

NEW YORK STATE : DEPARTMENT OF HEALTH

IN THE MATTER

of

MEETING

CONCERNING

Determination of criteria and strategy having
to do with habitability of Love Canal, Niagara
Falls, New York.

MINUTES OF MEETING held at the Red Jacket
Inn, Niagara Falls, New York, on Thursday, July 26,
1984, commencing at 8:30 a.m.

CHAIRMAN: THOMAS WELTY, MD.

PANEL MEMBERS: THOMAS CHALMERS, M.D.
ROBERT HUFFAKER, Ph.D.
PATRICIA MILLER, Ph.D.
FREDERICK G. POHLAND, Ph.D.
I. GLENN SIPES, Ph.D.
MICHAEL STOLINE, Ph.D.
JAN A. STOLWIJK, M.D.
DANIEL VANDERMEER.
PAUL WIESNER, Ph.D.
DEVRA LEE DAVIS, Ph.D.
ARTHUR UPTON, M.D.

CHAIRMAN WELTY: I would like to get
1 started today. We have a lot of things to cover.

2 First of all, the goals for today's
3 meeting, I would like the consultants to think
4 about these throughout the day as we are working.
5 We would greatly appreciate your assistance and
6 comments in revising the criteria that have been
7 sent out to you and I would hope that that would be
8 the main goal that we would be able to accomplish
9 today, is to have input from you so that we might
10 revise this criteria.

11 The next step in this process I think is
12 kind of up to the group here. We would like to
13 have you consider whether we should proceed through
14 the mail and try to revise the document and send it
15 out to you for further comment or if you would
16 prefer to schedule another meeting sometime in
17 August to discuss this further. That would be
18 another option.

19 So, I think probably as we go through the
20 day, it will become clearer which will be the
21 better way to go. We would like you to consider
22 both those options.

23 I think you all have received an agenda

1 here and I am pleased that Dr. Paigen has been able
2 to come and will be able to present her paper to
3 the consultants. However, before we get into the
4 discussion of Dr. Paigen's paper, I would just like
5 to ask Dan Vandermeer to summarize the events that
6 happened at a public meeting last Wednesday evening
7 because I am sure that if you haven't heard about
8 this particular meeting at this point, you will
9 hear about it very soon and we feel that it's
10 important for you to know what transpired at this
11 meeting at the beginning of our deliberations today.

12 Dan, could you please bring us up to date?

13 MR. VANDERMEER: Yes. Wednesday evening
14 there was a public meeting which followed up on a
15 regularly scheduled meeting of the technical review
16 committee. The technical review committee being,
17 as you remember, the four government agencies that
18 have come together to look at the issues of habit-
19 ability. At the very end of that Wednesday night
20 meeting in response to some very sharp questions
21 from the community, about construction and other
22 activities as had been noted by members of the
23 community on and around the Canal site, it was
learned that beginning Thursday morning the

1 Department of Environmental Conservation of the
2 State of New York was going to embark on a project
3 to trench into the clay cap as we were told to a
4 level of two and a half feet and the drums of
5 material, the drums that contained material that
6 had been taken out of the sewers on the inside of
7 the fence were to be buried into this two and a
8 half foot deep trench. We were told the work was
9 planned for 9 o'clock the next morning.

10 The community wanted to know what the
11 decision process was and why the community hadn't
12 been involved and spoken to about this and there
13 were, in my view, no satisfactory answers.

14 Mr. Nosenchuck from DEC said that they had
15 gained approval for this project from EPA head-
16 quarters in Washington, D.C. and that they were
17 about to begin at 9 o'clock the next morning and
18 that no amount of community criticism that night
19 was going to change the embarkation on this project
20 the next day.

21 As I understand it, because of community
22 concern and that has been registered both through
23 the news media and through elected officials, the
plan to put the barrels into this trench in the

1 clay cap has been delayed at least until next
2 Tuesday night when the DEC has agreed to come out
3 and "explain to the community the decision to put
4 the drums in the clay cap."

5 That is all the information that I have
6 and I think that is the fairest assessment of
7 what I know about the situation to date.

8 MS. GABALSKI: Dan, I just would like to
9 make an addition to that, just to be sure that you
10 have all of the facts. I am Anita Gabalski from
11 the DEC. Included in the proposal to bury those
12 drums is also a holding tank. It's now stored on
13 site. There is a tank that originally held all of
14 the materials that were taken from the sewers.
15 That is included and please don't separate that
16 in your thinking from the proposal to bury the
17 drums.

18 MR. VANDERMEER: The holding tank was not
19 discussed at the public meeting on Wednesday.

20 DR. STOLINE: I would like to mention that
21 Pat Brown from the ecumenical task force has copies
22 of I think all or most of the newspaper articles
23 pertaining to this issue as they appeared in the
papers in the area starting July 19th and if anyone

1 here would like copies of those articles, she has
2 them right now if you would like to see, if you
3 haven't already read those.

4 DR. DAVIS: Could someone from the DEC
5 explain to us the rationale for doing this and I
6 am curious as to whether this was done under the
7 authority of RECRA or CIRCLA? Is it now the
8 contention of the DEC that the Love Canal is a
9 permitted, class 1 secured landfill for trapping
10 dioxin and contaminated waste?

11 DR. HUFFAKER: The question was raised
12 the other night and that is part of what Mr. Nosen-
13 chuck is going to speak to on Tuesday.

14 MR. VANDERMEER: I think as a matter for
15 your information, DEC knows that this meeting was
16 scheduled for today and were invited to this meet-
17 ing. There is no one here from the DEC to answer
18 the questions.

19 MS. GABALSKI: Dan, the only other thing
20 that I can offer is that I was sent copies of all
21 correspondence and I did make additional copies for
22 each of the scientists here today and I will pass
23 those out.

DR. POHLAND: So, your response to us then

1 is, since no one here is from the DEC to speak to
2 that topic, we are not to be privy to an explanation
3 as to why this occurred?

4 DR. STOLWIJK: I think that there is some-
5 thing that I don't understand. There are a lot of
6 things that I don't understand but there is one
7 particular thing that comes to me at the moment and
8 that is what is the actual position and authority
9 of the TRC in the whole matter? How does the TRC
10 relate to the various jurisdictions as they control
11 events?

12 MR. VANDERMEER: My understanding of the
13 responsibility of the TRC was to have a group of
14 people who are representing each of the agencies
15 involved at Love Canal and that group had the res-
16 sponsibility of knowing and discussing what other
17 members of the agency were doing and to understand
18 what and why these activities were taking place.
19 I can only tell you that the TRC, no members of the
20 TRC were notified of this decision by anybody from
21 DEC.

22 DR. STOLWIJK: In other words, the TRC
23 has the function of facilitating and insuring
communications between the participants without

any authority attached thereto, is that correct?

1 MR. VANDERMEER: I'm not sure I understand
2 the question but---

3 DR. STOLWIJK: There is not the indica-
4 tion of any kind that the TRC has any kind of
5 authority over anything that is going on. It is
6 purely a communicative device.

7 MR. VANDERMEER: There is no legal authori-
8 ty for one agency.

9 DR. STOLWIJK: It was not given a charge
10 other than to communicate.

11 MR. VANDERMEER: That is correct.

12 DR. HUFFAKER: It's a coordinating agency.

13 DR. STOLWIJK: Does that mean then that
14 each of the participants in the TRC undertook to
15 discuss in advance anything with the TRC or was the
16 function of the TRC to be only effective to the
17 outside?

18 MR. VANDERMEER: The function of the TRC
19 as I understood it, Dr. Stolwijk, was for the
20 agencies to communicate and discuss with each other
21 key issues and decisions related to the rehabilitation
22 or no rehabilitation, that decision and implicit and
23 explicit in that was the link between habitation

and remediation.

1 DR. STOLWIJK: So, I think all we could
2 conclude from this is that whatever the system was
3 intended to do, it has broken down.

4 MR. VANDERMEER: In this case it clearly
5 has broken down in my view.

6 DR. STOLINE: I think the effect of this
7 may well be something--well, it is something that
8 I clearly as one member of this group think that we
9 are going to have to take into consideration and
10 that is the real possibility that this is from now
11 on going to be to some extent "an active dump site"
12 and what that pertains to as far as the issue of
13 habitability. So, throughout the day and whatever,
14 I think we should keep that in consideration.

15 MR. VANDERMEER: I understand your state-
16 ment and I would not argue with it.

17 CHAIRMAN WELTY: Thank you for your update,
18 Dan, and I think we will need to consider this as
19 we deliberate today about the criteria.

20 At this time I would like to introduce
21 Dr. Beverly Paigen who has done a number of health
22 related studies in the Love Canal area and I would
23 just like to mention a little background as to the

1 previous discussion that we had in relation to your
2 papers. I believe Dr. Huffaker contacted you early
3 on and you were kind enough to send us the drafts
4 of your papers and these drafts were made available
5 to our consultants here and we discussed them in a
6 closed session and in terms of the reason for the
7 closed session, most scientific papers are pre-
8 sented directly to the scientific literature and it
9 is the feeling that if the papers are presented in
10 an open meeting, frequently it's more difficult to
11 get them published in scientific journals.

12 So, we had offered you the opportunity to
13 discuss your paper today in a closed session but
14 you had indicated to Dr. Huffaker that you would
15 prefer that it be discussed in an open meeting.
16 So, we appreciate that and I presume that it is
17 still your preference to do that.

18 DR. PAIGEN: Yes.

19 CHAIRMAN WELTY: But I did just want to
20 clarify that the reason that we had the closed
21 session at the first, or at the May meeting was
22 because most scientists in presenting their data
23 prefer to send it directly to a scientific journal
before they present it at an open meeting because

1 it's more likely to be published or sometimes
2 certain journals are more likely to publish their
3 findings if they are presented there first.

4 So, that is just a clarification in terms
5 of the group here.

6 DR. PAIGEN: I understand that but the
7 reason I asked for an open meeting is that the
8 papers are all submitted. They are well along in
9 the review process and I have presented my results
10 at four separate scientific meetings already which
11 were open to the public and the press and so, it
12 seemed as if secrecy or closed meetings was beside
13 the point actually.

14 CHAIRMAN WELTY: Well, we are delighted
15 to have you here today.

16 DR. PAIGEN: Thank you.

17 CHAIRMAN WELTY: And also pleased that you
18 are going to present it in an open meeting because
19 we have made a special effort to involve the commu-
20 nity in the deliberations of this issue of habit-
21 ability.

22 So, the floor is yours.

23 DR. PAIGEN: All right. Now, I do have
slides with me and---

CHAIRMAN WELTY: Should we adjourn to the
1 other room?

2 DR. PAIGEN: I think that would be better.

3 CHAIRMAN WELTY: All right.
4

5 (Whereupon, the proceedings were adjourned
6 to the adjoining room.)
7

8 DR. PAIGEN: All right. I appreciate the
9 invitation to come to talk to this group today. I
10 realize you have a very full agenda and so, I'm
11 just going to highlight some of the things that I
12 have provided to you in written material.

13 I will be dividing my talk---wait a minute,
14 I'm not going to talk unless someone gets this
15 ready, otherwise---you don't have any way to change
16 these slides? This isn't focused on the screen.
17 I don't see any light on it so---technicalities on
18 the slide projector.

19 I am going to be dividing my talk into
20 three parts today and first I'm going to sort of
21 summarize what I think the evidence of the various
22 studies I have been involved with said about habit-
23 ability of Love Canal in terms of the time at which

1 different adverse effects occurred and also in
2 terms of was the whole neighborhood of Love Canal
3 affected equally and I am presenting that to you
4 first so, as I go through the data, you should
5 decide for yourself how strong the evidence is on
6 the various points and then I want to spend in the
7 second part of my talk some time on the study
8 design because the study design and the kinds of
9 biases that enter into this study are very important
10 for your deciding how reliable the evidence is, that
11 there was any problem at Love Canal, and finally,
12 the last part of my talk, I will highlight the data,
13 much of which has been presented to you in written
14 material.

15 One of the things that I will be talking
16 about today, as far as the decision of the Love
17 Canal, are the wet homes, homes that were along
18 former stream beds and swales that might have
19 provided preferential migration of chemicals and I
20 will show you some slides in a few moments that
21 indicate where those wet areas were and the other
22 kind of division that I used was close to the Canal
23 and far from the Canal and I divided the Love Canal
neighborhood into 200 foot wide bands and actually

1 for most of the computer analysis I condensed the
2 first two bands and I have drawn on this map a
3 little red line so that when I talk about close,
4 you will know that that meant homes within that
5 area.

6 This little map also shows you where the
7 voles were trapped in area one, which we will call
8 Love Canal, were right around the fence that out-
9 lines the Love Canal area. The control voles
10 were trapped over here on William Street which is
11 about a quarter of a mile away and then there was
12 some, also some voles trapped along the bottom,
13 right along the Buffalo Avenue and Frontier Avenue
14 Expressway.

15 Now, there are six kinds, if you will turn
16 to the summary sheet, consideration of geography
17 and timing for health effects at Love Canal, there
18 are six kinds of evidence that I will be discussing
19 briefly today. One is the excessive low birth
20 weight babies. One is birth defects in children.
21 One is various types of health problems. These
22 three things were obtained by interview and are
23 rather soft data. Then there are three things,
nerve conduction velocity tests, growth in children,

1 and the voles study, which are all harder data and
2 they were actually measured, were not made by
3 interview and in all six of these things we found
4 a difference between Love Canal and control and
5 then I analyzed whether different parts of the
6 neighborhood were affected differently and you
7 will see here in the column, low birth weight was
8 more pronounced in wet homes but not particularly
9 in close which was 400 to 800 feet. By the way,
10 the families that were closer than 400 feet, the
11 most exposed, had already been evacuated when we
12 did our study. They were not included in the study.

13 The birth defect also were more pronounced
14 in wet homes and not in close.

15 The health problems in children were both
16 close and wet.

17 The nerve conduction velocity, we did not
18 have enough children to analyze specifically the
19 wet homes to analyze whether it was more pronounced
20 than the close.

21 The growth, the length of residency of the
22 child was such an overwhelming factor in the growth
23 studies that there was---we couldn't have any effect
close or wet and for the voles, we did a trap or

1 we tried to trap them in the wet area and never
2 caught one. So, all the voles were trapped close.

3 Now, this raises a few questions. I was
4 struck by the fact when I first realized that the
5 data was falling out this way, that for pregnant
6 women the low birth weight in the first defects
7 being in a wet home was important and this was
8 also what the State of New York Health Department
9 found but for children it was both being in a wet
10 home and being close and I thought first that maybe
11 the closeness was because children who lived closer
12 to the Canal were more apt to go to the playground
13 that was on the Canal surface and the close was not
14 the chemicals migrating out necessarily but it
15 might have been the children migrating to that
16 central contaminated portion and that would be
17 important for consideration of the habitability of
18 Love Canal today because one thing that is changed
19 is that that portion has now been fenced off and
20 the kind of exposure that children would have gotten
21 by going to the playground is over. But as I will
22 show you down below, at least the nerve conduction
23 was after that whole construction area was fenced
and the clay cap was put on. So, some months after

1 the construction was finished and the children
2 could not get to that area, we still saw an effect
3 on nerve conduction velocity in children who were
4 close and the voles were trapped after construction
5 activity was done.

6 Now, the second---

7 DR. CHALMERS: Excuse me. Could we inter-
8 rupt for questions?

9 DR. PAIGEN: Yes, certainly.

10 DR. CHALMERS: I am still confused about
11 the distinction between wet homes and dry homes and
12 close and far. Is there a two by two factorial?
13 In other words, every home is either wet or dry
14 and close or far?

15 DR. PAIGEN: No, not at all and I hope
16 it will become clearer as I go along, some homes
17 are both close and wet.

18 DR. CHALMERS: That would fit in the two
19 by two.

20 DR. PAIGEN: Oh, that's right. The
21 analysis was usually done two by two. It's a
22 multiple regression analysis in which we put many
23 factors into the analysis such as demographic
characteristics like income of the family, education,

1 family size, you know, many factors, and so, the
2 close and wet are things that survived after fairly
3 sophisticated statistical analysis but that data,
4 this is somewhat like a summary.

5 DR. STOLWIJK: You are giving us a lot of
6 descriptions of wet and close but you are not
7 giving us, at least on this piece of paper, anything
8 about controls.

9 DR. PAIGEN: About controls, all of these
10 things were elevated in Love Canal.

11 DR. STOLWIJK: Yes, but you are not des-
12 cribing the controls to us.

13 DR. PAIGEN: I will describe the controls
14 to you.

15 DR. STOLWIJK: That is missing from this
16 page.

17 DR. PAIGEN: Right. This is a summary.
18 After I get through with the summary I will go
19 through the study design and describe to you very
20 carefully the controls.

21 The other thing is, I have done a time
22 line here in which I have put the years. Now, the
23 sort of scale changes every time I have a little
lip here. To give you an idea of when the studies

1 were done and when the different events occurred
2 and one thing that I did not know as I was sitting
3 here in May and which maybe Dr. Huffaker can
4 provide is when was the remedial construction begun
5 and finished? Was that the end of 1979? It
6 started in the fall of 1978.

7 DR. HUFFAKER: That is about right.

8 DR. PAIGEN: And it was completed, as far
9 as I remember, by November or December of '79.

10 DR. HUFFAKER: I wasn't out here for that.

11 DR. PAIGEN: Do any of you remember?

12 UNIDENTIFIED VOICE: It's still going on.

13 DR. POHLAND: To what are you speaking,
14 the clay cap and the drain and so forth?

15 DR. PAIGEN: Yes, put in the clay cap and
16 finished it and put this over here and I didn't
17 put the time in there but I know it started in the
18 very end of '78 and to the best of my memory it
19 finished by the end of '79.

20 DR. POHLAND: As described, that is
21 completed at that time.

22 DR. PAIGEN: Okay. So, the vole trapping
23 was started in the fall of '79 and some construc-
tion activity was going on and the rest of the vole

1 study extended through '80 when the clay cap was
finished.

2 The first nerve study was done in the
3 very beginning of 1980 when the clay cap was
4 finished. Permanent relocation was also gathered
5 that year. The data on the children study was
6 gathered in June of that year. The second nerve
7 study was done in the end of '80 and the third
8 nerve study was done in the beginning of '81.
9 So, those studies were done after the construction
10 was finished.

11 Now, the first question we asked was
12 whether the pregnancies which measure a brief
13 period in time, whether the low birth weight babies
14 and birth defects were sort of consistent over time
15 and so, we divided the children into three cohorts,
16 the oldest child in our survey was born in 1963
17 and the youngest child in our survey was born in
18 the end of '79.

19 DR. DAVIS: Are the age cases you are
20 referring to, is that self reported data about
21 birth weight on the part of the mother?

22 DR. PAIGEN: 25 percent was birth
23 certificates and 75 percent was undocumented.

1 DR. DAVIS: And you are aware that Dr.
2 Vianna has reported on using certificate data. You
3 are aware of his findings? They disagree with you
4 with respect to low birth weight.

5 DR. PAIGEN: I am aware of his findings
6 that agree that low birth weight was a problem.

7 DR. DAVIS: In previous years, in years
8 prior to. He finds that there was a problem in the
9 earlier pregnancies but not in the later.

10 DR. PAIGEN: Well, Dr. Vianna based that
11 on some figures which I have seen which is five
12 year moving averages over time and I thought that
13 was a really good idea and I tried that with my
14 data also and what I can tell you is that it doesn't
15 work. Statistically, it doesn't make sense. For
16 instance, he took miscarriage data, which is the
17 figure that I had, he took fifty pregnancies and
18 divided it over 26 years. So, that was about two
19 pregnancies a year and twelve miscarriages divided
20 over 26. So that you realize that at that point
21 you are dealing with---

22 DR. STOLWIJK: Well, we are talking about
23 low birth weight specifically, however.

DR. PAIGEN: The data on the low birth

1 I have not seen but I believe it's the same frequen-
2 cy of events. In other words, his percentage of
3 low birth weight was the same as the percentage of
4 miscarriages and you would have the same kind of
5 statistical problems and when I did this, what I
6 got, I did it by year and was just a graph that
7 went like this and when I did the five year moving
8 averages as he did, I saw a small peak in the
9 sixties but I have had my paper reviewed by several
10 statisticians and they all told me to take those
11 figures out, that is nonsense to deal with twelve
12 events over 20 years with a five year moving average.
13 It just is not the right way to do it. They
14 suggested three cohorts where at least you have
15 some kind of sensible groups and Dr. Vianna also
16 did that by decade and didn't have that very
17 pronounced effect by decade.

18 DR. DAVIS: When you say "cohort," you
19 mean children born from the period 1965 to 1970
20 and the period from '71 through '77 and then from
21 '78 until---

22 DR. PAIGEN: The exact years are marked
23 there.

DR. CHALMERS: How did you choose the

years?

1 DR. PAIGEN: Well, we chose them for a
2 very good reason and in our growth study we had
3 children who had passed puberty, 12 to 16, children
4 who were in their pre-school years where growth
5 would be very rapid, one through six and then six
6 through twelve. So, these were the three groups
7 and those were based on---

8 DR. CHALMERS: They were chosen without
9 looking at the data.

10 DR. PAIGEN: Right.

11 DR. STOLWIJK: And how do you get the
12 larger numbers of events in a five year cohort
13 than you get in a five year moving average?

14 DR. PAIGEN: No, it's that the five year
15 moving average---the bumps that you see are not
16 really---when most of the things are zero, let me
17 say, for instance, the low birth weight babies.
18 There are a pair of twins in there and that makes,
19 like, practically 100 percent of the babies low
20 birth weight in that particular year and that sort
21 of totally makes the thing look odd. I am sorry
22 I don't have those graphs with me, since I was
23 advised by my statistical experts that they weren't

sensible, I didn't even make slides of them.

1 All right. I would like to go into the
2 study design and if I may have the first slide here,
3 this is the Love Canal neighborhood in 1978 before
4 the cap was built and this area of homes was
5 evacuated and not included in my study which was
6 done in 1980 and then I simply took the rest of the
7 Love Canal neighborhood, including the renters and
8 the people on 93rd Street.

9 May I have the next slide, please?

10 I have talked about wet homes. I want to give you
11 an appreciation for what these are. When the
12 neighborhood was being built up, there were these
13 swales running through the Love Canal neighborhood.
14 Some of them were quite deep and when they were
15 filled, they were filled with building rubble and
16 that soil is predominantly clay. So, it's possible
17 that chemicals could have migrated, leachate could
18 have migrated more easily through the swales than
19 through the surrounding clay soil.

20 Next slide, please. This just gives you
21 an idea of the position of these swales. It was
22 determined by people from Cornell under contract
23 with the New York State Health Department. I have

1 indicated them by red and yellow lines and I have
2 indicated here with yellow dots the homes that were
3 designated wet. These were provided to me by the
4 New York State Health Department for this part of
5 the neighborhood and for this part of the neighbor-
6 hood, I just simply put the apartments immediately
7 adjacent and called them wet and this part of the
8 neighborhood too the New York State provided these
9 lines to me but they hadn't actually designated it
10 at that time. This was their control area so they
11 had them designated as wet and I just put these
12 homes that were either immediately on or on either
13 side of the swales.

14 You can see that the---actually, I had
15 only, this is a senior citizen center and this
16 doesn't very many apartments and this doesn't touch
17 any. So, I only had a total of twelve children
18 over here in the renters who lived in wet homes.
19 So, I really, for the most cases, wasn't able to
20 analyze the effect of wet in the rent population
21 but in the Love Canal population there was a large
22 number of children in wet homes, about, I think,
23 one-third of the children. Let's see, one-third
of the total children, renter and home owners, were

in wet homes.

1 DR. DAVIS: What was that number?

2 DR. PAIGEN: One-third, 963 children,
3 523 in the Love Canal and 440 in the control.

4 Next slide, please.

5 DR. MILLER: Excuse me, does that mean that
6 overwhelmingly the wet area children are Love Canal
7 children, Love Canal home owners?

8 DR. PAIGEN: Home owner children, yes.

9 DR. MILLER: So, you say one-third overall
10 are from wet homes and if you are just talking about
11 the home owner population, that becomes much higher
12 than that.

13 DR. PAIGEN: It becomes much higher than
14 that, correct. This is just the results of an
15 early survey at Love Canal, totally self report
16 that I am not going to talk about much but I just
17 put it on here because here schematically are the
18 swales and these are several diseases that I have
19 lumped together in this slide and I just show this
20 to you to show that there was clustering in this
21 early survey in the wet areas and particularly in
22 this pond area, this wet area, there are about 40
23 homes in here, a great deal of clustering of

disease and immediately north and adjacent is
1 another area of about 40 homes. Actually many of
2 these homes are also classified as wet because of
3 this swamp and this swale, but the interesting thing
4 here is that this swale never actually connected
5 to the Canal and you can see that there is just
6 quite a difference in incidents there.

7 Next slide, please. One of the---I should
8 say a little bit about what motivated us to go
9 into this children study to begin with. The
10 results of the epidemiology in a population like
11 this which is highly politicized, is just a lot of
12 problems. People are unsure about how important
13 is the response bias and reporting bias and the
14 other way that the State Health Department was
15 attempting to evaluate Love Canal was to look at
16 the chemicals and to sort of do risk assessments
17 based on the chemicals. They have, at the point
18 that David Raul and his committee met, they had
19 identified over 250 chemicals and the National
20 Institute of Health Scientists did a literature
21 search on these and they found that 36 of these
22 were neuro-toxins, 34 carcinogens and this is any
23 report of carcinogenic activity, all right.

1 Eighteen teratogens and 30 fetotoxins, hepatotoxins
2 and renal toxins, but probably the most important
3 thing that came out of the survey was there was
4 100 chemicals, over a third of which there was no
5 toxicological data at all and these were generally
6 byproducts or intermediates that are not on the
7 commercial market-place and there was no reason to
8 do any study on them.

9 The other thing that made the use of
10 environmental monitoring seem like a weak tool in
11 the face of a situation like Love Canal was the
12 early analysis of the data that New York State
13 Health Department did in measuring the chemicals
14 in the air of Love Canal basements, Love Canal
15 homes and their basements and they chose seven
16 marker chemicals, benzene, chloroform, trichlorethy-
17 lene, tetrachlorethylene, toluene and they measured
18 I think something like 150 or 250 homes and I
19 looked at those levels and I took the occupational
20 standards and first I lowered them because the
21 worker is exposed 40 hours a week and someone in a
22 home, 168, and then I just compared that level, what
23 that level was to what Love Canal homes were experi-
encing and the highest Love Canal home, this is

1 outside the fence, some homes inside the fence
2 were much higher, this is outside the fence, the
3 highest Love Canal home had levels that were
4 one one-thousandth of that occupational standard,
5 not levels that would begin to alarm a toxicologist
6 and yet at that time, Dr. Vianna was reporting that
7 low birth weight and miscarriages were increased
8 in those homes.

8 Can I have the next slide. So, I really
9 question how useful the measurement of chemicals
10 are. One is that you choose seven marker chemicals
11 and are they the right ones? They may not be and
12 there wasn't any toxicological data for a lot of
13 the chemicals. So, they didn't bother to measure
14 those. Another thing is that the number of samples
15 that were taken both by the State Health Department
16 and by EPA later so overwhelmed the capacity to
17 analyze samples for low levels that many of them
18 were stored long periods of time. There were
19 severe logistical problems and I think all of you
20 who have been bench scientists know what happens
21 when you take something that works very well on a
22 small scale and you scale it up suddenly. You just
23 get a lot of values that make you question the data

1 and I think that is what happened in the EPA study
2 and as I mentioned to you, the exposure was very
3 low and the other problem with the environmental
4 monitoring is that it's just very expensive.

5 Next slide, please. I was wondering why,
6 if it was true that these were the highest levels
7 in these Love Canal homes and if it was true that
8 miscarriages and low birth weights were increased,
9 why were such low exposure levels harmful? One
10 possibility is that our standards are based on
11 healthy male workers. What we were seeing was
12 exposure to the human fetus and it just may be a
13 very, very different kind of susceptibility.

14 Another thing is that occupational
15 standards just might not be right, you know, many
16 cases, some cases they are based on really good
17 data but unfortunately, in a lot of cases, the data
18 base is not as strong as we would like.

19 Another possibility is that since a body
20 has a tremendous recuperative power, there may be
21 something about being exposed for eight hours and
22 then having sixteen hours off to repair. That's
23 a lot healthier than exposure constantly. And the
other thing in Love Canal is that exposures to

1 mixtures may be much worse than we would expect
2 from any kind of additive effects and finally, the
3 chemicals that are being measured may not be the
4 right ones. It could be that those chemicals are
5 having no impact and that what is really happening
6 is something like C56 or Dioxin, which we didn't
7 even know about at that time. I remember the first
8 time a Love Canal resident suggested to me that
9 Dioxin was in the Canal, I said, well, that is one
10 chemical we don't have to worry about. Dioxin
11 binds so tightly to the soil that it will never
12 move from the spot it was put in and that was
13 totally wrong. We now know it moved considerable
14 distances.

15 So, measuring chemicals and doing risk
16 assessments on chemicals I thought had a lot of
17 problems as far as evaluating the population. So,
18 at that time Joe Highland and I got together and
19 did some brainstorming about what kind of alterna-
20 tives would be possible to evaluate this kind of
21 population if we didn't want to use the traditional
22 epidemiological survey and if we didn't want to use
23 environmental monitoring and Joe Highland and I
are both laboratory scientists and we feel much

1 better with hard data that you can go in and
2 measure. So, most of our ideas were based on that
3 and may I have the next slide, please?

4 These are some of the ideas we came up
5 with. Let's bypass people altogether and look at
6 the health of indigenous wildlife or birth weight
7 of babies, of course, had already been suggested by
8 the work of Dr. Vianna and so, if a baby's weight
9 is affected, how about the growth of children. So,
10 we thought that might be a pretty reliable thing
11 to measure and we had some evidence that neuro-
12 toxins was a big problem in Love Canal both from
13 the toxicity of the chemicals that David Raul
14 looked at and from the reports of the residents,
15 and finally, we thought you could look at blood and
16 urine for various kinds of evidence of liver
17 toxicity or renal toxicity.

18 Now, we wrote a lot of graphs and we
19 raised some money. We weren't able to carry out
20 this but we did do some work in these areas and
21 that is what I would like to report to you.

22 Next slide, please. First, we decided to
23 try to get a sample of the Love Canal population,
not a sample but the entire population of Love

1 Canal and we wanted to get a controlled population
2 so we examined the census tracts in Niagara Falls
3 and for income, education, percent employed, percent
4 employed in manufacturing, and children, and we
5 picked two census tracts that were adjacent that
6 matched Love Canal very well. It was a little
7 deficient in children but there was no other that
8 matched as well. Also, we had race in there but
9 at that time, this was 1970 statistics, there was
10 almost no blacks listed in the Love Canal census
11 tract because I guess the LaSalle Development was
12 not built and occupied and so at that time it was
13 essentially primarily white, 95 percent white.

14 We then drove over, looked at the task
15 force, New York State task force maps of where
16 hazardous waste sites were and Love Canal and we
17 eliminated sections of these two areas and then we
18 drove over the area and just eliminated any blocks
19 or nearby blocks where there were large unused
20 tracts of lands because by that time they had
21 identified so many dump sites in Niagara Falls that
22 we didn't even want a big piece of land where there
23 were no homes just in case there could be something
buried there.

Next slide, please. This is the Love Canal neighborhood right here and this is the adjacent census tracts that were used as our control. This is the chemical manufacturing complex. So, we had this group closer to the air pollution from the chemicals manufacturing than the Love Canal group. We weren't enthused about that but this was the best match as far as demography was concerned and we figured that this would tend to, if this air pollution was having an effect, it would decrease the difference between Love Canal control. So, we wouldn't be led into thinking that Love Canal had something that wasn't really true. We also used a little bit of the same census tract as Love Canal as a control. This was divided by a deep creek and so we didn't think there would be any chemicals from Love Canal migrating over there.

Now, Love Canal had two populations, the home owner population and the population that lived in the LaSalle Development and to give the control for them, we examined all the other low income housing units in Niagara Falls and we chose the one that was best matched in terms of race and

number of bedrooms and percent children and that
1 was over here and so those were our true populations.

2 Next slide, please. Now, at this time in
3 May of '80 permanent relocation had been offered
4 and the Love Canal community was dispersing. We
5 started measuring in June. So, in order to get as
6 high a participation as possible to this population
7 that was disappearing, we had a full time person
8 work on canvassing the neighborhoods, to get out
9 the children to participate and we tried to get a
10 total response from both the control and the Love
11 Canal children working from registries which we had
12 prepared and we leafletted the homes, we visited
13 the homes, we called, we arranged transportation
14 from motels and other temporary housing and we made
15 sure that both control and Love Canal children
16 coming into the site together so that the people
17 measuring were blinded as far as whether they were
18 measuring the exposed or control.

19 Now, the people doing the interview, they
20 were not blinded because part of the interview was
21 a big residential history. So, they did know
22 very quickly what they were measuring but we were
23 focusing on the hard data in this study and so none

1 of the hard data---all of the hard data was col-
lected in a blind manner.

2 We have an 82.8 percent response rate
3 from the renters in Love Canal and 80.8 percent
4 from the control. For the home owners, the response
5 rate was much lower, 62 percent and 63.3. One of
6 the problems was that it was much harder for the
7 renters to find other housing and so they were
8 moving out at a much slower rate than the home
9 owners and many of the home owners were in the
10 process of moving. So, we just couldn't quite keep
11 up with the population.

12 CHAIRMAN WELTY: Is your Love Canal samp-
13 ling a 100 percent sample of the people there?

14 DR. PAIGEN: Yes.

15 CHAIRMAN WELTY: I wasn't clear on how
16 you selected the homes in the control area.

17 DR. PAIGEN: We went for 100 percent
18 sampling of homes containing children below the
19 ages of 17.

20 CHAIRMAN WELTY: So, you had about 10,000
21 people in the control area.

22 DR. PAIGEN: No, not at all. Where did
23 you get that?

CHAIRMAN WELTY: That was the census
tract information.

DR. PAIGEN: 10,000 was the income, I
think.

CHAIRMAN WELTY: Oh, I'm sorry.

DR. PAIGEN: And we had a much reduced
sample.

Next slide. So, there could be a
participant bias, particularly here for the home
owners. We were very concerned about that and so
afterwards, after the study was completed and the
data was in and the stuff was on the computer,
we knew which health problems were more prevalent
in the population and we decided to go back and
take a random sample of the non-participants and
ask the nine most common health problems and see
how the non-participants matched in terms of
education of parents, income of parents, age of
children and those nine health problems.

May I have the next slide, please?

Oh, I gave the introduction to the wrong slide. We
will get to that in a few minutes. I'm going to
show you some slides on the matching. This is
annual income and this is Love Canal and control,

1 renters, Love Canal and control home owners, and
2 you can see the renters in the six to nine thousand,
3 here is the home owners at six to nine thousand.
4 Renters in the nine to fifteen thousand, and home
5 owners. So, you can see that the groups are reason-
6 ably well matched when matched renter for renter
7 and home owner for home owner but you see we did
8 have two very different populations. So, we had
9 to control all of our analysis.

10 Next slide, please. This is not the best
11 way to present this data, I'm afraid, but this is
12 the household size and this is the control, home
13 owners and Love Canal home owners and the medium
14 number per family is four and it drops off pretty
15 much at seven. There are a few larger families
16 here, and then the renter population here, Love
17 Canal and control, they had more small families,
18 more single parent families. I think there is a
19 sizable percentage of two person families and three
20 person families but there were also some families
21 that had fourteen, fifteen in them and in this
22 respect, the Love Canal group had more families
23 over ten than the control group.

Now, the reason for this is that the

1 LaSalle Development had more five bedroom units
2 than did any other low income housing in the city.
3 So, we knew we would probably get this difference
4 before we started and we controlled for this in
5 much of our regression analysis.

6 Next slide, please. This is the distribu-
7 tion of age of the children and this is one of the
8 most significant differences we had between Love
9 Canal and control. The solid bars are the control
10 and the hatched bars are the Love Canal and what
11 you immediately see is that in the younger ages, we
12 had far more controls. In the older ages we had
13 far more Love Canal. Now, I can explain why this
14 difference exists. In 1979 and we didn't take
15 children under this age because 18 months before,
16 New York State had announced that low birth weight
17 and miscarriages were important in the Love Canal
18 area and they had moved out all pregnant women and
19 children under two and advised people not to initiate
20 families. So, we did have very few Love Canal
21 babies in that age range living in Love Canal and
22 they were very non-representative because they were
23 in the fringes of the neighborhood that were not
covered by this relocation order and when you move

1 out pregnant women and families with children under
2 two, you lose a lot of young children. They just
3 simply weren't there anymore and I think the reason
4 we had more older children here in Love Canal is
5 that these are teenagers who have a lot of other
6 things going on in their life and the Love Canal
7 teenagers were more motivated to participate than
8 the control teenagers. We know from our survey of
9 the non-participants that those control teenagers
10 were there but they just weren't coming in. So,
11 the average age of the Love Canal population
12 differs by about a year.

13 Next slide, please. This is the response
14 that I started telling you about and for Love Canal,
15 we gave each of these---we looked at the percentage
16 of positive responses to these nine health problems.
17 So, this means that if you asked, I don't have the
18 end here for some reason, but if you ask 30 children
19 nine health problems, you would have nine times
20 thirty possible positive responses and this is the
21 percentage of positive response. We didn't analyze
22 the health effects because there weren't enough.

23 We took one-third of the non-participants
and you can see that the people who did participate

1 in Love Canal had a few more positive responses than
2 the ones who didn't participate but it was not a
3 significant difference. This end is the number
4 of children times nine.

5 The control participants, however, had
6 over twice as many health problems as the control
7 non-participants and this was significant. So,
8 this means that if there was any response bias in
9 our study, it was that the control children who
10 participated were more likely to have health prob-
11 lems than the children living in that control
12 neighborhood who did not have health problems.

