ORIGINAL

STATE OF CONNECTICUT

SITING COUNCIL

CONNECTICUT LIGHT & POWER COMPANY AND UNITED ILLUMINATING COMPANY	*	JULY 28, 2004 (10:00 A.M.)
APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION OF A NEW 345-kV ELECTRIC TRANSMISSION LINE AND ASSOCIATED FACILITIES BETWEEN THE SCOVILL ROCK SWITCHING STATION IN MIDDLETOWN AND THE NORWALK SUBSTATION IN NORWALK, CONNECTICUT	*	DOCKET NO. 272

BEFORE: PAMELA B. KATZ, CHAIRMAN

BOARD MEMBERS: Colin C. Tait, Vice Chairman
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Philip T. Ashton
Brian O'Neill
James J. Murphy, Jr.

STAFF MEMBERS: S. Derek Phelps, Executive Director
Fred O. Cunliffe, Siting Analyst
Robert L. Marconi, AAG

APPEARANCES:

FOR THE APPLICANT, CONNECTICUT LIGHT & POWER COMPANY:

CARMODY & TORRANCE, LLP
195 Church Street
P.O. Box 1950
New Haven, Connecticut
BY: ANTHONY M. FITZGERALD, ESQUIRE
BRIAN T. HENEBRY, ESQUIRE

FOR THE APPLICANT, UNITED ILLUMINATING COMPANY:

WIGGIN & DANA, LLP
One Century Tower
P.O. Box 1832
New Haven, Connecticut 06508-1832
BY: LINDA L. RANDELL, ATTORNEY
BRUCE L. McDERMOTT, ESQUIRE

FOR THE PARTY, THE CITY OF MERIDEN:

DEBORAH L. MOORE, ATTORNEY
142 East Main Street
Room 239
Meriden, Connecticut 06450

FOR THE PARTIES, THE TOWN OF WESTON AND
THE TOWN OF WOODBRIDGE:

COHEN & WOLF
1115 Broad Street
Bridgeport, Connecticut 06604
BY: DAVID BALL, ESQUIRE

FOR THE PARTY, THE TOWN OF MILFORD:

HURWITZ & SAGARIN
147 North Broad Street
Box 112
Milford, Connecticut 06460
By: JULIE DONALDSON KOHLER, ATTORNEY

FOR THE PARTIES, THE TOWN OF WALLINGFORD AND
THE TOWN OF DURHAM:

HALLORAN & SAGE
One Goodwin Square
225 Asylum Street
Hartford, Connecticut 06103
BY: PETER BOUCHER, ESQUIRE

FOR THE PARTY, THE TOWN OF ORANGE:

SOUSA, STONE & D'AGOSTO
375 Bridgeport Avenue
Box 805
Shelton, Connecticut 06084
BY: BRIAN M. STONE, ESQUIRE

FOR THE PARTY, THE TOWN OF WILTON:

COHEN & WOLF
158 Deer Hill Avenue
Danbury, Connecticut 06810
BY: MONTE E. FRANK, ESQUIRE

FOR THE PARTY, ATTORNEY GENERAL BLUMENTHAL:

MICHAEL WERTHEIMER
Assistant Attorney General
Ten Franklin Square
New Britain, Connecticut 06051

FOR THE PARTY, THE OFFICE OF CONSUMER COUNSEL:

BRUCE C. JOHNSON, ESQUIRE
Office of Consumer Counsel
Ten Franklin Square
New Britain, Connecticut 06051

FOR THE PARTY, THE TOWN OF NORTH HAVEN:

UPDIKE, KELLY & SPELLACY
One State Street
Box 231277
Hartford, Connecticut 06123
BY: BENJAMIN J. BERGER, ESQUIRE

FOR THE PARTY, THE WOODLANDS COALITION FOR RESPONSIBLE ENERGY:

PULLMAN & COMLEY
90 State House Square
Hartford, Connecticut 06103
BY: LAWRENCE J. GOLDEN, ESQUIRE

FOR THE PARTY, PSEG POWER CONNECTICUT LLC:

McCARTER & ENGLISH
Cityplace I
185 Asylum Street
Hartford, Connecticut 06103
BY: DAVID REIF, ESQUIRE
JANE K. WARREN, ATTORNEY
JOEL B. CASEY, ESQUIRE

FOR THE INTERVENOR, ISO NEW ENGLAND:

WHITMAN, BREED, ABBOTT & MORGAN
100 Field Point Road
Greenwich, Connecticut 06830
BY: ANTHONY MacLEOD, ESQUIRE

FOR THE INTERVENORS, EZRA ACADEMY, B'NAI JACOB, THE JEWISH COMMUNITY CENTER OF GREATER NEW HAVEN, THE DEPARTMENT OF JEWISH EDUCATION, AND THE JEWISH FEDERATION OF GREATER NEW HAVEN:

BRENNER, SALTZMAN & WALLMAN
271 Whitney Avenue
New Haven, Connecticut 06511
BY: DAVID R. SCHAEFER, ESQUIRE
KENNETH ROSENTHAL, ESQUIRE

FOR THE INTERVENOR CONNECTICUT BUSINESS & INDUSTRY ASSOCIATION:

ROBERT E. EARLEY, ESQUIRE
350 Church Street
Hartford, Connecticut 06103

FOR THE PARTY, THE CONNECTICUT DEPARTMENT OF TRANSPORTATION:

CHARLES W. WALSH, III, AAG
EILEEN MESKILL, AAG
Office of the Attorney General
55 Elm Street
Hartford, Connecticut 06106

FOR THE PARTY, THE TOWN OF WESTPORT:

WAKE, SEE, DIMES & BRYNICZKA
27 Imperial Avenue
Westport, Connecticut 06880
BY: EUGENE E. CEDERBAUM, ESQUIRE

FOR THE PARTY, SOUTH CENTRAL CONNECTICUT WATER AUTHORITY:

MURTHA CULLINA LLP
Cityplace I
185 Asylum Street
Hartford, Connecticut 06103
BY: ANDREW W. LORD, ESQUIRE

FOR THE PARTY, COMMUNITIES FOR RESPONSIBLE ENERGY:

PATRICIA BRADLEY, PRESIDENT
47 Ironwood Lane
Durham, Connecticut 06422

FOR THE PARTY, THE CITY OF BRIDGEPORT:

MELANIE J. HOWLETT, ATTORNEY
Assistant City Attorney
City Hall Annex
999 Broad Street
Bridgeport, Connecticut 06604

FOR THE INTERVENOR, THE TOWN OF FAIRFIELD:

EILEEN KENNELLY, ATTORNEY
Assistant Town Attorney
Sullivan Independence Hall
725 Old Post Road
Fairfield, Connecticut 06824

FOR THE PARTY, THE CITY OF NEW HAVEN:

ELIZABETH GILSON, ATTORNEY
383 Orange Street
New Haven, Connecticut 06511

FOR THE PARTY, THE TOWN OF MIDDLEFIELD:

BRANSE & WILLIS, LLC
41-C New London Turnpike
Glen Lochen East
Glastonbury, Connecticut 06033
BY: ERIC KNAPP, ESQUIRE

FOR THE PARTY, THE CITY OF NORWALK:
LOUIS CICCARELLO, ESQUIRE
Corp. Counsel

FOR THE PARTY, THE TOWN OF CHESHIRE:
RICHARD J. BURTURLA, ESQUIRE

FOR THE PARTY, THE CITY OF MIDDLETOWN:
TIMOTHY P. LYNCH, ESQUIRE

A PARTY, THE TOWN OF EASTON

A PARTY, THE TOWN OF BETHANY

A PARTY, THE TOWN OF HAMDEN

AN INTERVENOR, THE FIRST DISTRICT WATER COMPANY

AN INTERVENOR, NORWALK ASSOCIATION OF SILVERMINE HOMEOWNERS

A PARTY, ROBERT W. MEGNA, STATE REP. 97th DISTRICT

AN INTERVENOR, MARY G. FRITZ, STATE REP. 90th DISTRICT

AN INTERVENOR, AL ADINOLFI, STATE REP. 103rd DISTRICT

AN INTERVENOR, RAYMOND KALINOWSKI, STATE REP. 100th DISTRICT

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AN INTERVENOR, WILLIAM ANISKOVICH, STATE REP. 12th SEN. DISTRICT

AN INTERVENOR, JOSEPH CRISCO, JR., STATE REP. 17th SEN. DISTRICT

AN INTERVENOR, LEONARD FASANO, STATE REP. 34th SEN. DISTRICT

. . .Verbatim proceedings of a hearing before the State of Connecticut Siting Council in the matter of an application by Connecticut Light & Power Company and United Illuminating Company, held at Central Connecticut State University Institute of Technology & Business, 185 Main Street, New Britain, Connecticut, on July 28, 2004 at 10:00 a.m., at which time the parties were represented as hereinbefore set forth . . .

CHAIRMAN PAMELA B. KATZ: I'd like to call this resumption of the hearing on Docket 272 to order. Just a couple of procedural things. First a couple of announcements. First I forgot to make this announcement yesterday, but we'd really appreciate it if people could put their cell phones and pagers on silent or turn them off. In addition, the Council and the Council staff has a room back there in the corner. We're leaving some of our personal papers and things there, so we'd appreciate it if you'd need to step out to make a phone call or do some work that you not use that particular room.

Also I'd like to -- we have scheduled for a process meeting August 19th at our main office in --

MR. S. DERRICK PHELPS: Hearing room one on

August 19th, which I'm subject to check I think is a Thursday. I'm anticipating that the announcement or the notice for that process meeting will be for a 10:00 a.m. meeting. Again, hearing room one, 10 Franklin Square, over in our Siting Council building.

CHAIRMAN KATZ: And again, this is just for the Parties, Intervenors and their attorneys to review similar to the last process meeting, to review schedule, calendar and process. I think we'll find that helpful as we go toward the September 8th meeting. Okay. Mr. Marconi, do you want to do your announcement and then --

MR. ROBERT L. MARCONI: Yeah. Yes. I think it's certainly has come to my attention, it's come to certainly everybody's attention that this case has gotten very much into the news and there are various newspaper articles that have been written about this case. It gets on the radio and television broadcasts. First, this is not a jury that gets sequestered, the Siting Council, and thank goodness for that considering all the months that this case would be going on.

However, a bit of reminder to the Council members is that their decision will have to be based entirely upon the record and the law. And most of the articles that I have seen, most of the information that's

in it tend to be things that are already in the record so I don't think any of the Council members are tainted by the fact that they occasionally may see a news broadcast or a television report or a newspaper article, but I think a gentle reminder is just needed here because of the publicity of this case. Thank you Madam Chairman.

CHAIRMAN KATZ: Thank you Mr. Marconi. Okay. Let's do a report on homework assignments and putting in the new exhibit. Ms. Kohler, if you have questions later on the new exhibit we'll allow you to do that. Did this get passed out? I'm sorry.

MS. LINDA RANDELL: I have -- I thought I would have Ms. Bartosewicz identify the pictures and then we'd hand them up to the Council and we will provide copies to Ms. Kohler as well.

CHAIRMAN KATZ: Okay.

MS. RANDELL: Ms. Bartosewicz, you have in front of you four pictures. Could you identify those pictures?

MS. ANN BARTOSEWICZ: Yes. These are photographs taken yesterday afternoon in Eisenhower Park in the facility in which we discussed yesterday with Ms. Kohler. It does show an open area and it does include some bleachers and we've got four photographs to submit.

MS. RANDELL: Okay. And we would offer that as a full exhibit, number --

CHAIRMAN KATZ: Number 137.

MS. RANDELL: -- 137.

CHAIRMAN KATZ: Is there any objection to making those photographs, and you'll all get an opportunity to see them, a full exhibit? Hearing none, after you see it if you have an objection we'll take it up. Okay. We'll make that at this point a full exhibit.

(Whereupon, Applicant's Exhibit No. 137 was received into evidence as a full exhibit.)

MS. RANDELL: Thank you. And then Ms. Bartosewicz, you have at least one homework assignment to report on?

MS. BARTOSEWICZ: That's correct. Yesterday Chairman you asked about the number of facilities from Dr. Bailey's testimony, dated July 19th, Exhibit 2, and you had asked originally how many of these facilities were either above or below the 3.0. And there were some discussion amongst parties, someone else asked about the 0.6 mG level and someone asked about the 6 mG level so I did all three and I can read those in. And I did it -- I broke it down by the statutory facility categories that we identified. So the first one would be

public and private schools and there are two public and private school from Exhibit 2 that are between the zero to 0.6 mG readings. There are no schools at anything above that. So the other categories -- the other columns are zero.

MS. RANDELL: Ms. Bartosewicz, would that be calculations?

MS. BARTOSEWICZ: Yes. These would be actual calculations based on Dr. Bailey's Exhibit 2.

MS. RANDELL: Thank you.

MS. BARTOSEWICZ: So it's specific distance calculation. Licensed daycare facilities, there are three between zero and 0.6 and there are no facilities higher than the 0.6 level. Licensed youth camp and public playgrounds, there are two between zero to 0.6. One between 0.7 and 3.0 and none higher than that. On residential areas, there are seven residential areas based on the Company's definition between zero and 0.6. There are 13 between 0.7 and 3.0. There are four between 3.1 and 6.0 and there are two between 6.1 and 6.2.

CHAIRMAN KATZ: And this all segments one and two?

MS. BARTOSEWICZ: This is the proposed overhead route in it's entirety.

MS. RANDELL: Shall we file that as Exhibit 138 then?

CHAIRMAN KATZ: Yes, please. Okay. We will get that in written form?

MS. RANDELL: Yes.

CHAIRMAN KATZ: Okay. I have another homework assignment. You know, I do most of my thinking -- Mr. Frank?

MR. MONTE FRANK: I have a quick question. The numbers that were just provided is that based on the 15 gigawatt case or the 27.7 gigawatt case?

MS. BARTOSEWICZ: I'm sorry. They are based on the 15 gigawatt case.

MR. FRANK: And do we have similar numbers for the 27.7 gigawatt case?

MS. BARTOSEWICZ: I did not do that math last night.

MR. FRANK: Through the Chair can I please request those?

MR. ANTHONY FITZGERALD: You can do it.

MS. BARTOSEWICZ: All I did was take Exhibit 2 and look at the numbers and make a table.

CHAIRMAN KATZ: Okay. I'm taking that as an offer that they will do it. The 27 gigawatt case?

MR. FRANK: Thank you.

CHAIRMAN KATZ: Did I --

MR. FITZGERALD: No.

CHAIRMAN KATZ: -- oh, I'm sorry. Did I misinterpret you Mr. --

MR. FITZGERALD: Well, I was just saying that they can do it.

CHAIRMAN KATZ: -- oh, they can do it.

MR. FITZGERALD: It's just a --

CHAIRMAN KATZ: I thought you meant your --

MR. FITZGERALD: -- summary. It's just a summary of what's already an exhibit.

CHAIRMAN KATZ: I thought you meant your they, not their they. We'll -- I'll take it under advisement and we'll discuss it.

MR. FRANK: Thank you.

CHAIRMAN KATZ: Okay. Yes, I have another homework assignment. You know, I do most of my thinking about this Docket on my morning run and my husband says that either two things will happen. I will be taken out by a hit and run and the police will be looking at the fenders of all your cars, or secondly I'll get an anonymous note that's saying this Docket requires more thought. Lengthen your running route. So -- but what I

did is I went through volume nine last night and I was thinking about this because frankly my interpretation of a residential area is a little -- first a little broader than the Companies. And what I'd like to do is take one segment, and I picked segment 15 in volume nine because it had a number of residentials.

MS. BARTOSEWICZ: Excuse me Chairman. It's segment 15 or --

CHAIRMAN KATZ: Segment 15 on volume nine, the aerial photos.

MS. BARTOSEWICZ: -- okay. So it's one page?

CHAIRMAN KATZ: One page, let's start with one page. And what I'd like to do is take 300 feet from each side of the right of way and assume all residences and draw the 3 mG at 15 gigawatt, 3 mG contour on that one segment.

MS. BARTOSEWICZ: Based on the --

CHAIRMAN KATZ: Average cross sections. Not the site specific measurements, but the average cross sections that were developed.

MS. BARTOSEWICZ: And we should choose the low --

CHAIRMAN KATZ: The lowest EMF option.

MS. BARTOSEWICZ: -- and draw the line at 3 mG?

CHAIRMAN KATZ: Correct. Okay? Is that doable?

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: Okay. Let's just -- all residences.

MR. FITZGERALD: And if it turns out that one option is lower on one side and -- if it turns out that there's not one option that's lowest on both sides you'll leave it to the discretion of the Company that picked what they think is overall lowest?

CHAIRMAN KATZ: Right. Yes. Because they'll pick the one that's overall lowest for the most residences.

MS. BARTOSEWICZ: Correct.

CHAIRMAN KATZ: Okay?

CHAIRMAN KATZ: Comment? Sure. He asked for 27 gigawatt.

MS. RANDELL: There was so much extensive discussion not only yesterday, but in prior hearings about the loadings on the lines and how the 15 gig case is really designed to show what your loadings are likely to be, not only today but in the future, we would suggest

that the 15 gigawatt case is the appropriate way to look at it. And there's so much information put into the Exhibit 1 to the Bailey supplemental testimony that if Mr. Rosenthal and his clients would care to look at those -- we have information in the record. They know what the numbers are for the 27 gigawatt case. I don't think it helps us along to continue to put in information that is really not relevant. There was such extensive discussion about what the 15 gigawatt case represents and actually, you know, we probably mislabeled things. What we were really looking at was loadings on lines as Mr. Zaklukiewicz discussed yesterday. And to put in a case that has perhaps nine hours a year relevance doesn't further things.

CHAIRMAN KATZ: Mr. Ball, did you want to be heard on this?

MR. DAVID BALL: I did. Thank you. I appreciate Ms. Randell's view of the import of 15 gigawatts and 27 gigawatts. But I think the record is completely different from that. I think Dr. Bell and Dr. Rabinowitz testified at the last hearing as to the importance of looking at peak values in terms of health impact. And that's all we're talking about here is how to protect the public health. And the issue is whether or

not when there are surges in energy along the line what the health impact is on children. So 27 gigawatts is far more relevant than 15 gigawatts. I think that's their opinion. We have obviously conflicting opinions, but in the least I would think we'd want the 27 gigawatt case as well.

MR. RICH REED: Just to clarify something there, when we get to 27 gigawatts it is not a surge in the line. It's a loading on the line. A surge on the line is very, very much different than a 27 gigawatt case. It's a case where the loading exists for a very short period of time. It is not a switching surge, it's not a lightning surge. It is basically where the load exists for a period of time. It is not a surge.

CHAIRMAN KATZ: Thank you Mr. Reed. I think we're going to ask the Company to do it for segment 15 map, the 27 gigawatt case. Okay. We have any other procedural matters or homework or -- on that? Okay. At this time I believe Mr. Rosenthal we are in the midst of your cross examination of the Applicants' panel?

MR. KENNETH ROSENTHAL: Yes. I just have one --

CHAIRMAN KATZ: And I'm going to ask you to pull that mic. a little closer and I'm going to ask --

MR. ROSENTHAL: I just have one other question, maybe a couple of questions. But -- I'm sorry. I can't read your name.

