

CONSOLIDATED HEARINGS BOARD

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 ch.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.

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I N D E XWITNESSES:Page

|                                      |      |
|--------------------------------------|------|
| <u>RALPH E. CRYSLER</u> , Affirmed.  | 9058 |
| Examination-In-Chief by Mr. Hodgson  | 9058 |
| Cross-Examination by Mr. Olah        | 9098 |
| Cross-Examination by Mr. Tidball     | 9116 |
| Cross-Examination by Mr. Estrin      | 9159 |
| Re-Examination by Mr. Hodgson        | 9211 |
| <u>VICKY HENDERSON</u> , Affirmed.   | 9215 |
| <u>JOSEPH L. RINALDO</u> , Affirmed. | 9215 |
| Examination-In-Chief by Mr. Hodgson  | 9217 |
| Cross-Examination by Mr. Tzekas      | 9236 |

E X H I B I T S

| <u>Exhibit No.</u> | <u>Description</u>                 | <u>Page</u> |
|--------------------|------------------------------------|-------------|
| H-229              | Map of watershed boundaries.       | 9067        |
| H-230              | Drawing No. 1 from Site D report.  | 9067        |
| H-231              | Final Drainage Plan.               | 9070        |
| H-232              | Hydrologic data, Sites D & F.      | 9074        |
| H-233              | Regional drainage patterns Site F. | 9082        |
| H-234              | Pre-development drainage patterns. | 9082        |
| H-235              | Drawing 11R from D & O report.     | 9084        |
| H-236              | Drawing 9R from the D & O report.  | 9087        |
| H-237              | Early development of Site F.       | 9088        |



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E X H I B I T S

| <u>Exhibit No.</u> | <u>Description</u>            | <u>Page</u> |
|--------------------|-------------------------------|-------------|
| H-238              | Drainage criteria for Site D. | 9099        |
| H-239              | Drainage criteria for Site F. | 9099        |



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19 Affairs, on a request by the Regional Municipality of  
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21 Milton to redesignate a parcel of land comprising Part  
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23 from "Agriculture" and "Conservation and Hazard Lands"  
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Toronto, Ontario

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BEFORE: Dr. D.J. Kingham - Acting Chairman

H.H. Lancaster, Q.C. - Member

S. Tanner - Member



Hearing conducted at The Oakville  
Granary Commercial Centre, 105 Robinson  
Street, Oakville, Ontario, on  
Tuesday, October 13th, 1987.

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VOLUME 41  
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APPEARANCES:

|                                                 |                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|
| T.R. Lederer and<br>H.D. Hodgson                | for the Regional<br>Municipality of Halton<br>(Proponent)                                   |
| J.R. Tidball                                    | for the Ministry of the<br>Environment                                                      |
| T. Vigod<br>J.F. Castrilli                      | for the West Burlington<br>Citizens Group                                                   |
| D. Estrin,<br>F.E. Leitch and<br>H. Dahme       | for the Corporation of the<br>Town of Milton                                                |
| S.R. Garrod and<br>A. Nurvo                     | for the Milton Area Citizens<br>Coalition and several<br>affected Milton area<br>landowners |
| R.B. Tuer, Q.C.<br>E.A. Cronk and<br>F. Perrier | for National Sewer Pipe<br>Limited                                                          |
| L.F. Longo                                      | for Azova Investments<br>Limited                                                            |
| M.J. McQuaid, Q.C.<br>and C.J. Tzekas           | for the City of Burlington                                                                  |
| C. Mansfield                                    | for the Ministry of Natural<br>Resources                                                    |
| P. Renaud                                       | for Cumis Limited                                                                           |



APPEARANCES (Cont'd):

|    |              |                         |
|----|--------------|-------------------------|
| 1  | C. Stevenson | for Framgard Holdings,  |
| 2  | P. Hancock   | Fosseri Investments     |
| 3  |              | Limited, Seriphos       |
| 4  |              | Investments Limited and |
| 5  |              | Topic Investments       |
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Per: C.F. Nethercut, C.V.R.



Oakville, Ontario  
October 13th, 1987.

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--- Upon commencing at 9:30

DR: KINGHAM: Thank you, please be seated. Before we get started receiving fresh evidence this morning, it has been a very exciting week the past week and we will start off this week with an announcement from Susan Tanner.

MS. TANNER: I am sad to tell you this morning that I am going to be leaving the Board as of about five minutes from now. I have been asked to move to the Social Assistance Review Board as a Vice-Chair, and I'm honoured that the provincial government thinks that I can serve in that capacity, and my personal circumstances require I take a full time job so I am going to do that. I feel I can do this without creating too many practical problems for this hearing as we discussed over the summer that it should create no practical problem for the continuance of the hearing. You should be able to continue with two excellent members who are remaining and there is very good balance left on the board and I am anticipating that you will be able to continue with your excellent presentations as you have been doing.

I must say I am very sad to leave you, I will miss all your faces first thing in the morning,



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4 seeing who falls asleep first and how many fall asleep  
5 before me. just before coffee, and I really have been  
6 grateful for the opportunity to learn more about the  
7 environmental issues and refine my knowledge of  
8 hydrogeology and I will miss the hearing very much.  
9 It is a very difficult issue and with the standard of  
10 presentation that has been carried on, you will have  
11 an excellent and just decision at the end of the  
12 process. I wish you the best.

13  
14 MR. HODGSON: Perhaps I could say  
15 thank you very much for being here. I'm sorry we  
16 didn't get to know you better and I'm sure we would  
17 have got to know you very well when you wrote your  
18 decision, but we will now never read it and have now  
19 lost that opportunity. Thank you.

20  
21 DR. KINGHAM: Perhaps we can take a  
22 two or three minute break.

23  
24 We will now resume.

25  
MR. HODGSON: Could we take a ten  
minute break? My friends and I would like to discuss  
what just happened and Mr. Olah, who is representing  
the Conversation Authority, has just appeared and he  
will put some questions to Mr. Chysler, but we want  
to check that we are in agreement on a number of  
points and if we are in agreement it will take much



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4 less of the Board's time than striking our agreement  
5 before the Board because we can file a piece of paper  
6 and say this is what the Conservation Authority has  
7 asked for and what we have agreed to. Could we have  
8 that short period of time I am sorry to ask for it  
9 now but Mr. Olah just appeared.

10 MR. KINGHAM: If it will add to the  
11 overall efficiency of our undertaking, then I would  
12 agree with that. I don't see anyone in opposition,  
13 so we will in fact take a ten minute recess until  
14 ten to ten if that is enough time.

15 MR. OLAH: Good morning, but I thought  
16 I would clarify the position because I have not just  
17 suddenly appeared with this problem. Mr. Lederer and  
18 I have been discussing this problem and I thought we  
19 had it resolved and I thought everything was under  
20 control but that does not appear to be the case. I  
21 apologise. I believe the terms are fairly clear but  
22 we just have to review it and I want to make this  
23 clear; in addition to filing an agreement or putting  
24 it on the record, I will be conducting a short cross-  
25 examination of Mr. Crysler to make sure we understand  
why the terms are important to the authority so if  
you deem they are appropriate to incorporate into an  
order ultimately that you have an irrational basis



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3 for it.

4 DR. KINGHAM: Of course we would  
5 decide that ultimately, but if you think ten minutes  
6 would be useful now, and would that be adequate time.

7 MR. OLAH: I believe so.

8 DR. KINGHAM: All right, ten minutes.

9 --- Recess.

10 DR. KINGHAM: Thank you, please be  
11 seated while we receive the delegation of, one, with  
12 regard to whether an order would be issued confirming  
13 the vacancy in keeping with the Act, and we have heard  
14 directly from Mr. Stewart of the Ontario Municipal  
15 Board that it will be done as far as he is concerned  
16 and we understand Mr. Jeffery, the other half of the  
17 establishing authority, is in a car somewhere between  
18 Toronto and Kingston but we believe that he also will  
19 of course sign such an order confirming the vacancy  
20 and establishing whatever needs to be established as  
21 a quorum. If that was a concern you can rest assured  
22 it will be dealt with. Okay, I guess Mr. Hodgson  
23 we are ready to hear your witness.

24 MR. HODGSON: Sir, our next witness  
25 is Mr. Ralph Cryslar if he could be sworn.

DR. KINGHAM: I would be happy to do  
that except that I recall that on Thursday the Bible



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mysteriously disappeared from the table. There may  
be a hiatus. Does anyone know where it went to?  
Mr. Stevens?

RALPH E. CRYSLER, Affirmed

DR. KINGHAM: Thank you, Mr. Crysler.

EXAMINATION-IN-CHIEF BY MR. HODGSON

Q. If I could ask you to take out  
Exhibit H-7, Mr. Crysler's Curriculum Vitae which  
is at Tab 2. I understand you graduated in  
civil engineering from the University of Toronto in  
1949.

A. That is correct.

Q. Since that time you have been  
a member of the Association of Professional Engineers  
of Ontario.

A. I was registered in 1950  
as a professional engineer.

Q. You are still registered as a  
professional engineer.

A. I am.

Q. You are a member of a number of  
professional organizations, consulting civil engineers,  
the Soil Conservation Society?

A. That is correct.



Crysler ex  
(Hodgson)

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Q. You have held a number of professional offices as vice president of the Conservation Council of Ontario.

A. Correct.

Q. Chairman of the Environmental Affairs Committee of the Association of Consulting Engineers of Canada.

A. Yes.

Q. And other professional offices on your curriculum vitae.

A. Yes.

Q. Your professional experience; you practiced as a civil engineer from approximately 1950 to 1960 and in 1960 you were a founding member of your own firm, Chrysler, Davis & Jorgensen Ltd.

A. That's right.

Q. That was a firm involved in water management projects.

A. That is correct.

Q. You specialised in land drainage schemes, flood control and erosion control while with that company.

A. I did.

Q. From 1971 to '77 you were with Chrysler and Lathem and you are the Chrysler of Chrysler



Crysler, ex  
(Hodgson)

and Lathem.

A. I am.

Q. In that capacity you were responsible for environmental analyses, interdisciplinary studies and hydraulic design.

A. Right.

Q. From 1977 to 1980 you were manager of the environmental division for Monenco and during that time involved in other flood control and environmental matters.

A. I was the Ontario manager for Monenco.

Q. From 1980 to 1984 you worked in Alberta for Techman Engineers and were manager of development projects responsible for feasibility studies and environmental studies with respect to proposed resource developments.

A. That's right.

Q. From 1984 to the present you have been Manager of Environmental Services for Trow Hydrology Consultants.

A. That is right.

MR. HODGSON: I would ask he be qualified as an expert to give opinion evidence on the subject of hydrologic studies, water management,



Crysler, ex  
(Hodgson)

surface water impacts, drainage control et cetera.

DR. KINGHAM: Fine

MR. HODGSON: We handed out a revised witness statement for Mr. Chrysler in early September and it was mailed to my friends in early July and I believe it was marked as an addendum to Exhibit eight.

DR. KINGHAM: It was marked as H8B-1 and then there was an addendum to that, H8B-1A, being the errata and addendum to the revised witness statement.

MR. HODGSON: Thank you.

Q. Could I ask you first of all to describe for this Board your involvement with this environmental assessment from the beginning. When did you first become involved with it?

A. I joined, as you mentioned already, I joined the Trow Hydrology Consultants Ltd. in early 1984. At that time the firm was involved in the hydrologic and hydrogeologic studies at the stage 2C level, and I became part of the team who was working on those studies. In the 2C level it was Hydrology Consultants task to conduct preliminary hydrogeologic and hydrologic assessments and prepare generic conceptual



Crysler, ex  
(Hodgson)

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4 site development plans for the six sites.

5 My role was, as part of the team, to develop these  
6 generic sites, the generic plans for each site so  
7 that there could be a level of comparison.

8 Q. At the 2C stage?

9 A. Yes, that was at the 2C stage.

10 Q. In the so-called technical  
11 phase of the study, what was your involvement?

12 A. During the technical phase,  
13 during these technical studies, I was responsible  
14 for the surface water hydrology analyses and  
15 designs.

16 Q. In that regard you prepared  
17 a witness statement which appears as Exhibit  
18 H8B-1.

19 A. That is correct.

20 Q. Would you describe for the  
21 Board the methodology you employed for the kind of  
22 hydrologic study you have undertaken for this  
23 project.

24 Q. Yes. In this work we were  
25 concerned about the surface water runoff from the  
two sites and how that could be handled and  
controlled. Obviously the first part of that is to  
determine the quantity of water to be handled and



Crysler, ex  
(Hodgson)

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4 to determine this we used what is known as the  
5 rational method which is a well-established method  
6 which has been around for about 100 years used  
7 regularly by engineers to determine rates of runoff  
8 from particular storms. In the rational method you  
9 relate rainfall intensity to the drainage area and  
10 consider the type of soil, cover and topography to  
11 determine a rate of runoff from that particular  
12 area. We used for that reason -- and the rational  
13 method, as I say, has been around for about 100 years  
14 and although by some people it is considered to be  
15 simplistic, it is still widely used. For the purposes  
16 of determining the rainfall curves, we used  
17 intensity duration frequency curves, or what are known  
18 as IDF curves, prepared by Environment Canada through  
19 the Meteorological Service and this relates the  
20 intensity of rainfall to the duration of the storm  
21 and the frequency of that storm to determine a  
22 magnitude of storm.

23 For the type -- to determine  
24 the runoff characteristics from the soil from the  
25 sites, recognising the topography of those sites,  
we went into very standard tables which would  
produce proper coefficients for those areas for  
that type of soils.



Crysler, ex  
(Hodgson)

Q. So, could we refer then in a site-specific way to the work you have done and first referring to Site D. Your evidence on Site D begins on page 10 of the witness statement, but could you first describe from the point of view of hydrologic studies Site D.

A. Well, Mr. Hodgson, we prepared a number of drawings, or I have marked up a number of drawings for the purposes of explaining this information.

Q. I wonder -- a lot of Mr. Chrysler's drawings use as the base map the drawings from the design and operations report, but he has taken the base maps and has prepared overlays and done them up so he can describe the kind of evidence he will give. I wonder if they could each have a separate Exhibit number as he refers to them and perhaps the one on the left could be the next Exhibit.

DR. KINGHAM: That would be H-229.

MR. ESTRIN: Can I say I have never seen that, I don't believe, and I would like to know what it is before it is marked, but I thought -- it would seem to me that one of the requirements of these hearings is witness statements and reports



Crysler, ex  
(Hodgson)

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4 in advance, and that would include any drawings to  
5 be relied on. I may or may not be at any great  
6 disadvantage, but we don't have a hydrologist here  
7 and I would just like to know what it is and when  
8 this was prepared before it is marked as an exhibit.

9 MR. HODGSON: Q. Could you describe  
10 the document?

11 A. This is a map at a scale of  
12 1 to 10,000 based on the Ontario base mapping. We  
13 used it merely to define the total watersheds of  
14 each of the streams or tributaries to Site D, but  
15 if it is a problem we can skip it and go directly  
16 to the next one.

17 DR. KINGHAM: Before we do that,  
18 is that the same or essentially similar to the surface  
19 runoff map that appears in H-39?

20 MR. HODGSON: I believe that it is.

21 DR. KINGHAM: I'm familiar with the  
22 map...

23 THE WITNESS: I would have to look at  
24 the map.

25 DR. KINGHAM: Just to get around the  
problem.

MR. ESTRIN: I don't know if it is  
a problem, but I would like to know what it is and



Crysler, ex  
(Hodgson)

it seems to be a much larger area than anything I  
have seen so far and it may be useful, I don't know.

DR. KINGHAM: You're not objecting.

MR. ESTRIN: I wanted to know when  
it was prepared.

THE WITNESS: A couple of months ago.  
We had to prepare a map of this type to determine  
the total drainage areas for each of the tributaries  
we were concerned with and therefore it becomes  
part of the working drawings or working papers we  
need to do our work for the purposes of explaining  
this to the Board. We merely fixed it up a little  
bit to make it presentable. It merely shows where  
the drainage basins are and ties in with the text  
of my witness statement, sir.

DR. KINGHAM: We will enter it as  
H-229.

MR. LANCASTER: What was the design  
and operations report filed as, do you recall?

MR. HODGSON: I believe it was  
H-41 for Site D.

MR. ESTRIN: What are we calling  
H-229?

THE WITNESS: Watershed boundaries.

MR. HODGSON: Q. For Site D.



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A. For Site D.

EXHIBIT NO. H-229: Map of watershed boundaries.

MR. HODGSON: Q. Let's mark the  
next one as H-230.

DR. KINGHAM: Would you explain that  
as well.

THE WITNESS: This is drawing number  
one of eight from the Site D design and operations  
report on which we have merely highlighted the  
drainage basins and streams.

DR. KINGHAM: That will be H-230.  
EXHIBIT NO. H-230: Drawing No.1 from Site D report

MR. HODGSON: Q. Would you continue  
with your evidence and describe for the Board the  
essential features of the site, Site D, from a  
hydrologic point of view.

A. Yes. Site D -- Site D is  
located basically or straddles the watershed between  
Sixteen Mile Creek and Bronte Creek, and that divide  
is indicated by this solid orange line down through  
the middle. On considering first the Sixteen Mile  
Creek side, there is a very small branch of a  
tributary which drains across the north-east corner  
of Site D to join a much larger tributary which  
actually drains from just north of Derry Road, and



Crysler, ex  
(Hodgson)

1  
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3 they then proceed under Highway 25 and wander off  
4 to the southeast before they join the main stream  
5 of Sixteen Mile Creek which is further to the east.  
6 I should point out that if you look at the topographic  
7 map you will find this is now referred to as  
8 Oakville Creek.

9 On the west half of the property,  
10 it drains to Bronte Creek which historically was  
11 also known as the Twelve Mile Creek, and there is  
12 one tributary of Bronte Creek which flows through  
13 part of the west side of the site before passing  
14 under First Line then under the railway tracks to  
15 join -- under Tremaine Road to join the main stem  
16 of Bronte Creek and this part of Bronte Creek,  
17 although it doesn't show, it drains this large area  
18 behind here and further to the west. This gives the  
19 general basin or an idea of where they are. If you  
20 look more specifically at the site itself as shown  
21 on H-230, and can you see? We see that this very  
22 small tributary of a branch of Sixteen Mile Creek  
23 barely cuts across the corner and in fact cuts  
24 across here and will be enclosed by the landfill.  
25 On this drawing, the heavy green line represents the  
outline of the landfill itself and the solid orange  
line is the property itself. The orange line with



Crylser, ex  
(Hodgson)

arrows indicates watershed boundaries. This very small tributary of Sixteen Mile Creek comes across the corner of the landfill and joins the larger branch from the north just upstream of Highway 25. There are also a number of small surface runs in the southeastern part of the site which drain across the highway through separate culverts into Sixteen Mile Creek.

On the Bronte Creek side this branch which comes from the north flows, as you can see, through quite a piece of the landfill itself before coming out to the ditch along First Line and then going through the concrete culvert leading to the west. There are a couple of small tributaries of Bronte Creek which flow into that area and another one in the very southwest corner which comes to a culvert and drains off to the side. There are also small pieces of Sixteen Mile Creek which drain off the south of the property, and you can see back on H-229, they drain to the south to join Sixteen Mile Creek further on.

I should point out that all of these streams are intermittent, that is they may have water in them when it's raining and for not really long afterward, and that is all the streams on the



Crysler, ex  
(Hodgson)

property.

Q. All right, thank you. Now, Mr. Chrysler, if you can put up your next Exhibits, I want you to address the question of what effect will the development of the site as proposed by Mr. Hiraishi have upon existing drainage patterns and how do you propose to deal with those effects.

A. Mr. Chairman -- I should put it right side up -- this drawing is a marked-up copy of drawing eight of eight from the Site D design and operations report.

MR. HODGSON: Can we have that marked as H-231.

DR. KINGHAM: Certainly, H-231, and could you give us a name for it?

THE WITNESS: Final drainage plan.  
EXHIBIT NO. H-231: Map - Final Drainage Plan.

THE WITNESS: By having these two maps beside each other, we can see how the development of the site as a landfill will affect the streams. Obviously the one major concern has to be that that branch of Bronte Creek which drains through the landfill boundary itself; obviously that stream must be re-located and as part of the Site D development there will be constructed a



Crysler, ex  
(Hodgson)

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3 large screening berm parallel to the First Line  
4 running the full length of the property or nearly  
5 the full length of the property. It is then  
6 proposed that the tributary of Bronte Creek be  
7 diverted into a new channel which will flow south-  
8 ward between the First Line road allowance and the  
9 screening berm to pass through the present culvert.  
10 So, while the stream will enter the property at the  
11 same point it does now and will leave the property  
12 at the same point it does now, it will merely be  
13 moved from a great gentle sweep through the property  
14 to a controlled stream channel parallel to First Line.

15 The small tributary of Sixteen Mile  
16 Creek which crosses the corner of the landfill itself  
17 will merely be diverted around that landfill within  
18 the buffer zone so it comes in at the same point and  
19 leaves at the same point. Now, the other major  
20 change, of course, is the fact that the entire area  
21 of the landfill must be drained to either of these  
22 streams, and we have determined a watershed line  
23 basically down the middle of the landfill itself.  
24 Surface water running off the landfill...

25 MR. ESTRIN: I'm sorry, but would it be  
possible for the witness, and I don't know if he  
could possibly stand on the other side.



Crysler, ex  
(Hodgson)

THE WITNESS: We have established the divide because of the shape of the landfill. The surface water will run off on a divide line as shown by the solid orange line and basically down the middle of the landfill. The stormwater that runs off from the landfill will be collected in ditches at the toe of the slope all the way around.

Part of this will be drained to Sixteen Mile Creek and will go through a retention pond which we will talk about a little further in a minute, and that on the west side will come through a retention pond which will be located between the landfill and the screening berm and, fed in by the ditches there, and it will drain through a culvert under the screening berm to the Bronte Creek diversion.

Surface water from the site, that is that which runs off the berm or from around the buffer zone, will be collected in ditches and removed or separated from the ditch at the toe of the landfill, and it will also be fed through the same retention ponds before it is discharged. Now, what we could refer to as the east leg of the property will essentially be untouched, albeit there will be access roads and so on in that area, but the surface drainage there will continue to



Crysler, ex  
(Hodgson)

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4 flow as it does now to the two culverts under  
5 Highway 25, the two small culverts under Highway  
6 25. The area to the south will continue to flow  
7 south as it does now, and I should point out that  
8 that flow south is not in a defined stream channel.  
9 The small piece in the southwest corner will remain  
unchanged and basically that is it.

10 MR. HODGSON: Q. All right, thank you.  
11 Have you considered the sizes of the proposed ditches  
12 or retention ponds and the effect on downstream  
13 conditions?

14 A. Yes. Yes, we have done that.  
15 We had to develop the stream flows and we did  
16 assemble, Mr. Hodgson, a table and throughout my  
17 witness statement there a number of tables of data  
18 and we put these all together in one piece if it  
19 is of help of the Board to follow perhaps.

