Consolidated Hearings Board File No. CH - 86-02

IN THE MATTER OF SECTION 13 of the Consolidated Hearings Act, 1981, S.O. 1981, c.20;

- and -

IN THE MATTER OF an application by the Regional Municipality of Halton for:

(a) the acquisition of land for the construction, operation and maintenance of a sanitary landfill site to contain 7.96 million cubic metres of waste in the Regional Municipality of Halton by one of two alternative methods as follows:

(i) landfilling at the site referred to in Halton's Environmental Assessment as Site "F" in the City of Burlington;

(ii) landfilling at the site referred to in Halton's Environmental Assessment as Site "D" in the Town of Milton.

APPLICATION

OF

NSP INVESTMENTS LIMITED

TO

THE HONOURABLE,

THE LIEUTENANT GOVERNOR IN COUNCIL

Filed on Behalf of:

NSP INVESTMENTS LIMITED

By: Messrs. Fasken & Calvin
Barristers & Solicitors
Box 30, Toronto-Dominion Bank Building
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Eleanore A. Cronk; and
Leonard J. Griffiths

Of Counsel for NSP Investments Limited

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IN THE MATTER OF Sections 2 and 3 and 6(3) of the Consolidated Hearings Act, 1981, S.O. 1981, c.20;

- and -

IN THE MATTER OF Section 12(2) of the Environmental Assessment Act, R.S.O. 1980, c. 140;

- and -

IN THE MATTER OF Sections 30, 35 and 38 of the Environmental Protection Act, R.S.O. 1980, c. 141, as amended;

- and -

IN THE MATTER OF Sections 24 and 61(2) of the Ontario Water Resources Act, R.S.O. 1980, c.361, as amended;

- and -

IN THE MATTER OF Section 28(3) of, and Regulation 164 under, the Conservation Authorities Act, R.S.O. 1980, c.85, as amended;

- and -

IN THE MATTER OF Section 40(12) of the Planning Act, S.O. 1983, c.1, as amended; in connection with site plan control of the sanitary landfill site;

- and -

IN THE MATTER OF Section 22(1) of the Planning Act, 1983 in connection with a referral to this Board by the Honourable Bernard Grandmaitre, Minister of Municipal Affairs, on a request by the Regional Municipality of Halton to amend the Official Plan for the Town of Milton to redesignate a parcel of land comprising Part Lots 3 and 4, Concession 2 N.S. in the Town of Milton from "Agriculture" and "Conservation and Hazard Lands" to permit the construction, operation and maintenance of a landfill site, Minister's File No. 24-OP-0208-A01;

- and -

IN THE MATTER OF Section 34(11) of the Planning Act, 1983 in connection with an appeal to this Board by the Regional Municipality of Halton for an order directing an amendment to By-law 61-85 of the Town of Milton to rezone the lands situated at Lot 3 and part of Lot 4, Concession 2 N.S., in the Town of Milton from "Agriculture" to permit a regional sanitary landfill site and ancillary uses;

- and -

IN THE MATTER OF Section 15(1) of the Planning Act, R.S.O. 1980, c.379 in connection with a referral by the Honourable Claude F. Bennett, Minister of Housing on a request by Tremaine Britannia Citizen's Group for consideration of part of the Official Plan for the Halton planning Area with respect to Sections 1 to 5 inclusive, 7, 9 and 10 of Part III D3 Solid Waste Management, Minister's File No. OPC-0026;

- and -

IN THE MATTER OF Section 64 of the Ontario Municipal Board Act, R.S.O. 1980, c.347, as amended in connection with an application by the Regional Municipality of Halton for an order approving:

(a) the acquisition of land for the construction, operation and maintenance of a sanitary landfill site to contain 7.96 million cubic

metres of waste in the Regional Municipality of Halton and to do so by one of two alternative methods as follows:

(i) landfilling at the site referred to in Halton's Environmental Assessment as Site F in the City of Burlington;

(ii) landfilling at the site commonly referred to in Halton's Environmental Assessment as Site D in the Town of Milton

at an estimated cost of $12,775,000.00, and the borrowing of money by way of temporary advances not exceeding in the aggregate such estimated cost pending the sale of debentures, and

(b) the issuance of necessary debentures to a maximum of $12,775,000.00 for a term not to exceed fifteen years;

- and -

IN THE MATTER OF Section 193(5) and Paragraph 84 of Section 210 of the Municipal Act, R.S.O. 1980, c.302, as amended;

- and -

IN THE MATTER OF Sections 6, 7 and 8 of the Expropriations Act, R.S.O. 1980, c.148;

- and -

IN THE MATTER OF an undertaking of the Regional Municipality of Halton to provide facilities for the purpose of receiving, dumping and disposing of waste as required by section 137 of the REGIONAL MUNICIPALITY OF HALTON ACT, R.S.O. 1980, c.436, as amended, by acquiring the land for, constructing, operating and maintaining a landfill to contain 7.96 million cubic metres of waste in the Regional Municipality of Halton;

APPLICATION

OF

NSP INVESTMENTS LIMITED

PART I – SUMMARY AND GROUNDS OF APPLICATION

To The Honourable, The Lieutenant Governor in Council:

1. May it please The Honourable, The Lieutenant Governor in Council, NSP Investments Limited (hereinafter referred to as "NSP"), the Applicant herein, hereby makes application to the Lieutenant Governor in Council and requests the relief hereinafter summarized:

A. That the Decision of the Joint Board (hereinafter referred to as the "Board"), dated 24 February 1989, together with Addendum dated 2 March 1989, rejecting the

application of the Regional Municipality of Halton (the "Region") for approval to proceed with landfilling at the site referred to in the Region's Environmental Assessment as Site "F" in the City of Burlington, and approving the Region's application to proceed with landfilling at the site referred to in the Region's Environmental Assessment as Site "D" in the Town of Milton, subject to the Conditions set out in the Decision of the Board and directing the Approvals Director to issue a Certificate of Approval in accordance with the Conditions set out therein, be rescinded and a decision be substituted therefor that authorizes the Region to proceed with landfilling at Site "F" in accordance with the design proposed by the Region before the Board and subject to the conditions of approval proposed at the Hearing by the Ministry of the Environment;

B. In the alternative, that the Board's Order be varied and rescinded, as particularized in Part V hereof, so that the following findings of the Board are rescinded:

(i) the finding that Site "F" is hydrogeologically "unsuitable" and "unacceptable" for landfilling without a liner;

(ii) the finding that Site "F" is hydrogeologically "unsuitable" and "unacceptable" for landfilling with a liner;

(iii) the finding that Site "F" is otherwise unacceptable in the Public Health and Safety category for landfilling with or without a liner;

(iv) the finding that sanitary landfills which permit leachate losses in accordance with the Reasonable Use Policy (as hereinafter described) of the Ministry of the Environment are unacceptable;

(v) the finding that Site "D" is "acceptable" and "suitable" for landfilling as proposed by the Region notwithstanding the Region's failure, as proponent, to comply in the case of Site "D" with the Engineered Facilities Policy and Guideline (as hereinafter described) of the Ministry of the Environment;

(vi) the finding that Site "F" is unacceptable for landfilling from a planning perspective;

(vii) the finding that Site "D" is hydrogeologically "suitable" and "acceptable" for landfilling on the basis of the evidence presented to the Board; and

(viii) the finding that the economics of landfilling by the Region favours Site "D".

C. This Applicant respectfully requests, the following substituted findings:

(i) that Site "F" is acceptable for sanitary landfilling on the basis proposed by the Region and subject to the conditions of approval proposed at the Hearing by the Ministry of the Environment;

(ii) that, in any event, Site "F" is acceptable for sanitary landfilling if designed with a liner as referred to (but not proposed as necessary) in the conditions of approval proposed at the Hearing by the Ministry of the Environment and subject to approval by the Director of Approvals of the Ministry of the Environment;

(iii) that, in appropriate circumstances, sanitary landfills which permit leachate losses in accordance with the Reasonable Use Policy (as hereinafter described) of the Ministry of the Environment are acceptable;

(iv) that Site "D" is unacceptable and unsuitable for sanitary landfilling as proposed by the Region on the basis of non-compliance with the Engineered Facilities Policy and Guideline (as hereinafter described) of the Ministry of the Environment;

(v) that Site "F" is acceptable for sanitary landfilling from a planning perspective;

(vi) that it is uncertain, on the evidence that was available to the Board, whether Site "D" is hydrogeologically acceptable for sanitary landfilling with or without a liner; and

(vii) that the economics of sanitary landfilling by the Region, on the evidence available to the Board, do not favour Site "D" over Site "F".

D. In the further alternative, that a rehearing of the Region's application for approval to proceed with landfilling at Site "F" in the City of Burlington be required on the matters set out in (B) above, because of the Board's errors.

2. The first ground of this Application is that *the Board declined to approve landfilling by the Region at Site "F" on the basis that Site "F" was hydrogeologically "unacceptable" and "unsuitable" for landfilling and that, in the Public Health and Safety category overall, Site "F" was unacceptable for landfilling and, in so doing, the Board substituted its own opinion for that of all hydrogeology experts who testified before it.* The Board came to these conclusions in the absence of any expert evidence from any hydrogeologist that Site "F" was not now or could not be made by engineering measures safe for landfilling. As is manifestly clear from the hydrogeological evidence before the Board, these conclusions were reached by the Board in the face of unanimous and unequivocal expert evidence to the contrary.

3. The second ground of this Application is that the Board's Decision and Reasons establish that the only basis upon which sanitary landfilling may be approved is in reliance on a "total containment" engineering system. *This conclusion directly conflicts with express Ministry policy on the reasonable use of groundwater and has serious long-term implications for the availability of sanitary landfill sites in Ontario and for landfill applicants, which implications were not considered by the Board.*

4. The third ground of this Application is that *the Board's Decision to approve landfilling at Site "D", on the basis of the evidence available to the Board, directly conflicts with express Ministry policy on engineered facilities for landfills and constitutes approval of a sanitary landfill in the face of unresolved questions regarding public health and safety.*

5. The fourth ground of this Application *relates to the Board's implicit finding that Site "F" is unacceptable for sanitary landfilling from a planning perspective.* The evidence of all planning experts heard by the Board was that Site "F" was acceptable for landfilling based on planning considerations and, further, (with the exception only of 1 of 6 planners) that Site "F", on planning grounds, was to be preferred over Site "D" for landfilling. The exception planner, Mr. Ian MacNaughton, testified that both Sites were acceptable.

6. The fifth ground of this Application is that the Board, in approving Site "D" for landfilling, failed to address itself to critical evidence regarding public

health and safety concerns at Site "D" and, further, ordered engineering measures at Site "D" in the absence of any supporting engineering evidentiary basis therefor.

7. The sixth ground of this application is that *the Board overturned the carefully considered decision of the Region of Halton's duly elected representatives to prefer Site "F" for landfilling in the Region, a matter of extreme importance to the Region and citizens of the Region, including NSP Investments Limited.* The evidence heard by the Board and cited in its Reasons for Decision and Decision was not of such a convincing and compelling nature as is required to overturn such a decision. Further, and as is manifestly clear by a reading of its Reasons, the Board overturned the Region's decision for a preference for landfilling at Site "F" without giving the necessary and required consideration to the resulting range of consequences for the availability of sanitary landfill sites in Ontario and for NSP Investments Limited.

8. The further grounds of this Application, which are particularized in Part IV-G of this Application, are summarized hereunder:

- *the Board made numerous errors and seriously misconstrued the evidence in its Reasons;*
- *in other instances the Board failed in its Reasons to address itself to relevant evidence on issues related to the suitability of Sites "F" and "D" for landfilling; and*
- *the Board in its Reasons on matters of hydrogeology and planning substituted its own opinion for the opinion of experts duly qualified to testify on these issues before the Board and, in so doing, failed judicially to exercise its proper functions.*

PART II – GENERAL BACKGROUND

A. Site "F" AND NSP INVESTMENTS LIMITED ("NSP")

9. Site "F" is situate in the City of Burlington, immediately north of Highway 403 on the northwest corner of the North Service Road and King Road. *It is located between two existing or former landfill sites,* namely, the Region's existing landfill site (the "Burlington Landfill") on the west and the City of Burlington's former landfill site ("Bayview Park") on the east. Site "F" compromises

approximately 96 hectares, approximately 70.24 hectares of which are owned by NSP.

10. NSP is an Oakville-based corporation which carries on the business of constructing and selling sewer pipe, among other products. It has owned most of the lands comprising Site "F" since before the turn of the century. *As detailed below, it supports landfilling on its lands.* The balance of Site "F", not owned by NSP, is owned by a corporation known as Azova Investments Limited. *This owner also supports landfilling on Site "F".*

11. The majority of Site "F", for decades, has been maintained by its owners as vacant land, characterized by ravines, intermittent streams and wooded areas. A portion of the Site, in the north central area of the lands, has been licensed since August, 1972 by the Ministry of Natural Resources for the operation of a shale quarry. The area licensed for extraction comprises about 30 ha. (74 acres) of NSP's lands on Site "F".

Reference, Appendix "E", pp. 2, Exhibit N-586, p. 1

12. As early as mid 1979 NSP had itself identified the potential of its lands on Site "F" for landfilling. During the period 1979 to early 1982 it commissioned independently a number of consulting reports to support a private application for landfilling (including detailed hydrogeological and design and engineering studies and planning and environmental appraisal studies), and submitted various formal applications pursuant to the legislation governing privately operated landfill sites to obtain approval. It also engaged in discussions and negotiations with officials of the City of Burlington, the Region, the Ministry of the Environment and the then Ministry of Municipal Affairs and Housing.

13. On April 14, 1982, NSP submitted an application to the Minister of the Environment for a Certificate of Approval under the Environmental Protection Act (Ontario) for a waste disposal site on approximately 20.6 hectares of the lands now comprising Site "F". After April, 1982 the size of the area proposed by NSP for landfilling was twice increased such that, by December, 1986, NSP's application to the Minister of the Environment contemplated the use of some 40.5 hectares of NSP's lands for sanitary landfilling having an estimated waste capacity of 3,754,000 tonnes.

14. In late 1982, while NSP's applications for approval of a private sanitary landfill site were in progress, the Region began a review under the Environmental Assessment Act (Ontario) to select a suitable landfill site in the Region. NSP then came under pressure from various government agencies at both the municipal and provincial levels to defer its various applications until the Region's studies could be completed.

Reference: Appendix "E", pp. 6, Exhibit N-586, p. 5

15. In early 1983, at the request of the Region, Ministry of the Environment officials, representatives of the Ministry of Municipal Affairs and Housing and the City of Burlington, NSP agreed to defer any further processing of its application pending the outcome of the Region's Environmental Assessment Study, to facilitate the Region's search for a suitable new regional landfill site.

Reference: Appendix "E", pp. 6, Exhibit N-586, pp: 5-6

16. During the period July, 1982 to January, 1987 extensive research and investigations were carried out on behalf of the Region by various consultants to examine the Region's future solid waste management needs and to locate a suitable site for regional sanitary landfilling. The Region's consultants undertook and completed dozens of studies regarding the search for a new Regional landfill site and, with respect to Sites "F" and "D", considered and reported upon the following issues:

- *Public Health and Safety Issues Including Hydrology, Hydrogeology, Leachate Treatment, Transportation Issues and Engineering Issues:*
- *Planning issues;*
- *Issues relating to Biophysical, Air Quality, Noise, and Visual Impacts;*
- *Social Impact Issues; and*
- *Cultural Impact Issues.*

17. After investigating the entire Region for potentially suitable sites, the conclusion reached by the Region and its consultants was that Site "F" was the

preferred location for the sanitary landfilling component of the Region's solid waste management system. This conclusion was confirmed by the Region's consultants in January, 1987 after approximately five years of study.

B. SITE "D" AND ITS OWNERS

18. Site "D" comprises approximately 126 hectares and is situate between Highway 25 and First Line, approximately one-half kilometer south of Britannia Road, in the Town of Milton. As part of its site selection review process, the Region and its consultants identified six potential candidate sites in the Region, including Sites "F" and "D".

19. Title to Site "D" is held in multiple ownership. It is currently used for residential and farming purposes. *Use of Site "D" for landfilling would require expropriation of 4 landowners against their will. Three of these would lose their homes and some of them their homes and businesses.* These landowners were represented by Counsel at the Hearing before the Board and actively opposed the expropriation of their lands.

C. THE REGION'S PREFERRED SITE

20. As noted in paragraph 17 above, in January 1987 the final site comparative analysis report commissioned by the Region was delivered. It was the conclusion of the Region's environmental assessment study team, as set out in the final comparative report, that Site "F" was the preferred site for sanitary landfilling in the Region.

21. On March 4, 1987 the Regional Council of Halton approved the final comparative report delivered by the Region's consulting team of experts and resolved that both Site "D" and Site "F" were viable and safe as future sanitary landfill sites, but, inter alia, *that Site "F" is marginally preferred as a future landfill site for the reasons set out in the Comparative Analysis Report, January, 1987.*

Reference: Appendix "E", pp. 10, Exhibit B-348

D. The Hearing:

22. The Hearing before the Board commenced on May 5, 1987 and concluded on November 8, 1988 after the hearing of evidence and legal argument.

At the commencement of the Hearing in May, 1987 and throughout, until its conclusion in November, 1988, it was the position of the Region that Site "F" was the preferred site for regional landfilling in Halton.

23. *At the conclusion of the Hearing it was the stated position of the Ministry of the Environment that Site "F" was acceptable for landfilling in accordance with the design proposed by the Region and subject to proposed conditions of approval submitted to the Board by the Ministry. The full text of those conditions is set out in Appendix "F" to this Application.*

24. At the conclusion of the Hearing on 8 November 1988, the Board reserved its decision, and delivered 210 pages of Reasons on 24 February 1989, together with an Addendum thereto on 2 March 1989, the text of which has been separately filed with this Application as Appendix "A".

PART III - DECISION AND REASONS OF THE BOARD

25. The Board's disposition of the matters before it is found on pages 149 and 150 of its Reasons, (Appendix "A"). Insofar as it is relevant to this Application, the Board declined to grant approval to the Region to proceed with landfilling at Site "F" but did grant approval to proceed with landfilling at Site "D", subject to the Conditions set out and forming part of the Board's Decision. These Conditions of Approval are found at pages 172 to 203 of the Board's Reasons.

Reference: Reasons, Appendix "A", pp. 149-150; pp. 172-203

26. The following were stated, expressly or implicitly, as the Reasons for the Board's refusal to approve landfilling at Site "F":

(a) "the Board finds that Site "F" is not hydrogeologically suitable for landfilling" and "this Board finds Site "F" hydrogeologically unacceptable";

Reference: Reasons, Appendix "A", pp. 112-113

(b) "In the Public Health and Safety Category overall, this Board finds Site "F" clearly unacceptable";

Reference: Reasons, Appendix "A", p. 113

(c) Site "F" should have been eliminated from the Region's search for a new landfill site as early as 1982 on the basis of biophysical features associated with the Site and, further, Site "F" has the quality of an environmentally sensitive area;

Reference: Reasons, Appendix "A", pp. 43, 45 and 167

(d) Site "F" was unacceptable for landfilling from a planning point of view; and

Reference: Reasons, Appendix "A", pp. 122-136

(e) the economics of landfilling favoured Site "D".