13 DR. MILLER: Well, as a sociologist I
14 would posit that what you have here in both cases
15 and the pattern is consistent and it is very
16 interesting, is a problem in recall which probably
17 finds its origins in the fact that the interview
18 data that you were collecting from them wasn't
19 being collected by a common instrument so that the
20 probes in the kinds of things that cause people,
21 give people an opportunity to remember their
22 health history weren't there in the same way as
23 with a telephone interview as with people who were
part of the regular study.

1 DR. PAIGEN: That is possible. That is
2 very possible. I have another explanation, though,
3 which I think when you really got the information
4 on the control participant is a more likely one,
5 the people, these were very close neighborhoods,
6 they were demographically similar so that there was
7 a lot of movement between them. The people who
8 participated from the controls were very likely
9 to have a Love Canal connection. Twenty of them
10 had been born in Love Canal. 48 of them had gone
11 to the Love Canal schools. 48 out of 440, almost
12 10 percent. Many of them had grandparents living
13 in Love Canal and went to Love Canal to visit their
14 grandparents a lot or they had other relatives.
15 Some of them lived near Hyde Park. I mean, the ones
16 who came in had some personal connection with toxic
17 waste and what I should have done if I would have
18 understood this, if I had been a sociologist,
19 instead of a laboratory scientist, is I should have
20 gotten a lot more controls than Love Canal and I
21 should have thrown all of this out but I didn't.

22 DR. DAVIS: Have you tried to partition
23 your control population that way?

DR. PAIGEN: Right, yes. We partitioned

1 between ever lived in Love Canal and never lived
2 in Love Canal and everything increases a little bit,
3 those former Love Canal residents tend to bias our
4 study and we have a mix-up in exposure stratas but
5 I left them in because I think that that bias and
6 this bias both decrease the difference between Love
7 Canal and control.

8 Now, there is another bias that could
9 increase the difference between Love Canal and
10 control unfairly or in a false way and that is the
11 one that I was most concerned about and that was
12 that the recall of health problems would be better
13 in Love Canal residents. After all, these people
14 have been sitting there for two years being told
15 that they lived in a community where they were
16 exposed to toxic chemicals and they have been won-
17 dering and thinking about whether those chemicals
18 are affecting their health and the health of their
19 children and their recall could be much better and
20 I hope I have introduced the right slide. Can I
21 have the next slide?

22 Now, I can't get at recall bias very well.
23 There are different ways to do it. This is a way
that I did it. We had for birth problems a large

1 group of children living in Love Canal, born to
2 Love Canal mothers but who weren't born while the
3 mothers were living in Love Canal. So, in other
4 words, those women have been sitting and thinking
5 and worrying about health problems just like the
6 other Love Canal mothers but their children actual-
7 ly weren't exposed in utero. We had 305 of those
8 children and I compared that to the 415 controls
9 that were not born in Love Canal and you can see
10 that the low birth weight was equal to those two
11 groups. So, there wasn't recall bias as far as I
12 could tell or low birth weight.

13 Prematurity, actually it was a little
14 lower so there was no recall bias about prematurity.

15 We had gotten from the mothers the length
16 of pregnancy. So, we looked at small for gesta-
17 tional age and there didn't appear to be any recall
18 bias for gestational age.

19 Then we looked at the birth defects. Here
20 is 8.2 percent for the Love Canal children and 5.1
21 and there was a recall bias for birth defects.
22 Later we analyzed this further. We, in our end
23 analysis broke our birth defects down into mal-
formations and deformations. Deformations are

1 things like clubbed feet and bowed legs and hip
2 problems and things that are less severe and which
3 you might think there would be more recall bias
4 on and the recall bias was present for the deforma-
5 tions and not for the malformations and so I don't
6 place much value on the difference in deformations
7 that we find.

8 Also we think there was recall bias
9 because some deformations like club feet, we know
10 the incidence of club feet in the norm, in the
11 black population, and it was way under-reported in
12 Love Canal, both the Love Canal and the controls.

13 The other kind of bias is not recall but
14 what I call proving a point bias. These Love
15 Canal residents, you might say, want to prove that
16 they were sick and they ought to be moved out. So
17 there just might be some exaggeration of health
18 effects. So, we handled that in the following way
19 and I apologize, I don't have the slides for you.
20 You'll have to take my word on it but I had to
21 phone my secretary and get this slide out to me
22 and I didn't get everything I wanted. The first
23 health question we asked was the following: As
your child has been growing up---well, let me just

1 describe this and if you want to see this, I will
2 get the blackboard. As your child has been growing
3 up, would you say that your child has been sick
4 very frequently, frequently, about average, below
5 average or hardly at all, and our rationale was that
6 if people were trying to prove a point, then they
7 would say frequently or very frequently in Love
8 Canal, and that when you actually looked in the
9 specific health problems we got for the specific
10 health problems between what a Love Canal mother
11 would call very frequently, maybe a control mother
12 would call frequently. We would see that kind of
13 difference. So, we took those 40 health problems,
14 gave them a point and added up the points so that
15 every child had a point with a name and then we
16 looked to see for a mother that said the child
17 was sick hardly at all, how many points that child
18 had in terms of positive responses to health
19 problems and what we saw for the control was a line
20 that went up like that and there was an agreement
21 as to what you would get. For the health of the
22 Love Canal population, we got a shift, in other
23 words, the child that responded with five points
and the mother called that average in the control,

1 in Love Canal the mother called that less than
2 average. The line for the Love Canal residents was
3 higher at every single point. So that what a
4 Love Canal mother called frequent, the control
5 mother called very frequent. In other words, there
6 was no particular bias toward exaggerating the
7 number of health complaints.

8 Now, we also used that data in another way.
9 We thought if a woman is trying to prove a point,
10 then she is going to say her kid is sick frequently
11 or very frequently. So, let's throw away all those
12 children and just look at the health problems
13 between the children whose mothers said they were
14 sick average or less than average and for the
15 health problems, we found elevated in Love Canal
16 when we looked at that subset of children that the
17 mother said was sick average or less than average,
18 all of those differences between Love Canal and
19 control remained. They still had more seizures.
20 We still had more learning problems. They still
21 had more skin rashes. Now, some of them lost
22 statistical significance because we reduced the
23 size of the group considerably but the magnitude
of the difference was the same and some of them

were statistically significant.

1 So, we don't think that was an important
2 bias. Now, I think I have covered---

3 DR. STOLWIJK: Now, this analysis you used,
4 this multi-regression analysis, this is how it was
5 done?

6 DR. PAIGEN: We used, I think for the
7 data I have been showing you, I used multiple
8 regression analysis and used the parameters coming
9 out of that to calculate adjusted odds ratios with
10 the 95 percent confidence interval. That is how
11 I have presented most of the data. When we
12 analyzed by simple pi square statistics, Love Canal
13 and control, we had fourteen health problems that
14 were elevated but when we used the multiple regres-
15 sion, half of those disappeared and in the multiple
16 regression, we corrected for all the usuals, race,
17 income, education, age of child and things like
18 that and we also corrected for anything else that
19 looked important to that particular disease like
20 for the low birth weight and so forth, we had very
21 detailed pregnancy histories and we threw in some
22 of those.

23 DR. CHALMERS: Seems to me the best way to

1 check the recall and exaggeration bias would be
2 whether the mother remembered about the birth
3 weight versus the hospital record on birth weight
4 for each of these groups.

4 DR. PAIGEN; Well, when we did this study
5 we wanted birth certificates and we had the parents
6 bringing in the birth certificates but what was
7 disturbing to us was that the birth certificates,
8 what parents called birth certificates, often were
9 just hospital certificates that didn't have a birth
10 weight on them. So, we weren't prepared for that.
11 So, we didn't start out with consent forms to get
12 the hospital records. We couldn't get access to
13 the state records on birth weight. So, we were
14 awfully disappointed that we couldn't verify it.
15 We had 25 percent of our birth certificate, I mean,
16 25 percent of our birth weights are from birth
17 certificates. When you look at the mean birth
18 weight of those from certificates and from recall,
19 they are the same. When you look at the distribu-
20 tion, it's the same but it's only 25 percent, and
21 more of those are from Love Canal than from control.
22 They were much more motivated to go and dig up
23 something that was important to us and would go back

1 and find something better but that is why I say,
2 the first three things I looked at, birth weight,
3 health problems and birth defects in our interview,
4 although we tried to get hard data on birth weight,
5 we really sort of failed and I would say our hard
6 data is the growth and the neuro-toxin and the
7 voles.

8 DR. SIPES: When you do a recall, just
9 for my information, do you get the information
10 first and then substantiate that with the birth
11 certificates?

12 DR. PAIGEN: No. We didn't do that. That
13 would have been nice. I wish we would have done
14 that but we did not anticipate the problem. Now,
15 what we did, we did that kind of thing for the
16 height of the parent. We first asked the parent
17 their height and then we measured. So, we have
18 reported height and measured height for many, many
19 parents and we learned from this that women over-
20 reported their height by a quarter of an inch and
21 men over-reported their height by a whole inch.
22 So, when we had only reported heights, we subtracted
23 that difference and when we compared parental
heights.

Now, there was one question somebody asked---oh, I covered that. Now, that is sort of the study design and I will go over the data now. But if there are any other questions that people want to ask me about the study design, I have talked primarily about the study design of the children study, very little about the neuro-toxin and the voles. I will discuss the voles a little bit later but for neuro-toxicology, we took all 9 through 13 year olds who were in this study and measured their ulnar and sural nerve conduction velocity and the participation rate then was 59 percent and the reason given for not participating was fear of the test because we described it to them, it was a little electric shock and we felt that some of the kids just didn't want it. So, I think we have the neuro-toxic data on 146 children of the 9 through 13 age branch. If there are no questions I will go on then as to the data.

Next slide, please. All right. We took a height and weight and we converted, had these converted by the Children's Growth Center in Ohio to age and race and sex specific percentile and Z scores. Now, in this study we didn't have 963

1 children. We had 921. I can't remember the exact
2 reason but there were some children who we got
3 interviewed and didn't get measured and so forth.
4 The mean stature for age percentiles for all
5 controls are 53 and all Love Canals were 50. This
6 did not reach statistical significance. We then
7 looked at those that were born in the area and
8 compared these to all controls and we see a dif-
9 ference that reaches significance and then we ask,
10 was just being born enough or did it matter how
11 much of their childhood, so we looked at those that
12 were born and spent at least the first five years
13 of their life. We had fewer children but the
14 height drops and the significance increased or
15 decreased.

16 Then we looked at children who were born
17 and spent at least 75 percent of their life in
18 Love Canal and this is the group we worked with
19 later for the rest of the analysis.

20 Now, we asked the question, was it
21 important to be both born in Love Canal and grow
22 up in Love Canal. We had 41 children who were born
23 in Love Canal but spent less than 75 percent of
their lives. They moved to the control areas or

1 moved to the control area and moved back. Those
2 children were of normal stature. Then we had a
3 group of 82 children who had spent 75 percent of
4 their life in Love Canal but they weren't exposed
5 in utero. Their families had moved in shortly
6 after they were born. Those children were also
7 normal height.

8 So, it looked to us as if we had to have
9 in utero exposure and significant childhood exposure
10 to have this effect on growth.

11 Next slide, please.

12 DR. STOLWIJK: Can I ask about this
13 slide, what you are showing us, I am trying to under-
14 stand what the slide is saying, the mean is the
15 mean stature for age as compared to what you would
16 expect or is it a percentile in the population?

17 DR. PAIGEN: The mean percentile of the
18 whole population, U. S. is 50. All right, but that
19 is the whole U.S. of all groups. Our particular
20 mean---

21 DR. STOLWIJK: The number here is a
22 percentile.

23 DR. PAIGEN: The number here is a percen-
tile, that is correct, for the age of the child,

1 the sex of the child and the race because blacks
2 are a little taller.

3 DR. POHLAND: How can we have a standard
4 error in a percentile?

5 DR. PAIGEN: You can deal with these
6 percentiles. They are real. You can deal with
7 them in statistical weight. It's done all the time
8 in growth studies.

9 DR. DAVIS: Perhaps, John, it's just a
10 function of the end of the population.

11 DR. STOLWIJK: Well then you have one
12 number for a population. The percentile is clearly
13 the percentile that a particular individual places
14 on the curve. I think that is what she has here.

15 DR. DAVIS: But this is not just for an
16 individual. These numbers, as I understand it, are
17 for the average percentile for that group.

18 DR. PAIGEN: That is correct.

19 DR. STOLWIJK: But the average is made up
20 of each percentile, that each individual places in
21 it, as I understand it.

22 DR. PAIGEN: That is correct.

23 DR. DAVIS: And that would be why you
might be able to estimate a standard error because

you have an end specific number of individuals.

1 DR. STOLINE: Beverly, do you know what
2 the standard deviation is for the nation at large?

3 DR. PAIGEN: Of course, it's fixed with
4 percentiles, the standard deviation is 15.

5 DR. STOLINE: I guess what I am trying to
6 ask is---

7 DR. PAIGEN: The deviation is 15. It is
8 two-thirds. I'm trying to think, it's set by--

9 DR. DAVIS: Oh, you mean the statistical.
10 No. My question is a little different.

11 DR. STOLINE: What you have here is data
12 that apparently what you were saying is the
13 national norm here would be 50 percent for the
14 nation at large.

15 DR. PAIGEN: Yes.

16 DR. STOLINE: And I am asking, with
17 respect to that, what would one standard deviation
18 unit be?

19 DR. PAIGEN: Well, this is not a standard
20 deviation unit. That is standard error.

21 DR. STOLINE: Okay. So, the standard
22 deviation is divided by the square root, all right.

23 DR. PAIGEN: Right. The standard

1 deviation, I can't remember, but it was very
2 comparable to what is gotten by the Yellow Springs
3 group and the other things we did with these
4 children is that every---we had 7 percent of the
5 children selected randomly go through the station
6 the second time so that we had a technical error of
7 measurement. The technical error of measurement
8 was very comparable to what is obtained by the
9 group at Yellow Springs who is sort of the center
10 for measuring these things and we had the same
11 person measuring the same parameter throughout the
12 study. So, one person took height throughout the
13 study, one person took weight throughout the study
14 and one person---

14 DR. DAVIS: Did they just take one measure-
15 ment or did they do it two times or---

16 DR. PAIGEN: No, one measurement and each
17 day we had a standard group of nine individuals
18 who went through the measurement so that we checked
19 for measurement drift all the time, you know, if
20 you are having problems with measurement drift,
21 correct them at the beginning of each day.

22 DR. CHALMERS: How did you know the
23 person that made the measurement didn't suspect

where the person lived when they made it?

1 DR. PAIGEN: Well, all I can say is, if
2 you had seen the scene, I don't think you would
3 have---all of these children and people and parents
4 and crying babies just wasn't the kind of scene
5 that you think about when the child was the control
6 but you know, we had an I.D. number on the child
7 and we had the first name of the child.

8 DR. UPTON: You mentioned one interesting
9 comparison, the children who lived in the area and
10 were not born in the area.

11 DR. PAIGEN: Yes.

12 DR. UPTON: And were not significantly
13 different from the controls. How large a group
14 was that?

15 DR. PAIGEN: 82 individuals.

16 DR. UPTON: And they moved into the area
17 at various times.

18 DR. PAIGEN: At various times but all of
19 them lived at least 75 percent of their life and I
20 was very surprised at that but that is what the
21 facts were. Now, maybe 82 isn't big enough but it
22 says to me that this growth thing has to be a
23 pretty constant exposure.

1 DR. CHALMERS: Forgive me for bringing up
2 the measurement bias but I think it's critical.
3 You say each had an I.D. number. Is that I.D.
4 number random or could one tell which was the
5 control?

6 DR. PAIGEN: As they walked in they got
7 a sequential number. Later on---

8 DR. CHALMERS: With no distinction between
9 the control.

10 DR. PAIGEN: No, absolutely not. Later on
11 we added to the I.D. number things that identified
12 the family of the child and whether they were
13 control or not but the number they got as they
14 walked in the door had no relationship, no hint of
15 where they came from.

16 DR. CHALMERS: At the time the measurement
17 was made, these others had not been made?

18 DR. PAIGEN: Right. In fact, these others
19 were added months later. So, there was no way
20 that they could know.

21 We were pretty careful about that. For
22 instance, we had usually a community volunteer
23 sitting at the door while people were coming in and
writing their names in but that was in a separate

1 room. We kept the measurement so that we wouldn't
2 hear someone who knew them saying, "Oh, hi John.
3 How are you? How is your mother?" And saying
4 that. We had the measurement all in a separate
5 room so none of that would be overheard or the
6 children talking to each other or conversations
7 would not be listened to by the measurement people.

8 Now, I should say also here, I don't think
9 I have a slide on it, that the Love Canal parents
10 were not different from each other. I mean, they
11 were not different from the control parents in
12 either mean or distribution and another interesting
13 point is that we had 172 parents who grew up in
14 Love Canal. That was another thing that motivated
15 the controls to come into the study, is that the
16 parents had lived in the Love Canal and the children
17 and those parents' height were not different from
18 the height of the rest of the parents, and they
19 were in Love Canal either before the dump or around
20 the beginning of the dump.

21 DR. MILLER: Excuse me. Dr. Huffaker,
22 perhaps you could help me with this. It's my
23 recollection that Dr. Axelrod said that the height
of parents was not controlled in this study. I

1 don't know if you could speak with him or not but
2 that was what I remembered him having said when we
3 discussed the draft of this work, or did I hear
4 something else.

5 DR. HUFFAKER: What is your question,
6 whether both parents were control or that the
7 husband's didn't come in and the wives were con-
8 trolled?

9 DR. PAIGEN: Yes, both parents were controlle
10 for it. We used mid-parent height. Now, if you
11 read my paper, I'm going to give you these numbers
12 which are not exactly accurate but for mothers, out
13 of 921 children, I think we were able to measure
14 866 and then we had reported height for another 40
15 or so. Now, the way the physical anthropologist
16 goes about this study, you have a totally missing
17 height, you use the national mean so that you don't
18 use the value of a child. So, we had five children
19 for whom we used the national mean for the mother.

20 Now, for the father, we had a lot of
21 missing fathers. We were able to measure half the
22 fathers and then we had reported heights for another,
23 say, 45 percent and then some---maybe it was not
45, maybe it was 40, and then we had a small group

1 of fathers for which nothing was known and we used
2 the national mean for them. So, we then took the
3 father's height and the mother's height, made a
4 mid-parent height and that was what was entered
5 into the regression analysis. This is the kind of
6 methodology that has been standardized for growth
7 studies. In mid-parental height, it is surprising
8 it's not a huge contributor to children's height.
9 It's a very significant contributor but the mag-
10 nitude of the effect is small and if you look at
11 the regression analysis in the manuscript I gave
12 you, I don't have the slide here because the tables
13 are much too confusing to put up, but if you look
14 at what is called the Beta value which gives you an
15 idea of the magnitude of these effects, Love Canal
16 exposure was a very high magnitude with a P value
17 of perhaps---I don't remember, below .05.

18 DR. DAVIS: Do you know what your co-
19 efficient of variation was, how much of it was---

20 DR. PAIGEN: I have the paper. You mean
21 the coefficient of---

22 DR. DAVIS: Of determination. How much
23 of the variation is explained?

DR. DAVIS: It explained most of it, in

1 Love Canal more so. Now, for mid-parental height,
2 that factor, how much of a variation is explained
3 was very small but it was highly significant be-
4 cause it always goes in the same direction. You
5 follow your parents. You are a little taller but
6 it doesn't explain most of the variances.

7 DR. STOLINE: Did this chart appear in
8 any of the material that was circulated to us?

9 DR. PAIGEN: Yes.

10 DR. STOLINE: Okay. I somehow missed it.

11 DR. PAIGEN: It's in there. Okay. Next.

12 DR. UPTON: I have one question. We have
13 seen over time an increase in stature. It is very
14 striking and---

15 DR. PAIGEN: Yes.

16 DR. UPTON: Is that kind of chronological
17 variable controlled in the statistics somehow?

18 DR. PAIGEN: Okay. The stature/age
19 percentile are for this group of children in the
20 United States at this time. Now, it may be a
21 decade difference because it takes a while for that
22 growth, that Center for Growth statistics, and
23 that might be maybe the explanation why it's a
teeny bit higher than 50 or it could just be that

1 the population is a little bit better fed or some-
2 thing.

3 DR. UPTON: Are the controls then in the
4 children who are born, analyzed in the Canal,
5 matched for the year of birth?

6 DR. PAIGEN: Yes. We did it by year of
7 birth and it's---all the differences remained.

8 DR. UPTON: And the trend continued.

9 DR. PAIGEN: Right. Wait a minute, let
10 me say something, I shouldn't have answered that
11 question quite so readily because there was one
12 cohort where we didn't see the difference and I
13 will get to that. Well, I will explain it now
14 since you asked. When we corrected for the year
15 of birth, the children 1 through 6, that cohort,
16 big difference between Love Canal and control of
17 this height magnitude as you see here, born in 75
18 percent, and when when we looked at children 6 to
19 12 also there was some, and when we looked at 12
20 through 16 we did not see the difference. Now, why
21 didn't we see the difference? I don't know. My
22 co-author and I have different opinions. Her
23 opinion is that it's a cohort effect in children
12 through 16 didn't have as much exposure in vitro

1 as children younger. My explanation is, I have
2 children, and she doesn't, is that when kids go
3 through pubertal growth spurts and
4 it varies a lot. So, we of course, have a smaller
5 group but remember the deficiency of controls in
6 the 12 through 16. So, we have tiny groups of
7 control groups and kids are beginning their growth
8 spurts at different ages. So, you get too much
9 noise and too small a group and you don't see it.
10 Now, I don't know which explanation is correct.

11 Next slide, please. We looked at weight
12 for age percentiles and we see the same kind of
13 pattern, that it's really the born and living there
14 that have the greatest difference. The difference
15 is smaller and the difference we believe is really
16 totally dependent on the difference in height and
17 we come to that conclusion in the following two
18 kinds of analyses: This room is a little warm, I
19 see some of you are yawning and nodding off; are
20 there any windows that can be opened; I don't
21 like people to sleep through my talks.

22 DR. UPTON: I am still a little confused
23 because those who were born and spent 75 percent
of their lives show a larger effect than those that

1 were born in the first five years. That implies
2 that the bottom line on your chart involves children
3 older than five years.

4 DR. PAIGEN: No, it doesn't. This is not
5 the correct number, I'm sorry. I don't know what
6 it's supposed to be, 196. This group is a subset.
7 I mean, some of these people are in here because
8 children who are five years old or, no, children
9 who are eight years old can belong in this group,
10 right? So, that is what it is. It's a difference
11 of actually 20 children who get added---who get
12 subtracted from this group.

13 DR. CHALMERS: How did you choose 75
14 percent?

15 DR. PAIGEN: Well, it was arbitrary. It
16 was arbitrary.

17 DR. CHALMERS: But after or before looking
18 at the data?

19 DR. PAIGEN: This is the question we
20 asked, was the number of years that you spent in
21 Love Canal important or was it a fraction of your
22 life? The regression analysis, it was a fraction of
23 life rather than the number of years and that makes
sense if you think about it.

1 DR. CHALMERS: So the 75 percent was
2 picked as the most critical discriminating per-
centage?

3 DR. PAIGEN: No. It was picked on what
4 we called significant childhood exposure. We just
5 couldn't make it 90 because we had too few. So,
6 75 was an excellent number. We asked, could we
7 make it 100 percent or 90 percent, we would have
8 too few. So, we made it 75. It was nothing very
9 special in the decision.

10 DR. POHLAND: But how different would the
11 data have been should you have chosen 50 percent
12 or 60?

13 DR. PAIGEN: I never tried it.

14 DR. POHLAND: Or 50 or 60 or 40 percent.

15 DR. PAIGEN: I never tried that to tell
16 you the truth.

17 DR. POHLAND: I guess the question is
18 whether you chose your 75 based upon the difference.

19 DR. PAIGEN: No. I chose it based on the
20 end.

21 DR. CHALMERS: And you ought to be able
22 to confirm that effect by looking at it quantitative-
23 ly and the numbers get small up to 100 percent.

There ought to be some trend.

1 DR. PAIGEN: Yes. I could do that. I
2 haven't done that but I could certainly do that.

3 DR. CHALMERS: Well, what worries me is
4 the choice of the 75 being possibly the most
5 significant one.

6 DR. PAIGEN: I can assure you I didn't
7 choose it on that. I didn't do that much work. I
8 just tried---

9 DR. STOLWIJK: But this is another ques-
10 tion, that it suggests itself from the description
11 in the documents on the controls, on the Love
12 Canal population, the born and 75 percent white in
13 Love Canal, based on what you said, might it not
14 be a discreet average of the associate status of
15 the people that were involved in the program?

16 DR. PAIGEN: Oh, no. We compared the
17 socio-economic status of this group to the controls
18 to make sure that it matched and we also controlled
19 for all that in the regression analysis I'm about
20 to show you, all right.

21 Now, let me just say a little bit more
22 here about the weight, in that we looked at weight
23 for age. It was no difference between Love Canal

1 and the controls. So, what we are talking about
2 is not skinny kids, it's short kids and there have
3 been three previous studies of the effect of environ-
4 mental toxins.

5 DR. STOLWIJK: You say there is no sig-
6 nificant difference in weight for age?

7 DR. PAIGEN: In weight for stature, in
8 other words, the amount of weight that the child
9 of a particular height has.

10 DR. STOLWIJK: But I think, doesn't that
11 table seem to indicate that there is a significant
12 difference?

13 DR. PAIGEN: This is weight for age.
14 This is all five year olds. If you look at all
15 five year olds, all right, then those who are born
16 and live 75 percent of their lives in Love Canal
17 are a little bit lower in weight but the important
18 effect is that they are a little bit shorter in
19 height. If you looked at weight for height, then
20 these born in 75 percent of their lives are just
21 like controls and the reason this is interesting
22 is there have been three previous studies of
23 environmental toxins on growth of children. In
all three of those studies the height was much more

1 affected than the weight and also boys were much
2 more affected than girls as shown in the data
3 which I will show you and in one of them the age
4 of men was also a factor.

5 Next slide, please. We looked at age of
6 menarche because of the fact that this older group
7 of children did not show the difference and because
8 the timing of the growth spurt is very different,
9 we thought that we would probably have to analyze
10 this data by whether the child passed through
11 puberty or not and, so, to convince ourselves
12 whether that was so, we looked at age of menarche
13 in girls and these are all---this is a fraction
14 of girls who have reached menarche, taking the
15 subset of all girls eight years old and older and
16 this is the Love Canal group and this is the
17 cumulative fraction of those that have reached
18 menarche until age 16, we have 100 percent, and
19 this is the age of the control girls and this
20 difference here is about eight months. Now, this
21 had a statistical significance of .1. So, I'm not
22 suggesting that this was a statistically significant
23 result at all but it was sufficiently consistent to
us so that we then divided our group into 11 year

1 old or I think less than 11 for girls and less
2 than 12 for boys and continued the analysis on
3 children who hadn't reached puberty and these cut-
4 off points are those used by statistical anthropologists
5 and this is interesting. I just, from reading the
6 dioxin study in Missouri, that the DEC is doing,
7 all they have done is a little pilot study and so
8 they only have very small numbers but I couldn't
9 help but noticing that the age of menarche is
10 reduced by something like 12 to 13 months in their
11 exposed population.

11 DR. DAVIS: Dr. Paigen, under this vari-
12 able you might want to go to national norms instead
13 of the control population because I think it's
14 clear and it's regrettable that your control popula-
15 tion contains a lot of overlap as you, yourself,
16 acknowledge. It would be interesting to see what
17 this variable would look like when compared with
18 national norms for which, again, your standard
19 errors would be a lot smaller. The other end
20 point suggested might be worthwhile in future
21 studies should anyone here be interested in such a
22 thing is the onset of menopause. Recent thinking
23 in reproductive toxicity would suggest is not just

1 a function of age and the onset of menopause is not
2 just age related but may be susceptible to zeno-
3 biotics and it might be an end point worthy of
4 study.

4 DR. PAIGEN: I think that is a very
5 interesting suggestion and we are following up with
6 national norms in the person who offered to do this
7 for us, Dr. Hunt, Mr. Dr. Hunt, and who has pub-
8 lished on this thing and when he told me how to do
9 it, I thought the statistics were a little beyond
10 me and so he has offered to look at this population
11 and I should say that the collective age of menarche
12 for mothers did not differ very much from the
13 controls. Yes.

14 UNIDENTIFIED VOICE: I think that con-
15 firms the thought I have had, that is, a problem
16 with the controls and the control areas that you
17 take and you have got it very nicely on that map
18 of Niagara Falls and I happen to live in that area
19 and the control areas are due east of the indus-
20 trial complex. Prevailing winds are from the west.
21 So, it carries generally the atmosphere of low
22 level chemicals, a fair percent of the year for
23 people living in that area and I think it would be

1 interesting to check some national averages as
2 controls, you know, using national norms.

3 Also as another control, because I feel
4 even the control populations are being affected by
5 a similar type of atmosphere that the Love Canal
6 people have.

7 DR. PAIGEN: I think you are right and I
8 think that is particularly important for respiratory,
9 asthma and so forth. We did not see a difference
10 between the control and Love Canal and when we
11 designed the study, we really wanted, our original
12 design was a near control, Niagara Falls control,
13 not a far control. We had selected a census tract
14 in Buffalo. We just didn't have the bucks to do
15 it but I will tell you, you other people should
16 really have both controls, near control and far
17 control, because there is so much contamination of
18 your near control, not only with pollutants but
19 with people who lived in the control area, you know,
20 it's similar to my demographic area. I couldn't
21 believe how much crossing of schools and moving
22 back and forth there was.

23 Next slide.

DR. STOLWIJK: With respect to the height

1 and weight situation, there is also another ques-
2 tion that you may have addressed that isn't
3 evident and that is the effect that you see consis-
4 tent with the thought that the growth may be
5 delayed but the ultimate height is not that much
6 affected as much as it was at the time you looked
7 at it.

8 DR. PAIGEN: Right, and the physical
9 anthropologists who are advisers to this said it's
10 possible that with this growth spurt you are cor-
11 recting for all these problems, all kinds of things
12 happening in the pubertive growth spurts and I
13 just didn't have enough teenagers in the control to
14 answer this and that is an important question.
15 That is really an important question.

16 DR. STOLWIJK: Because if the parents
17 didn't show it, even the ones who had lived there
18 for a long period of time---

19 DR. PAIGEN: But don't forget, the dump
20 didn't exist forever. They grew up before the dump,
21 most of those people, but still, I really would
22 like to know that, yes.

23 Next slide, please. We also with Yellow
Springs, converted all the things to Z scores, and

1 the Z scores, as you remember, is a measurement of
2 standard deviation. So, a child who had a Z score
3 of minus one is one standard deviation below the
4 mean and a child who has a Z score of plus one
5 is one standard deviation above the mean and here
6 we see a Z score of zero is the average, and in the
7 control population here shown by the solid line,
8 about 50 percent of the control were at a Z score
9 of zero, which is exactly what they should be but
10 about 75 percent of Love Canal boys, white boys,
11 were below the average and this is the cumulative
12 percent. So, you can see that this whole fraction
13 in here, the distance between these two lines is
14 the extent of the Love Canal boys who are below
15 expected. We also see a similar group in the black
16 boys. We do have some very tall black boys in our
17 Love Canal population here but there certainly is
18 an exposed group.

19 Now, in white females there is absolutely
20 no difference between Love Canal and control and
21 this is consistent with previous studies showing
22 that boys are more affected than girls when an
23 environmental toxin affects growth.

Now, in black females we also seem to have

1 this affected group. It's surprising because we
2 don't see it in white females. I don't know the
3 explanation, whether many of the black families
4 have incomes below, half of them have incomes below
5 \$6000. So, it might be that exposure plus perhaps
6 inadequate nutrition causes this. I don't know.

7 Next slide, please.

8 DR. STOLINE: Just one comment on the
9 graph. It seems to me in this case, if I am under-
10 standing this correctly, you took the national
11 norms there because your little dots are, it seems
12 to me, at minus two, minus one zero, plus one, plus
13 two standard deviations.

14 DR. PAIGEN: Yes.

15 DR. STOLINE: And there would be national
16 norms that you could slip in there as horizontal
17 lines that are associated and the bottom line would
18 be minus two and the one above would be minus one
19 and zero.

20 DR. PAIGEN: Right.

21 DR. STOLINE: And you could get that to
22 convey more information.

23 DR. PAIGEN: Right.

DR. STOLINE: But not only comparing the

1 controlled group and your experimental group but
2 also a comparison to the national norm.

3 DR. PAIGEN: Right. I have done that. I
4 didn't put it on my final slide because I thought
5 it was a little complicated, but---

6 DR. STOLINE: It might be but it does
7 convey---

8 DR. PAIGEN: I think that is a good sug-
9 gestion and I really ought to do it on the one that
10 I publish anyway because then you could see better
11 but it fits reasonably. It's the same for control
12 except that the controls here you remember are 53
13 rather than 50. So, they are just a little---the
14 national norm is just a tiny bit below this line.

15 DR. UPTON: Does birth order affect the
16 stature?

17 DR. PAIGEN: Oh, boy, all kinds of things
18 affect stature. I should know this since I read
19 all the literature but---to write the paper, but I
20 don't remember whether birth order---number in the
21 family definitely affects it and we control for that
22 in our regression analysis. We had birth order.
23 We didn't control for birth order. I think we
looked at it but I simply don't remember. I'm

sorry.

1 Next slide, please.

2 I'm going to go a little quickly through
3 these things because I feel like time is going.
4 These are sort of the pregnancy histories of Love
5 Canal and controlled women and these are not all
6 Love Canal mothers. These are the mothers of
7 children who were born in Love Canal. So, that is
8 a subset of the Love Canal. We actually had a
9 population size in the control of 707 which were
10 our 440 controlled and our 300 and some children
11 who lived in Love Canal but were not born there
12 and the exposure is about 200 and the mean parity
13 of the exposed was a little larger and the maternal
14 age of birth was a little higher and essentially
15 everything else was well matched.

16 Next slide, please. And what we found
17 when we looked at the percentage of babies weighing
18 less than two and a half pounds, that there was an
19 increase in the home owners but not the renters and
20 the renters control already had a very high rate of
21 low birth weight babies. As expected, for a black
22 low income population, it was not increased by
23 Love Canal. These are the adjusted odds ratios

1 calculated from the multiple regression analysis,
2 controlling for all the factors and the confidence
3 intervals. We also asked about prematurity which
4 we defined as less than 38 weeks and there was not
5 a significant difference in prematurity.

6 Next slide, please. We then looked at
7 all the pregnancy outcomes just in the home owners
8 because they're the ones that looked like they were
9 affected and here is the calculated odds ratio and
10 the 95 percent confidence interval and you see that
11 low birth weight was increased, prematurity was
12 not. The birth defects was barely but when we
13 separated the birth defects into malformations and
14 deformations, malformations was increased and
15 deformations was not and your deformation had a
16 serious recall bias and I don't place much weight
17 on it. All these things are interview and softer
18 than the data I described.

19 Next slide, please.

20 UNIDENTIFIED VOICE: Dr. Paigen, may I?

21 DR. PAIGEN: Yes, of course.

22 UNIDENTIFIED VOICE: You just had that
23 one on pregnancy. What about the renters?

DR. PAIGEN: Could I go back one slide,

1 please. This is the percentage in the control
2 home owners. They had 5 percent of low birth
3 weight babies. In the control renters, they had
4 13 percent, very high number, and living in Love
5 Canal did not significantly increase it. In other
6 words, there was already a strong problem with low
7 birth weight babies in this population. So, we
8 didn't continue the analysis anymore because that
9 was not an effect with the renters of Love Canal.
10 We did actually continue it but there is no effect
11 between control renters and Love Canal renters and
12 the reason is that it's known from national
13 statistics that being black and having below income
14 increases the probability of having a low birth
15 weight baby and that effect was so strong that Love
16 Canal did not change it.

17 We looked at weeks gestation by mean birth
18 weight and this shows that the Love Canal babies
19 which are here in the solid line are below mean
20 birth weight, below the control babies for every
21 week except up to term which they seemed to be
22 about the same.

23 DR. DAVIS: This is still self report data.

DR. PAIGEN: This is a combination of 25

1 percent, right. So, this indicates to us that the
2 small birth weight is not an effect of being pre-
3 mature. It's an effect of being small for gesta-
4 tional age.

5 Next slide, please. These are the health
6 problems. This is the Love Canal group here,
7 exposure plus, just a raw percentage. The control
8 group and the raw percentage. These are the
9 adjusted odds ratio after using multiple regression
10 analysis to control for everything and here are
11 seizures, learning problems, hyperactivity, skin
12 rashes, eye irritation and abdominal pain and
13 incontinence. I should say there are a lot of
14 problems with these health effects. Learning prob-
15 lems, hyperactivity, abdominal pain, incontinence,
16 could be caused by the stress of living in Love
17 Canal.

18 DR. STOLWIJK: What is the plus and minus?

19 DR. PAIGEN: This is the exposure, Love
20 Canal group and not exposed side.

21 DR. DAVIS: Were lead levels done for any
22 of this group at any time?

23 DR. PAIGEN: No.

DR. DAVIS: Because that would explain many

1 of them it's conceivable and I recollect that the
2 lead levels at Love Canal were---

3 DR. PAIGEN: I don't think there is any
4 lead buried in Love Canal.

5 DR. DAVIS: No, It wasn't buried there.
6 I'm just saying the soil levels of lead were
7 consistent with an industrial environment.

8 DR. PAIGEN: Well, that could be, Devra,
9 I didn't see any lead soil levels. If you saw
10 Love Canal, it's not urban. It's more suburban
11 and so, I would think that the air exposure from
12 the gas would be less and the low income housing
13 is very new and it's not peeling.