20 MR. HODGSON: This will be the next  
21 Exhibit.

22 DR. KINGHAM: This will be H-232  
23 which is the Site D drainage basins.

24 THE WITNESS: Excuse me, but this  
25 group of tables includes both Sites D and F and this  
is just a repeat of the tables that are in the  
witness statement itself.



Crysler, ex  
(Hodgson)

DR. KINGHAM: How would you like to  
label this, Mr. Hodgson?

MR. HODGSON: Hydrologic data,  
Sites D and F if that's okay.

EXHIBIT NO. H-232: Hydrologic data, Sites D & F.

MR. HODGSON: Q. You were going to  
discuss the sizing of the ditches and the retention  
ponds at Site D.

A. Mr. Hodgson, the sizing of the  
ditches and the retention ponds develops from an  
understanding of the flows which have developed and  
which have to be handled in those ditches and those  
retention ponds. As you can see by the first chart,  
we had originally had -- we have some small changes  
in the drainage basins to the two streams, and this  
is because of the location of this divide line on  
the property. If you will look at the second chart,  
and if it would be of help I can put these on  
overheads. Dealing first with the Sixteen Mile  
Creek, we find that in the pre-development situation  
we deal with two major storms, the one hundred year  
storm and the twenty five year storm and these are  
identified as Q100 and Q25 respectively. We find the  
predevelopment at the site boundary which is at this  
point, but the one hundred year flow would be 1.98



Crysler, ex  
(Hodgson)

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4 cubic metres per second and the Q25 would be  
5 1.58. If we do not put in any retention ponds,  
6 the post-development flows would be 3.22 and 2.6 cubic  
7 metres per second which is an increase in each case of  
8 better than sixty per cent. Of course if we look at  
9 the downstream confluence situation, and that is  
10 where this stream off the property joins the other  
11 one coming from above, we find there is only an  
12 increase of two per cent and this is insignificant  
13 compared to the others.

14 MR. ESTRIN: I wonder if the witness  
15 could, referring to Exhibit 231, point out where  
16 the confluence is.

17 THE WITNESS: It is right here, a  
18 short distance upstream from Highway 25. Because  
19 of these increases in flow, we felt it was necessary  
20 to put in stormwater retention ponds or detention  
21 ponds with the idea that they will delay the  
22 downstream flows and reduce those downstream flows.  
23 When we put in the ponds, we find that at the site  
24 boundary the Q100 is 1.95, which is in fact a  
25 reduction of one and a half per cent, and the Q25  
is 1.55, a reduction of one point nine per cent,  
and by the time we get down to the confluence for  
all intents and purposes there is no change, and in



Crysler, ex  
(Hodgson)

those ways we have established the ponds and established a pond of a size that will control those flows within the limits. If you bear with me we will deal with Bronte Creek first and then we will get to the ponds themselves.

Q. This is page three of Exhibit H-232?

A. Yes. Now, with the Bronte Creek diversion we have an added problem in that the culvert under the First Line is a concrete box culvert which, I believe, is four feet wide by six feet high and we found very quickly that this was inadequate to handle the twenty five year storm, and in fact the capacity is just about met at the 10 year storm, that is before surcharges, and hence you can see on the table the stormwater flows pre-development at that concrete box culvert. In the post-development situation if we do not put in a retention pond, since there will be faster runoff from the landfill area itself, and the flow from upstream is unchanged, but there will be faster runoff from the landfill itself and those flows will increase and you can see it running anywhere from five to six and a half per cent increase. We then designed a retention pond to receive the



Crysler, ex  
(Hodgson)

runoff from the landfill itself before it enters --  
before it joins the tributary, the diverted tributary,  
and with that pond in place you can see that there  
is only a one per cent increase at Q25 and a one  
and a half per cent increase at the 100 year storm.  
However, because it is a stream and considered to be  
a proper stream coming through, we had also to check  
the diversion channel for the flows going off the  
property through the box culvert for the regional  
storm, which is essentially the Hurricane Hazel type  
storm, and we find it handles it with zero increase  
as we show in our chart here.

Q. "It" being the retention pond.

A. I'm sorry?

Q. The "it" that handles it is the  
retention pond and not the box culvert.

A. Yes, that is correct. The box  
culvert surcharges at the 10 year storm and in a  
100 year storm there is about -- during the  
100 year flood a length of about 350 metres would be  
of First Line would be inundated to a depth of up to  
0.2 metres, and that overtopping would start before  
the -- less than the 25 year storm.

Q. And that is the case now.

Q. That is the existing situation



Crysler, ex  
(Hodgson)

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4 and we are not changing that position. If you look  
5 at the next table on that Exhibit, you will find the  
6 summary of the ponds where we give the pond sizes  
7 for the east pond and the west pond, the elevations  
8 or dimensions, the amount of dead storage and the  
9 amount of live storage and the depths as well as  
10 the outlet pipe sizes. The Fire Department for  
11 the town of Milton asked that we provide storage  
12 for, I believe it was about 2,700 cubic metres of  
13 storage for fire protection purposes, and you will  
14 notice that the dead storage amounts to about  
15 3,200 cubic metres and this would be there  
16 permanently and this dead storage is that water  
17 which remains in the pond after it has reached the  
18 syllabus of the outlet pipe, and so we meet the  
19 requirement of the Fire Department in that way.

18 DR. KINGHAM: You say 3,200 cubic  
19 metres.

20 THE WITNESS: 2418 and in the  
21 east pond and 819 in the west pond.

22 MR. HODGSON: Q. That water is  
23 permanently available for fire protection; is that  
24 right?

25 A. Yes, albeit there will be  
some evaporation from it and so we asked for 2,700



Crysler, ex  
(Hodgson)

so we do have in excess of their requirements.  
If anybody wishes, we do have these available in  
imperial units.

Q. Mr. Chrysler, have you  
considered erosion and scour control at Site D.

A. Yes, we have Mr. Hodgson.  
We find that the erosion is a factor of velocity,  
is a function of velocity and material to be  
eroded. In the channels which are shown on the  
drawings in the D & O report, we looked at those  
channels and compared them with the flows to be  
handled and we find that we get a flow of under  
two metres per second at the critical point where it  
crosses under First Line and we actually have 1.5  
metres per second.

Now, a flow of one to 1.2 metres per second  
a grass-lined channel is adequate to contain that  
and retain it, and most of the channels will be  
in that category. The diversion channel, because it  
has a higher velocity, will have to have some form  
of rip-wrap or erosion protection put in it.  
Above and beyond that it is necessary, certainly in  
the diversion channel, to allow for a low flow  
stream and one problem with many man-made diversions  
is that they are designed with a bottom width -- a



Crysler, ex  
(Hodgson)

width in this case of about 2 metres, I believe it is, and on low flows a very small trickle creates a meander pattern down the middle and does in fact cause erosion. It is intended that we will provide a low flow channel designed for about the five year flow which will be a straight channel down the centre and it will be armoured with rip-wrap or whatever is required to maintain that so it will retain a permanent channel down the centre under those low flows.

Q. With respect to Site D, what in your opinion are the effects of surface water on the proposed design.

Q. Well, because we have reduced -- because of the ponds, we are not increasing the downstream rate of flow beyond what exists now or what would exist under the same storm conditions.

So we are not adversely affecting downstream flows by increasing them. At present the area upstream of this site on both Bronte Creek and Sixteen Mile Creek is agricultural land and in some times of the year, or some parts of the year when the land is raw and exposed, there is a fairly heavy silt load that comes down in those streams. The landfill itself will have a grass cover and will certainly reduce silt--



Crysler, ex  
(Hodgson)

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4 that will contain that silt, and we can't deal with  
5 what's upstream of the property, but on top of that  
6 the two retention ponds, because they will slow down  
7 the flow of water, they will allow any sediment that  
8 is picked up in the runoff from the site, like during  
9 the period of development, to have an opportunity to  
10 settle out in those ponds. So, the ponds are a  
11 retention pond from the point of view of stormflow but  
12 they are a detention pond as far as silt settling or  
13 for fire protection purposes.

14 Q. Are you satisfied you have  
15 dealt with any adverse surface water impacts at Site D.

16 A. Yes, I believe we have,  
17 Sir.

18 Q. Now, turning to Site F, I would  
19 like you to first explain the existing drainage  
20 patterns at Site F.

21 A. Perhaps, Mr. Hodgson, perhaps  
22 these should also be put in as Exhibits.

23 MR. HODGSON: If we could put these  
24 in. The one on the left could become Exhibit H-233.

25 Q. How would you describe H-233,  
Mr. Chrysler?

Q. Regional drainage patterns,  
Site F. H-233?



Crysler, ex  
(Hodgson)

the North Service Road and under Highway 403 in this same large box culvert to join Indian Creek flowing to the south.

Q. Now, with respect to Site D what affect will the development have, or what affect will the development of Site F proposed by Mr. Hiraishi have upon existing drainage patterns, and again, as with Site D, how do you propose to deal with those effects at Site F?

A. This drawing is Drawing 11R from the D & O report for Site F and we have marked it up to show the final conditions and I suggest it should also be an Exhibit.

MR. HODGSON: That, Mr. Chairman will be H-235.

EXHIBIT NO. H-235: Drawing 11R from D & O report.

MR. HODGSON: Q. Will we call that Site F with proposed drainage patterns?

A. Yes. Now, as you can see from H-234 where the hatched line is the outline of the proposed landfill, essentially all of A, all of B and a good part of C will have to be removed or diverted because they are now flowing through the main part of the landfill itself, or where the landfill will be. So, it is our intention on this drawing H-235 where you can see the outline of the



Crysler, ex  
(Hodgson)

landfill and the final contours of that landfill, and the stormwater will run off the landfill to either side and will be collected in perimeter ditches along the toe of that fill. The water that runs down on the west or collected on the west side will be drained to the south or to the east in a retention pond which we refer to as the south retention pond. The water -- the water from the landfill on the east side of the landfill will drain in a ditch along the edge of the landfill and it will also come down into the south retention pond.

The area outside the landfill, and of course the landfill is surround by an access road, and the area beyond that access road will be drained in it's own separate ditch and, now we are dealing with the east side, and it will come down past the Bayview site and receive some drainage from the Bayview site and it will be fed into the east retention pond and then on down to discharge. I'm sorry I did make an error earlier, as the north part of the landfill which drains to the ditch; the ditch for the north part will be diverted into the east retention pond and from the south part it will flow to the south retention pond, so the drainage off the landfill on the east side is split at the mid-point



Crysler, ex  
(Hodgson)

Q. Yes.

EXHIBIT NO. H-233: Regional drainage patterns, Site F.

MR. HODGSON: Q. The Exhibit on the right will become H-234 and perhaps you could describe it.

A. I would call it pre-development drainage patterns, Site F.

EXHIBIT NO. H-234: Pre-development drainage patterns.

THE WITNESS: H-234 is developed from drawing one-R of the Site F D & O report, sir. Again H-233 is developed from the one to 10,000 mapping, the Ontario base mapping, and really was one of our working drawings to determine the overall drainage basins.

Basically Site F is drained by two streams, Indian Creek and Falcon Creek, and the vast majority of the site is actually in Indian Creek, but there is a small part of the north of Site F and a small part in the southeast corner of Site F which does drain to Flacon Creek, and that part of Indian Creek which drains the site is part of a much larger Indian Creek, much larger drainage basin which goes out beyond. The purpose of this map is merely to show where they are relative to each other.

Moving to H-234, we can see that



Crysler, ex  
(Hodgson)

Falcon Creek or a small portion at the north of the property drains to Falcon Creek and which flows at that point to the east and around, and another portion in the southwest corner of Site F drains to the south through the ditch to the north of the North Service Road and flows to the west and then south into Falcon Creek. Indian Creek is a bit more complex in that on the Site F property there are five branches of Indian Creek and, for simplicity, I would suggest we refer to them as A, B, C, D and E.

Now, branches D and E flow to the south and they are not affected by the landfill operation, they are outside of it, and they are untouched as part of the operation and I suggest we can ignore them from that point of view. Branch A drains from the landfill over the south half of the landfill along the western side of that landfill to the ditch along the North Service Road. Branch B drains from the very north of the property and comes down through the centre of the property and also to the North Service Road and to the culvert under it. Branch C drains the northeast part of the site and it also receives drainage from the Bayview landfill site to the east and it flows southward to join the creek and branches A, B and C all pass under



Crysler, ex  
(Hodgson)

going into either the east retention pond or to the south retention pond.

The Indian Creek drainage will continue in it's present course on the west side of the west access road and will continue to flow into Falcon Creek as it does now and an area at the south-west corner of the property will continue to drain to Falcon Creek as it does. There will be an area of about four and a half hectares which presently is flowing into Falcon Creek which will now be draining into Indian Creek because of the shape of the landfill and the need to take the water, the runoff from the landfill mound through the retention pond, but other than for the four and a half hectares the Falcon Creek drainage basin remains unchanged.

Now, that is the situation when the site is completed. But, because of the way this site will be developed, it is necessary to think of half-way measures because the first half of the site -- the first development of the site will occur in the north half of the site and we have a different situation at that point than we have in the end. I would suggest that this be another Exhibit and it is based on Drawing 9R from the D & O report and it is -- I would mark this or suggest the title of



Crysler, ex  
(Hodgson)

drainage patterns at the end of year 11, Site F.

Is that H-236?

Q. H-236.

EXHIBIT NO. H-236: Drawing 9R from the D & O Report.

THE WITNESS: Now, in this case we have a mound of landfill at the north of the property and the south of the property has not been excavated, or at this point they are beginning to excavate in the south half. So, accepting what the final drainage pattern should be, we back off to the half-way point and we find that the drainage pattern on the east side of the property is already as it will be with the east retention pond in place. But, up until year 11 there was no need to have the south retention pond because the drainage pond -- because the drainage patterns on the south of the property are unchanged, but we did put in our proposal to construct what we refer as the west retention pond which will take the drainage from the west side of the landfill, feed it through the pond and then release it into the existing stream channel which would be the remnant of tributary A and feed it through. This retention pond will maintain tributary A, the lower part of it, in its essentially original condition as long as it can be that way. It permits this area to remain with



Crysler, ex  
(Hodgson)

the same, in effect, water balance and it will not affect the vegetation in that area at that time.

In year 10 or 11 when they complete the north side and start excavating in the south, they will soon be digging into tributary A and then it is necessary to put in the south retention pond and the west retention pond will eventually be abandoned and will disappear as part of the landfill takes over.

MR. HODGSON: Q. Then I think you had one more Exhibit with respect to one more stage of development.

A. Yes. This is earlier than H-236. This will be the initial site preparation.

MR. HODGSON: Could this be H-237 and can we call it early development of Site D -- Site F rather, excuse me.

A. Yes.

MR. KINGHAM: H-237 was temporary development of Site F.

THE WITNESS: Early development of Site F.

EXHIBIT NO. H-237: Early development of Site F.

THE WITNESS: Now, this drawing conceptualises what the site will be in the first



Crysler, ex  
(Hodgson)

couple of years when it is first developed and when excavation for the landfill starts at about the mid-point of the property and starts to work further north. At this point we would have an east retention pond and west retention pond in place and the perimeter road would be in place, the perimeter ditches would be in place on both sides of the service road, and part of the development of this property, as Mr. Hiraishi will be explaining, is the need to fill some of the very deep river valleys to bring them up to what is to be the base of the landfill itself. This means that tributary A will disappear in this part very quickly, but tributaries B and C will remain and will be collecting water and will in times of rainfall be running. I should have pointed out again, sir, that on this site as at Site D all streams are intermittent and flowing only during storms. So, during any amount of rainfall these creeks will fill with water and this will bring it down, the water will drain down against this fill which has been placed in the stream valley. It is intended that that accumulated water would be pumped out into the ditches and flow off down to either the east or west retention ponds. We have calculated -- we have investigated the amount of water that would



Crysler, ex  
(Hodgson)

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3 have to be stored for the 100 year storm at each  
4 stage as we worked up through the site, and we find  
5 that these ravines are so deep and the filling is  
6 sufficiently high that there is sufficient storage  
7 capacity behind the filling as it progresses north-  
8 ward to retain the 100 year storm without overflowing  
9 into the landfill operation. So, pumps can  
10 certainly keep ahead of it and they don't have to  
11 race madly over to deal with a 100 year storm. Now, we  
12 checked that out in a number of locations working on  
13 up through to deal with different depths of channel  
14 and different depths of filling and different size  
15 of drainage basins feeding to it. In this way we can  
16 say that any water that falls, any rainwater that  
17 falls on the undeveloped area will be kept from  
18 reaching the landfill itself and can be handled by  
19 pumps into the ditches and to the retention ponds.

20 Q. Now, I believe as you did for  
21 Site D you have also prepared for Site F some  
22 calculations of the stormwater discharges that form  
23 the basis of your calculations for the size of the  
24 retention ponds at Site F.

25 A. That is correct. As I  
mentioned earlier, since tributaries D and E are  
unaffected by the landfill, we have not considered



Crysler, ex  
(Hodgson)

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3 them and are only considering the runoff from  
4 tributaries A, B and C. In the pre-development  
5 condition we have under the 100 year flow a 5.14  
6 cubic metres per second and for the Q25 it is 4.22.  
7 In post-development those numbers jump to 5.81  
8 and 4.78, which is an increase of about 13 per cent.

9 When we started to look at putting  
10 retention ponds in and trying to consider the effect  
11 of the retention ponds, we felt it necessary to deal  
12 with two types of storms because of the affect of the  
13 retention ponds. The runoff time for stormwater in  
14 the pre-development condition on these sites is about  
15 51 minutes, just under an hour, and that means that a  
16 drop of water landing at the north end of the site  
17 exits the property in just under an hour. Now, a  
18 point that must be understood in the intensity/duration  
19 frequency curves is that the longer the storm the less  
20 intense it is measured in millimetres per hour,  
21 so that a 25 year storm for one hour has a higher  
22 intensity rainfall than a 3 hour storm, but the 3 hour storm  
23 will give more water in total and this is a  
24 consideration in looking at the sizing of the  
25 retention ponds. Hence we find that looking at the  
pre-development situation, the Q25 is 4.22 cubic  
metres per second in the 51 minute storm, but for the



Crysler ex  
(Hodgson)

three hour storm it is 1.77 cubic metres per second and therefore you can see it is much lower. When we put the ponds into place, you can see that the Q25 51 minute storm is 2.28 which really means there has been a reduced discharge of 47 per cent, but the three hour storm is 1.77 cubic metres per second or no change in the runoff, in the rate of discharge.

Similarly for the Q100, for the 51 minute storm there is a reduction of nearly fifty per cent, but for the 100 year storm there was a reduction of only five per cent, and that shows why we found it necessary to deal with both the 1 hour and three hour storms and in this way we can control both storms, we know they are controlled.

Now, the ponds themselves. This table shows you the elevation of the ponds, and this is in geodetic datum, the pond dimensions, the amount of dead storage, live storage and total storage, the outlet size and the depth of water in those ponds, and those -- when I say live storage, that is the maximum water level that would be reached and which is under the 100 year storm.

Q. Have you considered erosion control at site F.

Q. Yes, Mr. Hodgson, we have and



Crysler, ex  
(Hodgson)

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3 we checked it for both the 51 minute and the three  
4 hour storm and needless to say because of the IDF  
5 characteristics, the 51 minute storm was the critical  
6 one and in the majority of the ditches the velocities  
7 are considerably less than one metre per second --  
8 I am sorry, they are about one metre per second and  
9 we believe that for considerable lengths of those  
10 ditches we will be able to go with a grass lining.  
11 However, in order to keep the velocities relatively  
12 low on the very steep property that exists here, we  
13 believe it will be necessary to install a series of  
14 check dams or, in other words, have the water  
15 cascading over a series of short falls and at each  
16 of these steps, or check dams, it will be necessary to  
17 have erosion control measures in the stream to  
18 contain it. We will also need of course at the lower  
19 end as it approaches a discharge under Highway 403.

20 Q. What in your opinion are the  
21 effects of the proposed design on surface water flows  
22 on Site F. Could you just summarise.

23 Q. Yes. Now, dealing first of all  
24 with Falcon Creek, because we have in fact reduced the  
25 drainage area of Falcon Creek by about four and a  
half hectares, we will be reducing the discharge  
into Falcon Creek and therefore will be reducing the



Crysler, ex  
(Hodgson)

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3 flows downstream in Falcon Creek. We have been  
4 advised that Falcon Creek further south where it is  
5 contained in pipes is running pretty close to  
6 capacity at the present time and by reducing those  
7 flows we will be relieving some of that pressure on  
8 it. Now, dealing with Indian Creek, because of the  
9 retention ponds we are maining the discharges under  
10 403 at about or below the existing, the pre-  
11 development flows for the same size of storm, and  
12 hence we will not increasing the flows in Indian  
13 Creek, we will not be increasing the potential for  
14 downstream scour. On top of that the retention/  
15 detention ponds will also serve to allow some silt to  
16 settle out. I think a far more important  
17 consideration in this case is that the runoff of this  
18 property at the present time is carrying a very heavy  
19 silt load. We took water samples of it in the early  
20 spring and some of the samples exceeded the limits  
21 of the turbidity meter we were using and I wanted to  
22 present them to the Board but there was unfortunately  
23 a bit of contamination and they got a lovely growth  
24 of algae and a few other things growing on them in  
25 spite of the fact we kept them in the refrigerator.  
In the post-development situation the area will be  
grassed and I would anticipate considerably less



Crysler, ex  
(Hodgson)

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4 silt load being carried in these streams because of  
5 this large area of grass as opposed to the steeply  
6 incised and deeply incised channels now flowing  
7 through the shale on that site, and in that way we  
8 will be reducing the silt load considerably down-  
stream.

9 Q. One last question. When we  
10 started you discussed the methodology that you used  
11 for this study and described it as something called  
12 "the rational method." Did you consider or have you  
13 used any other methodology in preparing these  
14 preliminary surface water impact designs for Sites  
D and F.

15 A. We considered other methods  
16 and the problem -- we have also undertaken in the  
17 final design that other methods will be used. We  
18 chose to use the rational method at this time  
19 because of its great simplicity and because a  
20 number of authorities we have checked still feel it  
21 is a valid method to be used and it is much  
22 simpler when working at the development level we have  
23 been working at to use the rational method because  
24 it permits us to visualise what we are doing and to  
25 visualise more quickly changes that can be brought  
about by using the various ponds. Obviously we



Crysler, ex  
(Hodgson)

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4 had to use the flood routing method by hand to take  
5 the storm flows through the retention ponds, but  
6 the rational method as we used it is a hand method  
7 as opposed to a computer method, so it was a hands-  
8 on-operation and we felt we had a good feel for what  
9 was happening, but there are many other methods,  
10 computer-based methods which are coming into use  
these days.

11 Q. Are you aware of any commitment  
12 the region has made in respect to using another  
13 method at the next step which is final design for  
14 either Site F or Site D.

15 A. It is my understanding that  
16 the region of Halton has undertaken to have the  
17 final design checked by using a computer-based model  
and presumably the model known as the Hymo model.

18 MR. HODGSON: Thank you, those are all  
19 my questions.

20 DR. KINGHAM: We might take a short  
21 break, but before we do will there be cross examination  
22 of this witness? We had better also consider the  
order given the evidence presented.