MS. BARTOSEWICZ: Bartosewicz.

MR. ROSENTHAL: Bartosewicz. You indicated yesterday, I think there was some questioning about the fact that there had been proposals by the Company if I understood it for alternate routes in the area of the Jewish Center. Do you remember that?

MS. BARTOSEWICZ: The Companies have had discussion with the representatives from the -- both B'nai Jacob and the Jewish Community Center.

MR. ROSENTHAL: Okay. And the discussions about the alternative ways that the right of way could be run on the Jewish Center property I think you indicated there were two of them?

MS. BARTOSEWICZ: Yes. We provided the Jewish Community Center folks with two, which were attached to their testimony.

MR. ROSENTHAL: And the two alternatives, one of them would take the right of way further away from the building where the daycare is located and put it directly over the baseball field, is that correct?

MS. BARTOSEWICZ: We were asked to see

where we could move the right of way as far away from the building as possible, which is what one of the examples does.

MR. ROSENTHAL: So one of the examples puts it directly over the baseball field?

MS. BARTOSEWICZ: That's correct.

MR. ROSENTHAL: And the other example puts it directly over the baseball field and directly over the inground pool and set of buildings that the daycare uses as well, so that second right of way would be directly over two areas that the daycare uses, correct? Day camp uses?

MS. BARTOSEWICZ: It does do that. Yes.

MR. ROSENTHAL: Okay. And neither of those were acceptable to the Jewish Center.

MS. BARTOSEWICZ: Well, let's rephrase that. I mean, the point was not to put a right of way over a facility like a pool. The point was this is the only property available that the Jewish Community Center has and property to -- outside of that is property that's owned by others and there are homes along the edge of the Jewish Community Center's property. So obviously where you're limited with property rights if you were to move the right of way you would have to move the facilities.

CHAIRMAN KATZ: With the EMF numbers that we got from Dr. Bailey with the split phase and everything, were they from the power lines at the original location, the current location?

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: Okay.

MR. ROSENTHAL: Alright. I just wanted to clarify because there was some, I think, discussion in questioning --

CHAIRMAN KATZ: Yes.

MR. ROSENTHAL: -- by the panel as to an alternative route to the Jewish Center other than undergrounding --

CHAIRMAN KATZ: Right.

MR. ROSENTHAL: -- and I just wanted to have it clear. There may be -- I don't know if these photographs -- are these part of the record?

MS. BARTOSEWICZ: They were filed by the Jewish Community Center in their July 19th testimony.

MR. ROSENTHAL: Alright. So they are part of -- there is a set of photographs that shows these alternative rights of way going over those facilities?

MS. BARTOSEWICZ: Correct Madam Chairman.

CHAIRMAN KATZ: You're filing Mr.

Rosenthal?

MR. ROSENTHAL: Yes. I have no further questions.

CHAIRMAN KATZ: Okay. At this point thank you. We'll go to Council questions. Mr. Cunliffe?

MR. FRED CUNLIFFE: Thank you Chairman. In your supplemental filing to Exhibit 96 you provided two corrected pages. On cross section number two there was some data that's still to be determined. Is that still the goal of the Company to provide that information?

MS. BARTOSEWICZ: I'm sorry Mr. Cunliffe. This is the Durham bypass. I believe you're looking at page two of 13.

MR. CUNLIFFE: Okay.

CHAIRMAN KATZ: Is the Durham bypass what I'm calling the Royal Oaks jog the same thing?

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: Thank you.

MS. BARTOSEWICZ: We can choose to call it the Royal Oaks jog, that's fine. That's the new right of way and that's correct, those numbers are still to be determined.

MR. CUNLIFFE: You're working on that to provide --

MS. BARTOSEWICZ: Yes, we are.

MR. CUNLIFFE: -- okay. Thank you. And also in the supplemental testimony, Exhibit 124, Mr. Bailey's page seven, they go on to explain they're working on providing data to the Attorney General's set three question. What's the status of that analysis?

MS. BARTOSEWICZ: Correct. The EMF response to the Attorney General, we actually hope to file that this afternoon.

MR. CUNLIFFE: Thank you. In his Exhibit 1 of his testimony he decided to go out 150 feet on either side of the right of way. What was the reasoning of that distance?

MR. BILL BAILEY: That was based upon a previous analysis that indicated that the majority of the facilities of interest were in that range.

MR. CUNLIFFE: Could that be extrapolated out to show that the EMF levels -- could you bring it down to a point where it'll drop below one, so you just carry the table out until you see it go below one?

DR. BAILEY: For the statutory facilities we have the calculations out to those distances.

MR. CUNLIFFE: So all the statutory facilities are within 150 feet of the edge of the right of

way.

DR. BAILEY: No. An exhibit -- updated Exhibit 2 we have calculations out to wherever those statutory facilities are identified that go beyond 150 feet. So there's a statutory facility beyond 150 feet from the edge of the right of way. It's identified on Exhibit 2 and the calculations are provided.

MR. CUNLIFFE: Alright. And that distance is from the edge of the right of way?

DR. BAILEY: Yes.

MR. CUNLIFFE: So if I see 150 feet for Racebrook Elementary School that's from the edge of the right of way, not from the centerline?

DR. BAILEY: Yes.

MR. CUNLIFFE: Okay. And do you -- you did not demarcate what right of way edge that would be unless I went to a map I could probably figure that out, but it doesn't say if it's from the north, or south, or east, or west?

MS. BARTOSEWICZ: If you look at the accompanying maps you can see on the map -- I'm sorry, we didn't -- the presentation maps that we filed you can actually -- each statutory facility has a dot on the map and you can easily see which side of the right of way it's

on.

MR. CUNLIFFE: Alright. Thank you. Those are my questions Chairman.

CHAIRMAN KATZ: Thank you. Before I go to Mr. Emerick, those numbers that you read us this morning, do we have -- I'm going to need that for my cross and I'm just wondering if you have a copy handy?

MS. RANDELL: I have two and we can run some more.

CHAIRMAN KATZ: That would be appreciated. Mr. Emerick?

MR. BRIAN EMERICK: No questions. Thank you.

CHAIRMAN KATZ: Okay. I'm going to pass and study this and come back. Mr. Ashton?

MR. PHILIP ASHTON: A couple of questions. Have you read the testimony -- just hang on for a second while I get the right document. Dr. Bailey, have you read the testimony that is the, quote, supplemental testimony concerning background levels statutorily required buffer zones that Doctors Bell, Rabinowitz, Berber and so forth?

DR. BAILEY: Yes, I have.

VOICE: Microphone.

MR. ASHTON: I'm sorry. And in that

testimony they are recommending a background level or a level of EMF, which is equivalent to background and they use 6/10ths of mG as the -- as their quantitative figure?

DR. BAILEY: Yes.

MR. ASHTON: This 6/10ths of a mG, what -- how does that relate to the magnetic fields under distribution lines along streets?

DR. BAILEY: Well, first of all let me explain what that .6 mG value refers to the average, or the median value of the homes -- the almost 1,000 homes that were in the study. And the numbers from each home that went into that number was the average field in a residence. So that didn't mean that the median field of the residence was .6 mG throughout the residence, you could have places in the residence where the field would be essentially zero or at some higher mG level and you could have values measure in the house that were, you know, at much higher levels, you know, maybe a dozen mG. So those values within a home were all taken and collected together and then it was the median of all of those readings.

That's one thing to appreciate. That does not say that you have a house with a field of .6 mG, it's uniformly throughout the house. The fields from

distribution lines, Dr. Johnsonn has done many measurements of these and perhaps he can tell you --

MR. ASHTON: I'm happy to consider you as a pair.

DR. BAILEY: -- but we're talking, you know, you know, up into the dozens of mG. Gary?

MR. GARY JOHNSONN: During the course of different measurements and onsite investigations I've had occasion to take profiles or measurements that pass along distribution lines, underneath distribution lines, and in fact also as part of the study that generated that 0.6 mG number there were additional measurements on that that also did profiles that would typically go from street to the residence. I don't think those are collected and summarized as part of the overall report, but those measurements were done.

As far as going along distribution lines, walking down streets, it is not unusual at all to make -- see measurements and readings in the two to four mG range, depending on the loading on the distribution line even higher. And this is as you walk down the sidewalk along a city street. Recent measurements that I can think of where I was measuring along a street with a distribution line running down it, the levels were running typically I

think in the three to four mG range. Other times I've seen as you pass underneath a distribution line levels in the 8, 10, 12 mG. I'd have to say --

CHAIRMAN KATZ: How about 115?

DR. JOHNSONN: -- a 115 kV line?

MR. COLIN TAIT: Walking under a 115 line?

CHAIRMAN KATZ: kV line.

DR. JOHNSONN: Okay. Now that's a transmission line. I wouldn't call that a distribution line.

CHAIRMAN KATZ: No.

MR. TAIT: We just want the figures.

CHAIRMAN KATZ: Right. We realize that.

DR. JOHNSONN: Oh, okay.

CHAIRMAN KATZ: We've sat here long enough to realize the difference.

DR. JOHNSONN: Doing -- walking underneath the transmission line right at the peak, when you're within the right of way and you're passing underneath the line --

MR. CUNLIFFE: Or crossing a street or crossing your driveway.

DR. JOHNSONN: -- or if the 115 kV line is going across the roadway, as you pass underneath it,

again, depending on the loading you'll see levels between a 115 line 20 kV to 80 -- or 20 mG up to 80 mG. I mean, those are the type numbers that stick in my head. Depending on the particular loading it can be different than that, but in that range.

MR. ASHTON: Dr. Johnsonn, you mention a figure of two to four as being typical under a distribution circuit. That is a single circuit on the pole?

DR. JOHNSONN: Yes. It's not like a distribution line that might have two or three distribution circuits on it if it's say close to a substation or something.

MR. ASHTON: And do distribution lines have multiple circuits on the pole?

DR. JOHNSONN: They can occasionally, yes.

MR. ASHTON: And how would that effect the magnetic field?

DR. JOHNSONN: In some respects it's just like a transmission line with the multi-line corridor. If you have multiple lines on the pole you may have cancellation, you may have enhancement of the field. It's not just say if you have three circuits you now say it's going to be 12 mG. It might be 12 mG, it might be less,

it might be more.

MR. ASHTON: And --

MR. DANIEL LYNCH: Dr. Johnsonn, coming back to distribution for a second, as a person that has a transformer right in front of his house, does that increase the milligauss level?

DR. JOHNSONN: That probably tends to be a common misconception that if you have the transformer. Transformers have high magnetic fields. It's really the lines of the connections into the transformer, not the transformer itself. The fact that you have a distribution transformer right in front of your house really isn't going to change the milligauss level as opposed to it being next door to your neighbor's house or a couple of houses down. It really depends on the line and the loading on that line.

MR. LYNCH: That's what I thought. Thank you.

CHAIRMAN KATZ: Can I just ask a follow up question at this point? I'm sorry, you go first.

MR. TAIT: I'm a lawyer, so I'm entitled to ask a dumb question. It seems to me we're talking about magnetic fields, we always talked about EMF, but aren't we just talking about the health effects of magnetic fields

because when you bury it you get rid of the electrode?

DR. BAILEY: Most of the research is on magnetic fields, not electric fields.

MR. TAIT: Yes, so -- but we keep on saying EMFs, it's really the magnetic fields that we're worried about?

DR. BAILEY: Well, that's the topic of discussion primarily.

MR. TAIT: Yes. Now when you bury it you don't get rid of them. You get rid of the electric fields, but not the magnetic fields, unless you -- depending on how far down you go?

DR. BAILEY: Yes.

MR. TAIT: Alright.

CHAIRMAN KATZ: I'll just ask a follow up question. Let's assume that there -- the current 115 lines that go through segments one and two are not a health risk as they exist today. And let's assume for a second that our buffer zone is no net increase in EMFs at the edge of the right of way. Using split phasing and higher structures and moving it can we say that it's possible to have no net increase on the edge of the right of way? Can the line be designed for no net increase?

DR. BAILEY: Which cross section was that?

CHAIRMAN KATZ: All of them.

DR. BAILEY: All of them, okay.

CHAIRMAN KATZ: I'm not going to make this easy. If we wanted to define hypothetically our buffer zone to be no net increase in EMFs at the edge of the existing right of way can we design a 345 kV to do that?

VOICE: Homework.

CHAIRMAN KATZ: Homework? Thought?

MS. BARTOSEWICZ: I would prefer -- I want to double check before we give an answer, so we'll take it as homework. We can actually give you the answer after the break.

CHAIRMAN KATZ: Okay.

MS. RANDELL: Madam Chairman?

CHAIRMAN KATZ: Yes.

MS. RANDELL: Just picking up on Professor Tait's point, when you say the EMF you're really talking the magnetic field --

CHAIRMAN KATZ: Milligauses.

MS. RANDELL: -- not the electric volts?

CHAIRMAN KATZ: No. Milligauses --

MS. RANDELL: Okay.

CHAIRMAN KATZ: -- yeah. I think we've been mainly speaking about milligauses when we had the

scientists talking about health effects it was mainly milligauses. So let's stick with milligauses.

MS. RANDELL: Great.

CHAIRMAN KATZ: But if we said the buffer zone was no net increase over the existing 115 line can we do that?

MS. BARTOSEWICZ: And that would be for --

MR. TAIT: All overhead lines.

MS. BARTOSEWICZ: -- and what I'm going to base my answer on would be --

CHAIRMAN KATZ: 15 gigawatt case.

MS. BARTOSEWICZ: -- and it would be Exhibit 2 to Dr. Bailey's testimony where we've got the actual distance for the statutory facilities.

CHAIRMAN KATZ: Yes. Yes.

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: No. I'm saying edge of right of way.

MS. BARTOSEWICZ: Edge of right of way.

CHAIRMAN KATZ: At the edge of right of way.

MS. BARTOSEWICZ: Okay. We'll do that look.

CHAIRMAN KATZ: We wanted no net increase.

MR. TAIT: For all facilities, not just the statutory ones.

CHAIRMAN KATZ: No, I'm just saying edge of right of way.

MR. TAIT: Yeah. That's what I'm saying. Edge of right of way.

CHAIRMAN KATZ: Yeah.

MS. BARTOSEWICZ: Okay. Understand.

CHAIRMAN KATZ: If we wanted to go that route on defining a buffer zone, since apparently we do have discretion on how we define it. Okay. Back to you Mr. Ashton.

MR. ASHTON: Okay. Doctors Bailey and Johnsonn, if I could just pick up where we left off, we're talking about distribution lines. I believe you testified that you get electric -- magnetic fields two to four for single circuit and depending upon the way they're configured either more or less or equal for multiple circuits. We haven't talked about electric fields for underground distribution, which is often buried typically 24 inches below the ground surface, 24 inches or more or less I've seen. What kind of electric field -- magnetic fields do they generate? It may be out of sight, but is it out of mind too?

DR. JOHNSONN: Okay. Now in this case you're talking about the underground distribution feeders?

MR. ASHTON: Yes. Or direct buried underground in residential areas. Would you like to come back with the answer on that?

DR. JOHNSONN: That would take a little bit more checking. I know for the residential underground that tends to be low because typically the cables are triplex or bundled very, very close together. For underground distribution more commonly that will be in a duct bank with eight to 10 inches separation between the individual phases.

MR. ASHTON: What about direct buried, single phase, single conductor with ground?

MR. JOHNSONN: Okay. With the adjacent ground in close proximity for those configurations it would be -- it would be lower. If I gave you an exact number or a number at this time it would really be a gut feeling.

MR. ASHTON: Can I make a request for a little homework assignment that you come back and tell us a little bit about the magnet field associated with distribution? And you might give a variety of cases. Obviously a lot of it is single phase, single conductor

with buried ground no in duct, some in duct, typically PVC duct, underground distribution coming out of a substation is three-phase, multiple ducts in a bank.

CHAIRMAN KATZ: I'm sorry. This is what happens when you leave for a minute. You want this for the --

MR. ASHTON: Comparative purpose.

CHAIRMAN KATZ: -- comparative purposes?

MR. ASHTON: Yes.

CHAIRMAN KATZ: Understood.

MR. ASHTON: And you don't have to cover every conceivable configuration. I'm looking for a range of values.

DR. JOHNSONN: For a quick number at the moment, just in terms of a duct bank, say that might be running along the sidewalk or street for underground distribution, for the typical loadings since you're closer to it, since it may only be a few feet underground or three feet underground, levels like in the 10 to 20 mG range are probably going to be possible directly over it. So in some respects the underground distribution will have a slightly higher peak field than what you'd find at the peak directly underneath an overhead just because you're in closer proximity.

MR. ASHTON: I'll accept that as the range subject to your further research.

DR. JOHNSONN: Right. That would be great.

MR. ASHTON: Let me go up to the specific arrangement of conductors on a transmission line. At 345 the practice -- the early practice was to use a single conductor about an inch and three quarters in diameter and it later evolved into bundled conductors. I don't think in Connecticut there are more than two conductors per bundle. What is the relative magnetic fields from a single conductor or a bundled conductor with two or more parts see more conductors, how does that effect the magnetic field?

DR. JOHNSONN: Putting multiple conductors or bundling the conductors in the phase, going from like two conductors, three or even four conductors which you might find with a 765 kV transmission line, in terms of the magnetic fields will really have no effect on the magnetic fields you're measuring at the ground. If you're measuring the magnetic fields in very close proximity to the bundle, say within oh, five -- say 10 inches then you would see some impact of the current being on those individual conductors. But by the time you're a few feet away you can treat that two conductor bundle in terms of

the current as if that current was located at the center of the bundle. So in fact, whether you have one conductor, two conductors or three conductors in terms of the magnetic field it's not going to have an impact. It will for the electric field.

MR. ASHTON: Yes. In the -- just bear with me a second. In Exhibit 96 and then also in -- when was it. I guess it was one of the ones that came out yesterday. Yeah, that's the one I think. Also in the slides that came out, I forget the exhibit number. I've got it here --

CHAIRMAN KATZ: 124?

MR. ASHTON: No. I've got it here somewhere. Where the hell is it. Oh, it's 136, pardon me. 96 and 136 show a variety of structures and we've talked about the -- about the way you can -- the split phase optimize system where on a single structure you go A, B, C on one side and the C, B, A on the other. Is there any merit to the case, or to the idea of putting those conductors on separate structures so they could in the event of an outage operate as a single circuit? Suppose an outage -- lightning strikes, I believe under NEPOOL or ISO requirements you're looking to get rid of the opportunity for a double circuit outage caused by a

single incident. So there have been a number of instances where structures, double-circuit structures have been replaced by two single circuit structures. What's the merit of -- on reliability of putting up two separate structures as opposed to one double-circuit structure with really carrying a single circuit?

MR. ALLEN SCARFONE: Allen Scarfone. That's correct Mr. Ashton. If you separated the towers and you separated the circuit breakers at the substations, yes, you could consider those separate lines. I think what people have been talking about is split phasing, but when it gets back to the substation it's tied in through a single breaker. We would have to separate those into separate breakers into the bus, two separate -- totally separate the lines.

MR. ASHTON: My question is going to the merits of that. I understand the necessary configuration. You could even use the single breaker and disconnect switches on each line so if you have a fault you could clear the troubled line?

MR. SCARFONE: That's correct. You would increase reliability if you did that because you can consider those two separate circuits.