14 DR. DAVIS: But as you know, a major source
15 of lead would be prenatal as well and once in the
16 body, it stays there. You had mentioned that as
17 one of the potentials.

18 DR. PAIGEN: Yes. There is a lot of
19 problem with this data. Seizures I have a little
20 more confidence in as not being caused by stress.
21 Skin rashes, I don't feel is too much stress
22 related. So, I have a little more confidence in
23 these two things but really, the major reason for
collecting this data was sort of as a bench-mark

1 for our growth data. We had to select some health
2 problems because they affect growth. We added
3 some more in order to see how sensitive measuring
4 growth was compared to asking questions about
5 health and the answer is it's much more sensitive
6 to detect a difference of P level of .05 in our
7 children, but for what it's worth, here is the
8 illnesses. Next slide, please.

9 These are the illnesses by wet homes, dry
10 homes and control and there is a gradient of
11 exposure to almost all of these, not to eye irrita-
12 tion particularly and not for abdominal pain
13 particularly but there is for these some gradient
14 of exposure of wet versus dry.

15 Next slide, please. This is the distance
16 from the Canal. These children have been evacuated
17 for the study and so there is a gradient of distance
18 from the Canal for several of these things, rashes
19 and eye irritations are particularly interesting
20 because they are a kind of irritant phenomenon
21 and incontinence is not on here and there is no
22 gradient by distance of incontinence, which makes
23 us think even less of that particular difference.

But, there was some dose response in the

Love Canal community to these health effects.

1 Next slide, please. Now, I think you have
2 all had the vole paper. We trapped voles over
3 a year's time. We found several differences bet-
4 ween voles that were trapped around the fence at
5 Love Canal and voles that were trapped in the
6 control area. One of the most significant was the
7 density. Voles most often reach a density of 20
8 to 30 per hundred traps. This is how you measure
9 density. You walk three paces, lay a trap and you
10 walk three more and you lay a trap and you put it
11 in a grid and you check your traps morning and
12 night and you do it on the same nights as the
13 control and the Love Canal area and so that this is
14 right around the fence. This is on Frontier Avenue
15 and this is in the control area on the map.

16 Next slide. This is a survival curve.
17 We determined the age of the voles by doing a
18 regression analysis on the dry weight of the eye
19 lens compared to the body weight and we used that
20 to calculate age. This is a standard technique
21 among wildlife pathologists. Apparently the
22 protein content of the eye lens increases with age
23 and you can get a good idea of the age and these are

1 the survival curves of the control voles. This
2 turns out to be after weaning before weaning you
3 don't see them out in the field, but after weaning,
4 they lived 49 days in the control area and in the
5 Love Canal area I think they lived 25 days. That
6 is half the life span, and when we took the voles
7 and dissected them and looked at the various
8 tissues, we found that the thymus was affected, the
9 spleen was affected, the adrenal was affected, the
10 liver was affected. So, there were numerous signs
11 of toxicity in these voles trapped in Love Canal
12 compared to the control voles and when we took the
13 fat samples from these voles, analyzed them for
14 chemicals, we found dichlorobenzene in both the
15 control and Love Canal voles but the Love Canal
16 voles, it was a much higher concentration and also
17 found in the control voles, dichloromethylmaxalene,
18 hexachloroethoxyhexane, which is lindane in fairly
19 high concentrations, and one peak which was un-
20 identified because of the quality of our gas
21 chromatograph but it was at a high point; dioxin,
22 and as you know, dioxin is a very difficult thing
23 to analyze for so we don't know whether it was
there or not.

These voles were trapped---

1 DR. DAVIS: What is the normal life of a
2 vole, three or four years?

3 DR. PAIGEN: No. The normal life of a
4 vole in the field is two to three months. If you
5 take them into the laboratory, they might live as
6 long as other mice. They might live as long as
7 two years but in the wild, they are basically a
8 food supply.

9 DR. DAVIS: All right. Now, you did your
10 study in 1981, your vole study.

11 DR. PAIGEN: We did our study, we started
12 trapping in 1979. The clay cap was not totally
13 covered at that time. We then trapped again in the
14 spring of '80. The clay cap was covered and in the
15 summer and fall of 1980 and what I can tell you
16 about this is---

17 DR. DAVIS: Do you have time trend data
18 on the levels showing any changes in it, the levels?

19 DR. PAIGEN: No, because it was so hard
20 to get fat from the Love Canal voles. We had to
21 pool everything we had to get the samples.

22 DR. DAVIS: They were skinny.

23 DR. PAIGEN: They were skinny. They didn't

have very much fat.

1 DR. DAVIS: But even in 1980 there was a
2 difference, a change?

3 DR. PAIGEN: Oh, I can tell you a little
4 bit more about the time trend as far as pathology
5 and this is, in the fall of 1979 they were very---
6 the spleen weights---pathologists measure by liver
7 and spleen weights, I should say the testis weight
8 and seminal vesicle weight was also very low,
9 indicating delayed sexual maturation in voles.

10 In the spring of '80 they looked pretty
11 good, the very first samples we caught in the spring
12 of '80, which made us think, aha, construction
13 really did something. As the summer progressed,
14 they got worse and worse and this is our explana-
15 tion, in the spring, over the winter, voles, their
16 testis swell. Their testosterone level is still
17 up. They get very aggressive and territorial and
18 they spread out. So, what we saw in the spring,
19 right after the snow melted, was animals migrating
20 into an unpopulated area and as we continued to
21 collect, they got sicker and sicker and in order
22 to test this, we were going to build pens and put
23 the laboratory voles in the pen of the Love Canal

1 area and into the pens of the control area and
2 the state would not give us permission to build
3 those pens. I shouldn't say they wouldn't, we
4 still haven't received permission. We applied for
5 it in '79.

6 I will say that we had very enterprising
7 graduate students that went and built the pens
8 anyway and we put the clean voles in the pens and
9 the pens were tampered with and opened up and the
10 voles disappeared. So, we haven't been able to
11 really do the proof of that study which is dis-
12 appointing. Yes.

13 CHAIRMAN WELTY: Were the voles obtained
14 blindly in terms of where they were trapped?

15 DR. PAIGEN: Yes. The voles were---well,
16 let me explain what we did. When you collect them,
17 every vole was given a number and weighed immediate-
18 ly and then put in formalin for analysis and they
19 went to John Christian at Binghamton who then did
20 the rest of the analysis without the codes. So,
21 the first initial weight of the vole and the
22 identification by sex and maturity was not done
23 blindly. This was done by field persons who just
picked up the animal. The rest of the analysis,

the lens weight and all the pathology was done
1 totally blindly by a graduate student at Binghamton
2 who didn't have the code in their possession.

3 I think that's the last slide. Can I have
4 the lights, please?

5 There is just one more thing that I wanted
6 to tell you which is on these pieces of paper that
7 I have handed out and in the January through March
8 I think of 1980, we had a neurologist examine, I
9 think, 53 or 52 people from Love Canal in a control
10 area for various neurological signs, you know,
11 response to pain and touch and temperature and so
12 forth and also he did nerve conduction velocity
13 and response amplitudes on seven nerves, dividing
14 it between three motor nerves and four sensory
15 nerves and on the first page, which is called
16 Table I, you will see that there was essentially
17 no difference in the amplitude of these nerve
18 responses. There was some difference in the nerve
19 conduction velocity and this is consistent with---
20 see, some neurotoxins destroy nerve axons and then
21 you get a reduced muscle strength which is shown
22 in the amplitude. Some neurotoxins, they show up
23 and demyelinate the nerve tissue and then you get

the reversal and this nerve reduction velocity.
1 So, this initial pilot study indicated that what
2 we were looking at was more a toxin that probably
3 interrupted the myelinization of the nerve and that
4 sensory nerves were more affected than motor nerves,
5 as expected from the literature, and if you will
6 look at the next slide, that is our regression
7 analysis. This is the age, because age does have
8 an effect on nerve conduction velocity and you
9 will see that the ulnar sensory nerve and the sural
10 sensory nerve are the most sensitive.

11 Based on that, we did two studies. One
12 was the study of the Love Canal children 9 through
13 13 years old for which we measured only the ulnar
14 and the sural nerves and the second study was, we
15 took these 55 people who we measured in January
16 through March of 1980 and we remeasured them in
17 January through March of 1981 and at that point
18 relocation had occurred. Some of them had moved
19 out of the Love Canal neighborhood and some had
20 stayed, and on the next page you will just see a
21 figure, looking at the net change in ulnar nerve
22 conduction velocity and this time we measured both
23 ulnar nerves so we had a little bit more reliable

1 measure and all I have done is shown whether there
2 was an increase or decrease and the controls were
3 about the same. Love Canal people who stayed in
4 the neighborhood, there was a small improvement.
5 It didn't quite reach statistical significance.
6 The Love Canal people who moved out of the neighbor-
7 hood had a significant increase or improvement in
8 nerve conduction velocity and the open circles are
9 the ones who were one standard deviation below the
10 mean the first time and you can see that the people
11 who were really low the first time were the ones
12 who showed the most improvement.

12 DR. STOLWIJK: Excuse me. The marker is
13 one standard error?

14 DR. PAIGEN: Yes. These are the means
15 and error bars, one standard error.

16 DR. STOLWIJK: And these measurements
17 were made when?

18 DR. PAIGEN: The first set of measurements
19 were made January through March of 1980 and the
20 second set of measurements were made January through
21 February of 1981 and these were adults and they
22 were previously screened. So, we know that they
23 had no occupational exposures, no exposure to

1 neurotoxic meds. We eliminated anyone that had
2 one drink a day and we eliminated anybody who had
3 diabetes or first degree relatives with diabetes.
4 We were very stringent in our criteria. So, we
5 didn't think there was other possible explanations
6 for the low nerve conduction velocities.

7 DR. STOLWIJK: The ones with C are the
8 ones that stayed in the Canal, Love Canal?

9 DR. PAIGEN: Yes. LCN are the ones that
10 stayed in the Canal. R are the ones that moved
11 out. The length of time they were out was a mean
12 of nine months.

13 DR. POHLAND: They were examined blind?

14 DR. PAIGEN: They were examined blind, yes.
15 I had a physician transport them to the lab, the
16 neurology lab in Buffalo and the neurologist did
17 not know who was who and we told the participants
18 not to say, not to talk about their Love Canal
19 problems. So, yes, they were measured blind.

20 DR. POHLAND: Who are the controls?

21 DR. PAIGEN: Do you remember my first map
22 where I had a Love Canal neighborhood and then I
23 had a little control area north of the same census
tract, north of Berkholtz Creek, that is where the

1 control in this particular study came from and the
2 ecumenical task force was very helpful in helping
3 me get that neighborhood talked to and the controls
4 in and so forth.

5 We then measured the children. Now, this
6 was in September and October of 1980. Now, the
7 relocation had occurred in May. Some of the Love
8 Canal children had been out, some of them hadn't
9 been out. Some of them had been sent to summer
10 camp and moved back in.

11 On the next page, which is Table 5, you
12 will see how many kids had nerve conduction
13 velocities that were about one standard deviation
14 below the mean which here is the ulnar is lower
15 than 38 meters percent and for sural lower than
16 40 meters percent and you can see that the 42
17 children who had not been out of Love Canal for
18 the summer were the ones who were most likely to
19 have low nerve conduction velocities and that those
20 who had been out for awhile either just a few weeks
21 or a few months looked pretty good. Now, there
22 were ten children who moved out immediately as
23 soon as the relocation was offered and stayed out.
Five of them were low. These families, I went back

1 and looked for the people who felt they were very
2 affected, I mean, two of these five had a child
3 with severe learning problems and two birth defects
4 and the mother was convinced it was all Love Canal.

5 So, some of the worst ones were the ones
6 who moved out for the entire time, moved out
7 immediately.

8 The next page is, this is just---I am
9 sorry these aren't done very professionally but I
10 was doing them up just to give you an idea of the
11 difference. This is a nerve conduction velocity
12 just plotted in these 200 foot wide bands and you
13 can see that most of the low nerve conduction
14 velocities were with kids that were close to the
15 Canal and there really was not very much lower
16 values once you got a little bit away from the
17 Canal. Now, remember, this was done in '80. So,
18 already some time since the cap had been covered.

19 On the next page you will see the analysis
20 of variants for the ulnar and sural nerve conduc-
21 tion velocity and you will see that the most
22 significant variables were born and raised in Love
23 Canal. So that is long term exposure and the
distance, the summer residents had some, and living

in a wet home did not have very much.

1 So, that's the data now. I think what
2 this data says to me is that when you are thinking
3 about habitability, that doing risk assessments on
4 some selected sets of chemicals that you know a lot
5 about is not maybe the right way to approach the
6 issue of habitability in a neighborhood where there
7 is exposure to 250 chemicals, where you don't
8 know anything about a whole lot of them and al-
9 though you select the chemicals with the best
10 chemical properties, it's just really a very inade-
11 quate data base and we really don't know if we are
12 getting the right chemicals that are causing these
13 problems and we really know nothing about the
14 synergism and to me, really trapping voles might
15 be a much more sensible way to determine habit-
16 ability than to rely on some kind of risk assess-
17 ment where we just have so much lack of information.

18 DR. DAVIS: I actually suggested that a
19 couple of months ago and apparently New York State
20 did some studies in 1980 but I gathered that there
21 was not anything done since then and it seems to me
22 that it would make good sense to use the animals
23 as sentinals rather than sending people in.

1 DR. PAIGEN: It seems to me that is a more
2 sensible approach based on what I have done. I
3 feel, let me just give you my opinion now, after
4 sort of my experience with this data base and my
5 opinion is that the boundaries of Love Canal were
6 chosen out of political reasons and I don't think
7 all of those people were affected. When you take
8 the far group not in wet homes, I don't think there
9 was probably very much exposure there and if they
10 are any different at all from controls, I think
11 that is probably from going to those schools but I
12 do think that we have evidence that the homes that
13 were closer to the Canal and that were wet did have
14 some exposure. That can't be described by just
15 going to the school.

16 Now, is the remedial construction solving
17 that problem? Because there is no question that
18 putting that clay cap on and intercepting the flow
19 of chemicals into the neighborhood did something.
20 I mean, I have been up there a lot and it just
21 smelled. It did reduce exposure. So, did it reduce
22 it in the wet homes? Well, certainly it has barred
23 any further flow to the wet homes but the chemicals
that are already there, remedial construction did

1 nothing to remove them. Some of them will get
2 removed. I mean, I would think that things like
3 chloroform and benzine would get removed by the
4 processes of evaporation and so forth over time but
5 I don't think others will, like lindane and dioxin
6 and so forth, and just give me one more minute,
7 and the close homes, I think close is a little more
8 difficult because you can't tell how much was going
9 into the Canal and how much, how many chemicals
10 were coming out from the Canal, but the fact that
11 the voles in 1980 were ill and that the nerve
12 conduction in 1980 for children had a closeness
13 factor. It says that in 1980 that the rate, there
14 was still some chemicals out there close and the
15 only way to tell is more voles or something like
16 that; yes, Doctor.

16 DR. UPTON: Like yourself, I have devoted
17 my career to laboratory research and I am sympathetic
18 to the view that animal studies can tell us some-
19 thing. I have not studied voles. I am aware, as
20 you point out, that in the wild, animals die
21 primarily as a result of predation and I am wonder-
22 ing to what extent the survival of voles in the
23 Love Canal area reflects predation primarily and

1 not chemical toxicology. I am asking a question,
2 if the area is uninhabited, is the population of
3 predators such as to reduce survival more than in
4 a neighborhood where people are living and keeping
5 predator populations suppressed? I don't know the
6 answer.

7 DR. PAIGEN: Well, they are called cats.
8 That is probably the major thing.

9 DR. UPTON: Well, yes. I'm not arguing
10 because I don't know.

11 DR. PAIGEN: No. I think that these are
12 very good questions. I think they can be answered
13 by different study development. Let's not look to
14 density so much. Let's look at some other things
15 like organ pathology. Let's look at some
16 laboratory raised voles put in a pen with a cover
17 so you can't get a predator and look at what
18 happens to them. I think predation is one way.
19 I think if there is an effect on the nervous
20 system, then reduced ability to run away from the
21 predator would be a factor. I think there is the
22 effect on the thymus which shows an effect on the
23 immune system so the predators are not only the
animal predators, there are the parasitic like

1 bacterial. So, I think the way to answer the vole
2 study, there are people who know voles intimately.
3 I mean, the voles don't have a big range. They
4 are a quarter of an acre is what they are. So, in
5 the spring when they spread out, I think it's
6 possible to do a good vole study in Love Canal, and
7 in fact, Jack Christian has money from EPA to do
8 the study but he can't get permission from the
9 state to do it.

10 DR. DAVIS: There have been a number of
11 studies published which generally support the notion
12 that the voles that have been found closer to the
13 Canal area are a lot less healthier than the ones
14 outside of it. I would say with respect to this
15 notion that predators may differentially consume
16 the healthier voles, it sort of flies in the face
17 of conventional Darwinian thinking which does
18 apply to animals and that is that usually the
19 fittest animals survive and the weaker ones are
20 less likely to survive because by being weaker,
21 they are more vulnerable to attack. So, I'm not
22 so sure. Your point is a good one but I think we
23 ought to look at that.

DR. UPTON: I am not arguing that the

1 difference is solely predation but I raise that
2 question. In order to interpret the data, one needs
3 to look at factors other than chemicals.

4 DR. PAIGEN: I couldn't agree with you
5 more. Density and survival time, is not the way.
6 Building a pen and looking at what happens over
7 time to laboratory raised voles is better. Of
8 course, I should say that even if we saw an effect
9 in voles, that doesn't mean it's safe for people
10 because voles burrow in the ground and they eat
11 the local vegetation and they are much more exposed.
12 But I think if the study was done and the voles
13 were perfectly healthy, then you would feel one
14 way about the habitability. If they weren't
15 healthy, it wouldn't tell you it was habitable but
16 it would at least give you some information about
17 what---you could do it again the next year and see
18 what is happening over time and it's, to me, much
19 simpler and easier than environmental monitoring,
20 massive environmental monitoring, where the logis-
21 tics causes problems. I just can't help thinking,
22 when I was at Roswell Park we had something right
23 across from my office, a group of three people
making interferon. When interferon got hot, they

1 added 27 people to the group and their production
2 a year later was the same as the three and the
3 disasters and the breaking glass and the shrieks
4 that I heard through my office, that is the kind
5 of thing that I suspect went on at the EPA on the
6 New York State studies when they went from being
7 a laboratory that did small samples very carefully
8 to measuring thousands, and I just had questions
9 about that data. .

10 CHAIRMAN WELTY: Thank you, very much,
11 Dr. Paigen. You have been very helpful.

12 DR. PAIGEN: You are welcome.

13 CHAIRMAN WELTY: This has been very
14 helpful and you have give us a lot of food for
15 thought.

16 We will take a ten minute break and
17 reconvene at 11, please, in the other room.

18 (Whereupon, the above proceedings were
19 reconvened in the adjoining room after a ten
20 minute recess.)

21
22 CHAIRMAN WELTY: We will reconvene now.
23 We have a lot of items to cover. Dr. Huffaker

1 would like to go over some unfinished business from
2 the last meeting. So, I will turn the floor over
3 to him at this time.

4 DR. HUFFAKER: This will be brief. I
5 gave you a handout and it had three questions and
6 answers on it. The questions arose at our last
7 meeting, could the state sell the houses in the
8 declaration area with an agreement to repurchase
9 at the original purchase price at the new owner's
10 option at some unspecified time in the future.

11 We talked to counsel about it and counsel
12 said, yes, but there would be some administrative
13 problems of how to set up an entity that would be
14 empowered to do this and our request to you is
15 if you feel this is desirable, recommend it to us
16 in your final recommendation.

17 Can the state follow up the health effects
18 studies? The answer to that is yes, we will
19 maintain the registry. We solicit your recommenda-
20 tions regarding any follow-up, whether it's death
21 registry, the cancer and deaths or whatever, we
22 are probably going to need some funds to do this
23 and, again, we would solicit your recommendations
to support our request for the funds. We are

going to need to do this.

1 Can the state establish a Love Canal
2 data information center at the Canal to permanently
3 maintain the records. We think this is a good
4 idea. We talked with the DEC and that was included
5 in the original habitability criteria draft that
6 went out to you and that was the line on page 15
7 that was marked out. The DEC said that was totally
8 impossible. I would suggest putting it in the
9 expanded area there at the treatment plant. They
10 said that was impossible. That was a restricted
11 area, that it would be in the men's changing room
12 would be the only possible place and they didn't
13 have anyone who was a plant operator who would be
14 a good person to take care of it but the suggestion
15 was that we approach the City of Niagara Falls, the
16 library or perhaps the city record center or some-
17 thing of that sort to find out if there was a place
18 where this document, copies of these documents
19 could go so they would be available. We were
20 asked to prepare a history of Love Canal. That was
21 from the panel meeting before last and you have
22 that.

23 DR. CHALMERS: Where do we have that?

1 DR. HUFFAKER: That is in the pile of
material that was on your desk.

2 We were also requested air data from the
3 schools and that is in the handout, the long
4 tabular one, and this is on the 91st, 93rd and
5 99th Street school.

6 I gave you a copy of Dr. Pohland's letter,
7 a copy of Dr. Davis' letter and George Eden had
8 some comments on Dr. Sipes' selection of chemicals
9 and I have given those to Dr. Sipes and we are
10 Xeroxing them and we'll have them to pass out to
11 everybody shortly but I didn't get that until I
12 was going out the door yesterday and we also have
13 copies of Dr. Silbergeld's paper which I received
14 about the same time at the last minute, and she
15 also sent copies here that we have.

16 There was a request for information show-
17 ing which houses were vacant and I believe this is
18 the map. This is the occupied, new and occupied
19 homes in the declaration area.

20 There was a question as to what the
21 design criteria was for the cap and the drainage
22 system, was it a ten year storm or a fifty year
23 storm or a one hundred year storm and the DEC is

digging and I don't have that information yet.

1 Any questions?

2 CHAIRMAN WELTY: Thank you. The next
3 item on our agenda is to begin going over the
4 criteria document which was drafted. I would just
5 like to say a little bit about how this was done.
6 We read through the written comments and took into
7 consideration the information that was discussed at
8 the last several meetings in preparing this and I
9 hope that we were able to accurately reflect, at
10 least for our first cut, the feeling of the consul-
11 tants that are working on this project.

12 I would like to go through this now and
13 deal first with the methodology and then later on
14 this afternoon with how these criteria might be
15 able to be applied because I think the methodology
16 may help us decide how we would apply these
17 criteria.

18 So, just to get your feedback, let's start
19 off the introduction and definition of habitability
20 and I would like---

21 DR. DAVIS: I would like to make a comment
22 prior to that. I think that the recent events
23 suggest that we should have, as with some documents,

1 a prologue that states what things we are presuming
2 will be the case as, for example, that the committee
3 considers it important that there be continued
4 efforts to advise the community in advance of any
5 actions and that if that doesn't happen, then all
6 these criteria really mean nothing. They become
7 irrelevant because they presume that people are
8 acting in good faith and are going to be able to
9 have access to information.

10 CHAIRMAN WELTY: Would you suggest that
11 we expand the section 8 on page 15 to include that
12 where it deals with community involvement?

13 DR. DAVIS: I think it has to come first.
14 No, I think it has to come kind of first, so to
15 speak, that without that I, for one, really don't
16 want to waste my time on the details of these
17 things. It really seems to me that without assuming
18 that there will be a responsive governmental role
19 on all parties, I mean, I think---

20 DR. STOLWIJK: Devra, I couldn't agree
21 with you more. I would like to actually specificall-
22 ly suggest that we have a preamble that says that
23 in this particular occasion as in many other
occasions, the public is very directly involved and

1 had been very directly involved in the ongoings
2 at the site. The public has now become involved
3 both directly in terms of the effects and in terms
4 of worrying about the consequences of any action.
5 As a result, it is now not up to officialdom to
6 decide that now the public doesn't need to know
7 any more. I think it's the public that will tell
8 you whether it now doesn't care any more but I
9 think that until the public actually lets you know
10 that it's happy and doesn't care any more, I think
11 the public needs to remain informed of everything
12 that goes on. I think that is a condition. I
13 think that we ought to have that on the first page.
14 It's a realization that I think doesn't seem to be
15 shared by everybody yet.

15 DR. DAVIS: And we are sympathetic to the
16 problems that the CDC has had, the Health Depart-
17 ment has had. Obviously, the fact that the DEC is
18 not here today speaks for itself but it makes it
19 extremely difficult. I, for one, would have a
20 number of questions based on materials that the DEC
21 generated about sampling protocols and whatnot
22 that I cannot get answers to today and I think that
23 we will find it difficult to proceed and really

1 recommend anything if---I believe I have talked to
2 a number of people on the panel, that some small
3 preamble statement about the importance of there
4 being this continuing effort is essential at the
5 beginning.

6 DR. POHLAND: I think a reiteration of the
7 process that we as a panel were led to understand
8 with regard to the coordination of this whole effort
9 may be pertinent too. I see this thing collapsing
10 all of a sudden for some reason and we are not
11 getting very informative responses with regard to
12 why this is occurring.

13 I would also say that I am rather dismayed
14 that the DEC is not represented here today either
15 because certainly if they are going to explain the
16 most recent occurrence this coming week, I think we
17 should be deserving of a similar explanation as to
18 how this past occurrence has happened and why, in
19 some respects, we are not getting the kinds of
20 freely shared responses from DEC and perhaps we
21 could, since certainly in this event EPA was
22 involved, perhaps we could invite some response from
23 the EPA representative that is here today.

CHAIRMAN WELTY: Bob, do you want to

address that particular issue?

1 MR. OGG: Sure.

2 CHAIRMAN WELTY: Bob is from our regional
3 office of the EPA covering this letter.

4 MR. OGG: I am also on the technical
5 review committee and I am the chairman of that
6 committee when the chairman is unavailable to act.

7 I think we need to know your concerns in
8 some detail because it bothers us that you are say-
9 ing you are not getting answers to questions.
10 Sometimes you can't get answers because we don't
11 have them or they are impossible to give, but if we
12 can answer them, we should.

13 The handling of the announcement of the
14 disposal of drums was not in accordance with the
15 public participation program that the committee
16 presently has, nor is it likely to be in concert
17 with the public participation program that we will
18 ultimately develop. I think at this point I would
19 just like to mention that there is a coalition of
20 groups from this area who have worked very hard
21 and prepared an outline of a program that they
22 would really like to see implemented. They have
23 submitted it to the technical review committee and

1 they have submitted to anyone from the public to
2 comment upon. The DEC, as part of this committee,
3 should be participating equally as well as everyone
4 else in that program and the EPA should, just as
5 everyone else here has been.

6 I think simply we have made a mistake.
7 The work that was proposed was not announced cor-
8 rectly. We stopped that work. There will be a
9 meeting held next week to explain what it was that
10 we want to do and to receive comments and allow
11 people to effect the decision at that time.

12 DR. DAVIS: What is the mechanism by which
13 decisions are made and actions are taken with
14 respect to the monitoring and other arrangements
15 around the Love Canal? In other words, specifically,
16 what is your charge of responsibility? Who is the
17 operating officer? Who is the CEO? What one person
18 is in charge of what goes on at Love Canal and
19 therefore is the person responsible for coordinating?

20 MR. OGG: There are typically in government,
21 there are several levels of review and several
22 levels of responsibility. We are operating---the
23 coordination of this overall program via committee
approach and I think as I have said before---

1 DR. DAVIS: Who is the chairman of your
committee?

2 MR. OGG: Excuse me, I think I have said
3 once before that that would have been the last
4 option that I would have selected to run a project
5 but in the government, that is probably the one we
6 are stuck with. The chairman of the technical
7 review committee is Mr. William Labrese. He is my
8 supervisor at EPA and the regional office of the
9 EPA.

10 DR. DAVIS: Did he make this decision?

11 MR. OGG: The technical review committee
12 has one function. They do not necessarily make
13 every decision on the remedial project. There are
14 various levels of responsibility. The remedial
15 program at the Canal is being conducted under a
16 cooperative agreement that has provided federal
17 funds to the State of New York. Under that agree-
18 ment the State of New York and specifically the
19 DEC is responsible for all day to day activities of
20 that project. The EPA's role is to insure the
21 appropriate expenditures of our funds and that the
22 overall concept of the program meets with our
23 requirements and our thoughts but the day to day

1 activities, because of this agreement, is the
2 responsibility of the DEC.

3 DR. POHLAND: I guess my response to what
4 you said is this: I think it's rather inconceiv-
5 able that when we have made it public that we
6 believe that habitability criteria must be
7 inextricably linked to remedial actions taken now
8 and in the future, that we would be not apprised of
9 things that affected remedial action.

10 Now, I get a feeling that the agency, I
11 guess DEC in this case, has taken it upon them-
12 selves to judge the relevance of our request and
13 as a consequence, I find some dissatisfaction with
14 my inability to freely share with them their
15 thoughts and their plans for remedial actions.
16 We were given today a bunch of documents that
17 suggested the remedial action part of the drum
18 disposal, the tank disposal, and for that matter,
19 I guess in that same scenario, all the sediment
20 disposal and everything may well be earmarked for
21 the Canal, for the Canal site.

22 I can't understand why we weren't apprised
23 of the plan and I find it rather, even worse,
because suddenly we were alerted at the last minute

1 that in fact the plan was almost ready to be
2 implemented without---I am concerned that CDC
3 apparently didn't know about it. I am not sure the
4 Department of Health knew about it. I'm not sure
5 you knew about it.

6 MR. OGG: Okay. I think your complaint
7 is valid and it was an inappropriate action to have
8 taken not to inform you. Frankly, we are more con-
9 cerned that the community was not informed than
10 you were not informed. The EPA's point of view,
11 that was---

12 DR. POHLAND: Well, don't diminish my
13 sensitivity for the community by that statement.

14 MR. OGG: But I am saying we view it as a
15 dual problem. That was not informing the working
16 of this group of consultants and not informing
17 members of the TRC but most importantly we didn't
18 tell the community in an appropriate manner as we
19 said we would. We stopped the work. We are trying
20 to correct that situation.

21 DR. POHLAND: Okay. Getting back to our
22 dilemma, though, we are trying to develop our
23 decisions based upon our perceived credibility that
we can place with the operating agency. I must say

1 that some of that credibility has been tarnished
2 and I guess I am searching for a mechanism to
3 encourage that agency to be more forthright with
4 us so that we know what the plans are and then can
5 ask the proper questions. I am confronted with the
6 problem of getting only answers when I ask the
7 questions. I would prefer to have them come forth
8 and tell me about things and then we could enter
9 into a dialogue. I am concerned about the sediment,
10 the whole sediment issue is a crucial issue as far
11 as I am concerned with regard to ultimate disposal,
12 to what the implications are with regard to the
13 Love Canal site as being a repository for those
14 materials.

15 Now, I have asked for information about
16 permitting circumstances, both now and in the future
17 and I have gotten absolutely no response.

18 MR. OGG: Maybe some of your questions
19 have been funneled through to the EPA. I was asked
20 to be prepared for the meeting next week so that
21 all those answers could be responded to for the
22 community's benefit. I can't answer obviously the
23 other questions today. I am not prepared to do
that. We are aware of those questions. I doubt

1 that your questions are much different in regard
2 to permitting and legalities than many people's.

3 CHAIRMAN WELTY: What kind of assurances
4 can we have or can this group have and this
5 community have that this particular situation will
6 not recur?

7 MR. OGG: That is a very difficult ques-
8 tion, Tom. I mean, we can sit here and promise
9 things. People have heard that too many times in
10 the past. So, I don't think that is particularly
11 worthwhile. It is an issue that should be on the
12 agenda for the next committee meeting to make sure
13 that happens. I'm not sure that there are legal
14 mechanisms to compel someone to do a particular
15 action on this project. I think I can only say
16 that it's my sense of understanding both within the
17 EPA regional office and with the EPA headquarters
18 that this project will be run in an open manner
19 and that we are, in fact, upset about this last
20 mistake and want to make sure that we correct that
21 situation.

22 DR. CHALMERS: I can understand your
23 concern about the bad handling of the public. I
can't understand where we fit in your decision

making process.

1 MR. OGG: To a large extent, you are
2 advising these folks and they are advising us.
3 You are equal partners in this who are in the
4 project clearly. I don't want to diminish that in
5 any way and I am sure that---

6 DR. POHLAND: Now, who are the "we fellows"
7 and who are the "uses"? Now, I thought you were
8 one and the same there for a moment but now I see
9 there is a difference.

10 MR. OGG: Let me get to that to try and be
11 more responsive to what you just said. I don't
12 want to diminish the fact that I think it is
13 incumbent upon the Environmental Conservation
14 Department and the EPA to insure you are fully
15 informed of any activities that are planned or even
16 considered for the Canal. We will work to correct
17 that so that you are fully aware. The "thems" and
18 the "uses" are two halves of the committee. The
19 committee is comprised of four agencies who are
20 trying to coordinate their activities. Two of the
21 agencies are related, are health agencies with
22 expertise related to the health and the other two
23 agencies are the environmental agencies. It was

1 not my decision nor did I even have the capability
2 to say how we should set up this particular
3 aspect of the program. Dr. Huffaker and Mr.
4 Vandermeer did that.

5 DR. POHLAND: But you are in this group
6 together.

7 MR. OGG: We are coordinating the agency's
8 efforts.

9 DR. POHLAND: But that is who I thought
10 we were advising.

11 MR. OGG: You are but you are advising
12 through the Department of Health and through the
13 Center for Disease Control. Frankly, I don't
14 think that is a significant difference, at this
15 point.

16 DR. POHLAND: Yes. I guess being the
17 only engineer in the group, I am concerned about
18 the separation between what I conceive to be the
19 technical aspects and the everyday operational
20 aspects, maintenance, and the health aspects and I
21 thought they were merged somehow.

22 MR. OGG: Well, they are supposed to be
23 and the point is well taken and I agree with your
point. They are to be coordinated and complementary

1 to one another. That is true and obviously you
2 are having some difficulty in getting answers to
3 the aspects of this problem that you are assigned
4 or agreed to undertake and the only people who can
5 give you those answers are people from my agency,
6 people from DEC. So, all I can say is we will
7 correct that situation and get you the information
8 you need.

9 . CHAIRMAN WELTY: Thank you.

10 DR. STOLWIJK: Could I comment on that,
11 because I am getting more disconcerted by the
12 minute.

13 DR. CHALMERS: So am I.

14 DR. STOLWIJK: This group of people has
15 come here in order to try and be helpful. Now, all
16 of us I think take what we do very seriously and we
17 feel very responsible about what is going to be
18 done with any pronouncements that we utter. This
19 course of events in the last week, we have been
20 uncomfortable about communications before. This
21 course of events in the last week I think to me
22 indicates that whatever we say will have to be
23 predicated on stated assumptions about administra-
tive mechanisms that we thought were there but

1 clearly are not there. It is clearly possible for
2 parts of your combine to act independently and get
3 away with it. They can get slapped on the fingers
4 for it later but there is no administrative mechanism
5 to actually even bring about what the TRC does
6 because things can clearly be withheld from the TRC
7 and people can't act without getting the advice and
8 consent of the TRC.

9 That means that whatever we do, if we are
10 to produce anything, will have to be conditioned on
11 an administrative mechanism that makes quite sure
12 that that can't happen again and that will have to
13 mean a drastic revision of the administrative
14 arrangements that are now in effect.

15 MR. OGG: I'm not sure I agree with the
16 severity of what you call the drastic measures or
17 total lack of coordination in communication but
18 there is a problem. This incident has brought
19 that problem forward to everyone.

20 DR. STOLWIJK: Well, if I was the chairman
21 of this technical review committee, I would resign
22 or something.

23 DR. CHALMERS: Who is the chairman?

MR. OGG: Mr. William Labrese is my

1 supervisor of the EPA. He is the district
2 director within the regional office. He is the
3 chairman of the committee.

4 DR. DAVIS: Was he aware of this before
5 he read about this in the paper or was called by a
6 reporter?

7 MR. OGG: We were all caught short by the
8 fact that this announcement had not been made in a--

9 DR. CHALMERS: Could I ask if the Depart-
10 ment of Public Health knew about it?

11 DR. HUFFAKER: If we had been informed,
12 I had not remembered it. I was surprised when the
13 announcement was made. I talked to Norman about
14 it afterwards and he said that he thought it had
15 been discussed, some of the engineering plans,
16 earlier. If that is true, I didn't remember it.
17 I was surprised when the announcement came out.

18 DR. CHALMERS: So, the Commissioner didn't
19 know it.

20 MR. OGG: Just to clarify what I just
21 said, I was telling you that I am aware. I have
22 been aware of this drum disposal issue for awhile
23 but I was not aware it was not announced.

DR. DAVIS: Well, there is also, having

1 just briefly skimmed through the communications,
2 there are a couple of inconsistencies here that I
3 think for the record might be noted and that is
4 that the June 14th, 1983 letter from Don Clay
5 who was director, I guess, of the dioxin task force
6 at EPA headquarters, refers to three recommenda-
7 tions for the disposal of the dioxin. The first is
8 that the liquid should be placed in the leachate
9 treatment system for Love Canal, the drums should
10 be buried under the capsule of the Canal, and
11 samples should be undertaken. That was a June 14th
12 1983 letter to Norman Nosenchuck following conversa-
13 tions and prior to that there had been directions
14 that the drums should be overpacked and the photo-
15 graphs we saw of those drums, those are not new
16 drums, and they are not overpacked and I gather
17 that at the last minute there was a request from
18 Mr. Nosenchuck not to have---to overpack the drums
19 because the levels of dioxin would be "low." But
20 low wasn't specified.

21 Now, I would like to know what low levels
22 of dioxin means. Further, with reference to the
23 free liquid in the drums being decanted and sent to
the Love Canal leachate treatment plant for

1 treatment by an absorption on activated carbon,
2 where do these filters go when they are spent?
3 What plans are there for that? That is referred
4 to in a June 24th, 1983 letter from Norman
5 Nosenchuck.