23 MR. ESTRIN: I believe there will be  
24 some questions by various parties and I believe the  
25 Halton Conservation Authority wishes to, but I'm not



Crysler, ex  
(Hodgson)

sure.

MR. OLAH: My friend suggested that since we probably have a bit more expertise than the other parties, and because we have come to some agreement with the region that perhaps I should cross-examine first. It may alleviate the need or the length of cross examination thereafter and I am prepared to do that subject to your wishes.

DR. KINGHAM: I was wondering as to which counsel, which party would be last in the cross-examination of this witness. Perhaps, Mr. Chrysler you can tell me or tell the Board whether based on your evidence with regard to hydrology and surface water runoff you would lean towards Site F or Site D as the easier to deal with the runoff situation.

THE WITNESS: Mr. Chairman, it is my belief that Site D from a surface water point of view is easier to deal with, primarily because we would not be involved in the pumping that is needed in the Site F, the pumping of stormwater from behind the landfilling operation.

DR. KINGHAM: That is fine. Without going much further into that, I wanted to establish whatever order we would conclude and then after the break then we would leave the Site D parties last to cross-



Crysler, ex  
(Hodgson)

examine on these issues. We also have to make a few calls to check up on the matter that was raised at the outset this morning, so we will resume at 11:30 with a view to going right through to 1:00 if necessary.

--- Recess.

DR. KINGHAM: Thank you, please be seated. Now, we were going to start with you, Mr. Olah.

CROSS-EXAMINATION BY MR. OLAH

MR. OLAH: Before I proceed further, as I indicated to you before, the region and I are in agreement about certain conditions that we would ask be incorporated in any final order. Rather than putting them on the record formally, what I have done is I have had the actual conditions completed and I would ask they may be marked as Exhibits. May I do that please? Perhaps they could be passed out, copies of the conditions.

DR. KINGHAM: These two documents, one describes the Halton Region Conservation Authority drainage criteria Site D Milton and the other the Halton Region Conservation Authority drainage criteria Site F Burlington. These are Conservation Authority exhibits as opposed to Halton Exhibits and I guess we will



Crysler, cr. ex  
(Olah)

give them separate numbers.

MR. OLAH: They are joint submissions,  
so it could go in under the region.

DR. KINGHAM: You were not offended  
if they were H-233 for Site D and H-- excuse me, you  
did have some maps. I'm sorry H-238 and H-239, with  
H-238 being for Site D and H-239 for Site F.

EXHIBIT NUMBER H-238: Drainage criteria for Site D

EXHIBIT NUMBER H-239: Drainage criteria for Site F

MR. OLAH: Q. Mr. Chrysler, I would  
like to take a short period of time with you and  
explore a couple of areas that will perhaps assist  
the Board in understanding why some of these criteria  
and some of the matters you have conveyed in your evi-  
dence-in-chief are important to riparian owners downstream.  
First of all, dealing with Site F, Mr. Chrysler I take  
it you are familiar with the fact there are some  
concrete pipes or enclosed channels on portions of  
Falcon Creek downstream from the landfill.

A. I believe so.

Q. That is located between Plains  
Road south and Falcon Creek in an area known as  
Aldershot.

A. Correct.

Q. I understand, and please correct



Crysler, cr. ex  
(Olah)

me if I am wrong, that these storm sewers were  
installed in the early 1970's.

A. I can't speak to that.

Q. In any event, basically they  
convey, as I understand, 10 to 25 year design storms  
and do you know if that is correct?

A. That would be a reasonable  
design criteria for that era.

A. The significance of that is  
that if in the case of a regional storm or a 100  
year storm you had waters backing up -- first of all,  
would you have waters backing up in those storm  
conditions?

A. Oh, yes.

Q. Perhaps we could stop for a  
moment and explain what a regional storm is. Could  
you explain to the Board please precisely what is meant  
by a regional storm?

A. A regional storm is a design  
storm which has been set by the province of Ontario  
for designing flood control projects. It is based on  
the Hurricane Hazel storm centred over the area to  
be considered. It is basically a 12 hour storm, the  
Hurricane Hazel length, but it is preceded by 36  
hours of much lighter rainfall to give a pre-storm --



Crysler, cr. ex  
(Olah)

an antecedent condition of wet ground.

Q. Could you help us in defining what a 100 storm is?

A. A 100 year storm is a storm of an intensity such that it would occur on the average about once every 100 years.

Q. How does that compare in relation to a regional storm?

A. In the case of Site F the 100 year storm is smaller than the regional storm.

Q. In the case of Site D?

A. In the case of Site D if you compare the regional storm, the 12 hour regional storm with the IDF curve for the Hornby station, which is the closest station...

Q. A monitoring station?

A. That's a rainfall monitoring station and it's no longer in existence and it was only in existence for nine years, but I think you will find that the Hurricane Hazel or the regional storm is slightly above the 12 hour storm for the 100 year storm at Hornby.

Q. Let's deal with the importance of a regional storm for a moment. I take it that you are familiar with the regulations that encompass most



Crysler, ex  
(Hodgson)

flows downstream in Falcon Creek. We have been advised that Falcon Creek further south where it is contained in pipes is running pretty close to capacity at the present time and by reducing those flows we will be relieving some of that pressure on it. Now, dealing with Indian Creek, because of the retention ponds we are maining the discharges under 403 at about or below the existing, the pre-development flows for the same size of storm, and hence we will not increasing the flows in Indian Creek, we will not be increasing the potential for downstream scour. On top of that the retention/detention ponds will also serve to allow some silt to settle out. I think a far more important consideration in this case is that the runoff of this property at the present time is carrying a very heavy silt load. We took water samples of it in the early spring and some of the samples exceeded the limits of the turbidity meter we were using and I wanted to present them to the Board but there was unfortunately a bit of contamination and they got a lovely growth of algae and a few other things growing on them in spite of the fact we kept them in the refrigerator. In the post-development situation the area will be grassed and I would anticipate considerably less



Crysler, ex  
(Hodgson)

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4 silt load being carried in these streams because of  
5 this large area of grass as opposed to the steeply  
6 incised and deeply incised channels now flowing  
7 through the shale on that site, and in that way we  
8 will be reducing the silt load considerably down-  
stream.

9 Q. One last question. When we  
10 started you discussed the methodology that you used  
11 for this study and described it as something called  
12 "the rational method." Did you consider or have you  
13 used any other methodology in preparing these  
14 preliminary surface water impact designs for Sites  
D and F.

15 A. We considered other methods  
16 and the problem -- we have also undertaken in the  
17 final design that other methods will be used. We  
18 chose to use the rational method at this time  
19 because of its great simplicity and because a  
20 number of authorities we have checked still feel it  
21 is a valid method to be used and it is much  
22 simpler when working at the development level we have  
23 been working at to use the rational method because  
24 it permits us to visualise what we are doing and to  
25 visualise more quickly changes that can be brought  
about by using the various ponds. Obviously we



Crysler, cr. ex  
(Olah)

of the province of Ontario with respect to regional  
storms and conservation authorities controlling flood-  
plains.

A. I am.

Q. Most of these regulations and  
controlling devices came into effect as a response  
to the disaster in 1954 with respect to Hurricane  
Hazel.

A. I would think so.

Q. Where a number of lives were  
lost.

A. Yes.

Q. The bottom line, if I can put  
it that way, is that the object of the exercise in  
designing the landfill site with respect to F was to  
ensure that there would be no increase in runoff that  
would create a potential danger in terms of flooding.

A. That is correct. I am sorry, did  
you say "that would create?"

Q. That would create a potential.

A. I agree.

Q. And by preserving in effect the  
same levels of discharge, what you have done is  
maintained the status quo, if I may put it that way.

A. That is correct. That was our



Crysler, cr. ex  
(Olah)

intention.

Q. The other side of the coin with respect to surface drainage is potential erosion problems, am I correct?

A. Yes.

Q. Do you know as a matter of fact that there is already some existing bank erosion on Indian Creek in the Aldershot area?

A. Yes, I am aware of that.

Q. Are you aware that there is some erosion also on Falcon Creek downstream from Site F.

A. I am not aware of it but I would expect there would be.

Q. So, the importance of maintaining the status quo in terms of runoff is not only to prevent potential flooding, or increased danger of flooding, but also to prevent increased danger of erosion; am I correct?

A. Could I suggest to prevent increased rate of erosion.

Q. An "increased rate of erosion."

A. Yes. Because you said there is already erosion on both of those creeks now.

Q. As I understand your position, given the conditions that have been agreed to with



Crysler, cr. ex  
(Olah)

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3  
4 the Authority, it is that the development of Site F  
5 does not increase either the danger of flooding or  
6 the rate of erosion downstream from Site F. Am I  
7 correct in that?

8 A. That is our intention.

9 Q. Let us move very quickly to a  
10 different area and by the way that is the reason why  
11 for example in Exhibit H-239 we speak about drainage  
12 plans to maintain the natural existing catchment  
13 areas for Indian and Falcon Creeks, and am I correct  
14 in that?

15 A. That is what your statement  
16 says. You will recall in my direct evidence I stated  
17 we would be transferring about four and a half  
18 hectares of drainage basin from Falcon Creek to  
19 Indian Creek and that will relieve or reduce the  
20 danger of flooding in Falcon Creek. However, because  
21 of the stormwater managements ponds we are proposing  
22 for Site F, we are containing the increase of that  
23 drainage area without increasing the rate of runoff.

24 Q. All right, but the bottom line  
25 or the ultimate position is that given the situation,  
there will be no increased runoff that will impact  
downstream.

A. On either creek, that is



Crysler cr. ex  
(Olah)

correct.

Q. Let us move quickly to  
perimeter ditches and their design. First of all,  
there are perimeter ditches on Site F encompassing is  
it both sides, both the east and west sides of the  
site?

A. There are perimeter ditches on  
Site F on both sides of -- there are perimeter ditches  
on both sides of the access road and the access road  
exists on both sides of the site.

Q. All right. These are designed to  
receive runoff and then -- perhaps you could pull out  
the Exhibit that deals with them and point out where  
they are and what they are designed to accomplish.

A. Dealing with H-235...

DR. KINGHAM: Perhaps it would be  
better to deal with H-237 because it is closer to the  
condition that exists now. I take it you are  
asking these questions in relation to the condition  
that exists now?

MR. OLAH: That is right, sir.

THE WITNESS: The condition that  
exists now is H-234. Is that the one you wanted?

MR. OLAH: Q. Perhaps you could  
indicate to us where the perimeter ditches will be



Crysler, cr. ex  
(Olah)

located.

A. Well, the drainage area, or the landfill area sorry, the landfill area is outlined in this hatched line and surrounding that landfill area will be an access road and there will be a drainage ditch between the landfill and the access road on both sides so that the drainage either way would be picked up in a drainage ditch before it reaches the access road. There will also be a drainage ditch on the west side of the west access road to collect the Falcon Creek drainage off the Burlington landfill site and there will be a drainage ditch on the east side of the east access road to collect the drainage that comes off from the Bayview landfill site as well as that which comes from the buffer zone beyond the access road.

Q. Initially I think in your design, the design you had conceived, it was a 25 year design storm for those perimeter ditches, is that correct?

A. When the D & O reports were first published over a year ago that is correct, they were designed for a 25 year storm.

Q. You have now agreed with the authority, or the region has agreed that a 50 year



Crysler, cr ex  
(Olah)

design storm will be used with respect to those  
perimeter ditches.

A. That is correct.

Q. There will be erosion control  
protection up to the five year storm condition,  
condition two as we see on Exhibit 239.

A. Yes, that five year erosion  
control for five year storm conditions is what I  
referred to earlier as the low flow channel.

Q. In fact, Mr. Chrysler, as I  
understand, in fact that was a design that was used  
for the existing Burlington landfill site.

A. That is my understanding.

Q. Essentially what we are doing  
with this point two in Exhibit 239, H-239, we are  
mimicking an existing situation?

A. That is correct.

Q. What is the reason that you  
want to contain surface drainage in the perimeter  
roadside ditches?

A. I'm sorry?

Q. What is the purpose or what is  
the function that is served by these perimeter  
ditches; what are you trying to avoid?

A. I'm trying to control



Crysler, cr ex  
(Olah)

uncontrolled runoff.

Q. You don't want pollution or  
contamination into the receiving stream?

A. No, of course not.

Q. Now, the other thing that  
concerns one with respect to Site F is that you  
have a fairly steep terrain in this case, do you not?

A. That is correct.

Q. What that does is it generates  
fairly high velocities of runoff.

A. It could.

Q. I'm not sure if you mentioned  
this in your examination-in-chief, but one of the  
things that is going to be considered in the final  
design is to harden the ditches in order to prevent  
erosion.

A. In order to control erosion,  
since erosion or the potential for erosion is a  
function of the velocity of the water that is flowing  
in it, and if I remember correctly it's something  
like it varies as the forth power of the velocity,  
but since --- there are two ways we are looking at  
controlling that erosive force and one is to slow  
down the velocity of the water by putting in a series  
of check dams so that the gradient of the stream is



Crysler cr ex  
(Olah)

flatter than it would be if there were no check dams, and you would get a flat section and then a drop and then a flat section, and that way we control the steepness of the channel and thereby reduce the velocity and thereby its scouring potential. I also stated I believe in my evidence-in-chief that we will be providing erosion control as needed in those channels and where there are low velocities perhaps we might use a grass lining and where there are higher velocities we would have to be into some form of armouring, but these are really I suggest matters of final detailed design, albeit there will be erosion control provided.

Q. The third area I wanted to explore was stormwater management. Again, for the reasons that we have discussed previously with respect to Site F, namely the construction lower down on Falcon Creek and Indian Creek, I take it that you are agreed that the stormwater management ponds in this case will be adequate to cope with increased runoff?

A. That is correct.

Q. It is important that those stormwater ponds be existing and retained to ensure that the runoff will not increase for various storm



Crysler cr ex  
(Olah)

frequencies.

A. That is correct.

Q. So an essential criteria to maintain this status quo position we have talked about is that the retention ponds be retained and be present in any final design.

A. That is correct. We show as you saw in the direct evidence that we constructed the east retention pond and the west retention pond at the same time the site is first being opened up so that they are there at the beginning and would be available for use to handle -- to control flows at that time and at the end point we will have the east retention pond and the south retention pond and they will be there as permanent fixtures.

Q. If they weren't there at any point in time you would have the dangers we discussed earlier, namely increased potential for flooding downstream and also potential for erosion.

A. That is correct.

Q. Just so we are clear and the Authority understands the matter clearly, you are committed to a stormwater management programme with the necessary modifications sought by the Authority, namely that it will include flow rates for a range of



Crysler cr ex  
(Olah)

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3 storms up to and including the 1 in 100 year storm?

4 A. That is correct.

5 Q. That is item three in the  
6 agreed position.

7 A. Agreed.

8 Q. The last thing I wanted to  
9 explore with you with respect to Site F was something  
10 called the rational method of calculation you  
11 described in your examination-in-chief. You have  
12 seen, and I showed you some guidelines that were  
13 issued by the Ministry of Natural Resources that  
14 talk about the need for computerized models.

15 A. Yes.

16 Q. And one of the concessions or  
17 the agreements with respect to Site F and Site D is  
18 that a computerized hydrological and hydrolic  
19 calculation will be used in the final details.

20 A. Yes, and I would volunteer that  
21 it would be one of the models referred to in those  
22 guidelines or accepted by those guidelines since I note  
23 they don't deal with the computerized version of the  
24 rational method which is available, but we have agreed  
25 that we would use one of the programmes, whichever  
is recommended in those guidelines.

Q. All right. So, let us then turn to



Crysler, cr ex  
(Olah)

Site D for a moment. The main concern with respect to Site D from the Authority's perspective is the re-location of the Bronte Creek you have mentioned already. Perhaps we could just pull the appropriate sketch with respect to Site D.

A. The one before development or the one with the diversion channel on it?

Q. The one with the diversion channel on it please, Mr. Chrysler.

A. H-231.

Q. Turning to Exhibit H-238, the small document that we filed, the agreed criteria, item one:

"1. The Bronte tributary diversion, be sized to convey the regional storm flow and designed such that existing stage storage/stage discharge is maintained for the variety of storm flows up to and including the regional event ".

Perhaps we could take this one stage at a time and could you tell us what storage/stage discharge is?

A. Stage refers to water level in a pond or in a stream and storage obviously is the volume of water that is in there at any one point, so that a stage/storage relationship



Crysler cr ex.  
(Olah)

relates that at any water level the in situ storage remains the same or the stage/storage relationship relates to the in situ storage on in place storage at any given water stage or water level.

Q. The second part of that condition is that it is maintained through a variety of storm flows up to and including the regional storm event, and could you explain what that means?

A. This means, this is achieved if the discharge of the flow from the point of consideration remains essentially the constant or remains the same after development as it was before development for that particular storm flow.

Q. Just so we understand the situation, what this refers to is through a variety of storms, whether it be a Q25, which is a one in 25 year storm, right through to regional storm event which takes you through a series of levels including 50, or 1 in 50, 1 in 100 up to regional, you have the same stage/storage discharge situation.

Q. Yes. I'm having a problem with your wording because we usually talk in terms of stage/storage and stage/discharge, but I assume you mean both stage/storage and stage/discharge.



Crysler, cr ex  
(Olah)

Q. That is what I mean.

A. All right, fine.

Q. As I understand it, the diversion we are talking about in this case of Bronte Creek will not affect the stage/storage through those ranges of storms we have talked about.

A. That is correct because the vast majority of your runoff in that diversion is coming in from further north where we are not touching it, so up there it doesn't change at all obviously, or at least not as a result of this landfill. Because of the pond we have put in here, the west pond, we are about to maintain that stage/storage and stage/discharge situation including the runoff from the landfill itself.

Q. Now, I would like to ask you this, Mr. Chrysler. If you find in the final design criteria that additional land is required to maintain the stage/storage discharge characteristics, will the appropriate alterations be made.

A. They will have to be, of course.

Q. All right. We are talking about re-locating such things possibly as perimeter roadways, the berms, or even the limits of the fill itself.

A. That is correct and other



Crysler cr ex  
(Olah)

alternatives could be to create a small pond at the top end if need be and to add storage and there are a variety of ways it can be done, and dealing mostly with ponds.

Q. Dealing for a moment with the diversion again, I take it in turning now to the problem of erosion, I take it that to prevent erosion it may be and will in fact be necessary to include a liner on that channel or that diversion.

A. We will certainly need a liner for the low flow and our numbers at this point would suggest we would need it for the 100 year storm or the regional storm, so I believe, based on the information we have at this stage, it will be necessary to line the entire channel, and the form of that liner is a design detail as far as I can see at this point.

Q. That is item 2 on H-238; correct?

A. Right.

Q. The other matters, items 3 through 6, are basically identical to the terms that are to be found in relation to site F, are they not?

A. That is correct.

Q. You are in agreement that if Site D is the one that is selected, that these conditions should be incorporated into any order with



Crysler, cr ex  
(Olah)

respect to Site D.

A. Yes.

MR. OLAH: Mr. Chrysler, thank you very much for your assistance. Those are all the questions I have.

DR. KINGHAM: Mr. Tidball? I take it you have agreed on an order.

MR. TIDBALL: I believe that that is the order that has been agreed on, Mr. Chairman.

CROSS-EXAMINATION BY MR. TIDBALL

Q. Mr. Chrysler, I have just a few questions for you and some of them go beyond what your evidence was this morning and if Mr. Hiraishi is the more appropriate person to ask these questions of, please tell me and I will put them to him.

A. Very well.

Q. I had a couple of questions with relation to the contingencies you would have in mind should surface water be contaminated by leachate or by something else, but leachate is what I'm primarily thinking of, but pick either of the sites as I see the site D drawing is up there. I assume that all of the surface water that would drain off a final site goes through



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one of the retention ponds?

A. That is correct.

Q. Is there any ability to more or less shut off those retention ponds, or is that contemplated in your design?

A. There is the ability to do that because each pond has a discharge through a circular round pipe, and the sizes are listed in the table that was given out this morning, and those discharge pipes could be capped, or they could be fitted with a valve and in that way any leachate that might seep out of the landfill and into the perimeter ditches would be retained and contained within those ponds.

Q. Now, dealing with both of the sites, what kind of retention time would you have in those ponds? Start with site D, I guess.

A. Well, I'm not sure ...

Q. I assume there is first of all an amount of dead storage which is there more or less permanently?

A. That is correct.

Q. Let's say a 1-year storm. What kind of retention time do you have in one of the ponds at site D for water coming in, or a



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4 drop of water that comes in to one of the ponds  
5 in a 10 year storm?

6 A. Well, if the drainpipe is  
7 not plugged, the retention time on site F is  
8 something less than an hour or at the most perhaps  
9 an hour and a half in the 51 minute storm and in  
10 site D if we are talking in terms of, if my  
11 memory is correct, somewhere around two hours and  
12 forty minutes of storm time for the designed  
13 storm and since the pond is holding water back, it  
14 will be retaining that active storage for something  
15 longer than that, but you must appreciate that  
16 while that storm is on there is both inflow and  
17 outflow from the ponds. I suggest to you, and  
18 I think Mr. Hiraishi would verify this, but it is  
19 my understanding that the concern of leachate  
20 pollution of the stream is really a matter of a  
21 low flow concern and not a high flow concern.  
22 In the high flow, since the leachate seep would be  
23 in a very small volume, in a high storm flow the  
24 dilution factor is huge, and if the discharge from  
25 the pond was to be closed off with a valve, or  
if the pipe was capped, the concern we would have  
to deal with is overtopping of that pond in the  
effect of a large storm, because those ponds are



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designed to have both an inflow and outflow at the same time.

Q. Let's take the assumption of some kind of contamination in a low flow condition. First of all, can we take it that it would be your recommendation that the ponds be capable of being shut off?

A. Yes, I would agree with that.

Q. In the event there was contamination of leachate into those ponds, what are you suggesting would be the fate of that contaminated water, presuming you have to do something with it?

A. It is my understanding, and again I would defer to Mr. Hiraishi, but that that water would be collected and taken to a sewage plant.

Q. In the case of site F that would simply mean additional pumping into the sewer?

A. That's correct.

Q. In the case of site D that would mean additional trucking?

A. Or being pumped over into a leachate collection system and being trucked away



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from there, yes. This of course is based on the premise that the seep of leachate would be spotted and corrected as soon as possible.

Q. I took that as an assumption and I can explore that further with Mr. Hiraishi.

A. Yes.

Q. You dealt with the situation at site F whereby water that would sort of naturally want to flow into the excavation where waste is being filled would be held back by excavated material. Am I right about that?

A. No, not quite. It is held back because there would be fill and the upstream face of that fill would have to have a clay liner put on it to make it waterproof because we wouldn't trust the shale which decomposes or breaks down very rapidly under weathering conditions to maintain a reasonable degree of water-tightness.

Q. This has to do essentially with the operation method you would build, and you would actually build almost a barrier of fill with a clay lining behind it, is that right, and then you are filling in behind that and that is why water doesn't get in there?

A. That's correct, landfilling



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behind it.