Reference: Reasons, Appendix "A", p. 148

PART IV - GROUNDS FOR THE RELIEF REQUESTED

A. PUBLIC HEALTH AND SAFETY ISSUES - SITE "F"

27. The Board in its Reasons concluded that Site "F" was "*hydrogeologically unacceptable*" and that:

> "*In the Public Health and Safety category overall, this Board finds Site F clearly unacceptable, and Site D acceptable with the conceptual design proposed and appropriate conditions applied*".

Moreover, at page 112 of its Reasons, the Board stated that "*Site F is not hydrogeologically suitable for landfilling, but Site D is hydrogeologically suitable*". On the basis of this finding with respect to hydrogeology, and "*...other findings in the Public Health and Safety category, and findings in other categories it approves the undertaking to landfill at Site"D" only*".

Reference: Appendix "A", pp. 112-113

28. In considering matters related to Public Health and Safety, the Board had regard to a number of factors, some of which were specific to Site "D" only. It

is clear from the Board's reasons that, with respect to the Public Health and Safety implications of Site "F", the Board was chiefly concerned with hydrogeology, hydrology and engineering issues.

HYDROGEOLOGY, HYDROLOGY AND DESIGN AND OPERATIONS EVIDENCE

(i-a) GENERALLY

29. The Board's conclusion as to the "*acceptability*" and "*suitability*" of Site "F" for landfilling in the Public Health and Safety category was based primarily on hydrogeology and hydrology factors.

30. The Board accepted evidence from 8 hydrogeologists during the course of the Hearing. *It was the evidence of every hydrogeologist who testified before the Board that Site "F" was either now hydrogeologically suitable for landfilling or, with appropriate engineering facilities, could be made suitable for landfilling. No expert witness qualified to give evidence on hydrogeological matters suggested or opined to the contrary.*

31. Thus, in finding that Site "F" was "hydrogeologically unacceptable", "hydrogeologically unsuitable" and "clearly unacceptable in the Public Health and Safety category overall" *the Board rejected the evidence of every hydrogeologist who testified before it and substituted its own opinion for that of experts qualified in the sciences of hydrogeology, hydrology and hydrogeochemistry.* That the Board did so is clear from page 55 of its Reasons where it stated:

> "Many experts were clearly advocates for their clients and often did "disagree as amongst themselves". We felt it our duty therefore, even though one of the final two Sites was preferred by more hydrogeologists than the other, *to arrive at our own opinion* after carefully weighing and considering the evidence of the experts, and availing ourselves of all the assistance they were able to provide".
>
> Reference: Reasons, Appendix "A", p. 55

32. In so doing, it is submitted, the Board fell into serious error as particularized below. For this reason alone, the relief sought should be granted.

33. Hydrogeology, as acknowledged by the Board, is the science of the movement of water through the ground, whether through sand, soil, rock, fractures

or other media. Hydrogeochemistry, in turn, is the science of chemicals in water in the ground and their movement through the ground. Hydrology is concerned with the movement of water on ground surfaces.

Reference: Reasons, Appendix "A", p. 55

34. The Board, in its Reasons, stated that 7 hydrogeologists presented evidence to the Board and that the 8th individual was called by the Region as an expert witness to present evidence on hydrogeochemistry. In fact, the 8th individual, Mr. Stan Feenstra, was qualified before the Board to give evidence on matters related both to hydrogeology and hydrogeochemistry. The 8 hydrogeologists who presented opinion evidence to the Board were as follows: Messrs. Sobanski, Beechinor and Feenstra, for the Region; Drs. Charlesworth and Rowe, for the Town of Milton; Messrs. Petrie and Crutcher, for the City of Burlington; and, Mr. Bowen for the West Burlington Citizens' Coalition.

Reference: Reasons, Appendix "A", p. 55

35. *The evidence before the Board unequivocally established that Site "F" could be safely used for landfilling. All hydrogeologists who testified before the Board agreed, without exception. The issue with respect to Site "F" was whether it should be landfilled with or without a liner.*

36. The evidence of the hydrogeologists on the "suitability" for landfilling of Site "F" from a public health and safety perspective, is described in Appendix "C" to this Application. In brief, it was as follows:

(a) Messrs. Sobanski and Beechinor - *from a Public Health and Safety perspective, Site "F" was clearly the preferred site as between Sites "F" and "D" for landfilling. Site "F" is an unusual site in Ontario in many ways and the advantages it affords should be utilized. Mr. Sobanski stated:*

> *"...Site "F" is a strange sort of a site. I have never run into one of these in my career and I probably won't again. In any site that I have looked at I have always had concern for my decision because there are unknowns in hydrogeology. There are unknowns in waste disposal and there some calculated risk. I don't think in my career I am going to come up with many sites like Site "F" where I don't have to worry about hurting somebody at the Site. I always have that concern at other sites where I have wells located nearby.";*
>
> Reference: *Appendix "E", pp. 11-13, Vol. 37, pp. 8206-8207; Vol. 32, p. 7005*

(b) Mr. Feenstra - *Site "F" is suitable for landfilling without a liner and there should be no significant impact on groundwater or surface water environments from landfilling in and around Site "F". As far as the possible impact on surface water at Site "F" was concerned, it was Mr. Feenstra's opinion that the Board need not have any concern as there would be no significant impact;*

Reference: Appendix "E", pp. 16-17, Vol. 170, pp. 42328-29

(c) Drs. Charlesworth and Rowe - *a new landfill at Site "F" will have little significant impact on the environment due to the treatment of contaminants in the ground water regime. There will be no adverse impact on public health and safety from landfilling at Site "F";*

Reference: Appendix "E", pp. 18-19, Exhibit M-437, pp. 1-2

(d) Messrs. Petrie and Crutcher - *According to Mr. Crutcher, there is nothing emanating from the Burlington Landfill site that is causing an adverse health or safety risk to the people in Aldershot (Burlington). Similarly, he conceded that the Bayview Park Landfill site did not pose a threat to the public health and safety of residents of Aldershot (Burlington). With respect to Site "F" he admitted that for residents of Aldershot there will not be any direct exposure to contaminants from landfilling at Site "F". He was unable to indicate any adverse implications for public health and safety in Aldershot of having a failure of the engineered landfill facility at Site "F" even in circumstances where trace diluted and attenuated leachate escaped to the shale. He admitted that there were no public health and safety implications flowing from hydrogeological problems at Site "F" in the event of landfilling;*

Reference: Appendix "E", pp. 20-25, Vol. 121, pp. 29227-29
29249-50
290257

These admissions were obtained from Mr. Crutcher on cross-examination. However, in the the main report which they filed with the Board, Messrs. Petrie and Crutcher, who testified on behalf of the City of Burlington, made their opinion clear from the outset, that even if Site "F" were found by the Board to be unsuitable for landfilling without a liner, introduction of a liner would make it suitable. In exhibit B-617, their Site "F" Report filed with the Board, these witnesses stated (at page 162):

> *"For an alternative landfill design consisting of a suitable liner and an underdrain system, the site is hydrogeogically suitable for landfilling.";*

(e) Mr. Bowen - *This witness testified that there would not be a significant impact in terms of the water quality resource in the Aldershot (Burlington) area as a result of landfilling at Site "F". Moreover, he testified that there would be enough dilution or attenuation of the leachate between the Site and water well-users that there would not be any impact on the drinking water wells in the Aldershot (Burlington) area.*

Reference: Appendix "E", pp. 26-29, Vol. 160, p. 38904
pp. 38961-63

37. It is respectfully submitted that the Board's conclusion, in the face of and despite all expert evidence to the contrary, that Site "F" was hydrogeogically "*unsuitable*" and "*unacceptable*" is a substantial and fundamental error, warranting rescission of the Board's Decision regarding Site "F".

38. Moreover, it is respectfully submitted that the Board's Decision to substitute its own opinion on the hydrogeological suitability of Site "F", for that of all the experts, demonstrates that the Board erred in substance and in principle and that it failed judicially to exercise its proper functions. It is respectfully submitted that the Board's error in this regard constituted a denial of natural justice.

(i-b) EVIDENCE ON ATTENUATION

39. Fundamental to the assessment of the hydrogeological suitability or acceptability of Site "F" for landfilling, is an appreciation of the attenuation characteristics of the various geological materials comprising the ground at Site "F". "*Attenuation*", in this context, refers to the potential for diminution of contaminant strength via various scientific processes as contaminants move through the ground underneath or bordering the landfill.

40. As discussed in Part IV-B of this Application, the engineering facility proposed by the Region for Site "F" involves a leachate collection system at the base of the landfill which is designed to collect the leachate in the landfill and at the toe of the landfill. The term "*leachate*" refers to the liquid contaminant mixture produced when precipitation filters through the landfill and mixes with the garbage. The resulting, contaminant-laden liquid is referred to as "*leachate*".

41. On the evidence of all hydrogeologists and engineers who testified before the Board, the leachate collection system at Site "F" would capture the vast majority of the leachate to be produced at the landfill; however, some loss of leachate would occur, as described in Part IV-B hereof.

42. In consequence of the anticipated leachate that would not be captured by the engineered facility at Site "F", any environmental risk assessment at Site "F" necessarily involves consideration of whether the quality of the leachate which will be lost is environmentally significant. Expressed simply, the question that

arises is, 'assuming leachate losses, will the strength and composition of the lost leachate cause adverse environmental effects'?

43. The Board heard considerable and weighty evidence regarding the attenuation characteristics of the shale and related materials at Site "F". Most importantly, it was the evidence before the Board from all hydrogeologists that the shale at Site "F" possessed significant attenuation capability. The effect of this feature, according to the evidence, would be to reduce the strength of contaminants in any lost or escaped leachate at Site "F" to negligible levels.

44. It is respectfully submitted that the Board, in arriving at its conclusions concerning the acceptability and suitability of Site "F", erred in substance in failing to address itself to the evidence of:

(a) *Mr. Feenstra, who testified that "very extensive dilution" will occur at Site "F" and that the experience at the Bayview Park and Burlington Landfill sites proved that there were significant attenuation characteristics in the shale also found at Site "F". It was his evidence, to which the Board made no reference, that the investigations which had been undertaken at Site "F" suggested "there will be a fairly significant degree of attenuation". Mr. Feenstra also pointed out that a medium that has a cation exchange capacity over 10 or 20 millaequivalents per litre is considered to possess a significant attenuation capacity. At Site "F", the shale measures a cation exchange capacity of 66 milla-equivalents, suggesting substantial attenuation capacity;*

Reference: Appendix "E", pp. 30-35, Vol. 46, pp.10315-10316, pp. 10320, 10323-10324 and Vol. 169, p. 42206

(b) *Mr. Bowen, called on behalf of a party opposing the approval of Site "F", who testified that there would be no significant impact on water quality as a result of landfilling at Site "F" due to the opportunity for "dilution of the leachate";*

Reference: Appendix "E", p. 36, Vol. 160, p. 38904

(c) *Mr. Petrie, called on behalf of a party in opposition to approval of Site "F", who conceded under cross-examination that the shale at Site "F" has natural attenuation properties and that this included not only the lands to the south of the proposed landfill in the area of Aldershot but, as well, the lands to the north of Highway 403, immediately south of the proposed landfill;*

Reference: Appendix "E", pp. 37-39, Vol. 128, p.30951-30952 and p. 30955

(d) *Dr. Charlesworth, called on behalf of the Town of Milton, who testified that he believed that there would be no concern about adverse impacts at Site "F" from any possible contamination south of the Site due to the attenuation characteristics present at the Site;*

Reference: Appendix "E", pp. 40-41, Vol. 85, p. 20337-20338

(e) *Mr. Sobanski, who testified on behalf of the Region, that if the leachate losses from Site "F" travelled south to Lake Ontario there would be no contaminants present distinguishable from existing background water quality given the attenuation mechanisms that will be at work at the Site enroute and given the length of travel time required for migration of the contaminants. He added that this was his expectation and that it was borne out by the results of monitoring at the Burlington and Bayview Park Landfill sites;*

Reference: Appendix "E", pp. 42-43, Vol. 32, pp. 6939-6940

45. In addition to the evidence of these witnesses, as summarized in Appendix "C" to this Application, the Board received documentary hydrogeological evidence from a number of other investigators, including Dr. Keros Cartwright, Morrison, Beatty Limited and Dr. John Cherry. Dr. Cartwright expressed the opinion in a written report regarding the hydrogeology of the NSP lands that the chemical data suggested strongly that leachate could be attenuated and assimilated in the shale as it migrated from the site. These investigators, as well, confirmed the attenuation capabilities of the shale materials at Site "F".

46. The Board, in its assessment of the acceptability and suitability of Site "D" from a hydrogeological perspective, relied on the evidence of Mr. Sobanski regarding the attenuation characteristics of the tills at Site "D" to suggest that this Site was closer to having "maximum natural attenuation characteristics with minimum engineering requirements" than it was to having "minimum natural attenuation with maximum engineering requirements".

Reference: Reasons, Appendix "A", p. 75

47. In contrast, when the Board assessed the hydrogeological characteristics of Site "F", no mention was made by it of the evidence before it from the hydrogeology experts regarding the favourable attenuation characteristics of this Site. Particularly, the Board failed to address itself to the evidence on this issue of the only hydrogeochemist and hydrogeologist who testified before it, Mr.

Stan Feenstra. Mr. Feenstra testified during his first attendance that the attenuation capability inherent in the materials at Site "F" was superior to that at Site "D". During his reply evidence, he stated that on reconsideration, although it was not "superior" to that at Site "D", there was still significant attenuation capability inherent in the materials at Site "F". Mr. Feenstra concluded his evidence on this issue in the following terms:

> *"Q. Would you agree with me, Mr. Feenstra, based on what you know today that there being no need to be concerned about adverse impact from any possible contamination at Site F, that that is a very significant advantage of Site F over Site D, based on the information available to you today?*
>
> *A. That is a very significant difference between Site F and Site D. Even in the event that the interpretation of Site F isn't exactly as I have suggested, there will be no groundwater supplies that are endangered, so no human health and safety directly affected by the contamination of the ground water supplies.*
>
> *Q. To use the language I once used with you before, that is an enormous advantage of Site F over Site D?*
>
> *A. Yes, it is."*
>
> *Reference: Appendix "E", pp. 44-45, Vol. 172,pp.42901 to 42902.*

(i-c) EVIDENCE ON THE NEED FOR A LINER AT SITE "F"

48. The issue of whether a liner is required or desirable at Site "F' in order to permit landfilling to occur, is related to the issue of whether leachate will escape from the engineered landfill facility proposed for the Site. The Board heard considerable evidence on the anticipated "exfiltration of leachate" rates at Site "F" in the context of the engineered facility proposed by the Region.

49. The Board concluded, notwithstanding all of this evidence, that Site "F" was hydrogeologically unacceptable and unsuitable for landfilling *with or without a liner.* In the course of its Reasons, little consideration is given by the Board to the merits of a liner at Site "F" and to the consequences for public health and safety in the event of the introduction of a liner at the Site. The Board made note of a liner at Site "F" in four passages of its Reasons:

(a) at page 147, in its discussion of the cost implications of landfilling at Site "F" or Site "D", the Board stated:

"... Finally, it is likely that if Site "F" were approved for landfilling it would require a liner."

(b) at page 86 of its Reasons the Board, in referring to the evidence of Mr. Feenstra, stated (without referring to the reasons given by the witness for his opinion) that this witness did not feel that a liner was required at Site "F" to reduce exfiltration;

(c) at page 109 of its Reasons the Board stated:

"Finally, with respect to the matter of the security offered by a liner beneath Site "F", the Board noted that the strongest supporter of such an expensive measure, Mr. Crutcher, could not guarantee that a liner would not become fractured as a consequence of being laid down over different areas of intact bedrock and filled river valleys ..."

(d) finally, at page 106 of its Reasons, the Board again referred to evidence given by Mr. Crutcher that Site "F" required a liner if it was to be approved for landfilling and to the evidence of Mr. Petrie, Mr. Crutcher's colleague, supporting this view.

50. The Regions' hydrogeologists (Messrs. Sobanski, Beechinor and Feenstra) had all considered the merits of a liner at Site "F" and testified that a liner was not necessary or required. Further, the hydrogeologist called on behalf of the Town of Milton, Dr. Charlesworth, testified that a liner was not required at Site "F" and explained at length the reasons for this conclusion. Finally, *it was the position of the Ministry of the Environment that a liner was required at Site "D" but not at Site "F".*

Reference: Appendix "E", pp. 46-59, Submissions of the M.O.E., para. 29.

51. The Board in its Reasons failed to consider the evidence of Messrs. Sobanski, Beechinor, and Charlesworth on this issue or the position of the Ministry of the Environment. Indeed, apart from the reference to Mr. Feenstra's evidence noted above, nowhere in its Reasons does the Board even mention the

evidence of these various witnesses who testified that a liner was not required at Site "F", nor is any mention made of the position of the Ministry of the Environment in this regard.

52. As noted, it was the evidence of the hydrogeologists called on behalf of the City of Burlington, from the outset, that with a liner Site "F" was suitable. Accordingly, *no expert expressed the opinion that Site "F" was not now or could not be made, with the addition of a liner, suitable and acceptable for landfilling.* There was thus no evidentiary foundation upon which the Board could conclude, as it implicitly did in its Reasons, that even with a liner, Site "F" was hydrogeologically unacceptable or unsuitable for landfilling.

53. It is respectfully submitted that the Board's failure to consider the evidence of all of the hydrogeologists on the issue of the need for a liner at Site "F" and the failure of the Board to consider the position of the Ministry of the Environment in this regard is a substantial and fundamental error. Further, it is respectfully submitted that given the importance of this finding, the Board's failure to elucidate its Reasons for the conclusion that a liner at Site "F" would "likely be required" if Site "F" were to be approved for landfilling, itself renders the Board's Decision on Site "F" unsustainable.

B. CONFLICT AND NON-COMPLIANCE WITH MINISTRY POLICY

(i) THE NATURE OF THE "TOTAL CONTAINMENT" CONCEPT

54. The engineering design proposed by the Region for Site "F" involves the placement and maintenance of a gravity-fed leachate collection system at the base of the landfill. The purpose of the leachate underdrain system is to collect the leachate in the landfill and at the toe of the landfill. Messrs. Sobanski and Beechinor (two of the Region's hydrogeologists), in explaining the engineering design for Site "F", testified that the leachate capture efficiency of the underdrain system would be in the range of 93-96%. This means that approximately 4 to 7% of the leachate to be generated from landfilling at Site "F" would not be collected by the underdrain system but would move through the earth below the landfill.