6 MR. OGG: We haven't reached that.

7 DR. DAVIS: I'm glad. Some of us know the
8 answer to that question but in an October 6th,
9 1983 letter, Nosenchuck says the drums will be over-
10 packed and they will be placed in an area where
11 there is no competing or incompatible waste and
12 yet November 3, after a phone conversation, they
13 say, November 3, 1983, Norman Nosenchuck says it
14 will not be necessary to overpack the drums since
15 it is anticipated that the concentration will be
16 very low but again, very low is not a satisfactory
17 phrase for a group of scientists that are reviewing
18 the situation and it also seems that the written
19 directions up until that letter were for overpacking.
20 Overpacking refers to taking the drum and putting
21 it in another container that has material that will
22 absorb waste and contain it, because when the drum
23 does give way, and it seems that on the 30th
another notice was sent and until that point the

1 plan had been to put it in the Seacoast facility.
2 The Seacoast facility is a permitted landfill
3 facility in Niagara Falls but I guess on May 30th,
4 Seacoast refused to accept it, I would infer from
5 this letter, and then the decision was made to put
6 in into the Canal site.

7 There are a limited number of permitted
8 hazardous waste landfills in this country and I
9 realize that this is a difficult problem here in
10 apparently getting them to accept these wastes but
11 that needs to be fully discussed and disclosed to
12 those affected prior to, certainly, prior to the
13 construction and bulldozers and people coming in
14 moonsuits to engage in that.

15 MR. OGG: I absolutely agree with that.
16 I don't want to sit here and try to answer your
17 questions now because our problem has always been,
18 if I may, and I don't know everything, and if I am
19 making an inaccurate statement, I would be mislead-
20 ing some people and that is why, unfortunately, we
21 are, we were preparing to have all of these ques-
22 tions which are not only yours but many people have
23 raised the same questions, they are very good ones,
they are ones worthy of a decent answer and we are

trying to get those ready for a full discussion
next Tuesday night.

1
2 DR. DAVIS: And is the plan that then they
3 will go ahead with things? I mean---

4 DR. CHALMERS: That is the crux of the
5 matter. Is your thought a discussion being a
6 defense of your preconceived decision or are you
7 going to further explore the various options?

8 MR. OGG: My thought of the entire dis-
9 cussion is to present our thinking and our logic
10 behind what has happened at this point and to allow
11 people time to respond and criticize and comment
12 and to be sure that we take those comments into
13 consideration.

14 CHAIRMAN WELTY: Any other questions for
15 Bob before we move on?

16 DR. POHLAND: Well, I would just say
17 finally that I would hope that in the future if this
18 august group continues to meet, that the principles
19 involved in the various decision making processes
20 that they keep on talking about as something that
21 is going to occur in the future, would be available
22 to our group so that we could have some of these
23 questions answered forthright and not in anticipation

1 of something else. I really think it's---I don't
2 understand why we don't have a DEC representative
3 here today. I just can't conceive of that, particu-
4 larly under the circumstances because certainly what
5 is of interest to the local community is of interest
6 to us.

7 DR. CHALMERS: Have we had a DEC repre-
8 sentative at every previous meeting?

9 DR. DAVIS: Yes.

10 MR. OGG: I think so, at every one.

11 DR. STOLWIJK: See, the tragic part of
12 this whole event is that in fact the reconcentration
13 of things that have come out of the site and back
14 into the site is a very sound and suitable way of
15 managing a problem of disseminating stuff and putting
16 it back where it came from and containing it better
17 than it had been before. The action that had been
18 taken may have robbed you of that alternative. You
19 see, you may have done yourself out of what
20 probably was the best opportunity of managing the
21 situation.

22 MR. OGG: I fully understand that and I
23 agree that could be the tragic consequence of past
events.

1 DR. POHLAND: But the future remedial
2 actions to fall into this same scenario, the
3 sediment clean-ups and everything, you know, I hear
4 suggestions thrown out but I would like to know
5 something more specific about what is going to
6 happen when this program is set into place.

7 MR. OGG: As to the organization for
8 implementing any long term activities.

9 DR. POHLAND: The organization and what
10 seems to be the priority way of doing something,
11 because certainly if you are going to deal with a
12 sediment, you have to take them somewhere and I
13 suspect the top notion right now of what is going
14 on is that they are going to try to deal with it on
15 site. Now, my question then to you at EPA is,
16 how do you deal with the transportation of hazardous,
17 presumably hazardous materials from one location to
18 another location for either storage or treatment.
19 I mean, what is your intent with regard to the
20 regulatory control of that site should that be the
21 solution of choice and those are the kinds of
22 questions I would like to get some more informative
23 answers on.

MR. OGG: Okay. I think some of those we

1 can't give you many of the answers because they are
2 not fully developed at this time. Obviously,
3 sitting and looking at the situation, the options
4 for disposal of the creek sediments are the same as
5 the options for disposal of these sewer sediments.
6 It's a similar situation.

7 DR. POHLAND: Except that the sewer
8 sediments are already on site. Well, okay. If
9 you are talking about the new ones, yes, okay.

10 MR. OGG: There is a difference between
11 the sewer sediments that have been on site for
12 awhile and they were drummed and have been drummed
13 for awhile. In our process, though, for the
14 ultimate disposal of any action, we have to have
15 conducted a feasibility study that evaluated all
16 alternatives. The study that was issued was not
17 particularly clear on the disposal issue because it
18 could not come up with anything definitive. They
19 had the same problems that everyone has had with
20 disposal of waste that may contain dioxin and
21 labelled Love Canal. We all recognize that as an
22 issue but we need a full process simply to discuss
23 those disposal options with the community as well.
We are not pulling any wool over anybody's eyes.

1 An obvious option would be a similar solution as
2 was proposed for the drums. Of course, it's the
3 same types of materials.

4 DR. DAVIS: The ironic situation is that
5 what is going on in other less politicized hazardous
6 waste sites, they are being cleaned up and their
7 wastes are then being sent to interim permitted
8 RECRA facilities which are secured landfills.

9 MR. OGG: The interim is the only ques-
10 tion, the only word that bothers me there. There
11 are facilities that comply with the RECRA regulations
12 that are called having interim status.

13 DR. DAVIS: That's right.

14 MR. OGG: And there are others that are
15 fully permitted and fully comply with every require-
16 ment.

17 DR. DAVIS: A small number.

18 MR. OGG: Yes, that is true, a small
19 number.

20 DR. DAVIS: How many, approximately?

21 MR. OGG: Approximately ten. I'm not sure.

22 DR. DAVIS: In the whole country?

23 MR. OGG: In the country. I'm not sure
of that.

1 DR. DAVIS: I think that that is important
2 for the people to understand that, that with
3 respect to what you might call the Cadillac of
4 hazardous waste disposals in this country there
5 are fewer than 20 of such facilities.

6 MR. OGG: I know of two large active ones
7 that are right nearby, up here. This area is
8 blessed with a large percentage of those that have
9 been permitted.

10 DR. DAVIS: So, that is the dilemma.
11 That is common to all of us, that there is this
12 waste that needs to be disposed of but the details
13 of that are not what---we were not asked to get
14 into. We are a group of scientific experts who
15 were asked to advise on technical issues for
16 determining habitability. The reason why I repeat
17 that the first thing we have to clarify is what
18 administrative mechanisms will come into existence
19 to handle this is because once we go away, future
20 things will come up. There will be other questions,
21 and if there is not some built-in internal govern-
22 mental review process, then this can happen again
23 and I do not think that you ought to waste your
time and money on people like us at every step

1 along the way. You ought to simply set up a
2 process that has enough internal auditing that it
3 would work, and without that process I don't think
4 our advice will mean anything.

5 MR. OGG: I think that point is well
6 taken and the events of the past week exemplify
7 the problems that may exist. That in no way
8 denigrates, I think, the work that this group is
9 doing. I think it's very important and should
10 proceed.

11 DR. POHLAND: I guess I have to, you know,
12 I heard a little bit of a separation of these
13 health and technical issues again, maybe from what
14 you said, but we can't deal with the whole question
15 of habitability without having the assurances that
16 what is being done at Love Canal now and in the
17 future will not spoil the integrity of our
18 assumptions and most of them are going to, by
19 necessity, have to be assumptions, and it makes a
20 damn lot of difference if you are going to dump
21 all the sediments and the river cleanings in the
22 canal of if you are going to take them off, cart
23 them off somewhere else.

MR. OGG: And it would make a difference

1 whether it was a temporary situation placing them
2 in the Canal or a permanent situation and any other
3 alternatives, absolutely.

4 DR. POHLAND: And that is what we are
5 inviting the DEC to share with us. Let us hear
6 your thinking and show us how you are going to
7 manage it if you put it into place.

8 DR. STOLINE: What is the reason that
9 Seacoast cannot assume responsibility for these
10 materials?

11 MR. OGG: It's been pointed out that there
12 is probably correspondence existing between Seacoast
13 and the DEC that has not been presented. I am not
14 aware of what it says. It is primarily, it's my
15 understanding, the primary issue was that they
16 didn't want it as opposed to any other issue. There
17 may be plenty of other issues, I don't want to mis-
18 speak, and honestly, I can't actually answer your
19 question because I don't know.

20 DR. STOLINE: Let me ask you this question:
21 From the news media and the materials I have read,
22 apparently the most toxic material that is contained
23 in these drums is like 180 parts per billion of
dioxin.

MR. OGG: That is right.

1 DR. STOLINE: Does Seacoast accept levels
2 of contaminated materials higher than that from
3 other sources?

4 MR. OGG: I don't know.

5 DR. STOLINE: Because if the issue is it's
6 too contaminated and it's labeled a "hazardous
7 waste disposal site," and there are two such sites
8 in Niagara Falls, so the solution is we are then
9 confronted with burying it back in the area from
10 which it was taken and then we, this group, is
11 talking about moving people in and establishing
12 conditions under which it's safe to live around
13 an area that has materials put back in it that are
14 too dangerous for the most dangerous dump site,
15 it seems to me that this issue has to be addressed.

16 DR. MILLER: The point he raises is a
17 rather good one because what it comes down to or
18 may come down to is the case where the materials
19 are judged to be too toxic to be acceptable by a
20 toxic waste dump and, therefore, we are going to
21 bury them in a residential neighborhood.

22 MR. OGG: That is right. Unfortunately,
23 I wish I could give you the facts at this point.

1 I think there are probably other reasons they
2 wouldn't want it and not the fact that they felt
3 they couldn't handle it.

4 DR. CHALMERS: Who makes the decision
5 what they take?

6 MR. OGG: As I understand the process,
7 there are basic requirements placed upon them on
8 their operation in monitoring what they can and
9 cannot take but those are the outside limits.

10 DR. CHALMERS: What is the agency that
11 sets those?

12 MR. OGG: If they choose not to take any
13 of those, that is their business decision.

14 DR. CHALMERS: But what agency sets the
15 standards for them?

16 MR. OGG: At this point it is the Environ-
17 mental Conservation Department of the State of
18 New York.

19 DR. CHALMERS: The same department that
20 decided to put the material here?

21 MR. OGG: That is right.

22 DR. CHALMERS: Is responsible for their
23 acceptance of the material.

MR. OGG: The decision as to the appropriate

1 solution for the drums is a temporary solution which
2 has probably not been brought out. It was also
3 concurred upon, reviewed and concurred upon by the
4 EPA, whether it's 450 to 500 drums that we are
5 talking about. So, there is no mistake about that,
6 yes. The people who issue the permits are within
7 the same department as the people that are running
8 the treatment plant.

9 DR. CHALMERS: I guess I don't understand
10 enough to understand why that is a temporary solu-
11 tion. What would be done next with it to make it
12 permanent?

13 MR. OGG: No one has a good answer but in
14 general, all the decisions of dioxin disposal that
15 EPA is coming out with are labeled interim, labeled
16 interim, pending the possibility that there would
17 be final disposal facilities available in the future
18 that are not available now.

19 DR. CHALMERS: By "temporary," you mean
20 they might be dug up later and transported?

21 MR. OGG: Yes.

22 DR. CHALMERS: After they have rusted
23 through.

MR. OGG: Perhaps.

CHAIRMAN WELTY: Thank you, Bob, for your
1 comments and I just think it's important at this
2 point to perhaps state what I see as the options
3 for our consultants at the present time. The first
4 option would be to go ahead and state the criteria
5 as we have in the draft document. The second
6 criteria or the second option would be to try to
7 define some sort of a coordination process that you
8 have alluded to in terms of being an important
9 factor and then state the criteria. The third
10 option might be to state at this point that
11 coordination is so uncertain that you feel it's
12 too dangerous to make a criteria statement at this
13 point and more or less disband the group.

14 So, I would just like you to get some
15 feedback at this point on how you want to proceed
16 in terms of the criteria.

17 DR. DAVIS: Maybe we should discuss those
18 three options each in turn, and if anyone has any
19 comments on them and with reference to the three
20 options, would you just repeat those?

21 CHAIRMAN WELTY: I will reiterate the
22 options. The first would be to state the criteria.

23 DR. DAVIS: Proceed.

CHAIRMAN WELTY: Proceed. The second is
1 to try to define what you feel to be a reasonable
2 coordination process, a necessary coordination
3 process and then state the criteria. The third
4 would be to state that the coordination is so
5 uncertain that it's dangerous to make a criteria
6 statement at this point.

7 DR. STOLWIJK: I think option number three
8 basically says let's all go home and forget the
9 whole thing. I think we have all got a little too
10 much invested in this.

11 DR. POHLAND: Furthermore, I don't think
12 the problem of coordination necessarily precludes
13 us from coming to grips with the criteria. I think
14 that built into the criteria will be some provisos
15 that we have to place there in view of circumstances
16 and uncertainties and so forth, not unlike what we
17 have done the first time around, I guess, and hope-
18 fully this time around we can be more geared to all
19 the sensitivities of the issues that prevail.

20 I thought last time we were moving toward
21 a consensus on criteria which I hope this movement
22 still exists, notwithstanding the present problems.
23 I am a little bit concerned, I guess I have got a

1 copy that somebody wrote something on this, a copy
2 of this criteria about some responses to some of
3 our basic notions with regard to criteria. For
4 instance, there is a sub-item C on page 13 which
5 has to do with basically this issue of management
6 protocols and responsibilities and it bothers me a
7 little bit that there is a comment written there
8 saying that DEC feels this is excessive, exceeds
9 charge. Now, if indeed that is the case, I think I
10 agree with your third option. I'm ready to go home.

11 You know, I guess I'm wondering whether
12 the tail is wagging the dog at this time, you know,
13 if we are going to have a censorship of our
14 provisions as we go along. I don't find that a very
15 rewarding occupation.

16 CHAIRMAN WELTY: Bob, do you want to
17 comment on this issue related to page 13, item C,
18 where you notated, DEC feels this is excessive and
19 exceeds the charge, in relation to what the response
20 of the consultants should be in that regard from
21 the state's point of view?

22 DR. DAVIS: Excuse me just a second,
23 Dr. Pohland.

DR. POHLAND: Well, I think I know what my

1 response is. I'm just wondering why such a policy
2 position on the part of DEC should even be allowed
3 to enter our deliberations at this time. I would
4 hope that we could set criteria that can be
5 defended by this group and then ultimately used by
6 the state to make their decision. Now, if they
7 choose to go contrary to our criteria, so be it,
8 but I feel a little bit intimidated in this forma-
9 tive process by statements coming back at us from
10 the operating arm of this activity telling us to
11 stay out of this and stay out of that and don't
12 presume to have influence on this and so forth and
13 I guess it all comes together in the same feeling
14 of uneasiness that I have about the agency I think
15 that is going to be inevitably required to imple-
16 ment all of this activity.

16 DR. STOLWIJK: I think that perhaps we
17 should go with your option two which is that it is
18 necessary to add to our criteria for habitability,
19 our understandings of the organization of the
20 maintenance of the site and who is responsible and
21 how it's organized. That clearly is necessary.
22 Now I think it has been demonstrated that one of
23 the necessary criteria that we need to indicate

1 is that such an organization be identified with a
2 clear path of responsibility and with clear res-
3 ponsibility to the community.

4 DR. HUFFAKER: You had asked some ques-
5 tions which I responded to earlier and two of them
6 I said if this is what you wish, you should so
7 recommend and we will proceed in that direction.
8 We need your support to help us and on this
9 particular thing, if there is a problem here and
10 it's been called to our attention, then I think
11 the recommendation about how it should be managed,
12 the remediation or the continuous operation of the
13 plant and so forth would be inappropriate recom-
14 mendation to make. There is a point of contention
15 here.

16 DR. POHLAND: Yes. I think maybe our
17 intent is being misunderstood by the DEC. We are
18 not trying to interfere with the technical solutions
19 that they pose to implement but what we are trying
20 to indicate here I think is that nowhere have I
21 seen compelling evidence that the procedures,
22 protocols are so well established that I get the
23 same answer from each person I ask the question
and that has been the reason why I have taken special

1 efforts to visit the treatment plant, to talk to
2 the operators and visit the sites with remedial
3 action and I frankly must admit that there must
4 indeed be an absence of a recognized, routinely
5 utilized protocol of management and that is what I
6 am after. I want to know who is responsible for
7 what and how the decisions are made and even more
8 importantly, should something happen, who decides
9 what is going to be done and I get a lot of kind
10 of evasive answers.

11 I think that my intent is also misinter-
12 preted with regard to my interference with the
13 established structure. I am not trying to interfere
14 with that structure. I am trying to suggest that
15 in order for this thing to be palatable as far as I
16 am concerned, maybe as far as the community and the
17 rest of the panel is concerned, that we have to
18 receive the assurances that these things are in
19 place and will remain in place, in an effective
20 manner in the future, and frankly, just from a
21 technical aspect and I intentionally stayed out of
22 the health issues because that is not my area of
23 expertise, but the technical aspects are good.
The facilities are good but there isn't the kind of

1 operational and maintenance control that I would
2 have expected to see commensurate with those facilities.
3

4 DR. HUFFAKER: Could we prepare some
5 standards for our recommendations that would
6 incorporate your concern?

7 DR. POHLAND: Yes. You see, if I was to
8 design, and I have got to believe that it is out
9 there somewhere, if I were designing it, a treatment
10 system, part and parcel of my responsibility
11 for that design would be an operational manual
12 which all the operators know, they know what to do
13 here and there and in terms of some kind of contingencies
14 that may arise and everything and I couldn't
15 elicit that out of the people. You know, maybe it
16 was there at the beginning but it sure as heck isn't
17 very active right now and I don't propose to be so
18 bold as to suggest that I can write a better manual
19 on the operation of that plant but certainly when
20 that plant was designed and put into operation,
21 these aspects were dealt with.

22 Something similar must be a companion
23 item in my opinion as it relates to all remedial
actions and I see a certain amount of inconsistencies

1 with regard to who is doing what and who is going
2 to be responsible and how issues are going to be
3 dealt with as they arise and so forth and it
4 relates to this whole management thing that we are
5 emphasizing and I want to make it a matter of record
6 that I am not intending to try to interfere or
7 maybe suggest that the engineers and scientists
8 that are involved in this whole thing are not
9 capable or not doing their job in a professional
10 way. It's just that the problem of being assured
11 that we know with regard to our decisions, that
12 these people are identifiable, they know what the
13 protocols are, they know how to respond under
14 emergencies, they know what is to be delivered to
15 the public as in the planning stage or in any kind
16 of activity and they are not inundated by policy
17 decisions that are certainly vague to me and I
18 think are vague to some of the operational
19 personnel.

19 Now, the circumstances of the whole Love
20 Canal situation makes people reluctant to talk
21 freely about it but simply from a technical aspect,
22 there are things, items that have to be there and
23 they have to be visible and they have to be available

1 before I can be comfortable about the implementation
2 of a decision on habitability.

3 CHAIRMAN WELTY: From a health point of
4 view I just want to say that we appreciate these
5 recommendations and I also support them and would
6 like the group to consider what Dr. Stolwijk has
7 proposed in terms of the coordination process in
8 stating the criteria. These issues related to
9 adequate remediation certainly need to be continued
10 in this document.

11 I would just ask you to think about what
12 additional measures should be taken to coordinate
13 the Love Canal remediation and how can we succinctly
14 state that coordination process in this criteria.

15 Also I wanted to mention that in terms
16 of the community involvement, Devra, I don't have
17 any problems moving that and strengthening that,
18 the first part of this document and will do so in
19 addition. So, I will try to incorporate your
20 thinking in that regard in the revision.

21 DR. DAVIS: Let me make it clear, though,
22 that I am really not speaking now as a scientist.
23 I think that it is not my scientific judgment per
se that is involved here. I think that as far as I

1 know, none of us is an expert in operations---well,
2 you may be an expert in operation research too, but
3 on the question of management and that is really
4 what is involved here. These are management ques-
5 tions and without a management system in place
6 that one can reliably depend on, then all the other
7 stuff that we would do becomes irrelevant. That
8 is my point and I am reluctant to get---I don't
9 want to see our work in vain but I am not sure how
10 we can protect ourselves against that when we are
11 not in a position to deal with the main players,
12 the major one of which is not even here today. I
13 don't know how we can---we can recommend it and
14 I certainly think that I guess there seems to be a
15 consensus of the group here, although we are
16 individual consultants, that most of the individuals
17 to whom I have spoken seem to agree that you need
18 a mechanism of management that you do not have and
19 that without that, we can't proceed.

20 DR. STOLWIJK: I have a couple of sentences
21 here that we can try to see whether that might
22 function, Tom.

23 CHAIRMAN WELTY: Okay.

DR. STOLWIJK: The foremost criterion

1 for habitability of the emergency declaration
2 area is the presence of an administration and
3 resource structure which assures that the maintenance
4 of the Love Canal site will be effective, continu-
5 ous and clearly accountable. Effective and
6 continuous maintenance should include a complete
7 public operation. No changes in procedures or
8 operations should be initiated without prior public
9 and local hearings.

10 DR. DAVIS: And I would add to that some-
11 thing that I think obviously from the---I appreciate
12 the difficult situation that Mr. Ogg is in but
13 obviously from his statements and those of others
14 here, there needs to be in addition an internal
15 mechanism within the governmental process for
16 review prior to the announcement of actions.

17 DR. STOLWIJK: Well, I'm trying to get
18 this as early as possible so that no changes be
19 initiated. I think the public is able to integrate
20 all these things better than the officials can.

21 DR. DAVIS: Well, I agree with you on that
22 but I, for one, would want to support what Fred
23 was saying. We need to have the health people and
engineering people talking to one another and they

obviously were not in this situation.

1 DR. UPTON: I concur with what Dr. Stolwijk
2 has said. I think that Dr. Stolwijk's form of
3 words satisfies me. He said the presence of an
4 administrative and resource structure which assures
5 and so on. It seems to me that the structure which
6 he refers to should provide, if it does assure, it
7 should provide the safeguards and mechanisms that
8 Dr. Davis speaks to.

9 DR. DAVIS: You don't think we need to
10 specify we want to have the health and engineering,
11 that all the relevant parties ought therefore to be
12 in contact with one another within the government
13 prior to the announcement of actions? I mean, it
14 seems to me that your TRC in theory was doing this
15 and obviously it didn't do it. Obviously what we
16 have here was pretty much of a breakdown in commu-
17 nications.

18 DR. STOLWIJK: It was not effective or
19 continuous nor was it accountable.

20 DR. POHLAND: Yes. I think the words are
21 there and I wouldn't want to presume to interfere
22 with the governmental structures that are going to
23 come into play but certainly anybody that under-

stands the English language knows our intent there
and I would endorse such a statement certainly.

1
2 DR. SIPES: I think the last time we tried
3 to avoid the how and we specifically took that into
4 account and put those statements in there. So, I
5 think this is going to be just reiterating but I
6 too wouldn't want to be involved in getting into
7 the hows of how it is going to be done but---so,
8 that means we really wouldn't have to be defining
9 the coordination process. We would move along with
10 the task at hand of trying to get a criteria
11 established.

12 DR. POHLAND: Except that implicit in some
13 of the criteria I think will be items that we want
14 to see that relate to coordination.

15 DR. SIPES: Without outlining the whole
16 coordination effort.

17 DR. POHLAND: No, but like the one here
18 on protocols for operation. That I think has to
19 be written in there or we won't get it.

20 CHAIRMAN WELTY: Could I have that copy so
21 that I can get it down? I am sure we will get it
22 in the transcript but it will give me a head start
23 on it.

1 Moving through the document then, if we
2 could discuss the definition of habitability on
3 page 2. I appreciate Dr. Stolwijk here, your
4 reflection on this difficult issue of habitability
5 and would like to continue that section with just
6 some editorial changes in the wording and so on.

7 DR. DAVIS: Well, actually I had some
8 comments that were more than editorial.

9 DR. MILLER: I do as well.

10 DR. DAVIS: And they are in my document.
11 They really just expand on what Dr. Stolwijk did but
12 I think there is a paragraph that I wrote on the
13 concept of habitability and while that whole para-
14 graph needs not to be included, it was written with
15 the idea in mind that the concepts involved there
16 are important and that while scientific and tech-
17 nical factors are, of course, relevant when you
18 are assessing habitability, that ultimately the
19 concept depends on social context and what are the
20 dominant norms of environmental health and if you
21 are living in rural China and you burn coal inside
22 your home, you have to have a hole in your roof.
23 But if you are living in Newark and you burn coal
or peat for fuel, it's not a good thing to do and you

1 are not complying with the norm of the environmental
2 health. So, I think we have implicit in the
3 concept there is to be this function that we recog-
nize that it's a relative concept.

4 CHAIRMAN WELTY: Okay, and Pat.

5 DR. MILLER: Well, I have to apologize
6 because I haven't had an opportunity to read
7 Dr. Davis' statement simply because I didn't receive
8 it. The problem it seemed to me, with all due
9 appreciation for the folksiness and the literary
10 quality of Dr. Stolwijk's definition of habitability,
11 that I have some problems with it as a scientific
12 concept in that it's not clear to me how the notion
13 of homes at risk, of flooding or collapse, lend
14 themselves to a sort of operational definition of
15 habitability with reference to risk potential of
16 toxic chemical exposure.

17 I think I agree with Dr. Davis remark that,
18 first of all, the definition of habitability is
19 essential, that we find some consensus on one, and
20 also that it should contain that sense of relativity.

21 We suggested one in our own work which at
22 least does have the virtue of being, I think in a
23 rather obvious way, operationalized and that was

1 the determination that the present environmental
2 state of the Love Canal EDA is as if the toxic waste
3 landfill had never been there. I believe we under-
4 lined that on page 1 of the first paragraph of our
5 paper.

6 CHAIRMAN WELTY: Can I get some feedback
7 on that?

8 DR. POHLAND: I guess from a technical
9 standpoint I have trouble with that definition
10 because we have to deal with the realities of the
11 circumstances as they exist and I think that is what
12 Dr. Stolwijk was trying to suggest, is that we may
13 not have the luxury of dealing with the non-existing
14 Love Canal situation.

15 DR. MILLER: Well, I am not reposing that
16 as the ideal to which we should strive.

17 DR. POHLAND: Yes. It is kind of like a
18 zero discharge. It's a nice ideal but it will
19 never get there.

20 DR. MILLER: But I guess I do have this
21 problem of, I mean, well, as I said, I think he is
22 trying to make some---to communicate and he, of
23 course, might want to speak to what he was trying
to do there, trying to communicate by analogy.

1 DR. POHLAND: It might be informative to
hear how the rest of us interpret it, however.

2 DR. DAVIS: Well, on that point I thought
3 that the lack of mention of the outdoor environment
4 was important and, again, I have comments or my
5 comments speak to that, about the fact that children
6 at all ages are often, particularly in the summer
7 time, in close contact with the outdoor environment,
8 literally roll around in it, and we would be remiss
9 if we were to focus so much on the indoor environ-
10 ment as to forget that, particularly children love
11 to find or make themselves little creeks wherever
12 there is water and you have got a child under six,
13 they will go and jump around and play in it and I
14 am concerned not only about the sewers and the
15 possible cracks in the sewers, but what about if
16 chemicals, because of the water table, may be in
17 the soil in different levels and when you have
18 your next ten year flood, fifty year flood, you
19 name it, that the stuff would percolate up into the
20 grass and would affect the children in the wet
21 times of the year.

22 DR. SIPES: We talked about that on page
23 5. The whole thing was brought up and we didn't

1 want to go house by house. We wanted to look at it
2 as a concept of an area and they brought that out.
3 So, I think that---

4 DR. MILLER: Yes. We brought it out but
5 this is a substantial distortion of what we were
6 trying to say. I mean, the quota is correct but
7 that is pulled out of context.

8 DR. DAVIS: And I would think that in
9 terms of the---

10 DR. MILLER: I would hope that we would
11 get back to that.

12 DR. DAVIS: The focus on the discussion
13 of habitability, I think a way to put that concept
14 in at that point is to say that we are talking
15 about the environment in which humans live, including
16 the indoor and outdoor environment and we recognize
17 the areas and then using that, quote, from that,
18 that we recognize that that cannot be done on a
19 house by house basis, that it has to reflect an
20 area because after all, children---

21 DR. STOLWIJK: Debra, I was just as
22 frustrated as everybody else was in trying to
23 define habitability. So, what I did was to go and
look at cases where houses had been clearly

1 considered uninhabitable. I am aware of the out-
2 door environment being a problem. I was not able
3 to find examples of housing being declared uninhabit-
4 able because of something outside. There just
5 weren't any examples I could find of that.

6 DR. DAVIS: But there are examples of
7 areas being declared uninhabitable because of the
8 lead level in the soil is too high and there are
9 playgrounds in Baltimore and other cities where
10 they have found levels of lead so high that they
11 banned use of an area because of that. So, I don't
12 think we need to focus only the house. I think we
13 do need to focus on the area, particularly recog-
14 nizing that if we are talking about habitability,
15 our first concept would be it's for all persons who
16 could live there and by the way, that is what
17 leads me to consider that maybe what we are really
18 talking about in the case of Love Canal is not
19 habitability but land use and the possibility that
20 Love Canal might be quite acceptable for a golf
21 course or a storage facility for hazardous waste
22 materials which I'm sure there is going to be a lot
23 up here en route to a permanent landfill eventually
and that maybe we ought to mention that. We can

1 talk about what would be habitability for our
2 notion of normal residential use but we should
3 also indicate that there are all kinds of land
4 uses that could be made of the area.

5 DR. POHLAND: Of course, the problem of
6 the land use issue is that you can take any area
7 and look at it from that perspective and decide it's,
8 you know, its use as a way to get it zoned that way
9 or whatever, you implicitly declare the area
10 uninhabitable. I think it will divert us from our
11 charge if we start concerning ourselves with, well,
12 what if it's uninhabitable and then what should we
13 do with the area. I wouldn't want us to divert
14 ourselves from the issue of habitability per se.

15 I think we have to contend with that and
16 then should the decision be that it's uninhabitable,
17 then these other things come after that and I agree
18 there are all kinds of options that one could think
19 of about, you know, what it might be turned into,
20 including this golf course that you won't permit me
21 to drink on.

22 So, I think that we have to stick with the
23 issue of habitability and come to grips with that
and not really concern ourselves with other uses of

1 the land because we may unconsciously bias our
2 decision. I think we have to stick with the habit-
3 ability issue.

4 DR. STOLINE: I think that the habitability
5 statement should be really put more in the context
6 of the actual area that we are talking about, its
7 historic use which has been a residential area and
8 that habitability is normally defined, that it
9 would be a healthful place to raise a family, to
10 conduct your work, to go about your life, and maybe
11 mention a few things that it would be safe for
12 children to play in the yard, safe for people to
13 plant gardens, safe for people to wade in the
14 puddles if they happen to accumulate, safe for kids
15 to go to school in the normal context of what I
16 think we have in mind here as habitable, which
17 would be living in a residential area in an urban
18 society. I think the habitability that we have
19 talked about here has to really reflect that.

20 DR. MILLER: I have a real problem when
21 you say the normal sense because it's the case of,
22 of course, neighborhoods also have an abnormal
23 sense and the spring comes and the snow melts and
the sewers fill up with water and whatever is down

1 there begins to rise and floods the streets and I
2 guess, I think that we have got to move beyond the
3 sort of idyllic notion of kids going to school and
4 adults going to work and life sort of moving along
5 in some predictable fashion. We must take into
6 consideration those other things as well.

7 DR. POHLAND: I have heard both of you
8 suggest the possibility of things coming up as a
9 consequence of large storms and so forth. You see,
10 that is part of the dilemma. If we could get a
11 solid, defensible position from the state with
12 regard to the hydrogeological events surrounding
13 the canal, it may well indicate that the probability
14 of such an occurrence happening is very, very remote.

15 DR. MILLER: Well, it's happened before,
16 Dr. Pohland. This is the only thing that---

17 DR. POHLAND: Well, I don't know what you
18 are saying, when it happened before. I think there
19 are circumstances that existed before that may well
20 have abetted that kind of circumstance and then we
21 have to evaluate whether that still exists. So, if
22 the decision was that such an occurrence, such a
23 movement of materials and previously deposited or
migrating materials coming to the surface again

1 would be very, very remote, then that would
2 certainly weaken the concern for possible contact
3 with the surface soils.

4 UNIDENTIFIED VOICE: Could I just---

5 CHAIRMAN WELTY: Excuse me. Could we
6 hold off on the community comments until the after-
7 noon session?

8 UNIDENTIFIED VOICE: This is just a little
9 piece of information. I have studied the Love
10 Canal area quite extensively and the sewer system
11 there and generally the sewer system does surcharge
12 during most storms. There are extensive storms,
13 and you can check with the neighbors there. So
14 that this upwelling is not an uncommon thing but
15 it's something that is still relatively common
16 unless the whole sewer system gets changed. So,
17 I just wanted to mention that. So, it's not too
18 rare.

19 DR. POHLAND: But what I am saying is
20 that we have hearsay evidence about that, really.
21 If you see the--

22 UNIDENTIFIED VOICE: No, I have the
23 engineer's maps of the area and they indicate
24 surcharging along in most of the LaSalle area. The

1 sewer system is just too small to handle the runoff
2 from the area and it has to be wholly redesigned.

3 DR. POHLAND: When you say the engineer
4 maps, whose---

5 UNIDENTIFIED VOICE: This is from the city,
6 the city's maps of the sewer system.

7 DR. POHLAND: Okay. It was a question
8 that we posed before about the flooding conditions,
9 not only with the present circumstances but also
10 as it regards the new clay cap because the runoff
11 is going to be much more severe from that area
12 after the larger cap is placed on and we questioned
13 whether the system would accommodate that. Now,
14 either it can or it can't and these are the issues
15 as an engineer that I would like to address but I
16 am frustrated in doing so.

17 DR. STOLWIJK: Then there is another form
18 of flooding which could occur but probably doesn't,
19 at least I would assume that it doesn't and that is
20 that if it actually gets charged and then you have
21 the height differences, it can actually well up
22 under the ground, but that, I think, is not happening
23 here because the likelihood of that kind of transport
doesn't happen. So, it's surface runoff that we are

dealing with.

1 DR. DAVIS: Let me go back to the defini-
2 tion of habitability for a moment. I appreciate
3 the difficulty of doing this because I thought about
4 this, I know we all thought about it. I think that
5 the focus on physical changes in a home, code
6 violations, may be misplaced in a document such as
7 this because we are not being asked to answer the
8 question whether these buildings are structurally
9 sound and in fact the state has taken some down
10 because allegedly they were not structurally sound
11 although they did not do environmental sampling in
12 those homes before they took them down, which was a
13 point that I mentioned at the first meeting and
14 we still have not seen any environmental sampling
15 in any of those homes before they were destroyed
16 and they were destroyed because they were not
17 structurally sound. I think that we don't want to
18 focus and unduly call attention to those questions
19 because certainly none of us here is advising on
20 structural integrity of homes.

21 Third, I guess it's your fourth or last
22 paragraph on page 2 about the house may contain an
23 unusual number of consumer products, et cetera, and

1 people who are heavy smokers, I think I find that
2 paragraph a little confusing, just to me, particu-
3 larly in your analysis of it which is your second
4 paragraph on page 3 where you say that the third
5 example describes forms of everyday risk which most
6 of us accept routinely as a part of the modern
7 daily life.

8 Well, I don't accept being around
9 cigarette smoke routinely and I think we are---

10 DR. STOLWIJK: I also prefer the absence
11 of it.

12 DR. DAVIS: Well, we are confusing some
13 things here but people who live in a home don't
14 have a choice about what might be coming into their
15 basement. They can---except if they got hooked
16 when they were kids on smoking or they are addicted
17 now, they have a little bit of control over
18 cigarette smoking and they don't have a lot of
19 control about consumer products because if you want
20 to get spots out of your clothes, you are going to
21 get something, whether it's Shout or one of those
22 things, they all contain some form of tetra-
23 trichlorethylene. You don't have a lot of controls
over these kinds of exposures and I think the major

1 point of this committee is to focus on those
2 involuntary exposures that come from environmental
3 factors and that is what we are assessing. We are
4 not being asked to go in, even though this is 1984,
5 we are not going into homes and telling people what
6 consumer products to use or what to smoke. What
7 we are really trying to address is the question of
8 unintended release of toxicants into the home from
9 the environment.

10 DR. POHLAND: Okay. Wait a minute. Since
11 Jan won't defend his manuscript which we have
12 dutifully now critiqued and taken into pieces, I
13 would suggest hereafter we leave the quotes off
14 because I don't think it will show up in this form
15 again. I think we are missing the point on what I
16 thought you were trying to do and that was that
17 there are degrees of risk associated with habit-
18 ability and oftentimes the perception of these
19 degrees of risk are not so obvious and in fact,
20 everybody seems to react differently to them. So,
21 he was, in my opinion, trying to suggest that there
22 are levels that one might encounter in everyday
23 life and separating out those that are obvious
from those that are not so obvious and those that

1 may, in fact, be rather elusive and not perceived
2 because we live with them all the time and I think
3 that is what these latter cleaning fluids and aerosols
4 and so forth suggested.