Q. Does the same theory apply  
to site D?

A. No.

Q. What happens to water that  
gets into the excavation at site D?

A. That is really a problem for  
Mr. Hiraishi. Suffice if to say that any water  
which is contaminated by contact with actual  
garbage, or by actual contact with the garbage,  
would be treated as leachate and handled as such  
and efforts will be made to separate stormwater  
from that which is contaminated and that which  
can be prevented from being contaminated and that  
which is kept from contact with the garbage will  
be pumped into the storm system.

Q. Perhaps I can take that up with  
Mr. Hiraishi because there are some specific  
questions on that. Just a few other matters,  
Mr. Crylser. I take it you are assuming that all the  
ponds you designed would be capable and in fact  
would have to be cleaned out.

A. Oh yes.

Q. Can you enlighten us any  
further on how you would in fact clean those out?



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A. They are designed at a 4 to 1 sideslope which is something a front-end loader can drive down in a dry period and the water is shallow enough that they would be able to literally excavate with a front-end loader, or at worst they could reach it with a backhoe or with a dragline and excavate them.

Q. In your discussions with Mr. Olah on Exhibits 238 and 239, there are a number of criteria listed for each site which I gather the Region of Halton has agreed with the Conservation Authority would be incorporated into any final Order of the Board.

A. That is my understanding.

Q. Is it also your understanding that there would be some kind of final design approval following whatever decision this Board would make.

A. I have assumed that at all times, yes.

Q. You have assumed the final design approval or -- there would be a final design approval by the Ministry?

A. Ministry of the Environment?

Q. Yes.



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A. Yes.

Q. Are you also assuming some kind of final design approval by the Conservation Authority, and I didn't know if that was inherent in these exhibits or not.

A. Yes. I would expect that they would require that. They would certainly have to be satisfied the criteria had been met.

Q. There was one statement in your witness statement I wanted to ask you about and it's on the first page actually. Have you got it there? It is Exhibit H-8B-1.

A. Yes.

Q. I want to know if you are the correct person to ask about this. The second last sentence on the page when you are talking about the 2C report states:

"It was my responsibility to determine in general how surface water was to be handled and how collected leachate would handled on-site or off-site."

I am just curious about the last part of that sentence that it was your responsibility



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to determine the fate of collected leachate. Is that something that went into the 2C analysis?

A. Yes.

Q. The question I wanted to come to was evidently a decision was made at some point that the way to go at site D was to truck leachate. I was wondering if there was any evaluation that went into that decision on the part of the team you were part of?

A. In the 2C level of study, and if you wish to refer to the 2C reports; if I remember correctly for site D we identified where we could anticipate the nearest extension of sanitary sewers would be as set down by the five-year plan. We had to look at the possibility of a dedicated line, or the possibility of looking at a general line being made available in that area or the alternative would be to truck it, so indeed we did look at those alternatives and they were built into our thinking at the 2C level.

Q. Have you the 2C report there?

A. Somewhere.

Q. Perhaps I could read you something and it would be easier if it's not convenient. I wanted to refer you to page 42, the



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4 site D discussion. At the bottom there is a  
5 discussion of the leachate collector system, and  
6 I think that is what you have just been referring  
7 to, and that's all I wanted to draw your attention  
8 to where it says:

9 "The northern-most expansion  
10 of sewers based on a five-  
11 year capital budget should be  
12 Highway 5 between Walker's  
13 Line and Guelph Line."

14 A. That's what it says.

15 Q. That is where you determine  
16 the nearest sewer was, and somewhere in here, or  
17 is there somewhere else? Is there any valuation  
18 of the extension of sewers from there versus the  
19 cost of trucking?

20 MR. HODGSON: I think Mr. Tidball  
21 has the wrong witness here. This witness is dealing  
22 with surface water impact and I don't think anything  
23 he is dealing with will go into a sanitary sewer.  
24 If it goes into a sanitary sewer, that's Mr.  
25 Hiraishi's problem, and he is prepared to deal with  
this kind of thing.

MR. TIDBALL: If it's Mr. Hiraishi,  
that's fine, I was going back to the sentence where



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4 it was mentioned, the 2C report.

5 THE WITNESS: Yes, in the 2C report  
6 we looked at it that far, but when you look into  
7 the finals, that's a new ball game.

8 MR. TIDBALL: Q. I should ask  
9 Mr. Hiraishi.

10 A. Yes, and that is our final  
11 decision was based on, Mr. Hiraishi's design.

12 Q. Could I ask you one final  
13 question about site F. Do you have data, and if  
14 you don't that's fine, but I'm curious if anything  
15 exists, but on the actual flows in Indian Creek in  
16 the area south of 403. Perhaps you could take down  
17 H-231 and we could look at the one behind it, H-234.  
18 As I understood it, perhaps it's not even down there,  
19 but you get to a point where just before the CNR  
20 there is a sort of total flow where all of Indian  
21 Creek joins together, or at least the west branch  
22 of Indian Creek joins together near King Road  
23 and the CNR.

24 A. Yes.

25 Q. That point?

A. Yes.

Q. Have you any flow information  
on Indian Creek at that point?



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A. No, I don't. Bear in mind that the discharge off Site F is an intermittent discharge.

Q. I understand that. Is it your evidence that it's intermittent down to that point, the point we talked about near the CNR and King Road?

A. I have seen it dry at that point.

MR. TIDBALL: Those are my questions, Mr. Chairman, thank you.

DR. KINGHAM: Thank you, Mr. Tidball. Mr. Tzekas.

CROSS-EXAMINATION BY MR. TZEKAS:

Q. Mr. Chrysler, could I begin by asking you some general questions as to how the agreements with the Conservation Authority which have been marked as Exhibits 238 and 239 came about. First of all, it is my understanding, sir, that the jurisdiction over the alteration and the diversion of watercourses at both of these sites rests with the Halton Region Conservation Authority. Is that consistent with your understanding?

A. I think there is no



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4 doubt that the Conservation Authority has jurisdiction  
5 over discharges from the site and they do control --  
6 they do have authority over on-site discharges,  
7 on-site flows, but also the municipality has some  
8 jurisdiction as well.

9 MR. HODGSON: I think I may have  
10 missed part of the question and I'm not sure if we  
11 have the right witness on this issue either because  
12 on the issue of jurisdiction over surface water  
13 impacts with respect these applications, that matter  
14 is in the hands of this Board and not in the hands  
15 of the Conservation Authority, and that is why the  
16 Conservation Authority are a party before this Board  
17 in this hearing.

18 MR. TEZKAS: I didn't mean to be  
19 that subtle. Of course this Board by virtue of  
20 the application before it has the ultimate authority.  
21 My question to the witness was really to understand  
22 how the Conservation Authority comes into it in the  
23 normal course, and absent this kind of application,  
24 and perhaps that it would be the way to phrase the  
25 question.

26 Q. Mr. Crylser, absent this kind  
27 of application, I take it that any kind of construction  
28 project like the one that is being proposed for sites



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3 F or D would involve the Conservation Authority.

4 A. That is correct, and that is  
5 my understanding of it. You would have to ask the  
6 Authority for the fine points of what their  
7 jurisdiction is, but that is my understanding of it.

8 Q. And I understand that they  
9 become involved because both of these construction  
10 projects involve alterations of the discharges and  
11 the watercourses on either of the sites.

12 A. It involves the alteration of  
13 watercourses, yes.

14 Q. Now, was that something that  
15 you were aware of at all stages when you prepared  
16 your work?

17 A. Yes.

18 Q. I take it then you would have  
19 been aware of the fact that in order to obtain  
20 Conservation Authority approval, you would have  
21 to present the Conservation Authority with some  
22 fairly detailed plans and calculations.

23 A. We would have to satisfy  
24 their requirements, yes.

25 Q. My understanding is that  
their requirements and your procedure, at least  
in the initial stages, are not identical?



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A. I think you could assume that,  
yes, and that is one interpretation of it.

Q. My understanding ...

MR. HODGSON: Mr. Tzekas is so  
subtle, he's too subtle for me on this. While  
he indicated that he didn't want to get into this  
issue as to who had authority and was talking about  
the pre-development, he is now into this application  
and he is back confusing apples and oranges. If  
we are now talking about applications with respect  
to site F and site D, there was a Cabinet Order,  
a Cabinet Regulation which consolidated the hearing  
before the Conservation Authority with all of the  
other hearings that are consolidated before you,  
and you now have that jurisdiction, and therefore  
there is no need, with the greatest of respect, and  
I mean no disrespect, but there is no need for  
Halton to talk to the Conservation Authority.  
However, Halton has conducted lengthy discussions,  
and I could even call them negotiations with the  
Conservation Authority, because the Conservation  
Authority was concerned that it's jurisdiction had  
been taken away and didn't appreciate that fact  
and in fact is on record as having fought that  
and lost it. The Region has negotiated with the



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Conservation Authority, met the Conservation Authority's concerns and presented a united front here today, and you have it in H-238 and H-239. I don't understand why my friend wants to go back and replough all of that ground, but that appears to be where he is going.

MR. OLAH: Could I correct something? There was no fight by the Authority with respect to what has been termed a loss of it's jurisdiction as the jurisdiction of the Cabinet was subsumed in your findings and so I would like to correct that if I may.

DR. KINGHAM: The Board understands that the Conservation Authority and the Regional Government consulted on the matter of possible conditions should either site be approved.

MR. OLAH: That is right. There were certain concerns expressed by the Authority, and those concerns were adopted and found reasonable by the Region, and that is why we have incorporated them into Exhibits 238 and 239. It's as simple as that.

DR. KINGHAM: So it's not an issue of jurisdiction at this point?

MR. TZEKAS: I will be very blunt,



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4 sir. This witness indicated in chief that he used  
5 a particular method of assessment, and that was  
6 the rational formula, as I understood it. It is  
7 also my understanding, Mr. Chairman, that that  
8 particular formula is not a formula that the  
9 Regional Conservation Authority adopts in the approval  
10 of this kind of work. Now, I appreciate that in this  
11 particular application final approval rests with the  
12 Board, but what I am trying to get to is to understand  
13 first of all if there were differences between the  
14 formula adopted by the witness and what the  
15 Conservation Authority normally requires and,  
16 secondly, if those differences do exist I would  
17 like to explore what the rationale for picking one  
18 formula as opposed to the other was. I really didn't  
19 want to be this complicated, and I certainly am  
20 not intending to be difficult either to the Board  
21 or to the witness, but it appears to me that we  
22 have a formula being promoted to a certain stage  
23 in the hearing, and it is then subsumed by these  
24 and I would just like to follow that process and  
25 understand how we got from the rational formula  
to these particular design criteria.

MR. HODGSON: I can't really object  
to this except on one ground. We had a meeting last



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4 week of all counsel and it was an understanding that  
5 no party had a concern with respect to this witness'  
6 evidence, and on that basis I led a very abbreviated  
7 examination-in-chief, and among the questions I took  
8 out of my examination-in-chief was a detailed examination  
9 of the rational method and why the witness had  
10 chosen that method as opposed to any other method,  
11 and what in his opinion was an appropriate method  
12 to use and whether his opinion -- or whether any  
13 other method was required or necessary or appropriate  
14 in the circumstances. Having abbreviated the  
15 examination-in-chief in that way my friend now  
16 decides he wants to re-open what I understood last  
17 week was a closed topic and, with the greatest of  
18 respect, I don't understand why this is now happening.  
19 If it's going to happen that means we will not now  
20 be able to scope evidence from any witness, and if  
21 we will have counsel agree to one thing last week  
22 and conduct a different kind of examination this  
23 week.

24 DR. KINGHAM: Mr. Tzekas, were you  
25 in fact aware of the scoping exercise that took  
place?

MR. TZEKAS: I was aware there was  
a meeting of counsel and that certain items had been



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agreed to, and I understood some of the concerns that

both Mr. Estrin and Mr. McQuaid had were given to Mr. Hodgson, and I don't intend to do what Mr. Hodgson is suggesting is being done here, and that is to re-open the whole thing. I am more interested in the process and that is how did we get from one level of examination to another and what went into it. My understanding was, and this comes from Mr. McQuaid, but it was that that issue was not closed, and if it was then I may have to stand corrected on this, but I certainly didn't understand the scoping exercise would take away a right to ask that particular question.

DR. KINGHAM: I guess the issue here is whether you are now beginning a challenge of the choice of the rational method versus one of the other computer modelling methods for the hydrogeological work rather than questioning the process by which one went from one step to the other.

MR. TZEKAS: I think, Mr. Chairman, again to be quite blunt and give you a clear indication of where I am going, you will have before you a significant number of documents that adopt or are based on the rational formula. When



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4 my cross-examination is concluded, I hope you will  
5 understand how much weight should be given to those  
6 particular documents in the overall context. The  
7 point is very simply that I think we are into a new  
8 regime, and this is the one that will govern and  
9 that there isn't very much significance to be placed  
10 on the earlier investigations and earlier work,  
11 because the design criteria and the design methodologies  
12 are different and that is the point that is being made.  
13 I didn't understand that the scoping exercise had  
14 anything to do with that because we are not attacking  
15 the witness' conclusions or anything of that sort.  
16 I am not trying to suggest through any of this  
17 that there is a methodology that would lead to  
18 different results vis-à-vis the analysis of Site F  
19 and Site D and so on and so forth. I thought that that  
20 was what was being discussed.

21 DR. KINGHAM: The Board is clearly  
22 in a difficult position on this given it's desire  
23 to see the matter processed both efficiently and  
24 comprehensively. I understood from Mr. Crysler's  
25 evidence-in-chief that he indeed deal very, very  
lightly with the rational model, and so lightly  
that the assumption could be made by this Board  
that it was not at issue, and indeed Mr. Hodgson's



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3 words have confirmed that that was his assumption,  
4 that the matter was not in issue. I understand  
5 you are now suggesting to us that as far as you  
6 and your clients are concerned it is at issue  
7 because you would like the Board to give very little  
8 weight to the rational model, even though we have  
9 not had it explained to us in any detail.

10 MR. TZEKAS: If the concession you  
11 began with is made by the witness, then I can get  
12 off the topic and I need nothing more than that.  
13 If there is in his evidence or in his presentation,  
14 or if Mr. Hodgson would like to indicate clearly  
15 that little weight is to be placed on that model,  
16 then I don't need to explore it any further than  
that, and that was really the point of my discussion.

17 MR. HODGSON: My understanding, and  
18 we could have the witness' evidence on this, but  
19 I understand it is the witness' professional opinion  
20 that the rational model was the appropriate model  
21 to use in this situation. However, because  
22 provincial guidelines now suggest that a computer  
23 based model is necessary, and they are guidelines  
24 and only guidelines, and they are not the law,  
the Conservation Authority asked that that happen.  
25 Mr. Crysler told the Region that it would cost many



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thousands of dollars to computer model one of these sites, and that it was not necessary. The Conservation Authority, because they insisted upon this, the result was that the Region agreed that if one of the two sites is approved, and to satisfy the Conservation Authority, the Region would computer model the final design of the site selected. Now, on that basis I don't know what can possibly be achieved by going into the subject of why it is the witness chose the rational method and what is now defective about it, and why we should put very little weight on his conclusions, because his real conclusions have to do with whether or not surface water impacts, or any possible surface water impacts at either site can be dealt with in an appropriate manner by a qualified civil engineer, and he gave his opinion on that subject. However, to go back to the agreement of all counsel, I asked my friends do you have any concern with the evidence of Mr. Crysler, and both Mr. Estrin and Mr. McQuaid indicated they had some minor concerns, and I said take it up directly with Mr. Crysler, and he was here, and each of them spoke to him, and I know Mr. Estrin spoke to him and I'm almost certain Mr. McQuaid spoke to Mr. Crysler. There was never



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4 a suggestion that the concern was that his  
5 conclusion should be rejected because his methodology  
6 was totally inappropriate. That is a fundamental  
7 attack on the witness' evidence, and there couldn't  
8 be anything more fundamental than that, and for  
9 Burlington to now suggest that it can open that  
10 question, having said last week they had no concerns,  
11 is to me -- it's just silly and it makes our  
12 discussions ridiculous, and it makes the possibility  
13 of any further discussions -- it's just impossible.  
14 I can't rely on my fellow counsel to go through  
15 with an agreement, and I am prepared to have this witness  
16 or any other witnesses evidence gone into in whatever  
17 detail is required by my friends or this Board, but  
18 surely if we are going to have a discussion that it  
19 will be touched upon lightly, it should be touched  
20 upon lightly, and it has been done in enough detail  
21 that the Board can satisfy itself that if it makes  
22 an Order that this is an issue that can be dealt  
23 with to the satisfaction of the Conservation  
24 Authority and I would have thought my friends,  
25 since they agreed that that was the case last week.

MR. TZEKAS: Mr. Chairman, I'm not  
challenging the witness' conclusions, and I am not  
making that kind of suggestion. Mr. Hodgson is



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4 attributing something to this process that is not  
5 there. I do think it is important that the Board  
6 understand in a very, very general way what the  
7 methodology was, because it was that methodology  
8 after all that led to the selection team  
9 to prefer one site over another, and what it was,  
10 and how it is different from the agreement now  
11 made. I am not attacking to the conclusions to  
12 be drawn from those methodologies. I have some  
13 questions of information as to the application of  
14 the rational formula, but that is simply so that  
15 we can understand it, and that's as far as it goes.  
16 I don't think that that is outside of what was  
17 discussed. I sought guidance from other counsel  
18 and unfortunately I'm not sure that anyone but  
19 Mr. Estrin was there, and if I'm out of line, I  
20 would be quite prepared to go on to the next part  
21 of the examination. I think the danger, however, in  
22 not allowing at least a few questions on this is that  
23 the Board will be presented or have before it much  
24 information without any real understanding of what  
25 it's significance is vis-à-vis the design criteria  
or design modifications.

24 DR. KINGHAM: But that is surely --  
25 that comes to the issue of whether or not matters



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4 are in dispute. Mr. Crysler has arrived at some  
5 conclusions about runoff from these sites, the  
6 various storm scenarios based on the rational method,  
7 and we find from Exhibits H-238 and H-239 that in  
8 future should a site be selected he would continue  
9 the calculations based on a different method, a  
10 computer controlled method, and that leads the Board  
11 to the question quite rightly as to whether you feel  
12 in your professional opinion that you would have  
13 arrived at any dramatically different conclusions  
14 had you used the other method before, and I don't  
15 know if you are able to answer that kind of  
16 question or not, but surely that is germane to  
17 what this whole discussion is about.

18 THE WITNESS: Would you wish me to  
19 respond?

20 DR. KINGHAM: Yes.

21 THE WITNESS: The guidelines, the  
22 technical guidelines which are being referred to  
23 as far as I know were issued and released in 1987,  
24 it may have been the latter part of 1986. Prior  
25 to that the rational method was accepted by a variety  
of organizations; for instance in 1977 the guidelines  
were under the Lakes and Rivers Improvements Act,  
Ministry of Natural Resources used it, the storm-



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3 water management guidelines for the central region  
4 of the Ministry of Natural Resources in 1981, the  
5 Ministry of Transportation and Communications  
6 Drainage Manual, MTC Drainage Manual, Chapter B  
7 entitled Design Flood Estimation For Small Watersheds,  
8 Section Edition, 1984, and still in use, MTC  
9 recommends to their staff that for -- that the  
10 rational method be used for rural watersheds up  
11 to 2,500 hectares. They also in their description  
12 in that Chapter B make the commennt that the rational  
13 method is considered to over-estimate most storms.  
14 So, it is my opinion that the rational method has  
15 given us a reasonable approach as best as can be  
16 accepted knowing the variability of the sites,  
17 the variability of runoff conditions which are  
18 affected of course by the surface cover, the  
19 difference between spring and fall on agricultural  
20 land and so on, and it is my opinion that the  
21 rational method gives us a reasonable number for  
22 flows and it was my intention, and I have agreed  
23 that when we go into the final design the computer  
24 modelling, which I believe will probably be the  
25 Hymo program, will be a part of our design tools  
in that final run, in the final design.

DR. KINGHAM: I think what you are



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saying is had you used a computer model like the Hymo method rather than the rational method, you would not have arrived at a worse result for either site.

THE WITNESS: I don't believe I would, and that is my opinion, sir.

MR. TZEKAS: Then I will go on to the second series of questions.

Q. Mr. Chrysler, this is for some information about your use of the rational method. Can you indicate to me please that one of the elements in applying the rational formula, one of the considerations is the runoff coefficients.

A. That is correct.

Q. Those are referred to I think in your witness statement, but we do not have details as to what coefficients you actually used for either site, and are those easily available?

A. They are available, but I wouldn't say easily available. I haven't got them with me, other than to say the runoff coefficients we used ranged from .41 to .57 or somewhere in that neighbourhood, and the runoff coefficients, in many publications, MTC publications and Dr. Chou's Applied Hydrology and a number of well accepted reference books, and they give runoff coefficients for varying types of



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3 terrain, whether it is flat, level ground, steep or  
4 hilly ground, whether it's wooded, grassed, agricultural  
5 land and that sort of thing, and also the type of  
6 soil, whether it is a sandy soil or a clay soil,  
7 all of these factors or all these considerations  
8 get factored into this one runoff coefficient, and  
9 there are standard methods available to work a  
10 composite runoff coefficient because in any area,  
11 especially in this case on Site D much more than  
12 on Site F, there are a variety of types of runoff.  
13 There is road surface, agricultural land and  
14 eventually there will be a landfill at that site,  
15 and so we used composite figures using the standard  
16 methods of the rational method to arrive at that  
17 composite. If my memory is correct, our runoff  
18 coefficients varied between .41 and .5 or .55 or  
19 .57, in that neighbourhood.

20 Q. You made reference to various  
21 texts that could be referred to to develop these  
22 coefficients. Was there one in particular that  
23 you referred to, or was it a simple complication  
24 of the various authorities to arrive at a number?

25 A. They really don't disagree  
and they seem to keep repeating the same tables  
over and over and over in all the books, and there is



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thee an analysis or a methodology which describes  
how you arrived at that?

A. The rational method as I mentioned earlier has been around for nearly 100 years, and the first reference I read about was dated 1889, I think it was, and it's still has been in use in North America since that time. These methods have been evolved and have been written up in many handbooks and many textbooks and many reference books, and the rational method was a method which, for instance, I was taught in some detail when I was a student and is still being taught in the same way and still being used in the same way. Obviously when you are looking at any watershed and want to worry about or be concerned with the runoff characteristics, you have to have a feel for what the terrain is and whether it is steep or flat or whatever. So, we had to examine all of these and we would go to the standard references and use the standard long time used method of putting them together to arrive at a composite, and this is based on the areas of land of the different types under the different categories.

Q. I understand all of that,



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3 not a matter of disagreement between them. MTC  
4 publications use the same table as Dr. Chou  
5 uses in his Great Handbook of Applied Hydrology  
6 and which is the same thing you would find in  
7 several other references which I have.

8 Q. In order to apply these  
9 particular runoff coefficients, did you or others  
10 responsible for this kind of programming, did you  
11 happen to visit the site?

12 A. Indeed.

13 Q. I take it that inspection  
14 was part of the application of your judgment in  
15 the selection of the appropriate runoff coefficient?