Reference: Appendix "E", pp. 59, Exhibit H-40, p. 127

55. One of the central issues at the Hearing was the identification of the ultimate destination of the leachate that would not be captured by the underdrain system at Site "F" (the "leachate losses") and, the potency of the lost leachate, if any, as it moves through the earth at Site "F" and its environs.

56. In contrast, the engineering design for Site "D" as proposed by the Region, was based on the concept of a *"hydraulic trap"*. The premise of the hydraulic trap as suggested by the Region is that, given the hydraulic gradients at Site "D" (the force that causes water to move from one place to another), the trap while in operation will contain all of the leachate in the landfill and will draw water from beneath the trap up into the trap. The leachate stored in the trap, according to the Region's proposal, would then be trucked away from Site "D" to a leachate treatment facility.

57. One of the central issues at the Hearing with respect to the "hydraulic trap" concept was its potential for partial or entire failure and the nature of the environmental consequences in the event of such failure. As long as the trap successfully operates, the Region's evidence suggested that all of the leachate would be contained in the trap, that is, there would be "total containment" of leachate and no "leachate losses".

58. The concept of "leachate losses" was sometimes referred to in the evidence as "exfiltration", that is, the amount of leachate that exfiltrates from the bottom of a landfill and moves via groundwater or surface water systems. If leachate exfiltrates from the bottom of the landfill, at either site, it would carry with it the contaminants inherent in leachate that build up during the course of the landfill operation.

59. *One of the principal and key differences between Sites "F" and "D", from the perspective of environmental risk assessment, is that there are no downgradient water well users within one kilometre of Site "F". In contrast, there are residents on-site at Site "D" and in its immediate vicinity that rely on ground and surface water for their domestic and agricultural water needs. Thus, at Site "D" there is a currently used water resource, whereas, at Site "F" there is no use of the water resource within one kilometre of the Site. Moreover, in the case of Site "F", municipal water services are currently available* to the residents of Burlington who reside to the south of the Site (that is, to the residents of

Aldershot). In contrast, no municipal water services are currently in place nor, according to the undertaking proposed by the Region, are any planned in the vicinity of Site "D".

60. The Board in its Reasons effectively concludes that a sanitary landfill engineering proposal which contemplates the loss of <u>any</u> leachate from the landfill is unacceptable and that only a "total containment" engineering system is suitable. This finding by the Board is reflected in the following portions of its Reasons:

(a) at page 159: "At Site F even the engineered fix is questionable, given that it contemplates daily losses of 4,500 gallons of leachate to the environment. In contrast, the engineered solution at Site D is designed to prevent any leachate losses";

(b) at page 27, the Board, in discussing social impacts from landfilling, refers to the evidence of Ms. Ellen Baar, a member of the public who testified before the Board and who said that if leachate could not be contained at Site "F" and could be at Site "D" then, in her opinion, from a regulatory perspective the choice of the Board was "clear". The Board said "that it took this perspective into account as it considered its decision";

(c) at page 118, the Board stated that "a hydraulic trap properly installed, maintained and operated, could be a permanent solution for landfills in some glacial tills";

(d) at page 95, the Board indicated that it would be "...hardpressed to approve landfilling at Site F if this meant that it would be unable to assure the public that there could not be significant migration of contaminants away from the proposed landfill site".

<u>Reference:</u> Reasons, Appendix "A", pp. 159, 27, 118 and 95

(ii) <u>APPLICABLE POLICIES OF THE MINISTRY OF ENVIRONMENT</u>

61. The Ministry of the Environment (the "M.O.E.") has three written policies which relate to the decision by the Board that "total containment" engineering facilities are to take precedence over facilities which allow some leachate losses. These are as follows:

(a) <u>Exhibit 154 before the Board</u> - M.O.E. groundwater quality management policies and procedures contained in the publication "Water Management - Goals, Policies, Objectives and Implementation Procedures of the Ministry of the Environment", revised as at May 1984, (the "Water Management Policy");

(b) *Exhibit 154 before the Board - policy for the "Incorporation of the Reasonable Use Concept Into M.O.E. Groundwater Management Activities", effective April 25, 1986 as detailed in the document entitled "The Incorporation of the Reasonable Use Concept into the Groundwater Management Activities of the Ministry of the Environment", September, 1986, (the "Reasonable Use Policy");*

(c) *Exhibit 928 before the Board - policy entitled "Engineered Facilities at Landfills That Receive Municipal and Non-Hazardous Wastes", effective May 11, 1988, together with the Ministry's Guideline For Engineered Facilities at Landfills, and Exhibit N-475 before the Board, entitled "Ministry Interim Guideline on Engineered Facilities at Landfills", dated July 13, 1987, (the "Engineered Facilities Policy").*

Reference: Appendix "G", Exhibits 154 and 928

62. It is the stated goal of the M.O.E., as appears from its written Water Management Policy, with respect to *surface water quality management,* "to ensure that the surface waters of the Province are of a quality which is satisfactory for aquatic life and recreation" and, *with respect to groundwater quality management, "to protect the quality of groundwater for the greatest number of beneficial uses".*

63. The Water Management Policy provides:

> *"The waste control requirements for proposed regulated waste discharges will be established on a case-by-case basis. As a general policy, water quality degradation will be controlled in order to protection reasonable uses, existing or proposed, of both ground and surface waters."*

Reference: Appendix "G", Exhibit 154

64. Thus, the Water Management Policy is based on protecting existing and potential reasonable uses of water. The "reasonable use concept" applies only to groundwater quality management.

65. Dr. George M. Hughes, Supervisor of the Landfill Disposal Technology Unit, Waste Management Branch of the M.O.E., testified before the Board regarding the Reasonable Use and Engineered Facilities Policies of the Ministry. With respect to the Reasonable Use Policy, it was the evidence of Dr. Hughes that:

> *"A determination as to what constitutes reasonable use is case specific and is based on the present use of the groundwater, the future potential use of the groundwater and the amount and*

quality of groundwater available for use. In most cases, the potential reasonable use of groundwater in Ontario will be domestic consumption.

I am informed that certain witnesses before the Joint Board have stated that the only reasonable use of groundwater downgradient of Site F is leachate attenuation. In my opinion, such a determination is possible within the confines of the policy and guideline, although I am unable to give an opinion on whether such a determination is appropriate in this case."

Reference: Appendix "G", Exhibit 928, paras. 8 and 9

66. Dr. Hughes also testified that it was acceptable to the M.O.E., in exceptional cases, to permit the limited impairment of groundwater off-site through the designation of a "*Contaminant Attenuation Zone*". The circumstances considered by the Ministry to be suitable for such a designation include circumstances where an alternate source of water is far superior to any associated with a Contaminant Attenuation Zone. This circumstance, according to the M.O.E. Reasonable Use Policy, can arise where good supplies of water are available, either from surface water sources or from municipal systems, and the groundwater supplies in a particular unit are marginal with respect to their quality and/or their quantity. In such circumstances the M.O.E. has indicated that it may support the use of that groundwater as a Contaminant Attenuation Zone.

Reference: Appendix "G", Exhibit 928, para. 12

67. *In his oral evidence before the Board, Dr. Hughes confirmed that the M.O.E. Reasonable Use Policy was based on the assumption of some leachate losses at any landfill site. This, on the evidence before the Board, applies to Site "F".*

68. *Further, based on the unchallenged evidence of Dr. Hughes, leachate attenuation can be a permissible and reasonable use of groundwater under the policies of the M.O.E. in circumstances where groundwater supplies in a particular area are marginal with respect to their quantity and good supplies of water are available from municipal systems. This also is the situation which applies to Site "F",* namely, the quality of the groundwater at Site "F" and its environs is poor, but good quality water is available from municipal systems already in place in the area.

(iii) CONFLICT OF BOARD'S DECISION WITH MINISTRY POLICY

69. At page 105 of its Reasons the Board found that:

> "...the M.O.E. policy does not say that "the most reasonable use of the groundwater... is for waste disposal," as suggested by Dr. Charlesworth, nor does it encourage such use where there are alternatives which could prevent groundwater contamination."

70. The Board's findings, as set out in paragraphs 60 and 69 above, effectively mean that:

(a) only engineering facilities which provide for total containment of leachates are and will be acceptable in the future for sanitary landfill sites; and

(b) the Reasonable Use Policy of the M.O.E., to the extent that it permits some leachate losses at landfill sites and, further, leachate attenuation in appropriate circumstances as a reasonable use of groundwater, is unacceptable.

71. It is respectfully submitted that the Board's Reasons and Decision in this respect therefore directly conflict with government policy and, further, take no account of and do not consider the implications for the long-term sanitary landfill policies of the M.O.E. and the availability of sanitary landfill sites in this Province.

72. In further particular, it is submitted that the Board's Decision eliminates the potential in the future for use of non-total-containment engineered landfills, which landfills have been used in the past and will be needed in the future.

73. The Decision eliminates from future candidacy as sanitary landfill sites those sites which would require, as a reasonable use of groundwater, leachate attenuation in Contaminant Attenuation Zones. As such, it is respectfully submitted that the Board's Reasons and Decision: (i) are contrary to the interest of the public in finding timely, and environmentally sound solutions to municipal waste disposal issues; and (ii) unreasonably and unjustifiably constrain the scope of available engineering solutions to such issues.

74. In consequence of the effects set out in paragraphs 72 and 73, it is respectfully submitted that, as a matter of policy, the Board's Decision regarding Site "F" should be rescinded.

(iv) POSITION OF THE M.O.E. AT THE HEARING

75. It was the stated position of the M.O.E. at the end of the Hearing that both Sites "D" and "F" were acceptable for landfilling under the Environmental Protection Act (Ontario) and that either site could be given a certificate of approval thereunder. Further, it was the M.O.E.'s stated position that:

> *"Impacts on surface and groundwaters have been given appropriate weight in the Environmental Assessment and that either site is acceptable with respect to those issues".*
>
> Reference: Appendix "E", pp. 46-59, Submissions of the M.O.E., p. 6, para 13.

76. With respect specifically to Site "F", it was the stated position of the M.O.E. before the Board that:

> *"In the vicinity of Site "F", the reasonable use of groundwater in the Queenston Shale is contaminant attenuation and the reasonable use of the groundwater in the lacustrine sands south of Highway 403 is drinking water. Groundwater in the Queenston shale does not constitute a viable resource in terms of quantity or quality because of its poor natural quality and limited yield. The reasonable use policy will bear the interpretation suggested and in all the circumstances it is submitted it is the only reasonable interpretation. On the other hand, the groundwater resource in the "rind" in Aldershot has some limited present and potential use".*
>
> *And further:*
>
> *"It is submitted that it is common ground on the part of all hydrogeologists that there will be no impact on the groundwater in the lacustrine sand deposit in Aldershot.*
>
> *It is submitted that it has been demonstrated that any leachate migration from Site F will not impair the reasonable use of groundwater on adjacent property...."*
>
> *And further:*
>
> *"It is therefore submitted that, in terms of impacts on groundwater, Site F is acceptable.*

With respect to impacts on surface water, it is submitted that additional design features, namely a deep perimeter drain as suggested by Mr. Feenstra, are necessary to make Site F acceptable....

It is therefore submitted that, with the imposition of the conditions set out at Tab 4, Site F can be approved under the Environmental Protection Act and a certificate of approval can be issued."

Reference: Appendix "E", pp. 46-59, Submissions of the M.O.E., p. 12, para. 36; p. 13, paras. 40 and 41; p. 14, paras. 44, 45 and 47

77. It is respectfully submitted that, in reaching its conclusion that no leachate losses from Site "F" would be acceptable and that only the "total containment" engineering facility proposed for Site "D" was acceptable, the Board erred in failing to address itself to:

(a) the premise of the Reasonable Use Policy and its implications for sanitary landfilling in Ontario; and

(b) the evidence before it regarding the attenuation characteristics of the ground materials at Site "F". The evidence regarding these characteristics is summarized in PART IV-A, (i-b) above.

78. *Finally, it is respectfully submitted that the Board's conclusion on this issue and, in particular, its decision to reject the Reasonable Use Policy as it applies to Site "F", will be relied upon by some to suggest that Site "F" is hydrogeologically unacceptable for sanitary landfilling now and in the future by anyone. It is submitted that the elimination of Site "F" for landfill consideration on this basis, when all the hydrogeology experts and the M.O.E. concluded that it was acceptable, is:*

(a) contrary to the public interest as it may effectively prevent the candidacy of Site "F" for sanitary landfilling in the future, notwithstanding the urgent need for acceptable sanitary landfill sites; and

(b) gravely and unjustifiably prejudicial to NSP.

(v) NON-CONFORMITY OF SITE "D" WITH MINISTRY POLICY

79. It is the position of the M.O.E. under its Engineered Facilities Policy and Guideline that the acceptability of an engineered facility for a

new municipal landfill is to be judged in accordance with the following requirements:

> "AN ENGINEERED FACILITY MUST FUNCTION AS LONG AS NECESSARY FOR THE PROTECTION OF THE ENVIRONMENT. IF PERIODIC OR CONTINUOUS MAINTENANCE OR REPLACEMENT OF AN ENGINEERED FACILITY OR ITS PARTS IS REQUIRED, EVIDENCE MUST BE PROVIDED BY THE APPLICANT THAT THIS CAN AND WILL BE ACCOMPLISHED. IT IS THE APPLICANT'S RESPONSIBILITY TO DEFINE THE SERVICE LIFE OF AN ENGINEERED FACILITY AND INDICATE THE FREQUENCY OF REPLACEMENT AND THE NUMBER OF TIMES IT MUST BE REPLACED. IN SO DOING, THE APPLICANT MUST ADDRESS THE CONTAMINATING LIFESPAN (i.e. THE TIME PERIOD DURING WHICH THE LANDFILL WILL PRODUCE CONTAMINANTS AT LEVELS THAT COULD HAVE AN UNACCEPTABLE IMPACT IF THEY WERE TO BE DISCHARGED INTO THE SURROUNDING ENVIRONMENT) OF THE LANDFILL, EQUATE THIS WITH THE SERVICE LIFE OF THE PROPOSED ENGINEERED FACILITY AND SUPPORT ANY PROCEDURES HE INTENDS TO USE TO ENSURE THAT THE SERVICE LIFE OF THE FACILITY EXCEEDS THE CONTAMINATING LIFESPAN OF THE LANDFILL (Emphasis added.)
>
> Reference: Appendix "G", Exhibit 928, Attachment "B", pp. 1-2

80. The Policy and Guideline also provide that if an applicant cannot specify the time period for the decommissioning of an engineered facility the Ministry will consider that the facility will be required indefinitely and provisions for its perpetual care, maintenance and replacement must be provided. Under the Policy, this is the responsibility of the applicant.

> Reference: Appendix "G", Exhibit 928, Attachment "B", p. 2

81. The Policy and Guideline provide, with respect to leachate collection facilities for municipal landfills:

> "To serve effectively leachate collection facilities and leachate treatment facilities must function for the contaminating lifespan of the landfill. The state-of-the-art does not allow precise determination of rates of attenuation or degradation of leachate within landfills. Therefore in the absence of data or site specific information to the contrary, where the complete attenuation of the contaminants in the leachate is necessary, the Ministry will require that these collection

facilities and treatment facilities be maintained in perpetuity."

Reference: Appendix "G", Exhibit 928, Attachment "B", p. 4

82. This Policy and Guideline became effective in May and April, 1988, respectively. However, they were preceded by Interim Guidelines on Engineered Facilities at Landfills dated July 13, 1987 which are substantially identical to the final Policy and Guideline approved by the Minister of the Environment.

Reference: Appendix "G"

83. Dr. George Hughes of the M.O.E. confirmed in his evidence to the Board that the Engineered Facilities Policy has been approved by the Minister of the Environment and is now official Ministry policy and further, that the Policy and the Guideline apply to *all* engineered facilities associated with the control of contaminants produced by landfills, including leachate collection systems, liners and monitoring facilities.

Reference: Appendix "G", Exhibit 928

84. The Board heard some evidence regarding the length of the contaminating lifespan and the service life of the proposed engineered facility at Site "D". On the evidence of Dr. Rowe, called on behalf of the Town of Milton, the contaminating lifespan of this Site ranged from 50+ years to 80+ years.

Reference: Appendix "E", pp. 60-66 , Vol. 86, pp. 20489-95

85. The Board also heard evidence that the service life of the leachate collection system proposed for Site "D" could approximate 20-25 years, that is, that the hydraulic trap could fail in part or in whole after 20 or 25 years. Dr. Hughes, in the course of his oral evidence on behalf of the M.O.E., testified that a leachate collection system of the type proposed by the Region for Site "D" would be required, under the Engineered Facilities Policy and Guideline, to have a service life which exceeded the contaminating lifespan of the landfill and that, if the service life of the proposed leachate collection system was 20 to 25 years and the contaminating lifespan was 50 or more years, this would not be acceptable under the Policy.

Reference: Appendix "E", pp. 67-70, Vol. 167, pp. 41698-41699, pp. 41715-41716

86. *It was clear at the end of the Hearing that the contaminating lifespan of the landfill at this Site had not been adequately defined. This was the position of the M.O.E.* in final submissions to the Board:

> *"The 'contaminating life-span' of Site D has not been accurately defined throughout the course of the hearing. The length of time over which the leachate collection system can be expected to function and maintain the hydraulic head in the landfill at an appropriately low level has also not been precisely defined. It is submitted that the prudent finding of fact from all the evidence is that the leachate collection system will probably not last as long as it needs to prevent off-site impacts".*
>
> Reference: Appendix "E", pp. 46-58, Submissions of M.O.E., p. 10, para. 25

87. Counsel for the Region also acknowledged in his final submissions to the Board that the evidence suggested that the proposed under-drains at Site "D" would fail within the contaminating lifespan of the Site. Engineering measures such as leachate wells in the waste, he suggested, are technically capable of responding to the failure of an under-drain system. However, under the engineering proposal made by the Region with respect to Site "D", such leachate wells are a contingency and not part of the primary engineering facility proposed for the Site.

88. The Board in its Reasons *erred in failing to address itself to the issues of the contaminating lifespan of a landfill at Site "D"* and *conformity of Site "D" with the Engineered Facilities Policy.* The only reference contained in its Reasons concerning the contaminating lifespan of an engineered facility is found at page 105, and deals with the meaning of the term "contaminating lifespan" pursuant to the Engineered Facilities Policy.

Reference: Appendix "A", p. 105

89. It is respectfully submitted that the failure to adequately define the contaminating lifespan of a landfill at Site "D" and the failure to adequately define the service life of the leachate collection system proposed for that Site, in whatever form, constitutes non-compliance with the Engineered Facilities Policy and Guideline of the M.O.E. *The failure to meet the requirements of the Engineered Facilities Policy and Guideline gives rise to serious, unanswered hydrogeological*

questions relating to public health and safety at Site "D", given the existing in use water resource at that Site.