5 I guess that my response to this and what
6 Dr. Miller suggested is that we are indeed somewhere
7 between the extremes of things. We are confronted
8 with the realities of the circumstances as they
9 exist and I think to presume that somebody is
10 suggesting that we not concern ourselves with the
11 very important issues that you bring up is not
12 really germane to what I thought you were trying to
13 do. I thought you were just trying to spread out
14 for us a kind of a---

15 DR. STOLWIJK: Now I will say something.

16 DR. POHLAND: Now he is going to recritique
17 the critique.

18 DR. STOLWIJK: What I was trying to convey
19 is that when you try to think about habitability
20 which is not a scientific concept, habitability
21 occurs or uninhabitability occurs when somebody in
22 authority makes the pronouncement that something is
23 uninhabitable. That is when uninhabitability occurs.
It's a construct that doesn't have a precise

scientific measurement to it.

1 Also I tried to indicate by giving these
2 various examples that there is a continuum of
3 desirability for habitation that goes all the way
4 from clearly unacceptable to very clearly acceptable.
5 Our charge is to give criteria that might lead to
6 a decision of habitability or inhabitability, I
7 think has to reflect the fact that it is a continuum.
8 It is not dichotomous. It only becomes dichotomous
9 after you make the pronouncement. Before you make
10 the pronouncement, it is not. It's a continuum of
11 characteristics and we have to indicate what sorts
12 of things would lead to clearly unacceptable and
13 what sorts of things are desirable and if you are
14 going to make criteria, then they are going to
15 reflect as kind of continuum and I was trying to
16 make examples or indicate by example of current
17 practices, how you might lead or how you might be
18 led to criteria for habitability in areas which in
19 opinion in the past, we have no past record that
20 we can point to as to how this was done. It's
21 never been done like this before and we are being
22 asked to do something new and I was trying to give
23 examples of that, not the same, but it might be

1 helpful in guiding our thinking about criteria,
2 that we might state.

3 It was not my intent to directly compare
4 things." It was my intent to provide us with a
5 perspective that you can try and place our thoughts
6 into when they relate to the particular kind of
7 problem.

8 DR. MILLER: Well, I believe that you---
9 I think I have two reactions to that. First is that
10 you are implicitly creating three categories, I
11 think, along that continuum. There is the unaccept-
12 able at one extreme, the desirable at the other and
13 then a sort of large, middle ground, I think, that
14 implicitly comprised the things that are situations
15 that are not either unacceptable or desirable and
16 I suspect that is approximately where we are in the
17 present situation. There was also something else
18 you said---well, I will let it go for the moment.
19 It will come back.

20 Oh, yes, you said that habitability wasn't
21 a scientific concept and I mean, anything, of
22 course, or at least in my discipline can be a
23 scientific concept as long as it's sort of logical-
ly operationalized. So, I mean, habitability

1 becomes then what we define it to be and that then
2 in turn leads to a series of measurements to assess
3 the extent to which we satisfy or fail to satisfy
4 the working definition we have of it.

5 CHAIRMAN WELTY: I want to interject just
6 as a practical point here, some of our consultants
7 have to leave early so I would like to know if the
8 group would like to have sandwiches brought in and
9 we will have a working lunch or would people be
10 agreeable to that? Off the record.

11 (Discussion off record.)

12
13 CHAIRMAN WELTY: Back on the record. Okay.
14 I have a handout here and this relates to the
15 feasibility of doing various chemical analyses to
16 go along with all your other handouts and I think
17 that perhaps the group may have a bit more to dis-
18 cuss about habitability before we move on.

19 John, do you have any further comments in
20 relation to that?

21 DR. STOLWIJK: No, I didn't, except Paul
22 is scratching away at things on the original draft
23 in ways that I liked, looked fine to me.

1 DR. CHALMERS: I have a question about
2 habitability. It seems to me that somewhere this
3 document doesn't really state the problem and that
4 before one can talk about what we are going to be
5 coming up with in recommendations, we have to state
6 the problem and the implication is that the problem
7 is when should people move back into the EDA but
8 no one has ever mentioned anywhere in the document
9 the problem faced by people now living in the EDA.
10 So that what we are talking about when we talk about
11 habitability is presumably the Health Department
12 has made the decision that the EDA is habitable.
13 At least it doesn't fall in Dr. Stolwijk's first
14 category of the kind of living space that would be
15 condemned because people live there.

16 MR. VANDERMEER: My understanding of the
17 situation, Dr. Chalmers, is that the residents of
18 the EDA were offered the option to leave, the home
19 owners were offered the cost of their housing and
20 renters were offered a relocation subsidy.

21 DR. CHALMERS: But if you find the house
22 is uninhabitable, the Health Department finds that
23 a house is uninhabitable, they don't just offer
somebody something else, they close the house.

1 MR. VANDERMEER: But that is my point. It
2 was not found to be uninhabitable. Our uninhabit-
3 able question was, is the neighborhood habitable or
4 not and at the time no one knew and so that as a
5 prudent public health protection measure, the
6 Health Department and the federal government offered
7 to make it possible for people to leave while the
8 decision as to whether it's habitable or not was
9 made. It turned out that that decision has never
10 been made and the question lingers on until today.
11 So, our charge is to develop what criteria might
12 be used to judge the habitability.

13 DR. MILLER: Well, I believe the decision
14 was rather clearly reflected in both of the
15 emergency declarations forthcoming from the State
16 Department of Health, that the neighborhood at
17 least was not habitable by pregnant women and
18 children under two.

19 DR. CHALMERS: But there are pregnant
20 women and children there now.

21 DR. MILLER: I don't know if that is true
22 or not, Dr. Chalmers. I would be most surprised.

23 DR. CHALMERS: You mean a renter, the
renters don't get pregnant.

1 MR. VANDERMEER: Dr. Miller, I think we
2 may be confusing the inner rings of homes immediate-
3 ly around the Canal with the larger EDA.

4 DR. MILLER: Well, Dr. Axelrod did release
5 in the February 6th, 1979 declaration, I am talking
6 about ring three now, the February 6th, 1979
7 emergency declaration pertains to ring three and
8 that was the order to move out pregnant women and
9 children under two from the larger area in conse-
10 quence of the findings that were coming---or wait
11 a minute, it may not be the entire EDA. I think it
12 may be simply the area east of rings one and two
13 which is, they call it Frontier and over 103rd
14 St. Dr. Huffaker, do you recall what Dr. Axelrod's
15 February of '79 health declaration was?

16 DR. HUFFAKER: That went over to 103rd.

17 DR. MILLER: Yes. That is what I was
18 saying but they were being evacuated because the
19 state commissioner ascertained that---

20 DR. HUFFAKER: He kept saying pregnant
21 women and kids and the governor kept saying every-
22 body. Do you remember?

23 DR. MILLER: But that's the earlier.
That is the August 2 declaration.

1 DR. HUFFAKER: This is it. The outside
2 red line is the last State Health Department
3 declaration and then the big one is the federal.

4 DR. MILLER: What I am trying to say to
5 him, he was saying that that area was inhabitable
6 and I said that wasn't true. There have been two
7 declarations and the second one referred to the
8 EDA, part of the EDA and that was called Colvin to
9 Frontier east of .99th Street, right?

10 DR. HUFFAKER: As I recall, the language
11 was that the recommendation was that pregnant
12 women and children under two would be temporarily
13 relocated and then the governor followed and said
14 this is impractical, everybody should be relocated,
15 but not for health reasons. It was pregnant women
16 and kids as far as the details went on that.

17 DR. CHALMERS: Well, all I am trying to do
18 is to have it somewhere in the first page or so a
19 statement of the problem as it now exists which is,
20 should people move back in and should people who
21 are living there stay there.

22 CHAIRMAN WELTY: Okay.

23 DR. CHALMERS: Because it seems to me there
has been sort of a sociologic rather than a medical

1 decision made here which is, if you can't afford
2 to move out, you live there, and it's all right,
3 and if you can afford to move out, you move out.

4 DR. MILLER: That is why there are very
5 few pregnant women.

6 DR. STOLWIJK: Yes. You have children to
7 raise and that seems to be the dividing line.

8 DR. DAVIS: Well, I understand the median
9 age of those who live there now is 62. That would
10 also explain the lack of pregnancies.

11 DR. CHALMERS: That is the median age.
12 That is not the minimal age.

13 DR. MILLER: I think in our sample the
14 minimal age we found was 39 or forty. I don't have
15 our report. Where did you get that figure, the
16 median age of 60?

17 DR. DAVIS: I think I got it from Sister
18 Margeen.

19 DR. MILLER: Well, they are certainly
20 older. The median is definitely in the non-
21 reproductive age.

22 DR. STOLINE: The cutting issue is whether
23 their families were raised or not. That is really
the primary deciding factor.

1 DR. DAVIS: While we are sort of talking
2 and eating at the same time and being rude, let me
3 just raise the issue of procedurally, perhaps you
4 already discussed this but is the goal to produce
5 ideally, of course, to finish the draft today but
6 may be not possible but to try to finish the draft
7 today, circulate it for our comments and then we
8 will give it back to you but there is no additional
9 meeting planned at this point?

10 CHAIRMAN WELTY: Not at this point but that
11 should be an item for discussion between now and
12 when we disband the group.

13 DR. DAVIS: I think we should discuss it
14 now because when the group gets ready to disband---

15 DR. WELTY: All right. Let's discuss it
16 now but before we do that, one other issue I would
17 like some feedback on is whether you want to
18 consider habitability in terms of Love Canal or in
19 the generic sense. These criteria, do you want
20 them to apply and determine whether the presence
21 of Love Canal makes the area uninhabitable or
22 whether the area might be uninhabitable from other
23 factors besides Love Canal.

DR. MILLER: Are you talking---I'm not

1 sure I understand what you are saying but I assume
2 that you are making some allusion to the 102nd St.
3 dump and other sources of contamination. Could
4 you repeat the question again, please?

5 CHAIRMAN WELTY: I think the question is
6 our primary concern is the Love Canal poses an
7 unacceptable risk for residents of the EDA. Is
8 that a statement that you can live with?

9 DR. MILLER: Well, I guess I have a lot
10 of difficulty with it because based on things that
11 Dr. Huffaker and other people have said to me,
12 there seems to be considerable question about the
13 origins of many of the sources of contamination in
14 the community. You referred to hot spots, I believe,
15 in a conversation I had on the telephone with
16 you at one point, of unknown origin, and if we
17 restrict it to a concern for contaminants originating
18 in the Love Canal, I think we have got two problems.
19 The first is I am not aware that there is really
20 any way to definitively establish where a given
21 contaminant originated from and that is the first
22 problem and the second problem it seems to me is
23 that you risk throwing out the baby with the bath
water. If the neighborhood is profoundly contaminated

1 from the 102nd St. dump but in fact not only
2 minimally contaminated from the Love Canal itself,
3 then I guess I wouldn't believe we would want to
4 artificially limit the scope of the investigation
5 and be at risk of moving people back into what was
6 an unsafe situation. Do I misunderstand something?

7 CHAIRMAN WELTY: No. I just wanted to get
8 clarification and see how the other people felt
9 about this issue.

10 DR. DAVIS: Those are the kinds of questions
11 I had for the DEC today and they are based upon the
12 responses that we received to the public comments
13 which was dated I think July 17th and there were a
14 number of---let me just, I have them here, there
15 are a number of questions that I had about these
16 responses to comments. Who was pumping at the
17 93rd St. on December 12th, 1983. The answer, which
18 I find unacceptable, is the city's Department of
19 Public Works should be contacted for the information
20 as to who was pumping at 93rd St. Well, if the
21 state can't ask the city, that seems a little odd
22 and that, again, bespeaks to the problem that we
23 started out talking about today.

Another question, they were talking about

1 doing sampling and there is a description of our
2 role, by the way, which I think would be useful for
3 us to recall by the State of New York, Department
4 of Law, the U. S. Department of Health in coopera-
5 tion with TRC will formulate habitability criteria,
6 a "outside panel of experts," will be used to
7 assist in the development of that habitability
8 criteria methodology. Environmental quality data
9 will be compared with these criteria. A more
10 complete description of the TRC process will be used
11 to make the habitability decision and it is avail-
12 able at the Public Information Office at Niagara
13 Falls.

14 So, maybe we ought to get that complete
15 description and take a look at it. That Public
16 Information Office, by the way, itself is going to
17 be tested because it is in between manholes 265
18 and 265A and there is some suggestion that there
19 might be some migration but---

20 DR. HUFFAKER: It was tested.

21 DR. DAVIS: That was tested and it was
22 negative. Do you have the results yet?

23 DR. HUFFAKER: They are already over there.
I didn't bring them with me. We talked about it last

time.

1 DR. DAVIS: No. This document is dated
2 July 16th.

3 DR. HUFFAKER: So, it wouldn't be in
4 there. We tested two houses, one just around the
5 corner, and didn't find anything. It was ambient
6 and the house on Colvin was nothing and in the
7 house there was trichlorethylene, very low levels,
8 and toluene, 8 parts per billion, something like
9 that. It was very low levels.

10 DR. DAVIS: Okay, and finally, additional
11 sampling has been recommended in the Berkholtz
12 Creek to verify these chemical contamination evalua-
13 tions are complete. That has been recommended.
14 Will it be done?

15 CHAIRMAN WELTY: It is done and it was
16 discussed at the last meeting.

17 DR. DAVIS: But this is dated July 16th.

18 MR. OGG: That is referring to additional
19 sampling that will be done during the design phase
20 when we are trying to determine how many or trying
21 to determine what to do with the samples at the
22 creek. There will be a whole new round of sampling
23 at that time. That has not occurred yet.

DR. DAVIS: All right.

1 CHAIRMAN WELTY: Getting back to the
2 question in relation to habitability, I think that
3 concern I had was whether we should relate this to
4 habitability in relation to contamination from Love
5 Canal versus habitability in the generic sense and
6 I think if we can do this in a two phased manner
7 it might be acceptable where the primary concern
8 is still whether Love Canal poses an unacceptable
9 risk to those residents of the EDA, but if in the
10 process of looking at this question we do find
11 unacceptable levels of contamination from other
12 sources, it would also render the area uninhabit-
13 able or a section of the area uninhabitable and
14 that seems to me like a reasonable way to go if
15 it's acceptable to you.

16 DR. STOLWIJK: It is really a combination
17 of the generic decision which deals with concepts
18 and these concepts would be applied to the local
19 situation, one of which would be through reduction
20 of emanation from the site. If the reduction of
21 emanation from the site does not reduce the
22 concentrations, then you clearly have other sources
23 and that needs to be considered.

1 CHAIRMAN WELTY: I would like to move on
2 to section 3 on page 3 and see if there were any
3 particular problems with that as written.

4 DR. DAVIS: I'm sorry, I don't think my
5 question has been answered as to what the process
6 is. Will there be another revision of this or do
7 we need another meeting?

8 CHAIRMAN WELTY: Oh, I'm sorry. I would
9 like feedback on that. Do we need another meeting
10 or can we handle this by the mail? That was what
11 I started out with the first thing this morning.

12 DR. STOLWIJK: I think my suspicion would
13 be, Tom, that what we probably do need is a round
14 of mailings and see how that goes before we decide
15 whether in fact we are going to have another meet-
16 ing or not. If you now decide to have another
17 meeting, then you may find that that would be can-
18 celled because it is in fact sufficient progress by
19 mail and if the progress by mail looks like we are
20 having a hard go of it, then I think there would
21 be time for another meeting but at least it would
22 have been one or two rounds of mail communications
23 would have preceded it so it will increase the
effectiveness of this meeting if there were some

more home work done.

1 DR. HUFFAKER: Could we have a hold date
2 or something in case it falls through?

3 It would be impossible to get this gang
4 together by mail and find an open date.

5 DR. POHLAND: I think that we ought to set
6 up a tentative date anyway when we might presume
7 to meet again.

8 CHAIRMAN WELTY: Okay. I'm open for sug-
9 gestions. Off the record.

10

11 (Discussion off record.)

12

13 CHAIRMAN WELTY: We're back on the record
14 now and starting on page 3 of the document,
15 establishment of habitability criteria, according
16 to this document, we have come to an agreement that
17 criteria can be established for the EDA and I guess
18 that was reinforced today when we began this
19 deliberation. Does anyone have any problem with
20 that?

21 DR. MILLER: Well, there is something that
22 I have written out and I am going to read it because
23 before all of this is over, I want to satisfy

1 myself that I have managed to communicate in as
2 clear a fashion as possible a central concern of
3 mine and I want it in the record and then I'm not
4 going to say any more about it I hope.

5 DR. POHLAND: Oh, I will take odds on that.

6 DR. MILLER: The count of the number of
7 chemicals that have been identified at Love Canal
8 seems to be ever growing but there is some reason-
9 able consensus around the notion that about 250 have
10 been identified. In his working paper, Dr. Sipes
11 has suggested that some eleven of these are good
12 candidates for routine monitoring in the EDA, owing
13 to high concentrations of them that have been found
14 there. Their known or suspected toxicity with
15 respect to humans and their "reasonableness" as
16 indicators of migration and the feasibility of
17 obtaining "accurate and reproducible measurements"
18 and it appears to me at least that the implicit
19 assumption is that extensive sampling of a small
20 number of marker chemicals is preferable to a more
21 limited sampling of a larger number of chemicals
22 given some finite limitation in terms of both time
23 and money. I think that is what we are saying.
At least that is what I understand the argument to be.

1 My analogy to that, as I look at that,
2 there are in my own discipline times in which people
3 have to make those kinds of judgments as well so
4 that sociologists not uncommonly in the absence of
5 data to allow us to make valid designations about
6 social class will use simply years of education
7 completed in order to construct what we refer to
8 ourselves as a quick and dirty index of social
9 class and I suspect that something like that may
10 be going on here and in raising this I have no
11 desire at all to take out after Dr. Sipes who is a
12 rather sweet fellow and very capable. I want to
13 know, though, if what this committee is---if the
14 official position of this committee is going to be
15 that residents should have nothing to fear from the
16 239 chemicals that are not going to be evaluated
17 and on what basis do they have nothing to fear from
18 those 239 chemicals. Are we going to tell them
19 that we are not going to look at the 239 chemicals
20 because it would cost too much and take too much
21 time and that we propose to study only these eleven,
22 trusting to God that the remaining 239 aren't going
23 to be a problem since the eleven are demonstrated
not to be. That is one concern that I have.

1 The second concern is related to that and
2 both of these are things that we tried to articulate
3 and I suspect rather badly in our own working papers.

4 Our interviews with those families sug-
5 gested very clearly to us that residential exposure
6 to the toxic waste in the EDA gave rise to fears
7 among the respondents that we spoke to that this
8 exposure caused a number of debilitating chronic
9 conditions that when experienced as an enduring way
10 of life, rather markedly diminished the quality of
11 that life. We argued, therefore, in our working
12 paper for the necessity of including marker
13 chemicals that, while not necessarily lethal, if
14 you will excuse the use of that term, are nonethe-
15 less known to cause headaches, nervous disorders,
16 digestive disorders, skin disorders, et cetera.
17 We continue to assert that there is more implied in
18 habitability than the markers of birth and death
19 and that there is a whole lot of life that goes on
20 between the moment of birth and the moment of death
21 and that that is important as well in establishing
22 habitability.

23 Thank you. Now, I am raising or putting
 those two into the record at this point because I

1 don't know whether the first issue that I raised
2 has implications for number 3B, objective, quantifi-
3 able and reproducible. I suspect it may.

4 DR. STOLINE: I would just like to add
5 something. I have produced a memo that is pertinent
6 to the first point here and I haven't circulated
7 this yet but maybe I will right now and just talk
8 about it as one of the issues that has been raised,
9 if that is okay.

10 Glenn already has a copy of this so why
11 don't I just pass this out.

12 I have, as you know from many of my com-
13 ments, I have really extensively looked at aspects
14 of the EPA data and what I would like to share with
15 you is a focus for a few minutes on just the summary,
16 if you wish, of the soil testing that was accomplished
17 by the EPA between 1980 and published in 1982 and
18 this is contained in Volume 3 and specifically
19 what I am looking at are the 145 chemicals that
20 were measured by the EPA in the soil and just to
21 simplify things because there is a mass of data
22 here, I am simply focusing on the maximum amount
23 of the substance that is found in either the canal
or the EDA or the control and for the sake of

simplicity also, there are three categories:

1 B is below detection, T which is a trace amount
2 and M which is a measurable amount and these are
3 the three designations for the maximum amount of
4 substance that is measured in each of the substances.

5 Also at the bottom of the first page, the
6 units are given. I won't go through that.

7 Roughly the sample sizes are given at the
8 top of the first paragraph of the second page and
9 let me just summarize what is going on here. Of
10 the 145 substances and this is excluding dioxin,
11 there were 68 substances that were observed at a
12 maximum concentration of B in all three locations,
13 the EDA, the Canal and the control. There were 77
14 substances that, and that is the focus of the table
15 in the middle of the page, which were measured at
16 a trace level or above which is a T or M in at
17 least one location and I have actually categorized
18 these 77 substances into six categories and in
19 particular I want to just talk a little bit about
20 this categorization because that has to do with
21 this issue of few versus many and I don't know the
22 answer myself but at least I'm sharing this informa-
23 tion with you. This data is, as I say, from one

source.

1 The first code would be simply that there
2 is an M in the EDA only, which means that there is
3 a measurable amount and it was only found in the
4 EDA which means that it was at a trace or lower in
5 the other two, the control and the Canal. There
6 were 17 substances that could be categorized like
7 that. There were three that were at an M in the
8 Canal only which means that they were at a T or a
9 B, a trace or below detection in the EDA and the
10 control. There was one that had an M in both the
11 EDA and the control. There were 14 that were
12 in measurable amounts in all three locations and
13 the comment at the bottom of the page here is that
14 these are perhaps candidates for the word, or the
15 adjective word ubiquitous. If a material is measur-
16 able in all three locations, perhaps this is some-
17 thing that possibly could---a substance that we
18 might consider not monitoring simply because they
19 are ubiquitous to the area.

20 But in particular, what I wanted to do is
21 focus on code 5 here because aside from code 1,
22 code 5 is another interesting one in the sense that
23 it is an M in both the EDA and the Canal which means

1 that it's essentially at a trace or below level of
2 detection in the control.

3 So, if one were to look at something which
4 you might say a Love Canal type chemical, you might
5 look at code 5, which means there are measurable
6 amounts only in the EDA and the Canal. There are
7 30 that fit that category.

8 So, what I have here, I will go just to the
9 top of the third page here, it is not a long memo
10 but the 17 code 1 substances, those that were
11 measured at M only in the EDA and the 30 that are
12 measured at code 5 which are EDA in the Canal only
13 were uniquely found in measurable quantities---well,
14 I mentioned that. I am suggesting here that we
15 should perhaps---or whoever does this, should
16 individually carefully examine these 47 and all of
17 them actually for possible inclusion in at least
18 the future soil monitoring activities.

19 Now, what I am concerned about here is the
20 fact that there are a large number of materials
21 here that were measured and detected. Now, I don't
22 have anything on standard deviations here, just
23 focusing on the maximum amount found which for
simplicity's sake that is what I focused on. If I

1 had to select one number, that would be the one I
2 would suggest.

3 The conclusions, I will just briefly go
4 through this, as I already stated, there are
5 relatively large numbers of substances that were
6 detected in the EDA and more than 47 but these 47
7 that I have tagged here are ones that one would be
8 somewhat concerned about because they were not so
9 much found in the control. And another point is,
10 and I don't have hard evidence on this, but it
11 seems that these substances do not seem to be con-
12 centrated in any particular sub-area and this
13 bothered me a lot. I wish I could say all of this
14 data, all of the maximums and all of the M values
15 were focused in a particular area so that we could
16 simplify it that way but I can't say that. It
17 does not seem to be true.

18 The second point is getting at what Pat
19 has mentioned, using too few sentinel chemicals
20 you may miss possible contamination from other
21 substance sources in the soil immediately. That is
22 what I am concerned about. I am not saying that it
23 isn't a good idea to look at too few chemicals, I'm
just saying that this kind of data that I have here,

1 someone really needs to take a look at this and
2 the issue of whether we can use a few or we can't
3 is a pertinent issue.

4 The third is, and I am sticking my neck
5 out here because I haven't talked to anybody about
6 this but it seems to me that this data has to be
7 interpreted to the people and to the public and I
8 would seriously consider adopting or having this
9 panel consider adopting some type of standard for
10 when we are given a number 5, what does that 5 mean.
11 Is that an action number? Is that above a certain
12 limit or is it below a certain limit? What we dis-
13 cussed at our last meeting was that there were no
14 national standards for soil testing. I would just
15 like to lay out on the table, just for possible
16 consideration and for a discussion point here that
17 we maybe consider to whoever it is, the scientific
18 group or whatever, that they do consider adopting
19 soil standards and possible adopting, if you don't
20 have them, set them somewhere, say, between the
21 drinking water standards and the surface water
22 standards for the material that we have at hand here.

23 Now, I am just, as I say, I am just setting
this out as something that I think people are going

1 to want to know. What does that number mean and
2 I think we have talked about the coordination and
3 DEC and all this, I think these people are not only
4 going to have to be more cooperative, they are going
5 to have to talk to the public in ways that the
6 public can understand and be assured that these
7 numbers, what do they mean, and we can talk all day
8 about measuring humongous amounts of material and
9 get lots of numbers but we are going to have to
10 be able to, it seems to me, use these numbers in
11 such a way that we know whether an area is safe or
12 not or whether that particular number is something
13 which is an action number which means above a
14 certain limit and we should do something or it's
15 below a certain level and "it's okay."

16 DR. POHLAND: Excuse me. You said drink-
17 ing water standards and surface water standards
18 or ground water.

19 DR. STOLINE: I meant---

20 DR. POHLAND: You wrote ground water.

21 DR. DAVIS: Ground water can sometimes be
22 drinking water.

23 DR. STOLINE: I am sorry. I meant surface
water.

DR. POHLAND: I guess I am having trouble
1 with the connection between surface water standards
2 and ground water standards or drinking water
3 standards. Drinking water standards are set for
4 human consumption. Surface water standards are
5 kind of set in anticipation of use and use may not
6 necessarily be human consumption. It could be all
7 types of uses.

DR. STOLINE: Presumably the person would
8 then, with drinking water, it is ingested internally
9 into the body. With surface water there would be
10 some type of contact with, possible contact with
11 the human body, the external contact I mean, and
12 I'm thinking about kids.

DR. POHLAND: One thing we suggested last
14 time, it could be swimming water standards or
15 agricultural, irrigation water standards, but one
16 thing that came up last time and that is why I was
17 confused about whether you said---you meant ground
18 water because we did mention last time the way the
19 EPA regs go on monitoring of contamination of
20 ground water from land disposal sites where implicit
21 in those are ten times drinking water concentra-
22 tions.
23

1 DR. STOLINE: I thought it was one
hundred. I remember one hundred being the label.

2 DR. POHLAND: One hundred is right.

3 DR. STOLINE: Now, maybe it could be above
4 the surface water standard, I don't know. I just
5 thought that if I had to peg it, I would say some-
6 where between but that is just being somewhat
7 conservative. I'm thinking about children that
8 might come in contact with soil, people coming in
9 contact with soil when they are working in the
10 garden, whatever, and that that contact would be
11 rather similar to the contact that you might come
12 into if you were living with a stream or something,
13 like this Berkholtz Creek.

14 DR. POHLAND: Yes. I guess I am trying to
15 ascertain what you mean ingestion of it or---

16 DR. STOLINE: Contact.

17 DR. DAVIS: For example, the CDC set a
18 standard for dioxin in soil as one of the things,
19 few things. It's not a standard because the CDC
20 can't set standards. The CDC recommended guidelines
21 where there are soils on which people come into
22 close contact and at times peaks at a level recom-
23 mended at 1 ppb. But you are quite right. We don't

have, even for lead, generally, levels in soils.

1 DR. STOLINE: And the last point on this
2 is just saying that maybe similar kinds of descrip-
3 tive analyses could be performed on other data sets
4 for other media and so on prior to going ahead with
5 whatever analyses are actually performed.

6 Then in Table 1 itself, actually it is
7 four pages at the end that contains this specific
8 information and I think that hopefully this will be
9 useful for this committee and hopefully it will be
10 useful for whatever group, if there is one, that
11 continues to work after we are through.

12 CHAIRMAN WELTY: The concentrations are in
13 parts per---

14 DR. STOLINE: Well, the concentrations are
15 in the units on the front here.

16 CHAIRMAN WELTY: Okay.

17 DR. STOLINE: Nanograms and they are in the
18 following units per kilogram. Now, I'm just---I
19 don't know what to suggest about doing with this for
20 today. I'm sorry I didn't get this done earlier
21 but it was typed yesterday.

22 DR. SIPES: Well, I think we need to dis-
23 cuss the philosophy more so than the actual chemicals

1 because remember the last time I made the plea,
2 that I just listed the philosophy and then a group
3 of chemicals for coming out at least for discussion
4 and that indeed someone should go very carefully
5 over the chemicals that would be selected or, of
6 course, a list such as this. But it goes back
7 to the philosophy and I don't think any of us here
8 would want to make the statement that we are trying
9 to do a quick and dirty or cheap type of monitoring.
10 It comes down to the question of, we have to
11 approach it in a practical situation. There is no
12 possible way that you could monitor 250 chemicals
13 and what do you gain by that information.

14 So, you need to choose a selective group
15 of chemicals that will allow you to do quantitative
16 and reproducible analyses over time.

17 DR. MILLER: Okay. Explain why you can't
18 do 250 chemicals? I mean---

19 DR. SIPES: Did you hear what Barbara
20 said this morning about---I mean, I agree with her
21 one hundred percent. I think all that we are doing
22 with the chemicals is selecting a group of chemicals
23 to monitor whether or not remediation is being
effective. We are not going in and looking at---

1 if we wanted to pick a chemical that is toxic, then
2 we should pick dioxin and go with that and that is
3 our toxic chemical. I think everyone would agree
4 with that but you can't do 250 chemicals over a
5 time, I don't think.

6 DR. MILLER: Okay. But then what you are
7 saying is, it seems to me implicit in that assump-
8 tion is that we find ten or eleven of them that
9 have kind of appealing properties and---

10 DR. SIPES: First of all, that were in the
11 Canal.

12 DR. MILLER: No, no, no, I'm not arguing
13 with that but then we say that if we find them,
14 then that tells us something about migration.

15 DR. SIPES: Secondly, were they in the EDA?
16 If they were in the Canal but not in the EDA, why
17 are we looking at them in the EDA? Why are we
18 spending our time and effort on chemicals that are
19 not there. So, that is where this document now,
20 he has 30 chemicals, okay.

21 DR. MILLER: But where are they going to
22 be in 30 years? Are they still going to be in the
23 Canal?

DR. SIPES: Well, that is----

1 DR. MILLER: Well, no. You have to come
2 back and make the assumption that you use a
3 selected group of chemicals because of their condi-
4 tions. If remediation is successful for a tri-
5 chlorobenzine, it is probably going to be just as
6 successful for a dichlorobenzine. So, you can't
7 go and take a look at---I mean, you could, but I
8 don't think it is practical.

9 DR. DAVIS: Let me suggest a solution,
10 that---

11 DR. SIPES: We are just talking philosophy.
12 We are not arguing. We don't argue. I think she
13 is very sweet too but this is the kind of philosophy
14 that I want the people in the audience to understand
15 as well as those here. The rationale is let's not
16 go after 250, let's go after the ones that, first
17 of all, as Mike has pointed out, they are here.
18 Now we find them in the Canal and the remediation
19 should be successful.

20 So, you had a statement, go ahead.

21 DR. DAVIS: No. I had a comment to make
22 on one way to develop a guiding philosophy and
23 that would be to classify the chemicals. You did
that but now to take Mike's list and now that he

1 has done it, go over it and see what kinds of
2 physical chemical properties would suggest common
3 migration and we may well end up with a different
4 list.

4 DR. STOLINE: This is of the soil only.

5 DR. MILLER: But that I think is the
6 point because you see, obviously my working know-
7 ledge of chemistry is typical of the average person
8 on the street. So, I am a buffoon but if you can't
9 persuade me, I don't think you'll be able to
10 persuade them either.

11 If it's the case that chemicals move, as
12 much of the work I have read seems to indicate,
13 in ways that seem to be unique to the chemical
14 itself and the setting in which it's found, and
15 we are only choosing eleven chemicals that we are
16 going to---or nine, it doesn't matter what the
17 number is, in the chemicals we are going to monitor,
18 then the question becomes, how do we know that those
19 are the best chemicals to choose because of the
20 fact that it may be the case that there are seven
21 others that we are not going to collect anything on
22 at all and that they are going to be rampant all
23 over the place. Are there attributes of these

chemicals so that they could be organized in terms
of families?

DR SIPES: Yes.

DR. POHLAND: That is what he was doing.
That is what he tried to do last time.

DR. CHALMERS: That is the job of this
committee.

DR. POHLAND: And there have been studies
on just about all the classes of chemicals with
regard to their mobility in soil which takes into
account then all the interactions that that chemical
could possibly enter into as it migrates. So, I
think that that, by class, and of course, not all
the chemicals have been run, but at least by class
there is that kind of information which would allow
us to make some good judgments regarding whether or
not they would migrate. Some chemicals go through
like there is nothing in its way.

DR. MILLER: Could I ask then that the
logic of selecting the indicator should be fully
and carefully explicated for an informed lay
audience as part of this document that we are
putting together?

DR. SIPES: Remember, if you read what I

1 put in my documents, I was putting out a list of
2 chemicals for discussion and I asked that the
3 technical review committee look over the data and
4 the chemicals as far as their selection. It was
5 just, what I did, was I went through, as Mike probab-
6 ly did, this huge stack of chemicals and looked for
7 those that were in the Canal and those that were in
8 the EDA and then where there was at least the
9 repeated measurements, that you didn't have a value
10 of zero and a value of 10,000 and then came up with
11 a parts per million of 5000 where you added two
12 numbers together and came up with a number, I had
13 no confidence in that data. So, we are just trying
14 to establish some philosophy as to how the criteria
15 should be set up.

16 Now, if you look at a few of these things,
17 there are cases where they are higher in the EDA
18 than they were in the Canal or where they were
19 higher in the control area than they were in the
20 Canal. So, are we doing ourselves a service by
21 taking those chemicals and monitoring them? I
22 don't know. If TCDB is higher in the control area
23 than it was in the Canal, then that raises a
question and that comes back to, should it just be

Love Canal or habitability in general.

1 DR. STOLWIJK: And of course, these are
2 maximum concentrations and they are not the average
3 concentrations or anything else. They may be just--
4 --they may just represent one single measurement
5 that happens on the site.

6 DR. STOLINE: There is no question about
7 that. That happens in many, many cases. There
8 are just a few numbers that are at the M category
9 and several more at T and quite a few at below
10 detection.

11 MS. MONSERRATE: I might point out that in
12 my memo based on EPA data, it does complement
13 yours in that I identified the same---well,
14 Dr. Sipes' chemicals basically but provided the
15 information for ground water and indoor air and
16 gave a statistical summary showing the number of
17 observations, the mean standard deviation, so that
18 if you are interested in that, then that may help.

19 DR. SIPES: Now that we have more data, we
20 can revise the list because we have some quality
21 assurance on the data as well as Mike had gone
22 through and found it so when I looked at this, I
23 did see that at least probably for the eleven

1 chemicals I picked there was some rationale for
2 these because you found them in those areas, but I
3 eliminated a few for specific reasons, like we dis-
4 cussed the metals because they are all over the
5 place, where some cases they are higher outside
6 than inside, and a few of these, like the polycyclic
7 aromatic hydrocarbons, we may want to go back and
8 look at those but those are somewhat ubiquitous
9 but I do see you have some down here which are
10 fairly high in the EDA but you look at those values
11 in the Canal. The bottom of the page, Table 1,
12 the chemicals 45 and 46---

12 DR. STOLINE: Yes. I don't know what
13 those are.

14 DR. SIPES: See that leads to problems
15 because these come from everywhere, not just there
16 and you can see that at least they weren't found
17 in the Canal where the Canal was sampled but all
18 of a sudden they are fifty to one hundred times
19 higher in the EDA, which means they are probably
20 coming from much different sources.

21 DR. MILLER: I have recently been, for
22 the last few months, doing historical work in the
23 newspapers on pollution in Love Canal from 1899

forward and there were some hearings on the Air
1 Pollution Control Board in the late sixties and
2 early fifties which indicate that Berkholtz Creek
3 was being used by more than one factory to dump
4 residues from chromium, the chromium industry,
5 chromium factories. So that there was water, you
6 know, it was washed with metals, cleaning operations
7 and plating operations and it was being dumped in
8 tremendous quantities in that creek. So, I think
9 there is more at issue here than the careless
10 builder who picked up material on top of the Canal
11 and moved it. I mean, there is a history of
12 contamination, industrial contamination from other
13 sources, more pervasively throughout the city.

14 DR. SIPES: Can we go back and answer
15 Tom's question? This is getting right down to what
16 you started right after lunch which is are we
17 making this just relating to the Love Canal or are
18 we looking at it as the habitability of this area
19 and questions like that, where it's not canal
20 related, it comes back and creates quite a problem
21 for us.

22 CHAIRMAN WELTY: I think the rationale,
23 well, my opinion would be best selected based on

1 chemicals known to be in the Love Canal and on these
2 differences that you pointed out in your document.
3 Otherwise your task would be infinitely complicated.

4 DR. DAVIS: How about, though, we might
5 want to eliminate Fluoranthene and Pyrene because
6 they are of such common combustion byproducts that
7 you would expect to find them everywhere but we
8 might want to include substances which are parts of
9 chemical classes that are industrially manufactured
10 and known to have been in both areas and may well
11 be in fact in other areas. I would suspect one of
12 the problems with benzene is it's hard to get good
13 environmental levels on benzene depending on what
14 the media is you are looking at.