16 A. That is correct.

17 Q. With respect to the rational  
18 formula, you have indicated you used composite  
19 coefficients, and do I take it that it was based  
20 on your decision that there were various site  
21 characteristics on Site D and Site F that had  
22 different coefficients?

23 A. That is right.

24 Q. And somehow these have been  
25 blended.

A. Yes.

Q. Again, if it is convenient, is



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3 in your view?

4 A. I think what we are concerned  
5 about in any of these streams is the control of  
6 the peak flows under any particular design conditions,  
7 because those are the ones which overtop banks and  
8 those are the storms which cause erosion in scour  
9 and those are the ones which overload culverts and  
10 pipes and bridges, bridge crossings. So, our  
11 concern has to be with the peak flows, and anything  
12 less than that is going to cause less problems, and  
13 if we can deal with the major problems certainly  
14 we can accept that the lesser problems are not  
15 problems.

16 Q. Now, I would just like to  
17 ask you some general questions as well about the  
18 two sites and their comparison. As I heard your  
19 evidence, Site F requires the construction of an  
20 additional temporary pond, the west pond.

21 A. It doesn't require it, but  
22 we chose to put it in because we thought it would  
23 be a better solution, but we could do without it.  
24 There is no need for it to be there. But, by  
25 putting in that temporary west retention pond  
we are encouraging that area, the south half of  
the site to be retained in it's present condition



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Mr. Chrysler, but I am wondering if there is some place we can look to see what you did. I'm not questioning what you did or the propriety of it, I accept all of those things, but is there somewhere we can look to see what was done?

A. Working under the instructions of the Region of Halton, our clients, we did produce and hand over to the Conservation Authority, through the Region, a complete set of design notes for both sites, and in those design notes is spelled out in very great detail how we arrived at it.

Q. Can you tell me in terms of the use of this particular methodology, my understanding is that the rational method was intended primarily to estimate peak flows.

A. Oh yes.

Q. My understanding as well is that it is not a methodology that is particularly useful in measuring runoff, runoff flow as well as peak flows.

A. Peak flows are runoff. The runoff causes the peak flow.

Q. Right, but wouldn't the duration of the storm have some effect on runoff? Let me ask you this; are the two terms synonymous



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4 about the first half of the development, we are  
5 proceeding from the midline upward and we are  
6 filling these creek valleys with material which  
7 will be the floor of the landfill. Therefore,  
8 as the natural runoff occurs from any storm in  
9 those creeks, it will come down and be ponded  
against this fill.

10 Q. Is that a condition that applies  
11 in any way at Site D?

12 A. No, it's a different situation.

13 Q. Do I take it that it's that  
14 situation that creates the need for pumping  
equipment?

15 A. Yes, but pumping equipment  
16 will also be required at Site D.

17 Q. Under what circumstances would  
18 it be required at Site D?

19 A. Well, when the landfill or  
20 a cell on Site D is opened, and again Mr. Hiraishi  
21 can speak more fully to this, but when a cell is  
22 opened and the waste material is being deposited  
23 in the cells, or in a small piece of that, and if  
24 a storm occurs, any water that gets into that  
excavation for the cell, the intention would be  
25 to keep it as much as possible from coming into



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as long as possible, otherwise we would be diverting the natural flow of waters away from it.

Q. Perhaps I phrased it badly, but it is your recommendation rather than it being a requirement that there be an extra pond.

A. That is correct.

Q. Or temporary. That is something that doesn't exist, I take it, on Site D.

A. Site D is a very different condition, that is correct.

Q. Did I also understand that with Site F there would be a system of fill used as, if I can use the word, a dike to prevent the runoff on the northern part of the site from entering into the landfill area. Did I understand your evidence correctly on that?

A. Inherent in the engineering design of Site F, which Mr. Hiraishi will eventually be speaking to, is ... inherent in that design is the fact that the river valleys will be partly filled, the present creek valleys will be partly filled to raise up to the floor of the landfill, and this fill in effect will create dams, and in each case we are working from the south to the north on the property, and therefore we proceeded, talking



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4 this fill working up the creek valleys and forming  
5 natural ponding and forming a great sump to pump  
6 out of.

7 Q. You indicated there was  
8 sufficient storage created by these fill conditions  
9 to deal with a 100 year storm at Site F. Was any  
10 consideration given to what would occur in the  
11 course of a regional storm at Site F?

12 A. In the regional storm they  
13 would probably overtop, you would overtop those,  
14 and some additional water would probably have to  
15 be treated as leachate, and I suggest the same  
16 thing would occur at D.

17 Q. The significance that I take  
18 from this goes back to your testimony, and I hope  
19 I heard it correctly, that the regional storm  
20 conditions on Site F are somewhat different as  
21 compared to the 100 year storm condition, whereas  
22 on Site D those two conditions are more or less  
23 similar.

24 A. As best as we can interpret  
25 the IDF curves for the four stations which were  
relevant to this study, there will be a greater  
difference between the 100 year storm and the  
regional storm at Site F than there will be between



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contact with the garbage. If it comes into contact with the garbage, it would have to be treated as leachate and dealt with accordingly, and I believe I mentioned in my direct evidence that there would be a system of pumping from these cells that water which does not come into contact with the waste material, and the only way you will get it out of the cell is to pump it out into the stormwater ditch.

Q. I take it that that scenario which you have outlined also occurs at Site F and that deals with the working area during a rain?

A. That is correct.

Q. I understood at Site F there was some unique feature which required pumping equipment outside of that on the north side of the dike, if you will.

A. No. I suggest, and again Mr. Hiraishi may wish to correct me on this, but it was my understanding that that area above the fill will be restricted in size at all times so that anything that lands on there basically will end up being treated as leachate, and instead of having pumps and small dikes right around the bottom of the cell as we would on Site D, in Site F we have



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4 THE WITNESS: No. In that exhibit  
5 we have the IDF curves for each of the four  
6 stations involved, but what we have done on this  
7 particular chart is we have taken the 100 year storm  
8 line for each of those three sites and we show in  
9 green the Hornby station, in blue the Oakville  
10 station, in red the Burlington station, and in black  
11 the Hamilton station. Now, you can see that based  
12 on the flow records of the storm records at each  
13 of these stations, the Hornby flows are higher than  
14 the other three, and the intensity of the storm  
15 is measured here in millimetres per hour on the  
16 left margin and the duration of the storm is the  
17 logarithmic scale across the bottom. We have  
18 shown here on this the total rainfall as an average  
19 of intensity per hour in the regional storm, and  
20 you can see it is just slightly above the Hornby  
21 station for that year and it is considerably above  
22 the other three. That is why I say when we did  
23 our work on this for Site F we used the Burlington  
24 and Hamilton stations only because they bracketed  
25 Site F very well. They are unfortunately of  
relatively short duration, duration of record  
for each of these stations, and for Site D,  
considerating the possible abberation of the Hornby



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the regional storm and the 100 year storm at Site D. In both cases the regional storm is the same, though. It's the 100 year storm that is different.

Q. I take it, Mr. Chrysler, that in the final design it is possible that the computer modelling techniques will lead you and others to different conclusions as to the location and sizing of the ponds. Is that a possibility?

A. It is a possibility, yes.

Q. I take it at the present time that is not something we can be informed about, it simply awaits the final design stage.

A. That is correct.

MR. TZEKAS: If I could have one moment.

DR. KINGHAM: While he is having his moment, perhaps you could give us the difference between a regional storm and a 100 year storm in the vicinity of D and F and why in one instance there will be a difference and in the other there won't?

THE WITNESS: All right. I just have something that has been prepared. What we we have here ...

DR. KINGHAM: This is from your existing exhibit you showed us?



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and the first one, correct me if I am wrong, there would be a reduction of flow in storm sewers downstream, or at least one of the storm sewers downstream which you indicated may already be at it's maximum capacity.

A. Bronte Creek, I understand, has overtopped in certain storms and, as Mr. Olah pointed out, it has overtopped in the past, and he suggested that it was designed, I think he said, for a 10 year storm or 25 year storm which would not be unusual in an urban situation, and considering the era in which they were built.

Q. As I understand it, the engineering proposed at F would in your evidence reduce flow into that drainage system and therefore assist in a positive manner with peak flow problems that may result now?

A. There would be some small measure of assistance.

Q. Another beneficial affect as I understood your evidence with regard to the proposal at Site F is to deal with heavy natural siltation arising from close-off, that area?

A. Heavy siltation which is



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3 a fixed storm and the 100 year storm is site-specific,  
4 and a regional storm is decreed by the province to  
5 be a specific storm.

6 Q. At the time of a regional  
7 storm or a 100 year storm, say at Site D, you  
8 have indicated the size of the ponds has been  
9 calculated to deal with such a storm, right?

10 A. The ponds have been designed for  
11 the 100 year storm.

12 Q. What sort of freeboard would  
13 be left in the height of a 100 year storm?

14 A. If my memory is correct I  
15 think we allowed a two-foot freeboard above the  
16 100 year storm.

17 Q. And a freeboard in layman's  
18 language ...

19 A. A vertical measurement or  
20 vertical height, or in other words you could put  
21 two more feet of water in there before it  
22 overtopped the embankment.

23 Q. I wanted to go over some of  
24 the matters I heard this morning with regard to  
25 Site F. First of all, as I understood your evidence,  
there would be one or two beneficial effects from  
the proposed work of a hydrological nature at Site F,



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A. We used the formula to find that number.

Q. Can you tell me what that number was?

A. It was given on the little tables as the design flows under different conditions which were determined by the rational method.

Q. I think what I'm getting at, and perhaps I'm not making myself clear, but it really deals with the question of infiltration rates as opposed to simply the runoff off-site, and I think that that may have been what was confusing you. Did you have infiltration rates in mind?

A. The runoff coefficient that we were speaking of earlier takes into consideration infiltration based upon soil types, and also takes into consideration ponding and temporary detention on-site to delay the runoff.

Q. Would that information be included as part of the detailed notes that were given ...

A. Yes, because, as I mentioned earlier, the runoff coefficients take into consideration the type of soil you are on, which would therefore affect the infiltration rate, and



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station being above, we took an average of all four and for Site D our average would be about here but for Site F we were at this point and you can see the difference as to where the regional storm comes in.

DR. KINGHAM: Could you simplify that down to maybe one or two sentences?

THE WITNESS: At Site F they appear to have lower rainfall on average than at Site D.

DR. KINGHAM: Therefore your 100 year storm is a more dramatic variation from the norm?

THE WITNESS: That is correct, sir.

DR. KINGHAM: I see.

MR. TZEKAS: Q. Mr. Chrysler, just one more question. Can you indicate to me please in the application of your formulae what figures you were using to calculate total site runoff.

A. I'm sorry? Could you repeat that again?

Q. Certainly. In applying your formula you must have had in mind some quantum of runoff, surface runoff. Is there a number that you were using or that you had in mind at the time you applied your formula?



1 Board has considered this very carefully and has a few  
2 things to suggest to you. First we would propose that  
3 we in fact sit on Remembrance Day, the 11th with perhaps  
4 a break in the morning, but we propose to sit on that day,  
5 and I understand that is not a problem for Mr. Tidball or  
6 the Ministry of the Environment, it doesn't contravene  
7 anything serious.

8 As we mentioned last week, this Board is  
9 prepared to sit any and all Fridays if it is at all  
10 possible to arrange that between now and the end of this  
11 hearing, to which end we would encourage counsel to put  
12 up on a map somewhere the Fridays available to see if any  
13 of them in fact are available to all of you, in which case  
14 you could simply notify the Board and we would be pre-  
15 pared to use them to any extent possible.

16 We agreed we would not adjourn for the  
17 March break, notwithstanding earlier commitments of a  
18 Board member, nor will we adjourn for February, with a  
19 considerable saving in time we would hope. That would  
20 mean we would adjourn only once for the Christmas-New  
21 Year's break period, and it is our proposal to do that  
22 from the 14th of December to the 8th of January. This is  
23 our best attempt to try to see this hearing through to it's  
24 most expeditious end, and of course we want your reaction  
25 to this on the record and we recognize that in a way this



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they take into effect the steepness of it and they take in the surface cover. We did in fact, as I stated in my witness statement, look at four different formulae and one of them in particular deals more with infiltration than others, or it deals more with soil types, and they don't deal specifically with infiltration, but rather they deal with soil types which of course really have a bearing on infiltration, but that is in those detailed notes.

MR. TZEKAS: Thank you very much.

DR. KINGHAM: I wonder if rather than beginning another stage -- Ms. Vigod?

MS. VIGOD: I have no questions.

DR. KINGHAM: How long do you anticipate, Mr. Estrin?

MR. ESTRIN: I will be in the vicinity of half an hour.

DR. KINGHAM: Rather than beginning that, perhaps we can shortly adjourn, but before we do, the Board wanted to make a few observations concerning the events of last week and the discussions surrounding those events in which we are all striving for the most expeditious and comprehensive consideration of the evidence in this matter. The



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4 DR. KINGHAM: Yes. That would be  
5 the only break we would anticipate between now  
6 and the end of this hearing, and all parties I  
7 hope would realize that that should bring this  
8 to a conclusion much sooner than the end of July,  
9 based on the earlier calculations, and we hope  
10 it would bring it to a conclusion sooner than the  
11 end of June, and in fact if you have arrived at  
12 some agreements between you all as to matters not  
13 in dispute, we may see this end before the end  
14 of May, and I'm sure that that is the wish of all  
15 of us.

16 With that, we will adjourn until  
17 2:10.

18 ---Luncheon adjournment 12:55 p.m.

19 ---Upon resuming at 2:15 p.m.

20 DR. KINGHAM: Thank you. Please  
21 be seated.

22 CROSS-EXAMINATION BY MR. ESTRIN:

23 Q. Mr. Crysler, a couple of  
24 points arising from your testimony this morning.  
25 At site D, using very layman's language, is a  
regional storm worse than a regional storm at F?

A. No sir. A regional storm is



1 constitutes, or the demands of this hearing constitute a  
2 considerable burden for the taxpayers of this area, with  
3 Burlington and Milton in a sense having a kind of double-  
4 burden to carry, and Halton of course having the respon-  
5 sibility of providing this facility on behalf of all of  
6 the people of the Region. So, I would appreciate your  
7 reactions to this proposal as to whether we have in fact  
8 all party consent to proceed in this way and in what we  
9 hope will be the most expeditious fashion. I don't care  
10 where we start, but I suppose we can start with Burlington  
11 and then hear from Milton and then Halton.

12 MR. TZEKAS: We have no difficulty  
13 with it, Mr. Chairman.

14 MR. ESTRIN: That seems reasonable.

15 DR. KINGHAM: Any other comments?

16 Mr. Hodgson?

17 MR. HODGSON: The Region has no difficulty,  
18 but for clarification you said we would break in December  
19 from the 14th through to the 8th and you meant we would  
20 not sit on the 14th?

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presently occurring there.

Q. Have you been there and seen the streams flowing red, not from leachate but from the shale?

A. Indeed I have.

Q. Could you describe that a bit?

A. Well, we were there in March of this year and again in April for the purpose of assessing the silt load in them, and we took water samples in both cases, and the normal turbidity measurement is one of what you can see through on a measurable thickness and it runs on a scale to 500, and we were off the scale completely. The stream is flowing very, very red and we took a standard sample bottle about four inches in height, and when we let the thing settle for a day or in the lab, there was over half an inch of sediment at the bottom which would be the shale. The water was still red.

Q. Could you indicate on a drawing or map on Site F where your sampling was done?

A. Site F?

Q. Yes.



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6 4 A. We took it right at the point  
5 where we cross under the 403 and took it right  
6 before it entered the culvert under 403.

7 Q. Flowing into which creek?

8 A. Indian Creek.

9 Q. Is there any ... did you  
10 make any observations of that nature with regard  
11 to Falcon Creek?

12 A. We did not.

13 Q. Because you didn't look or  
14 there isn't any siltation, or did you know?

15 A. We did not look.

16 Q. So, as I understood your  
17 evidence, the engineering that would be developed  
18 in connection with the Site F would use retention  
19 ponds to reduce, if not significantly reduce  
20 that siltation loading on the creek, is that  
21 right?

22 A. Siltation ponds during a  
23 major storm. The detention ponds would not  
24 retain the water long enough to substantially  
25 drop silt out of it, and on Site F we would be  
expecting a considerable reduction in silt load  
because of the grassed surface that would result  
on top of the landfill, the completed landfill,



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and therefore it would cut down erosion and we will have also erosion resistant channels, and so on completion of the site the natural conditions that will be left, or the manmade conditions that will be left will be rather immune to erosion because of the velocities and so on.

Q. Overall that would be a beneficial effect in hydrological terms?

A. For the surface water condition I believe it would be a beneficial effect, yes.

Q. Did you do a survey of the downstream -- the area of downstream of the proposed Site F. Did you walk it or ride around or look at the area generally?

A. In general, yes, and not at the time we took the water samples.

Q. No. Did you do the same with regard to proposed Site D?

A. Yes, indeed I did.

Q. I take it you would agree that around Site D there are a number of surface water users, and by that I mean farm ponds, ponds around houses, dug-outs, things which may be used by farmers or their animals and by people



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residing in the area.

A. Yes, I believe that that is  
so.

Q. Did you see anything of a  
similar nature downstream of Site F?

A. For sediment load?

Q. Pardon?

A. For silt load?

Q. I'm talking about the use of  
surface water.

A. No, but I understand and have  
been advised but have not seen myself, that the  
golf course draws water from the stream or from  
a pond off the stream.

Q. But I take it you didn't  
make any survey or didn't specifically try to  
identify ponds or cisterns or any other surface  
water uses around Site D?

A. Around Site D we didn't  
identify them, but we certainly saw them. There  
was a chap right across the road from the site  
from where the Bronte Creek diversion exits  
the property who has quite a large pond.

Q. What kind of pond?

A. A fair sized pond, ornamental more



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or less. Just upstream of Tremaine Road there is a fairly large pond that a farmer has created by damming across the creek at that point.

DR. KINGHAM: Where would that be on the map?

THE WITNESS: This is the First Line and Tremaine Road and the residence -- not a farmer, but a rural home, but right beside the creek here, he has a farm pond and this property has created a dam at this point, and you can see the retention behind it.

MR. ESTRIN: Q. You are then pointing to a dam just east of ...

A. Just east of Tremaine Road.

Q. Indeed some of the drawings, if I can direct your attention to Exhibit M-102, it would appear ...

A. There is one of the farm ponds and you can see it and there is the back-up of the pond from Tremaine Road.

Q. Perhaps you could trace the Bronte Creek tributary on this aerial photograph.

A. The Bronte Creek tributary coming from north of Britannia Road is west of First Line and crosses under Britannia Road and crosses



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10 4 under the First Line, goes on the property, sweeps  
5 back to the First Line and into the ditch at First  
6 Line at this point, and then crosses under First  
7 Line flowing west, wanders over under the railway  
8 tracks and continues west through this pond to  
9 Tremaine Road and crosses Tremaine Road and enters  
the main stream of that creek.

10 Q. It would appear at the present  
11 time on-site, Bronte Creek passes through this  
12 wooded area?

13 A. Yes.

14 Q. And again to the west of  
15 First Line it passes through another fairly  
extensive wooded area.

16 A. Correct.

17 Q. And then continues on. If  
18 we have reference to the topographic map which  
19 I don't believe has been made an exhibit, and I'm  
20 not sure that we need make it an exhibit, but I  
21 see something marked on Tremaine Road called  
Reservoir Dam.

22 A. That would be it.

23 Q. That is the reservoir dam you  
24 were referring to?

25 A. Yes.



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Q. There appears on the topographic map to be what appears to be a pond just south of Site D.

A. There are several ponds shown in this area south of there, and some of them may be dug-out ponds and others may be natural depressions.

Q. These are things -- have you seen any of these yourself?

A. Oh yes.

Q. There are one or two ponds or more on Site D itself, I understand?

A. Yes.

Q. Perhaps you could put the aerial photograph which is behind you back up again. There are three which have been highlighted in green on M-102 and would you agree that the operational plan for landfill would still have those three ponds essentially remain, or at least two if not three?

A. I think that the development will eliminate the one at the south to the west, and the one in the centre, and this one would remain.

Q. The one furthest to the east?

A. The one to the east could remain,



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yes.

Q. Just looking at that aerial photograph, you used aerial photography in your work, in the initial phases of it to assist in developing contours stereoscopically, I understand, but you used it to help develop your drainage maps?

A. Yes.

Q. Looking at that Exhibit M-102, it would appear to me as a layman that there would appear to be some drainage patterns to the south of Site D, particularly in the middle and eastern half going in a southeasterly direction, or am I looking at that incorrectly?

A. That is correct.

Q. Could you point those out?

A. You are referring to these patterns and over here and which are shown on our drawing, Exhibit H-230, where we show these patterns flowing in this direction and the pattern down there as well as these pieces beyond.

Q. It looks to me like the aerial photograph, M-102, takes us further to the south than the other exhibit and helps us see that there is certainly surface drainage that starts on the property which is bounded in red on M-102



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and then continues south or southeasterly, is that fair?

A. That is correct, yes. These are draws or swales and I wouldn't dignify them by calling them streams.

Q. These would generally be wet and flowing in spring or in periods of reasonably heavy precipitation.

A. Yes.

Q. Such as snow melt.

A. Yes.

Q. How many times did you actually visit proposed Site D for the purposes of making inspections of the drainage features, do you recall?

A. Good heavens! Quite a few. At least a half a dozen. I have probably done half a dozen in 1987 alone.

Q. One thing I'm not sure I fully understand, but there is this tributary of Bronte Creek running through the proposed Site D. I guess from what we know at the moment, is it fair to say that the Halton Region Conservation Authority has not actually done a floodplain regional storm calculation for this part of it's watershed at this point?



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A. It is my understanding that they have not produced floodplain mapping for this portion of Bronte Creek on Site D.

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Q. In other words, just to clarify that, there are areas of the Region of Halton within the jurisdiction of the Halton Region Conservation Authority where floodplain mapping has been done such that it is possible to determine from looking at a map right now, and produced by the Conservation Authority, that certain areas would flood or be subject to flooding in a regional storm or a 100 year storm -- a regional storm.

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A. That's right.

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Q. That mapping has not been done for the area around Site D?

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A. That is my understanding.

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Q. What do we know then for sure about the extent to which Site D right now floods, or any portion of it floods in a 25 year storm or a 50 year storm or 100 year storm, where Bronte Creek runs through it right now?

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A. Very little. It has not been mapped is what I mean.

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Q. Would it be fair to say -- you tell me about Bronte Creek that flows through

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3 the site, the proposed site right now. Is it fairly  
4 shallow? You characterize it.

5 A. The creek, Bronte Creek, the  
6 last time I walked up it would have been about  
7 July I think, May or June, somewhere in there, and  
8 it is a defined creek back this far, but in some  
9 areas you can see there is evidence it has been  
10 cleared. If you walk through here, parts of this,  
11 since there are nice straight lines you can tell  
12 they have been cleared or cleaned out by the farmers  
13 to soften the meanders, but when you get up  
14 in this area up above, in most cases it is just a  
15 swale, but in the lower part it is defined, and where  
16 it comes through that woodlot it is a defined  
channel.