C. PLANNING ERRORS

90. In addressing the issues before it regarding the Planning Act (Ontario) and the suitability of the proposed Sites from a planning perspective, the Board did not expressly conclude in its Reasons that one Site was preferable to the other. On a reading of its Reasons, however, it is clear that the Board implicitly found that landfilling at Site "F" was unacceptable in planning terms.

Reference: Reasons, Appendix "A", pp. 122 to 136

91. That this was the conclusion of the Board is amply demonstrated by the following statements from the Board's Reasons:

> -"There could be serious conflicts between landfilling [at Site "F"] and these latter uses [adjoining land uses]. From this perspective, Site F appeared to be a less desirable location overall". (Reasons, Appendix "A", p. 122);
>
> - Preservation of natural features to the maximum extent possible on Site "F", clearly would not be possible for those areas which are not now part of the National Sewer Pipe Quarry license in Site F" (Reasons, Appendix "A", p. 126);
>
> - "the regulations of the Parkway Belt West Plan would have to be amended" in the event of landfilling at Site "F" (Reasons, Appendix "A", p. 126);
>
> - "If Site F were developed, it is clear that some if not all of these developments [residential and industrial developments] in the vicinity of Site F would be impeded, or prohibited" (Reasons, Appendix "A", p. 132);
>
> - "Landfilling in the middle of this area [the area from Waterdown Road to King Road] will minimize the extensiveness, and probably the value, of this natural area" (Reasons, Appendix "A", p. 133); and
>
> - "of the 37 environmentally sensitive areas in Halton, only 6 met more of the ESA criteria than did Site F which met 5 of the 9 criteria, including the *crucial* criterion #6" (Emphasis added) (Reasons, Appendix "A", p. 133);

92. *The conclusion by the Board that Site "F" is unacceptable for landfilling from a planning perspective is contrary to all of the expert planning evidence received by the Board. Six planners testified. None of them testified that*

Site "F" was unsuitable or unacceptable on planning grounds. Indeed, all planners who testified before the Board, save only for Ian MacNaughton (the City of Burlington's planning witness), stated that Site "F" was preferable to Site "D" for landfilling, based on planning considerations. As acknowledged by the Board in its Reasons, even Mr. MacNaughton recognized that Site "F" was suitable for landfilling. It was his view that either Site was acceptable.

Reference: Reasons, Appendix "A", p. 123

93. It is respectfully submitted that the planning conclusions reached by the Board regarding Site "F" therefore constitute a substantive and fundamental error warranting rescission of its Decision. The expert planning evidence in fact before the Board on the issue of Site "F"s suitability for landfilling, in brief, was as follows:

(a) the Region's expert planner, *Mr. Peter Walker,* testified:

> *"I believe that from the planning standpoint Site F is the most appropriate use for sanitary landfill in the Region of Halton and that is based on the scope of the studies and type of studies undertaken and from the standpoint of good planning."*

Reference: Appendix "E", p. 75, p.13918 of Transcript

(b) the planner who testified on behalf of the Town of Milton, *Mr. Paul Stagl,* stated:

> *"We have concluded out of this comparison was that Site F is significantly more appropriate and better suited from a land use perspective to support a landfill site facility than was Site D. That was the conclusion we had come to. ... We looked at land use policies, physical characteristics, essentially we were looking at, given the choice that we have here, which is the better of the two sites from a planning perspective."*

Reference: Appendix "E", p. 77, p. 22530 of Transcript

(c) *Mr. Leon Kentridge* (expert planner for the Milton Area Citizens Coalition and several affected Milton Area landowners) testified:

> *"It seems to me in terms of land use planning at least, Site F is very substantially preferred."*

Reference: Appendix "E", pp. 78-79, pp. 23219-20 of Transcript

(d) *Mr. Max Bacon*, called as a planning witness by NSP, testified:

> *"As a result of the planning analysis carried out by Proctor & Redfern, it is our opinion that (i) use of the NSP land for sanitary landfilling as proposed by NSP in its application under the Environmental Protection Act, now revised to 40.5 ha., and as proposed by the Region for Site F is the most appropriate land use for the land and is consistent with sound planning principles; (ii) the planning context of the NSP land renders the site unusually suitable for landfilling; and (iii) sanitary landfilling on the NSP land can be carried out in an environmentally sound and prudent manner with little disruption, if any, to existing land uses and users."*

Reference: Appendix "E", pp. 80-81, p. 24566-67 of Transcript

(d) *Mr. Jon Kauffman*, a second planning witness called on behalf of the Milton Area Citizens Coalition et al., also testified that landfilling at Site "F" would have low to moderate impact on surrounding land uses.

Reference: Appendix "E", pp. 82-86, pp. 24109-24110 and p. 24179 of the Transcript;

(e) as noted, *Mr. Ian MacNaughton* alone of all the planning witnesses did not express a preference for Site "F" from a planning perspective. Nonetheless, it was his evidence that Site "F" was acceptable on planning grounds:

> *"I do view the Sites as being very close. I view them as being real alternatives....From a land use standpoint, the proposed landfill is acceptable at either site based on the proposed mitigative measures."*

Reference: Appendix "E", pp. 87-89, p. 38398 of the Transcript and Exhibit B-901, pp. 21 and 27

94. *It is submitted that in reaching its conclusions on the planning issues the Board failed judicially to exercise its proper functions in that it substituted its own opinion for that of the planning experts who testified before it. In so doing, it is respectfully submitted, the Board misconstrued certain of the planning evidence before it and, in other instances, failed to note or address itself in its Reasons to planning evidence of great importance.* It is submitted that, in combination this constituted a denial of natural justice. As detailed in Appendix "D" to this Application, these errors include:

(a)- the finding that there could be serious conflicts between landfilling at Site "F" and land uses adjacent to Site "F";

Every planner who testified before the Board agreed that significant physical and man-made barriers existed on all sides of Site "F", insulating the Site from surrounding land uses and buffering those land uses from interference or conflict by Site "F".

Reference: *Appendix "D", paras. 2-6*

(b)- the Board, at page 126 of its Reasons, indicated that section 6.2.3. of the Parkway Belt West Plan "sets out some stringent conditions, in subsection Q, that would not be met by landfill. Thus, the regulations of the Parkway Belt West Plan would have to be amended";

Site "F" is situate within the Parkway Belt Planning Area, delineated under the Parkway Belt West Plan, 1978.

There was no evidence before the Board that an amendment to the regulations of the Parkway Belt West Plan is required to permit landfilling by the Region at Site "F". Indeed, all the evidence was to the contrary: for regional landfilling, no amendment is necessary. This was confirmed by production to the Board of Regulation 263/79 under the Parkway Belt Planning and Development Act, 1973 (Ontario) which amended the land use and development control Regulation under the Act (Regulation 482/73) so as to expressly exempt the Region from the application thereof;

Reference: *Appendix "D", paras. 7-10, and*

Appendix "E", pp. 90-95, Exhibit H-321 and 320

In consequence, as a matter of law, no amendment to the Parkway Belt West Plan is required to permit regional landfilling at Site "F".

It is respectfully submitted that the Board also erred in its suggestion that section 6.2.3, subsection (q) of the Parkway Belt West Plan is relevant to the issue of landfilling at Site "F". As detailed in Appendix "D", this subsection pertains only to industrial developments.

(c)- at page 43 of its Reasons, the Board stated that "Since Site "F" met criteria 1, 3, 4, 5 and 6 [of the criteria for designation of an environmentally sensitive area] the Board considered that "it would have been reasonable for the site to have been eliminated in the early screening". Further, at p. 133 of its Reasons, in its discussion of the planning evidence, the Board states that "of the 37 environmentally sensitive areas in Halton, only 6 met more of the ESA criteria than did Site F which met 5 of the 9 criteria, including the <u>crucial</u> criterion #6";

Criterion #6 for the designation of an environmentally sensitive area (an "ESA") requires a site to be of regional environmental significance.

The Board in its Reasons failed to address or note in any way the crucial evidence of Ms. Linda Hellas, an expert on flora and fauna called by the Region, that:

(a) <u>Site "D" also meets "crucial" criterion #6 of the criteria for designation of an ESA.</u>

<u>Reference:</u> Appendix "E", pp. 96-97, pp. 1131-1132 of the Transcript

(b) Site"F" has not been designated as an International Biological Program Site, has not been designated under the <u>Wildlife Act</u> (Canada) and has not been identified as an Area of Natural and Scientific Interest by the Region or the Halton Conservation authorities;

<u>Reference</u>: Appendix "E", pp. 98-107, pp. 1056-1058 and 1064-1069 of the Transcript

(c) many other areas of the Region, if studied in sufficient detail, would also likely meet criterion #6 for designation as an ESA;

Reference: *Appendix "E", pp. 96-97, pp. 1131-1132 of the Transcript*

(d) the use of Site "D" for landfilling also represents a compromise from a biological protection standpoint; and

Reference: *Appendix "E", pp. 106-107, pp. 1169-70 of the Transcript*

(e) a natural area which meets one or more of the criteria for designation of an E.S.A. does not necessarily become an E.S.A., as other factors are taken into account in the decision to designate.

Reference: *Appendix "E", p. 109, p. 1130 of the Transcript*

D. PUBLIC HEALTH AND SAFETY CONCERNS AT SITE "D"

95. The Board heard extensive evidence regarding the hydrogeological characteristics of Site "D" from a Public Health and Safety perspective. The Board found that Site "D" is hydrogeologically suitable and acceptable for landfilling and that Site "F" is not. Further, in the Public Health and Safety Category overall, the Board found Site "D" acceptable "*with the conceptual design proposed and appropriate conditions applied*".

Reference: Reasons, Appendix "A", pages 112-113

96. In its Reasons, the Board erred in that it:

- rejected evidence that the *unweathered upper till unit at Site "D" may be fractured,* without addressing relevant evidence concerning the likelihood of the existence of such fractures and the consequences of their existence;

- failed to address itself *to the evidence before it* concerning the *implications of the introduction of fractures* in the unweathered upper till as a result of the construction of a landfill site at Site "D";

- failed to address itself to relevant evidence regarding the potential from landfilling *for depletion of the water resource at Site "D";* and

- failed to address itself, <u>at all,</u> in its consideration of the hydrogeological evidence regarding Site "D", *to the need for a liner at the Site* although it made provision therefor in the Conditions that it ordered should attach to the Certificate of Approval for Site "D".

1. <u>THE UNWEATHERED UPPER TILL AT SITE "D"</u>

97. The errors made by the Board in its Reasons, as set out in paragraph 96 above, relate to the *unweathered upper till unit* at Site "D". Accordingly, a background explanation of the evidence regarding this unit is necessary.

98. As acknowledged by the Board at page 60 of its Reasons, the description of the geology at Site "D" suggested that the top stratum (layer of ground) at the Site, is comprised of 8 metres of material known as "upper till", the top 4 metres of which is weathered and the lower 4 metres of which was described by various witnesses as "unweathered".

<u>Reference:</u> Reasons, Appendix "A", p. 60

99. The hydrogeological characteristics and thickness of the *unweathered upper till* at Site "D are critical to an assessment of the *"acceptability"* and "*suitability*" of the Site for landfilling. As appears from the following observations of the Board, this is so because:

(a) the unweathered upper till was proposed by the hydrogeologists who testified before the Board as being the unit which would control the rate of leachate loss from the landfill in the event of failure of the proposed engineered facility, namely, the *hydraulic trap*;

<u>Reference</u>: Reasons, Appendix "A", p. 70

(b) the unweathered upper till is also to control the rate of groundwater inflow to the hydraulic trap when the trap is working as designed;

<u>Reference</u>: Reasons, Appendix "A", p. 70

(c) the primary natural contingency measure at Site "D" proposed by the Region's hydrogeologists is attenuation of contaminants in the upper unweathered till unit;

Reference: Reasons, Appendix "A", p. 117

(d) immediately below the unweathered upper till unit lies a layer of ground described as the *"lower till"* and *"granular units"* (sand or gravel lens) embedded in the lower till. *It is from these granular units that land owners at Site "D" and adjacent to the Site generally draw water for domestic and agricultural uses;*

Reference: Reasons, Appendix "A", pp. 60, 62 and 70

(e) the spread of contaminants from the proposed landfill at Site "D" in the event of failure of the hydraulic trap, would be through the flow of groundwater at the Site. Accordingly, the possible flow of groundwater-bearing leachate or contaminants from the landfill through the granular units to adjacent wells is of obvious importance to the hydrogeological suitability and acceptability of Site "D".

Reference: Reasons, Appendix "A", p. 70

2. THE POTENTIAL FOR FRACTURING IN THE UNWEATHERED UPPER TILL

100. At the conclusion of the Hearing, the Region recalled Mr. Stan Feenstra, to introduce new evidence in Reply regarding the hydrogeological characteristics of the unweathered upper till unit at Site "D". As stated by the Board at page 67 of its Reasons, Mr. Feenstra testified that there may be fractures which penetrate the unweathered upper till which could allow leachate to traverse this unit into the granular, water-bearing units below. The impetus for Mr. Feenstra's evidence in this regard was work carried out in the Sarnia area and reported upon in a Masters' Thesis prepared by a University of Waterloo graduate student in the summer of 1988.

Reference: Reasons, Appendix "A", p. 67

101. The significance of fractures in the unweathered upper till unit is simply t*hat if fractures exist in this unit it will result in faster contaminant migration, if the hydraulic trap at Site "D" fails. In this situation there would be a rapid arrival of contaminants at the water-bearing granular units beneath the landfill. Once such contaminants reach the granular units, contamination of an existing, currently used water resource will occur.* As expressed by Mr. Feenstra:

> "*The presence of fractures extending through the unweathered upper till has a significant effect on the nature of contaminant transport through this unit. In the event of failure of the hydraulic trap, contamination of the [upper granular unit] may occur rapidly (less than a year). Though there are no site-specific data indicating the presence of fractures at Site "D", at this time, it is my opinion that it is a reasonable possibility that they exist.*
>
> *In the event that fractures extend through the upper unweathered till, a groundwater monitoring plan such as typically implemented at municipal landfills in Ontario will not be sufficient to protect the nearby groundwater users ... for the case where the unweathered upper till is fractured and travel times may be less than a year, the time required for detection of groundwater contaminants and construction of the purge wells, contaminants from the landfill may result in impacts on the nearby groundwater users". (Emphasis added)*
>
> Reference: Reasons, Appendix "E", p. 112,
> Exhibit H-936, p. 4, paras. 7 and 8

102. At page 69 of its Reasons, the Board concluded:

> "Having considered all the evidence, the Board does not find support for Mr. Feenstra's hypothesis about fracturing in the vicinity of Site "D". To the contrary, the bulk of the evidence supports the conclusion that groundwater moves very slowly through the unweathered upper till. By Mr. Feenstra's own admission, there is no way to conclusively prove or disprove this hypothesis. Notwithstanding his statement on this matter, council for the Town of Milton sought leave to introduce test pit evidence of the sort which Mr. Feenstra had averred would not help to clarify the situation.
>
> This Board is of the view that according great weight to an unprovable hypothesis *introduced at the very end of evidence in a two-year long hearing,* might be interpreted by others who may have to participate in the environmental assessment process as a strategy for success. This legacy is not one we seek."
>
> Reference: Reasons, Appendix "A", p. 69

103. Notwithstanding its rejection at page 69 of its Reasons of the evidence of Mr. Feenstra concerning potential fracturing in the unweathered upper till unit,

the Board in the Conditions which it ordered should attach to the Certificate of Approval for landfilling at Site "D", included conditions which specifically contemplate the possibility of fracturing in the unweathered upper till unit. These conditions include Condition 5.3 relating to monitoring wells, Condition 5.4 regarding a possible liner at Site "D", and Condition 14 regarding the monitoring of leachate in the landfill. The legal and engineering deficiencies of this approach are discussed below.

104. At the conclusion of the Hearing, *the Board was urged both by the proponent itself and by the Ministry of the Environment, as well as various other parties,* to accept Mr. Feenstra's evidence regarding the potential for fractures in the unweathered upper till unit and to evaluate the hydrogeological suitability and acceptability of Site "D" in accordance with that evidence. The Board declined to do so notwithstanding that *it had received evidence indicating that the rejection of the fracturing potential was tantamount to "gambling with public health and safety".*

105. No hydrogeologist was called on behalf of any party after the Reply evidence of Mr. Feenstra to dispute his evidence regarding the potential for fractures in the unweathered upper till unit. The Town of Milton requested leave to introduce further evidence in light of the Reply evidence of the Region in this regard and such leave was refused by the Board.

106. *It is respectfully submitted that the Board's rejection of the evidence of Mr. Feenstra regarding the potential for fracturing in the unweathered upper till is a substantial and fundamental error. For this reason alone the Decision of the Board regarding Site "D" is unsustainable.*

107. It is further respectfully submitted that the Board's rejection of this evidence and its incorporation in the proposed Conditions to attach to a Certificate of Approval for Site "D" of Conditions apparently intended to respond to the possibility of fracturing in the unweathered upper till *reflects an inconsistency in the Board's approach in this matter which constitutes an error in substance by the Board.*

108. The Conditions proposed by the Board suggest that Mr. Feenstra's evidence on fracturing was accepted, yet the Board's Reasons confirm it was

rejected. The legal deficiencies of this treatment of the evidence are at least twofold:

(a) By appearing to reject the evidence regarding fracturing in its Reasons, it became unnecessary to undertake on this issue a comparative assessment of the merits of landfilling at Sites "F" and "D" on public health and safety grounds. This assessment, therefore, was not undertaken by the Board in the context of the fracturing concern at Site "D". On the evidence this assessment would clearly have favoured landfilling at Site "F";

(b) Although this comparative assessment of the safety aspects of the two Sites was not undertaken by the Board (in consequence of the rejection by the Board of the fracturing evidence), the Board then proceeded to accept the fracturing evidence for the purposes of imposing Conditions on the Certificate of Approval to be granted for Site "D";

This approach, in the result, so prejudiced the assessment of Site "F"'s merits for landfilling, that the Reasons of the Board do not reflect a balanced consideration of the risk assessment evidence before it.

109. The Board had an obligation to consider the fracturing potential at Site "D" on its merits - regardless of the timing of the introduction of the evidence. The Board's Reasons clearly suggest that the Board was sufficiently preoccupied with the timing of the proponent's introduction of this evidence, that it improperly influenced the Board's weighing of the evidence. Further, it is respectfully submitted that the matters described in paragraphs 103, 107 and 108 hereof demonstrate a non-judicial and arbitrary treatment of this evidence by the Board which, in the circumstances, constitutes a denial of natural justice.