15 DR. SIPES: That is what the letter to
16 the Health Department came to, that it would be nice
17 to do that but there may be some problems with
18 that.

19 DR. DAVIS: Okay. But for some of the
20 other substances, they can be easily monitored and
21 I think we wouldn't want to make the sole criterion
22 for inclusion be whether or not they were in the
23 Canal and the EDA, but whether or not they were
common industrial contaminants that pose a hazard

to human habitability.

1 Now, would you, for example, Aldrin,
2 Dieldrin or Fluoranthene Heptachlor are compounds
3 which have been used for years as termiticides and
4 they are commonly applied by injection into the
5 foundation and when misapplied could get into all
6 sorts of things. There are standards for how to
7 use them. You would expect to find them in lots
8 of places but you should not find high levels of
9 it. So, I think if I might suggest a list might
10 include not only the classes but the level, you
11 know, so to speak, an action level or a level of
12 concern because you do have some environmental
13 monitoring data that the EPA has collected over
14 the years about what these---what the background
15 level is for some of these and we might want to
16 indicate what that is and what levels one should be
17 concerned with.

18 DR. STOLWIJK: Wouldn't commercial applica-
19 tion of Dieldrin produce locally very high concen-
20 trations if you happen to sample the data?

21 DR. DAVIS: Well, if you sampled right
22 after it was applied, yes, but the rationale for
23 this, the standards and regulations is that you

1 should apply it properly and now there are even
2 recommendations for not occupying the home for a
3 certain period of time.

4 DR. POHLAND: The concern for these other
5 than Canal chemicals seems to me can be accommodated
6 in what was previously said with regard to the fact
7 that we would suggest habitability criteria on a
8 basis of information relating to the degree of
9 contamination of an area with chemicals from the
10 Canal but not excluding the proviso that other
11 decisions regarding future discoveries would enter
12 into the picture when that information becomes
13 available. So, I think if we know that in the EDA
14 there are chemicals other than from the Canal, it
15 would be prudent to suggest, if not otherwise
16 accommodated in your classification scheme, that
17 they be included.

18 DR. STOLWIJK: Wouldn't it make sense,
19 because otherwise we are not going to make much
20 progress, would it make sense to ask Dr. Sipes to
21 take the information from CH₂M Hill and from
22 Michael and make up a list that has with it as much
23 of the documentation in terms of the concentrations
found and the maximums and minimums and so forth and

1 make that a part of the criteria that says that
2 these are chemicals that clearly are involved here
3 and this group or some subset of them is recommended
4 for monitoring purposes.

5 DR. SIPES: I think in Dr. Silbergeld's
6 letter she stated here, she had a very revealing
7 point on the bottom and I don't know how accurate
8 this is but knowing her I imagine---well, I don't
9 know her but I know her reputation, but I imagine
10 that would be quite accurate but, "The environmental
11 conditions and routes of human exposure remain
12 uncertain, despite expenditures in excess of \$25
13 million for environmental analysis."

14 So, do we want to spend another \$25 million
15 looking at 250 or 300 chemicals and come back with
16 the same statement four years from now? That is
17 why I thought that some selection process and I
18 appreciate what Dr. Miller is saying in the dis-
19 cussion that we had.

20 The last thing I would like to state is
21 that I think people should realize that this is
22 only part of our criteria scheme, monitoring
23 chemicals. We talked about health effects and
monitoring health effects over time. What

1 Dr. Paigen mentioned this morning about using
2 animals as biological markers, that is a rational
3 approach which is giving us another way. So, this
4 is not---everything is not going to be decided on
5 seven or eleven chemicals. It's just one tool out
6 of many to help us establish some sort of criteria.
7 Now, it may end up to be 18 chemicals or four, I
8 don't know but---

9 DR. MILLER: Well, I also think that we
10 need that in our report as well. I mean, you know,
11 there are a variety of different, first of all,
12 chemical indicators, that come together that point
13 in a certain direction and then a variety of
14 different kinds of data, chemical and other that
15 come together and point in a certain direction.

16 CHAIRMAN WELTY: Are you comfortable then
17 with the suggestion to have Dr. Sipes develop this
18 list and we can include it in the revision of this
19 document?

20 DR. CHALMERS: Yes.

21 DR. STOLINE: The only thing that I would
22 add to that list is that this is just the soil.
23 There is a comparable kind, it's much smaller
actually with respect to the amount of----or the

1 number of materials that were actually summarized
2 in Volume 3 that were measured in the air.

3 But there are probably 145 materials that were
4 monitored in deep wells and probably about 145
5 also in ground water somewhere which I haven't looked
6 at.

7 CHAIRMAN WELTY: I guess what you are
8 saying is that we need separate lists for each
9 media.

10 DR. STOLINE: That might be.

11 CHAIRMAN WELTY: Because you are not going
12 to measure the PCDB in the air.

13 DR. STOLINE: I would be willing to try
14 to put together a complete list from Volume 3 of
15 those other media just to make it---it's going to
16 be quite a bit of work but I would be willing to
17 do it. It's just so that this group knows at
18 least what there is, at least what is there and
19 what I consider to be the largest amount of
20 information data set that we have.

21 DR. STOLWIJK: Could we ask Dr. Sipes to
22 identify in the same list of chemicals those that
23 have sufficient data so that they are likely
candidates to be sentinals for air monitoring.

1 DR. SIPES: I was looking at the letter
2 that Dr. Huffaker gave me and I think that, you
3 know, the comments from the director of their
4 laboratory there says we would probably have to
5 focus on those that would be air and those that
6 would be soil and so, that is certainly, I mean,
7 also I would prefer and I agree with what they
8 would like to do is that they would work up a soil
9 sample and out of one analysis be able to measure
10 three or four or five chemicals that we want
11 instead of having to go through six different
12 procedures but that may or may not be possible.
13 But the air we may want to add another compound or
14 two that would be in the air. So, all of this,
15 I guess what my report did do was generate exactly
16 what I wanted. Mike got to work and gave me some
17 lists and not that you hadn't been working before,
18 but we had discussed having this before and I
19 really appreciate having it and the feedback from
20 the State Department or the New York State Department
21 of Health.

22 CHAIRMAN WELTY: I had a couple other
23 things to mention as feedback from CDC. We felt
that benzene and carbontetrachloride were fairly

ubiquitous and for that reason may not be good ones
to include.

1
2 DR. DAVIS: That is true of the levels.
3 That is why I mentioned the possibility of having
4 some kind of a cutoff for a level. I mean, you
5 even have benzine in strawberries but at a very,
6 very small level.

7 DR. STOLWIJK: People parking cars in the
8 EDA, they won't park there now. They will be
9 producing more benzine in the atmosphere than
10 anything else. Benzine is being introduced into
11 the environment at this point more by lead free
12 gasoline than anything else.

13 DR. SIPES: You said carbontet and ---

14 CHAIRMAN WELTY: Carbontet and benzine.

15 DR. SIPES: They are ubiquitous. I don't
16 know.

17 CHAIRMAN: The other question that I had,
18 Glenn, was under Item 5, is benzine hexachloride the
19 same as lindane?

20 DR. SIPES: I'm going to have to check on
21 that because really, I meant to check on that but
22 I'm not sure. I thought it was, benzine hexa-
23 chloride, but---

1 DR. DAVIS: There is also a hexachloro-
benzine.

2 CHAIRMAN WELTY: Here is some information
3 on that.

4 DR. SIPES: One of them is misnamed be-
5 cause it's the fully saturated compound and it
6 shouldn't be a benzine derivative. That's a
7 cyclohexane group and I get those confused.

8 UNIDENTIFIED VOICE: Lindane is gamma PHC.
9 It's a benzine hexachloride. That has no relation
10 at all to hexachlorobenzine.

11 CHAIRMAN WELTY: Okay. Thank you.

12 DR. POHLAND: Tom, I noticed that we focused
13 now on the air and soil. I was wondering whether a
14 similar focus on water might not be appropriate.

15 CHAIRMAN WELTY: Good.

16 DR. STOLWIJK: I think we were thinking
17 about, at one point, about some monitoring of the
18 monitoring wells and some analysis from monitoring
19 wells.

20 DR. POHLAND: Yes. Well, as for the
21 other two phases, there are data out there.

22 DR. STOLWIJK: I think the monitoring
23 for ground water, that is being monitored already

1 I think in connection with the operation of the
2 treatment plant.

3 DR. HUFFAKER: I believe they are monitor-
4 ing levels primarily, aren't they, and the chemical
5 monitoring is on the effluence to make sure that--

6 DR. STOLWIJK: I thought that I heard
7 Joe Slack say that in fact there were chemical
8 analyses done on the monitoring wells. Maybe not.

9 DR. DAVIS: I thought so too. I thought
10 that was the case also. Is that not the case?
11 Could you ask him that question? Could you ask
12 Joe Slack the question whether they are not doing
13 chemical monitoring on the wells?

14 DR. HUFFAKER: They are doing some but it
15 isn't routine. That came up at the TRC meeting the
16 other day.

17 DR. STOLWIJK: I think he said that they
18 did it once a year or something like that.

19 DR. HUFFAKER: Yes. It is very---I will
20 ask him, though.

21 DR. POHLAND: I think inevitably we will
22 go to the same exercise on the water phase so we
23 might as well address it right off the bat.

DR. STOLWIJK: And some of the representa-

1 tives on the list would be suitable for the water
2 phase.

3 DR. SIPES: Yes.

4 CHAIRMAN WELTY: I have been told that
5 CH₂M Hill may be able to help you, Glenn, to look
6 at the data, to pick out the chemicals.

7 MR. HOFFMAN: We have the EPA study loaded
8 now in the computer and can play all kinds of
9 statistical games with the results.

10 MS. MONSERRATE: The results of my memo
11 are just an example of what can be done using the
12 statistical package. Whatever kinds of analysis
13 you want done on the data, we can probably do it
14 for you.

15 DR. STOLINE: Could you reconstruct my
16 Table 1 fairly easily?

17 MS. MONSERRATE: Yes.

18 DR. STOLINE: Would you be willing to do
19 that?

20 MS. MONSERRATE: Yes.

21 DR. STOLINE: Lovely.

22 MS. MONSERRATE: That is, you know, we
23 would have to know exactly what you want.

DR. POHLAND: I guess you got off the hook

again.

1 DR. SIPES: Would that give us the number
2 of replicate samples in an area and then the vari-
3 ance of those replicates so we could have that?

4 MS. MONSERRATE: Yes.

5 CHAIRMAN WELTY: Have we finished ground
6 water then?

7 DR. POHLAND: I don't know.

8 DR. MILLER: What page are we on?

9 CHAIRMAN WELTY: I think we skipped around
10 a little bit.

11 DR. POHLAND: Martha, are you going to do
12 it on water too?

13 MS. MONSERRATE: Whatever media you decide.

14 DR. POHLAND: Well, I think we kind of
15 decided all three, air, water and soil.

16 MS. MONSERRATE: Ambient air.

17 DR. POHLAND: There is two airs, indoor
18 and ambient. You want both.

19 DR. STOLINE: I think the EPA doesn't have
20 indoor air much.

21 DR. POHLAND: Those are short lists, by
22 the way, so that won't be too terribly taxing.

23 MS. MONSERRATE: That is indoor air,

shallow ground water and shallow soil.

1 DR. POHLAND: That would be the most
2 logical.

3 CHAIRMAN WELTY: Let's go back to page 3
4 to go through the rest of this. Pat, you brought
5 up a point related to item B there. Has that item
6 been sufficiently addressed to your satisfaction?

7 DR. MILLER: Yes, it has. I still don't
8 have any answer from anyone that makes me feel
9 better about my concern for chronicity but other
10 than that, yes, I'm satisfied. My concern for
11 chronicity, what I said before, about the headaches,
12 the nosebleeds, the skin rashes, the nervous dis-
13 orders, the digestive disorders.

14 DR. CHALMERS: I would be glad to take
15 that on if you don't think me an unsweet person.

16 DR. DAVIS: Well---I'm sorry, go ahead.

17 DR. CHALMERS: Well, I'm sorry, go ahead.

18 DR. CHALMERS: Well, I will let you do it.

19 DR. DAVIS: I was just going to say that
20 some of those end points are certainly important.
21 Some of those end points are certainly important.
22 They are, however, difficult to get consistent
23 case ascertainment of and many of them rely on self

reporting. Beverly Paigen acknowledges it's very
1 difficult for any one of them to get reliable data
2 on. However, we could stipulate, and I think
3 Dr. Silbergeld makes this point quite well in her
4 memo if I could find it, that one should not only
5 look at the end points of birth and death but as to
6 morbidity and she suggests the following, and I
7 will give you an example of the things that might
8 be easier to replicate in terms of analysis,
9 patterns of absenteeism or sickness in employment
10 and school attendance, birth weight as a continuous
11 variable, school performance, induction physicals
12 for military service, veterinary records and
13 hospital use patterns. Now, all of these, while
14 they are somewhat amenable to qualification have
15 their own kinds of problems. For example, one I
16 have been interested in at the academy is there are
17 registries of tumors in animals, you know, pets,
18 but there is a lot of self selection as to those
19 people whose pets get veterinary care to get
20 recorded that have cancer and these would probably
21 not be very valuable with respect to studying com-
22 mon cancers like lung cancer but might be useful
23 for very unusual cancers like mesothelioma which is

1 associated especially with asbestos exposure. So,
2 it's well taken to suggest that we ought to look at
3 other end points but in doing that, I don't think
4 we ought to specify, you know, nosebleeds, and the
5 names of them but---

6 DR. MILLER: No. I was just sort of
7 specifying what people said.

8 DR. DAVIS: No, I understand but I think
9 we should specify that an interest should be made
10 in documenting verifiable cases of morbidity and
11 not just focusing on mortality and then leave it
12 to those who are involved to decide what would be
13 the most easy types.

14 DR. MILLER: But you see, the state's
15 reaction, if you will excuse me, I really hate to
16 take your name and---

17 DR. POHLAND: You are not being sweet now.

18 DR. MILLER: I mean, the state's reaction,
19 it seems based, on my perception of it at least,
20 when these things come up, is again and again and
21 again to talk about subjectivity, throw your hands
22 in the air and to conclude that there is no way
23 around it and at the same time, for example, when
we were doing our field work and collecting our

1 interviews among present and former residents of
2 the neighborhood, we were astounded. We were
3 dumbstruck at the number of people who reported to
4 us that they had received physician ordered
5 CAT scans for headaches and that's an indicator
6 or a verifiable indicator and I am talking about
7 CAT scans that had been ordered in 1974 and 1975
8 and 1976, before there was ever any issue about the
9 Canal or its contents. That could have been picked
10 up and something could have been done. I mean,
11 there had to be, you know, that could be reconstruc-
12 ted for the area but there seems to be no enthusiasm
13 for it and that is the problem that I have. I
14 think that it's that lack of enthusiasm is also
15 reflected in the fact that there are rather varied,
16 a lot of difficulty in assessing what the knowledge
17 base is and what the comparative---

18 DR. DAVIS: I am sympathetic to your
19 concerns but that one example, there is a county
20 in California that had recorded, I think, one of
21 the highest rates of death from a particular kind
22 of heart disease in the country and it turned out
23 that the reason why it had that recorded was that
there was a physician in that county that---and he

1 liked to list that, who was listing it as the cause
2 of death. Now, the same situation that you men-
3 tioned about the CAT scans, the CAT scans were
4 just coming in about that time and very fashionable
5 and very expensive, and Blue Cross was paying for
6 it. So, I'm just trying to say that it's very
7 difficult to control for how much of this is diag-
8 nostic fads and it needs to be done, and I think we
9 need to say that these things need to be done but
10 we should be aware of the need to do this in a way
11 that can be acceptable by epidemiological standards.

12 DR. CHALMERS: You lost me. I don't think
13 we should say something should be done if the
14 results of doing it are totally uninterpretable.

15 DR. DAVIS: Oh, no.

16 DR. CHALMERS: And right up until then
17 I was going along with you, that what you are doing
18 is listing in chronology the symptoms which man
19 and womankind have when they are exposed to all
20 kinds of environment and we have all found through
21 the years that when you try to interpret these
22 galaxies of functional-like complaints in the
23 environment in which there are stresses and strains,
they become uninterpretable and emphasizing them

1 causes more harm than benefit by increasing atten-
2 tion to them, in which case they increase, and if
3 we can't find and set up some method of quantita-
4 tively interpreting whether or not these symptoms
5 are any more frequent as a possible result of the
6 toxins, we shouldn't be trying to measure them.

7 DR. DAVIS: You and I are in agreement.
8 The only difference is that I think that there may
9 be some ways of going about this that haven't yet
10 been successfully done and we ought to at least
11 encourage the development of replicatable techniques
12 for evaluating these kinds of syndromes. I think
13 that that is all that I would say.

14 DR. STOLWIJK: One technique that we have
15 used and had some degree of success is to use
16 school absences which can be documented but it
17 requires a degree of institutional coordination
18 that given what we have experienced here so far
19 may be beyond getting.

20 DR. CHALMERS: Also, if you find differences,
21 you don't know whether that is due to chemicals in
22 the environment or due to the fact that people are
23 worried about chemicals in the environment.

DR. STOLWIJK: But it places some

1 surveillance on the thing and if people are worried
2 about it and are doing something about it, at least
3 they don't keep on doing it, after a couple of
4 months they forget about it. So that there is a
5 way of having continuous surveillance in a commu-
6 nity on the welfare of children by looking at the
7 school absences. It's possible to do that and it
8 might be identified that that is one convenient
9 way to accommodate the desire to look and check on
10 the quality of the wellness in a population. That
11 is not a difficult way to implement.

12 CHAIRMAN WELTY: It seems like this has
13 led into a discussion of health and---

14 DR. CHALMERS: Just another word on this,
15 just one second and that is that when one does have
16 a group of people who are assumed on their own,
17 through their own judgment and judgment of others
18 to be at a somewhat increased risk, keeping a
19 child home from school is a natural reaction to
20 worry about that and again, I think that kind of
21 data could be highly unreliable because it has so
22 many interpretations with regard to the possible
23 causes.

DR. STOLWIJK: The school absence is not

unreliable. That is there.

1 DR. CHALMERS: No, but the interpretation
2 of whether they are absent because the families
3 would like to establish the fact that they are
4 living in an endangered area and would like compen-
5 sation, subconsciously have a feeling that because
6 of that they want to be more careful.

7 DR. DAVIS: Then you would accept the use
8 of school attendance records prior to the public
9 fuss about the Love Canal, right? Those would be -

10 DR. CHALMERS: Sure.

11 DR. DAVIS: So that there may be some
12 historical records of value and that I think is
13 the point that we could say that it may be useful.
14 There may be some data. For example, if one could
15 get, and I don't know if it's possible, military
16 induction physicals on young men and you would need
17 to get a lot of them, obviously, who had been
18 residents of the canal, and compare them to others.
19 That sets a whole series of tests.

20 DR. POHLAND: I would just like to comment
21 on that, reflecting back on my physical, I don't
22 think that will tell you a damn thing.

23 CHAIRMAN WELTY: I think we need to maybe

1 just focus on this a little more in terms of page
2 14. Could you all turn to page 14 in the document
3 and I would like to pursue this, particularly,
4 Dr. Davis, before you leave, since I think you have
5 some good issues.

6 DR. CHALMERS: I think it is important to
7 get the report and I think that this morning was
8 very worthwhile because I think that on probing
9 and unless protocol had been changed through the
10 years, I am convinced that the children who lived
11 there had developed physical abnormalities which
12 had been documented. That seems to me that the
13 study has clearly documented that. I don't pay
14 much attention to the symptom complexes because
15 they are so highly suggestive, susceptible to
16 suggestion but the other data along with the fact
17 that there was a transient decrease in birth weight
18 documented from hospital records, it seems ines-
19 capable that children in utero and born during that
20 high contamination area in Love Canal did suffer
21 and I don't know that we have to keep pursuing that
22 any more, things like that, by looking at the draft
23 physicals or school attendance or anything else.
I think that we can as a group, probably, and I

1 would like to hear if anybody disagrees with me,
2 say that there are now apparently reliable data of
3 the fact that there were some changes.

4 CHAIRMAN WELTY: My point was that---

5 DR. CHALMERS: What their meaning is, we
6 don't know.

7 CHAIRMAN WELTY: My point was that, in
8 terms of the statement that is there, it was the
9 fact that our knowledge of adverse health effects
10 of past Love Canal exposures is not going to improve
11 and the suggestion as to whether we should pursue
12 that, to answer some of the questions that you have,
13 is it feasible to do that, and then Bob has asked
14 your input in terms of the questions related to
15 mortality, cancer and congenital malformations,
16 what should be done and how would the registries
17 best be used to answer those questions.

18 DR. MILLER: Well, I would like to know
19 what the first line of that third paragraph means,
20 habitability should not be contingent on past or
21 future health studies. I assume that that is
22 just an unfortunate construction or does somebody
23 literally mean that regardless of what we find the
future health situation of that community to be, we

1 are not going to make any, nor should we make any
2 decisions on habitability with reference to that?

3 DR. DAVIS: I think that simply refers to
4 the fact that it is unlikely that epidemiological
5 studies are going to be able to document the
6 extent of a health risk and one should not make the
7 decision to reinhabit an area contingent on showing
8 that previous inhabitants, in fact, were at risk.
9 That is what I am interpreting it to mean and I
10 think that is what Dr. Silbergeld interpreted it to
11 mean and she wrote it in her comments as well.

12 I would like to comment on the points that
13 you have raised. I would like to suggest that the
14 first paragraph be deleted as it stands now. I
15 think that the presentation we saw this morning
16 and the notes that I have raised, and I will just
17 briefly review them since I know most of you just
18 saw them this morning, suggest to me, at least,
19 that I cannot agree with this statement that there
20 are no convincing studies that show that there was
21 sizable, significant increase in any of the outcomes
22 above the normally expected level and in fact, if
23 you read the Genrick study of Love Canal cancer
incidents, there was an elevated rate of lung cancer

1 in Love Canal. It did not appear to be in the
2 particular homes that people at that time thought
3 would have been the homes most likely to have the
4 increased rate but it was in women which is very
5 instructive, as well as men, and the data, there
6 is a peculiar sentence in that article which caught
7 my eye and it said that because of all the public
8 attention, they were going to restrict their
9 analysis to cancer incidence data collected prior
10 to 1977.

11 Well, the only problem with that statement
12 is that it implies that you could have reported
13 cases of cancer incidence that might not either be
14 real cancer incidence or that you could have
15 increased reporting in a very short period of time.

16 CHAIRMAN WELTY: It may not imply that.
17 Bob might be able to answer this. It could mean
18 that women are going in for more screening because
19 they are having symptoms and they are picking up
20 the cervical cancer more frequently or other cancers.

21 DR. DAVIS: Well, I was just going to say,
22 except for the breast cancer where we had exactly
23 this happen after Mrs. Rockefeller and Mrs. Ford
both developed their problems with breast cancer,

1 there was an effect which increased, but for many
2 of the other cancers, especially those analyzed in
3 that paper, it is extremely unlikely that that
4 could be happening. Now, for other diseases, the
5 ascertainment is not quite as good but we have
6 pretty good data on cancer by now and what I would
7 hope would be done and I think I might volunteer
8 for this group, is to take the data that Genrick
9 had and use a different reference population to
10 come up with the expected rate. What that article
11 did was to take the rate in the Love Canal area and
12 compare it to the rate in upper New York State.
13 We now know that upper New York State has a lot of
14 other sources of industrial pollution. If the
15 true purpose is to test the effect of living in
16 Love Canal, then what you want to use for your
17 comparison population is a population which does
18 not have similar exposure.

18 DR. CHALMERS: We had that same problem
19 this morning with the children data.

20 DR. DAVIS: Yes. That is why the data
21 are all the more impressive, that there is any
22 effect at all, because it's really two exposed
23 populations with a differential between exposure

1 in Dr. Paigen's work and that is what you have in
2 the Genrick cancer research paper and I think it
3 would be worthwhile first to ask the state health
4 people for additional data because they say in that
5 article in Science Magazine that lung cancer should
6 continue to be monitored and in addition, to
7 calculate the rate looking at a different standard,
8 a different comparison population. What you do in
9 epidemiological terms, you take your observed rate
10 from some standard population and you compare it
11 to your expected rate and the expected rate from a
12 standard population and you observe your study
13 population.

14 DR. HUFFAKER: I think it depends on what
15 question you are asking. If your question is
16 are lung cancer rates at the Canal higher because
17 people live at the Canal or is lung cancer in
18 Niagara County higher, including the Canal, and
19 this is what Genrick did. He said there was no
20 difference for the whole county, that the Canal was
21 essentially the same, as I remember the paper.

22 DR. DAVIS: No, no. Does anyone---no,
23 that is not correct. Actually that is not what he
said. Love Canal lung cancer rate was higher

1 than the surrounding area as a matter of fact but
2 in looking at the place of residence, I have it
3 here, in looking at the place of residence for
4 those lung cancer cases, the Love Canal census
5 tract incidence rate of lung cancer are higher
6 than the city average of Niagara Falls and lung
7 cancer rates should be monitored in this area in
8 the future. The city in general has a rate of lung
9 cancer which is slightly above the rest of the
10 state. The magnitude of the increased frequency
11 is unknown but he did find that it was higher
12 and this, by the way, is not indicated in the
13 abstract either and so I read that article over
14 again and I thought, gee, I must have misread it
15 the first time because this article was generally
16 explained to me as saying there was no effect.
17 I do not think it shows that and I think it would
18 be worthwhile to recalculate those data.

19 Does CH₂M Hill have that in their program?
20 Have you entered any of these type of data?

21 MS. MONSERRATE: No. We are dealing
22 strictly with the environmental data.

23 DR. DAVIS: Well, I think that ought to
be done. I would be glad to work with you on that.

1 CHAIRMAN WELTY: So, just to summarize
2 then, your two concerns are, first of all, to update
3 the lung cancer incidence rates for this area.

4 DR. DAVIS: Right.

5 CHAIRMAN WELTY: And the second thing is
6 to ask the question, are the rates from the Love
7 Canal census tract higher than the national rates.

8 DR. DAVIS: Yes. Well, I think you need
9 to use a different population.

10 CHAIRMAN WELTY: Because that is asking a
11 different question. I would have to agree with
12 Bob in that regard.

13 DR. STOLWIJK: You really would like to
14 ask the question yet another way and that is, Love
15 Canal census tract, of course, contains a number of
16 people who were not exposed. So, it gets even
17 different from that again if you want to pursue that.

18 CHAIRMAN WELTY: Well, that is it. The
19 thing that Bob is asking is, using the registry of
20 people that they have on file, supposed to be about
21 8000 people, right? Should we request the State
22 Health Department to look at their rates specifical-
23 ly to see if the residents of Love Canal are
subjected to higher rates of cancer.

DR. CHALMERS: The answer to that is yes.

1 DR. DAVIS: And also I don't agree with
2 this notion that you should stop at 1977 incidence
3 data. Look, for example, you can justify that if
4 you take liver cancer, pancreatic cancer, take
5 your fatal cancers for which incidence and
6 mortality are practically one to one. Then you
7 could do that. But it seems to me that to exclude
8 all cancers after 1977 because of the political
9 interest in Love Canal is really an extreme
10 exclusion and you are throwing away data that
11 might be of some value.

12 DR. HUFFAKER: What did the epidemiologists
13 say about using the Canal census tract? The area
14 here has been gutted. Most of our population is
15 gone and I don't see the merit of doing studies
16 like this.

17 DR. DAVIS: Well, I understood Dr. Vianna
18 to say that you had completely ascertained that
19 cohort, that you had found all of those---

20 DR. HUFFAKER: Well, that is different.
21 You said in the Niagara Falls area and you said
22 doing 8000 cohorts.

23 DR. DAVIS: I'm talking about the cohort

1 of persons who have lived in the Love Canal and
2 I understood him to say that he had identified all
3 of them.

4 DR. CHALMERS: You have to do more than
5 lung cancers because the cigarette smoking rate
6 is so---lung cancer is so sensitive to cigarette
7 smoking that it will throw you off.

8 DR. DAVIS: But not among women, not
9 yet.

10 CHAIRMAN WELTY: It is now.

11 DR. DAVIS: No, it just has become that.

12 DR. CHALMERS: Well, the end result has
13 become that.
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DR. DAVIS: But if you were to look at age specific, sex specific lung cancer rates in women, say '65 through '84, that is not a group of women who had historically smoked a lot or even take '55, women smokers, that is a newer development. That is a younger cohort affect.

6

DR. HUFFAKER: Okay. I have a tactical problem here. This is going to cost maybe \$80,000, something like that. This is going to take a little while and wherewithal to design the study and all of the rest of it. Would the group mind making this a recommendation that this specific study be done because that would take a little bit of - -

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DR. CHALMERS: That would cost one-hundredth as much as measuring those 250 chemicals.

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DR. HUFFAKER: That is true but - -

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DR. UPTON: Will it affect the habitability criteria?

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DR. HUFFAKER: Not any.

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DR. UPTON: I can't see that it really impacts on habitability criteria, not that it isn't worth doing but that it takes time or money doesn't really influence our work.

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DR. DAVIS: And my only point in raising

2 it was really, I was spurred by Dr. Stolwijk's
1 statement with which I had first agreed and then I
2 thought wait a minute, that we don't have health
3 evidence, that we - -

4 DR. STOLWIJK: Then you didn't read the
5 last sentence.

6 DR. DAVIS: Last sentence.

7 DR. STOLWIJK: Of the same paragraph.

8 DR. DAVIS: No, I did. I did but I
9 think that those whole two paragraphs, the only
10 sentence I would tend to - - I tend to think that
11 we would now rewrite them and I would probably
12 start that section with some variation on your
13 sentence, habitability should not require demonstra-
14 tion of past health harm has occurred. I think
15 that that I would agree with.

16 DR. POHLAND: I'm not sure that you can
17 ascribe that to him. That's the way it came out.

18 DR. DAVIS: Well, to whomever. I think
19 that - - that - -

20 CHAIRMAN WELTY: I will take responsi-
21 bility for that.

22 DR. DAVIS: The concept is a good one.
23 I don't think we should make blanket statements

3 about the evidence because I think the evidence
1 is not in yet.

2 DR. CHALMERS: I want to disagree, Arthur,
3 with the statement that finding out if cancer
4 rates are higher in those 8,000 is not pertinent
5 to habitability because I think if we find that
6 it is not, it reassures us that people moving into
7 an area that has a lot less contamination now than
8 it had then is relatively safe, whereas if we find
9 that the rates of cancer are higher, I think we
10 have to interpret the present data a little more
11 cautiously. We need more data to show that
12 harm was done.

13 DR. UPTON: I agree with you but you
14 are not arguing that the efforts to establish
15 criteria should be deferred until the studies are
16 finished.

17 DR. DAVIS: No, no.

18 DR. UPTON: That is what I was saying.
19 We need to press on.

20 DR. CHALMERS: Yes. I wouldn't abandon
21 and I think it is critically important that these
22 8,000 be followed in every possible way.

23 DR. DAVIS: Bob, what are you referring

4 to that would cost \$80,000?

1 DR. HUFFAKER: That is a rough figure
2 that we had that it would cost about \$100 a name
3 to do a run on them.

4 DR. DAVIS: You mean to track the people?

5 DR. HUFFAKER: No. This is just to run
6 a registry, to make a computer run on it. We
7 would have to get the national cancer thing and
8 I don't know when the last data was on that, when
9 it was reported.

10 DR. DAVIS: Well, no. They are available,
11 you know.

12 DR. HUFFAKER: We know that and then to
13 do a match and run them and then there would be
14 follow-ups I suppose. Would you take whatever
15 the tape said or would you go back and verify that
16 you had a hit there?

17 DR. DAVIS: Perhaps I could talk to you
18 about this later. I have some thoughts about how
19 you could do that.

20 DR. HUFFAKER: Let's do that.

21 DR. DAVIS: You could do this in incred-
22 ible ways, since this has already gone through
23 peer review and already been published and I think

5 with the programmable calculator and the cancer
1 incident data, you could come up with that.

2 DR. CHALMERS: You are talking about
3 different things now. You are talking about taking
4 the original data and we are talking about gather-
5 ing new data on outcome.

6 DR. DAVIS: We can talk about that
7 later.

8 CHAIRMAN WELTY: Bob, are all your
9 questions answered then in terms of what your
10 concerns are related to the health questions?

11 DR. HUFFAKER: Well, somewhere out in
12 the criteria I hope there are some recommendations
13 to the Health Department as to some specific
14 things and we badly need those specific recommenda-
15 tions in order to go forward with these activities.

16 DR. UPTON: On Page 15, it says HHS and
17 DOH will report on the feasibilities at this
18 meeting.

19 CHAIRMAN WELTY: Dr. Huffaker has said
20 that they are feasible, it is just a matter of
21 getting the resources to do them. So, in order
22 to get those resources, he feels that a recommenda-
23 tion from you all would be helpful.

6

DR. HUFFAKER: The congenital malformation study is winding up and we will have something to send to you soon.

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CHAIRMAN WELTY: The other question that Dr. Miller brought up was, other types of health problems that the populace is complaining of and are there any studies that are feasible to do and along these lines, perhaps we should discuss your suggestion of using certain animals as sentinels and whether that is feasible.

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DR. DAVIS: Oh, it has been done already. Dr. Paigen presented some of her work on voles but there have been two articles on voles that we have seen, one in the Natural History and one in the Peer Review Journal, Environmental Health.

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CHAIRMAN WELTY: Yes. I am familiar with the articles. I am not clear on how they would fit in with habitability and in terms of whether the habitability would be contingent on them showing no effect or whether they would just be like these health studies, something that should be done to increase our knowledge about the conditions related to the canal.

So, how would you propose doing these

7 studies?

1 DR. STOLWIJK: I think the difficulty
2 with the voles is the predator problem and as
3 long as you have more than one variable that you
4 cannot control, it's very difficult. If you have
5 these pens that they are talking about, I would
6 be a lot happier with it, with the longevity
7 involved.

8 CHAIRMAN WELTY: So, you put the pen
9 down and have your voles run around on the
10 ground.

11 DR. STOLWIJK: Yes.

12 CHAIRMAN WELTY: And sort of see how
13 long they live.

14 DR. STOLWIJK: Yes.

15 DR. CHALMERS: The other, the natural
16 stuff is impossible to interpret because if the
17 place is more inhabited, there would be more cats
18 and cats would knock out the controlled ones that
19 are small, leaving just big tough ones surviving
20 in the control area.

21 CHAIRMAN WELTY: Is that what you had
22 in mind? In terms of your suggestion, I'm not
23 really clear on that .

8 DR. DAVIS: Actually I indicated I
1 had both in mind. I indicated there were two
2 types of animal studies that were relevant, one
3 would be taking experimental animals and exposing
4 them to ambient Love Canal conditions and there
5 I have in mind your usual, you know, Fisher Rat.
6 The other is monitoring of native animals and I
7 guess I have been talking to some of these people
8 that are veterinary epidemiologists, I never knew
9 it existed until a month ago and there are some
10 fairly well-established protocols for how to do
11 this and I am not an expert in it but I could
12 tell you some people who are. Dan Glickman,
13 University of Pennsylvania and Fredrick Lowe,
14 Dean of Veterinary School at Tufts in Boston and
15 it would certainly be worthwhile to explore either
16 of these options and certainly I think that there
17 is a general sense here among the individual
18 experts in this group that would be far better
19 to find out what is going on with these little
20 critters before making decisions about what to do
21 with humans.

22 DR. HUFFAKER: I think we may have
23 already biased your study. The homeowners group

9 inside the EDA was complaining about rats, mice
1 and we asked the County rodent control people to
2 come in and do a program and they did.

3 DR. DAVIS: All right. I don't think
4 that would interfere with my study.

5 DR. CHALMERS: You might find some
6 lethal chemicals there.

7 DR. DAVIS: You have to control for your
8 organocides and unfortunately most of those are
9 not too successful anyway.

10 CHAIRMAN WELTY: Well, I have no idea
11 the timing of how this would occur, I mean, how
12 long does it take to do these? Are we going to
13 hold up the decision on habitability until we
14 get these studies? I mean, that is what you are
15 proposing. You are making habitability contingent
16 on these, the beneficial outcome of these studies.

17 DR. DAVIS: No.

18 DR. STOLWIJK: Why was there a problem
19 with getting permission to put pens out?

20 DR. CHALMERS: Why did the State refuse
21 permission?

22 DR. DAVIS: Apparently for five years.

23 DR. HUFFAKER: That was the first I heard

10 about it.

1 DR. DAVIS: Is Dr. Paigen here?

2 UNIDENTIFIED VOICE: No, she left. She
3 just left.

4 DR. DAVIS: What about this fellow,
5 Christiansen who wants to do this?

6 CHAIRMAN WELTY: Has the EPA funded
7 this study that Dr. Paigen mentioned?

8 MR. OGG: I'm not sure of the specifics.
9 I know we have some money in a study. I am not
10 sure which one or how far it goes.

11 CHAIRMAN WELTY: No answers to that
12 question. I guess we will have to get back to
13 you on that.

14 DR. STOLWIJK: But it would seem logical
15 that if there is already a funded study or a
16 study like it that takes care to avoid the problems
17 that you have with the capturing from the wild,
18 then that would seem to be something that could
19 be gone through very quickly.

20 DR. CHALMERS: Yes, this summer, since
21 they only live a short time anyway.

22 DR. SIPES: But that is not holding up
23 the criteria development as much as it would be the

11 habitability itself. I mean, if a recommendation
1 was made for biological monitoring that should be
2 done as a criteria that we would like to see
3 established, it doesn't hold up the document, but
4 it may hold up the ultimate decision by some
5 other body, whoever that would be.