MR. ASHTON: What would it do to cost?

MR. SCARFONE: Increase the cost.

MR. ASHTON: Okay. I'll buy that, like what are we talking about? Do you want to come back after doing a little thinking?

MR. SCARFONE: A 345 kV circuit breaker installed may be a half a million dollars.

MR. ASHTON: I didn't say -- ignoring the switching, I understand the switching game. What I'm looking for is what is the merit to putting the conductors on separate structures and what is the cost impact? It's split phasing, optimized split phasing, I understand that. What are we talking about in terms of cost?

MS. BARTOSEWICZ: I couldn't give you a cost number off the top of my head. It would be structures and foundations.

MR. ASHTON: Well, you're presumably lighter because you're getting rid of the double-circuit on one structure. You know, some give ups here.

MS. BARTOSEWICZ: Correct.

MR. ASHTON: Why don't you think about it and come back with a horseback estimate as to it's impact?

MS. BARTOSEWICZ: We can do that and the -- one comment on that is you probably lose the ability to go from different types of the split phase as you go down the

right of way. In other words, that would have -- now you'd have to do that -- that same split phase for a certain distance because you're splitting them onto different structures. So that would be another consideration. A third consideration would be making sure you had enough right of way to actually physically separate the poles.

MR. ASHTON: Why would it take more right of way? If you put them on one structure or on two the spacing horizontally between the equivalent phases is the same, isn't it?

MS. BARTOSEWICZ: There would need to be some distance between the two poles and I'd have to have the engineers double check that distance.

MR. ASHTON: Well, okay. I'd like to hear a little bit more about this, so maybe you can do a little scratching. I have nothing further.

CHAIRMAN KATZ: Mr. Emerick?

MR. EMERICK: I don't want to ask Mr. Ashton's question, but his question stimulates a question that I guess I'll ask the panel. If you were to look at a configuration that Mr. Ashton talked about wouldn't you have to -- and if it -- as reliability of the system wouldn't you have to do that from substation to

substation? You can't do the split phasing as we talked about yesterday where some portion of the line between substation might go to split phasing, it's got to be the whole way?

MR. SCARFONE: That's correct. It has to be the whole way because you couldn't -- if you split phase in the middle of the line when you combine the line it's considered a single circuit net.

MR. EMERICK: Okay.

CHAIRMAN KATZ: Mr. Marconi, you had a point of law that you wanted to cover?

MR. MARCONI: I would like to address this to -- probably to counsel of course. I've reviewed the comments of Attorney General Blumenthal and I was wondering since it appears that he's indicating that we need to make the record complete and in accordance with Public Act 04-146 the Applicant needs to provide additional maps of the proposed route, as you might notice on page seven of their comments, and then states on page eight of the comments that the Council must provide Applicants -- or must require the Applicants to provide additional information concerning EMF at specific sites along the proposed route and alternate routes. Without my opining as to whether or not that is in fact required or

not I'd like to ask whether or not the Applicant could on it's own choose to provide that additional information to the Council?

MR. FITZGERALD: Well, let me -- Mr. Wertheimer must have written that because it's right.

MR. MARCONI: He's usually very much on the point.

MR. FITZGERALD: As opposed to --

CHAIRMAN KATZ: We'll just leave it there Mr. Fitzgerald for your own protection.

MR. FITZGERALD: -- and secondly we -- because we agreed with that that's what we've been endeavoring to do. That's what all these exhibits that we've filed are.

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: Exhibit 132, the new mapping that's been filed. We agree and we're doing that.

MR. MARCONI: Okay. So you feel basically this has been complying with the Attorney General's requirements?

MR. FITZGERALD: Yes.

CHAIRMAN KATZ: I think at some point -- so whatever decision we make I do not want to have it be considered anything defective because we left something

out. So at some point that I think we need some type of thing saying, okay, we believe the following exhibits provide the information asked for in this part of the Public Act, okay? If we could have that?

MR. FITZGERALD: Well, indeed this goes beyond the Public Act. It's the whole -- it's the whole statute.

CHAIRMAN KATZ: Right. Yes. Right.

MR. FITZGERALD: And I agree.

CHAIRMAN KATZ: Yes, you are more correct. In the statute. Yes, if we could just -- so that we can check off that we've covered everything required.

MR. FITZGERALD: Right, I understand that.

MS. RANDELL: We agree with that and we'd actually -- we agree with that. We've actually started listing the exhibits that we should look at in terms of cover letters and such. And when we do that as a complete document in the not so distant future we would ask that if Mr. Wertheimer --

MR. TAIT: Which would be my request since you --

MS. RANDELL: -- disagrees -- if he can let us know?

MR. TAIT: -- since you all seem to agree

with him, make sure he agrees with us.

MS. RANDELL: Right.

MR. TAIT: If he doesn't, the sooner he speaks up the better.

MS. RANDELL: Right.

CHAIRMAN KATZ: Because at the end we need a complete package.

MR. TAIT: We don't want objections at the end that we didn't do something that Mr. Wertheimer thinks we all agree we should do.

CHAIRMAN KATZ: Right. And ideally we'd like them while we're still in public hearing mode. Okay. Mr. Ashton completed --

MR. TAIT: If Mr. Wertheimer is right.

CHAIRMAN KATZ: -- okay.

MR. MICHAEL WERTHEIMER: Certainly our intention of filing our comments and filing actually comments before you asked for them was to make sure that everything is put on the record during the case. We have no intention of trying to like the game, got ya, at the end. I think it's in everyone's interest to do this the right way the first time. I'm not in position to give you an answer now because the information is still coming in and it's obviously something that's right on my list of

things to keep track of as we go along and if there are any problems bring it to the Applicants before we bring it to you. I think this is something that will not be -- should not be an issue that has to even come to your attention.

CHAIRMAN KATZ: Thank you.

MR. TAIT: Thank you very much.

CHAIRMAN KATZ: And we appreciate the spirit of everyone trying to get everything in the record early enough in the process. Okay. Mr. Heffernan?

MR. GERALD HEFFERNAN: No questions.

CHAIRMAN KATZ: Mr. Lynch?

MR. LYNCH: No questions.

CHAIRMAN KATZ: Okay. I'm going to go back to mine at this point. Okay. Going back to the document, which is Exhibit 130 -- Ms. Bartosewicz that you read into the record this morning? Did we give you our only copy? Did you give us I mean?

MS. BARTOSEWICZ: Oh, I have one.

CHAIRMAN KATZ: Oh.

MS. BARTOSEWICZ: We saved one.

CHAIRMAN KATZ: Okay. I want to make sure I understand the assumptions that were used in this. This assumes split phasing?

MS. BARTOSEWICZ: Correct.

CHAIRMAN KATZ: Okay. To the maximum EMF reduction?

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: Okay. So for example, I'll give two hypotheticals. One let's say we chose -- there's different way to choose a buffer zone. Some people want us to do distance, some want milligauses, let's say we did a milligauses buffer zone and let's say we chose 3 mGs. Now you show four residential areas above 3 mGs.

MS. BARTOSEWICZ: Actually, that would be six. Four in the column, 3.1 to 6 --

CHAIRMAN KATZ: Exactly. You're right. Add the two columns, okay. Yes. You show six above 3 mGs.

MS. BARTOSEWICZ: -- correct.

CHAIRMAN KATZ: How would you -- if we -- how would you handle that if -- or is this a point of law Mr. Fitzgerald?

MR. FITZGERALD: Well, no. I don't think it's a point of law. You just stated a hypothetical and said, if we did this how would you handle it?

CHAIRMAN KATZ: Yes.

MS. BARTOSEWICZ: I can hypothesize --

MR. FITZGERALD: Other than by jumping out a window --

MS. BARTOSEWICZ: -- how we might handle it.

CHAIRMAN KATZ: I would appreciate that.

MS. BARTOSEWICZ: Let me start with the least maybe of truces and we could certainly go back and I know that we talked about a passive loop essentially. We could go back and see that if for example a passive loop might work for that if it's a house or a group of houses, so we would look for there. On the other extreme if that were indeed the ruling at 3 mG and you would have to take the property.

CHAIRMAN KATZ: Now are these six residences in one general area or are they all over segments one and two?

MS. BARTOSEWICZ: These are residential areas, so first of all you would probably -- they're residential areas so they fit our definition.

CHAIRMAN KATZ: Right.

MS. BARTOSEWICZ: So you'd want to go out and see -- you'd probably -- if we're going to be very careful and specific now with a decision you'd want to go out and check every house essentially to make sure that

what the actual calculation is I would expect. Because you'd want to know now for every home that you were going to even think about having to acquire you'd want to know does this fall into your three milligauss category or not. And these cases here are -- are certainly neighborhoods, the two neighborhoods that fall in the 6.1 to 6.2 are two neighborhoods in cross section two. The first one is Royal Oak and the second one is I think coming off of Beseck Mountain.

So let's take the Royal Oak for example, and you might look at the bypass again and you might say --

CHAIRMAN KATZ: Okay. This is --

MS. BARTOSEWICZ: -- can we go around this neighborhood with that bypass?

CHAIRMAN KATZ: -- okay. So this is not with the bypass?

MS. BARTOSEWICZ: This is not with the bypass.

CHAIRMAN KATZ: Okay. So putting the bypass in automatically reduces this number?

MS. BARTOSEWICZ: No. Because if you look at our charts the -- actually that 115 line that's on their existing right of way today they would have higher

levels than if we put the 345 on the same right of way. So you would take the 345 off the existing right of way. You would put it on the bypass and now you would be taking the reading on the 345 line and because that's the facility now we're building the 115 can remain on the existing right of way. So do they fall under your criteria now or don't they? We wouldn't be touching those lines any further.

MR. FITZGERALD: Alright. Now we're getting into legal stuff.

CHAIRMAN KATZ: Let me ask the -- I'll get back to the technical questions because I don't even want to go there legally. Do they have in Royal Oaks right now over 6 mGs on the existing 115 line?

MS. BARTOSEWICZ: Yes, they do.

CHAIRMAN KATZ: Okay.

MS. BARTOSEWICZ: If you look at Dr. Bailey's calculations --

CHAIRMAN KATZ: Yes.

MS. BARTOSEWICZ: -- at the 15 gigawatt case --

CHAIRMAN KATZ: Yes.

MS. BARTOSEWICZ: -- they indeed fall -- and if we have to look at these across the board at the 15

gigawatt case they are indeed about 13.9 mG.

CHAIRMAN KATZ: Okay. Therefore, I am going to be -- now you have me even more interested in my no net increase --

MS. BARTOSEWICZ: Yes.

CHAIRMAN KATZ: -- hypothetical. Okay. Let's go -- shifting gears, let's go to the pictures of Eisenhower Park. Who is it who testified yesterday, was it you Mr. Cretella? You had indicated that this area near the bleachers was not under your definition of a statutory facility?

MR. ALBERT CRETELLA: Correct.

CHAIRMAN KATZ: Okay. And can you explain again why it isn't?

MR. CRETELLA: It's in our definition, or I shouldn't say definition, of how we attempted to identify --

CHAIRMAN KATZ: Interpretation?

MR. CRETELLA: -- public playgrounds, which is what the statute calls for, we looked at -- at facilities where there were equipment and/or provisions for places for children to play. Again, based on kind of our interpretation as to what the statute was intended to do, which would be to protect children from magnetic

fields, in our -- in trying to apply that rule of thumb we looked at public parks and whether or not they did contain facilities for children to play, jungle gyms, etcetera, playgrounds, and whether or not they had ball fields where children would congregate and/or play. In our particular situation we looked for kind of active areas that were being used for those purposes.

When we made our determination for Eisenhower Park we did not believe that this particular set of bleachers and/or open grass area was an active playground for children --

CHAIRMAN KATZ: Did you ask the City if this part of the park gets active use?

MR. CRETELLA: -- no, we did not.

CHAIRMAN KATZ: Okay. Because in my town the soccer club comes in and sets up the nets at either end for the weekend and then at the end of the weekend the soccer nets go away and you wouldn't know, I mean, you wouldn't know that that was a playing field and I guess that's my problem. Sometimes the hardware comes in.

MR. CRETELLA: Right. And I guess that's true for this particular endeavor for trying to do this exercise we essentially use the aerial maps and looked along the route to try to identify first whether it was a

public playground or a park and whether or not it had some active areas or facilities where children would congregate.

CHAIRMAN KATZ: Okay. Ms. Kohler, I'm going to give you an opportunity while the witness panel is still here to see if you have any questions on this exhibit.

MR. LYNCH: Madam Chair?

CHAIRMAN KATZ: Just a second. Yes Mr. Lynch?

MR. LYNCH: Mr. Cretella, as far as being - -

MR. CRETELLA: I'm sorry?

MR. LYNCH: -- no, as far as this being an active field most municipalities that I know of with their park and recs if it is an active field, especially a baseball field, they will line the fields. As I look at these photographs I don't see any lines that would make this an active field. Baseball equipment and bags can go away, but if there's going to be an event the fields will always be lined. I just didn't see that.

MR. CRETELLA: And that's I guess how we came to this similar conclusion.

CHAIRMAN KATZ: Okay. Ms. Kohler, did you

want to cross on this exhibit?

MS. JULIE DONALDSON KOHLER: Actually I don't need to cross on it --

CHAIRMAN KATZ: Oh.

MS. KOHLER: -- I just wanted to --

CHAIRMAN KATZ: Go ahead.

MS. KOHLER: -- wanted to say two things. When I spoke with Eisenhower Park Committee this morning to confirm whether or not the ball field is actually in use or not in use and they said in fact the ball field is in use for a variety of different types of things, none of which seem to be actual ball field playing, but they have a lot of events there and actually will provide me with a list of all the different events that they hold there on the ball field.

CHAIRMAN KATZ: Okay. And you will file that?

MS. KOHLER: Yes. And I will file it. The second thing is I know that the Applicants have met with the Eisenhower Park Committee who have spent the last year and a half working on developing Eisenhower Park, specifically this area, because it's one of the only flat non-wetland areas in Eisenhower Park in which they can put this juvenile day camp pool area. And thirdly, I haven't

felt the need really to defend this as a ball field because it was not the City that identified it as a ball field, the Applicants identified it as a ball field and their A.G.'s response. So --

MR. TAIT: Could I ask Attorney Kohler, would you also indicate the hours of use, not just that they had a fair here one Saturday afternoon, but for the last year --

MS. KOHLER: Absolutely.

MR. TAIT: -- what events and the time duration of those events and who were the attendees?

MS. KOHLER: And I wouldn't be surprised --

MR. TAIT: Were they adults, were they children?

MS. KOHLER: -- I wouldn't be surprised if we have a witness from Eisenhower Park Committee that perhaps could shed some more light on that during our direct case.

MR. TAIT: Okay. I think it would be very useful to have a written list.

MS. KOHLER: Absolutely.

CHAIRMAN KATZ: Thank you. That would be helpful. Mr. Emerick, you wanted to add to that?

MR. EMERICK: No. With the clarification

of the use I'm all set. Thank you.

CHAIRMAN KATZ: Okay.

MR. CRETELLA: May I add a comment or two?

CHAIRMAN KATZ: Yes.

MR. CRETELLA: One of the difficult things we face again with the statute is, what is a public playground.

CHAIRMAN KATZ: Yes.

VOICE: That's our problem, not yours.

MR. CRETELLA: And the -- in the guise of any open field that exists on --

MR. TAIT: We'll let you know.

CHAIRMAN KATZ: Yes.

MR. CRETELLA: -- it would be very helpful.

MR. TAIT: Well, it's our job. It landed in our laps, we'll have to do it.

CHAIRMAN KATZ: Right. Yeah. Professor Tait is absolutely correct. We have some discretion, but we're trying to understand the root -- we're trying to understand the spirit of the statute and that's why we're peppering you with these questions so that we hopefully don't make many mistakes. Okay. Does the Counsel have other questions of this witness panel? Mr. Fitzgerald?

MR. FITZGERALD: I would just like to

remind you that you asked Dr. Bailey and his colleague to --

CHAIRMAN KATZ: Dr. Johnsonn.

MR. FITZGERALD: -- Dr. Johnsonn, yes.

CHAIRMAN KATZ: This is scary that I know this and you don't.

MR. FITZGERALD: To be prepared to talk about DC magnetic fields today?

CHAIRMAN KATZ: Yes, EMFs. Right, before 3:00 o'clock today. Yes.

MR. FITZGERALD: And -- okay.

CHAIRMAN KATZ: Yes.

MR. FITZGERALD: Because Dr. Bailey has got to appear before the -- one of the task forces that the CEAB has established this afternoon. So --

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: -- but he'll be available to do that before that.

CHAIRMAN KATZ: Okay. If we could have that report now on EMFs from DC?

DR. JOHNSONN: Looking briefly, the question is about magnetic fields from DC facilities or DC cable, underground cable I think in specific. Looking briefly last night at the references and information I had

available, in terms of the magnetic field that one might measure above ground at more or less a standard measurement height of one meter, about 3.3 feet, the values for like roughly 1,000 amps on the cable run from about 100 mG up through about 300 mG directly above the cables. Now again, that's going to depend on how deep the cables are buried and the specific configuration that they have underground. And that's why for similar type loadings of 1,000 amp you have this variation in the magnetic fields from about 100 mG to 300 mG.

Now in addition, this is the field from the cable. You have to put that in the context of the static magnetic field that you have naturally with the earth. That in Connecticut runs about 500 to 550 mG. So sort of on top of this -- or not on top of, but in addition to this 550 mG you're getting maybe 100 to 200 mG from the DC cable that's interacting with that. So the actual measured magnetic field could be enhanced or it could be decreased depending on the orientation of the DC cable with the earth's own DC magnetic field. So the actual measured value might range from 300 mG to say 600 mG.

CHAIRMAN KATZ: As you step away from being directly above -- let's assume the DC cable is in the street, okay?

DR. JOHNSONN: Okay. And if we take --

CHAIRMAN KATZ: As you step away toward the front yard, okay? How quickly does that reading dissipate back down to the background of the earth EMFs?

DR. JOHNSONN: -- okay. The decrease with distance is going to follow the same rules as any other magnetic field dropping off roughly is one over the distance squared. And for an underground cable with typical separations in depth this, what I call perturbation, will drop off within about 10 or 20 feet.

CHAIRMAN KATZ: Okay. So assuming it's in the street in the front yard by the back yard the person --

DR. JOHNSONN: You're essentially going to be back down to the normal earth type range levels.

CHAIRMAN KATZ: -- back to background.

DR. JOHNSONN: Other things in the ground in some cases when we've made measurements, I can remember one case there was a buried old railroad rail. Because of the iron and ferromagnetic material in it it actually perturbed the earth's measurements and was causing about a 50 to 100 mG change just because of the normal magnetism on that rail. I've seen perturbations with -- I remember on car doors. You're out in the middle of New Hampshire

making measurements and the DC field that you measure you're expecting like 570 mG, I was measuring 430. It's because I was within about 15 or 20 feet of a vehicle and one of the metallic panels on the vehicle I guess had been magnetized and you're picking it up in the DC field reading.

CHAIRMAN KATZ: A Hummer must give a real reading.

DR. JOHNSONN: Depends on how it was assembled and what it's been in contact with.

