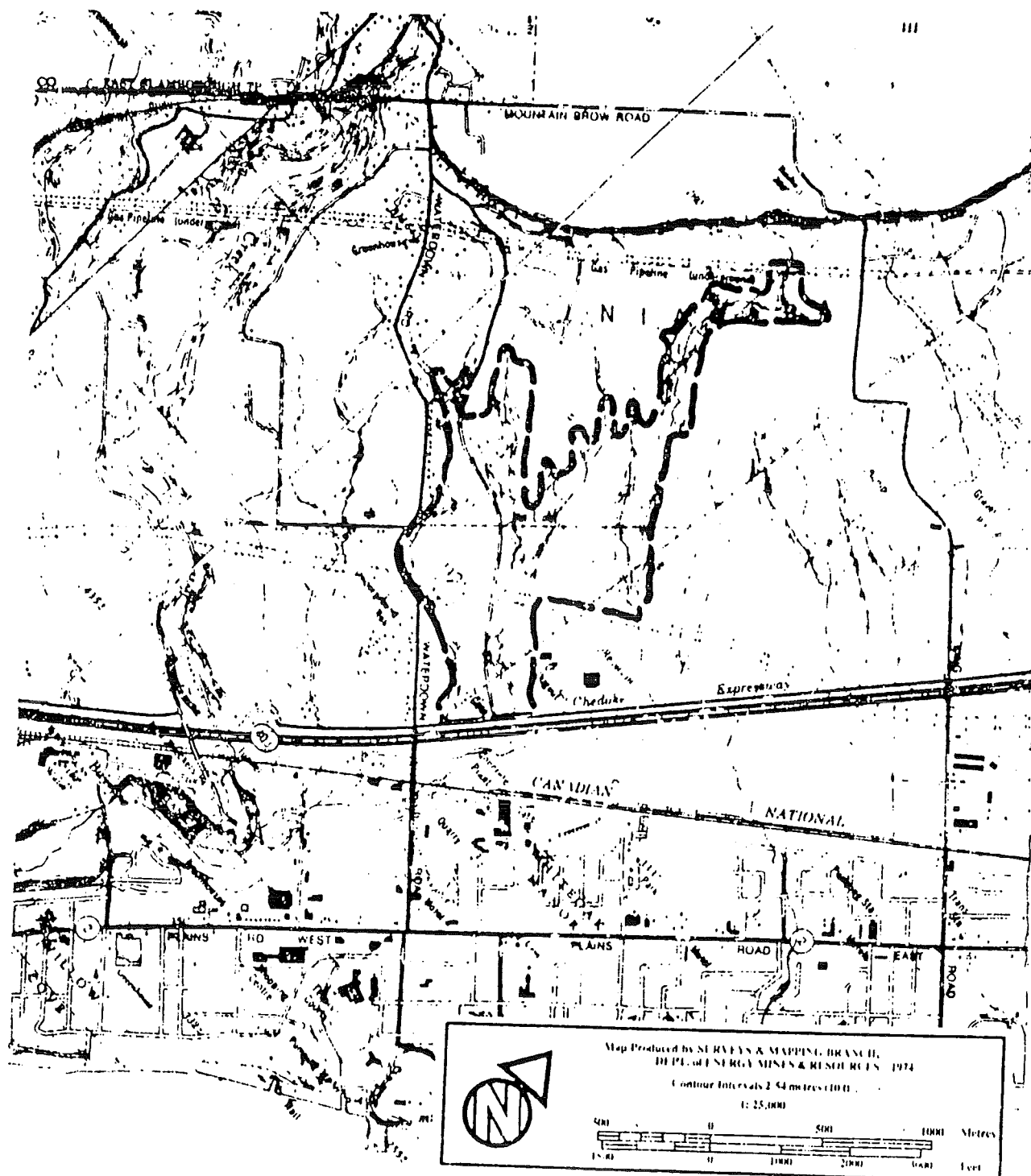
HALTON REGION

ENVIRONMENTALLY SENSITIVE AREA STUDY

E.E.A.C.

SASSAFRAS WOODS

E.S.A. NO 4



E.S.A. NO 4

NAME Sassafras Woods		MAP NAME		MAP NUMBER	UTM REF.
COUNTY, DISTRICT or REGIONAL MUNICIPALITY Halton Formerly Wentworth		LAT. ° 'N	LONG. ° 'W	ALT. MIN.	MAX.
LOCALITY ½ mile North of Aldershot		1:50,000 NTS MAP SHOWING AREA BOUNDARIES 1:250,000			
TOWNSHIP	LOTS	CONCESSIONS			
East	6	I			
Flamborough					
AREA acres ha					
OWNERSHIP					
ADMINISTRATION					
FOREST REGION AND DISTRICT		SITE REGION AND DISTRICT 7			
MNR REGION AND DISTRICT		CONSERVATION AUTHORITY			
AERIAL PHOTOGRAPHS BASE MAP: YEAR ROLL FLIGHT LINE NUMBERS					

PHYSICAL AND BIOLOGICAL FEATURES

This tract of attractive forests is one of the largest areas of forest in East Flamborough Township apart from Niagara Escarpment lands. At the southern end it is associated with the Iroquois Beach Shoreline and northward with a series of sharply cut valleys of tributaries of the grindstone Creek. On the old beaches there is a large rectangular block dominated by Quercus rubra with Acer saccharum, Quercus alba, Carya ovata, Ostrya virginiana, scattered Pinus strobus and such interesting components as Cornus florida (north limit), Castanea dentata (fruiting), Sassafras albidum and extensive Hamamelis virginiana. Uncommon understorey plants included are Collinsonia canadensis, Anemonella thalictroides, Swertia caroliniana, Sphenopholis intida, Desmodium cuspidatum and Polygala verticillata. The northern segments are forested with Pinus strobus, Ostrya virginiana, Carpinus caroliniana, Acer saccharum, Quercus rubra, Fagus grandifolia, Carya ovata and Quercus alba. It contains abundant Amelanchier arborea. This tract is not only diverse and interesting floristically but it forms an integral landscape link with the adjacent Escarpment.

DATA SHEETS ATTACHED		SUMMARY SPECIES LISTS		MAJOR INFORMATION SOURCES	
PHYSICAL DESCRIPTION	☐	PHYSICAL FEATURES MAP	☐	Halton Region Environmentally Sensitive Areas report, 1978.	
VEGETATION SUMMARY	☐	VEGETATION MAP	☐		
EVALUATION SHEET	☐	BIBLIOGRAPHY	☐		
COMMUNITY DESCS.	☐	PHOTOGRAPHS	☐		
COMMUNITY COMP. LISTS	☐				

EVALUATION AND PRIORITIES	
DATE COMPILED MAY 1984	COMPILER PAUL F. WATSON