17 Q. But it would be fair to  
18 predict that in any event of any kind of a major  
19 storm, 25 or 50 a 100 year kind of storm, that the  
20 topography being relatively flat, that to the extent  
21 there was any overflow of the channel it would tend  
22 to spread out for some distance beyond the channel  
itself?

23 A. Yes.

24 Q. It's not like a steep gorge  
25 situation where you just have back-up in the gorge,



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and this would be a situation where if you got  
flooding in the event of a major storm, it would  
tend to spread out?

A. That is correct.

Q. Can you assist us in any way  
in what ways relatively speaking, and I know you  
have not been there through one of these storms I  
don't think, but in what general way would it tend  
to spread out?

A. Since the land is very flat,  
obviously it would spread across a fair width in  
this area here and the shading you can see on the  
map would indicate there is an area here at the  
time the photograph was taken, there was more  
dampness in this area than say for instance here,  
and there is still some roll and still some defined  
valley and not a gorge or anything like this, but  
the woodlot I suspect stays damp a good part of  
the year, otherwise it probably would have been  
converted into a ploughed field.

Q. But you think it is evident  
from M-102, and knowing what you do about the  
land, that in the event of overflowing the banks it  
would tend to spread out and go in either direction,  
east-west from that stream?



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A. That is right.

Q. Is there any way of sort of highlighting what you are saying and where you see it actually spreading out based on that photograph. Perhaps we have a highlighter somewhere.

A. I wouldn't want to be in a position to say this is the limits of it by any means.

Q. Perhaps a dashed line indicating what you see based on that.

A. Well, at the time this photograph was taken, as best I can interpret the shading on the photograph, it would indicate it would a line along this area and somewhat out like here and in that area, plus a few little draws coming in from the side and maybe a piece in here.

Q. On both sides?

A. Yes, as it follows the natural topography, the naturally gently rolling topography of that area.

Q. As you say, you have no way of knowing if that is the maximum extent, in fact it would not likely indicate the maximum extent in a regional storm.

A. All I can say is that it indicates the area of ground which appeared to the



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camera to be wetter than the rest at the time the photograph was taken.

Q. In fact, as I recall at a hearing over the Region of Halton's proposed landfill in 1979, what we are now calling Site E, just to west about a mile and a half or so, your firm, Mr. Rivero was engaged by the Halton Region Conservation Authority to do some kind of floodplain mapping of that site.

A. What do you mean my firm?

A. Chrysler & Lathem.

A. I was not part of the company at that time.

Q. But your name was on it.

A. So be it.

Q. My recollection -- let's put it this way; you also looked at Site E on a comparative basis.

A. In Stage 2C, yes.

Q. There is a creek running through there as well; Indian Creek, I believe.

A. Yes, and it's not to be confused with Indian Creek for Site F.

Q. In fact we are better off not to use the term Indian Creek -- no, sorry. I've even



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4 seen the words Indian Creek used at Site D in some  
5 reports, but Site E is just a mile and a quarter or  
6 so away.

7 A. That is right.

8 Q. There is also a creek running  
9 through that. Could you sort of point that out, or  
10 going by it.

11 A. The creek -- it appears to be  
12 a series of ditches which are nice straight lines  
13 draining the area to the north of Site E, and I  
14 believe they drain to the west and follow down in  
15 that stream in that direction.

16 Q. I don't want to discuss  
17 Site E, but my recollection was that when floodplain  
18 mapping or calculations were actually done on that  
19 site, it indicated that in a regional storm there  
20 would be, because the area was relatively flat, in  
21 a regional storm there would be a degree of flooding  
22 and not marked by any means, but it would spread  
23 itself over quite an area. Assuming that that is  
24 the case at E, I take it from what you said before  
25 you would tend to agree that that would be the general  
nature of what would happen at D.

A. At Site E when we were doing  
the Stage 2C work, we had the floodplain mapping of



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4 that area and, if I remember correctly, E as  
5 presumably marked here, but as we finally defined  
6 it, we kept it outside the floodplain area and so  
7 we were not encroaching on the floodplain area.  
8 Now, the area is very flat and the defined mapping  
9 indicated some considerable expansion of the  
creek at that point, yes.

10 Q. And there would be no reason  
11 to suspect anything different at D?

12 A. A big storm in that relatively  
13 flat country, it is bound to spread out.

14 Q. Now, I would like to go to your  
15 witness statement if I could, Exhibit HB-1, and I  
16 wanted to look at page 10 under the heading of  
Bronte Creek Tributaries.

17 A. Yes.

18 Q. You tell us, going into the  
19 third sentence, or the second sentence, and this  
20 is Bronte Creek:

21 "It exits the site through a  
22 concrete box culvert under the  
23 First Line and drains to the  
24 west, past the CNR tracks  
25 and across Tremaine Road  
to join the much larger branch



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of Bronte Creek. Upstream  
of the First Line box culvert,  
this tributary drains a total  
of 273.6 ha of  
agricultural land, of which  
67.3 ha are on Site D. "

Could you roughly indicate where  
those 67.3 hectares are. Is it everything west of  
the drainage divide?

A. Yes, it is everything west  
of the drainage divide, this area. As it crosses  
under the First Line in that box culvert, it is not  
only what is coming from the north, but also the  
small creek tributaries from the south and east  
and as defined by the main watershed divide between  
Bronte Creek and Sixteen Mile Creek, and between  
Sixteen Mile Creek and this little piece below, the  
bottom corner.

Q. In a regional storm we simply  
don't know to what extent Bronte Creek, if it was  
left where it was, would tend to back up upstream  
and contribute waters. It couldn't go higher than  
the drainage divide, I take it?

A. I wouldn't expect so.

Q. But it possibly could at a  
minimal depth go almost that far?



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A. I'm not able to answer that.

Q. The last sentence in the

paragraph says:

"Residents along First Line  
report frequent floodings and  
overtopping of the road  
adjacent to the box culvert  
(personal communication)."

Did you interview some of these  
people, or what did you do?

A. I was running a survey along  
the road to determine how long that side was, and  
I think it's fair to say that the residents  
interviewed me.

Q. What did they basically  
inform you of?

A. They thought they were getting  
flooded a lot and they wanted to know what I was  
going to do to make it better or worse.

Q. What kind of flooding did  
they tell you about or did you yourself see any  
indications of occurring?

A. Well, you have to appreciate  
using the air photograph, that there are a number  
of homes developed along the First Line, and I think



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1 they were referred to by the planners as rural  
2 residential or rural estate, and in particular  
3 the stream crosses at this point and this landowner  
4 and this landowner in particular talked to me at  
5 some length and while we were there, I think this  
6 one came out of his driveway and stopped for a  
7 moment and kept on going, but they said that yes,  
8 they get flooded, it's not unusual to be flooded  
9 in the spring, and they felt there was back-up coming  
10 from the CNR tracks. There was overtopping of the  
11 road, but there was a worse condition of overtopping  
12 further north where the creek crosses the First  
13 Line before it reaches Site D because this is a  
14 relatively small metal pipe as opposed to the six-  
15 foot by four-foot box culvert at this point.

17 Q. So there is overtopping on  
18 First Line, or flooding of First Line because, first  
19 of all, the culvert exiting the site right now is  
20 perhaps too small, even under a 10 year storm?

21 A. Yes.

22 Q. And secondly, there may be  
23 flooding occurring between First Line and Tremaine  
24 Road because of back-ups along the railway line.

25 A. I would say from they advised  
me, my interpretation is that there would be back-



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ups between the CNR tracks and the First Line.  
Under the railway tracks there are two 60-inch  
diameter corrugated metal pipes and the top of  
those pipes is about five or six feet below the  
base of the rails, below the tracksthemselfes,  
and so they get quite a surcharge on them. However,  
the topographic mapping, the Ontario base line  
mapping is at a 1 to 10,000 scale and it indicates --  
excuse me -- those maps indicate, or the spot elevation  
on there indicates that the track at this point  
is about a half a metre above First Line at this  
point. Now the culvert of course is well below  
it, but there is also both

north and south of those culverts a few  
structures which were referred to as cattle passes  
which were provided for farmers in earlier years so  
their cattle could move back and forth across the  
tracks without having to go over the tracks, and  
these in effect are big walk-through culverts,  
and they occur both north and south of the stream  
crossing. The indications are that the land in  
this area and this area is sufficiently below the  
tracks that it would overflow towards those cattle  
passes before it would overtop the railroad, and  
before the water level reached the level of First Line.



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Q. If I understood what you said correctly, in the area immediately to the east of the railway tracks, north and south of the creek, in the event of a seasonal flow that was of a sufficient nature, you are saying the land would tend to get flooded in that area as well?

A. Yes. It would flood in that area before it would overtop the railway tracks, and I have not run any calculations to determine what flow would be going through the pipes under the CNR tracks before it reached that level and in fact it would be overtopping.

Q. Have you any idea of the extent to which flooding of that land would occur north and south of the creek under a 10 year or 25 or regional storm.

A. No, I haven't.

Q. Now, I just wanted you to explain the next paragraph in your witness statement:

"The extreme southwest corner of Site D drains to Bronte Creek through a 450 mm steel creek culvert under First Line."

Would you point that out to us on the



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aerial photograph?

A. This is a culvert in the extreme southwest corner which is this culvert under the First Line which is about three-quarters of a mile -- about three-eighths of a mile to half a mile south of the concrete box culvert we are talking about or, if you wish it on this one, if I can find it, it would be right beside this farmstead, to the south side of the farmstead, at the south side of that farmstead.

Q. I see a somewhat darker patch that seems to originate perhaps at that pond marked in green and then it goes in a westerly directly by the farmstead and then continues.

A. Well, sir, I have looked at that particular pond because one of our boreholes was put down in the 2C stage and was not far from it, and we were out in this field so I wandered over to look at the pond, and I'm not sure whether it is a dug pond there because it did not appear to have either an inflow or an outflow.

Q. I'm still curious. Where is this drainage path you mentioned in your witness statement.

A. Generally in this way.



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Q. Where does the water seem to originate?

A. This is just a matter of surface runoff from a rainfall or snow melt situation, and it doesn't flow from anywhere, it originates at that point. If you wanted to draw a drainage base on there you could sort of loop around those darker lines, but it's hardly a drainage basin.

Q. Could it be groundwater discharge in part. Are you saying it can't be groundwater discharge in part?

A. I would question whether it's groundwater discharge because those streams all go dry, totally dry.

Q. You made that observation in what years?

A. Well, sir, you will recall that last Thursday it rained here ...

Q. I don't actually recall.

A. It did, believe me. I went out in the middle of that storm and there was no water at all going through under that box culvert at that time. There was evidence it had gone through before and which is to be understood because I didn't reach the peak of it, and this is a fairly



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fast flow-through, but I left the office in  
Brampton when I thought the storm was doing well,  
but I obviously missed the peak here.

Q. Very rapid travel time.

A. Very rapid travel time, but  
there was no water flowing through it at all at  
that point.

Q. You were talking about which  
one to be specific?

A. At the box culvert under  
First Line.

Q. Did you make any observations  
about the one to the southwest?

A. No.

Q. Let's come to page 12 where  
I wanted to ask you a question again about Bronte  
Creek under Item vii. You have figures for the  
pre-develeopment and post-development drainage  
areas of these tributaries, and what have you done  
to arrive at the difference in figures on the Bronte  
Creek one, how did you calculate that?

A. Well, I would take them right  
off the mapping, and in the case of pre-development  
we have defined the areas and the tributaries to it,  
both on the small map and the larger map which takes



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in the area above, and we literally measured that area on the map and converted it by the map scale. When we look at the post-development situation, we did the same thing, we have an affected upstream and we made a small change here on the property itself.

Q. Looking at Exhibit 230, are you telling me you have taken the area to be landfilled between the green line and the drainage divide?

A. I am not. I said anything within the orange, the drainage lines which are the orange lines and including the area to the north of the property. We are talking about the area which is tributary to that road crossing. Now, that is regardless of whether it is on the landfill or not.

Q. Okay. Now, coming over to page 13, on Bronte Creek again, you are telling us in the first paragraph the culvert capacity showed that the road would be overtopped when the flow is about 5.34 centimetres which is the 10 year flow, and then in a 100 year flood you would get flooding of about two feet, .2 metres.

A. .2 metres is about 8 inches, a little less than a foot.



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Q. I'm sorry, 28 inches?

A. I'm sorry, hang on.

Q. In the middle paragraph.

A. The .2 metres is less than  
a foot.

Q. You are right. Then, under  
existing conditions, First Line will rise by only  
.2 metres, but this very long sag in the road.  
Does that mean a depression?

A. A sag, yes. There is a low  
spot and the First Line north of the crossing is  
lower than it is at the crossing.

Q. Is that sag in the road on  
the road allowance?

A. It's on the pavement, sir.  
The pavement itself is the highest point within  
the road allowance, and it is the pavement itself we  
are measuring.

Q. Well, has the sag in the road  
been taken into account by you -- as I understand  
it, it has been taken into account in determining  
the impact of a 100 year flood, and the fact it is  
there was one of the things, and it's length and  
it's aerial extent, was one of the things you took  
into account?



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A. That is right, to determine how high the water would be to back up towards Site D.

Q. How far does this .2 metres extend? Is that it's maximum height?

A. Yes, 350 metres in length is almost a thousand feet, it's more than a thousand feet and it's a long sag and the maximum it sags -- the .2 metres was computed as a water level and we ran a level survey from south of the box culvert right through for several properties north of Site D to see where the road profiles were and what the gradients were on the road, and we found this long sag in that 1,000 feet or so just north of the culvert and we plotted that and computed for various water levels what the flow would be, combining the flow through the culvert, plus the flow over the road.

Q. I guess one thing I'm interested in is what if the road is improved?

A. How would you define improvement?

Q. From the point of view of traffic it would be raised so it wouldn't be flooded in a storm?



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A. If that were so, they would obviously have to increase the size of the culvert, otherwise it will just keep backing up the water and going over top right at the culvert or wherever the low point is.

Q. Now, let's come over to page 14, the middle paragraph:

"In the post-development situation, the flow from the area upstream of the site is diverted in a new channel around the screening berm. The discharge of the drainage from the actual landfill area joins the upstream flow shortly before the combined flow passed under the First Line."

A. That is correct.

Q. Where is that?

A. The discharge of the drainage from the actual landfill area, which would be coming out from the retention pond at the berm, joins the diverted channel a short distance upstream of where it would pass under the existing



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box culvert.

Q. When that box culvert crosses the road, is it on a property line between two residential properties?

A. More or less.

Q. In effect, those two residential properties are shown on Exhibit M-230.

A. H-230.

Q. H-230.

A. Yes.

Q. On your exhibit one property owner is indicated as Pompa and the other is Chlon.

A. That's correct.

Q. Assuming those names are correct.

A. Yes, those are the names we have. This would indicate the property line is closer to Chlon's property and I know Pompa tells me he cleaned that ditch out himself.

Q. How deep is that?

A. Just give me a moment, I think I can give you that. The channel that has been cleaned out is approximately 6 feet wide by about 5 feet deep.

Q. It's not something you hop over?



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A. I don't.

Q. I don't think I would either.

A. I was there and I was never  
much at track and field.

Q. Did he indicate how he  
cleaned it out?

A. No.

Q. How would you suggest it  
be cleaned out?

A. Probably with a small tractor-  
mounted backhoe. I doubt if he did it by hand.

Q. Could you see how far back  
he had cleaned it out or deepened it?

A. He told me he had cleaned  
it back into his bush which we can see on your map  
here. He has cleaned it into the bush at this  
point and apparently he didn't clean it beyond  
that and it seems to fade out in there and I know  
down at the other end if I look at from the  
railway tracks, it is not a dug channel, but a  
naturally-cut channel.

Q. I want to return to page 14  
of your witness statement, the same paragraph.  
Under the proposal before the Board:

"The flow from upstream is



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unchanged for the pre-  
development flow, but the flow  
from the landfill area will be  
increased."

That is what it says there.

A. Until we put in a retention  
pond, and a retention pond brings it down.

Q. What I want to understand is  
what is the flow from the landfill area. What do  
you mean by that?

A. By that I mean the surface  
runoff from this area into the perimeter ditches  
which flows to the retention pond and on through  
the culvert.

Q. When you say the flow will  
be increased, that is increased over what?

A. Over the present rate of  
runoff because we will have a smooth surface and  
steeper sideslopes and therefore there will be  
a faster runoff from that area, and that is why  
the pond is there.

Q. I want to come back to the  
next sentence:

"Without a retention pond,  
the pre-development



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and post-development flows  
at the First Line culvert  
are: ..."

Then you give us the figures.

A. Yes.

Q. The percentage increases we  
see on page 14 represent the difference in flow off  
that portion of the site with the landfill and  
without; the landfill as completed and without  
a landfill and is that it basically?

A. It is the difference between  
the existing conditions and the final conditions  
after the landfill is completed.

Q. But the percentage difference  
is made up of what is flowing off that area and  
into the creek, is that it?

A. Yes, because the land upstream  
of the development is untouched, so the difference  
is entirely on the landfill.

Q. Is the percentage increase you  
show on page 14 constituted, and I want to be clear,  
but solely by this difference in runoff from what  
it is today to what it would be when the landfill  
is completed from that specific area.

A. The difference in the flow,



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the total flow at First Line, where it crosses under there, the total flow, and which includes the area to the north which is still flowing through there.

Q. You see, one thing that concerns me is that under this proposal, as I understand it, and from what you told us a few minutes ago, under present conditions during a storm of 25, 50 or 100 years, as you said, there would be some -- if Bronte Creek overflows it's banks it will tend to spread out, and perhaps not to great depth, but it will spread out in a fair area on either side of the creek; right? Now, under the proposal which is before the Board, as I understand it, what you are doing is you are taking Bronte Creek and putting it down the extreme west side of the site and the proposal is to build a berm immediately to the east; right?

A. To the east of the diversion channel, yes.

Q. So in the event of a major storm, the drainage that has heretofore been coming down to that point you are saying, from north of the site, it can't spread out as I understand it any more to the east because it faces



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this wall, this berm.

A. That is right.

Q. It will now have to spread out to the extent it is going to spread out to the south or to the west, fair enough?

A. I don't think that that follows.

Q. Why not?

A. We are removing from that channel this entire drainage basin here which flows, as you know from your map, into this creek as it comes along, and we are cutting out that entire drainage basin and dealing with it separately and taking the flows as they come on to the property and taking them through, and you can't ignore the runoff that originates on the property under the existing conditions.

Q. But you told us that the net effect of building the landfill is to increase the flow into that stream by 5 per cent?

A. Yes.

Q. Without any catchment basin or retention pond. The retention pond is designed to deal with that increase of runoff from that area of the site that would flow into that creek, right?

A. No, it is intended to sufficiently



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3 reduce the rate of flow off the property to  
4 compensate for the lost storage that might exist  
5 on the site. We are concerned, and our numbers  
6 are concerned only with the flow as it crosses  
7 First Line and we put the two together. One will  
8 come through a little bit faster so we hold the  
9 other one back a bit more.

10 Q. Are you able to provide me  
11 with the specific calculations that show that you  
12 are taking into account both the stuff that comes  
13 from the north of the site and how it would be  
14 accommodated in the retention pond as well as the  
15 increase that would be flowing off the area of the  
16 proposed landfill?

17 A. As I mentioned to one of the  
18 counsel this morning, we provided to the Conservation  
19 Authority through the Region at the Conservation  
20 Authority's request our detailed calculations, and that is  
21 information is all a part of those calculations.

22 Q. I assume there will be no  
23 problem in us getting that. I just want to  
24 satisfy myself that the calculation has been properly  
25 done.

MR. HODGSON: If Mr. Estrin wants only  
to satisfy himself he can have them.



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MR. ESTRIN: I may need some expert assistance in order to understand it.

Q. Do you understand, Mr. Chrysler, why I had some initial concern. Right now Site D does serve as a floodplain area for Bronte Creek; correct?

A. Yes, it serves as a floodplain area for that tributary of Bronte Creek, yes.

Q. What the proposal will do is eliminate on that site that area of flood storage that would otherwise have been available and so that has to be compensated for in some way, regardless of whether it's a landfill or anything else that is happening.

A. You will recall that in discussion with Mr. Olah this morning we talked about stage storage and stage discharge curves and this all ties together in that. The stage/storage is what you are worried about, the flooding across there. If we maintain the stage/storage, stage/discharge relationships, then we have maintained that balance.

Q. What I am scratching my head about and worrying about on behalf of my clients is that since we don't know the extent to which this will

Crysler, cr ex  
(Estrin)

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4 actually flood in a regional storm, how do we  
5 calculate the kind of storage capacity that is  
6 needed?

7 MR. HODGSON: Mr. Chairman, I want  
8 to rise because I am so frustrated with this now  
9 I won't even to object, but out of an abundance of  
10 at least fairness to Mr. Tzekas, Mr. Estrin has  
11 even gone so far as to use the word concern in the  
12 last question and now he is scratching his head,  
13 which I take it is another form of concern he has  
14 in this question. I just to indicate to the Board  
15 that I thought there was an understanding among  
16 counsel that no one had any concern with this  
17 evidence, but now it appears there is an abundance  
18 of concern with this evidence, and the agreement  
19 that counsel had is now just meaningless. I rose  
20 to object to Mr. Tzekas' question and I think I  
21 have to object to the line that Mr. Estrin is now  
22 following even if it appears productive to the Board  
23 as it does contravene what I understood was an  
24 understanding among all counsel. I thought in fact  
25 that when other counsel said we don't have concern with  
this evidence that it meant that we could put it in in  
chief and it would be over with and there might a  
few clarifying questions in cross-examinatin, but it



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now appears that that's impossible.

DR. KINGHAM: The Board appreciates this difficulty if for no other reason in that it was not a party, nor should it be, to that which you agreed amongst yourselves as to what was not in dispute. We are left to just listen to the apparent concern that still exists at this stage, and it's something the parties will have to work out if they are serious about making the process work better. There's very little the Board can do at this time.

MR. ESTRIN: Mr. Chairman, it became evident this morning that to the extent there was any agreement we are certainly seemingly moving away from it. I have to infer that my friends in Burlington were certainly contemplating, if not ready to call a hydrologist with respect to their concerns at Site F given the type of questioning they were engaged in, but I felt there was no alternative but to at least raise some of these concerns with respect to Site D while the witness is still here. I don't think I will be much longer, but these are certainly things that have occurred to us as being things that should be canvassed.

Q. As I understand your evidence,



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the diversion channel itself, the Bronte Creek  
diversion, is sized for a 100 year storm.

A. No sir.

Q. A regional storm?

A. A regional storm.

Q. You have also told me that  
essentially there is no difference in the size or  
depth of the diversion channel that is proposed for  
sizing it for the regional storm and that proposed  
in the design and operation drawing number 6, I  
think it is.

A. Whatever it is, number 4.

Q. Comparing the numbers in the  
chart you handed out this morning to the numbers  
on Drawing 6, they are essentially the same?

A. That is correct.

Q. Now, would you turn to page 16,  
Sixteen Mile Creek. I have a couple of questions  
relative to that. You say in the middle of the  
page:

"In the post-development  
condition, there will be  
an increased area draining  
to this tributary because of  
on-site grading and drainage.