DR. BAILEY: I would also point out that there's no body of evidence suggesting that variations in the earth's magnetic field at these levels are associated with human health effects.

MR. TAIT: I'm going way back behind my high school physics now and saying, when we talk about electric fields I understand gas and water won't effect that. But do any other flowing fluids or things in the ground have any magnetic fields, does a gas line, does a water line create any magnetic field?

DR. JOHNSONN: Essentially no. I mean, if you've got a lot of conductive metallic particles in water, I guess -- and even then you're not going to measure it.

MR. ASHTON: What would happen, to pick up Professor Tait's thinking, a natural gas transmission line uses cathartic protection where they impress a small voltage on it to prevent corrosion, does that create a magnetic field? And if so, what kind of magnitude?

DR. JOHNSONN: You -- for the cathartic protection it's really a voltage and not a current flow. And the current flow if there would be anything there is extremely small.

MR. ASHTON: Okay. So no field there?

DR. JOHNSONN: Essentially no field.

MR. ASHTON: Given a New York City type of environment, or a London, or Boston, or what have you where there are large DC traction systems, or AC traction systems, does that cause magnetic fields and if so, what sort of fields?

DR. JOHNSONN: DC magnetic fields?

MR. ASHTON: Well, traction mode is DC in many cases.

DR. JOHNSONN: Yes. Yes, in some cases I don't remember the specific site, if it was in New York or some other facility, but I have heard the case and I don't know if it's rumor or not. But when the train went by because of the increased DC current it was causing a

paperclip to basically rise up and stand on end.

MR. ASHTON: That sounds like a novel -- a novelty market there.

DR. JOHNSONN: But when you do have those increase in the DC currents you will get a fluctuation in the DC magnetic fields.

MR. ASHTON: What kind of magnitude are we talking about here? Milligauss, fractions of a milligauss, tens, hundreds?

DR. JOHNSONN: In some cases, again, depending on your location and the magnitude you would have -- in the case of a DC traction system where you can be in very close proximity within a few feet you can probably get several hundred milligauss-type changes. I think possibly even up into the 1,000 gauss range.

MR. ASHTON: Thank you.

DR. JOHNSONN: Or not -- I'm sorry, not 1,000 gauss, 1,000 milligauss, or one gauss.

MR. ASHTON: Yeah, yeah.

DR. BAILEY: I would also point out that everywhere you have light rail systems that are powered by DC catenary systems like you have in many cities, like the St. Louis and Houston and other cities, that you have a measurable magnetic -- DC magnetic field from these

facilities that you could measure out maybe almost 800 feet or something on either side.

MR. ASHTON: Just to complete the analogy or story, Connecticut recently re-electrified the railroad from New York to Boston and they added a new feature. They converted -- first of all they converted an existing systems from 25 Hz to 60 Hz and then added a system which went from New Haven eastward all the way to the Rhode Island border. What kind of magnetic field -- it's an AC system, forking kV to ground I believe, what kind of magnetic field would they have on that? Would that extend well beyond the tracks or --

DR. BAILEY: The magnetic fields for that system would extend beyond the tracks and if I recall it's perhaps it would take several 100 feet to get out to two milligauss. And onboard the train, not in that section, but I've seen readings taken on the section between Washington and New York City in which the field might average 30 to 50 mG in a car and peak as high as 300 mG during the train ride.

MR. FITZGERALD: Are we talking AC or DC?

DR. BAILEY: These are AC fields for this traction system that Mr. Ashton was asking about.

MR. ASHTON: And the Legislature is

considering a light rail proposal to go from New Haven to Hartford and possibly onto Springfield, electrified, and that would have the same kind of characteristics I assume?

DR. BAILEY: Yes. Many forms of electrified transportation, you know, buses, aircraft and so on, you would have average fields in the range of, you know, a few milligauss to even 20 mG average and peak levels multiples of that.

MR. ASHTON: Thank you.

CHAIRMAN KATZ: Mr. Emerick?

MR. EMERICK: A question on the magnetic fields from the AC and DC. I know yesterday, I think Dr. Johnsonn indicated as long as it's flowing current, whether it's AC or DC, you're going to have magnetic fields. The only difference being with DC it's going to be constant, with AC it's going to be alternating. Earlier in the hearing you had an awful lot of studies submitted with respect to health effects. Do any of those studies distinguish AC or DC magnetic fields? Is there a property difference that we're being told the difference between and one oscillates and one is constant, does that have any influence with respect to those studies?

DR. BAILEY: By and large almost the entirety of body of work that has been under discussion

before has concerned alternating current magnetic fields. In some additional studies measurements have been made of the earth's magnetic field to try and see is -- does it require a constellation of planets as it were, does it require an AC magnetic field of a particular magnitude in direction with conjunction with a DC magnetic field of a particular magnitude and direction as provided by the earth for example in order to produce a biological effect. And I don't think any consistent interpretation of those measurements has ever been made. So measurements have been made of DC magnetic fields in some studies, but they have not themselves been linked to health effects. And all of the literature that we've been talking about at this hearing has concerned AC magnetic fields.

MR. EMERICK: So if we are to consider a DC line then the health effect -- the health studies that we have are really not appropriate applied?

DR. BAILEY: That is correct. One --

MR. EMERICK: Even though we have a magnetic field in milligauss reading we should discount those studies?

DR. BAILEY: -- well, I would say -- I would say that it would be most appropriate to consider studies that have been done of AC magnetic fields in

relationship to AC facilities and studies of DC magnetic fields in terms of DC facilities. Having said that there -- except for a few phenomena there's not a body of evidence to tell you that there's really in terms of biological effects there's much difference. That is you can find laboratory studies that have reported biological changes to very strong DC magnetic fields that are similar to that that have been reported for AC magnetic fields.

MR. FITZGERALD: Are there epidemiological studies that deal with --

DR. BAILEY: No there are not. These are experimental studies in a laboratory of just ordinary biological phenomena.

MR. EMERICK: Then I think you're telling me we have no information in the record with respect to DC magnetic fields? Or very little.

DR. JOHNSONN: Well, in terms of -- the DC magnetic fields, one other thing to keep in mind that I sort of mention this in terms of the earth's magnetic field, in Connecticut we're talking about roughly 530, 550 mG as sort of the background earth's field. But --

MR. EMERICK: Is that a DC or AC field?

DR. JOHNSONN: -- that's DC. So right now sitting in this room we probably have about 500 mG of DC

magnetic field. However, that's also modified by the building's structural steel, any steel that happens to be magnetized that we've walked near. So probably as we walk through this building and out to our cars we may see this DC magnetic field vary from 200, 300 mG up to maybe 800 mG depending on what we pass near. Also the earth itself, if you eliminate all other building material, naturally you have a variation in the DC magnetic field of the earth from something around 300 mG at the equator up to about 700 mG at the North and South Pole.

So it naturally varies sort of with latitude as you go from the equator to the poles. So the type levels of DC magnetic fields that we're talking about is in the same range that we go about and, you know, moment to moment in our daily lives.

CHAIRMAN KATZ: We had testimony about they have to have converter stations at each end of the DC line. And the EMFs at the converter stations, which are above ground, what type of levels are we talking about there, do we know?

DR. BAILEY: The converter stations are designed in these days to be basically contained units. That is a building that has a metallic building that provides a shield partially and so the fields outside of

the converter station would not be in a magnitude any different and perhaps even lower than what would be observed from a typical substation.

CHAIRMAN KATZ: Okay. So the siting of converter stations doesn't have to be sensitive to schools or residences and such?

DR. BAILEY: I think that you would want to -- the lines going in and out of the converter station, or the AC lines would be the motivating criteria to place those in a particular location according to the Act.

CHAIRMAN KATZ: Okay.

DR. BAILEY: But not for the sources within the converter station itself.

CHAIRMAN KATZ: Okay. Thank you. Do we have other questions for this witness panel? Mr. Fitzgerald? Yes, Mr. Cretella?

MS. RANDELL: Mr. Cretella wanted to add something.

MR. CRETELLA: What I wanted to do was clarify my comments earlier on how we identified these public playgrounds. And I did state that we used aerial photography as a way of doing that. That was our initial way of identifying the facilities. Obviously in all cases in order to actually go out and take the measurements

there were field visits to all of those locations. So I just wanted to clarify that it was a combination of aerial with subsequent follow up on field visits. In some cases our field visits did reveal additional facilities that should be included.

CHAIRMAN KATZ: Okay. Thank you for that clarification.

MS. RANDELL: Madam Chairman --

CHAIRMAN KATZ: Yes.

MS. RANDELL: -- could I just add one --

CHAIRMAN KATZ: Let's get you a microphone.

MS. RANDELL: -- on the clarification?

CHAIRMAN KATZ: Yes.

MS. RANDELL: Thank you. Just an additional clarification Mr. Cretella, with respect to licensed facilities that information was taken from State web sites?

MR. CRETELLA: All of the information relating to licensed facilities for daycares and youth camps were obtained from lists obtained from State of Connecticut web sites.

CHAIRMAN KATZ: Okay. Thank you.

MS. RANDELL: Thank you.

MR. FITZGERALD: Two things please Madam

Chairman. First of all, I'd like to ask one follow up question about the DC examination and secondly there was some testimony yesterday about the visit that Dr. Bailey and Dr. Johnsonn made to the NYSEG facility where they looked at and took measurements and evaluated these split phased the line there --

CHAIRMAN KATZ: This is the one in western New York?

MR. FITZGERALD: -- yes.

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: And they -- they produced a report of that visit and I thought that perhaps it would be appropriate before the 11:30 break we can mark the report and take it into evidence. We have copies --

CHAIRMAN KATZ: Yes.

MR. FITZGERALD: -- and then people could look at it during the break if anybody had any questions about it and we could then finish up with them.

CHAIRMAN KATZ: Okay. Would you like to have that exhibit identified and verified?

MR. FITZGERALD: I'm sorry. I was being talked into the other ear at the same time as you spoke.

CHAIRMAN KATZ: Would you like to have that verified now?

MR. FITZGERALD: Yes, I would. Thank you. Dr. Johnsonn, you've just been handed a document. Do you recognize that as a report that you and Dr. Bailey prepared of your visit to the New York State Electric and Gas facility near Sidney, New York and that company being sometimes known as NYSEG?

DR. JOHNSONN: Yes, I do.

MR. FITZGERALD: And is the information in there true and correct to the best of your knowledge and belief?

DR. JOHNSONN: Yes, it is.

MR. FITZGERALD: We offer that as a full exhibit. I believe that would be -- would it be 139 Mr. Cunliffe?

CHAIRMAN KATZ: Mr. Cunliffe, 139?

MR. CUNLIFFE: Yes.

CHAIRMAN KATZ: Any objection to making that a full exhibit? And you'll serve the list or do you have copies here?

MR. FITZGERALD: We have copies here for those who are here who would like to see it, but we'll also serve the list.

CHAIRMAN KATZ: Thank you. Okay.

(Whereupon, Applicant's Exhibit No. 139 was

received into evidence as a full exhibit.)

MR. FITZGERALD: So that we can get a complete record on the DC fields would you comment on the typical fields -- magnetic fields, that is, that are associated with overhead DC lines?

MR. JOHNSONN: For overhead lines again, the particular DC field will depend of course on the configuration and the exact height and geometry of the line. But again, for about 1,000 amps on the conductors because the DC overhead line is further away from ground the peak fields that you might encounter underneath an overhead DC line will be probably more in the 100 mG range or below, 80 to 100 mG as opposed to some of the levels you would find directly over an underground facility.

MR. FITZGERALD: And is the curve of the decay of the -- of the magnetic field as you go away from the lines similar to that of an AC field?

MR. JOHNSONN: Yes. Again, the decay as you go away from the overhead lines the decay of the magnetic field would be the same basic laws that would effect the AC magnetic field. It's roughly one over the distance squared.

MR. FITZGERALD: And when you said that the field directly under the line could be typically something

like 100 mG you were referring to the field associated with the line itself, not the field that you would measure?

MR. JOHNSON: That's right. With this case it's the field directly responsible for the line ignoring the other earth's DC magnetic field.

MR. FITZGERALD: Thank you.

CHAIRMAN KATZ: Other questions of this witness panel? Mr. Stone, you wanted to be recognized?

MR. BRIAN STONE: Yes please.

CHAIRMAN KATZ: Can you come to a microphone?

MR. STONE: Certainly. Brian Stone, town of Orange. Good morning. I have a follow up really to Mr. Ashton's line of questioning concerning splitting the circuit on a split phase line to increase reliability. Yesterday there was testimony that if you lost one line on the circuit in the split phase that you would have zero magnetic field because you essentially would lose the entire circuit. Would that not be different if you split the circuit by using two different breakers so that you had two different lines?

MR. SCARFONE: Allen Scarfone. If you split the circuit and if you lose one line you'll lose the

entire three phases, the entire line. The other line will still be in service if you had already split the breakers at the substation.

MR. STONE: And wouldn't that have the result of eliminating the benefit from split phasing and cancellation of the EMF field?

MR. JOHNSONN: When you lost the one circuit -- if you put it on two structures and let's say for some reason you lose like one half of the split phase then yes, you've lost the cancellation effect because you need both halves of that in operation to get the full benefit of the split phase. So for the duration that you've lost that one half you would lose the benefits of the split phase.

MR. STONE: Thank you.

CHAIRMAN KATZ: Are we complete with this witness panel? Mr. Boucher?

MR. PETER BOUCHER: Thank you Madam Chairman. I have a couple of follow up questions based on the testimony this morning.

CHAIRMAN KATZ: Okay.

MR. BOUCHER: There was testimony indicating what the existing EMF levels are in the Royal Oak neighborhood and I'd like to understand what the -- I

believe the indication was that it was above six mG and I'd like to get clarification as to whether that's existing or whether that's a calculated number?

DR. BAILEY: Turning to updated Exhibit 2, my testimony, in the first row for R-11 gives the values for the Royal Oak neighborhood. And those are distinguished between measurements made and then the calculated fields from existing lines, proposed lines, and the lines as configured under various mitigation options.

MR. BOUCHER: Right. And I thought the question put by the Chairperson was, what's the existing level of EMF in the Royal Oak neighborhood. And my question is, from this chart what's the existing level?

DR. BAILEY: That calculated level at zero feet, which is at the edge of the right of way, is 13.9 mG.

MR. BOUCHER: And my question is, what's the existing level as reflected in this exhibit?

DR. BAILEY: That is the calculated level of magnetic field at the edge of the right of way produced by the existing lines under the 15 gigawatt loading condition.

MR. BOUCHER: Okay. Then would you please explain the significance of the .8 mG level that's

reflected under the column headed, Measurement of Fields from Existing Transmission Lines and Other Sources? What's the significance of the .8 mG?

DR. BAILEY: That was a measured value that was taken and where a measurement was taken. And that was -- I can't tell you which side of the right of way that was on right now from the material here in front of me, but it may not have been on that same side of the right of way as the --

MR. BOUCHER: So if the question -- if the question is what's the existing level of EMF at the Royal Oak neighborhood today based on measurements actually taken would the .8 be the correct answer? I don't know if you heard the full question.

DR. BAILEY: Yeah. If you could repeat it again please?

MR. BOUCHER: Okay. If the question posed to you is, what's the existing level of EMF at the Royal Oak neighborhood currently based on actual measurements would the .8 mG level be the correct answer?

DR. BAILEY: That -- the measured values are taken at a specific location at a specific point in time. If you went to other locations within the Royal Oak neighborhood the numbers could easily be different or even

at a different time of day they could be different. The best estimate of the -- of the magnetic field in that neighborhood at the closest residence would be the calculated values for the average loading condition.

MR. BOUCHER: Are you indicating that the .8, which you've put into this exhibit, is not something that you want the Council to rely on?

DR. BAILEY: If you recall the history of these values these measurements were produced at the request of the Attorney General. As you well know, that a measurement made at a specific location at a specific point in time may not tell you about what that field level will be on the next day or the next month or at a different location on the property.

MR. BOUCHER: Let me ask --

DR. BAILEY: So it was just another piece of information that was requested by the Attorney General and the Companies have provided that.

MR. BOUCHER: -- is there any protocol under which actual measurements of EMF levels is considered to be a reliable indication of the EMF levels at any given location?

DR. BAILEY: There is a protocol for taking measurements of magnetic fields in the vicinity of power

lines. It's IEEE Standard 644. And to the best of my knowledge those measurements that were taken by the Companies were consistent with that protocol and that at a specific -- again, those measurements would reflect the current flows on the line at a specific point in time and those measurements are routinely used by power engineers to reflect the operation of facilities at a point in time at a particular location. You would not take those measurements at a particular location at one point in time and use that to predict field values at a different location at a different point in time.

MR. BOUCHER: If the Council wanted to know what's the measured level of EMF in the Royal Oak neighborhood for purposes of understanding what's going to be the impact on that measured level as a result of the facility being proposed here is there a way for the Companies to provide that baseline information as to measured levels of EMF at the Royal Oak neighborhood so the Council could have that information in the record?

MR. FITZGERALD: Excuse me. Did you -- I believe the question -- I believe the question asked about measurements of magnetic fields from the proposed facility. As such, it's impossible to answer.

CHAIRMAN KATZ: Would be fair to say that

we say measurements of existing facilities and calculations of proposed facilities?

MR. BOUCHER: Certainly Madam Chairman. Right now we're looking at our numbers that are purported to be projected existing levels and that's what I think is confusing the record. What I'm interested in having the Council have in it's record is what is the measured level of existing EMF -- what's the measurement of existing EMF levels at a given location. In this case the Royal Oak neighborhood. Because I'm not sure if that information is in the record.

MS. BARTOSEWICZ: Chairman Katz, I just want to bring us back to some even level of knowledge. When one goes out to take a measured reading it is for that moment in time that it's real for.

CHAIRMAN KATZ: Understood.

MS. BARTOSEWICZ: Every other hour, every other day that could change depending on how much energy the region is using --

CHAIRMAN KATZ: Right.

MS. BARTOSEWICZ: -- what generation is on, what generation is off.

CHAIRMAN KATZ: Mr. Zak explained that very well yesterday.

MS. BARTOSEWICZ: Correct. And so what this shows you is for that moment in time that was the measurement. The existing and the proposed and the low option measure -- calculations are just that. It is baseline data to take it at a 15 gigawatt case so you can compare apples and apples of what the lines would give you at a 15 gigawatt moment in time compared to what the other -- what the proposed would look -- give you at the same moment at 15 gigawatts compared to what the low field options are.

CHAIRMAN KATZ: Mr. Boucher?

MR. BOUCHER: And my question is, is there a way for the Applicants to put into the record what is a reasonably reflective indication of the existing levels of EMF at the Royal Oak neighborhood so that that can be compared to the projected EMF levels that are also in the record?

MS. RANDELL: At what location and what point in time?

MR. BOUCHER: At a location that would be reflective of the Royal Oak neighborhood similarly to the way that they're portraying the .8 as having some significance to the Royal Oak neighborhood in this exhibit?

CHAIRMAN KATZ: Do you understand the question Dr. Bailey?

DR. BAILEY: Yes. And I would direct Mr. Boucher to page 15 of the volume six of the application, section 2.5.2, labeled Black Walnut Drive, Durham, which we have -- we have measurements of the magnetic field profile going from south to north under the existing transmission lines and we also have an electric field profile that gives you on that day that measurements were made what the field levels were from that line in that neighborhood.