6 DR. DAVIS: I guess it raised for me
7 the question of whether there might not be some
8 other environmental sample that could be drawn,
9 perhaps from the trees or vegetation and that
10 one could readily determine what the current levels
11 are. That is my concern, at least.

12 DR. HUFFAKER: The EPA samples quite
13 a lot of biota from polliwogs, crawdaddies,
14 grass, voles, mice, tree leaves and got what you
15 would expect to see out of the trees and mice and
16 all the minerals that you would expect to see and
17 so on, but there was not much new there. They
18 got some bad stuff out of the animals in the creeks.

19 DR. DAVIS: Yes. I would think you
20 should really look at the fat, things that have
21 fat in them. Animals have fat.

22 CHAIRMAN WELTY: What was your concern
23 about other animals or how would you propose

12 designing a study of animals in basements or - -
1 I mean, you had said that this previous study
2 didn't have enough power to detect effects. So,
3 do you have something specific in mind?

4 DR. DAVIS: Well, there are accepted
5 protocols for chronic animal bio-assays, you just
6 can't do it. They happen to involve between 100
7 to 400 animals at different dose regiments and
8 the prescribed pathology and they cost an average
9 of \$300 to \$1 million, \$300,000 to \$1 million
10 and you can't do those kinds of tests. So, I
11 would guess that I would think that the best bet
12 would be to go for the natural, so-called natural
13 experiments where you have a better shot at it.
14 I am not recommending that you start a bio-assay
15 program in the basement of Love Canal but simply
16 that the only point I wanted to make was that the
17 one test that was done that was referred to me as
18 an example of the study, really was not of suffi-
19 cient power to have shown an effect and in fact,
20 it did show you an effect and I believe I mentioned
21 this. This was the teratology study of inhalation
22 teratology of 15 animals in one Love Canal home
23 where they were exposed under controlled conditions

13 but the 15 animals, that would be an extremely
1 low probability of finding an effect unless the
2 effects were very prevalent. That is just a
3 statistical statement and even so, this study
4 found areas of uterine hemorrhage in three of the
5 exposed rats and none in the controlled rats.

6 So, one would tend to think of that as
7 perhaps an important finding but again, the numbers
8 are too small to demonstrate that. So, if you
9 had a frozen section that remained of controlled
10 rats, you could reexamine that and make sure that
11 there was no uterine hemorrhage and then you would
12 be more confident of the evaluation but basically,
13 this study was sent to me with a cover saying
14 that it was a negative study and I am saying
15 back to you, no, it's not a negative study, it's
16 an inconclusive study, because it didn't have
17 sufficient power to find an effect and under
18 these circumstances, since you are not going to
19 be doing chronic bio-assay studies, what you ought
20 to do is look at the natural environment and I
21 think that from the people I have spoken to and
22 I have given you their names, there may be something
23 more to be gained from veterinary epidemiology

14 here and it appears that there have been a number
1 of people interested in doing this in the area for
2 at least the past five or six years and I think
3 that I would like to know why they haven't been
4 allowed to do their study and maybe other people
5 here would like to know too and they ought to be
6 encouraged and that these studies ought to be
7 done; better voles than kids.

8 CHAIRMAN WELTY: We will try to secure
9 the protocol for that study and review it and
10 find out why it wasn't done and get back to you.

11 Dr. Miller's question, I'm not sure if it
12 was satisfactorily answered, that has to do with
13 chronic health effects and whether there is any-
14 thing we can further do in that regard to answer
15 the concerns of the community.

16 DR. DAVIS: I have wording on that. I
17 would like to say that on Page 15, to put a
18 D and I would suggest that, have other chronic
19 diseases or social problems that can be indepen-
20 dently verified, increased in Love Canal residents.
21 That is, have other chronic diseases or social
22 problems and that as you know is very widely
23 defined, that can be independently verified, that

15 is the trick because it's very difficult to
1 independently verify any of these things,
2 increased in Love Canal residents and so the
3 onus is on some innovative social scientist to
4 figure out how to independently verify that.

5 DR. CHALMERS: I think that is a ridicu-
6 lous statement, excuse me.

7 DR. DAVIS: That is okay.

8 DR. CHALMERS: If you said - - you
9 ought to say since other chronic disease mani-
10 festations that we can think of cannot be
11 independently verified, there is not much point
12 in devoting a lot of effort to it.

13 DR. DAVIS: Well, I'm not saying how
14 much effort should go into it and I think that
15 there probably are people who have been thinking
16 about this longer than you or I and maybe they
17 have some ideas. I mean, it is a constant problem
18 now. You know the problems of the Wilburn
19 situation and it's a difficult problem. You are
20 using self-report information.

21 DR. CHALMERS: In situations in which
22 you have very precise and measurable experiments
23 like a randomized control trial of convention of

16 heart disease, people invariably end up with just
1 measuring death or hospitalization because anything
2 less than that turns out, even in very carefully
3 followed people in circumstances in which they
4 have been randomly selected rather than in the
5 existing in the normal environment, you can't
6 interpret the data.

7 DR. DAVIS: Okay. So, how about hos-
8 pitalizations as being something that could be
9 measured?

10 DR. CHALMERS: You can't interpret that.
11 That is a very soft figure which you just can't
12 interpret.

13 DR. DAVIS: Well, how about hospitali-
14 zation for mental problems?

15 DR. MILLER: How about presentation to
16 social welfare agencies or counseling services
17 for marital problems?

18 DR. CHALMERS: What has that to do
19 with the possible exposure of chemicals?

20 DR. DAVIS: That could be just stress
21 related.

22 DR. MILLER: Well, not if it's prior to
23 1976.

17

DR. DAVIS: Okay. So, we make a stipulation prior to - -

1

DR. MILLER: I mean, you still have a problem of demonstrating cause but you have got that with any of this.

2

3

4

CHAIRMAN WELTY: Well, when we get back to prior to 1976, we get into the issue of feasibility.

5

6

7

DR. CHALMERS: The control population is impossible.

8

9

CHAIRMAN WELTY: How would you get records of what happened in 1976?

10

11

DR. MILLER: Well, you see, if none of this is doable, then it's moot and it doesn't matter whether it is in there, right?

12

13

14

DR. CHALMERS: That is my point.

15

DR. MILLER: So, if we could put it in there, it wouldn't hurt anything, right, because it is not doable and it will never get done.

16

17

18

DR. CHALMERS: Well, I think one of the purposes of this Committee is to sort in our minds what we think is doable and recommend what we think is doable and not what isn't.

19

20

21

22

SISTER HOFFMANN: Dr. Welty, can I just

23

18 intervene a minute because I can answer his
1 question. Yes, I have a lot of questions about,
2 for example, schizophrenia and we will deal with
3 this later and some of that can happen when age
4 increases but why, for example, I just have a very
5 tiny example, why, for example, on one street in
6 that EDA do you have five suicides, four diagnosed
7 schizophrenia? We are dealing right now with a
8 situation where one of those cases, she wants to
9 do away with herself, OD, 130 pills just the
10 other night, is in the hospital, this kind of thing.
11 This thing continues on and I am just trying to
12 go back to that, that this thing is going on yet
13 and your remark wasn't so silly, better voles than
14 kids and can you measure that, like schizophrenia,
15 high levels of mercury in the blood? We are
16 finding out on some of these and then the suicides.

17 CHAIRMAN WELTY: The suicides would turn
18 out in the mortality studies so that would be
19 something that we have already addressed.

20 DR. CHALMERS: Plus the suicide might be
21 the result of our deliberations, not vice versa.

22 DR. MILLER: Well, I think that - -

23 SISTER HOFFMANN: Well, there is a woman

19 sitting in this room and she did say that - -

1 CHAIRMAN WELTY: Can I just ask you,
2 Sister - -

3 SISTER HOFFMANN: Who is on tranquilizers,
4 I just want to say in your deliberations, that is
5 why this is so very important and I just wish you
6 would look and she took me in the back and showed
7 me her back and her arms and people are really
8 stressful. But you don't count that into it.

9 CHAIRMAN WELTY: Could I ask that we
10 hold off on community input until 3:30, please?

11 DR. MILLER: Could I respond to your
12 question? If it is the case that we have at least
13 what in my mind is a rather strong suggestion that
14 chronicity in consequence of exposure, chemical
15 exposure at Love Canal has created a set of
16 or accounts for a set of disorders that compromise
17 the quality of life on the one hand and on the
18 other hand, we do not have a methodology that
19 allows us to address it, in other words, that the
20 state of the art is such that all we can conclude
21 is that science doesn't know and can't know, then
22 I guess I would have questions about whether or not
23 it's possible to establish criteria for habitability

20 in the EDA.

1 I mean, that is where I am at.

2 DR. CHALMERS: Taking your definition,
3 we would all agree that it is impossible. In
4 other words, if you say we have to be able to say
5 that there will not be an increased incidence of
6 relatively minor, non-fatal symptoms among the
7 people who move in before we can recommend that
8 people move in, we never can recommend that
9 people move in and maybe that is why - - that
10 is not in our charge. Our charge is just to say
11 how to make the decision and not make the
12 recommendation.

13 DR. MILLER: Well, I thought our charge,
14 Dr. Chalmers, was to determine, first of all,
15 whether or not it was possible to establish
16 scientific criteria by which to evaluate habit-
17 ability and it seems to me that this is an area
18 where I, at least, have very, very serious con-
19 cerns.

20 DR. CHALMERS: And that applies to the
21 world, not just Love Canal because we have no way
22 of telling whether those things are any different
23 at Love Canal, might be any different among people

21 who would move into Love Canal in the future versus
1 whether they lived anywhere else in the United
2 States or in the world.

3 DR. MILLER: But the problem isn't the
4 problem in the rest of the world, because the
5 rest of the world doesn't live on a toxic waste
6 dump.

7 DR. CHALMERS: I'm not so sure. We are
8 getting there pretty rapidly and we are talking
9 about generalized environment problems, not just
10 Love Canal. You are asking us to prove that a
11 negative - - in other words, to prove the negative
12 and you never can prove the negative.

13 DR. MILLER: Well, I'm not asking you to
14 prove the negative.

15 DR. CHALMERS: Then you have to accept
16 a measurable increase of risk which you will then
17 look for and say that it is not possible that this
18 measurable increase of risk is going to exist or
19 is possible.

20 DR. MILLER: But see, as I understand it,
21 the way we are defining and again, maybe I am
22 confused, the way we are defining here the questions
23 that are relevant as we move into the future, we are

22 excluding future health studies and any reference
1 to anything that pertains to chronicity, that is
2 mortality and cancer and conceivably congenital
3 malformations are going to be the only indicators
4 that we are relying on.

5 DR. DAVIS: There will be another draft
6 and I presume that that other draft will take
7 into account the comments of Dr. Silbergeld on
8 Page 5, where she discusses the need for more
9 sensitive parameters of health and well-being
10 and I think we should probably move on at this
11 point.

12 The views of Dr. Silbergeld are kind of
13 clear and I think there probably is some middle
14 ground and I hope that this person who is drafting
15 this document will find it for us.

16 CHAIRMAN WELTY: I will try.

17 Okay. Thank you for your suggestion to move
18 on.

19 DR. POHLAND: Since she introduced that
20 document, I would like to ask that we receive some
21 personal impressions of answers that have been
22 asked in that document from the originator of the
23 questions. It's easy enough to ask all kinds of

23 questions. I think what we are trying to do is
1 to assemble the answers and I think it would be
2 productive to receive impressions of answers to
3 the same questions that were asked. There are
4 some questions in here, for instance, one that
5 kind of bothers me a little bit is that somewhere
6 in here about the fact that -- I have it under-
7 lined in a copy here, habitability should follow
8 remediation rather than based on commitments
9 to continuing efforts. That is good in principle
10 but may not be viable in fact because recognizing
11 that the system that exists there is one that is
12 an active system, I think remediation will con-
13 tinue and, you know, I am having a little diffi-
14 culty following her trend of thought on some of
15 these things. She has basically posed a lot of
16 questions which I think are valid questions but
17 I would like to at the same time get her perspec-
18 tive on this. It is a her, isn't it?

19 DR. DAVIS: Yes.

20 DR. POHLAND: Get her perspective on
21 this.

22 DR. DAVIS: I have spoken to her about
23 this, so I don't know. I can't speak for her but

24

perhaps I could convey some of your concerns.

1

DR. POHLAND: Okay. That is all.

2

CHAIRMAN WELTY: Can we go back to Page

3

4? We haven't discussed that yet. We had out-

4

lined those five options which we have discussed

5

before and the statement was made that the

6

consensus is that habitability criteria be based

7

primarily on the comparative option C, specifically

8

criteria based on a comparative option provide a

9

reasonable degree of assurance that Love Canal is

10

environmentally as safe as other urban areas.

11

My concern is that we need to be a bit more

12

specific if possible about the other urban areas

13

that will be used as a comparative area. Dr.

14

Paigen has chosen to use areas within Niagara

15

Falls. A suggestion was made at one point to use

16

homes in Lockport. Other people have suggested

17

Buffalo or New Jersey or wherever and I am wonder-

18

ing if you want to be more specific or leave it

19

general as it is there.

20

DR. DAVIS: Let me call your attention

21

to the fact that I did some checking after I

22

looked at Bayonne, New Jersey levels and the Love

23

Canal areas and I thought it just doesn't make

25 sense, Bayonne, New Jersey had higher levels than
1 Love Canal did and what I found in talking with
2 people who conducted some of those studies and
3 I reported that in my paper which I am sure you
4 all haven't had a chance to look at, was that
5 some of what was going on when they were doing that
6 monitoring indoors where they had the high levels
7 of benzine, was painting and other activities
8 that would have, of course, produced very high
9 levels and that it's extremely important in
10 any recommendation to do a comparative analysis,
11 to specify that the monitoring must be done under
12 certain parameters, indoor monitoring should be
13 conducted with specified conditions of heating,
14 ventilation, temperature, humidity, windows should
15 be closed for 24 hours prior to monitoring and
16 throughout the monitoring period to maximize
17 protection. We have heard stories about when
18 people knew they were coming to monitor their
19 houses in Love Canal, they would open up the
20 windows for 24 hours so that the levels would
21 go down.

22 DR. POHLAND: They also spiked the
23 sumps.

DR. DAVIS: Where did they get the stuff

26 to spike the pumps?

1 DR. POHLAND: You could buy it in a
2 drugstore.

3 DR. DAVIS: All right. It all gets to
4 be very complicated but I just want to specify
5 that monitoring is not monitoring. It has got to
6 be very much specified and controlled.

7 DR. STOLWIJK: That's why when I made
8 that table, Devra, I took care to use levels out-
9 doors and I took great care to use the levels that
10 were suffered by personnel by wearing 24-hour
11 monitors. I think your comments are not relevant
12 to, at least the number that I provided but I am
13 glad they stimulated you.

14 DR. DAVIS: Well, my understanding was
15 that there were activities, industrial activities
16 going on that may have accounted for some of
17 those exposures, at least some of the team people
18 who gathered the data did say that that may have
19 been the case.

20 DR. CHALMERS: It sounds anecdotal to
21 me.

22 DR. DAVIS: It is. Both of our informa-
23 tions are anecdotal and one should not assume that

27 data should be accepted as such without knowing
1 the exact circumstances under which they were
2 gathered and that is my only point and I was
3 prompted to say that by looking at those data.
4 We need to know more about the conditions under
5 which they were gathered.

6 DR. UPTON: I missed the earlier dis-
7 cussion on the selection of C as the option, major
8 option. It's not clear to me what degree of
9 comparability of levels of contamination would be
10 considered acceptable.

11 CHAIRMAN WELTY: That needs to be
12 specified for each media and probably each chemi-
13 cal.

14 DR. MILLER: I thought that was what you
15 were doing on Page 9.

16 CHAIRMAN WELTY: Yes. That is what I
17 am doing on Page 9.

18 DR. CHALMERS: Well, we wondered why
19 it was ten times, I think.

20 CHAIRMAN WELTY: That's derived from a
21 statement on the order of magnitude. An order of
22 magnitude is ten times and I was wanting to get
23 your feedback as to perhaps two standard

28 deviations of the lab measurement might be a
1 more rational comparison.

2 DR. MILLER: How about one standard
3 deviation? Why two? I mean, you are getting
4 back to statistical significance, right?
5 I mean, that is another way of saying statistical
6 significance.

7 CHAIRMAN WELTY: Right.

8 DR. CHALMERS: That is another way of
9 saying that there is a 5% chance that it was within
10 the population.

11 DR. DAVIS: Yes. If you think of this
12 in terms of establishing safety factors and,
13 of course, this is not being applied as a safety
14 factor sense so I think you probably need something
15 different than perhaps a plus or minus one
16 standard deviation might be a little too small
17 but perhaps two standard deviations would be
18 sufficient.

19 CHAIRMAN WELTY: I don't know what the
20 standard deviation is on these measurements. Do
21 you have any information on that?

22 MS. MONSERRATE: It's in the table that
23 I have provided. The standard deviation is listed

29 for each of the markups that Dr. Sipes identified.

1 DR. STOLWIJK: Two standard deviations
2 in the EPA measurements in general would include
3 all measurements and zero.

4 DR. UPTON: Would that amount to a factor
5 of ten?

t-12 6 DR. STOLWIJK: No. The kind of measure-
7 ments the EPA made tend to have a variability in
8 it so that the two standard deviations in that
9 population usually include zero.

10 DR. STOLINE: I would like to comment
11 on that a little bit if I might interject. There
12 really are three levels of measurement, B, which
13 is below detection, T, which is a trace and then
14 there is a number which means that it was measur-
15 able. So, it's one or a four or something like
16 that and it's really difficult to try to come
17 up with a concept of standard deviation when you
18 have two measures that really, the B and the T - -

19 DR. STOLWIJK: They would have to be set
20 on zero.

21 DR. STOLINE: Yes, but they are different
22 because the B is less than T and you have to come
23 up with a - -

30

DR. STOLWIJK: But it's so much less, you know, it's all so small that it doesn't matter any more when you compare it with the actual number.

DR. STOLINE: There needs to be some agreement as to how to define standard deviation with respect to the situation where we have some combination of what is called nominal or not nominal, that is actually ordinal, an interval and it doesn't fit any of those categories. So, standard deviation should be succinctly defined for such data sets that contain combinations of data that are ordinal. B and T which are less than the M but the M data which are measured has a number. So, that is an interval data.

DR. UPTON: So are we talking about time-weighted averages and peaks or averages or a series of sites?

DR. STOLWIJK: We made one determination and then they do a number of sites. That is basically what the number says.

DR. UPTON: Well, suppose one gets a sample variation among the sites.

DR. CHALMERS: You can avoid that by not

31 doing duplicates. That is what bothers me all the
1 way through. Repeatedly you keep seeing figures
2 in which there is no variance because they only
3 measured it once. Somehow I don't understand why
4 the people are doing physical measurements and
5 don't do the same thing as people doing biological
6 measurements do.

7 DR. POHLAND: They do, it is just, I think
8 in that study it was a crises situation and it
9 wasn't conceived and controlled the way it ought
10 to have been. I wouldn't condemn the whole chemical
11 measurement profession.

12 DR. CHALMERS: I am just saying that it
13 helps me to interpret the results if I see what
14 two independent samples done and maybe even diff-
15 erent days in the lab come up with done blind
16 without knowledge of the previous day's determina-
17 tion and I'll bet there would be a lot of swinging
18 back and forth between your three categories in
19 the same specimen which, if we had those figures
20 and knew how often that occurred, we would know
21 how often to put credence in the measurable ones.

22 DR. UPTON: This implies the mean level
23 and not necessarily the peak level.

DR. STOLWIJK: Martha can probably off

32 the top of her head tell you when the averages were
1 given and then the standard deviation probably
2 was an appreciable part of the average number I
3 am sure.

4 MS. MONSERRATE: I am not sure I under-
5 stand your question.

6 DR. STOLWIJK: The mean level that
7 you found on a number of determinations for a
8 particular chemical was 100, then the standard
9 deviation that would be attached to that mean would
10 be likely to be like 50.

11 MS. MONSERRATE: Right.

12 CHAIRMAN WELTY: That would be bigger
13 than an order of magnitude.

14 MS. MONSERRATE: The standard deviation
15 was for all the samples in the EDA. So, that
16 is covering a large geographic area. That is
17 one thing that is really important in those
18 numbers.

19 DR. HUFFAKER: Rather than worrying
20 about them at the level you are talking about
21 now, would you be willing to consider them on the
22 basis of the lower part per million, that it was
23 diminimus.

93

DR. STOLWIJK: You can't do that
1 because there are certain favorite substances
2 that would be too high.

3 DR. HUFFAKER: Well, put a number on
4 some of them, a cut-off and avoid the problem
5 of how accurate one would have to get.

6 DR. STOLWIJK: I guess we would have to
7 look and see what you have actually - - I don't
8 remember what your list looked like, with the
9 averages and so forth. So, I don't know what
10 they are and when you look at it, then maybe that
11 can be more properly dealt with.

12 CHAIRMAN WELTY: Can you give me some
13 help then in, I don't know, in writing this
14 section and also you, Mike, in terms of the
15 statistical design of that particular process.

16 DR. STOLINE: Okay.

17 CHAIRMAN WELTY: Do you want to just - -

18 DR. STOLWIJK: Shall I send you a
19 revision of this?

20 CHAIRMAN WELTY: If you would, that
21 would be helpful and should relieve the comparative
22 discussion as written on Page 5 as "as environ-
23 mentally safe as other urban areas" or do you want

34 to specify Niagara Falls or just leave it in a
1 general sense?

2 DR. DAVIS: No.

3 DR. CHALMERS: I'm glad to see our
4 message to the Commissioner on the bottom of
5 Page 5.

6 DR. STOLWIJK: I think it would
7 probably be desirable, however, Tom, that if
8 a body makes a determination about habitability
9 and does it on the basis of the comparison,
10 that the basis for that comparison be stated to
11 be made a part of that conclusion. In other words,
12 I wouldn't like to see a conclusion state that
13 in general it's compared. I would like to see
14 the basis for that comparison be stated by who-
15 ever has made that kind of decision.

16 CHAIRMAN WELTY: Okay. Let's move onto
17 the application of habitability criteria and
18 I drew primarily from Drs. Miller and Fowlkes
19 for this section and I hope that I accurately
20 reflected your feeling on this.

21 DR. MILLER: You did not. That's okay.
22 Let me see if I can - - I have got some written
23 comments on that too if I can get my hands on them.

35 What we were trying to say, you say the con-
1 sensus that habitability be determined in this
2 manner, it is unlikely the environmental sampling
3 scheme could be designed on a house by house or
4 residential lot by lot basis, unquote.

5 CHAIRMAN WELTY: No, the unquote was
6 two sentences earlier.

7 DR. MILLER: No, no, I am unquoting
8 you now, not me.

9 CHAIRMAN WELTY: Okay.

10 DR. MILLER: What we were arguing was
11 that in fact it was essential that data be
12 collected on a house by house and lot by lot
13 basis and that the data thus obtained be subse-
14 quently pooled to determine the habitability of
15 these small contiguous subareas within the EDA.
16 The idea being then that with a single home or lot
17 within an identified subarea to fail to satisfy
18 the habitability criteria, that the entire sub-
19 area then would be declared uninhabitable. That
20 was what we were thinking of and it seemed to us
21 that that responded both to - - that solved a
22 number of problems and it creates some that I am
23 not aware of but the concern that an individual

36 family would have about the home that it lived in
1 or the home that it was thinking about moving into,
2 I thought could be satisfied if in fact we could
3 assure them that measurements had been made on that
4 lot and in that home and that at the same time,
5 those measurements could then be used together
6 to evaluate the contiguous area.

7 In a related concern that I had to this
8 was the reference that you made somewhere else in
9 the document to the effect that air sampling
10 would go forward in 10% of the homes because given
11 the variability that we know obtains in the
12 geography in that area, with the wet and dry
13 areas as only part of that and also the variability
14 and the quality of the structure of the homes, the
15 variability in the age of the homes, it is not
16 clear to me that a sample that doesn't at least
17 find one of its sampling points within each
18 home and on each lot is really a reasonable
19 sample. Also I think 10% is terribly small.
20 I don't see how in the world you can ever reach
21 statistical significance on a ten-part sample.

22 CHAIRMAN WELTY: Where are you talking
23 about?

37 DR. MILLER: Well, I am bringing up
1 two points. Maybe I should hold the other one.
2 You were talking about, I think indoor air.

3 CHAIRMAN WELTY: The indoor air, that
4 was not 10%, that was 10 homes.

5 DR. MILLER: There were roughly 500 homes
6 in the EDR or am I mistaken about that? It used
7 to be 550. Now, I don't know how many of them
8 have been torn down, I thought about 30 which
9 leaves us with roughly 520 homes and you are
10 planning on sampling 50 of them and I think that
11 that is a 10% sample.

12 CHAIRMAN WELTY: That is a 2%.

13 DR. MILLER: No, no, no. I thought
14 you were saying one in 10 homes.

15 CHAIRMAN WELTY: No, 10 homes. That
16 wasn't what I was saying. That was what was said
17 at the meeting the last time.

18 DR. MILLER: Okay. Well, I'm not
19 holding you accountable for it. It's in the draft
20 on Page 9, a representative sample of occupied
21 EDA homes should have air - - oh, I'm sorry. Okay.
22 It is another point.

23 But again, I don't get it. Now, I don't get

38 it even more. I'm even more confused than I was
1 before.

2 DR. HUFFAKER: I have a different
3 problem. We are talking about doing occupied homes
4 in the controlled area and the occupied area
5 here and then we are talking about doing a house
6 by house sampling. Most of these houses are
7 empty and to what do we compare the empty houses?
8 Perhaps that is all we really need to do is to
9 sample the empty houses that we propose to put
10 them back into and see what is there. We have
11 not done that. Could you give us criteria for
12 the levels that would be acceptable in an empty
13 house?

14 DR. MILLER: I don't know. Dr.
15 Stolwijk?

16 CHAIRMAN WELTY: The question was,
17 on the empty houses, before you move people back
18 in, are there any criteria that would pertain to
19 deeming those particular homes to be habitable
20 in terms of indoor air pollution? That is your
21 question?

22 DR. HUFFAKER: Yes. The occupied houses
23 compared to occupied houses - -

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DR. MILLER: That is straightforward.

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DR. HUFFAKER: But the ones that we are really interested in are the ones they don't have anyone in them right now and comparing the two occupied groups will give us an opportunity to compare how much man brings into dwellings with him. We have dwellings now that have been empty for four years and most of the man-associated living-type chemicals are gone. In fact, we didn't see anything at the limits of detection we were using in these two houses or this one house that had been empty.

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DR. STOLWIJK: I think that if we are going to look at controlled houses now and occupied houses in the area and empty houses in the area, all right, well, my guess would be that I would, first of all, have the opportunity to see whether the occupied houses in the control and in the EDA would have any differences and then it would give you a value for the unoccupied houses which, by all rights, should certainly be below whatever you find in the other two. There are no accepted standards for these other than go to one-tenth of what the TLV's are or

40 something like that. At the moment, I am involved
1 with trying to revise the ventilation standards
2 for the air conditioning industry and what we are
3 faced there with is a difficulty of trying to
4 define in advance what acceptable levels of a
5 bunch of organic chemicals might be that are
6 allowed to be in the air in buildings that are
7 being ventilated. There is no effective way of
8 dealing with that because there just aren't
9 standards for it. The method that we use there
10 or that we will be using after the standard comes
11 out is to say for organic chemicals for which there
12 are no known standards, what we will do is we
13 will use the TLV's that have been established
14 in the workplace and divide them by 10 but that
15 is just a working definition.

16 DR. HUFFAKER: This is office space,
17 not apartments.

18 DR. STOLWIJK: No. It is all ventilation
19 space, whether it is apartments or offices.
20 If it were offices, then you set it at the TLV
21 but if it's offices to which other people come and
22 who don't work there and who are non-occupationally
23 exposed or if it's apartment houses, then I think

41 the level they have settled on is one-tenth
1 of the TLV.

2 DR. HUFFAKER: I wondered if you used
3 apartments because they are put into a 24-hour
4 occupancy mode.

5 DR. STOLWIJK: You will be using that
6 in apartments too, the same number that will be
7 used in the apartments will be in the industry.
8 So, that is one way of doing it and we are
9 only doing it that way because there really isn't
10 another effective way of going after it.
11 There are no other standards and you can't just
12 shake them out of the air. The TLV's at least
13 have been thought about. A group has sat around
14 thinking about that.

15 DR. MILLER: What does that acronym
16 stand for? That is threshold limit value and those
17 are the values that effectively are operative in
18 any work space. So, if you go to one-tenth of
19 that, that is the first cut. If you do that,
20 let's say for formaldehyde, which is one of
21 the things that is being much in contention, the
22 TLV for formaldehyde in the work place is one
23 part per million. It would get you then at

42 one-tenth of a part per million which is also,
1 it so happens to be what a lot of other countries
2 have actually set it, the indoor atmosphere at.
3 So, whenever you have a chance to check it, it
4 comes out fairly well.

5 CHAIRMAN WELTY: Pat, could we go back
6 to Page 5 now and I want to explain some of the
7 thoughts that we had I think discussed at the
8 last meeting. One of the concepts that was
9 presented was that of composite sampling of the
10 soil and that involves taking a sample and
11 in various parts of a neighborhood, mixing it
12 together and then analyzing it and this is a
13 procedure that is used routinely by EPA in doing
14 soil samples and it is, as I understand it,
15 the accepted methodology of a sampling protocol
16 in most cases, for instance, I reviewed recently
17 a protocol from Missouri where they were cleaning
18 up dioxin and the clean-up was monitored by taking
19 samples from 50 locations on a grid, mixing them
20 up and measuring it and using the residential
21 guidelines of one part per billion as the goal
22 to which they were cleaning this up.

23 DR. MILLER: Would you not take the

43 same strategy and apply it on a lot basis so that
1 in fact you were going to collect ten or fifteen
2 samples on a given lot, mix them all up and then
3 do an evaluation for that lot. I mean, that solves,
4 at least intuitively, it seems much more - - would
5 give you a much better indicator of the condition
6 of that lot than one single sample that would then
7 be pooled.

8 DR. POHLAND: You have a difference in
9 mobility potential. If you are up in the air and
10 the motion or the mobility of that air to change
11 and to be contaminated directly is different
12 than something that has to be deposited or migrated
13 in and settled in an area in the soil so that
14 your chances of detecting it in the air are much - -

15 CHAIRMAN WELTY: No, we are talking
16 about soil.

17 DR. POHLAND: Yes, I know but there is
18 a different philosophy. Here your ability to
19 detect it in the home in the air is better than
20 the likelihood of you happening to pick the area
21 where maybe the contamination resides in the soil
22 because it isn't so homogeneous.

23 DR. MILLER: Yes. I understand that.

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DR. POHLAND: So, you are better off, I mean, you are more likely to find in a gridded determination of sampling in the soil; you have got a better opportunity of detecting it there.

DR. STOLWIJK: The question that she has is the size of the grid. In other words, she would like to have a grid imposed on the lot.

DR. POHLAND: Oh, I see. I'm sorry. I misunderstood.

DR. STOLWIJK: And what we are discussing is to set a neighborhood grid up and reduce the total number of samples that are going to be specifically recorded.

DR. POHLAND: Are the lots pretty well uniform in size?

DR. MILLER: They are very small. They are modest lots on the whole thing.

DR. UPTON: Wouldn't the design of the sampling system be contingent on the variation you encountered? If you discover that there is a lot of variation within the neighborhood, then one sample per neighborhood certainly isn't going to characterize the neighborhood as a whole.

45 DR. POHLAND: That's the purpose of
1 gridding the neighborhood. You are trying to -

2 DR. UPTON: But there is a great deal
3 of uniformity and a lot by lot or house by
4 house sampling becomes inordinately expensive.

5 DR. STOLWIJK: There are two items. It
6 is not difficult for or expensive to take a
7 very large number of samples. If you composite
8 them and mix them together, then you get an
9 average concentration for that very large number
10 of samples. The difficulty comes, every time
11 you report from that assembly, then you have to
12 run an analysis and so the question becomes, do
13 we need a report? It is not the number of samples
14 that are taken because that is not much of the
15 problem.

16 DR. MILLER: It's the number of analyses
17 that were run.

18 DR. STOLWICJK: It was the number of
19 analyses that were run and that have to be reported
20 and then apply to whatever it is that you are
21 reporting to. All that is according to complica-
22 tions.

23 DR. POHLAND: Implicit in that kind of

46 scheme is that it depends upon then what you find
1 and then you could go back and more deliberately
2 go after the smaller segments of the grid that
3 you had previously composited.

4 DR. UPTON: That is a coarse screening
5 first.

6 DR. POHLAND: Yes, a coarse screening
7 first and it narrows down your need to.

8 DR. STOLWIJK: The protocol might
9 actually ask for, let's say 100 grams of soil to
10 be taken from each location that you originally
11 sampled, 50 grams to be used for the first
12 composite to find out what you have on a
13 neighborhood basis and then the other 50 grams
14 would be held in reserve in case there is more
15 detailed questions that arise. That would be
16 the kind of thing and then you would still do it
17 on a smaller scale and you wouldn't have to go
18 back.

19 DR. STOLINE: I have a question too with
20 respect to just let's focus on dioxin because
21 the action level there is one part per billion.

22 CHAIRMAN WELTY: In residential areas.

23 DR. STOLINE: In residential soil.

47 Let's just say, for example, that the grid has
1 ten components to it. So, you are mixing things
2 from ten components and let's assume it's very
3 thoroughly mixed. What would be the action level
4 for dioxin with that composite measurement that
5 is made by mixing those ten subsamples together
6 into one?

7 CHAIRMAN WELTY: As I understand, the
8 way the action level was derived and maybe Dr.
9 Wiesner might want to comment on this as well,
10 is that it takes into account that kind of variability.
11 In other words, it's based on young children eat-
12 ing dirt. That is basically how the kids get
13 exposed from dioxin in the soil or that is who is
14 most likely to be exposed and those kind of kids,
15 in essence, go to locations in a random fashion
16 and sample much as you would do with this composite
17 sampling. So that the action level was based on
18 taking this consideration in mind, the fact that
19 there may be some areas where it's higher than one
20 part per billion and other areas where it is lower
21 than one part per billion.

22 DR. STOLWIJK: In other words, there would
23 be one hundred pieces of soil assembled and the

48 average level is one part per billion, that
1 would be the limit of the action. That might not
2 mean that some little pieces of earth might not
3 have had one hundred parts per billion in it.

4 DR. WIESNER: I was wondering whether
5 Pat could, in an a priori sense, do you think a
6 sociologist could define a neighborhood, I mean,
7 taking the EDA, do you think - - I mean, I was
8 very intrigued by your paper and I started to
9 think about how do I define my neighborhood, you
10 know and then it's like a lot of behavioral
11 determinants to that, where would you go to
12 borrow something, how far do your kids roam,
13 I mean, is there a way for you all to define a
14 neighborhood and if you could, that is one way
15 you could place your grid and then you could
16 decide and give some advice on, within that
17 neighborhood, whether a particular lot is as
18 important to have the same degree of sampling as
19 a composite of five or six lots or something.
20 I mean, I just wondered. I think you have got
21 a real contribution to make in that particular
22 area and that is defining the grid.

23 DR. MILLER: Well, it's not the case

49 when sociologists talk about community. Physical
1 barriers are really sort of secondary to symbolic
2 ones. So that for instance, one would expect that
3 the renter/owner distinction would be much more
4 important in determining who becomes friends with
5 whom or goes to church with whom or whose children
6 play together than whether your house happens to
7 be across the street from one another but I think
8 it is the case that there are natural boundaries
9 and geographic boundaries within that area and
10 we do have, I mean, we have got from our own work
11 some data on visiting patterns and neighboring
12 patterns that suggest frankly that people do not
13 roam very far in that neighborhood prior to 1976
14 anyway. Things changed a bit after that and
15 people got to know one another a little more, but
16 they tended to be rather close.

17 DR. WIESNER: So that I mean, the ques-
18 tion I guess is in a general sense, if you took
19 the whole EDA using that kind of analysis, would
20 you end up with every house and lot in a neigh-
21 borhood? It seems like you almost would have to.

22 DR. MILLER: Yes, I think so. I don't
23 even think you need me to do it. Sister Margeen

50 could do it, I mean, anybody who knows that
1 neighborhood well and has worked in that neigh-
2 borhood could do it.

3 DR. WIESNER: But then the question
4 comes up on a house to house versus neighborhood,
5 where would you value the sampling grid and dis-
6 tributing that across that neighborhood and I
7 think you might not buy off on a house to house
8 sample when we get to thinking about that and
9 laying that out as much as you would the neigh-
10 borhood concept with a hope that your sampling
11 would cover individual lots sufficiently but that
12 your overriding concern was your definition of
13 a neighborhood.

14 DR. MILLER: I don't know if I under-
15 stand you exactly, what you are saying. It's my
16 impression based on the various controversy I
17 guess surrounding the swales, for example, that
18 there is a tremendous variability in the geo-
19 graphic conditions I guess on a lot by lot basis
20 in the area east of the canal and south of Colvin
21 Boulevard at 103rd Street and down to Frontier
22 and I mean, that is the reference really for the
23 concern that I have.

51 Secondarily is a historic preference, I
1 think perhaps insistence that has come out of the
2 community that they want some kind of house by
3 house evaluation. They are just going to feel
4 better.

5 DR. WIESNER: I understand that. Okay.

6 DR. MILLER: And it seemed to me that
7 there might be a way to pull it all together
8 and please everybody while you are doing it so
9 that some of the needs of science and the pressures
10 of a community could be satisfied in one data
11 collection.

12 DR. WIESNER: I could see a situation
13 where you would have, say, if you were to say
14 define six neighborhoods in the EDA and neighbor-
15 hood X, it may be very important for you to point
16 your grid toward a house by house analysis area,
17 I mean, neighborhood Y and then important for
18 you to have some emphasis on the swale area for
19 instance and so, if you made a categorical thing
20 that you want to build your neighborhood data
21 solely by building household data, you may miss
22 something.