Reference: Reasons, Appendix A"A", p. 69

2-i. EVIDENCE IN SUPPORT OF THE FRACTURING POTENTIAL

110. It was Mr. Feenstra's unchallenged evidence that rejection of the possibility of fracturing in the unweathered upper till unit at Site "D" was tantamount to "gambling with Public Health and Safety".

Reference: Appendix "E", pp. 118-119, pp. 42863 and 42869 of the Transcript

111. It is respectfully submitted that the Board erred in principle in basing its rejection of Mr. Feenstra's Reply evidence on the matters set out in paragraph 102 hereof when, in doing so, it failed to address in its Reasons or note *at all* the following critical evidence bearing on the issue:

(a) *the results of the studies in the Sarnia clay tills, which caused Mr. Feenstra to initiate his review of the potential for fracturing in the unweathered upper till at Site "D", were not released until June, 1988 and only then on a confidential basis to Mr. Feenstra by Dr. John Cherry of the University of Waterloo. Accordingly, none of the other hydrogeologists who testified at the Hearing regarding the hydrogeological Public Health and Safety aspects of Site "D", including Messrs. Petrie and Crutcher (the City of Burlington's hydrogeologists) were aware of this new evidence of fracturing in clay till materials at the time they testified (including Mr. Feenstra during his first appearance) and, consequently, did not assess its implications for Public Health and Safety at Site "D";*

(b) *while the Board correctly indicated that Mr. Feenstra had stated in his Reply evidence that the presence of fractures through the unweathered upper till was not confirmed or even suggested by field data at Site "D", it was the evidence before the Board that the type of tests which could have identified such fractures in the unweathered upper till unit <u>were not conducted</u> by any of the hydrogeologists who investigated the Site;*

<u>Reference</u>: Appendix "E", pp. 120-126, Vol. 169, pp. 42095-6
42070-71
42081, 42083
Vol. 122, p. 29562

(c) *it was the evidence of Mr. Feenstra on the occasion of both of his appearances before the Board that although there were certain dissimilarities between the till materials at Sarnia and Site "D", there were, as well, numerous similarities;*

(d) *the Sarnia data identified the presence of water-bearing open fractures over a range of depths from 2.1 metres to 13 metres in tills previously thought by hydrogeologists to be unfractured. If fractures of like depths exist in the unweathered upper till unit at Site "D", they would extend into the lower till where the granular units are present;*

<u>Reference</u>: Appendix "E", pp. 127-137, Volume 169, pp. 42079-42089

(e) *it was the evidence of both Mr. Petrie (on behalf of the City of Burlington) and Mr. Feenstra (on behalf of the Region) that the field investigations performed at Site "D" were limited in nature and could easily have missed identifying the presence of vertical fractures in the unweathered upper till;*

Reference: Appendix "E", pp. 122-126, Volume 122 (Petrie) p. 29562; and Volume 169 (Feenstra), pp. 42070-42071, 42081 and 42083.

(f) *Mr. Petrie himself, at work undertaken in Waterloo, Ontario in till materials, established the presence of vertical fractures in till units;*

(g) *data collected in till areas in Illinois established that open fractures can and do exist in clay till materials even where they have been buried by other strata and, further, that they can occur at depths of as much as 10 to 20 metres;*

Reference: Appendix "E", pp. 138-140, Volume 169 (Feenstra) pp. 42093-42095

(h) *it was the evidence before the Board that investigations by the Ontario Waste Management Corporation of various sites in the Halton Hills had revealed the existence of water-bearing fractures at depths as great as 6.5 metres; and*

Reference: Appendix "E", p. 141-143, Volume 172, pp. 42840 - 40842.

(i) as acknowledged by Mr. Feenstra, the tritium findings at Site "D" do not suggest the presence of fractures in the unweathered upper till. Nonetheless, Mr. Feenstra described several explanations for the tritium data which would be consistent with fracturing in the unweathered upper till. The Board failed to address or note in its Reasons these explanations for the tritium data;

Reference: Appendix "E", pp. 110-111, Exhibit H-936,para. 3, pp. 2-3.

112. Finally, on September 30, 1988, after the Reply evidence of Mr. Feenstra, the Town of Milton brought a Motion before the Board seeking leave to call as a reply witness Dr. Nicholas Eyles, a quaternary geologist.

113. In respect of the Town of Milton's Motion, the Board received a Witness Statement from Mr. Eyles, together with a series of photographs relating to a test pit at Site "D", which documents became Exhibit M-962 before the Board. In his Witness Statement Dr. Eyles stated:

> *"On the basis of this test pit at Site D there are fractures extending below the weathered zone through the upper till and that some of these may extend into the lower till. However, on the basis of the one test pit, it is not possible to determine the frequency or spacing of such fracturing".*

Reference: Appendix "E", pp. 144-154, Exhibit M-962, p. 3

114. The Board ruled on the Town of Milton's Motion and declined to entertain the proposed Reply evidence to be given by Dr. Eyles. The Board did so at a time when it had received and was aware of the existence of documents specific to Site "D" which supported the evidence given by Mr. Feenstra.

115. On all of the evidence before the Board, if fractures exist in the unweathered upper till at Site "D", the continued viability of the water resource at that Site is in jeopardy.

116. *It is respectfully submitted that the potential for fractures in the unweathered upper till unit at Site "D" is of such fundamental importance to the Public Health and Safety attributes of that Site, that to authorize and proceed with landfilling at that Site before determining the existence, if any, of such fractures and the extent thereof, if they exist, is prejudicial to the public interest and, on policy grounds, should not be permitted.*

3. POTENTIAL FOR INDUCEMENT OF FRACTURES DUE TO LANDFILLING

117. Mr. Feenstra in his Reply evidence also testified that the construction of a landfill at Site "D" could itself induce fractures in the unweathered upper till unit .

Reference: Reasons, Appendix "A", p. 70

118. Mr. Feenstra testified that the possibility of the inducement of fractures or the opening of existing fractures consequent upon introduction of a

landfill at Site "D" should be studied in detail by a geotechnical engineer prior to the construction of a landfill at Site "D".

Reference: Appendix "E", p. 155, Vol. 169, p. 42122 of the Transcript

119. The Board *received no evidence from any engineer as to the likelihood of fractures being induced by introduction of a landfill at Site "D", nor as to the consequences for the operation of the hydraulic trap in the event of such an occurrence.*

120. The Board addressed this evidence from Mr. Feenstra only at page 70 of its Reasons where it stated:

> "The second of Mr. Feenstra's additional hypotheses was to postulate that the construction of the landfill itself could induce fractures itself in the unweathered upper till.
>
> The Board finds that the proponent's timing for the introduction of these latter hypotheses was not the best possible. They could have been, and should have been, introduced during the proponent's original case."

Reference: Reasons, Appendix "A", p. 70.

121. As appears from this statement by the Board, the Board was concerned with the timing of the introduction of this evidence by the Region through Mr. Feenstra. However, the Board failed to address the issue raised by Mr. Feenstra in any manner whatsoever in its Reasons and, thus, did not address itself to the implications for Public Health and Safety at Site "D" were such induced fracturing to occur.

4. DEPLETION OF THE WATER RESOURCE AT SITE "D"

122. Mr. Feenstra also testified in his Reply evidence that the presence of a landfill at Site "D" could cast a precipitation shadow on the ground beneath it preventing the water table from being replenished and thus depleting the quantity of the water resource available in the environs of Site "D". It was further his evidence that drought in the area of Site "D" could have a similar effect. This was subsequently referred to at the Hearing as the "shadow effect".

Reference: Reasons, Appendix "A", p. 70.

123. The effect of such water resource depletion would be two-fold: first, it would reduce the quantity of the water resource now in use by persons resident in

the vicinity of Site "D"; secondly, as the concept of the hydraulic trap at Site "D" is premised upon the attraction of water from below the trap into the trap, the depletion of water levels below the trap could result in water flowing away from the trap instead of towards it. Should this occur, it was the evidence of the hydrogeologists that the hydraulic trap would fail, thus releasing contaminants from the landfill site.

124. It was the evidence of Mr. Feenstra that:

> *"The effect of the landfill itself on the groundwater levels beneath the site is difficult to quantify without a computer model and a good understanding of the areal extent of the units, the existing recharge and discharge areas and the groundwater flow patterns. A more detailed understanding of the groundwater flow system would be required before a rigorous evaluation of the effect of the landfill on groundwater levels beneath the landfill can be made.*
>
> ...
>
> It is also my opinion that reductions in the groundwater level in the UGU [the upper granular unit embedded in the lower till below the unweathered upper till at Site "D"] due to drought or the effect of reduced recharge due to the landfill may result in seasonal or long-term failure of the hydraulic trap."
>
> Reference: Appendix "E", pp. 114-115, Exhibit H-936, pp. 6-7.

125. Mr. Feenstra also testified that this potential for the depletion of the water resource at Site "D" might be compensated by upward flow from the bedrock at the Site and lateral flow of water through the lower till in the vicinity of the Site. It was the evidence of both Mr. Feenstra and Mr. Petrie, however, that there was not a great deal of data available regarding the bedrock hydraulics at Site "D", that the Region's hydrogeologists had not investigated the bedrock at the Site and that, in the words of Mr. Petrie:

> "... at some portions of the Site there may be a flow from bedrock to till as a function of that elevation change which could be reversed elsewhere on the Site but I do not know".
>
> Reference: Appendix "E", pp 156-160, Volume 133, pp. 32129 to 32130; and Volume 172, pp. 42775-42777

126. The Board, at page 70 of its Reasons, again indicated that the proponent's timing for the introduction of this evidence through Mr. Feenstra was "not the best possible" and suggested that the evidence should have been

introduced during the Region's original case. Regardless of this observation, however, the Board acknowledged in its Reasons that fractures in the unweathered upper till might bring on the failure of the hydraulic trap which, "in conjunction with declining water levels caused by drought or the 'shadow effect', could cause more rapid contamination of the upper granular unit if the unweathered upper till was actually fractured". The Board further acknowledged that if this were the case, it suggested that the lateral groundwater flow at Site "D" is so sluggish as to not replenish water losses beneath the landfill.

Reference: Reasons, Appendix "A", pp. 70 and 79.

127. Apart from the observations noted in paragraph 126 above, the Board erred by failing to address itself to the Public Health and Safety consequences of a depletion of the water resource at Site "D" in the manner suggested by Mr. Feenstra. The Board, in its Reasons, did not reject or accept this evidence from Mr. Feenstra.

128. Mr. Feenstra also testified that there was insufficient information available before the Board to reject the potential for the "shadow effect" at Site "D". It was his unchallenged opinion that to accommodate this potential effect, the design proposed by the Region for Site "D" was inadequate and that it would have to be re-evaluated and amended.

Reference: Appendix "E", pp. 161-165, Volume 175, pp. 42914 to 42915; Volume 172, pp. 42919 and 42921

5. NEED FOR A LINER AT SITE "D"

129. As noted, Mr. Feenstra suggested that to address the various concerns regarding the unweathered upper till unit at Site "D" that he had identified, there were a number of design options available to the Region. These included the design, installation and testing of a purge well system before the start of landfilling; the conduct of detailed pumping tests to assess the presence of fractures in the unweathered upper till; the potential connection of residents in the vicinity of Site "D" to a piped municipal water supply; or the construction of a liner of recompacted native clay silt till at the base of the landfill to eliminate the effect of fractures extending through the unweathered upper till unit.

Reference: Appendix "E", pp. 112-113, Exhibit H-936, pp. 4-5.

130. Although Mr. Feenstra suggested certain engineering options which he felt would respond to the Public Health and Safety concerns which he had raised regarding Site "D", the Board did not receive any engineering evidence at all with respect to the design options proposed by Mr. Feenstra nor as to their compatibility, or lack thereof, with the hydraulic trap/leachate collection system concept relied upon by the Region for the success of landfilling at Site "D".

131. There was thus *no evidentiary foundation before the Board upon which it could conclude, from an engineering perspective, that the design options proposed by Mr. Feenstra were adequate or appropriate to the hydraulic trap proposal as propounded by the Region.*

132. It was the position of the Ministry of the Environment at the conclusion of the Hearing as expressed by its Counsel to the Board that, in light of Mr. Feenstra's Reply evidence, the possibility of fracturing extending through the unweathered upper till unit at Site "D" should be accepted and, further, that the most appropriate additional level of engineering to accommodate this possibility is a liner at the base of the Site.

Reference: Appendix "E:, pp. 46-58, para. 29

EVIDENCE OF JAMES HIRAISHI

133. The only engineering evidence received by the Board throughout the course of the entire Hearing regarding the impact of a liner at Site "D" was that received from James Hiraishi, an engineer called as a witness on behalf of the Region to testify as to the proposed design and operation of a landfill at the Site. Mr. Hiraishi, in a written memorandum dated November 8, 1987 to another member of the Region's Environmental Assessment consulting team, indicated:

> "As you are aware, the basis for Site D design and operations is premised on the concept of a hydraulic trap. The trap is intended to capture all of the leachates produced at the Site in addition to some groundwater resulting from creating a discharge condition. *A liner, in effect, would contravene the basic underlying philosophy used to develop the design and operations concept.*
>
> With a liner, there will no longer be a need for a hydraulic trap which in turn will impact on the base contour design, leachate collection system and the final contour design. In addition, hydrogeologic assessment will need to be made in terms of an effectiveness of a liner and the impact on surrounding water users. Our

> analysis, as contained in the reports, is that a liner is not required and has not shown to be necessary. Moreover, *we have not established all of the potential impacts arising from the installation of a liner at Site D from a hydrogeologic and design and operations perspective. In short, we anticipate that a liner requirement will entirely alter the design and operations from that given in our previous submissions. ..."*
>
> Reference: Appendix "E", pp. 166-170, Exhibit H-312.

134. This evidence from James Hiraishi was the only engineering evidence before the Board concerning the implications of a liner, *of any kind*, at Site "D". This evidence was given prior to the Reply evidence of Mr. Feenstra in which it was suggested, as one design option, that a liner be installed at the Site and which led to the recommendation from the Ministry of Environment that a liner be required at the Site.

135. The Board in its consideration of the hydrogeological implications of Site "D", set out at pages 60 to 82 of its Reasons, did not address itself in any way to either the suggested need for a liner at Site "D" or to the evidence received by it from Mr. Hiraishi. It is respectfully submitted that this constitutes a further fundamental error by the Board.

> Reference: Reasons, Appendix "A", pp. 60-82

136. In rejecting the evidence of Mr. Feenstra regarding fracturing in the unweathered upper till unit at Site "D", the Board thus implicitly rejected the need for a liner at Site "D". However, notwithstanding that it had failed to address itself to the need for a liner at Site "D" and the engineering and hydrogeologic implications of introducing one, the Board in Condition 5.4 of the Conditions which it ordered should attach to the Certificate of Approval to be issued with respect to Site "D" stated:

> "If the results of the pump tests and response tests described in Condition 5.3 can reasonably be interpreted by the Approvals Director to correspond to a permeability for the unweathered upper till greater than 1.4×10^{-7} cm/sec, than a liner of compacted native glacial till shall be constructed at the base of the excavation by remoulding the upper one meter or more of the unweathered upper till material on site to achieve the lowest practical permeability".
>
> Reference: Conditions, Appendix "A", p. 183

137. The Board thus provided for the possibility of a liner at Site "D" notwithstanding that it had not addressed in its Reasons the evidence regarding a

liner and, in particular, the evidence of James Hiraishi in this regard and, further, notwithstanding that there was *no evidentiary foundation before the Board to address engineering design implications of a liner of the type proposed by Mr. Feenstra* in the circumstances of the existence of fracturing in the unweathered upper till unit.

138. It is respectfully submitted that the legal deficiencies of this treatment of the evidence by the Board are as set out in paragraphs 131, 135 and 137 hereof.

139. It is further respectfully submitted that this treatment by the Board of the issue of the need for a liner at Site "D" and its failure to address itself in any way to the evidence it had received regarding the implications of a liner at Site "D", constitutes an error in substance and in principle warranting rescission of the Board's Decision that Site "D" is hydrogeologically acceptable and suitable for landfilling.

140. In the alternative, it is respectfully submitted that the matters outlined in this Part IV-D hereof, warrant a re-hearing by a panel of the Joint Board on the need for and the implications of a liner at Site "D" in hydrogeologic and engineering terms.

E. OVERTURNING OF MUNICIPAL DECISION

141. The Board's Decision overturned the carefully considered decision of one of the largest regional municipalities in the Province, the Regional Municipality of Halton. That decision by the Region was that Site "F" was marginally to be preferred for sanitary landfilling over Site "D". That decision by the Region, made by elected representatives, was the culmination of a lengthy planning and evaluation process extending over six years, constituting a comprehensive review not only of the hydrogeological, planning, social, cultural and *Environmental Protection Act* merits of the proposed Site "F" landfill, but also of the broader issue of the advancement of the Region's solid waste management strategy as a whole.

Reference: Appendix "E", p. 10, Exhibit B-348.

142. It is submitted that the *Board's Reasons for overturning the Region's decision fall short of the serious, weighty, convincing and compelling municipal errors which must be manifest before such a step is warranted.* That deficiency is exacerbated by the Board's utter failure to consider the evidence explaining and supporting the Region's preference for Site "F" and by the Board's error in misconstruing the evidence explaining and supporting that preference by the Region. The particular errors and deficiencies in the Board's Reasons and Decision are summarized in Parts IV-A, B, C, D, F and G of this Application, and are discussed further in Appendices "B", "C and"D".

F. ECONOMIC ISSUES: COSTS OF LANDFILLING

143. The Region called two witnesses to testify as to the economic implications of landfilling at Sites "F" and "D", mainly, Messrs. Watson and Rinaldo. It was Mr. Watson's evidence that the costs for Site "D" were approximately $63,000,000 whereas the costs for Site "F" were approximately $61,000,000. It was his expressed opinion that, in these circumstances, there was very little difference from an economic point of view between the two Sites.

Reference: Reasons, Appendix "A", pp. 144-145

144. The Board accepted that these cost estimates meant that the costs of each Site were approximately equal with Site "D" being more expensive than "F" by approximately 2.9% based on up-dated figures provided by Mr. Watson during the course of the Hearing. These cost estimates, however, assumed that a liner would not be introduced at either Site.

Reference: Reasons, Appendix "A", p. 142

145. It was Mr. Watson's evidence that if Site "D" needed a liner, approximately $5.7 million of incremental costs would be added to the cost estimates relating to this Site.

Reference: Reasons, Appendix "A", p. 142

146. In the case of Site "F" only the hydrogeologist for the City of Burlington suggested that a liner was required at this Site. It was Mr. Watson's stated opinion that if a liner was necessary the incremental costs at Site "F" would

be in the order of $5.1 million, subject to reduction if the clay till on-site at Site "F" was used for construction of the liner. Conversely, the hydrogeologists for the City of Burlington and the economists called to give evidence on behalf of the City of Burlington, suggested that the costs of a liner at Site "F" could be much higher.