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This will result in increased  
flows at the site boundary  
as follows: ..."

When you site boundary, where do  
you mean specifically please?

A. I mean the property boundary  
at the site.

Q. Could you point that out?

A. In all cases we are computing  
our flows at the point where the flow exits the  
property.

Q. The property goes to Highway 25,  
and is that where you mean?

A. My understanding is that this  
is the property line, so it's halfway between them,  
so we are talking about that point, the flow at this  
point, and this flow does not touch the property down  
here at all.

Q. When you say site boundary,  
you mean the easterly portion of the northern leg?

A. The easterly side of the  
northern leg, that's right, because that tributary  
we are talking about, that's the only place it is.

Q. I just wanted to be clear. You  
say:



Crysler, cr ex  
(Estrin)

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"However, 400 m downstream,  
the tributary joins the larger  
branch ..."

and that is where you say you get it down to  
essentially what it was before. There are some  
private properties between the site boundary on  
the east and that point, are there not?

A. That is correct.

Q. I understand -- are you  
recommending that the retention pond be built?

A. I am.

Q. If the retention pond was  
not built you would have this increase of 62 to 64  
per cent, depending on the storm, and that would,  
I take it, increase waters flowing now through  
the adjoining properties?

A. That is correct. There would  
be a sixty some odd per cent increase in flow between  
the site boundary and the point of confluence which  
is across private property which is why we  
recommended putting in the retention pond.

Q. Did you do any calculation  
as to what height or what extent there would be  
a floodpath in that situation without a retention  
pond?



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A. No, because we assumed as soon as we saw the numbers, we assumed we would put in a pond.

Q. Was it part of your responsibility to make any investigation, returning to Site F, of the sanitary sewer situation around Site F?

A. No, it was not.

Q. Is that Mr. Hiraishi?

A. Yes.

Q. If I can just have a moment I may not have any further questions. Just so I am clear, nothing the Region is proposing will alleviate the flooding conditions which now exist from time to time, year in more or less as a regular event around Site D, the First Line situation. To the extent that flooding now occurs along First Line and affects the properties to the west, nothing the Region is proposing or that you are recommending is designed specifically to alleviate that situation?

A. No. Our design is to end up with the conditions as close as we can to the conditions which presently exist.

Q. I take it that is why some of those people were interrogating you?

A. It could be.



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4 MR. ESTRIN: Fine, thank you. I  
5 have no further questions. Of course that is subject  
6 to seeing that document.

7 MS. NURVO: I have no questions.

8 MS. GOLDING: Ms. Cronk has no  
9 questions either.

10 DR. KINGHAM: Rather than brining  
11 a new witness right now, there are a couple of  
12 questions I would like you to answer, Mr. Crysler,  
13 if I may, and then we can adjourn for a few minutes.  
14 My first question is really quite a general question.  
15 I am trying to understand the significance, if any,  
16 between a regional storm, which I understand is the  
17 Hurricane Hazel type storm with certain definite  
18 parameters and standards, and a 100 year storm which  
19 is where every 100 years or so you might expect  
20 to have one of these storms in the course of 100  
21 years, and it is not precisely defined like a  
22 regional storm, and a Noah's Ark type storm where  
23 in the case of Noah's Ark I don't think he would  
24 have begun to build the ark in time for Hurricane  
25 Hazel, but what I am getting at is it has been  
raining for a week or two weeks and just seems to  
keep raining, and is that a one in 100 year storm?

THE WITNESS: That is what we believe --



Crysler,

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Noah had to survive what is known as the maximum probable flood.

MR. HODGSON: A biblical storm!

THE WITNESS: Something way beyond.

DR. KINGHAM: Bringing it down to earth, would your one in hundred or regional storms accommodate the sort of days of rain, and not a heavy intense storm which is what I think you are referring to in these storms, but where there is a lot of rain falling.

THE WITNESS: Oh yes, sir, the hundred year storm we are talking about on Site F would be a storm that lasts for three hours, but is very intense in that time. We also checked it out for the 50 minute storm which is even more intense. On Site D we are talking in terms of somewhere around two hours and forty minutes which was our design time there, but the very intense storms we get from time to time are in fact considerably less than a 100 year storm because if you look at the IDF curves you have to consider what is the length of time that that intense rainfall lasts.

DR. KINGHAM: I understand that and I understood the curves, but my question is what



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happens to a landfill? We are not dealing so much with the flash flood situation, but when you have a lot of rain over a one or two week period.

THE WITNESS: It steadily runs off.

DR. KINGHAM: You have no problem with your holding ponds or their capacity?

THE WITNESS: The rate of runoff will be considerably less than you have in the design storm; just the total amount of rain falling would be less.

DR. KINGHAM: If you had your druthers and could start choosing a site on the basis of hydrology alone, surface water runoff, would you pick a site at the bottom of a river valley, at the side of a hill, on a very flat plain, on a slight height of land or an extreme height of land if you consider it from a surface water runoff perspective. What is the best thing?

THE WITNESS: I certainly wouldn't want to put it in the bottom of a ravine because there you get all the major floods coming through, and by major ravine I take it you are thinking of something like we see out here at Sixteen Mile Creek where you have a major ravine which historically floods from side to side every couple of years, or it



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did in this area until they put landfilling in down here. Read the history books about Oakville.

DR. KINGHAM: So you would go to places like hillsides and very flat plains and slightly curved plains.

THE WITNESS: The higher up you get towards the divide and towards, shall we say a plateau sort of situation, the less water you will have to deal with because eventually you will only be dealing with the water that lands on the site itself. In the case of Site D, we have something less than a square mile of land upstream which is draining through here, but in the case Site F it is in fact a plateau because the north end of Site F drains to the north into Falcon Creek. There are no streams on Site F which come through the site, they all originate on the site, whereas in Site D we do have this tributary of Bronte Creek flowing in from above and having less than a square mile of drainage basin upstream of it and the very small amount of Sixteen Mile Creek, but that's only a few acres in extent, so you are fairly close to the top with Site D and with Site F you are in fact at the top.

DR. KINGHAM: A height of land in both



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cases. Maybe if you put up that H-234.

THE WITNESS: On H-234 you can see there is the divide there and north of that goes into this part of Falcon Creek and goes off and way around, and all of these creeks arise on there, so we are only dealing here with the rainfall that actually lands on that site. There is a very small amount off on the Burlington landfill to the side which comes in, and a small amount on to the Bayview site which comes in, but basically you are at the head of the watershed.

DR. KINGHAM: Similarly if you put up H-230.

THE WITNESS: H-230. As I say, we have about a square mile upstream draining into it, and a few acres in here, but about a square mile, and all of the rest of it originates on the property.

DR. KINGHAM: So, when I consider your charts that you showed us in H-232 and in your witness statement where you talk about the same matters on pages 16 and 17, you talk about per cent increases in flow from the sites, and I have some difficulty in understanding that. If the rain falls on the site now then all of the rain runs off the site in due course very quickly.



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THE WITNESS: That is right.

DR. KINGHAM: If when the site is completed, as you have shown in H-231, and the rain falls on the site, all of the rain which otherwise would run off straight away is now impeded by the holding ponds, is that right?

THE WITNESS: That is right. If we did not have the holding ponds, the rainwater which falls on the developed landfill would run off more quickly than it does now, and therefore we put the retention pond in and the water flows into the retention pond faster than it is permitted to flow out.

DR. KINGHAM: That is why I wondered why there is a slight increase in the runoff with the retention ponds in place when, based on your charts here, one might have expected a slight decrease in runoff after a storm because some of the water will be held that otherwise would have run off.

THE WITNESS: If the pond were not there the runoff would be much greater, and it's a matter of the sizing of the pond and it's very much a trial and error situation and when we got down to about one per cent we thought we were



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3 doing pretty good and we didn't refine it further,  
4 but that can be refined further, the question of  
5 a larger pond so it takes more water per inch to  
6 raise the water level, and since the outlet pipe  
7 is fixed, the water level determines the rate at  
8 which it goes out because of the depth in effect  
9 over a weir.

10 DR. KINGHAM: So you engineered  
11 that to maintain approximately the same outflow  
12 in a given storm and so the water is collecting more  
13 quickly in the retention ponds from the sides of  
14 the landfill and then flowing out at a rate which,  
15 combined with the rest of the tributary, approximates  
16 the rate it would have run off the land anyway.

17 THE WITNESS: That is correct.

18 DR. KINGHAM: And adjusting the  
19 height of the outlet affects whether you get  
20 plus or minus a percentage.

21 THE WITNESS: We could make the  
22 pipe smaller or of less capacity or make the pond  
23 bigger in surface areas so it takes more water,  
24 more cubic feet of water to raise the height of  
25 the pond an inch or whatever.

DR. KINGHAM: All right, that  
certainly clarifies those matters.



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MR. HODGSON: I have one question  
in re-examination.

RE-EXAMINATION BY MR. HODGSON:

Q. Mr. Crysler, Mr. Tidball  
asked you whether or not any parties would have  
an opportunity to give any final design approval,  
and the concept being that should this hearing  
result in the Board ordering one of these sites  
can be landfilled that final design including the  
final hydrologic design would be prepared for  
that site, and the question was whether or not the  
Ministry of the Environment would have an opportunity  
to approve the final design and whether or not  
the Conservation Authority would have the opportunity  
to approve the final design. What is your  
understanding of the legal requirement as to who  
has the right to approve final design?

A. I'm not a lawyer. However, it  
is my understanding that the Ministry of Natural  
Resources has granted to the Halton Region  
Conservation Authority control over filling and  
alteration, the filling of floodplains and  
alterations of stream channels within the area  
of jurisdiction of the Conservation Authority, and



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3 inasmuch as we are affecting a stream in all  
4 cases, then I would see them having some jurisdiction  
5 over that matter.

6 Secondly, the Ministry of the  
7 Environment, who I believe end up hopefully issuing  
8 a Certificate of Approval, before they do  
9 so will want to see all of the detailed drawings  
10 which, of course, would include surface water.

11 Q. Do you know for a fact  
12 whether or not either of those bodies have a  
13 right to approve the finals?

14 A. That's a fine technical  
15 point that I couldn't answer.

16 MR. HODGSON: Thank you. I just  
17 wanted to make the point because it really is  
18 a matter for legal argument, but Mr. Tidball  
19 led the witness into suggesting that both the  
20 Ministry and the Conservation Authority would have  
21 the right to approve the final design. With  
22 regard to the Ministry we will have some discussion  
23 about that and I doubt there will be any objection,  
24 but with regard to the Conservation Authority, I  
25 don't believe they have any right to approve the  
final design, but the assumption, which I think is  
a fair assumption, is that the Region would be quite



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4 happy to continue consultation with the Conservation  
5 Authority as it has in the past, but whether or  
6 not the Conservation Authority has the right to  
7 approve the final design -- I'm not sure it's  
8 an issue, but if it is an issue I don't think they  
9 have that right.

10 DR. KINGHAM: We will adjourn for  
11 a short while, and I assume your next witness  
12 is available.

13 MR. HODGSON: Yes.

14 DR. KINGHAM: Is there a Bible  
15 available?

16 MR. HODGSON: We can run out and buy  
17 one.

18 ---Recess.

19 ---Upon resuming.

20 DR. KINGHAM: Thank you, please  
21 be seated. Before we begin, we were just discussing  
22 a matter we raised very briefly sometime ago but  
23 never concluded briefly, and that was the timing  
24 of a visit to the site, or I should say sites.  
25 Not wanting to interfere with the progress of the  
hearing, and given the suggestion we might do it  
without counsel being present, we were thinking of  
doing it on a Friday so as to not conflict with the



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3 hearings.

4 MR. HODGSON: Mr. Chairman, I think  
5 there is some understanding that counsel would like  
6 to be present, and there are some counsel missing  
7 at the moment so perhaps we should not have a  
8 detailed discussion of this, but certainly my  
9 friend Mr. Leitch indicated that it is his view  
10 that he thought counsel should participate. I  
11 wonder if we could defer this discussion until  
12 counsel could get together with a formal position  
13 to put to the Board, hopefully an agreed position,  
14 and I take it the Board wouldn't object if counsel  
attended on the site tour.

15 DR. KINGHAM: We were basing our  
16 observations on your earlier suggestion that you would  
17 prefer not.

18 MR. HODGSON: On a matter of  
19 timing, Mr. Lederer indicated to the Board last  
20 week that we may have a problem with our witness  
21 Mr. Walker in the month of November, and we might  
22 lose a few hearing days and one way we could make  
23 up that time is to have the site visit on one of  
those hearing days.

24 DR. KINGHAM: Fine. We were thinking  
25 of November as well.



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MR. HODGSON: We were hoping we could find a party to call a witness of theirs to fill up the time. Perhaps we could come back on that very shortly.

DR. KINGHAM: Very good. I see we have a witness panel.

MR. HODGSON: The next witnesses are Mr. Rinaldo and Mrs. Henderson for the Region of Halton and their curricula vitae are in Exhibit 7, and perhaps we could have both witnesses sworn. We don't have a Bible, so again I would ask the witnesses be affirmed.

DR. KINGHAM: Mrs. Henderson.

VICKY HENDERSON, Affirmed.

JOSEPH L. RINALDO, Affirmed.

MR. HODGSON: In order to avoid some of the difficulty that arose this morning between the Region and my friends from Milton and Burlington over this issue of scoping the evidence, I wanted to indicate for the record that we have had a discussion about this aspect of the evidence, and we have agreed, and perhaps I could describe the agreement as follows. Mr. Chairman, the evidence



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4 on EFW we are about to call arises as a result of  
5 a study undertaken by the Region in 1983. The  
6 Walker, Wright, Young team prepared the exhibit,  
7 I believe it is Exhibit 9, the waste needs and systems  
8 analysis report, and out of that report came  
9 a recommendation that some of the Region's waste  
10 should be burned in an energy from waste facility  
11 and some should be landfilled, and we will get into  
12 the details with the witnesses in a moment. The  
13 Region made a decision that it would conduct a  
14 study on the energy from waste component, and that  
15 study was conducted and certain conclusions were  
16 reached and the Region in effect made a decision  
17 in 1984 that by 1996 it would have an EFW facility  
18 in place and at that time 50 per cent of the waste  
19 stream would be burned in an EFW facility. It  
20 has been agreed that the EFW study that arose out  
21 of the waste needs and systems analysis report  
22 and the recommendations made in 1984 are not in  
23 issue. However, one of the parties has indicated  
24 that it does wish to explore the Region's commitment  
25 arising out of that decision in 1984, or wants  
to explore the Region's commitment as to whether or  
not it will have an energy from waste facility on  
stream by 1996, and will be diverting 50 per cent of



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the waste stream to that facility at that time. So, the examination-in-chief will be tailored a little bit to take account of the concern raised by one of the parties, and with respect to the rest of the evidence it is in effect going to be brushed over lightly. I hope I do it in enough detail to satisfy any concerns the Board may have, and of course the witnesses are here to answer any questions that may come up as a result of so doing.

EXAMINATION-IN-CHIEF BY MR. HODGSON:

Q. Turning to the curriculum vitae of Ms. Henderson, I understand you graduated from the School of Design at Fanshawe College in 1977 as a landscape designer.

MS. HENDERSON: A. Yes.

Q. From 1977 until 1981 you worked for a development company, and then two consulting firms, really as a consulting planner.

A. Yes, the development firm was actually a consulting engineer, not a development company.

Q. You in effect were involved in all aspects of urban planning, preparation of



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3 of feasibility studies, assisting clients with  
4 official plan amendments, zoning amendments, et  
5 cetera.

6 A. That is correct.

7 Q. Between 1981 and 1983 you  
8 attended the University of Western Ontario and  
9 took a degree in public administration and public  
10 policy?

11 A. Yes.

12 Q. Since 1983 you have worked  
13 at the Region of Halton.

14 A. Yes.

15 Q. From 1983 to 1985 you were  
16 project officer for the energy from waste project.

17 A. Yes.

18 Q. For the Region?

19 A. Yes.

20 Q. Since 1985 you have been  
21 assistant to the chief administrative officer of  
22 the Region.

23 A. Yes.

24 Q. Mr. Henderson -- I'm sorry,  
25 Mr. Rinaldo.

MR. RINALDO: A. Thanks Doug!

MR. LANCASTER: They are a team,



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but not that team.

MR. RINALDO: I hope not.

MR. HODGSON: Q. Maybe it will feel like a marriage by the time you leave the witness box. I hope not. I understand you are the Commissioner of Finance for the Region of Halton.

MR. RINALDO: A. Yes.

Q. The regional treasurer?

A. That is correct.

Q. You have held that position since 1982?

A. That is correct.

Q. You are a member of the society of management accountants and you hold the professional designation of CMA?

A. That is correct.

Q. You have worked in finance and treasury type occupations since 1967, first with the City of Hamilton and then the Regional Municipality of Hamilton-Wentworth and you came to the Region in 1982.

A. Yes.

Q. Thank you.

DR. KINGHAM: You are undoubtedly delighted to see the efforts we are all making to get



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this matter over with as quickly as possible.

MR. RINALDO: Absolutely Mr. Chairman,  
the sooner the better for the sake of our  
residents.

DR. KINGHAM: And your budget.

MR. RINALDO: Yes, for the sake of  
our budget.

MR. HODGSON: Q. Mrs. Henderson,  
how did the Region become involved with it's  
energy from waste project?

MS. HENDERSON: A. It originally became  
involved through the waste needs and systems analysis  
prepared by Walker, Wright, Young, as you previously  
mentioned, Exhibit 9, and upon completion of this  
study it was recommended that Halton proceed with  
energy from waste as a component of it's waste  
management system. The Council's position was  
that it should be 75 per cent energy from waste, or  
75 per cent of the total waste should be diverted  
to energy from waste.

Q. All right. I'm sorry, but  
Council's decision was to commit, could you restate  
that?

A. Council accepted the policy  
that 75 per cent of the total waste stream should be



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diverted to an energy from waste facility within the  
20 year planning period from 1988 to 2008.

Q. As a result of that decision  
what did Council do?

A. Council recommended the  
establishment of a task force to look at the  
feasibility of energy from waste. The first  
component of the work by that task force was to  
determine if there was available markets for the  
energy that would be produced from the plant.  
Walker, Wright, Young had recommended to Halton  
that initially the prospect of a steam customer  
be looked at over an electricity producing customer,  
in that revenues from steam were considered to be  
more favourable than from electricity and that was  
accepted by Council.

Q. Council then created a study  
team?

A. Yes. The study team was  
made up of myself as the project co-ordinator,  
and also included members of the Finance Department,  
the Public Works Department and the Planning  
Department. We worked together as a task force  
under the direction of the CAO at the time, Denis  
Perlin.



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Q. What was the first stage of the study team's work?

Q. The first stage was, as I mentioned earlier, to look at available market alternatives, and in order to do this approximately 1,300 businesses and institutions in Halton were surveyed to determine their energy requirements and there then was a review of this information and more detailed analysis and research undertaken to identify initially approximately 11 potential energy customers. These 11 energy customers were then reviewed further and interviewed with members of the task force as well as some technical expertise that was retained, and from this it was determined that Halton should proceed with three energy market alternatives. Now, if I may show the map. As a conclusion of the market study it was recommended that the three market alternatives we should pursue would include six private sector energy customers and the six are the Beardmore Tannery in Acton, Leaver Mushrooms in Milton, F.W. Feerman's Meat Processing Plant in Burlington, Petro Canada, the Refinery in Oakville, the Union Carbide Plant in Oakville, and this happens to an electricity customer rather than a steam customer



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3 so it is somewhat unique, and also the Ford Assembly  
4 Plant in Oakville. Those six are referred to  
5 as dedicated customers, and that was reflecting  
6 their private sector energy requirements and  
7 ownership. In addition, it was also requested that  
8 we look further into something we called a dedicated  
9 customer plus electrical grid. This was essentially  
10 and attempted to oversize the energy requirements  
11 of these six customers in order to maximize the  
12 amount of waste that would be diverted. So for  
13 instance in the case of Ford, a portion of the energy  
14 produced from the incineration of the garbage would  
15 be turned into steam and the remaining capacity  
16 in the oversized plants would be used to generate  
17 electricity to sell to the Ontario hydroelectrical  
18 grid. In addition, the third alternative was  
19 involving transformer stations. Although there are  
20 seven in Halton, we identified the four preferable  
21 ones which should be looked at further, and the  
22 four transformer stations are the Milton transformer  
23 station, Trafalgar transformer station, the  
24 Burlington transformer station, and the Palmero  
25 transformer station. All in all there were actually  
15 alternatives looked at.

Q. Were those conclusions



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summarized in a report?

A. Yes, they are the conclusions of the final market study which is H-47.

MR. HODGSON: H-46 through H-50 are copies which you have behind you, copies of the final energy from waste study as well as Exhibits H-80 and H-81 which were submission reports that went along with those studies.

Q. Mr. Rinaldo, as a result of the marketing study, what kind of commitments did Council make?

MR. RINALDO: A. As Ms. Henderson alluded to, Council had a strong commitment to energy from waste and as a result of a request from a regional councillor, we developed a financing plan which would establish for the 1984 taxation year the funding that we would set aside in advance of the EFW alternative, whichever one we would select, that we would set aside in advance to raise \$9-million by the year 1988.

Q. That was established in 1984?

A. The initial contributions were established in 1984 with an annual contribution of approximately \$450,000 at that point in time.

Q. Mrs. Henderson, as a result of



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the marketing study, what did the Regional Council do next?

MS. HENDERSON: Q. Regional Council then concluded that energy from waste should form a part of Halton's waste management system and it authorized the selection of consultants to assist in what was called the preliminary feasibility study. This was a more detailed look at the 15 alternatives that had been identified as part of the market study. Through that preliminary feasibility study we retained the assistance of consultants known as SNC Limited to assist on the technical evaluation of the preliminary feasibility study, and also a consultant by the name I.E.C. Beak who undertook the environmental evaluation of the preliminary feasibility study. There was some assistance provided by a company known as W.P. London and Associates.

Q. Did each of the groups in the study team prepare a draft report?

A. Yes they did. There was a total of four draft reports prepared in total. The technical report was -- I can give you the exhibit number. The technical report H-50 was prepared and concluded that the energy from waste



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4 was technically feasible with the identified energy  
5 customers who had been looked at, and there was also  
6 a conclusion reached by the people undertaking the  
7 environmental feasibility analysis, which was report  
8 H-48, and they concluded it was environmentally  
9 feasible, and Mr. Rinaldo can speak to the financial  
10 feasibility, but before he does I should add  
11 that the three documents were consolidated into the  
12 summary report, or H-46, and that report was  
13 prepared by myself under the direction of the chief  
14 administrative officer.

15 Q. I want to caution the Board  
16 that the witness is referring to the draft reports  
17 and what you have are the final reports, and there  
18 were slight changes to them, and we will indicate  
19 in the evidence what the changes were. Mr. Rinaldo,  
20 could you indicate to the Board what were the  
21 conclusions of the draft financial report?