23 DR. MILLER: Well, I mean, you may in

52 fact have this superior argument which is to say
1 that these decisions should be made contextually
2 and not categorically.

3 DR. WIESNER: Yes, within a neighborhood
4 context and it may end up that you will have to
5 emphasize a house by house in some neighborhoods
6 and not.

7 DR. MILLER: Yes but again too, I
8 think the community is an issue as well.

9 CHAIRMAN WELTY: Pat, do you feel it would
10 be appropriate in a next draft to try to define
11 the neighborhoods as you had suggested here by
12 natural geographic and socio boundaries?

13 DR. MILLER: Are you going to be in town,
14 Margeen, so we can talk about these neighborhoods?

15 SISTER HOFFMANN: I am going to be
16 here.

17 DR. MILLER: You are going to be here
18 for the next month?

19 SISTER HOFFMANN: Not from the 4th to
20 the 11th, otherwise I am here.

21 DR. MILLER: Well, we can talk about it.
22 I mean, it might take a special trip up and the
23 problem would be, if we meet on the 6th, I don't

53 know if there is time. I mean, August is just
1 about dead for me, just gone but we can talk about
2 it. It's not impossible, not inconceivable.

3 DR. SIPES: Pat, you made a statement
4 about if you took 15 samples per lot and then just
5 did a single analysis by pooling that on one lot.

6 DR. MILLER: Yes.

7 DR. SIPES: Is that reasonable in your
8 mind and then I am just asking - -

9 DR. MILLER: I don't know whether it is
10 or not. I mean - -

11 DR. SIPES: That is better than what we
12 were talking about before because if you take 15
13 or 20 samples per lot and make a pool out of that
14 and that comes out, there is no action level to
15 worry about, fine and then you can have your
16 larger pattern, which is your neighborhood so you
17 get through this part of the neighborhood which
18 is fine but over here there is a hot spot where
19 you sample more. Is that what you were thinking?

20 DR. MILLER: That is what I was think-
21 ing.

22 DR. SIPES: Because I think the idea of
23 pooling samples and doing it on a lot by lot, you

54 take 20 samples per lot and then that really is
1 only once it's made into a homogeneous mixture,
2 that is one analysis or two, whatever it takes to
3 do it.

4 How many analyses can they do a day? Do you
5 have any idea, Paul?

6 DR. HUFFAKER: No.

7 DR. SIPES: I mean, 50, so if you had
8 500 samples or 1,000 samples, could you do 20 a day
9 or what?

10 DR. HUFFAKER: I would have to talk to
11 someone on that. I'm not sure our lab would be
12 doing that. That may be EPA's matter, of course
13 and you could talk to them. That's a trade-off,
14 obviously, the more lab analyses you run, the
15 better off you are because that makes it more
16 specific and the more pooling, the more dilution
17 you have and if you find anything, you might want
18 to go back and find out whether it was through the
19 area or whether it was a hot spot that got diluted
20 out to the whole smear.

21 CHAIRMAN WELTY: Well, I think we have
22 covered the major items that I wanted to cover
23 in the document. Is there any area that you would

55 like to briefly mention? We have a few minutes
1 remaining. If not, I would like to open it up for
2 our public comments. We have had the public wait-
3 ing here all day and I would like to give them a
4 few extra minutes unless you all have further
5 comments.

6 (No response.)

7 Okay. Anita, are you still with us?

8 MS. GABALSKI: Yes.

9 CHAIRMAN WELTY: Will you be able to
10 coordinate this?

11 MS. GABALSKI: We have any number of
12 speakers. I have at least eight people on the
13 list. If there is anybody who comes up with an
14 additional question, we will try to limit it. We
15 have about a half hour. We will start out with
16 Sister Margeen.

17 SISTER HOFFMANN: I would like to just
18 begin by saying that I would like to thank all of
19 you for this. It is a very difficult task that
20 you have undertaken and I have I think stated that
21 from the very first meeting.

22 I am here personally and also on behalf of the
23 people that I represent, a lot of people who are

56 not here that you have never seen and a lot of
1 people not only from the Love Canal site but
2 from other hazardous waste sites, such as Bloody
3 Run, Hyde Creek Community, the 2nd Street dump,
4 the S area dump. We have 16 of the top inactive
5 dump sites in Niagara Falls, 16 of the 19 in
6 Niagara County out of the 859 in New York State.
7 So, you see it's a grave concern how you address,
8 as you are addressing this fall out from the
9 kinds of things that you are doing to these other
10 areas and that is some of our concern. It is not
11 just a one time, one topic project issue. It
12 goes on and on and on for us.

13 Today I am beginning my sixth year here at
14 Love Canal, almost every day and every day and
15 the days are not eight-hour days but ordinarily
16 12, 18-hour days. So, you see our concern and
17 sometimes why we may speak with a great deal of
18 fervor and passion on this and we would like some
19 resolutions. So, I do thank you for that par-
20 ticularly, from what I have seen, I would like to
21 state that first of all and the number of people
22 that science, I have some hope that science can
23 interface with the human dimension and I have some

57 very human kinds of response, some very - - I
1 get more than just professional ethics, something
2 deeper coming out of the people I have seen sit
3 here from the engineers to the sociologists, the
4 epidemiologists and I would like to thank you very
5 much for this. It is a very helpful thing for
6 those of us who are doing this as a very pragmatic
7 kind of thing.

t-13₃ I have a few things. Some of them are in
9 question form. You have not lost sight of the
10 idea of habitability as it first started off and
11 was presented to us at the Love Canal Area
12 Revitalization Agency, a quasi-governmental type
13 agency created by government, was not to only look
14 at the issue of habitability of the Love Canal
15 area by humans in houses, residential homes, that
16 is, but also looking at other habitability uses,
17 for example, research laboratories, short-term
18 recreational sorts of uses. One of the ones that
19 comes up time and time again is using this as a
20 national center research but it wouldn't be a
21 place where people were here 24 hours a day,
22 day after day after day. I just hope that is
23 being considered and that you have got that built.

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~~In there somewhere instead of their being a~~
mind set that it is only a residential area to
take care of some kind of tax burden or relief.

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DR. MILLER: Margeen, are you saying
that LCRA had a mandate to look at other forms
of land use?

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SISTER HOFFMANN: It was also to con-
sider alternative uses, not only reinhabiting it
and making it back into this residential type.

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DR. MILLER: And where did that mandate
come from? Did it come from the State, the
State Legislature?

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SISTER HOFFMANN: Yes. I think that is
correct. I can get that. I believe I am correct
in saying what I am saying. I can't give you the
direct reference but I will find that.

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DR. MILLER: Well, I think that is
certainly the case that some of us at least on
this group would welcome an opportunity to think
about that, revitalizing this area along the lines
other than residential.

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SISTER HOFFMANN: Mr. Smith has been
here and he just went downstairs and he is from
the Love Canal Revitalization Agency and is also.

59 a City Councilman of the City of Niagara Falls
1 but I don't see him here. I think that is correct,
2 am I not? I would ask the community, my impression,
3 that it was also other alternative uses for Love
4 Canal to be considered, is that correct? It was
5 not just - -

6 MS. GABALSKI: Sister Margeen, I think
7 Morris also has a map of a number of different
8 things that were considered. There are consultants
9 that did prepare a map with other different uses.

10 SISTER HOFFMANN: Are you people aware
11 of that?

12 DR. MILLER: No.

13 SISTER HOFFMANN: That is my point I
14 guess.

15 DR. POHLAND: I guess when I responded
16 earlier today with regard to the points that were
17 brought up on alternative use, I think as far
18 as habitability is concerned, the most sensitive
19 habitability criteria would, I think, be applied
20 to individual residences and so, in a way we would
21 cover just about any other option should the
22 decision be for something other than residences
23 and we can't make the decision. We can only try.

60 to establish the most sensitive criteria that
1 we can.

2 SISTER HOFFMANN: I understand that and
3 your point is well taken, Doctor. I just wanted
4 to be sure that when you say that, what we have
5 had the experience with, if I can make that
6 clear, our experience has been that you say some-
7 thing like that and then right away it's assumed,
8 oh, that means we'll use it for residential and
9 they don't say - -

10 DR. POHLAND: No, because our decision
11 may be such that the final decision will say it's
12 uninhabitable for personal residences. So, I
13 think we are trying to embrace your concern in
14 what we view.

15 SISTER HOFFMANN: All right. The other
16 thing that I have, I may have dealt with this and
17 I may have been out when you discussed this but
18 the community involvement, did you go beyond what
19 is here on Page 15, No. 8 as it's stated?

20 CHAIRMAN WELTY: Yes, we did.

21 SISTER HOFFMANN: You did.

22 CHAIRMAN WELTY: The consultants
23 requested that we elaborate further and put that

61 statement at the beginning of the revised draft,
1 in other words, put - -

2 SISTER HOFFMANN: That's how far you
3 went?

4 CHAIRMAN WELTY: Yes, to strengthen
5 that statement and to put it in the first part of
6 the revised draft so that is, as I understand it,
7 the consultant's recommendation.

8 SISTER HOFFMANN: I guess it's my
9 prerogative, you know, because I think that is a
10 very weak aspect, not only where it's placed and
11 that is well taken but my comment to that - - but
12 it's also very weak as it just stands. A library
13 also is only as good as it allows for interpretive
14 resources along with it. I could go on about
15 that. There is much more community involvement
16 that must be solicited. I would like to see that
17 strengthened and I would propose how you do that.
18 That is also a very practical and it's also a
19 very - - that is a science and an art on how you
20 do that, and there are people who do know how to
21 do it at this point and I am saying, I am very
22 biased, perhaps today, I am not sure the govern-
23 ment, the State, Federal and Local are the people

62 that you get to do that.

1 DR. MILLER: Well, it might be the case,
2 Margeen, that this committee would welcome a draft
3 that you would prepare for our edification that
4 would lay out for us what ideally the community
5 would like so that at least we had a sort of a
6 uniform sense of what that was and that became
7 something that we could add into the mix of
8 materials that we are looking at and in drafting
9 this document.

10 SISTER HOFFMANN: I think the community
11 would like to at least have some kind of input
12 that they could help, feel that maybe in some way
13 they gave some ideas to that, to co-design some
14 of that process. Yes, I think it is real weak as
15 it just stands but it is there but it isn't any-
16 thing like anybody is going to do anything about
17 it. You have some questions up here about the
18 thing and actually people are saying, can people
19 fund that and he said, we got some money from the
20 EPA, maybe we can fund that, put the pens in and
21 fund some of this, put this in. This community
22 involvement must be solicited. Well, until and
23 unless you have got somebody real aggressive - -

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DR. MILLER: Will you draft something
before the next meeting?

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CHAIRMAN WELTY: Let me just interject
that the community has a participation plan that
has been submitted to the EPA. Would that be - -

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SISTER HOFFMANN: No.

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CHAIRMAN WELTY: That is not what you
are referring to?

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SISTER HOFFMANN: No.

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CHAIRMAN WELTY: Would the consultants
be interested in seeing that particular plan?

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DR. STOLWIJK: Yes, I would.

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CHAIRMAN WELTY: Do we have a copy of it
here available?

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UNIDENTIFIED VOICE: We will have copies
mailed out.

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CHAIRMAN WELTY: Okay.

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SISTER HOFFMANN: I think that that plan,
are you listening to me? Are you wondering what
my objection was to that?

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DR. STOLWIJK: Yes. I thought that
came from you.

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SISTER HOFFMANN: Yes. Some of that came
from us, yes as part of the coalition and I would

64 think that, you know, the question that she just
1 asked, some of the things that I would do if I
2 were to be with the coalition, I would identify
3 who did help me do that but at this point, I
4 couldn't say. It was just the coalition and also
5 that is for another specific kind of interaction
6 with the TRC. This is community involvement, how
7 the community is involved here given, let's say
8 applying the habitability criteria because you
9 are doing it now, aren't you, throughout the
10 process of development of habitability criteria?
11 Aren't you developing it now?

12 CHAIRMAN WELTY: We are trying. We
13 are trying to solicit community involvement. I
14 mean that is what we are here for right now.

15 SISTER HOFFMANN: You are doing it in
16 this phase. I was saying, there might be some
17 other ways to do than just this.

18 DR. POHLAND: We are open to any sug-
19 gestions.

20 DR. MILLER: Anything that anybody
21 would like to present in draft and make available
22 to us in draft, we would welcome it.

23 SISTER HOFFMANN: We will make it

65 available to whoever is in charge.

1 DR. MILLER: Well, I suppose it would
2 go to Tom.

3 DR. HUFFAKER: I handle the mail, that
4 is all. If you give it to me, I will reproduce
5 it and send it to everybody.

6 SISTER HOFFMANN: That is a promise?

7 DR. HUFFAKER: I will.

8 DR. POHLAND: If he doesn't and you did,
9 you will find out about it.

10 SISTER HOFFMANN: Thank you.

11 MS. GABALSKI: Joanne Hale.

12 MS. HALE: I have a couple of just quick
13 points and then whoever thinks that they can
14 answer them or comment on them, just go ahead and
15 do it.

16 When I sat here and watched the show with
17 you people being upset about you didn't know about
18 the dioxin being buried and you were really quite
19 upset, it seemed like, and calmed yourselves down
20 and went back to your original purpose. How do
21 you think we have been feeling all along and then
22 Margeen gets up and talks about the community
23 involvement and that is missing too basically and

66 then Mr. Welty here says that we are involved
1 because we are involved with the TRC. Yes, you
2 can't deny that but we are still not involved.
3 We really don't know what is going on. We really
4 have tried to work as a community, as a coalition.
5 It doesn't always work that way but we have tried
6 real hard at it and if we don't know what is going
7 to be done with the dioxin until next Tuesday,
8 how can you sit here six hours and try to make a
9 decision on habitability criteria if you don't
10 know what is going to happen?

11 DR. POHLAND: I think we voiced our
12 concern in that direction.

13 MS. HALE: Right and I am voicing mine
14 now. We have a whole half hour between all of
15 us and I am going to take every three minutes I
16 get and I don't mean to be rude and I apologize
17 for it but I still don't know what is going to
18 happen to the dioxin. You don't know. The DEC
19 is not here presenting themselves and again,
20 they get mud in their face and they got caught
21 with their pants down again and that is basically
22 what is happening and I think I am getting a little
23 upset and disillusioned about the whole thing and

69 if I was one of those scientists, I think I would
1 have taken Option 3 and walked out of the door.
2 That is all.

3 DR. POHLAND: Being a scientist takes
4 a certain amount of perseverance and I guess that
5 is why we are still here.

6 MS. HALE: So am I, six years.

7 DR. POHLAND: We are learning from you,
8 I guess.

9 MS. GABALSKI: Okay. Could we hear
10 from Violet.

11 MS. IADIACCO: I disagree with Joanne.
12 I am glad you didn't take Option 3 and walk out
13 the door because the issue is to establish criteria
14 for the habitability of Love Canal and I heard a
15 lot of talk about the rest of the record and the dum
16 sites and everything but that is not what you
17 are here for. You are here to establish the
18 habitability for the Love Canal and when you go
19 about doing that as Dr. Miller said, you know,
20 defining what a neighborhood is and I think we have
21 to start defining what a dump site is because all
22 of this money has been spent to clean up Love
23 Canal and so far as we know now, they haven't

70 cleaned up anything. All they have done is
1 contained it. So, if they have contained every-
2 thing that they have taken out, that is in a sense
3 already a dump site which almost qualifies it for
4 nonhabitability and we have waited six years to
5 find out what we basically knew to begin with but
6 it's your job to establish that criteria and
7 hopefully they can use that criteria for the rest
8 of the world. That would be really beneficial and
9 quite a feather in your hats too.

10 That is all I wanted to say.

11 MS. GABALSKI: Walter Mikula.

12 MR. MIKULA: Yes. I don't suppose
13 that there is one of you on this panel that would
14 recommend building a home or development on the
15 S area dump or the Hyde Park dump or the Wheat-
16 field dump or the perimeter of any of these
17 dumps, yet you are here discussing the habitability
18 of Love Canal, people moving back in there. I am
19 sure you wouldn't want to picnic at one of the
20 lagoons at the SCA or have your kids roll around,
21 row around in a boat there. Do you expect people
22 to send their kids out in the yard to play there?
23 I can't see where we can even consider it.

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I have heard some people say, well, I have lived there for 20 years and I am all right. That kind of reminds you of the guy that jumps off a 30-story building and got down to the 5th floor and he said well, I am okay so far. Some people may jump from a building a little bit higher and it takes a little bit longer.

There are carcinogenic chemicals there. There are residuals that build up in your system. Some people have more tolerance than others. Eventually something has got to happen to you.

It's too bad Dr. Chalmers left. He brought up the risk factor. Hey, we don't have anything to say about the chemicals that are manufactured in this town or dumped in our back yards, not a word to say about it. They can make anything they want, they can dump anything they want and until this Love Canal thing, why, they did anything they wanted anywhere they wanted. That is why we have got the problems we have today.

That is all I've got to say.

MS. GABALSKI: Okay. Mr. Pulgensik.

MR. PULGENSIK: Yes. I am a taxpayer and I still live in Love Canal. It didn't kill me

72 yet.

1 What I would like to know is, these wells
2 that you have dug, how many - - are they monitored
3 and how often are they monitored, the wells?
4 There must be a thousand of them, at least I see
5 that many. I was just wondering. Do they
6 monitor? They must mean something.

7 Bob Ogg, can you address that question?
8 Did you hear the question?

9 MR. OGG: Yes. There has been a whole
10 bunch of wells dug out all around the neighborhood.

11 MR. PULGENSIK: We know that. We know
12 that. I walk out to there everyday and I haven't
13 seen a white-coated person yet.

14 MR. OGG: Right now they are not routinely
15 sampled.

16 MR. PULGENSIK: Pardon?

17 MR. OGG: Right now they are not
18 routinely sampled. They were used for one or two
19 or three studies and they have only been sampled
20 periodically. One part of this whole project
21 is to determine how much monitoring should take
22 place routinely over the future. So, they may be
23 used in the future. We may discover that they

73 were put in the wrong place and there have to be
1 put in other wells but the routine monitoring is
2 not happening right now.

3 MR. PULGENSIK: Well, the only reason
4 I said that, I walked down there and walking down
5 through there now for three years and kind of
6 for my health and like I said, there should be
7 more men studying those damn holes. That is the
8 reason you put them there. Hell, I'm not a
9 scientist. I'm just a carpenter but there is
10 a lot to that in that hole to find out. If you
11 study it. If you can't study it there, put a
12 laboratory there and put some think tank in.
13 You will get more by that than all of this damn
14 talking. You are talking and we talk and we
15 talk. I wonder, talk is wonderful but while
16 we are talking, let's look. Let's look and see.
17 We seem to be talking and we don't look. It seems
18 like - - I don't know, like a bunch of dummies or
19 something, I don't know and here the next thing,
20 they got some barrels down there. I watched
21 them barrels now for two and a half years. They
22 are still there. I wouldn't be surprised if the
23 barrels are dried out. I bet if they were filled,

74 I'm sure they would be dry by now, two and a half
1 years. They should be real dry now.

2 MR. OGG: The water, any free water
3 that was in the barrels was drained off.

4 MR. PULGENSIK: If you leave it alone,
5 nature will take care of it. Maybe if you leave
6 this all out, nature will take care of everything
7 for us. We wait for nature to do these things.
8 As a matter of fact, I think that is what we are
9 waiting for, nature. Nature is going to take care
10 of everything. That is what I am afraid of, the
11 hell on the canal. That canal don't mean anything
12 to me. That is what I am afraid of. We are
13 going to lose that drinking water one day. That
14 is what I am afraid of. I can live in that canal.
15 I sleep there but damn it, we need that drinking
16 water. We are ruining that drinking water. That
17 is precious. If they had that in Arabia, they
18 would give you oil wells for that, for every river,
19 they would give you 25 oil wells and here we
20 are killing them, killing those and that is
21 something that will never come back. That will
22 never come back.

23 We are talking and we talk and they are

75 worried about drums, burn the damn things where
1 they come from. What is somebody looking for
2 a big handout? It's ripping us off right now.
3 It's a rip-off. More people - - we started out
4 with \$20,000,000 and the guy went to Florida. He
5 went to Florida. That was during that investigation
6 So, they give you \$20,000,000 and then the car-
7 penter comes in and he broke his hand when he gives
8 you the handshake and another \$20,000,000. What
9 the hell they been doing?

10 I am living where I am living and nothing
11 bothers me. It's good. I like it there. It's a
12 wonderful place. This is - - all this talk here,
13 he has a place there, that place of Christ. They
14 should pay that man to stay there or get out. He
15 has to come down here and fight for what was only
16 right in the first place, a man of God and no
17 one hears him.

18 Well, all I can say about those drums, I
19 don't know, I think LaFalce and Pelletier, they
20 must be sleeping, all the big fuss they made after
21 the facts, the newspapers had to tell them after
22 the fact. My God, you know, there is more stuff
23 buried from this point to this point in Tonawanda,

76 my God, they have been putting it in here for
1 55 years. I used to swim - - I swam from down
2 there way up to the Tonawandas. Now you look at
3 the rocks in there, they turn green or yellow
4 from the chemicals all along and here you used
5 to swim here and fish, fish that long and we are
6 worried about the drums, talking about the drums.
7 That ain't the issue. Forget the damn things.

8 That is all I got. Let's make some laborator-
9 ies if you want to spend your money right, spend
10 a million dollars and put up something there that
11 says here and put a think tank and make them
12 think, just think, think what they can do. That
13 is better than having - - what the hell, they
14 knocked down 30 houses. This coming year will
15 be 30 more knocked down. I told you, mother
16 nature will take care of everything. You will
17 see trees growing through the houses, yes, up
18 through the garages and I see it. I have to bring
19 my saw along to maybe cut them down so you don't
20 lose it, I don't know.

21 MS. GABALSKI: Thank you, Mr. Pulgensik.

22 Reverend Kiefer.

23 REVEREND KIEFER: It struck me when I

77 heard that the comparison was going to be made
1 that the Love Canal is environmentally safe as
2 other urban areas and several of the control areas
3 that were selected were on other dump sites around
4 Niagara Falls and I think the control areas have
5 to be rather carefully specified. It can be in
6 another urban area but not on other dump sites
7 and so, I think that that has to be made - - maybe
8 a little further specified than just an urban
9 area.

10 CHAIRMAN WELTY: Thank you.

11 MS. GABALSKI: Nunzio Laverdi.

12 MR. LAVERDI: Well, I just like to thank
13 you gentlemen for the difficult task that you
14 have taken with the complex issue of the Love
15 Canal and when I left this morning, I heard you
16 arguing about the drums and that, that it wasn't
17 brought to your attention that these drums were
18 to be buried there. This is a controversy that
19 has been going on here for the last week. I would
20 like to ask if I can get a risk assessment per-
21 taining to these particular drums in the manner
22 and condition that they are in now and the manner
23 that they were before, buried in that canal.

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1 Now, one that is concerned because I repre-
2 sent the concerned area residents as President
3 of the Area of Concerned Residents. I live in
4 the Niagara Falls Housing Project which is closest
5 to them drums that contain 180 parts per trillion
6 or per billion over the EPA standards. From where
7 I am at, you can throw a ball. We have several
8 children and several families that live there.
9 Now, the controversy over it I heard from Dr.
10 Stolwijk, can I just review this one, I think
11 you went over this this morning, I think you
12 stated to the DEC that it was probably proper to
13 bury the chemicals in the manner of burying them
14 on top of the landfill, that that is probably safer
15 there than it would be in a position where they
16 would be exposed, in other words, not exposed but
17 barrels containing these deadly dioxins. Now,
18 what is the risk for people in that area closest
19 to it now, now, not the people that moved here,
20 sold their homes and decided to get out of this
21 area because they thought it was unsafe but the
22 people who are important and stuck with Love
23 Canal now for six years because we believe in the
 EPA and the scientists of this country and the

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scientific community.

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Now, it seems to me that we should be concerned over them barrels and that them barrels, it would be absolutely essential to bury them barrels as soon as possible.

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You have seen another individual just speak up, let alone the psychological effects of this in our area where we live next to but given the knowledge you scientists have of all the other difficulties surrounding this Love Canal and its issues, what is our risk now at this time with them deadly dioxin that we have here at 180 parts per trillion over the standards? What is our risk now because I live as a gamble in the Love Canal. I depend on you, you, the scientists, the people in the scientific community to now give me, is my risk higher or is it lower that that dioxin is contained in barrels and it's exposed to the community? The children can go over the fence. Sarah, am I right, we can throw balls over there. We have had kids jump that fence. So, therefore, gentlemen, I would just like to see if I can get an answer to this particular question. Have we got a higher risk or a lower

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risk, because this means a lot to me because I live in it. This is a risk factor. This is not a risk-free society that we live in, I don't ever expect it to be as long as I am alive, to live in a risk-free society but I think that this is what we should base this whole technical review committee and the pertinent information that could be put into it.

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Another question I would like to ask you is: There was a school built there, children playing on that school ground, some of them might have ate the dirt. They were children. There were people that had special educational problems there that were sent to that school because it was there to help them and instead, we found out that it was saturated with every chemical of its type. I always thought it was a shame from all the environmental people all over the country, that the controversy over this is the adverse effects to hazardous wastes and we had an opportunity to study it and we let it go just because children were more susceptible to chemicals, I think we had a great opportunity that we let go but now we are just trying to determine habitability and are we

81 going to get a continuation of conflicts of
1 interest, that people that sold their homes, believe
2 that this area was unsafe to live in and moved out.

3 So, I want you to consider the other side of
4 the coin, the people that are there, the people
5 that have to live there, that believe in this
6 country, that believe in the EPA, to come up with
7 an answer here and that is all I wish for and
8 I have fought for this for six years and I feel
9 that them chemicals, it's essential to bury them
10 and bury them as soon as possible. I want a
11 scientific view of that now and then I will keep
12 my mouth shut and sit down. You know, it's
13 very seldom that we can get a scientific fact
14 pertaining to this Love Canal. We have heard all
15 kinds of unsubstantiated evidence of chemicals,
16 adverse effects and nobody could prove anything
17 here about any of us getting sick in the Love
18 Canal. I think if we are going to study anybody,
19 let's study the people that live there now. Let's
20 take it from here, today or six years ago. Can
21 I get them two answers from the scientific
22 community? It's not often that we can get some-
23 thing that sticks here on the barrels. Are they

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more dangerous exposed to us who live there now
closest to it or bury them right away because
that would be the safest. Give me a risk. Give
me an assessment on this.

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DR. SIPES: You might get a scientific
opinion but I don't think you are going to get a
scientific fact.

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MR. LAVERDI: Well, gentlemen, I grant
that this gentleman said that because we are
starting to apply now, even the scientists,
a little common sense which should be applied to
this issue and he gave you common sense, that the
best thing to do with those things and with the
DEC, knowing the knowledge of the issue, was
trying to get rid of this here stuff in the Love
Canal that nobody wants, as a matter of fact,
Hooker has been trying to apply for a permit to
burn some of them things that are in the Love
Canal. They even stopped a ship from burning,
incinerating in the middle of the Atlantic Ocean
over some political - - something political that
messed it all up or whatever happened but I want
you people to look at the facts as far as the
health, adverse effects are concerned and get

83 every piece of that. There is an awful lot of
1 unfairness to the people of this community. Not
2 just to the Love Canal and this is one of our
3 great wonders of the world. People come here from
4 all over the world and Love Canal is deteriorating
5 the whole community of Niagara Falls and that is
6 why I say, you have a difficult task but I am
7 glad you have enough guts to sit back down here
8 and say, let's call it quits because of the
9 credibility gap here.

10 We have had - - you are talking about
11 credibility? What kind of credibility did Mr.
12 Carter have with these EPA officials that came
13 over here and released the chromosome study with-
14 out even reviewing it in the scientific community
15 and the hostage taken from the Homeowner's
16 Association. That information is all pertinent
17 and it is all applied to this. So, can I get
18 two answers there and I will sit down.

19 DR. STOLWIJK: As far as the barrels
20 are concerned, you know, of course, that as long
21 as it sits inside the barrels, it isn't going to
22 harm you. It isn't going to harm anybody.

23 MR. LAVERDI: What if somebody jumps,

84 jumps over that fence? We have a family of 50
1 people and their kids who have got a fence.
2 What if somebody climbs over that fence? What
3 if some rainfall comes?

4 I mean, are we supposed to dioxin? You know,
5 dioxin was exposed in, where, someplace in Sicily
6 when the whole place got evacuated because of
7 some dioxin escaping.

8 CHAIRMAN WELTY: Nunzio, can you let
9 him answer your question?

10 DR. STOLWIJK: As long as the stuff
11 stays in the barrels, it is not going to harm
12 anybody, not even someone who walks close by it
13 and jumps on top of it. It will not harm anybody
14 when it is buried in the canal site, as long as
15 it stays contained where you put it. As long as
16 it doesn't move - - in the new form of the canal
17 site and with the maintenance of it, it is not
18 likely that anything will ever again come out of
19 that canal site. The concern that we have and
20 that you have is that the way that these things
21 are being handled is causing you and everybody
22 else to be very upset in the way that the process
23 is going on. We hope that eventually it will

85 improve to the extent that you can have confi-
1 dence in what is going on and will not have to
2 become excited about the goings on in the
3 Love Canal area and the Love Canal site but
4 there is not any risk for you to be immediately
5 excited about that is associated with these
6 barrels sitting there. Even after they have
7 been buried in an appropriate way, they will not
8 be an immediate source of concern. The material
9 is not of the same - - not in the same concentra-
10 tion as occurred in that accident in Italy.
t-14 That was very concentrated dioxin, very large
12 quantities that was disseminated over a, very
13 suddenly over a community. There is no danger,
14 no matter what anybody does of anything like that
15 happening here.

16 MR. LAVERDI: I hear your words, sir
17 and I accept your words. Now, I would like to
18 thank you for that.

19 Now, I repeat the question about the whole
20 bunch of chemicals together and maybe if you could
21 assess it by the children being by it.

22 CHAIRMAN WELTY: My statement that the
23 standard for dioxin in soil was based on the most

86 likely exposed person and that happens to be a
1 child. A child goes out and as you know in the
2 yard, frequently plays in the dirt and mud puddles
3 and has an opportunity to eat dirt more than
4 adults or old people. So, the standard that was
5 developed by the CDC was based on recommendations
6 formulated to minimize the exposure of these
7 children to a level that was considered to be
8 safe. So, I am not sure if that answers your
9 question that you had but that is what I was
10 referring to when I said that these standards
11 were based on the amount of dirt that a child
12 might eat while playing.

13 MR. LAVERDI: I think that the
14 scientific community should know the fact that
15 we had a school there which had a playground and
16 which they played, maybe an hour a day, went to
17 school there and for five hours a day and as
18 a matter of fact, this is the same area and sector
19 where the most dioxin and chemicals are buried.

20 CHAIRMAN WELTY: I wasn't aware that
21 those chemicals were found in the soil samples
22 on the surface of that schoolyard, though.

23 MR. LAVERDI: Well, you better look at

87 your data.

1 MS. GABALSKI: Thank you, Nunzio. We
2 have two other questions.

3 Lynette LaMastra?

4 MS. LAMASTRA: Hi. I would like to thank
5 you very much for your time and everything and I
6 just - - these people that say that, you know, it
7 hasn't killed them yet, well, they have no common
8 sense because all of this didn't even happen with
9 barrels starting to leak and that. You know,
10 that was maybe, you know, eight or nine years
11 ago and all of these chemicals haven't surfaced
12 even in the next how many years. So, we haven't
13 had the long-term exposure to them, whereas where
14 the problem comes in, as far as I can see. Of
15 course, you know, like Mr. Laverdi said, he has
16 lived there 25 years and - - but I don't know.

17 Another thing to is, of course, the Niagara
18 River. Nobody knows what that force will do in
19 the swales and the wet area and what it will do
20 to the canal walls or anything. I mean, over a
21 year that is common sense that we don't know
22 what is going to happen. So, we have to deal
23 with those unknown factors. It does not seem

88 sensible, okay and like my particular instance,
1 I did live in the canal. I have children. I have
2 a mother who has medical problems. My daughter's
3 blood test came back abnormal. I felt because
4 common sense told me that before they said any-
5 thing, I didn't want it on my conscience that if
6 something came up with my children's health later,
7 I didn't want to say, "God, I should have moved."
8 You know, but I also have a rental property left
9 there and what I want the scientists to do is to
10 please set forth a timetable that is stuck to.
11 You all have the clout to ask the questions we
12 think, okay. They have to give you an answer.
13 They don't give us answers. If you will just
14 please set up whatever you are going to do and
15 just please make sure that you stay on the time-
16 table. My house is there. It is uninhabitable
17 because they had my tenants leave, which I am
18 glad for my tenants but it is a very bad financial
19 burden and I think that, you know, if you guys
20 would just let the question, you know, be
21 answered for us, that would be great.

22 Thank you.

23 MS. GABALSKI: The last questioner or

89 statement is Reverend Dyer.

1 REVEREND DYER: It seems to me that
2 there has been a lot of confusion over the
3 government activities and you have expressed them
4 today and I think you are expressing it because
5 you have a project that you are oriented to take
6 care of and it hinders you taking care of that
7 because of an unknown, that bit of information
8 gets thrown in your lap.

9 We are eternally there. It's uncontrolled
10 future. We cannot determine what our future
11 will be because we don't really know what is going
12 on. I wonder what other things have been going
13 on that we have never somehow had the sense or
14 just maybe it was just extreme fortune on our
15 part to ask a question and someone to make a
16 statement because that is the only way we are
17 getting answers by just an accident, someone
18 makes a slip of the tongue and it gets in the
19 news and so, I am wondering what are the things
20 that have gone on that we haven't had the knowledge
21 to ask the questions and the thing connected with
22 that is that if you are going to recommend
23 criteria, the criteria you should have is the

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top criteria, it should be who are you going to recommend to oversee your recommendations. I think I could pass a recommendation and say okay, everybody is going to get out and sweep the streets but they say that is what you think and unless someone is in place, there is a mechanic in place where someone will not pass the buck and say, okay, I am going to be the ultimate one in charge and this is who is in charge. See, this is what I deal with. There is never a clear idea who is in charge.

There is a fence that was removed and we talked about it at a meeting in the past few days and I wanted to know, connected with that fence, because there was a fence that was right up against my church and they moved this fence and they are not putting it back because the neighbors that are living there said it looks a lot nicer view for them. I said, okay, move the fence on my part then. It makes us, gives us a finer point of view. They said, well, we can't do that because we don't own the fence. I said, who owns the fence and so, they were trying to figure out who owns the fence and I said, well,

91 DEC was in control of the fence. They were in
1 control of the fence but someone else owned the
2 fence and I am not trying to be confusing but
3 it's very confusing on our part because no one
4 knows what to do and if I asked Dr. Huffaker
5 a question, he wants me to - - he wants to point
6 me to the federal officials and someone else will
7 point me to the local county officials. We need
8 the thing that I think will solve so many problems
9 today is to have one person that will say I am
10 in charge. If they could vote on him, whatever,
11 if they could come up with someone you could go
12 to. That is our frustration. There is no one
13 that you can go to. There is no one. You tried
14 and it would seem that there should be somebody
15 that we could go to and the community could go
16 to and find out the answer for our questions and
17 that would be the one that would not pass the
18 buck and do the finger-pointing. Because, when
19 the finger-pointing starts, the pressure starts
20 and see, when you have five or four agencies work-
21 ing on it, the finger-pointing starts and the
22 ones that are under pressure that day doesn't
23 show up, like where is the DEC today and it would

92 have been much nicer for them to have been here.

1 So, the pressure is there. There is a lot
2 of people that can make the decision. One clear
3 person could make the decision and then those
4 people, they become invisible for a period of time
5 until it kind of blows over and they can
6 rethink their area. Like the question was asked
7 at a meeting a few days ago, why someone was not
8 doing something, so, a few hours later they had
9 CM 2H hill, they said they are here, okay but
10 what are they doing. Two hours later they had a
11 presentation, you know, they quickly came up
12 with a presentation. I'm not saying that was the
13 only thing but between the two meetings and if
14 there is someone that is clearly responsible,
15 then we don't have to kind of just drop it for
16 a little while and then have them come up and
17 say this is the answer to it. We can have a
18 credible thing that is going on and the greatest
19 value to me, as a person in the community, would
20 be that we could understand what is going on and
21 that there would be someone that we could go to
22 and my comment concerning Love Canal, as long as
23 there is chemicals that are contained there and I

93 have heard this from two or three different
1 people here, it's still a dump and if other
2 places there are approved dump sites that will
3 not take the things, then it is still a dump.
4 It's still got dangerous toxic wastes that are
5 there that other dumps won't take and how can we
6 make a habitability study and say that the
7 people can live there? I think you have got no
8 other decision than to say that the people can't
9 live there because it's still got a dump. We
10 are not moving people over to Sea Coast, around
11 the edge there and that is an approved one.
12 Let's not move people back into this. Let's
13 not make this something that we are going to
14 regret in future years. That is the thing that
15 I think is - - the person dealing with, human
16 lives is something that we can live with after
17 we have decided to do it or a research center
18 would sound good to me.

19 CHAIRMAN WELTY: Anita, are there further
20 comments because some of our people have to leave,
21 leave fairly soon.

22 MS. GABALSKI: Oh, no. That is it,
23 Tom. I guess that is it.

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CHAIRMAN WELTY: Mr. Steele did

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mention to me that he would appreciate having an

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opportunity to comment on the revised draft so

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I wanted to assure the community that you all

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would have an opportunity to review and comment

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on the revision of this habitability criteria

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draft.

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So, we will send it through the usual channels

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to you. Okay.

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Thank you.

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(Whereupon, the above-proceedings

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were adjourned.)

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