Reference: Reasons, Appendix "A", p. 143

147. The Board found that an assumption of $4 million for a liner at Site "F" was in the reasonable range of costs for a liner at this Site.

Reference: Reasons, Appendix "A", p. 143

148. It is respectfully submitted that the Board erred in finding that the costs of the landfill at Site "D" would be about $6 million less than the costs of the landfill at Site "F", in present value terms, and in suggesting that the economics of landfilling by the Region favoured Site "D".

Reference: Reasons, Appendix "A", p. 148

149. The Board's findings in this regard were based on its calculation of the effect of changes to Site costs indicated during the course of the Hearing. At page 145 of its Reasons, the Board sets out in Table form its view as to the effect of the changes it suggests were demonstrated. The final adjusted totals, according to the approach taken by the Board, indicate a total cost at Site "D" of $60.8 million and a final cost at Site "F" of $67.8 million.

Reference: Reasons, Appendix "A", p. 145

150. It is respectfully submitted that the Board here fell into serious error in that:

(a) *in preparing the Table set out at page 145, the Board included the cost of a liner at Site "F" at a cost of $5 million, notwithstanding that the Board failed to address itself in its Reasons to the basis for suggesting that a liner was required at Site "F" and, equally importantly in this context, notwithstanding that the Board elsewhere in its Reasons found that $4 million was a reasonable cost estimate for the cost of a liner at this Site;*

(b) *in preparing the Table at page 145 of its Reasons, although the Board included the cost of a liner at Site "F", it did not include the cost of a liner at Site "D" notwithstanding that the Conditions which the Board ordered should attach to a Certificate of Approval for Site "D" include contingent provision for a liner. On the basis of the evidence of Mr. Watson, the incremental costs at Site "D" for a liner are $5.7 million;*

(c) *accordingly, had the Board accurately included the costs of a liner at Site "D", in recognition of the Conditions which it itself ordered for the Site, the cost advantage perceived for Site "D" by the Board over Site "F" would have been completely eliminated; in failing to include the costs of a liner at Site "D" in these circumstances, it is respectfully submitted that the Board seriously erred;*

(d) *unchallenged evidence was led before the Board by the Town of Milton in its Reply case from engineers that the on-site clay till materials at Site "F" were suitable for use in constructing a liner at that Site. Accordingly, the cost estimate proposed by Mr. Watson for the cost of a liner at Site "F", in the sum of $5.1 million, should have been reduced by the Board for the purposes of its Table at page 145 of its Reasons by the proven savings to be generated by the use of on-site materials. In failing to reduce the costs of the liner appropriately for the purposes of its calculations, the Board over-stated the costs of a liner at Site "F" to the detriment of Site "F" in a comparative appraisal of the two Sites on economic considerations;*

(e) *in calculating its comparative costing set out at page 145 of its Reasons, the Board makes certain assumptions regarding the continued provision of a transfer station related to Site "F", and the value of 120 acres of land at Site "D", among other assumptions. At no time during the course of the Hearing did the Board provide notice to the parties and, in particular,*

Counsel for the parties supporting Site "F", that the Board so regarded the evidence or was considering carrying out a calculation of this kind based on the assumptions set out in the Table. It is respectfully submitted that failure by the Board to so indicate these assumptions and its suggested cost comparison constituted an error by the Board which prevented parties at the Hearing from submitting evidence to the Board with respect to the validity of these assumptions and the appropriateness of the cost comparison in fact carried out by the Board.

151. It is respectfully submitted that these errors by the Board, warrant rescission of the Board's finding that the economics of landfilling favour Site "D" over Site "F".

G. JOINT BOARD ERRORS

152. It is respectfully submitted that the Board made numerous errors and seriously misconstrued the evidence in its Reasons. Those matters are dealt with in detail in the preceding Parts of this Part IV of this Application and, additionally, in Appendices "B", "C" and "D" to this Application. They are here briefly highlighted in point form:

- *the Board, in concluding that Site "F" was hydrogeologically "unacceptable" and "unsuitable" for landfilling, rejected or ignored the evidence of every hydrogeologist who testified before the Board and, in so doing, the Board substituted its own opinion for that of experts' qualified in the sciences of hydrogeology, hydrogeochemistry, and hydrology;*

- *in reaching the above conclusion regarding Site "F", the Board failed judicially to exercise its proper functions;*

- *the Board failed to address itself to the evidence before it on the attenuation characteristics of the shale at Site "F" and the public health and safety implications thereof for landfilling at that Site;*

- *the Board erred substantially and fundamentally in ignoring documentary hydrogeological evidence presented to it regarding the suitability and acceptability of Site "F" for landfilling;*

- *the Board, in finding that leachate losses from a sanitary landfill are not acceptable in some situations, rejected the Reasonable Use Policy and Water Management Policy of the Ministry of the Environment without weighty and compelling evidence on which to do so;*

- *the Board, in finding that Site "D" was acceptable and suitable for landfilling notwithstanding non-compliance by the Region, in the case of Site "D", with the Engineered Facilities Policy of the Ministry of the Environment, approved Site "D" in the face of serious outstanding and unanswered hydrogeological questions relating to public health and safety at Site "D";*

- *the Board erred in substance and fundamentally by concluding that Site "F" was unacceptable for landfilling from a planning perspective and, in so doing, rejected or ignored the unanimous evidence from all of the planners who testified before it;*

- *in reaching its conclusion that Site "F" was unacceptable from a planning perspective, the Board substituted its own opinion for that of the planning experts who testified before it and, in so doing, the Board failed judicially to exercise its proper functions;*

- *the Board, in finding that the approval for landfilling of Site "F" would require an amendment to the regulations of the Parkway Belt West Plan, erred in law and on the evidence;*

- *the Board, in finding that subsection 6.2.3 (q) of the Parkway Belt West Plan imposed stringent conditions that would not be met by landfilling at Site "F", erred in law and on the evidence;*

- *the Board erred in finding that there would be serious conflict between landfilling at Site "F" and adjacent land uses;*

- *in its consideration of biophysical impacts at Sites "F" and "D", the Board ignored significant and critical portions of the evidence of the Region's expert, Ms. Hellas, regarding both Sites;*

- *the Board fell into substantial and fundamental error when it rejected the evidence of the Region's expert hydrogeologist and hydrogeochemist, Mr. Feenstra, regarding the potential for fracturing in the unweathered upper till unit at Site "D";*

- *the Board further fell into substantial and fundamental error when it purported to reject in its Reasons this evidence of Mr. Feenstra but then relied upon this evidence to propose, in the absence of any supporting engineering evidence, Conditions of Approval for the design and operations of Site "D" and, in so doing, the Board failed judicially to exercise its proper functions;*

- *the Board failed to address itself to relevant evidence regarding the potential for inducement of fractures at Site "D" due to landfilling and, further, failed to address the public health and safety implications thereof;*

- *the Board failed to address itself to relevant evidence concerning the potential for depletion of the water resource at Site "D" and, further, failed to address the public health and safety implications thereof;*

- *the Board ignored in its entirety Mr. Hiraishi's evidence regarding the implications of introduction of a liner at Site "D";*

- *the Board erred in failing to address itself in its Reasons, in any way, to the basis for the finding that Site "F" was likely to require a liner in the event of landfilling at that Site;*

- *the Board overturned the informed decision of the elected Regional Council of the Region of Halton in the absence of evidence of serious, weighty, convincing and compelling municipal errors which must be manifest before such a step is warranted;*

- *the Board erred fundamentally in finding that the economics of landfilling by the Region favoured Site "D";*

- *the Board erred in rejecting the usefulness and value of the data available from the Bayview Park and Burlington Landfill site precedents in assessing the hydrogeological public health and safety features of Site "F"; and*

- *the Board, in concluding that the Region's landfill site selection process was faulty because it included selection of a site on fractured rock, erred in failing to address itself to evidence before it regarding the past use of pits and quarries for landfilling.*

PART V – CONCLUSION AND ORDER SOUGHT

153. It is respectfully submitted that there is a substantial preponderance of important reasons why sanitary landfilling at Site "F" by the Region should be approved, on the basis proposed by the Region and subject to the conditions of approval proposed at the Hearing by the Ministry of the Environment. Further, it is submitted that on all the evidence before the Board there is considerable and substantial uncertainty as to whether Site "D" is hydrogeologically suitable and acceptable for sanitary landfilling by the Region at this time, with or without a liner. Finally, it is respectfully submitted that the future availability of sanitary landfill sites in Ontario and the availability of engineering solutions to solid waste

disposal issues will be seriously adversely affected by the Board's Decision; that on all the evidence before the Board there can be no doubt that sanitary landfilling at Site "F", on the basis proposed by the Region and subject to the conditions of approval proposed by the Ministry of the Environment, will be safe from a public health and safety perspective and hence is hydrogeologically suitable and acceptable; that the approval of such sanitary landfilling at Site "F" is consonant with and in furtherance of the policies of the Region and Regional Council and that the benefits of such sanitary landfilling at Site "F" to the Region of Halton community as a whole are so substantial that the Board's Decision should be rescinded as requested in Part I of this Application.

154. This Applicant therefore requests:

A. That the Decision of the Board, dated 24 February 1989, together with Addendum dated 2 March 1989, rejecting the application of the Region for approval to proceed with landfilling at Site "F" in the City of Burlington, and approving the Region's application to proceed with landfilling at Site "D" in the Town of Milton, subject to the Conditions set out in the Decision of the Board and directing the Approvals Director to issue a Certificate of Approval in accordance with the Conditions set out therein, be rescinded and a decision be substituted therefor that authorizes the Region to proceed with landfilling at Site "F" in accordance with the design proposed by the Region before the Board and subject to the conditions of approval proposed at the Hearing by the Ministry of the Environment;

B. In the alternative, that the Board's Order be varied and rescinded so that the following findings of the Board are rescinded:

(i) the finding that Site "F" is hydrogeologically "unsuitable" and "unacceptable" for landfilling without a liner;

(ii) the finding that Site "F" is hydrogeologically "unsuitable" and "unacceptable" for landfilling with a liner;

(iii) the finding that Site "F" is otherwise unacceptable in the Public Health and Safety category for landfilling with or without a liner;

(iv) the finding that sanitary landfills which permit leachate losses in accordance with the Reasonable Use Policy of the Ministry of the Environment are unacceptable;

(v) the finding that Site "D" is "acceptable" and "suitable" for landfilling as proposed by the Region notwithstanding the Region's failure, as proponent, to comply in the case of Site "D" with the Engineered Facilities Policy and Guideline of the Ministry of the Environment;

(vi) the finding that Site "F" is unacceptable for landfilling from a planning perspective;

(vii) the finding that Site "D" is hydrogeologically "suitable" and "acceptable" for landfilling on the basis of the evidence presented to the Board; and

(viii) the finding that the economics of landfilling by the Region favours Site "D";

C. This Applicant respectfully requests the following substituted findings:

(i) that Site "F" is acceptable for sanitary landfilling on the basis proposed by the Region and subject to the conditions of approval proposed at the Hearing by the Ministry of the Environment;

(ii) that, in any event, Site "F" is acceptable for sanitary landfilling if designed with a liner as referred to (but not proposed as necessary) in the Conditions of Approval proposed at the Hearing by the Ministry of the Environment and subject to approval by the Director of Approvals of the Ministry of the Environment;

(iii) that, in appropriate circumstances, sanitary landfills which permit leachate losses in accordance with the Reasonable Use Policy of the Ministry of the Environment are acceptable;

(iv) that Site "D" is unacceptable and unsuitable for sanitary landfilling as proposed by the Region on the basis of non-compliance with the Engineered Facilities Policy and Guideline of the Ministry of the Environment;

(v) that Site "F" is acceptable for sanitary landfilling from a planning perspective;

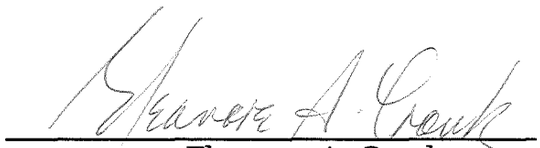
(vi) that it is uncertain, on the evidence that was available to the Board, whether Site "D" is hydrogeologically acceptable for sanitary landfilling with or without a liner; and

(vii) that the economics of sanitary landfilling by the Region, on the evidence available to the Board, do not favour Site "D" over Site "F".

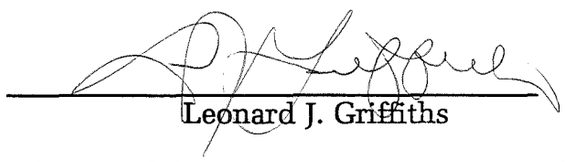
D. In the further alternative, that a rehearing of the Region's application for approval to proceed with landfilling at Site "F" in the City of Burlington be required on the matters set out in (B) above, because of the Board's errors.

DATE: March 22, 1989

ALL OF WHICH IS RESPECTFULLY SUBMITTED



Eleanore A. Cronk



Leonard J. Griffiths

Of Counsel for NSP Investments Limited

APPENDIX "A"

JOINT BOARD DECISION AND REASONS,

24 FEBRUARY 1989 AND ADDENDUM,

2 MARCH 1989

(FILED SEPARATELY)

APPENDIX "B"

DISCUSSION OF JOINT BOARD ERRORS

1. As set out in paragraph 8 of Part I of the Application, the Board:

- *made numerous errors and seriously misconstrued the evidence in its Reasons;*

- *in other instances, failed in its Reasons to address itself to relevant evidence on issues related to the suitability of Sites "F" and "D" for landfilling; and*

- *in its Reasons, on matters of hydrogeology and planning, substituted its own opinion for the opinion of experts duly qualified to testify on these issues before the Board and, in so doing, failed judicially to exercise its proper functions.*

These errors are discussed below. The transcript references and Exhibits referred to are contained in Appendix "E".

I. *FAILURE TO CONSIDER RELEVANT HYDROGEOLOGICAL EVIDENCE CONCERNING SITE "F"*

2. The Board in its Reasons failed to address itself to documentary evidence produced on behalf of NSP regarding the hydrogeological investigations of the Site "F" lands carried out by non-Regional investigators. Further, the Board erred in failing to assess the significance of this evidence as it related to the public health and safety features of Site "F".

(A) EVIDENCE FROM DR. J. CHERRY

3. It was recognized by all the hydrogeologists who testified before the Board that Dr. John Cherry of the Department of Earth Sciences at the University of Waterloo and co-author of the seminal text entitled "Groundwater", was the leading Ontario expert on hydrogeology and groundwater movement. Exhibit N-747, received in evidence by the Board, was part of a report prepared by Dr. Cherry and one of his colleagues in

October, 1980 in consequence of their retainer to assess the hydrogeological information relevant to the NSP site to arrive at a conclusion regarding the hydrogeological suitability of the site for landfilling. Dr. Cherry expressed the opinion in this report that *the site was suitable for sanitary landfill for municipal refuse.*

Reference: Appendix "E", pp. 171-181, Exhibit N-747, p. 5

4. Dr. Cherry, in forming his conclusion, referred to (1) the poor natural quality of the groundwater in the shale on the NSP lands; (2) the fact that the quality of groundwater was such that it was not suitable for human consumption; (3) the fact that no water supply or wells were known to exist in the area; (4) the fact that it was unlikely that the shale would be viewed as a significant reservoir of groundwater resources because the permeability was not high enough for large scale pumping; and (5) the fact that the area has received refuse for many years and accordingly was not expected to cause any "unique" impacts on the groundwater system or the associated surface water system. The impact at worst, in his opinion, would be an increase in the scale of the existing types of impacts.

Reference: Appendix "E", pp. 171-181, Exhibit N-747, p.5

(B) EVIDENCE FROM MORRISON, BEATTY LIMITED

5. Exhibits N-185 and N-186 before the Board were hydrogeology reports prepared by the firm of Morrison, Beatty Limited. In both reports the authors expressed the opinion that *the hydrogeological conditions at the NSP site were "ideal" for a landfill operation and that the site was hydrogeologically suitable for landfilling.*

Reference: Appendix "E", pp. 182-199, Exhibits N-185, p. 2 and N-186, p. (iii)

(C) EVIDENCE FROM ACRES CONSULTING LIMITED

6. Exhibit N-596 before the Board comprised part of a report prepared on behalf of the City of Burlington in 1981 by Acres Consulting Limited, a hydrogeology consulting firm, regarding the Region's solid waste management strategy and NSP's proposal to operate a private sanitary landfill on its lands. The report was signed by P.H. Rennick who was the Study Director for the Report and who is the former Director of the Environmental Assessment Branch of the Ontario Ministry of the Environment. In the report, the opinion is expressed that the lands forming the NSP proposal were "*hydrogeologically suitable for a landfill operation.*"

Reference: Appendix "E", pp. 200-201, Exhibit N-596

(D) EVIDENCE FROM DR. K. CARTWRIGHT

7. Exhibit N-470 filed with the Board was a report prepared by Dr. Keros Cartwright, an expert hydrogeologist from the State of Illinois who has published extensively in the area of hydrogeology and landfilling. Dr. Cartwright was retained by NSP to investigate the hydrogeological aspects of the NSP lands. In his report dated November 1982, Dr. Cartwright concluded that the NSP site was "*well-suited for the disposal of municipal waste*" and that "*the site was hydrogeogically suitable for sanitary landfilling*". He further indicated that the existence of two sanitary landfills on adjacent land provided a "*unique opportunity*" to assess the effects of a landfill in that environment.

Reference: Appendix "E", pp. 203-207, Exhibit N-470, p. 6

8. Dr. Cartwright's curriculum vitae was filed before the Board as Exhibit N-749. Further, a number of articles authored by him on hydrogeology were filed as Exhibits before the Board.

Reference: Appendix "E", pp. 208-216, Exhibit N-749

(E) FURTHER EVIDENCE FROM MORRISON, BEATTY LIMITED and JANET HEWETSON

9. Exhibit N-471 before the Board was a report by Morrison, Beatty Limited prepared in mid-July, 1985 regarding the suitability of *Site "F"* for landfilling. The authors of the report were Brian Beatty, a qualified hydrogeologist, and Janet Hewetson, a hydrogeologist now in the employ of the Ontario Ministry of the Environment. In their report the authors concluded that Site "F" was acceptable for landfilling and further:

> *"There would be no risk to human health and safety as a result of landfilling at Site "F". There are few landfill sites in Ontario where one can be so confident."*

Reference: Appendix "E", pp. 217-224, Exhibit N-471, p. 8

10. The Board, in its Reasons, made only passing reference to the work of all of these investigators when it stated (at page 55):

> "More information was available to this Board over the course of the Hearing than was available to hydrogeologists prior to the Hearing. Hydrogeologists considering an earlier, different proposal for landfilling in the vicinity of Site "F" were handicapped by having even less data than this Board had at the beginning of the Hearing."