MR. TAIT: Do your calculations agree with that if you did a calculation on that part --

DR. BAILEY: We have -- in order to match that we would have to know what the load flow was on those lines at the time we took the measurements. But as you saw from the video of the split phase model, you know, if you know the currents on the conductors and the arrangement of the conductors you can calculate very accurately values that would match the measured fields. And you see that same is the case for the measurements that we made near the split phase line in western New York State that you'll see in the memo that the calculations match that very well.

Dr. Johnsonn also points out that those 115 kV lines in the Royal Oak neighborhood are optimally split phased in their operation as they are today.

MR. BOUCHER: By way of clarification is the profile that has just been referred to is that taken at a moment in time or is it taken over a period of time so that it conveys more content?

DR. JOHNSONN: That profile on page 15, the duration of time needed to take the profile extends over a few minutes so it's not just one measurement at an instant in time, it actually takes a few minutes to basically walk the distance.

MR. BOUCHER: Okay. And does it reflect the load, you know, the line loading at the time and the other indicators that have been suggested as having to be -- you need that information in order to be able to interpret the EMF levels?

DR. JOHNSONN: It is the measured magnetic field would be reflective of the current on the line, the line height during the time of the measurement.

MR. BOUCHER: Right. And you know -- and did you factor in what the current loading was at that time to know that it was reflective of what is typically the case over some duration of time?

DR. JOHNSONN: We did not have the information on the loading during the course of the measurements.

MR. BOUCHER: Okay. Okay. So that information is just as lacking in --

CHAIRMAN KATZ: We're not going to let you characterize, so just ask a question.

MR. BOUCHER: -- okay. That information -- that information is similar then to the .8 measurement, which is at a moment in time that is reflected in the updated Exhibit 2?

DR. JOHNSONN: In both cases they're a magnetic field measurement. Whatever the loading was on the line at the time the measurements were made that is reflective of the magnetic field.

MR. BOUCHER: Right. And is that the -- the most explicit information that is in the record with regard to let's say to the Royal Oak neighborhood as to what existing EMF levels are in that location?

DR. BAILEY: It reflects the magnetic fields that we measured at that location. The calculations as we've described what the contribution of the existing lines and the proposed lines in various configurations would be to magnetic fields in the Royal

Oak neighborhood. But those projections would not take into account the magnetic fields produced by sources in the vicinity of any individual residents from distribution lines from appliances within the home, from currents flowing on water pipes that were not produced by the transmission line. So to that extent we are not making measurements of those other sources in people's homes.

MR. BOUCHER: Alright. So just to wrap this up then. If the Council wanted to know what existing levels of EMF are in the Royal Oak neighborhood the .8 that's reflected in updated Exhibit 2 and the chart as described on page 15 of, I believe volume six, that's the beginning and end of the information that's in the entire record relative to existing EMF levels at that location? Is that a fair statement?

DR. BAILEY: I think the question has been asked and answered.

CHAIRMAN KATZ: Mr. Emerick?

MR. EMERICK: Dr. Bailey, just a question with respect to your characterization of what is currently the state of the right of way through Royal Oaks. Did you say it was currently optimized split phase?

DR. BAILEY: Okay. Yeah. Based on the discussion yesterday Mr. Zaklukiewicz brought it to our

attention that some of the existing lines when you really look at them since they've been bundled and in that case more or less split and yet are the same circuit based on sort of the definition of split phase that we used in the video they are already existing split phase. Going back taking a look at some of the 115 lines along the corridor and recognizing that they are the same circuit and the current has been evenly split between the two structures this particular line, which is on page 15 designated line 1975A and 1975B, is essentially a split phase line and the phasing on it is such that it would be in an optimized configuration. So technically, yes, it is a split -- optimized split phase line configuration, albeit horizontal and on two structures.

MR. EMERICK: In terms of optimizing in a horizontal configuration, we had yesterday a vertical, how do you optimize it when it's horizontal?

DR. JOHNSONN: For the phasing in a horizontal it would be considered split phased and optimized if as you go say in this figure 15 from left to right on the photograph, Phase A, Phase B, Phase C and then on the second structure you have Phase C, Phase B, Phase A. And actually looking at the other cross sections there is another case where this occurs and I believe it's

on -- I don't have my notes in front of me, but it's on one of the structures on cross section eight. Again, it's a -- as Mr. Zaklukiewicz described it, a bundled line but you have it on two sort of circuits on either side of a lattice tower. In that case the phasing is not optimized, but it is technically a split phase line, but without the optimum phasing.

MR. EMERICK: So it turns out we didn't have to go to western New York?

DR. JOHNSONN: Looking back on it that's true.

MR. EMERICK: Thank you.

CHAIRMAN KATZ: Hope you at least got lunch out of it. Okay. Do we have any other questions of this panel? Mr. Frank?

MR. FRANK: I'd like to ask a couple of follow up questions based on Mr. Boucher's questioning.

CHAIRMAN KATZ: Do you want to sit over here?

MR. FRANK: Thank you.

CHAIRMAN KATZ: Is there anyone after Mr. -- okay.

MS. KOHLER: While Mr. Frank is getting himself oriented, I think I already know your answer to

this, but we'd like Mr. -- Dr. Bailey and Dr. Johnsonn to be able to come back at some point so we can cross them on the report that we just got?

CHAIRMAN KATZ: Yes. I think on clean up day, can we do that? Nod?

MR. FITZGERALD: Well, we could. My hope was that by passing it out before the break that if there were questions on it they could be asked today.

MS. KOHLER: I think we had hoped that we'd at least be able to have our experts take a look at it and give us some recommendations.

CHAIRMAN KATZ: Yes. I think that's a fair request and --

MS. RANDELL: If need be of course. We'd just like to be advised in advance rather than have them come and have no questions.

CHAIRMAN KATZ: Yes. Correct. I think that's -- I think that's fair. Ms. Kohler, after your experts have a chance to look at it if they have no questions please indicate that? The same with other parties and intervenors for Dr. Bailey and Dr. Johnsonn. Okay. Mr. Frank? You can take us to lunch here.

MR. FRANK: I hope to do that early, but we'll see how it goes.

CHAIRMAN KATZ: Yeah. We're going to run -- Mr. Fitzgerald's stomach runs on court time, so if we're going to run try to run on court time and maybe start lunch a little early.

MR. FRANK: Alright. Dr. Bailey, if I could direct your attention please to Exhibit 2 to your supplemental testimony? And direct you down to DC 47, which is the Jewish Community Center Daycare facility?

DR. BAILEY: Yes.

MR. FRANK: Okay. The measurements of fields from existing transmission lines with other sources for that facility the actual measurement is 10.6, right?

DR. BAILEY: Yes.

MR. FRANK: Okay. Which is a higher number than the calculated existing magnetic field under average load and under peak load, is that correct?

DR. BAILEY: At which location? I'm not sure we're talking about the same location.

MR. FRANK: Okay.

DR. BAILEY: The measurement was made as indicated at zero feet, that means at the edge of the right of way and the calculations were made at a distance of 60 feet from the right of way.

MR. FRANK: I understand. Now the magnetic

field as measured at 10.6 -- I assume that was not on a day when there was peak load on the line?

DR. BAILEY: I have no idea what the loading was on the day that those measurements were taken.

MR. FRANK: Okay. Is it fair to say that the day that that measurement was taken that the load on the line was somewhat less than 24.5 gigawatts, which is the peak that has been --

DR. BAILEY: Again, I don't know.

MR. FRANK: -- okay. So you don't know what the load was for that particular day when the measurement was taken?

DR. BAILEY: That's correct.

MS. RANDELL: Professor Tait -- Professor Tait, might I just have point of clarification? There's no way there was a 24 gigawatt load on that line?

MR. TAIT: I think he said he doesn't know.

MR. FRANK: For clarification for the record the 24.5 gigawatt case is clearly the New England System load. And I'm attempting to compare the 6.5 number, which is the existing peak -- existing magnetic field as calculated for a peak load of 27.7 system-wide. That's the clarification. Okay. So the station between the 10.6 magnetic field for some New England-wide load,

less than 24.5 as compared to peak load as calculated or peak at 27.7, one of the distinctions you're making is based on a distance of 60 feet?

DR. BAILEY: Yes.

MR. FRANK: Okay. Why don't I move you up the page to P-13, which is the ball fields on South Cherry Street in Wallingford. Now the actual measurement of fields from existing transmission lines was 5.3, right?

DR. BAILEY: Yes.

MR. FRANK: Okay. And that is a higher number than the peak load New England-wide of 27.7, which is calculated at 1.8, right?

DR. BAILEY: The numbers are -- do differ, that's correct. What we're -- again, in one case the measurement was taken somewhere within the right of way. I don't have a distance there which side of the right of way it's on. And the calculation was made at the edge of the right of way. So again, these could be at very different locations and that difference could account even if they were at the same loading conditions could have accounted for a difference. So location is different and the loading as I responded to Mr. Boucher, the loading on the existing lines at the time those measurements were taken is not known.

MR. FRANK: To be fair, would you agree that in order to properly understand EMF calculations you need to know what the load on the line is or was when these measurements, the actual measurements were taken?

MR. FITZGERALD: Excuse me. I just need to object because again, you mixed calculations and measurements in the same question.

MR. FRANK: I'll try again. In order to understand within the context of your exhibit what the effect is of the measurement that you've taken wouldn't you need to know to have a complete understanding what the load was on the line for that particular day?

DR. BAILEY: You know, the Attorney General asked for measurements at locations and the Companies provided them. What was the interpretation that he wanted to attach to those measurements I don't know. But it was -- this was not something that the Companies itself produced as something that was a means of assessing what the impact of existing lines was or compared to proposed. As was pointed out earlier if you want to compare existing and proposed conditions you have to do it under the same conditions and that would be under the calculation conditions, not with measurements.

CHAIRMAN KATZ: Dr. Bailey, how would you

determine the peak on the peak EMFs on the existing line, how would you estimate that?

MR. FITZGERALD: Excuse me. You mean the peak that has occurred thus far in history?

CHAIRMAN KATZ: Historically, yes. How would you estimate that?

MS. BARTOSEWICZ: On a historical basis?

CHAIRMAN KATZ: Yes.

MS. BARTOSEWICZ: You would have to get from -- maybe you'd better do that.

CHAIRMAN KATZ: We missed you Mr. Scarfone.

MR. SCARFONE: Glad to be here. On a historical basis we would have to go through our convex records.

CHAIRMAN KATZ: Yes.

MR. SCARFONE: The Connecticut Valley Exchange, the satellite at CONVEX and see if we can find what the highest power flow on that line, you know, has been over the past year or so.

CHAIRMAN KATZ: And you could also use those records to do the average power flow? This is where I'm going and then you can help me.

MR. SCARFONE: Yes.

CHAIRMAN KATZ: If this Council determined

that the buffer zone was no net increase we will want no net increase on the average now to be the average with the 345 kV and we'd want the no net increase to be that the peak would not be exceeded from the existing 115 kV to the peak of the 345.

MR. SCARFONE: I see what you're --

MR. FITZGERALD: Can we answer this question after -- can we take this question up again after the break?

CHAIRMAN KATZ: Yes. But I just want to -- I'm asking the witness, do you understand where I'm going?

MR. SCARFONE: -- yes. I think what you're looking for a flow duration curve similar to Exhibit 87 --

CHAIRMAN KATZ: Yes.

MR. SCARFONE: -- for that line. Going in the past we can do that.

CHAIRMAN KATZ: Okay.

MR. SCARFONE: Into the future it's totally dependant on the market system --

CHAIRMAN KATZ: Yes.

MR. SCARFONE: -- loadings, generation dispatch, transfers across New England and New York. There's a lot of -- as Mr. Zak had indicated yesterday --

CHAIRMAN KATZ: Right.

MR. SCARFONE: -- there's a lot of other factors that go into and determine what power flows will be on that specific line at any given moment.

CHAIRMAN KATZ: But if we went with no net increase we'd have to understand what no net increase meant under what circumstances. That's all I'm saying. And I'm just asking if historically there's enough data that you could say that. But Mr. Fitzgerald said, give that some thought.

MR. SCARFONE: Okay.

CHAIRMAN KATZ: Mr. Frank, back to you.

MR. FRANK: Thank you. Let me just try to clarify this. Dr. Bailey, under the -- under your calculations for an average load of 15.5 New England-wide you had a calculated EMF of 1.4 mG, right?

DR. BAILEY: Could you direct me back to which I.D. number we're --

MR. FRANK: Exhibit 2, Jewish Community Center Daycare.

DR. BAILEY: -- DC --

MR. FRANK: DC 47.

DR. BAILEY: -- DC 47, okay.

MR. FRANK: Is that right?

DR. BAILEY: And we have again the numbers?

MR. FRANK: Average load in New England, 15.5 gigawatts shows an average load of 1.4 mG, that's your calculated number?

DR. BAILEY: Yes.

MR. FRANK: Okay. And at a peak load of 27.7 gigawatts New England-wide you show a peak load of 6.5?

DR. BAILEY: Yes.

MR. FRANK: That's calculated?

DR. BAILEY: Yes.

MR. FRANK: Okay. Now when you went into the field for measurement you came up with a measured number of 10.6 mG, right?

DR. BAILEY: At a different -- yes, at a different location.

MR. FRANK: And one of the reasons you suggested for this significantly higher measured reading, a higher measured reading, is that there is a distance of 60 feet separating the two -- the calculation versus the actual measurement, right?

DR. BAILEY: Yes, that's part of it.

MR. FRANK: And isn't it also -- and we also know that to date 24.5 has been the peak load New England-wide on the system, right?

DR. BAILEY: That's been testified to in this hearing.

MR. FRANK: So we know that the 10.6 mG reading that was taken in the field was for a system-wide load of 24.5 or lower, right?

DR. BAILEY: That seems a reasonable assumption.

MR. FRANK: Okay. So another difference between the measured readings and the calculated readings is load, isn't that right?

DR. BAILEY: Yes.

MR. FRANK: Thank you.

CHAIRMAN KATZ: Thank you Mr. Frank. Is there anyone else before we take our lunch break? We're going to dismiss this -- oh, Ms. Bradley, would you like to come up to the table? If you could identify yourself and your organization before you start?

MS. PATRICIA BRADLEY: Trish Bradley, Community for Responsible Energy. I just have a couple of questions because I'm not sure everybody understand what the difference between in the application existing is and actual. In the application, volume six for the Royal Oak neighborhood, you have at the existing EMF level at the edge of the right of way as three mG, is that correct?

You just had it out a couple of minutes ago.

CHAIRMAN KATZ: Just -- why don't you just give him a moment to get to the page.

DR. BAILEY: This does not have the edge of the right of way marked on it. I would have to go back and roughly estimate where that edge of the right of way might be from the lines here and then read off that value.

MS. BRADLEY: There was one -- I'm sorry, I don't have that with me, but there was one chart in there that had it at three mG, the edge of the right of way.

DR. BAILEY: Perhaps are you talking about --

MS. BRADLEY: Okay. Well, we'll skip that for now, okay?

DR. BAILEY: -- okay.

MS. BRADLEY: Later on there was a filing done that we all got in the mail and email that stated there's -- that there were revised numbers that the existing numbers and I was like, well, how can the existing change? And in testimony later we asked how did the existing change?

DR. BAILEY: Okay.

MS. BRADLEY: The numbers went from three mG up to 12 mG. And the reasons that were listed were the

existing, what you call existing, were due to four components, four contributing factors. One being that phase one was accepted. Once phase one goes into place and there were three other contributing factors, four altogether, that once in place, not what's actually today, once in place that's what you are calling existing measurements. Is that correct?

DR. BAILEY: I'll take you -- I found the three mG value. Let me answer this in two parts. We found the three mG value that you referred to and it's on page 26 of volume six of 12 and it is the calculated values at the edge of the right of way of cross section two on the east/south side for the 15 gigawatt case and that is the three mG.

MS. BRADLEY: Right. Then later the number changed.

DR. BAILEY: For the existing -- for the existing facilities and by existing we mean the lines that are presently on that right of way that are built.

MS. BRADLEY: The lines that are there, but not with those contributing factors.

DR. BAILEY: And the loading that was resulted in that three mG calculation was based upon the loading that we had at the time that the application was

filed. You're correct at a subsequent point the company updated the estimates of load flows and some of the values for the cross sections changed and perhaps that -- this was one of those cross sections where the calculated fields from the lines that exist today changed from the application because of better information about what the load flows would be in the future under an assumed mix of generation.

MS. BRADLEY: Right. So I'm correct then in saying when you -- in your exhibit, Exhibit 2 here, existing is not actually what's existing today, it's not actual, it's what will be once the load flow increases? It's the actual lines, it's the same existing lines, but the load will increase on the lines once phase one is put into place and those other three contributing factors?

DR. BAILEY: No. As I understand the Companies' description of their 15 gigawatt case those load flow conditions in fact could occur today. It's not just in the future.

MS. BRADLEY: Have they?

DR. BAILEY: And that's testimony that's been offered earlier in this hearing.

MS. BRADLEY: Well, if we have 10 different measurements in Royal Oak, different months of the year,

different times of the day, different homes and all of the levels have been below one mG would that be indicative of a typical reading in that area? Would you consider that?

CHAIRMAN KATZ: Good question.

DR. BAILEY: It would depend on where those --

MS. BRADLEY: I understand that it will always change.

CHAIRMAN KATZ: But you've got to --

MS. BRADLEY: We have different months, different years, different places.

CHAIRMAN KATZ: -- yeah. You've got to give him a chance to answer.

MS. BRADLEY: Sorry.

DR. BAILEY: I don't know -- I don't know -- I couldn't answer that unless we had some idea of where those measurements were taken. They certainly would not be the values you typically expect to measure in your home for instance. Now out in the middle of a field you could easily get -- if there are no sources around you, you could get fields, you know, way less than a mG, that's correct. But whether those numbers you quoted are fair characterization of the existing fields in your community I think that's something that would, you know, you'd

actually have to go out and take those measurements on a particular --

MS. BRADLEY: Well, if --

DR. BAILEY: -- and it would just tell you what those values were on a particular day. It wouldn't tell you what they were in a season.

MS. BRADLEY: -- I understand that. I understand that. But if we have 10 different homes, 10 different measurements, peak months, July and August at the edge of the right of way and they have all been below one mG, different years even, would you expect to see all of a sudden a 14 mG reading? I mean, would that be typical?

MR. FITZGERALD: I have to object to the question. It's multiple and incoherent.

MS. BRADLEY: Okay. I'm sorry. I'm not used to this. Okay. So does the existing -- existing measurement of 13.9 in Exhibit 2 refer to a calculated number for the 15 gigawatt case once phase one is put into place along with the other contributing factors?

DR. BAILEY: I've already --

MS. BRADLEY: Or is that what you would consider existing today?

DR. BAILEY: -- yes. Yes. Yes.

MS. BRADLEY: So the .8 measurement is more typical of what is there today, is that correct?

DR. BAILEY: No. I would not agree. The .8 measurement as we discussed before is just a measurement that was made at one instance in time, at one location and the -- if we went out today and took a measurement --

MS. BRADLEY: I understand. I understand.