22 MR. RINALDO: A. Essentially what  
23 it said was that the energy from waste plant of  
24 the size of a 360 tonne per day capacity was in  
25 fact financially feasible for the Region of Halton  
starting in 1988, and that is essentially what the  
conclusions were, and that was the number one  
priority, and from a net present value point of view



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they were looking at a 600 tonne per day plant which was also financially feasible with some constraints on fiscal capacity.

Q. Mrs. Henderson, what were the overall conclusions of the study team at the draft report stage?

MS. HENDERSON: A. That energy from waste was technically, environmentally and financially feasible for the Region of Halton in 1988, and at a capacity of approximately 50 per cent of the waste stream.

Q. These conclusions were reached when in 1984?

A. In June of 1984.

Q. Were there subsequently final reports prepared?

A. Yes there were. The final reports were produced in August 1984.

Q. I want to ask you before you talk about the final reports, what happened in the Region of Halton between the preparation of the draft and the preparation of the final reports?

A. There were a number of public meetins held, and the most significant one was held at Oakville-Trafalgar High School at which the Town



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of Oakville hosted a meeting inviting the residents primarily surrounding the Ford assembly plant at this end of Oakville. At that meeting approximately 500 people attended and it was controversial, or there was a substantial amount of public opposition. This is confirmed by a press release that was released by Ford on the same date indicating that Ford had made no commitment to proceed any further with energy from waste to Halton and that the situation would be monitored. About a week later Ford advised the Region in writing that they wished to be withdrawn from the study and no longer wished to be considered part of the preliminary feasibility study, and they would no longer consider themselves an energy customer. Shortly after this we received a number of letters from other energy customers, and in fact our other recommended energy customers were Union Carbide, and they expressed their concern over the public opposition and indicated to us that unless there was public support for the project, they would not be interested in pursuing the matter further. Petro Canada advised they had reservations as a result of public opposition and Feermans indicated that they also had some difficulty in proceeding with what was obviously a



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very controversial project and all parties, the private sector companies, were concerned about their image in light of the public opposition.

Q. As a result of these events do the conclusions in the final report vary from the draft reports?

A. They did. In the final reports and the accompanying CAO report that went along with them, it was recommended that the date of implementation of energy from waste be postponed from the 1988 that had been recommended as part of the draft until 1996. This recommendation was based on an indication of how long it would be until a suitable energy customer, similar in energy consumption requirements and size to the Ford steam customer that had been previously identified, and also the estimated length of time it would take to get such a new energy customer, perhaps one not currently located in Halton, to go through the approvals and construction process. In identifying those individual steps, which are also described in detail in Part 4 of Halton's response to the Ontario Government Review, or H-77, it was estimated it would take 12 years, from 1984 until 1996, in order for an EFW to be implemented.



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Q. What did Council do with the conclusion and recommendations of the study team?

A. Council again indicated it's support for the concept of energy from waste. However, they did express concern of the need for public education and greater public awareness of the merits of energy from waste as a waste disposal alternative, and it requested that staff work on terms of reference and the establishment of a Citizen's Solid Waste Advisory Committee, more commonly known as SWAC.

Q. Mr. Rinaldo, did Council take any steps that you are aware of as a result, or any other steps you are aware of as a result of the receipt of the conclusions and recommendations of the study team?

MR. RINALDO: A. From the conclusion of the financial study it still showed that energy from waste was financially feasible and at the conclusion level there was only one project which made any significant change and that was the Petro Canada 600, which went from fourth to sixth in the terms of the final analysis, but in addition to that I submitted a report revising our financing plan for providing funds for an energy from waste



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3 plant in 1996 to accumulate -- our revised plan  
4 would be to accumulate \$19-million by 1996 in  
5 order to help us finance the energy from waste  
6 plant planned at that time.

7 Q. Is that funding arrangement  
8 in place?

9 A. Yes, that arrangement is  
10 still in place today and by the end of 1987 we  
11 expect to have approximately \$3.5-million in the  
12 fund at that time.

13 Q. Are you on track to have the  
14 \$19-million by 1996?

15 A. At this point in time, yes.

16 Q. Now, Mrs. Henderson, what  
17 has occurred since September 1984?

18 MS. HENDERSON: A. In March of 1986  
19 the Citizens Solid Waste Advisory Committee produced  
20 a final report which was known as energy from waste --  
21 a citizen's perspective. The main recommendation  
22 of this evaluation and review of energy from waste  
23 by this particular citizens group was that Halton  
24 should proceed with energy from waste as soon as  
25 possible, there should be a single large electricity  
producing plant built and the site selection criteria  
identified by the citizens as a result of their



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tours of various EFW plants and their own evaluations and investigations, that the site selection criteria should be considered by Halton in any future consideration of EFW plants at particular sites.

Q. Were the conclusions of the Solid Waste Action Committee, is that it?

A. Advisory Committee.

Q. The Solid Waste Advisory Committee, were they presented to Regional Council?

A. Yes they were. Regional Council adopted a policy at that particular time which again reaffirmed support for energy from waste and this time they said, however, that the size of the plant should be from 50 to 75 -- sorry, the diversion should be from 50 to 75 per cent of the available waste stream, and what they were doing was, depending on the economics of the larger plant, they recognized it may be necessary to consider a smaller plant. In other words, divert as much as possible, but depending upon the individual circumstances of the project, it was recognized that only 50 per cent may be achievable and that was in light of the information previously provided by the Finance Department.

Q. What is the current status of



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energy from waste in the Region of Halton?

A. At the present time the regional staff, and with some outside expertise are in the process of evaluating a number of energy from waste options, and these options include those alternatives both inside and outside Halton. The alternatives outside Halton, first of all, include the St. Lawrence Cement project which is generally in this particular area in Mississauga, a refuse-derived fuel plant which has been under study for a number of years.

Q. You are indicating ...

A. It's off the map.

Q. About two inches into the Region of Peel.

A. Yes, in the Region of Peel.

Q. Very close -- that is close to the Town of Oakville?

A. Yes. Also we were looking further at the Occidental Chemical Plant in Niagara Falls, New York which is where approximateley 50 per cent of Halton's waste is currently going, and another alternative was the solid waste recovery unit in the Regional Municipality of Hamilton-Wentworth, or more commonly known as the



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SWARU plant. In addition, we are looking at a steam producing plant in Halton which is basically involving a review of our initial market study to determine if perhaps anyone was missed, anyone who had said no who might be interested at the present time and also to look further at an electricity producing plant in Halton. This electricity producing plant would sell electricity to Ontario Hydro; the local Hydro Commissions have indicated that they have no interest or are technically not able to purchase electricity from the Region. Finally an inter-regional facility is being looked at, and that is a facility that might involve the production of electricity from waste from the Region of Halton as well as one or a number of other regions such as Peel, Metro, whoever, the other parties that might be involved have not yet been determined.

Q. When you say you looked at it, are feasibility studies being prepared?

A. It is in initial review at this stage, and the Stage 1 is to compare on an equal basis the alternatives inside and outside Halton including looked at the financial aspects of each, and if it was determined at the end of that evaluation that the preferred alternative, or



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alternatives involved the construction of a new site in Halton, then a detailed site investigation would be undertaken.

Q. Mr. Rinaldo, you were involved in preparing the financial aspect of that study.

MR. RINALDO: A. Yes, we were, and in fact we will do the detailed financial analysis, obviously with some assistance to help us evaluate the private sector.

Q. To summarize, Mrs. Henderson, what is the Regional Council's current -- what is your understanding of Regional Council's current commitment to energy from waste. What is Regional Council currently committed to?

MS. HENDERSON: A. To divert 50 per cent of the waste stream from the landfill site or through energy from waste for 12 of the 20 year planning period beginning in 1996.

MR. HODGSON: Thank you, Mr. Chairman, those are my questions.

DR. KINGHAM: Thank you. I guess on this one it's difficult to know any order of cross-examination because it's not clear what would be the prescribed order, but Mr. Estrin, are you volunteering?



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4 MR. ESTRIN: No. But in fact we  
5 had some discussion about this and I understood  
6 that Burlington had some questions they wanted to  
7 ask and they agreed, as I understood it, to precede any-  
8 one else and depending upon what their questions  
9 or answers are, there may or may not be other  
10 questions from other parties.

11 DR. KINGHAM: Well, the Board would  
12 certainly be agreeable to that. Mr. Tzekas.

13 CROSS-EXAMINATION BY MR. TZEKAS:

14 Q. Mrs. Henderson, I think you are  
15 the more appropriate person to answer these  
16 questions, but if that is not the case, then please  
17 feel free to defer the question. May I ask, was  
18 the 1986 report that was prepared for Council by  
19 the staff consistent with the report that was  
20 prepared by the Citizens Advisory Committee?

21 MS. HENDERSON: A. Are you referring  
22 to the report prepared in March of 1986?

23 Q. Yes.

24 A. They are not identical. They  
25 are similar in that both suggest energy from waste  
is a viable component of Halton's waste management  
system. The Citizens Solid Waste Advisory Committee,



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as I recall, suggested that the 75 per cent EFW would be the preferred and the Council recommendation that followed I believe said ranging from 50 to 75 per cent. One of the differences is that the Citizens Solid Waste Advisory Committee did not go into detail in terms of the financial analysis.

Q. Certain recommendations then were put to the Regional Council, as I understand it, in April of 1986 and my understanding is as well that those recommendations were adopted by Council.

A. There was one change. Could you give me the report number?

Q. I am referring ...

A. I know the meeting, but it is 149 or 159. Perhaps you could advise me of that.

Q. I have it as 158-86; report CAO 158-86.

A. There were two rather lengthy reports that were part of that, and that is why I was concerned. The subject on that was the strategy for the implementation of energy from waste?

Q. I'm looking at the recommendations that appear on page 12 of what may be an agenda or a summary.



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A. May I see it, please?

Q. Sure. I don't think it is necessary to burden you with additional exhibits as I don't intend to put this in.

A. Generally speaking, as far as I can recall, those were adopted.

Q. Between the adoption of those recommendations they include the hiring of certain staff and the hiring of certain experts to carry out environmental studies and so on in February of 1987. Could you tell me what progress was made in implementing the specific recommendations, and perhaps I could put the document in front of you.

A. I am going to be referring to something that was entitled Supplement to the CAO Report 35-87. When the second report, which was in February of '87 went forward, Council requested we do a comparison between the two strategies, the initial one that came when SWAC finished it's report, and then a subsequent strategy that came sometime later. There were a number of things, and first of all the initial report, although it identified a number of actions that were required, it did not have funding attached to it and there was no specific sources of funding to budget the



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4 implementation of the particular item such as  
5 staffing. Another area we wanted to look at was  
6 to make sure that the processing which we were  
7 about embark on in this new phase of studying  
8 was consistent with requirements of the Environmental  
9 Assessment Act and so the details of how that  
10 strategy should be approached and the different  
11 components of the study that should be looked at,  
12 we wanted to undertake those different aspects,  
13 and those are the two pieces.

14 In terms of differences and  
15 similarities, maybe one of the simplest ways I can  
16 say is that the initial report suggested that we  
17 limit ourselves to within the Halton area and to  
18 identify an electricity producing -- the preferred  
19 site for an electricity producing plant, in other  
20 words limited to Halton's boundaries. The second  
21 strategy suggested we look beyond Halton's boundaries  
22 to include consideration of those alternatives such  
23 as the Occidental Chemical plant in New York, the  
24 SWARU plant, and the St. Lawrence Cement. It also  
25 suggested we should take one more look to make sure  
we haven't missed a steam customer in that steam is  
a very important revenue side, and we wanted to make  
sure our information was accurate and still valid.



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1 The other thing that was different was that in the  
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4 second report we put a bit more emphasis on the  
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6 options for an inter-regional facility, Halton  
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8 working with someone else, but the second strategy  
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10 basically had a phase 1 and a phase 2, and phase 1  
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12 was an evaluation of the options inside and out,  
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14 and phase 2 was very similar in scope and nature to  
15  
16 the initial strategy which was to find a site for  
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18 an electricity plant, or it could be.

19 Q. We may be getting ahead of  
20  
21 the Board here by our use of terminology. When  
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23 you speak of a first strategy, am I fair in  
24  
25 describing it as the strategy, and that language  
is actually used, that was adopted by Council in  
April of 1986.

A. Yes.

Q. When you speak of a second  
strategy, it is again a strategy adopted by Council  
in February of 1987?

A. That is correct.

Q. Those documents are not  
before the Board and that is why I am anxious  
to proceed slowly. Would I be fair in saying  
that between April of 1986 and the adoption of the  
second strategy, the February 1987 strategy, that



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3 a great many of the recommendations in the 1986  
4 report were not accomplished or achieved? For  
5 example, my understanding is that the consultants  
6 referred to as Beak Consultants Limited were not  
7 in fact retained and there was no, as you indicated  
8 I think, staff hired to carry out the implementations  
9 of the '86 strategy.

10 A. Beak Consultants were in fact  
11 retained to the extent that they put together  
12 two or three proposals and worked with our Public  
13 Works staff trying to sort out the best process  
that should be followed by staff.

14 Q. Did it go beyond that?

15 A. No, it did not. As I said,  
16 we relooked at that strategy in more detail in  
17 light of a number of things and one of those was  
18 that the upcoming environmental assessment hearings  
19 relating to the Region of Peel for their Petro-Sun  
project.

20 Q. I take it from what you have  
21 just said that there was a shift in political  
22 perspective, and is that fair, which resulted in  
23 the adoption of a slightly different strategy in  
24 1987?

25 A. Political perspective, no.



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Q. I don't mean in terms of the political perspective in terms of a commitment to energy from waste, but in terms of the kinds of things you would be studying and looking at; the specifics of the strategy altered, and perhaps that is a fairer way to say it.

A. The specifics of the strategy were reviewed and refined, I think I prefer to say.

Q. Again a series of recommendations were put forward and adopted in February of 1987. Am I right in thinking that to this point the Region has not settled on any particular strategy as outlined in this document, the February 1987 document?

A. No, I wouldn't say you are right. I disagree, I guess.

Q. Please be full.

A. The report that was prepared in February of 1987 is in the process of being implemented and the two positions created as a result of that report which had at that particular time funding attached to them have both been filled, and the various parties involved including the Finance Department are in the process of undertaking the evaluation of options, and work has



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been initiated on all the alternatives identified.

Q. I'm not suggesting work has not been initiated on this report, but what I am suggesting is that there are still a number of options under consideration and that no decision has been made with respect to those options.

A. That is correct.

Q. You would agree with me that at least some of the options contained in this report were not present a year earlier, the recommendations set out in the 1986 report?

A. I think they were there a year earlier, and I think the difference is a matter of focus, and going back as early as 1983 when we completed the market study we identified there were a number of alternatives that were available outside the regional boundaries, and at that time the decision was made to concentrate on those alternatives within Halton's boundaries in that those alternatives were perceived to be at the time less complicated and therefore quicker to implement and more within Halton's control. So the alternatives outside Halton were identified somewhat before and it was decided, I guess in early



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87 1987, to put more emphasis on those outside  
4 alternatives.

5 Q. You gave us one reason for  
6 the decision to put more emphasis on those other  
7 alternatives, and you mentioned a hearing in  
8 Peel. Could you explain the connection?

9 A. The connection is simply that  
10 the company I.E.C. Beak who had undertaken our  
11 environmental analysis in our preliminary feasibility  
12 study, the project manager of that environmental  
13 analysis was an individual by the name of Wilson  
14 Eadie and Wilson Eadie is involved in the preparation  
15 of the environmental assessment documentation  
16 for the upcoming EFW hearing in Peel. So to a  
17 certain extent it was through his input from his  
18 firsthand experience of putting together some  
19 of that documentation that we had additional  
20 insight into the complications or possible road-  
21 blocks to the process.

22 Q. Is it possible that in future  
23 some of these options might again or the emphasis  
24 on some of these options might again change and  
25 would you agree that that is a possibility?

24 A. Things are changing constantly.

25 Q. We know at this point that the



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88 4 studies are ongoing, but I take it you would agree  
5 that Council has certainly not committed itself to  
6 any particular option on the energy from waste  
7 program.

8 A. At the present time they are  
9 committed to the Occidental Chemical facility in  
10 New York State which is where the Region is currently  
11 taking it's waste.

12 Q. That doesn't flow from any  
13 particular study or long-term decision on energy  
14 from waste?

15 A. No, not long-term.

16 Q. That is what they are now  
17 doing to deal with the current problem, as I  
18 understand it?

19 A. That is correct.

20 Q. With respect to this particular  
21 report, if we were to review the options, we could  
22 not tell with any certainty at this point which  
23 of those options, if any, Council might adopt?

24 A. No.

25 Q. Even assuming that Council  
were to adopt any one of these particular options,  
would I be right in thinking that at that stage  
the reports would have to be prepared and necessary



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89 for some kind of hearing and approval process.

4 A. Eventually it is anticipated  
5 we would go through a public hearing process.

6 Q. I take it at that point the  
7 public would once again have the opportunity to  
8 input into the specific decision that Council had  
9 made at that point just as they had in the early  
10 1980's.

11 A. In actual fact I believe  
12 Council is on record and committed to involving  
13 the public throughout the process, and not just  
14 at the final hearing stages.

15 Q. Do either of you have any  
16 knowledge or information as to how long it would  
17 take to construct an energy from waste plant once  
18 approval has been obtained, once the process has  
19 been completed?

20 A. The reference is outlined in  
21 the response document which I indicated earlier was  
22 in document H-77, Halton's response to the Ontario  
23 Government Review, and it's within Part 4 of that  
24 and the estimate for construction was two to three  
25 years.

Q. It is after the granting of  
the approval?



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A. Yes.

Q. Would you agree with me then that there is still some uncertainty as to the form that the energy from waste program -- I'm sorry, that wording is vague, so let me use the word option which is the one we have been using-- but it is still uncertain as to what option, if any, will be adopted. Is that a fair statement?

A. What option? I don't think "if any" is a reflection of Council's position in that they have been consistent in supporting energy from waste throughout the process.

Q. I don't doubt that, and I am not seeking to imply anything but that, but just as the policy seemed to change emphasis from 1986 to 1987, I think you agreed with me that other things might emerge which might change the emphasis again and is that not a possibility?

A. I don't think the emphasis changed in terms of the waste disposal alternative, but what has changed is the date of implementation and the quantity of waste that can be diverted. The emphasis has never changed from there will be energy from waste as a component of the waste management system.



Henderson, Rinaldo  
cr ex (Tzekas)

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Q. I agree with that, but how you go about doing that has changed from time to time, has it not, or at least the range of options as to how you go about doing that?

A. The process certainly has been looked at on a number of occasions. As I mentioned earlier, because the outside Halton alternatives were identified as early back as 1983, what we have now is not necessarily new but merely bringing back something that was put aside because of a feeling a number of years ago that inside Halton would be easier to implement and therefore better able to be implemented by the 1988 implementation date targeted at the time.

MR. RINALDO: A. If I may add, I believe the Region has and is looking at all of the alternatives, the six outlined to you in the report that Ms. Henderson has alluded to, and has covered all the alternatives with regard to energy from waste, and again Council has made a very strong commitment and have made a financial commitment to energy from waste by 1996.

Q. Mr. Rinaldo, if I heard the history correctly, sir, in 1983 there would seem to be a commitment which studied very specific options,



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92 and in 1986 there were a number of other options  
4 considered, and in 1987 there were yet another  
5 series of options considered. I am not disagreeing  
6 with you as Council may have had all of these  
7 in it's mind from 1983 on, but am I unfair in  
8 saying that at these different stages there seemed  
9 to a different emphasis placed on what was being  
10 studied, what wide a range of options would be  
considered.

11 A. Basically I don't think that  
12 what has been studied has changed at all. It is  
13 still the objective of diverting 50 per cent of  
14 our waste, our solid waste to something other than  
15 landfill, and we have expanded the alternatives  
16 and looked at them in more detail, and as the  
17 process evolves we get into a different level of  
18 detail and that's the only thing that has changed.

19 Q. What about the date? Has it  
20 not changed as well during the course of this  
1983 to 1987 period?

21 A. Through you, the date has  
22 changed once, and when we did the preliminary  
23 feasibility study for the energy from waste we  
24 were looking at 1988 and in re-assessing it we  
25 see the date 1996, and we still see that as the



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3 outside date. In other words, if there is a  
4 feasibility earlier than that, we would obviously  
5 look at implementing something prior to that, but  
6 that is our outside target date from a planning  
7 point of view, and obviously when you get into  
8 the next level of detail you may find the timing  
9 may be 1994, 1995 or 1996, and it's possible that that  
10 could change, but our target is 1996.

11 Q. I understand that, but isn't  
12 it possible that that target might not be met; just  
13 as it was not met once it might not be met again.

14 MS. HENDERSON: A. I think one  
15 thing to mention again is that Halton is currently  
16 diverting 50 per cent of its waste to an energy  
17 from waste plant in 1987, and has been for at  
18 least a year.

19 Q. But we discussed briefly the  
20 reasons for that.

21 A. It's being looked at as a long-  
22 term option.

23 Q. Of course. There is no  
24 disagreement there. I can't really fathom that  
25 as I stand here I am being unfair in saying that  
there is some uncertainty to all of this.

A. There is uncertainty perhaps



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3 in terms of the energy customer and whether it is  
4 a new plant or an existing plant that incinerates  
5 Halton's garbage.

6 Q. Might that uncertainly not  
7 affect public reaction, or might it not affect  
8 construction timetabling, might it not affect  
9 cost, might it not affect all of those things?

10 A. That is why in the estimate  
11 of the time frame there is to a certain extent  
12 a range of time that is estimated for the individual  
13 phases, but we are still confident overall that  
14 within those parameters, and in fact the parameters  
15 of the process are not fully known, that the 1996  
16 deadline is realistic.

16 MR. TZEKAS: Thank you, Mr. Chairman.

17 DR. KINGHAM: Thank you, Mr. Tzekas.  
18 Are there any other questions of these witnesses  
19 from the other parties?

20 MR. LEITCH: Mr. Estrin has some  
21 questions, but he had to leave.

22 DR. KINGHAM: Then I guess we will  
23 have to resume tomorrow. You are both in town,  
24 aren't you?

24 MS. HENDERSON: Yes.

25 MR. RINALDO: I am.



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3 MR. HODGSON: Am I to understand that  
4 Mr. Estrin is the only counsel left with questions?

5 DR. KINGHAM: I beg your pardon?

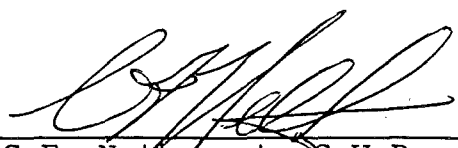
6 MR. HODGSON: Is Mr. Estrin the  
7 only counsel who has questions?

8 DR. KINGHAM: I quickly canvassed,  
9 but saw no reaction. I will canvass again. Do  
10 other counsel have other questions for these  
11 witnesses? I think not. I guess we will have to  
12 resume in the morning with these witnesses at  
13 9:30 and complete the cross-examination. All right,  
14 we will adjourn now.

15 ---Adjournment (4:37 p.m.)

16 ---Page 9300 follows.

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20 CERTIFIED CORRECT

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23 C.F. Nethercut, C.V.R.  
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