11. At page 85 of its Reasons for Decision the Board stated:

> "It was clear to the Board from Ms. Cronk's cross-examination of Mr. Sobanski that Site "F" was one of the most studied sites in Ontario, from a hydrogeological perspective. But the earlier NSP conclusions, and those of Trow [the Region's hydrogeologists], were founded on the premise

that the hydrostratigraphy was relatively uniform across the site."

Reference: Reasons, Appendix "A", pp. 55 and 85

12. Finally, at page 87 of its Reasons, the Board quotes from a portion of the November, 1982 report prepared by Dr. Cartwright, referred to above in paragraph 7.

13. Apart from these references the board failed to address itself at all to the documentary evidence before it from Drs. Cherry and Lush; Morrison, Beatty Limited, Dr. Cartwright, Ms. Hewetson and Acres Consulting, all of which confirmed the hydrogeological suitability of NSP's lands for landfilling.

14. Many of these hydrogeological reports were specific to the lands proposed by NSP for landfilling (which formed, prior to December, 1986 only part of Site "F" as defined by the Region). Nonetheless, these reports dealt in detail with the hydrogeological conditions prevalent on the NSP lands and the expected impacts from contaminant migration or leachate movement in the event of landfilling on the Site.

15. Further, the July, 1985 report prepared by Brian Beatty and Janet Hewetson specifically concerned Site "F" and was not restricted to the lands proposed by NSP for landfilling.

16. *It is respectfully submitted that the Board's failure to consider the evidence contained in these exhibits and the evidence given at the Hearing by various hydrogeologists concerning these reports, is a substantial and fundamental error.*

17. Further, the Board misconstrued the evidence when it suggested that these reports were premised on the assumption of uniform hydrostratigraphy at Site "F". It is apparent from the report of Dr. Cartwright (Exhibit N-470) that he recognized that transmission of groundwater at Site "F" was almost exclusively through fractures in the rock in that, at the date of his report, the precise groundwater flow paths had not been defined. In Exhibit N-471, Morrison, Beatty Limited recognized that on a micro-scale,

groundwater movement in the fractured Queenston shale could be considered complex. They also noted, however, that on a regional scale groundwater movement through the shale exhibited a general trend and was not complex. Thus, the regional groundwater flow system in the fractured shale in the vicinity of Site "F", in their opinion, had been effectively defined.

Reference: Appendix "E", pp. 202-207 and 2317-224, Exhibits N-470 and N-471

II. REJECTION OF THE BAYVIEW PARK AND BURLINGTON LANDFILL SITE PRECEDENTS

18. The Board stated, at page 83 of its Reasons, that:

> "Although Mr. Sobanski acknowledged during cross-examination by Ms. Cronk that lands adjacent to Site "F" had been used for landfills, in keeping with an earlier decision of the Environmental Assessment Board, this Board notes that the earlier decision concerned extension of the site into the glacial till areas to the north, rather than development of a site on the gullies to the south. This Board was not swayed by the earlier Board's decision, preferring to judge the present application on the weight of the evidence before us."

19. Further, at page 87 of the Board's Reasons, the Board states:

> "The review by the Region's consultants (Messrs. Beechinor and Sobanski) of borehole logs in the vicinity of Bayview Park to the east of Site "F", revealed that for most of the holes dug there was clay overlying the rock beneath, and that the clay layers were approximately 8 feet thick at well locations LW-1 through LW-6. If such silty clay

> overlays the rock under the Bayview landfill, then *the Board must take this into account in considering the migration of leachate beyond the site boundaries, and the postulated 'security' of Site "F", based on the performance of adjacent sites.* Similarly, a large portion of the Burlington Landfill site was acknowledged to be on till, whereas some 60-70% of Site "F" would be founded on shale." (Emphasis Added)
>
> Reference: Reasons, Appendix "A", pp. 83 and 87

20. The import of these statements by the Board is to suggest that the hydrogeological precedent afforded by the Burlington Landfill site is of no assistance in assessing Site "F" because the former site is located on till whereas Site "F" is located on shale and, similarly, the Bayview Park Landfill site precedent is of no assistance because it is protected by underlying clay layers whereas Site "F" is not.

21. The Board thus rejected the usefulness of the hydrogeological data available with respect to the Bayview Park and Burlington Landfill sites as indicators of the hydrogeological conditions at Site "F". It is respectfully submitted that the Board erred in its treatment of this aspect of the evidence in that:

(i) there was evidence before the Board establishing that the 1984 expansion of the Burlington Landfill site by the Region was an expansion onto exposed shale bedrock as well as glacial till areas. The Board in its Reasons failed to take this evidence into account;

(ii) the majority of the original Burlington Landfill site is situate directly on shale and not on till;

(iii) all hydrogeologists who testified before the Board agreed that the existing hydrogeological data base with respect to Site "F" and is environs and, in particular, as concerned

the Bayview and Burlington Landfill sites, was an extremely useful tool to be used in the assessment of the hydrogeological suitability of Site "F" itself for landfilling, and

(iv) the wells at Bayview Park, relied upon by the Board as indicating the existence of clay layers at that site (well locations LW-1 through LW-6) are leachate wells located in the waste itself and were not designed to assist in identifying hydrostratigraphic or geological units on site.

(i and ii) THE NATURE OF THE STRATA UNDERLYING THE BURLINGTON LANDFILL

22. As noted, the Board stated in its Reasons that the 1984 Burlington Extension Decision relating to the Burlington Landfill concerned extension of the Site into the glacial till areas of the north rather than development onto the gullies to the south. It is respectfully submitted that the Board was in error in that the extension obtained with respect to the Burlington Landfill in 1984 pertained to additional landfilling on both glacial till and shale areas.

Reference: Reasons, Appendix "A", p. 83

23. That this was the case, was confirmed by Mr. Crutcher (one of the hydrogeologists who testifed on behalf of the City of Burlington) during cross-examination, when he indicated that the area of the extension included an area that had been disturbed into the shale and further, that the lands immediately south of the southern limit of the Burlington Landfill extension area, where landfilling had already occurred, were extensively disturbed into the shale.

Reference: Appendix "E", pp. 225-233, pp. 27659-27667 of the Transcript

24. Moreover, Mr. Crutcher admitted under cross-examination that the Burlington landfill site had occurred on shale and that similarly, the Bayview Landfill Site had also been done in part on shale. He also

conceded that the Burlington Landfill Site had been considerably disturbed by erosional channels and like activities and that, similarly, at least 60-70% of the Bayview Park Landfill Site was seriously disturbed.

Reference: Appendix "E", pp. 232-233 and 236; pp. 27666-27667 and p. 27694 of the Transcript

(iii) EVIDENCE ESTABLISHING THE RELEVANCE OF THE BAYVIEW AND BURLINGTON LANDFILL SITES

25. Mr. Feenstra, a hydrogeologist and hydrogeochemist called on behalf of the Region, testified:

> *"That the existence of data with respect to Bayview Park and the Burlington Landfill site provides a higher level of confidence regarding hydrogeological projections and contaminant migration projection than would otherwise be the case in assessing the suitability of Site "F" for landfilling. Further, there is a higher level of certainty in a situation where an existing contaminant plume is present and can be used in an assessment rather than simply relying on hydrogeological predictions."*

Reference: Appendix "E", pp. 237-238, Volume 44, pp. 9870-9871 of the Transcript

26. Messrs. Petrie and Crutcher, the hydrogeologists who testified on behalf of the City of Burlington, conceded that the hydrogeological environments at the Bayview Park and Burlington Landfills and Site "F" were essentially the same.

Reference: Appendix "E", pp. 239-241, Volume 121, pp. 29164-29165 and 29247 of the Transcript

27. Dr. John Cherry, in preparing his report on the hydrogeological suitability of the NSP lands (referred to in paragraphs 3 and 4 above) specifically noted that because of the closeness of the Bayview and Burlington Landfill sites to the proposed site on the NSP lands, assessment

of the hydrogeological aspects of the proposed new site could be made using hydrogeological information obtained almost exclusively from the two existing landfill areas and from adjacent areas down the escarpment from the Bayview Landfill.

Reference: Appendix "E", pp. 171-181, Exhibit N-747, p. 2

28. Dr. Cartwright, in his report referred to in paragraph 7 hereof, specifically indicated:

> "*The existence of two sanitary landfills on adjacent land provides a unique opportunity to assess the effects of a landfill in this environment.*"

Reference: Appendix "E", pp. 202-207, Exhibit N-470, p. 6

29. In its reports, Morrison, Beatty Limited endorsed the relevance of the Bayview and Burlington Landfill site precedents and stated:

> "*It was recognized that the presence of two municipal landfills in the immediate vicinity of the proposed landfill would provide a unique opportunity to model the leachate attenuation capacity of the site.*"

Reference: Appendix "E", pp. 182-199, Exhibit N-186. p. 3

30. Thus, the hydrogeologists who testified before the Board or whose reports were available and filed with the Board, acknowledged the relevance of the Bayview Park and Burlington Landfill site precedents as a means of providing useful hydrogeological information concerning Site "F". The significance of the data available from these two sites is readily apparent in light of the evidence which the Board received that despite operation of the Bayview Park Landfill site for many years, *there is no evidence of contaminant migration from that landfill.* Similarly, at the Burlington Landfill site, the evidence before the Board was that *there has been no*

development of a significant contaminant plume (movement of contaminants) from that landfill.

31. Accordingly, it is respectfully submitted that the rejection by the Board of the usefulness and relevance of the data emanating from the Bayview and Burlington Landfill sites constituted a substantive error by the Board warranting recision of its hydrogeological findings regarding Site "F".

(iv) THE NATURE OF THE STRATA UNDERLYING THE BAYVIEW PARK LANDFILL

32. It is respectfully submitted that the Board clearly erred in suggesting that the Bayview Park Landfill site is protected from contaminant migration or leachate losses by underlying clay layers, and is thus to be distinguished from Site "F". It was the evidence before the Board that:

> "*The Bayview landfill covers an area of about 18 ha. Much of the site is located in worked-out shale quarries. The site is situated on sloping shale terrain devoid of any overburden cover. ...*
>
> *The Bayview landfill is comprised of domestic, commercial and industrial refuse collected from the Town of Burlington and the surrounding rural areas. In the latter years of the operation, after implementation of the Waste Management Act, cover was applied to the refuse on a regular basis. The cover material was shale, excavated on-site, and excavation spoil trucked to the site from construction projects. ...*
>
> *The surface of the landfill is relatively flat, with a gentle southward slope of less than 4%. At the south end, the landfill is elevated about 10 m above the original shale surface. ...*"
>
> Reference: Appendix "E", pp. 182-199, Exhibit N-186, p. 4

III. EVIDENCE REGARDING USE OF PITS AND QUARRIES AND FRACTURED ROCK SITES FOR LANDFILLING

33. The Board, at pages 57 to 59, 157 and 169 of its Reasons, is critical of the Region's landfill site selection process because it included selection of a site on fractured rock. This discussion by the Board related to the Board's concern that Site "F" was chosen as the Region's preferred Site, notwithstanding that it was a Site in part comprised of fractured rock.

Reference: Reasons, Appendix "A", pp. 57-59, 157 and 169

34. It is respectfully submitted that the Board, in suggesting that Site "F" as a pit and quarry site was unsuitable for consideration by the Region virtually from the outset of its study process, erred in construing the evidence before it and in failing to consider relevant evidence which documented the prior use of pits and quarries and fractured rock sites for landfilling.

35. Evidence before the Board indicated that there was considerable support in the planning and engineering fields for the use of quarry or gravel pit sites for landfill purposes. Landfill has been undertaken or is now in process at a number of quarry or gravel pit locations in Ontario including the former Springbank Sand & Gravel Pit in Mississauga; the Walker Brothers Quarry in Niagara Falls; the former Glenridge Quarry in St. Catharines; the Steetley Quarry in Flamborough Township; the Cope Quarry on Highway 20, south of the Queen Elizabeth Way in the City of Stoney Creek; and the Domtar Quarry in the City of Mississauga. Some of these sites have received municipal waste, while others are restricted to industrial waste. Nowhere in its Reasons did the Board even mention this evidence.

Reference: Appendix "E", pp. 242-244, Exhibits N-586, p. 47 and N-586a

36. There was also evidence before the Board that:

> *"... Metro Toronto, which buries close to half of all of the garbage produced in Ontario, currently uses*

only abandoned, engineered aggregate pits for sanitary landfill and has done so for many years without obvious bad effects. The same is true for many other municipalities. Thus, this option warrants full and careful consideration in Halton."

Reference: Appendix "E", pp. 245-246, Exhibit H-10, p. 53

IV. PLANNING ERRORS

37. The planning errors made by the Board are discussed in detail in Part IV-C of this Application and Appendix "D" to this Application.

V. ERRORS REGARDING PUBLIC HEALTH AND SAFETY CONCERNS AT SITE "D"

38. The errors made by the Board regarding public health and safety concerns at Site "D" are identified and discussed in Part IV-D of this Application.

VI. ERRORS REGARDING ECONOMIC FACTORS

39. The errors made by the Board regarding the costs of landfilling at Sites "F" and "D" are identified and discussed in Part IV-F of this Application.

APPENDIX "C"

DISCUSSION OF HYDROGEOLOGICAL EVIDENCE ON PUBLIC HEALTH AND SAFETY ISSUES - SITE "F"

1. This Appendix is a summary of the relevant evidence of the 8 hydrogeologists who testified before the Board regarding the hydrogeological "suitability" and "acceptability" of Site "F" for landfilling from a hydrogeological public health and safety viewpoint. The evidence of these witnesses is summarized in Part IV-A of this Application.

I. EVIDENCE OF MESSRS. SOBANSKI AND BEECHINOR

2. Messrs. Sobanski and Beechinor were called as a panel of witnesses to testify on behalf of the Region regarding hydrogeology matters particular to both Sites "F" and "D". It was the conclusion of these witnesses that Site "F" was to be preferred over Site "D" for landfilling from a public health and safety viewpoint. Mr. Sobanski testified:

> "Q. I put it to you squarely that from a public health and safety perspective, given the advantages you have identified for Site "F", it is clearly the preferred site of the two for landfilling?
>
> A. That is what we said in our overall assessment.
>
> Q. It is because of the nature of the advantages at Site "F", I suggest?
>
> A. Yes. Site "F" as I said is an unusual site in Ontario in many ways.
>
> Q. And the advantages it affords are unusual and should be utilized in your opinion?
>
> A. Yes."
>
> Reference: Appendix "E", pp. 11-13, Volume 32, p. 7005 of the Transcript.

3. Later in his evidence, when cross-examined by Counsel on behalf of the City of Burlington on the comparative advantages and disadvantages of Sites "D" and "F", Mr. Sobanski testified as follows:

> "Q. Let me make it a little more specific. Let me make it more specific. If in fact there was a sanitary line going near Site "F" that it could use and a piped water system going near Site "F" -- I'm sorry -- Site "D" in both cases, sanitary pipe going near Site "D" and a piped water system going near Site "D", one to take the leachate and the other in the

event of complete failure and all these things we have talked about, that would allow people to go on the water system near Site "D". Would I be correct that then you would have to look at the sites hydrogeologically different, first of all?

A. I still think there is -- this is being very philosophical. I still think there is a difference because at Site "F", as I see *Site "F", if I contaminate the resource to some degree which hasn't been demonstrated at the existing sites to any great degree, if I were to contaminate it I haven't done any great harm because of its existing quality.* If I were to contaminate the resource at Site "D" then I have contaminated the resource. At Site "F" if I do have some contamination I don't think you would even see it because of the poor quality water but at Site "D" if I were to contaminate the resource then there would be an impact overall on the ecology of that area, the aquatic environment because what we are assuming there is a failure. People have a piped water supply. *Site "F" is a strange sort of a site. I have never run into one of these in my career and I probably won't again. In any site that I have looked at I have always had concern for my decision because there are unknowns in hydrogeology. There unknowns in waste disposal and there is some calculated risk. I don't think in my career I am going to come up with many sites like Site "F" where I don't have to worry about hurting somebody at the site. I always have that concern at other sites where I have wells located nearby".*

Reference: Appendix "E", pp. 11-13, Volume 37, pp. 8206-8207.

4. Counsel on behalf of the City of Burlington then continued to cross-examine Mr. Sobanski on two assumptions: first, that a sanitary sewer line would be introduced at Site "D" and secondly, that a piped water system would be introduced at Site "D". The Region, in its undertaking for approval of landfilling presented to the Board had proposed neither introduction of a sanitary sewer line at Site "D" nor a piped water system. Nonetheless, based on these hypothetical assumptions, Mr. Sobanski indicated that in these circumstances there would be no difference between the two sites, that they were the same. He then added "*...then the only concern is, of course, in the event of failure would there be any effect on the resource. In terms of effect on people there would be none at either site*". Even under these assumptions with respect to Site "D", there was no suggestion from Mr. Sobanski that landfilling at Site "F" would in any way be unsafe or would in any way constitute a threat to public health and safety based on hydrogeological concerns.

Reference: Appendix "E", pp. 14-15, Volume 37, pp. 8208-8209.

II. EVIDENCE OF STAN FEENSTRA

5. Mr. Feenstra was called to give evidence on behalf of the Region on two occasions: first, as part of the Region's case in chief, and secondly, to give Reply evidence at the conclusion of the Hearing. In both instances, Mr. Feenstra was formally qualified as an expert in matters of hydrogeology and hydrogeochemistry.

6. During his Reply evidence, in August , 1988, Mr. Feenstra stated:

> Q. I think that takes us, Mr. Feenstra, to your conclusions?
>
> A. My conclusions, yes. My first conclusion, to just restate what I indicated, is that *in my opinion Site F is suitable for landfilling for the Region of Halton without a liner. There should be no significant impact on groundwater or surface shallow water environments in and around Site F.*
>
> The main reason for the lack of impact, even though there is some degree of exfiltration from the landfill itself and moving into the shallow shale, is the expectation that the perimeter drain system would be effective in capturing the shallow groundwater flow in and around the southern portions of Site F.
>
> *In the event that my interpretation of the site,* particularly with respect to deeper flow from Site F, *may differ from the actual conditions beneath Site F,* because there are no water supply wells immediately threatened by this deeper migration, and given the performance of pumping test PW-1 which shows that the horizontal fracture zones which do exist are really quite extensive and can be pumped quite capably by a pumping well, *it is my opinion that there would be ample time for the implementation of effective contingencies such as a purge well system to deal with that migration if it did become evident.*
>
> Q. *Is that something that you expect?*
>
> A. *That is not something that I would expect, no.*

Reference: Appendix "E", pp. 16-17, Volume 170, pp. 42328-42329.