DR. BAILEY: -- we could come up with a different number.

MS. BRADLEY: And then if we have all those other ones that are in the same range it seems to look like that's the general where they're falling, no?

DR. BAILEY: Not from -- I understand from a homeowner's perspective if you go out and take a reading somewhere that that's the number that you fix in your mind as perhaps for you would be the typical number --

MS. BRADLEY: No, I understand it fluctuates with the field.

MR. TAIT: Please, please.

MS. BRADLEY: Sorry.

DR. BAILEY: -- but the number that we would come up, you know, as scientists and engineers to characterize the fields in the vicinity of your house

might be arrived at by a different method.

MS. BRADLEY: Okay. But that 13.9 that you have -- that the calculated once all those other contributing factors are put in place, is that correct?

DR. BAILEY: Yes. We've answered this already.

MS. BRADLEY: Okay.

CHAIRMAN KATZ: Thank you. I believe Mr. Smith? Identify yourself for the record?

MR. RAYMOND SMITH: Yes ma'am. Raymond Smith, Director of Utilities in Wallingford. One of the questions I have in observing the existing magnetic field calculation was that done on standard design or split phase design?

DR. JOHNSONN: Can you clarify the question please?

MR. SMITH: Well, the question is you've calculated existing magnetic fields in all these locations. Were they done based on standard construction or as you learned yesterday, it's split phase out there?

DR. JOHNSONN: They are based on what actually is out there. If what is out there happens to be what we recognize now as a optimized split phase that's how it was calculated. If what's out there is existing is

not optimized, but is like a bundled or split line, that's what was calculated. It's a representation of what's out there. And when we took those -- basically looked at the geometry and put it into the calculations it was as exists.

MR. SMITH: Okay. In all cases then, because there are other segments of lines that are now in split phase construction and some not optimized, and I'm not sure that this is optimized, I want to check. I thought they were running A, B, C, A, B, C because that line runs through Wallingford. But you're saying that all of your calculations are based on actual installations recognized in their split phase or optimized split phase?

DR. JOHNSONN: All the calculations were done for what is physically there in the cross sections. Looking back on that, in this one case like I think along Black Walnut Road I guess it's line -- what, line 1975 I think, in that case looking at it we recognize now from what Mr. Zaklukiewicz said is it's on two structures but it's the same circuit --

MR. SMITH: That's correct.

DR. JOHNSONN: -- and recognizing it now it could be considered a split phase line since the current is splitting between the two sections of the circuit and

then looking at the phasing that happens to be on that line for the calculations we did we see that it's optimized in terms of the phasing.

MR. TAIT: But that doesn't change your calculations at all.

DR. JOHNSONN: No, no.

MR. TAIT: It's existing as existing. So - -

DR. JOHNSONN: I mean, we basically --

MR. SMITH: Okay. I just want to have that verified because that could influence what --

MR. TAIT: -- he's not projecting if it was optimized, no. He's doing what is there.

MR. SMITH: -- right, right.

DR. JOHNSONN: There is no effort to change what was there or what wasn't there. We just took what was there and calculated it.

MR. SMITH: Okay. Thank you.

CHAIRMAN KATZ: Thank you Mr. Smith. Mr. Emerick?

MR. EMERICK: Yes. Dr. Johnsonn, when you sat down to make these calculations and look at the configuration through Royal Oaks you would have known that, hey, we have a case where we have split phasing and

it's been optimized. Would you know that?

DR. JOHNSONN: It's some -- well, in hindsight, yes. When we --

MR. EMERICK: Because in order to make -- oh, excuse me.

DR. JOHNSONN: -- it was on -- in that case it was on two separate structures. The circuit was designated as I think 1975A, 1975B and we had the loadings on it. At that point I didn't fully understand that it was the same circuit and at some point the current was just being split further down the line, that it was bundled and could be considered as a true split phase circuit.

MR. EMERICK: But in order to make your calculation wouldn't you have had to have known that this is conductor A, B, C, C, B, A?

DR. JOHNSONN: Yes.

MR. EMERICK: So you knew that?

DR. JOHNSONN: I recognized that it was optimally -- probably optimally phased.

DR. BAILEY: But he didn't know at that time that the circuits were the same.

DR. JOHNSONN: We had the geology's, we had the currents, we had the phasings.

MR. EMERICK: And knowing that it wasn't the same circuit would not have changed your calculation?

DR. JOHNSONN: No.

MR. EMERICK: Okay. Thank you.

CHAIRMAN KATZ: Okay. I think we are complete with this witness panel and I want to talk about what we're going to do after lunch. Yes Mr. Fitzgerald?

MR. FITZGERALD: Well, I thought that we asked that we be allowed to address -- to fully answer your question about the termination of the historical peaks and so forth?

CHAIRMAN KATZ: I thought you wanted to do that later? Do you want to do that now?

MR. FITZGERALD: Well, I thought I meant later after the break.

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: So I think we'll -- we would intend to keep the panel around at least until that question has been dealt with.

CHAIRMAN KATZ: Okay. Okay. I just want to remind everybody that not all parties and intervenors here are represented by attorneys. And traditionally the Council has given latitude to the non-attorneys in their cross examination and I just ask all of you to do the

same. Okay. After lunch we are going to return to this panel, correct? Briefly. And then the next is DOT is going to put into the record their exhibits and that I think will be brief. And then we will go to the Woodbridge organizations are going to be putting into the record their new exhibits and will be available for cross examination. Then we are going to go into the towns, those towns which elect to do so we are going to put their exhibits into the record and ask that they be available for cross examination.

Also we'd like the Applicant, after all the towns go, we'd like the Applicant to have a witness who will talk about what they heard from the towns, if that's possible. What's doable and not doable? If that's a problem tell me later, think about it.

MR. FITZGERALD: Well, I just have to look around the room and see who's here.

CHAIRMAN KATZ: Right. Discuss it over lunch. Right. Then no matter where we are at 2:00 p.m. we will suspend the cross examination. There's some members of the Legislature who want to come in and address the Council. We are treating this as a limited appearance. We are not asking them questions, we are not having them ask you questions. So I'm asking everyone to

please handle this in that manner.

MR. FITZGERALD: I take it you don't want us to ask them questions?

CHAIRMAN KATZ: Exactly. Did I say it subtly enough? Okay. So we are handling it as a limited appearance. They have asked to come in and address the Council. We are handling it as a limited appearance. Okay? So any procedural matters before we adjourn at 1:00 o'clock? We will be back at 1:00 o'clock.

(Whereupon, a 50 minute lunch break was taken.)

CHAIRMAN KATZ: Resumption of this hearing. Mr. Fitzgerald, the floor is yours.

MR. FITZGERALD: Yes, I just -- thank you Madam Chairman. I just want to report that we did discuss your request during the lunch break and got as far as agreeing that we wouldn't be able to give you any kind of a report or a feasibility assessment now, but we --

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: -- do believe we understand what you're asking for and we will be getting to work on trying to meet the request.

CHAIRMAN KATZ: Okay.

MR. FITZGERALD: But we just don't know

enough about --

CHAIRMAN KATZ: Right.

MR. FITZGERALD: -- the availability of the data yet.

CHAIRMAN KATZ: Is there anything you'd want the opportunity to report on tomorrow morning at the beginning of the session?

MR. FITZGERALD: I don't think so. If we have anything to report we will.

CHAIRMAN KATZ: Okay. Okay. We will hold that option open.

MR. FITZGERALD: Thank you.

CHAIRMAN KATZ: Okay. Mr. Fitzgerald, did you have anything else you need to cover?

MR. FITZGERALD: No Madam Chair.

CHAIRMAN KATZ: Okay. At this point DOT.

MR. FITZGERALD: Don't get too comfortable.

CHAIRMAN KATZ: Yes. We have a witness to be sworn, correct? Witnesses to be sworn? Mr. Walsh?

MR. CHARLES WALSH: Good afternoon Madam Chairperson. Yes. My name is Assistant Attorney General Charles Walsh and with me is Assistant Attorney General Eileen Meskill. We have two witnesses to be sworn in today.

CHAIRMAN KATZ: Thank you. Mr. Marconi?

MR. MARCONI: If they could both state their full name, spell their name for the record and give their position?

MS. BARBARA B. RICOZZI: Barbara B. Ricozzi, R-I-C-O-Z-Z-I. I'm a Transportation Principal Engineer in the Division of Traffic Engineering at Connecticut Department of Transportation.

MR. CARL F. BARD: Carl F. Bard, B-A-R-D. I'm the Engineer Administrator of the Connecticut Department of Transportation.

(Witnesses sworn)

CHAIRMAN KATZ: Thank you. Which one of you will be taking the lead?

MS. EILEEN MESKILL: I'm going to have them verify the exhibits Madam Chairman.

CHAIRMAN KATZ: Thank you.

MS. MESKILL: Mr. Bard, can you take a look at, or do you have in front of you a letter dated July 19th, 2004 to the Siting Council?

CHAIRMAN KATZ: How about -- excuse me for interrupting. How about before we do that we have them verify their résumés, do you want to do that first?

MS. MESKILL: Oh, sure. Okay. Do each of

you have your résumés in front of you?

MS. RICOZZI: Not in front of me.

MR. BARD: I do.

MS. MESKILL: Okay. But you -- okay. And have you -- are those accurate and complete to the best of your knowledge and belief?

MS. RICOZZI: Yes.

MS. MESKILL: Mr. Bard?

MR. BARD: Yes, it is.

MS. MESKILL: Okay.

CHAIRMAN KATZ: You're both P.E.s. You already have points with Mr. Ashton and I. Yes. Any objection to making the résumés full exhibits? Hearing none we'll make them full exhibits and we're calling them DOT 10 and 11.

(Whereupon, DOT Exhibits 10 and 11 were received into evidence as full exhibits.)

CHAIRMAN KATZ: Okay. At this point why don't we do your other exhibits?

MS. MESKILL: Yes. The letter -- Mr. Bard, the letter dated July 19th, 2004, was that prepared under your direction?

MR. BARD: Yes, it was.

MS. MESKILL: And is that accurate and

complete to the best of your knowledge?

MR. BARD: Yes, it is.

MS. MESKILL: I'd like that admitted?

CHAIRMAN KATZ: Is there any objection to making DOT 9, Comments on the Route, a full exhibit? Hearing none, we'll make that a full exhibit.

(Whereupon, DOT Exhibit No. 9 was received into evidence as a full exhibit.)

MS. MESKILL: Alright. And Ms. Ricozzi, the map that was submitted on the CD to the Siting Council was that prepared under your direction?

MS. RICOZZI: Yes, it was.

MS. MESKILL: Okay. Is that the map that's been laid out here as well?

MS. RICOZZI: Yes, it is.

MS. MESKILL: Is that true and accurate to the best of your knowledge and belief?

MS. RICOZZI: Yes.

MS. MESKILL: That's 9A I believe.

CHAIRMAN KATZ: 9A? Any objection to making 9A a full exhibit? Hearing none, we'll do that.

(Whereupon, DOT Exhibit No. 9A was received into evidence as a full exhibit.)

CHAIRMAN KATZ: And you'll make copies of

the CD available to the service list? Is that the intent?

MS. MESKILL: I was going to say that I know that DOT submitted this on their own and I'm -- I think we actually -- the witnesses today -- we're not clear, but if anybody wants it please we'll be happy to submit it.

CHAIRMAN KATZ: Okay. The offer is out there for anyone who wants a copy.

MR. WALSH: Madam Chairman, I believe it's also available on the Siting Council's web site already.

CHAIRMAN KATZ: Oh, okay.

MS. MESKILL: It is on the web site.

CHAIRMAN KATZ: How long does it take to download? Okay. If you don't want to spend a while downloading it you may request a CD from DOT. Okay. Are we ready for cross examination of the witnesses?

MS. MESKILL: Yes.

CHAIRMAN KATZ: Okay. First I'm going to do this, I'm going to ask you to briefly for the education of everyone out in the room, if you could just briefly summarize your testimony on Exhibit No. 9? Where DOT wants to see this and where they don't want to see it.

MR. WALSH: I'll handle that question. What we're trying to is find an alternate route that

Corrected page

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MR. BARD: I'll handle that question. What we're trying to is find an alternate route that removes

removes the installation as much as possible from the State Highway System. The primary reason is that the installation and maintenance of the system, should it be within the right of way, produces a whole series of problems relative to maintenance of our facility, interference with traffic, overall safety and obviously the effect on operations.

CHAIRMAN KATZ: Thank you. So you would like -- if it's done underground you would like it on local roads, correct?

MR. WALSH: Yes.

CHAIRMAN KATZ: Okay. And I believe you've also testified that Route 15 is definitely not a desirable route as far as DOT is concerned?

MR. WALSH: That's true.

CHAIRMAN KATZ: Yeah. To my disappointment. Okay. I think we -- thank you for your summary. Mr. Fitzgerald, did you have any questions of these witnesses?

MR. FITZGERALD: No Madam Chairman.

CHAIRMAN KATZ: Okay. What I'm not -- I'm not going to read the whole list. I'm going to ask if there's any other party or intervenor who has questions of these witnesses? Okay. Mr. Cunliffe, any questions?

MR. CUNLIFFE: Yes. Has this been presented to the Applicant prior to it being provided to the Council?

MR. BARD: The CD I believe was sent to the Applicants. I believe it was referenced in the letter to the Chairperson, if I'm not mistaken.

MR. CUNLIFFE: And has DOT had any discussions with the Applicant regarding placement of facilities other than in State roads?

MR. BARD: Over a period of time, yes. Many times.

MR. CUNLIFFE: And the map that you provided to the Council this has only been provided to the Applicant as of recent?

MR. BARD: As of -- it was worked up subsequent to their submission of it to us and then we forwarded it back out on the 19th of July.

MR. CUNLIFFE: I'm confused. The Applicant provided you a route?

MR. BARD: They have a route --

MR. CUNLIFFE: Right.

MR. BARD: -- on that map which is their preferred route.

MR. CUNLIFFE: Okay.

MR. BARD: We reviewed it and said we would much prefer our route.

MR. CUNLIFFE: Okay. And when did you do that?

MR. BARD: That was what we sent out on the 19th of July.

MR. CUNLIFFE: Okay. Thank you. Those are my questions.

CHAIRMAN KATZ: So can you give us an example of State routes that you have asked the Applicant to avoid on their preferred --

MR. BARD: Well, there's a whole -- primarily Route 1.

CHAIRMAN KATZ: -- okay.

MR. BARD: That is our main concern. But we -- what we did is we went through and I would say Ms. Ricozzi's people specifically, looking at the traffic volumes on all the different State routes, obviously trying to avoid the most heavily traveled ones and come up with an alternative route where we can either utilize a less traveled State route and/or a system of local roads to get to the same destination.

CHAIRMAN KATZ: Did you get feedback from the Applicant about not using Route 1?

MR. BARD: Yes. Yes, we have. Quite a bit.

CHAIRMAN KATZ: Have these -- there been any mutual agreement on an alternative to Route 1?

MR. BARD: I don't believe so, no.

CHAIRMAN KATZ: Okay. And we're talking mainly segments three and four, correct?

MR. BARD: Correct. Especially four.

CHAIRMAN KATZ: Four, which is Norwalk --

MR. BARD: Bridgeport to Norwalk.

CHAIRMAN KATZ: -- yes.

MR. BARD: But there is -- there are sections even in the Milford to Bridgeport area also.

CHAIRMAN KATZ: Okay. Are these discussions continuing with the Applicant on an alternative to Route 1 from Bridgeport to Norwalk?

MR. BARD: Yes, we meet on a semi-regular basis.

CHAIRMAN KATZ: Okay.

MR. BRIAN O'NEILL: Have you met -- have you met with the towns regarding these alternative routes?

MR. BARD: I haven't.

MR. O'NEILL: No one from your Agency has?

MS. RICOZZI: Not to my knowledge.

CHAIRMAN KATZ: Okay.

MR. O'NEILL: Have any of the towns seen your comments, did you file them with the service list?

MR. BARD: I would defer to -- well, it says service list on the memo.

MR. WALSH: If I may Commissioner, the letter that was sent out to the Council on July 19th from the DOT was sent to everybody on the service list. The DOT I believe asked for bulk filing status for the filing of the map as well as the CD-ROMs. However, copies of the CD-ROMs were sent to the Applicants and according to this letter were sent to municipalities of Bridgeport, Fairfield, Norwalk and Westport where the DOT route alters from the preferred route of the Applicants.

MR. TAIT: And have you heard from the towns in response to this?

MR. WALSH: I have not.

CHAIRMAN KATZ: Okay. I think if the route is going to change we need to know while we are still in the public hearing process. September 8th and 9th would be an opportunity I think for -- to have a report back from the Applicants on the status of these discussions between DOT and the Applicants, is that doable?

MS. RANDELL: Madam Chairman, I do think

that's doable. However, we do need to clarify the record since I've been informed that as far as the Applicants are concerned the route changes have never been discussed between DOT and the Applicants and that the first time we heard about these proposed changes was when we received the July 19th filing.

CHAIRMAN KATZ: Okay. I am going to highly encourage these discussions to be active and frequent if we are -- I don't want to -- Mr. Fitzgerald, I don't want to have to have a certificate and then find out later that it's not buildable.

MR. FITZGERALD: I couldn't agree more.

CHAIRMAN KATZ: Okay. So we're going to encourage that these discussions happen.

MR. TAIT: It's not just discussions between the Applicant and DOT, it's with the towns and DOT --

CHAIRMAN KATZ: Right.

MR. TAIT: -- and I would say that --

MR. FITZGERALD: That's why I was making the --

MS. RANDELL: We agree with that.

CHAIRMAN KATZ: Okay.

MR. TAIT: -- for those towns that are

impacted by this, building on their roads, I hope they're talking to DOT --

CHAIRMAN KATZ: Right.

MR. TAIT: -- and don't do it for the first time on September 8th.

CHAIRMAN KATZ: Right. Because apparently you've indicated some local roads and so we need agreement between DOT and the Applicants and the towns if the --

MR. TAIT: What's the preferred route if it's going to go underground.

MR. BARD: Well, if I might just say something? The charge to us when we developed this was that you were looking for comments on the various routes --

CHAIRMAN KATZ: Yes.

MR. BARD: -- so we went through this particular exercise and then simply said from our perspective it would be much better to have it on a system like this as opposed to --

CHAIRMAN KATZ: We appreciate that.

MR. BARD: -- going through Route 1.

MR. TAIT: I think that's a good approach. The next question is now we've got to fine tune this to see that all the players are onboard.

CHAIRMAN KATZ: Right. Yes. We are not criticizing input.

MR. TAIT: No.

CHAIRMAN KATZ: We just want to make sure that from -- now that we're all on the same page on this that we move forward towards --

MR. TAIT: Cooperatively.

CHAIRMAN KATZ: -- cooperatively, thank you.

MR. TAIT: And not have to try to find three horses. We don't want three horses, we want one horse.

CHAIRMAN KATZ: Right.

MR. ASHTON: I think this is more a process of validation in that the proposals of CONNDOT may be find, but there may be aspects of it unbeknownst to them that make the route totally impossible.

MR. TAIT: Or modifications that the town want that are doable.

MR. ASHTON: Right. So that I would join in this very strongly to urge that this tripartite issue that needs to be resolved.