7. In his Witness Statement for his Reply Evidence, Mr. Feenstra indicated:

> "*... At the current rate of total exfiltration of leachate from the Burlington and Bayview sites (i.e., with the toe*

> *drain collection systems in operation), neither site produces a significant impact on the surrounding groundwater or surface water environments. Similar conditions would be expected for Site F. There would be no additional benefit to the addition of a liner, consequently, it is my opinion that a liner is not required at Site F.*
>
> It is my opinion that Site F is suitable for landfilling. There should be no significant impact on the groundwater or surface water environments due to landfilling at Site F. In the event that subsurface conditions differ from my interpretation of the site and these conditions allow the migration of groundwater contaminants off-site, no water supply wells would be threatened and the would be ample time for implementation of contingencies if they were required. [sic]
>
> Reference: Appendix "E", pp. 116-117, Exhibit H-936, pp. 16-17, para. 49-50.

III. EVIDENCE OF MESSRS. PETRIE AND CRUTCHER

8. The evidence of Messrs. Petrie and Crutcher is referred to in paragraph IV-A on pages 18 and 22 of this Application. As noted, in their Evaluation Report concerning Site "F", filed with the Board, these witnesses expressed the opinion regarding Site "F" that: "*For an alternative landfill design consisting of a suitable liner and an underdrain system, the site is hydrogeologically suitable for landfilling*".

Reference: Exhibit B-617, p. 162.

9. Messrs. Petrie and Crutcher were extensively cross-examined for several weeks. During the course of cross-examination, they conceded that neither the Burlington Landfill nor the Bayview Park Landfill Sites posed any threat to the public health and safety of Burlington residents and that the same could be expected of Site "F" in the event of landfilling at that Site. The relevant exchange with Mr. Crutcher concerning the public health and safety aspects of Site "F" consumed over twenty pages of the transcript. It began with the following:

> "Q. *Do you think that the fact that the groundwater in the shale underneath Aldershot is of very poor natural quality, does that represent a risk to the health and safety of the people of Aldershot in your view?*
>
> A. *You wouldn't want to drink the water.*

11. Finally, Mr. Crutcher testified as follows:

"Q. *Can you tell me, Mr. Crutcher, of any public health and safety -- any adverse implications for public health and safety in Aldershot of having a failure at Site F and having some trace diluted and attenuated leachate in the shale under me?*

A. *Not directly, no.*

Q. *So we don't have public health and safety implications flowing from hydrogeological problems at Site F do we?*

A. *Not directly.*

Reference: Appendix "E", p. 25, Volume 121, page 29257.

IV. EVIDENCE OF PAUL BOWEN

12. Mr. Paul Bowen testified before the Board on behalf of the West Burlington Citizens Group. This party supported landfilling by the Region at Site "D" in the Town of Milton and opposed landfilling at Site "F" in the City of Burlington. Mr. Bowen, during his examination-in-chief was questioned concerning the potential for adverse impact from landfilling at Site "F". He testified:

"Q. In terms of possible impact of leachate, could you comment on that?

A. *I feel that there won't be a significant impact, there will not be a significant impact in the water quality in these existing wells as a result of the landfill. That is mainly because they are situated a fair distance down-gradient and that I believe most of the discharge of leachate will occur before the groundwater flow system reaches these wells.*

Also, given the distance between the site and those wells, there is an opportunity for dilution of the leachate. So, I don't think there will be a significant impact in terms of the water quality resource in the Aldershot area as a result of Site F.

Reference: Appendix "E", p. 26, Volume 160, p. 38904.

13. On cross-examination, Mr. Bowen was requested to elaborate further on this opinion. The evidence previously given by Mr. Feenstra was put to him and he was asked to comment upon it. He testified as follows:

"A. ... Mr. Feenstra was talking about, I guess, the ultimate impact of leachate as it left Site F and what impact it might have on the wells in the Aldershot area indicating that if, at least my understanding, if leachate entered the the deep groundwater system, flowed at some depth and then discharged closer to the lake, perhaps in the Aldershot area or somewhat north of that, if that would occur we would also see the natural ground water from the deep discharge area or the deep groundwater flow area, that being the salty water discharging in that area and we wouldn't see this freshwater rind, it wouldn't be present. That was my understanding and based on that, it was his conclusion that one could see that there would be no deep discharge or for that reason, no leachate that entered that deep flow system discharging upward into the wells located in the Aldershot area.

Q. I understood that completely, Mr. Bowen. I understood from your report that you were agreeing with that hypothesis, were you not?

A. That is right.

Q. So now what we are talking about is that active flow system and that is the system you think takes perhaps 90% of what is going to exfiltrate Site F.

A. That's right.

Q. I am trying to put this together with your comment that you don't believe there will be any impact on the wells in that groundwater resource.

...

A. *Okay... The main reason I say that is that it is quite a distance from where the leachate would enter the system to where the first well is located. I believe there will be enough dilution or attenuation of the leachate in that distance that one would not see any impact or one would not be able to measure a significant impact in the drinking water wells in the Aldershot area. I base it mostly on the distance and amount of dilution or attenuation I would expect to occur over that distance."*

Reference: Appendix "E", pp. 27-29, Volume 160, pages 38961-38963.

V. EVIDENCE OF OTHER INVESTIGATORS OF SITE "F"

14. In addition to the evidence to these hydrogeologists, the Board received documentary evidence from a number of other hydrogeologists who had examined Site "F" or part thereof prior to commencement of the Board Hearing. These investigators included Dr. Keros Cartwright of Chicago, Illinois; Morrison & Beatty Limited; Dr. John A. Cherry, of the Department of Earth Sciences, University

of Waterloo, Waterloo, Ontario and author of the textbook entitled "*Groundwater*"; and Acres Consulting Limited, retained by the City of Burlington.

15. The opinions of these hydrogeologists regarding the environmental impact of Site "F" (or the NSP lands, as applicable), is detailed in Appendix "B" to this Application. In summary, all of these investigators, including the consultants for the City of Burlington, concluded, expressly, that the Site was hydrogeologically suitable for sanitary landfilling. Brian Beatty of Morrison & Beatty Limited and Janet Hewetson, the latter now of the Ontario Ministry of the Environment, expressed the opinion that there would be "*no risk to human health and safety as a result of landfilling at Site 'F' "* and that "*there are few landfill sites in Ontario where one can be so confident*".

Reference: Appendix "B" to this Application, paras. 3-17

APPENDIX "D"

DISCUSSION OF PLANNING ERRORS

1. As detailed in Part IV-C of this Application, it is submitted that th its Reasons made a number of errors regarding the planning issues at . These are discussed in detail below.

A. The finding that there could be serious conflicts between landfilling at Si "F" and surrounding land uses (Reasons, Appendix "A", p. 122).

2. Every planner who testified before the Board agreed that large physical distances, functions and grades and natural and man-made barriers existed on all sides of Site "F" which acted as barriers isolating the Site from surrounding land uses and creating an insulated Site.

3. Mr. Peter Walker, the Region's planning expert, agreed that in land use terms Site "F" was "quite unusual in that it is completely surrounded on all sides by either natural or man-made physical barriers from the populated areas further out around the site" and that the site "is sheltered on all sides by barriers of one form or another".

Reference: Appendix "E", pp. 247-254, pp. 14716-14723 of the Transcript.

4. Mr. Max Bacon, the planner called before the Board on behalf of NSP, described in detail the land uses surrounding Site "F" and stated in his Planning Report filed with the Board:

> *"The effect of these surrounding land uses is to create around NSP Land, on all sides, physical barriers in one or more forms separating and shielding the Land from the closest population areas."*

Reference: Appendix "E", pp. 255-256, Exhibit N-568, pp. 13-14.

5. Mr. Paul Stagl, the planner who testified on behalf of the Town of Milton, confirmed in his evidence that physical buffers exist in each direction from Site "F", shielding the Site from surrounding land uses. It was his evidence that Site "F", in distinction to Site "D", is a Site very much insulated from surrounding land uses.

Reference: Appendix "E", pp. 257-270, Volume 95, pp. 22709-22721 of the Transcript.

6. Mr. Ian MacNaughton, the planning expert called on behalf of the City of Burlington, did not disagree with the evidence of the other planners in this regard.

B. The finding by the Board, at page 126 of its Reasons, that the Regulations of the Parkway Belt West Plan would have to be amended to permit landfilling at Site "F". (Reasons, Appendix "A", p. 126).

7. Site "F" is situate within the Parkway Belt Planning Area as determined under the provisions of the Parkway Belt West Plan, 1978 (the "P.B.W. Plan"). The Official Plan for the Halton Planning Area specifies that the development of lands in the Halton Planning Area that are affected by the P.B.W. Plan are to be governed by the provisions of the latter Plan. Similarly, the Burlington Official Plan specifically adopts the P.B.W. Plan. Regulation 482/73 to the Parkway Belt Planning and Development Act, 1973 (Ontario) is a land use regulation which implemented a development control mechanism in the Parkway Belt Plan Area in Burlington.

8. On April 6, 1979 Regulation 482/73 was amended by Regulation 263/79 to exempt the Region of Halton from its application. Pursuant to this amendment, a copy of which was filed with the Board as Exhibit H-321, section 9 of Regulation 482/73 permits the Region, notwithstanding anything elsewhere contained in the Regulation, to *"use land or erect any building or structure for the purpose of providing a service to the public"*.

Reference: Appendix "E", pp. 90-95, Regulations 263/79 and 482/73.

9. It was the unchallenged evidence before the Board that, in consequence of Regulation 263/79, the Region can use the land within the Parkway Belt Planning Area (including Site "F") without regard to Regulation 482/73 so long as the intended use is for the purpose of providing a public service. *Moreover, it was the uncontradicted evidence of the planners before the Board that Regional sanitary landfilling is a public land use.*

10. Prior to the Hearing, the Region had maintained that a regionally operated landfill facility, as a public undertaking and public land use, did not require an amendment to the P.B.W. Plan. The Region's contention in this regard was confirmed in a letter to the Region from the Minister of Municipal Affairs dated

June 24, 1986, a copy of which was Exhibit H-6 before the Board. The letter confirms that the Minister of Municipal Affairs, the Honourable Bernard Grandmaitre, had declared, in accordance with subsection 9(2) of the Ontario Planning and Development Act, that the Region's proposed landfill undertaking at Site "F", was deemed not to conflict with the P.B.W. Plan.

Reference: Appendix "E", pp. 271-272, Exhibit H-6.

11. *Accordingly, it is respectfully submitted that the Board's finding that regional landfilling at Site "F" would require amendment of the regulations to the P.B.W. Plan was in error, as a matter of law and on the evidence.*

C. The finding by the Board, at page 126 of its Reasons, that section 6.2.3. of the P.B.W. Plan "sets out some stringent conditions, in subsection (q), that would not be met by landfill." (Reasons, Appendix "A", p. 126)

12. At page 126 of its Reasons, the Board stated that section 6.2.3 of the P.B.W. Plan sets out stringent conditions, in subsection (q), that would not be met by landfill at Site "F". *It is respectfully submitted that the Board misconstrued the evidence before it on this subsection of the P.B.W. Plan as it applies only to industrial land uses and not to public uses such as landfilling.*

13. Map 2 to the P.B.W. Plan, entitled "Escarpment Link", designates the northerly portion of Site "F" as a *General Complementary Use Area* and the remainder of the Site as a *Special Complementary Use Area.* On lands designated as *"Special Complementary Use Areas"*, permitted uses are those set out in section 5.5.2 of the P.B.W. Plan. In addition, Section 6.2.3 of Part 6 of the P.B.W. Plan provides, in subsection (q), that in the *Special Complementary Use Area* of which Site "F" forms part, uses set out in subsection 5.5.1 are permitted. These uses are those permitted for *General Complementary Use Area* lands. Further, pursuant to subsection (q), "some further industrial development" is permitted in this *Special Complementary Use Area.*

Reference: Appendix "E", pp. 273-276, Parkway Belt West Plan, Exhibit H-319

14. The evidence of the expert planners before the Board was that sanitary landfilling by the Region at Site "F" was an appropriate land use under the provisions of the P.B.W. Plan in both the *Special* and *General Complementary Use*

Areas. This was the evidence given by each of Messrs. Walker, Stagl, Kentridge and Bacon. Mr. MacNaughton did not dispute this evidence.

15. Subsection 6.2.3(q) of the P.B.W. Plan reads as follows:

> "In cases of discrepancy between the following specific implementing actions for this Link and the provisions of Part 5, the following implementing actions will prevail:
>
> ...
>
> (q) In the Special Complementary Use Area located north of Highway 403, between the Burlington Landfill Site and the Burlington-Guelph Electric Transmission Line, permit uses set out in Subsection 5.5.1.
>
> Subject to Subsection 5.1.3, the Plan permits some further industrial development in this area. The Plan does not permit uses beyond those set out in Subsection 5.5.1 until a comprehensive restricted area by-law and development agreements under Section 35(a) of the *Planning Act* have been prepared in consultation with municipal authorities, Provincial ministries, and other concerned persons or agencies, and subsequently approved by the appropriate authorities.
>
> Buildings and structures associated with *such industrial uses* may have a maximum lot coverage of 20%, exclusive of parking, and shall meet the following conditions:
>
> [these conditions pertain to parking requirements, lot coverage requirements, parking facilities, storage areas, landscaping, setbacks, etc.]
>
> Reference: Appendix "E", pp. 273-276, Parkway Belt West Plan, Exhibit H-319

16. In light of the Board's finding, noted above, regarding subsection 6.2.3(q) of the P.B.W. Plan, two features of this subsection are important:

(a) The subsection specifically permits uses set out in subsection 5.5.1, which subsection specifically permits public uses. As noted in paragraph 9 above, it was the uncontradicted evidence of the planners before the Board that regional sanitary landfilling at Site "F" is a public land use; and

(b) The remaining provisions of subsection (q) apply, specifically, to industrial uses only. It is this portion of subsection (q) that sets out "stringent conditions" and, as such, it has no application to a landfill use on Site "F".

D. The finding that since Site "F" meets 5 of the 9 criteria for designation of an environmentally sensitive area (an "E.S.A.") and, in particular, "crucial" criterion #6, it should have been eliminated from further consideration early in the site selection screening process of the Region (Reasons, Appendix "A", pp. 133 and 43).

17. It is respectfully submitted that the Board erred in its treatment of certain of the biophysical impact evidence before it. In particular, although the Board dealt on a number of occasions in its Reasons with the evidence regarding the flora and fauna conditions at Site "F", as explained to the Board by Ms. L. Hellas, *it failed to address anywhere in its Reasons her evidence that Site "D" also met the criterion for designation of an E.S.A. that the Board described as the "crucial criterion", namely, criterion #6.*

18. Ms. Hellas's evidence in this regard was as follows:

> *"Q. Do you agree with me that a kind of natural area meeting one or more of the criteria listed does not necessarily become an ESA but is simply eligible to be considered as one?*
>
> *A. That's correct.*
>
> *Q. And that other factors come into the decision about whether or not it will in fact be designated as an ESA into the Regional Official Plan?*
>
> *A. Yes.*
>
> *Q. And that, generally speaking, the idea behind this for the ESA designation is to identify and designate and offer some degree of protection to good representative examples of the various environments in Halton County?*
>
> *A. That's right, yes.*
>
> *Q. And among the factors that would be considered is whether or not a particular location is in good condition?*
>
> *A. That's not specified in the documents, and I don't know that for a fact, but I'm sure people would probably take that into consideration.*
>
> *Q. Would you agree with me that if we look at Criterion No. 6 -- and I have that marked as being found at page 59A of Exhibit H-10 this talks about a habitat for rare or endangered species that are endangered regionally, provincially or nationally. First of all, would you agree with me that language is somewhat unfortunate --*
>
> *A. Yes.*

Q. -- because it tends to confuse "endangered" with "rare"?

A. Yes.

Q. But notwithstanding that, I understand that you've interpreted it as meaning that if you have provincially rare or regionally rare plants, that it would meet that Criterion?

A. Yes.

Q. And you would agree with me therefore that Site D would also meet criterion 6 --

A. Yes.

Q. -- in terms of being a regional ESA?

A. Yes.

Q. And in fact many other areas of the Region, if studied in sufficient detail, would likely also meet that Criterion?

A. Yes.

Q. And that alone would not be sufficient for all of these areas to become ESA's?

A. Not in my opinion."

Reference: Appendix "E", pp. 96-97, Volume 6, pp. 1130 to 1132 of the Transcript.

19. *It is therefore respectfully submitted that if satisfaction by Site "F" of criterion #6 for designation as an E.S.A. is "crucial", as stated by the Board in its Reasons, and was sufficient to have eliminated Site "F" from further consideration at the early stages of the Region's site selection process, the same conclusion applies no less strongly to Site "D".*

20. It is also respectfully submitted that the Board further erred in its treatment of the relevant biophysical evidence concerning Site "F" in failing to address or note at all in its Reasons the evidence of Ms. Hellas that many areas of the Region, if studied in sufficient detail, would also likely meet criterion #6 and further, the following evidence given by Ms. Hellas *concerning Site "D"*:

"Q. And indeed, just on the issue of trade-offs, Ms. Hellas, Site D in fact is not your most preferred site for landfilling, is it? Site A was?

A. At the 2C Stage, yes, Site A was.

Q. Well, it is only at the 2C Stage and the earlier stages that you were looking at other sites in addition to D or F, isn't that fair?

A. That's correct.

Q. So in the comparative world, when we're undertaking a comparative assessment of more than two sites, your most preferred site is in fact, not Site D?

A. That's correct.

Q. So to that extent Site D, even within the framework of your opinion, is a compromise site, isn't that so?

A. Yes.

Reference: Appendix "E", pp. 107-108, Volume 6, pp. 1169 to 1170 of the Transcript.

21. Finally, with respect to Site "F", Ms. Hellas testified that Site "F" had not been designated as a natural area warranting scientific interest or protection by any of the various agencies whose responsibility it is to designate appropriate protection areas, including the Ministry of Natural Resources which designates "areas of natural and scientific interest", the International Biological Program, the federal regulatory authorities under the Canadian Wildlife Act or the City of Burlington or the Conservation Authority in Halton Region.

Reference: Appendix "E", pp. 98-106, Volume 5, pp. 1056 to 1058 and 1068 to 1069 of the Transcript.

22. The evidence of Mr. Kitchen, on behalf of the City of Burlington, is also relevant. He confirmed that Site "F" is not designated by the Province as an area of natural and scientific interest and that it is not designated by the Region in its Official Plan as an E.S.A. Further, he testified that *only part of Site "F" qualifies as an E.S.A.*, namely, approximately 20 ha. of land situate south of NSP's quarry on the site. Thus, on this witness' evidence, when related to the area proposed for landfilling by the Region (some 96 ha.), only a small proportion of the lands comprising Site "F" meet the E.S.A. designation criteria.

Reference: Appendix "E", pp. 277-279, pp. 36069 to 36070 and 35966 of the Transcript.