CHAIRMAN KATZ: Now as you're aware there's a working group, the rock group, and perhaps DOT needs to

be in listening in on these conference calls so you know what's going on, especially on the segments. Correct?

MR. WALSH: We have been participating in listening in on all the conference calls.

CHAIRMAN KATZ: Excellent. Good.

MR. ASHTON: I have one question that I would hope that insofar as DOT has significant construction plans for any segments of Route 1 that they get those plans aired in this matter so that that can help the judgement. It's one thing just to say, you know, we don't want to go on this section of Route 1, but I think it would be helpful to say also that we're planning to go from two lanes to four lanes and change the grades, rebuild the bridges and all the rest of it. That adds to the materiality to the comment.

MR. BARD: We can provide that.

MR. ASHTON: Yeah. And I think -- I know CONNDOT does a good job of long range planning and I think that would help. And also insofar as CONNDOT is aware of that any other plans that where they're involved with a municipality that would have some bearing on alternate routes too. Clearly it's in the best interest of Connecticut society to optimize the location of this to minimize the cost for everybody. I think insofar as --

that's one more reason why I'd urge lengthy detailed discussions on how this thing would work.

MR. BARD: If you would like I would include in the program discussion also any STC certification processes that we have ongoing or certainly that we're aware of along Route 1 because they would have an impact on it also.

MR. O'NEILL: Could you please define STC?

MR. BARD: State Traffic Commission.

MR. O'NEILL: Sure.

MR. BARD: Anytime a developer comes along and you need to utilize the State Highway System they have to go through a certification process for their work.

MR. ASHTON: Absolutely. You know, it's -- where society is using -- struggling with trying to get a route for power facilities while you're struggling to maintain road communications we've got to make sure that what we do is compatible in the long haul.

CHAIRMAN KATZ: Mr. O'Neill, did you have a question?

MR. O'NEILL: Would you please give us some idea of the number of miles you're talking about modifying relative to the project?

MR. WALSH: We ended up adding about three

corrected page

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MR. BARD: We ended up adding about three

miles to the system, but the modification I'll let Barbara speak to.

VOICE: That's incremental mileage over the route.

VOICE: What is the variation from the proposed plan?

MS. RICOZZI: Well, the original proposal from the utility company is 22 and a half miles and our proposed route is 25.6. Those are approximate mileages.

MR. O'NEILL: With how many miles going off of this proposed route?

MS. RICOZZI: I can't answer that question without -- I don't have those figures in front of me.

MR. O'NEILL: How many miles of State highway do you have left on your proposal and how many miles of town roads?

MS. RICOZZI: I can't give you answers in mileage. There are some areas where we are --

MR. O'NEILL: Could you do that -- could you do that for us?

MR. BARD: We can quantify that.

MS. RICOZZI: -- yes.

MR. O'NEILL: Quantify what the current State highway mileage is as proposed and town mileage and

your proposal in town mileage and State mileage.

MR. ASHTON: After it gets aired.

CHAIRMAN KATZ: Is it clear to all the parties here what the expectations of the Council is on this?

MR. FITZGERALD: Well, no.

CHAIRMAN KATZ: Okay. Ask.

MR. FITZGERALD: And I can -- I certainly can understand that you would like an evaluation from the Applicants, a comparative evaluation of this proposed route to the route that the Applicants propose that would address whether the comparative costs and environmental impact differences, if any, and is this a constructable route, is it as constructable as the other.

CHAIRMAN KATZ: Yes.

MR. FITZGERALD: And we would expect to do that. However, if there is an expectation that the Applicants and the DOT and the towns will enter into discussions that will -- the end result of which will be a route on which everybody agrees is the optimal underground route I would have to say that experience has taught us that that is really an unrealistic expectation, because going back to phase two, to the Bethel to Norwalk line and coming forward the towns have been consistent and the DOT

has been consistent. Well, DOT didn't -- the process didn't start until after the certificate was issued in the Bethel to Norwalk, but the DOT says go to town roads, the towns say go to DOT roads.

We started out in this proceeding with a underground route that was largely on town roads. The outcome of the municipal consultation process was we're in State roads.

MR. TAIT: I have a question then, maybe others have too, is what is our authority as the Siting Council to site on roads if the people who have the roads don't want it sited there? I thought we had a memo to that in phase one?

MR. FITZGERALD: Oh, I remember doing the memo. Maybe it was in the other --

MR. TAIT: And that was on State highway and Super 7 and could they go around Arrowhead or something. And the question I think we need it here now is do we site the roads after hearing from everybody and that's it, or do we say what we think you can do and anybody else can say, no you can't, and therefore the certification is worthless?

MS. RANDELL: Professor Tait, my understanding is that this is already on our briefing

list. If there is a conflict between the Council and the DOT who wins?

MR. TAIT: And the towns.

CHAIRMAN KATZ: Okay. We'd like the discussions --

MS. RANDELL: And the towns.

MR. TAIT: I think the sooner we have that so people will start thinking about the end result.

CHAIRMAN KATZ: -- okay. We'd like the Trilateral Commission here to meet. Okay. We'd like to have them indicate to us in September the areas of agreement, the areas of disagreement, and then at the end I guess the Siting Council is going to have to trump and indicate --

MS. RANDELL: Madam Chairman?

CHAIRMAN KATZ: -- right.

MR. FITZGERALD: We've made -- right now we already have -- one can tease out what the areas of agreement and disagreement are by looking at what the filings that have been submitted are.

CHAIRMAN KATZ: Right.

MR. FITZGERALD: And then -- and then I suppose the next step would simply be, okay, now everybody has seen the others. Has anybody's mind changed?

CHAIRMAN KATZ: Right.

MR. FITZGERALD: Please let the Applicants know.

VOICES: No.

CHAIRMAN KATZ: No.

MR. TAIT: Come talk to us and see if we can't broker this as to where it should go. We know where the disagreements are. We don't want people sitting back and saying, no State roads, no town roads. That's not going to help.

MR. FITZGERALD: Who's the broker?

MR. TAIT: I don't know.

CHAIRMAN KATZ: No, we want --

MR. TAIT: We want a process. We can't be that process.

CHAIRMAN KATZ: -- we want to see if there's middle ground at all here. We just don't want everybody hunkering down on their choices.

MR. TAIT: Everybody needs to be realistic if this thing is going to go through it's got to go somewhere.

MR. FITZGERALD: I know. But --

CHAIRMAN KATZ: The Applicant wants this built in a timely manner.

MR. FITZGERALD: -- this is the process inquiry. How do you suggest that the Applicant finds this middle of the road position from the towns --

MR. ASHTON: Can I suggest a couple of things? I think that it would pay to have a three-way conversation and I think insofar as there is agreement that can be documented on a section of line. Insofar as there is a disagreement I think it's going to then eventually come back to the Council and I think it would be helpful to me as a Council member to know what the respective position of the parties, the three involved are, so we can make an intelligent assessment here. It's -- we're dividing the baby. We're never going to be anybody's friends, we understand that. But we are trying to make an intelligent assessment and insofar as we have the facts, the positions before us, I'm prepared to make some tough decisions.

MR. TAIT: But I don't want to entrench positions saying no towns roads, no State highways. That's not what we want.

MR. ASHTON: Yeah. That's not going to help and it's not going to fly.

MS. RANDELL: We do hear you. I've just spoke to --

MR. TAIT: Try a process -- try a process hearing, a tripartite meeting and come back to us with what you think is a doable way to get this information together.

MS. RANDELL: -- Professor Tait, we are prepared to do that. Ms. Bartosewicz has confirmed that we will in fact invite everyone to a meeting, the towns, the DOT, we'll host it or we'll do there, however. And we will endeavor to get this process going sooner rather than later.

MR. TAIT: And report to us with what your suggestion is.

MS. RANDELL: And report back. I would just note one thing if --

CHAIRMAN KATZ: This is for segments three and four, right?

MS. RANDELL: -- for segments three and four. And it looks to me as if some additional miles of undergrounding would be added to segments three and four if the DOT route were accepted and I just wanted to make sure everyone understood that because of the other discussions that are ongoing about making the existing level of underground.

CHAIRMAN KATZ: Yes, understood.

MS. RANDELL: We'll try to set that up and then respond.

CHAIRMAN KATZ: Okay.

MR. ASHTON: I would just urge all involved to carefully think their positions. A categorical flat never -- only in town roads, or only in State highway ain't gonna hack it.

CHAIRMAN KATZ: Right.

MR. TAIT: Just as we would urge towns to assess their railroad right of ways and their highway right of ways, be realistic.

CHAIRMAN KATZ: And we expect a report on September 8th. Mr. Emerick, did you have a question?

MR. EMERICK: I had a question earlier on in the discussion that may have been --

CHAIRMAN KATZ: It's now moot?

MR. EMERICK: -- perhaps set aside given the future discussions. But it was really getting at the facts that were used in selecting the alternative that's presented before us. What kind of information did you look at with respect to selecting that route?

MS. RICOZZI: We assembled the street maps for the area in question and we looked to find -- we knew where the substations were. We looked to find a route

that was minimizing the turns required and to get from Point A to Point B. In the first area a lot of the routing that we selected was the same as the Applicants because it was on a town road. And then towards the middle of section four we did deviate from that, but we attempted to find long straight runs and minimize the number of turns.

MR. TAIT: Do you have any of Route 1?

MS. RICOZZI: Yes.

MR. TAIT: So there is some of Route 1 in your preferred route?

MS. RICOZZI: Yes.

CHAIRMAN KATZ: Okay.

MR. BARD: And there's other State highways also involved in that.

CHAIRMAN KATZ: Okay.

MR. EMERICK: In selecting that did you have any more specific information about the road you selected, it's width?

MS. RICOZZI: No, we did not. We have volume information periodically on the town roads that we selected and we did a very cursory visual inspection of the roadways.

MR. EMERICK: So you drove it?

MS. RICOZZI: We drove it.

CHAIRMAN KATZ: Okay. At the process meeting on August 19th, I'd like to touch base on this subject and then we'll expect something for the September 8th hearing, okay?

MS. MESKILL: Madam Chair, may I clarify something for the record? Have Ms. Ricozzi just -- there are numbers listed on that map, is that correct?

MR. RICOZZI: Yes.

MS. MESKILL: Can you just explain what those numbers are so everybody -- whoever looks at that will understand what those numbers mean?

MS. RICOZZI: There are numbers called ADTs, they're Average Daily Traffic.

CHAIRMAN KATZ: Thank you. We would not have guessed that.

MS. RICOZZI: Each town is counted in a specific year. So the years throughout the map are not all the same, but they are consistent by town so you can compare 2000 traffic counts on the State roads in Milford with 2000 traffic counts on the town roads in Milford.

CHAIRMAN KATZ: Okay. Okay.

MR. ASHTON: And do they include any disasters such as the bridge at Route 25, which would

twist the local counts?

MR. RICOZZI: No.

CHAIRMAN KATZ: Okay. Is there any other questions for this witness panel? Well, I'm glad we touched base on this because it's another wrinkle that we will address.

VOICE: We've got more wrinkles than a 150 year old woman.

CHAIRMAN KATZ: Any other things? Okay. The witnesses are excused. Thank you very much. Okay. If we could have up to the table Mr. Rosenthal and your witness, Dr. Bell?

(Off the record)

MR. WALSH: (Begins before tape.) CD right now and we have a few copies available in hard copy. And we could have hard copies made I believe if necessary if anybody requests it.

CHAIRMAN KATZ: At this size?

MR. WALSH: At that size.

CHAIRMAN KATZ: Oh, okay. So you don't have a series of like 11x17?

MR. WALSH: I would have to check to see whether or not that would be doable.

VOICE: Eight and a half by 11.

MR. WALSH: I will check with my client to see if they can provide that.

CHAIRMAN KATZ: We appreciate that.

MR. WALSH: Thank you.

CHAIRMAN KATZ: Okay. Mr. Rosenthal you have -- oh, two witness and they've both been sworn, correct?

MR. ROSENTHAL: I think they've both been previously sworn, yes Madam Chair.

CHAIRMAN KATZ: Okay. And if you could identify their new exhibit?

MR. ROSENTHAL: Yes. Doctors Bell and Rabinowitz are here on supplemental -- July 19th supplemental testimony concerning background levels and statutorily required buffer zones and an appendix thereto.

CHAIRMAN KATZ: And if you could have them verify this exhibit?

MR. ROSENTHAL: Yes. Doctors Bell and Rabinowitz, did you prepare the July 19th supplemental testimony in question?

DR. LEONARD BELL: Yes, we did.

DR. PETER RABINOWITZ: Yes, we did.

MR. ROSENTHAL: And do you confirm the truth and accuracy to the best of your knowledge and

belief of the testimony that's contained therein?

DR. BELL: Yes.

DR. RABINOWITZ: Yes.

MR. ROSENTHAL: And are you asking this to be submitted to the Siting Council for their consideration?

DR. BELL: Yes.

DR. RABINOWITZ: Yes.

MR. ROSENTHAL: I would ask that they be entered as full exhibit?

CHAIRMAN KATZ: Any objection to making them full exhibits? Hearing none they're full exhibits.

(Whereupon, supplemental testimony of Doctors Bell and Rabinowitz were received into evidence as full exhibits.)

CHAIRMAN KATZ: We'll start with cross. Mr. Fitzgerald, you get to go first.

MR. FITZGERALD: Thank you Madam Chairman. Good afternoon gentlemen.

DR. BELL: Good afternoon.

DR. RABINOWITZ: Good afternoon.

MR. FITZGERALD: In the testimony that has just been submitted you suggest to the Council that the appropriate target for EMF levels at the boundary of any

buffer zone recognized by the Council should be a level that is no greater than the background or ambient levels which you have determined to be .06 mG, correct?

DR. BELL: Actually it's 0.6.

MR. FITZGERALD: Zero, I'm sorry. I misread that. 0.6.

DR. BELL: Correct.

MR. FITZGERALD: 0.6, yes. Six tenths. And you base this on your evaluation of the epidemiological literature that you have previously testified about?

DR. BELL: Actually, in particular the two additional cited references that Mr. Rosenthal noted as well that were contained as exhibits.

MR. FITZGERALD: Now in the Album (phonetic) and others that analysis has previously been received into evidence and your -- as an exhibit to your initial testimony, Album and his co-authors state and summarize their results as being in summary the 99.2 percent of children residing in homes with exposure levels of greater than four microtesta (phonetic), .4 microtesta or 4 mG, and estimates compatible with no increased risk while the .8 percent of children with exposures above .4 microtesta or 4 mG have a relative risk estimate of

approximately two. That was how Album and his co-authors characterized the results of their meta-analysis, right?

DR. BELL: I'm sorry Mr. Fitzgerald, I apologize. Were you just reading exactly out of the abstract?

MR. FITZGERALD: Yes, I was.

DR. BELL: Then I agree. I'm sorry. Thank you.

MR. FITZGERALD: And then if we move on the Greenland anal. study. Again, just -- this is the meta-analysis that you testified about previously. And again, just looking at the abstract for a summary at the end of it do you find the statement -- the results also suggest that appreciable magnetic field effects if any may be concentrated among relatively high and uncommon exposures and that studies of highly exposed populations would be needed to clarify the relation of magnetic fields to childhood leukemia, correct?

DR. BELL: That's stated above 3 mG, yes.

MR. FITZGERALD: Now in your testimony you've referred in particular to the meta-analysis of Wortenberg (phonetic), which is number 19 in the volume one of the appendix to your initial testimony. And you say that Wortenberg has demonstrated that there is a

continuous and linear relationship as opposed to a threshold relationship between EMF levels and the risk of childhood leukemia. And did you mean to imply there that Wortenberg has found, or suggested that there is such a continuous and linear relationship from background or ambient levels as low as .6 mG?

DR. BELL: Mr. Fitzgerald, we meant to state that he found a significant non-threshold dependent relationship between EMF and childhood leukemia in his meta-analysis.

MR. FITZGERALD: And would you show us where he says that in his article?

DR. BELL: He states on page S-99 with the title is -- it's under summary, it states population attributable risk (PAR) and he states that the exposure response follows a log linear relationship which does not -- well, that's actually where it is. That's the answer to your question. Sorry.

MR. FITZGERALD: He says, finally I conduct a quantitative risk assessment by calculating the population attributable risk. This is a prediction of the impact of residential magnetic field exposure predicated on the assumptions that, A, the exposure causes leukemia in children, B, the studies are accurate and

representative, C, the exposure response follows a log linear relationship. That's the section to which you're referring?

DR. BELL: Yes, that is the initial section.

MR. FITZGERALD: Yes. Now what he's saying there is that he's making a calculation based on that assumption, right?

DR. BELL: That is correct.

MR. FITZGERALD: Is that different than saying that Wortenberg has demonstrated that there is a continuous and linear relationship?

DR. BELL: Actually where he shows the continuous relationship is in table 11 where he has -- I'll wait till you refer to it.

MR. FITZGERALD: Yes, I see it. Table 11 is calculated summary of NIEHS meta-analyses --

DR. BELL: Wortenberg 1998.

MR. FITZGERALD: -- right?

DR. BELL: And he actually has measured calculated fields and he looks at continuous relationship and for calculated fields he has an odds ratio of 1.2 showing a 20 percent increase in risk based upon only a continuous relationship as opposed to the dichotomous at 2

mG, which is 1.4, who we'd all accept in an increased relationship.

MR. FITZGERALD: So your statement then is based on your interpretation of the data displayed in the table in which Wortenberg summarizes meta-analyses, is that right?

DR. BELL: Actually Mr. Fitzgerald, Dr. Wortenberg is summarizing Dr. Wortenberg.

MR. FITZGERALD: Well, where does -- does Dr. Wortenberg say anywhere in the text that he has concluded that there -- that a continuous and linear relationship has been demonstrated by the data?

DR. BELL: No. The data on table two shows that.

MR. FITZGERALD: It shows it to you. Okay. By the way, isn't it the case that the other two meta-analyses, Album at all and Greenland at all, are superior to the Wortenberg meta-analyses for the reason that in the other two the authors actually had access to the original data used in the underlying field studies whereas Wortenberg did not?

DR. BELL: Mr. Fitzgerald, that would be similar to saying I prefer apples over oranges. The hypothesis tested in each of the meta-analyses are

different from each other. They had different questions that they asked and answered. One hypothesis asked by Wortenberg prospectively was whether a risk of 2 mGs or greater provided an increased likelihood of childhood leukemia he answered that hypothesis in the affirmative that it represented significant risk. He also asked whether there was a linear relationship. Album and Greenland did not ask at 2 mGs or greater, they also did not -- they looked at three and at four and neither of them assessed whether there was a linear relationship.

MR. FITZGERALD: Well, before I ask you to answer the question I'm going to have to -- I guess we'll have to go back to the Wortenberg study and you can show me where Wortenberg states his priority question as to -- that he's investigating, which is whether or not there is a linear relationship demonstrated?

DR. BELL: So you would like me to find a sentence in the manuscript that lays out his prospective hypothesis?

MR. FITZGERALD: I would like you to find a sentence in the manuscript that says that he is setting out to investigate whether there is a continuous linear relationship.

DR. BELL: That will take me some time to

read that for you, but I'd be glad to. Dr. Rabinowitz points out on page S-87 Mr. Fitzgerald, near the bottom the left-hand side of the page right above the bold print that says, a review of the meta-analyses of residential EMF exposure in childhood leukemia -- I'll read you the paragraph. It says, "Another large issue in mega-analyses is the need to apply regression models to assess trend and exposure response. In preference simple dichotomous models and also to adjust" -- I added also, "and adjust for confounding and effect modification." He continues and concludes, "Limiting analysis to dichotomous exposures can obscure some patterns in the data and limit interpretation." So that is the section of his methods where I believe he lays out what he's going to do and indeed does. I can continue to search for more references of that if you'd like.

MR. FITZGERALD: Now -- alright. We'll take -- as far as you're concerned that's the same thing as saying I'm in this study going to determine whether there is a continuous and linear explosion?

CHAIRMAN KATZ: Mr. Fitzgerald, could you just point your mic. a little closer to you?

MR. FITZGERALD: Okay.

CHAIRMAN KATZ: Thank you.

MR. FITZGERALD: Going back to my question --

DR. BELL: Yes sir.

MR. FITZGERALD: -- is it the case that the Album and Greenland meta-analyses are superior to Wortenberg's in that the other two sets of authors had access to the data underlying the field studies that they evaluated whereas Wortenberg did not?

DR. BELL: Mr. Fitzgerald, I can then again repeat my answer. One could assert that Wortenberg may be superior because the answers are more clinically relevant situation because he looks at a continuous exposure. One could also assert, as you have, that having further access to the data is a further advantage. I think either are probably reasonable assertions.

MR. FITZGERALD: Have you ever made the assertion that you are now attributing to me?

DR. BELL: Which assertion? I'm sorry.

CHAIRMAN KATZ: Just let's --

MR. FITZGERALD: Well, can I ask you -- can I ask you Doctor, you probably don't have the transcript with you --

DR. BELL: I know Dr. Gerber was very fond of Sandra Greenland, that I'm familiar. No, I mean, so

it's very possible.

MR. FITZGERALD: -- just give me a minute here.

DR. BELL: I think -- I think what would be helpful is to define superiority and then probably you'd get an objective response. I'd be glad to answer that.

MR. FITZGERALD: Okay. You know what? I wasn't attributing to you something that --

DR. BELL: I'm sorry?

MR. FITZGERALD: -- I need to apologize because I actually had in mind something that Dr. Ginsberg had said.

DR. BELL: Either way though I think it's a reasonable conversation. I mean, even if I didn't say it.

MR. FITZGERALD: Okay. Now you testified that an appropriate target for EMF levels was this .6 mG value. What do you mean by a target?

DR. BELL: Well, I think it's in the context of the recently passed Public Act which led to establish safety buffer zones around new 345 kV lines.

MR. FITZGERALD: But are you suggesting that that value should be a goal or that it should be a mandatory requirement? That's what I meant by target.

DR. BELL: I'm sorry. I apologize. No, I

think it's -- I think it's a difficult thing to focus on. I think there are many reasonable targets. Many of which have been discussed today here by the Siting Council and by you're your clients as well. And I think it depends on how much risk one wants to take. So if one wants to take risk with the children of Connecticut where this is a 43 percent significant increase in leukemia, or an 80 percent increase risk in leukemia, or 100 percent increase risk in leukemia there are plenty of targets out there, it would be 2, 3 or 4 mG. If on the other hand one wants to lay out a situation in the State of Connecticut where the risk to children in the State of Connecticut near power lines would be no greater than that risk to the majority of children in the United States, then it would be .6 mG.

MR. FITZGERALD: Now you don't mean no greater than the risk to children in the majority of the United States from power lines, do you?

DR. BELL: I apologize. Actually the majority of the children in the United States from exposure to EMF.

MR. FITZGERALD: Alright. Let's talk about that a little later. But could you help me with what you mean by a target? Are you saying that this should be an aspirational goal that should be balanced with other

considerations or that this is something that the Council should adopt as a fixed standard requirement?

DR. BELL: I think what we tried to provide to the Council was an algorithm so there's several different paths one could take and that there isn't likely to be, as we've heard many times now, a one size fits all to every situation siting this power line. So in my view if the policy objective is to provide to increased risk to children in Connecticut compared to the majority of children in the United States EMF then it should be the objective. If the risk is actually to come as close to providing no increased risk compared to the majority then I think then as you're saying Mr. Fitzgerald, it could be a target.

MR. FITZGERALD: Would -- in considering how to and whether to attain such a target are other factors such as the height of an overhead structure that would be required to do that or the amount of and extent of property that would have to be acquired in order to do that, are those factors that the Council could rationally take into consideration?

DR. BELL: From a health safety point of view speaking to only the direction of the Legislation focusing on the buffer zone, so from a health safety point

of view as I mentioned points greater than .6 mG would expose children in Connecticut to greater than EMF exposure to the majority of children. But I do recognize as you're suggesting there certainly are a variety of other factors. In fact, you know, one could easily take Wortenberg, which I think as you would agree as well, would be the extreme position in which we wouldn't advocate in the least, that once you reduce the EMF risk to zero and the answer is that's not accomplishable, nor should it in my view be an objective.

So I think that .6 mG seems like something that's accomplishable with several different scenarios as well as provides the minimal risk to children in Connecticut.

MR. FITZGERALD: While it's accomplishable with scenarios such as acquiring very large rights of way and excluding any use of those rights of way by others, at least by children, right?

DR. BELL: That would certainly be, you know, one potential scenario. I think that similarly from a corporate point of view taking off a position hat, you know, we're looking to make as taxpayers a half billion to a billion dollar investment. So there are multiple ways obviously of getting there that would provide for safe and

-- health and safety of children.

MR. FITZGERALD: I don't -- I'm not following you.

DR. BELL: Well, the Applicant I think has very diligently proposed a series of different technologies that they would look to apply presumably to meet the needs of lowering electromagnetic fields within certain areas. Certainly they have done that understanding that as described would have some greater expensive, whatever that expense would be, and the Applicant presumably is also looking to make that investment decision based upon the empirical data they have today that it's worth it. So there are lots of considerations that go forward into how one would actually meet the .6 mG. And I think from a health and safety point of view I would suggest that if it couldn't be met the -- by undergrounding or by have a 300 foot buffer or just by itself with some additional technology that the siting of the line ought to be altered to protect the children as required by the buffer.

MR. FITZGERALD: Well --

CHAIRMAN KATZ: Just a moment Mr. Fitzgerald before you continue. Mr. O'Neill has a question on this line of thought.

MR. O'NEILL: Yes. Dr. Bell, do you know anywhere in the United States, other states which have standards other than Connecticut's regarding the buffer zone and EMF exposure?

DR. BELL: There are states actually we filed testimony I guess it was in May that spoke to -- I'm not sure if I actually have it handy or not, but spoke to that of other states. Certainly other states give guidance on what would bring down a power line to less than 1 mG. So for example, not stating that that's the requirement, but they give advisement on what that would be. The state of New Jersey states that to be 400 feet.

As Mr. Fitzgerald and I discussed in June, I think it was, the Tennessee Valley Authority provides suggesting for a 300 foot buffer for homes and a 1,200 foot buffer for schools. And certainly as we know that the state of Michigan requires 2 mG or less for public financing -- excuse me, financing for public housing.

MR. ASHTON: Isn't that more in the area of prudent avoidance though?

DR. BELL: I guess Mr. Ashton all this since it hasn't been built would account as prudent avoidance. We're all talking about new facilities. I think we haven't opened this Docket to discussion of

existing facilities and certainly, yes, all this would be a look to focus in the state of Connecticut the statute that we have now provides more guidance in terms of the objective being to obtain a safety buffer for susceptible populations. I don't believe that's actually obtained explicitly in any other state in the United States.

MR. O'NEILL: Have you studied the Florida model for example?

DR. BELL: Studied would be excessive on my party. I think I've probably glimpsed at it a little bit and certainly they give guidance in terms of -- and I remember actually I believe that actually was in our previous filing, although it's not redacted again in this one.

MR. O'NEILL: Well, as I recall it basically states that there goal and objective is to preserve the status quo as it exists with the minimum amount of --

DR. BELL: Sure. That's absolutely, you know, that's a very fine policy objective. In the state of Connecticut it's actually to provide for the health and safety of susceptible target populations. Meeting the status quo, if that status quo doesn't provide for health and safety it will be in itself unacceptable. In the

state of Florida where there are a lot of things fortunately for us in Connecticut different in Florida, they may be willing to live with that. But in the state of Connecticut the law says you have to provide for the health and safety of children. It doesn't address whether just because today they have elevated EMF levels that's acceptable. Indeed if there are elevated above the levels we've described here we'd find those equally unacceptable.

MR. O'NEILL: Have you studied at all what the impact on local zoning practices would be if we had a change such as you're suggesting?

DR. BELL: You're going to add some change I think, so and there are lots of different ones to do. And I think that certainly, you know, there are a variety of implications. We heard DOT discuss just now, and I think that's part of the objective is to fit and identify now for the Siting Council that you yourselves need to identify an algorithm, something that you'll live with understanding that every site won't be the same, because we know that's not going to happen. And you have to be able to then fit it and have a default where it kicks out and say, no, it can't go there. And the reason for that is the statute requires our primary objective to focus on the health and safety. I think if there are implications

on zoning and so forth and you require additional assistance, we'd be glad to be of assistance as well.

MR. O'NEILL: Thank you Doctor.

CHAIRMAN KATZ: Is the EMF level now at the JCC and Ezra Academy at an unhealthy level?

DR. BELL: I don't have it in front of me, but if you have it in front of you I'd be glad to remark on it. You know, I think we probably heard in the cross examination of Dr. Bailey, I'll try and pick out numbers I remember, something like six to 10. You know, and there was a question of where it was measured and so forth. Does that sound roughly in the correct range? You know, certainly that if you expect to see 100 percent increased risk with a likelihood of that being due to chance at one in 1,000 at 4 mG, somewhere between six and 10 provides an increased risk.

CHAIRMAN KATZ: Okay. So you're saying -- I guess back to my question. Having looked at the EMF levels at the campuses now --

DR. BELL: Yes.

CHAIRMAN KATZ: -- do you think they're at an unhealthy level right now?

DR. BELL: I think they provide an unacceptable level of risk in the current -- in the place

now with a current statute.

CHAIRMAN KATZ: Okay. Are -- is the organization actively doing something to reduce the existing -- the risk of the existing lines?

DR. BELL: I know I understand actually that they have actively moved children away. That I understand. As best as possible as I think -- I'm not as familiar with the geography as perhaps I could be, but you know, certain fixtures like swimming pools and the like that are fixed are fixed. But other things that have variable positions, so where you have an archery tent or something like that, I believe they've been moved. Yes.

CHAIRMAN KATZ: Okay. So they wouldn't plan any new facilities under these existing lines, correct? Because --

DR. BELL: I wouldn't speak from the JCC, but as a rational person that would be hard to anticipate how someone would willingly do that.

CHAIRMAN KATZ: -- okay. Okay. So no new pools, no new day camps, things like that.

DR. BELL: Again, I wouldn't speak for them, but I'd be very surprised one would do that.

CHAIRMAN KATZ: Okay. Thank you. Back to you Mr. Fitzgerald.

MR. FITZGERALD: Sure. Getting back to where we were. Now you know of course that as far as new 345 kV lines are concerned we're only talking about overhead construction to the extent that undergrounding is found to be technologically infeasible?

DR. BELL: That's my understanding.

MR. FITZGERALD: Alright. So and that's what gets us to talking about, okay, now we're looking at overhead lines that have to have a buffer zone. That's the context of the buffer zone.

DR. BELL: I think the context actually is that the siting of new 345 kV lines needs to provide for the health and safety of children. So for example in the event that one takes a different contortion of maybe a five inch buried line or a two foot buried line or a potentially more deeply buried line, one still needs to provide for the health and safety of the children.

MR. FITZGERALD: But I'm talking about now -- what I want to talk about with you is not buried lines, but buffer zones for overhead lines.

DR. BELL: I'm just stating that --

MR. FITZGERALD: And I want to make --

DR. BELL: -- I appreciate that.

MR. FITZGERALD: -- sure that we

acknowledge that in that context we've already taken undergrounding off the table. We're now looking -- because it can't be underground. We're looking at constructing overhead with a buffer zone, okay?

DR. BELL: Yes sir.

MR. FITZGERALD: And if you'll go along with me and assume that the kind of technological approaches that you referenced that the Company has explored are not going to be sufficient to get edge of right of way values in the area of .06 mG -- 0.6 mG, I'm sorry, would you agree that at that point you were necessarily looking at the remaining option, which is expanding the right of way and precluding it's use by children?

DR. BELL: I believe that the statute speaks to a buffer zone, the minimal buffer zone as a right of way. So the fact that you can't get .6 mG at the right of way, you know, as a separate issue from the buffer zone, the Applicant is seizing on the right of way as a default buffer zone. But in reality it may or may not provide safety to the children, it's just an action of real estate. That's why actions of real estate of how much land one wanted to purchase for a right of way has nothing to do with the health and safety of children

through the exposure of EMF and the increase in acute lymphocytic leukemia.

MR. FITZGERALD: But if you were looking at providing a buffer zone between the lines at any given point in order to guarantee or provide that the values from the lines at that point will be below a target value, is there any way to do that once the technological avenues of reducing the fields on the right of way have been exhausted, is there any way to do that other than expanding the right of way?

DR. BELL: Yes. Move the lines. Because you don't need to expand the right of way as much as have a different siting path. So it may be that when you go through your algorithm, which I know is certainly the diligence that you guys must apply to this, it may be that your best fit for identifying where you'd be able to create the acceptable buffer zones includes actually a different path for your power lines.

MR. FITZGERALD: Yes. If there -- that would be the other potential strategy if there -- if the state were such that you could find a place where the line could be moved that did not run adjacent to any of these facilities then you could look at doing that, I agree.

CHAIRMAN KATZ: But you've got to play

Jeopardy Mr. Fitzgerald.

DR. BELL: Anything to ask?

MR. FITZGERALD: Oh, ask a question. Yeah, right. Okay. Alright. So that's the -- so that's the universe that you're left with. If you can't find a place to move the line where it's not going to be adjacent to any statutory facilities and then you are left with looking at expanding the existing right of way to get the buffer?

MR. ROSENTHAL: I think I'm going to object. I think it mistakes -- and Dr. Bell can correct me, what the algorithm here suggests. It's not what -- .6 mG at the edge of the right of way, it's .6 mG at any of the protected facilities I believe.

CHAIRMAN KATZ: Dr. Bell, do you want to clarify your answer?

DR. BELL: There's a buffer zone established around power lines 345 kV and above that remains to be established what the identify of that buffer zone is, such that buffer zone provides health and safety to children at the central target organizations. And so you either can establish the appropriate buffer zone or not establish the appropriate buffer zone and willingly, in a willful way expose selected children to an increased

risk of leukemia. That's a path that the corporation could take I suppose, or it could site it differently.

MR. TAIT: I thought the question was, where do you put this 0.6 at the right of way or at the residence? Just for an example. I thought you said at the buffer zone?

DR BELL: At the edge of the buffer zone.

MR. TAIT: Yes. Not at the residence Mr. Rosenthal, at the edge of the buffer zone.

DR. BELL: Well, the buffer zone, which I think there was discussion if I remember yesterday about this the question then is as was brought up very clearly I believe by Attorney Kohler was the question of whether, you know, the buffer zone there's obviously issues about children and playgrounds behind the house with swing sets.

MR. TAIT: All I'm saying is that your testimony was at the edge of the buffer zone --

DR. BELL: Correct. Yes, Mr. Tait, thank you.

MR. TAIT: -- so Mr. Rosenthal is not correct when he says it's the residence. It could be the back yard, it --

DR. BELL: We could discuss where the buffer zone exists, but the answer is at the edge of the

buffer zone.

MR. TAIT: -- I just want to clarify. It's at the edge of the buffer zone.

MR. FITZGERALD: Okay. Now Doctor you also suggest in your algorithm a minimum distance from the center of the line configuration of 300 feet as a potential buffer zone determinant, is that right?

DR. BELL: Yes. Concomitant with a measurement of .6 mG or less.

MR. FITZGERALD: I'm sorry. What do you mean by concomitant with?

DR. BELL: No, it actually provided with -- I think what we actually described is we described first an algorithm where there's a prioritization. The first objective would be to underground 345 kV or above power lines such that children wouldn't be exposed to greater than .6 mG. Second one that one would be established a 300 foot buffer from the edge of the transmission line such that the end of the buffer -- provided the end of that buffer would be at .6 mG or less at maximum capacity. And the third one was that as a third priority that the Siting Council could identify it at some cases you can obtain .6 mG at maximum capacity but you wouldn't be able to obtain it at 300 foot. And we actually provided that

would be one outcome as well.

CHAIRMAN KATZ: So it's sort of a decision tree is the way you're describing it?

DR. BELL: That's correct. And such that you can then identify site by site and presumably one would identify in advance -- I'd like to have 80 percent or 90 percent or 70 percent in tier one, 25 percent in tier two and five to 10 percent in tier three. And you would then with a portion of it understanding that you've done a good job in hitting a fixed buffer with an absolute exposure at the edge of the buffer zone, but you've done it through several different ways at your -- based upon the diligence through the siting of the line.

MR. FITZGERALD: So you're saying that there would be places in which your .6 mG edge of right of way value would be achievable, but you would still want to go out to 300 feet?

DR. BELL: That would be a preference and the reason for that would be that there are certain other advantages. There are harmonics that wouldn't be measured at 60 Hz that would dissipate at 300 foot, but wouldn't be measured in the 60 Hz EMF measurement. There's a value in terms of policy that you can clearly identify 300 foot from the edge of a line. So for children and adults --

MR. FITZGERALD: Now you've -- your testimony, your pre-filed testimony includes the question what is the minimum distance generally believed to provide sufficient distance for a safety buffer zone? You see that question?

DR. BELL: I believe you and I'll see it in a moment. Yes sir.

MR. FITZGERALD: And then you've got a long answer to it, but isn't -- isn't the answer that you give really an answer to the question, what is the distance at which it is generally believed that the magnetic field from high voltage lines decays the background?

DR. BELL: I think actually in addition to the comments I just made about the advantage of having a fixed distance of being able to have the population be clearly attuned to where they are supposed to be and not supposed to be easily verifiable without requiring a third party. I think they should be able to provide a decay as you're describing to background levels of electromagnetic fields at 60 Hz.

MR. FITZGERALD: Was that an answer to the question I just asked?

DR. BELL: I think so. At the very end I think it was. You can just replay the last part.

MR. FITZGERALD: Well, I don't -- I'd ask him to if it was a stenographer, but it's too cumbersome to do it with the tape delay.

DR. BELL: I'll give you a gratis one.

CHAIRMAN KATZ: Well just go to the next question.

MR. FITZGERALD: Let's go to the -- well, no. Let's ask it again and just answer the question this time, okay?

DR. BELL: Absolutely.

MR. FITZGERALD: Isn't the question that that answer answers, what is the distance at which it is generally believed that magnetic fields from high voltage lines decay the background?

DR. BELL: I think you want to say, isn't the answer provided by that question, but in any case, one of the questions that could be answered by 300 foot is the question that you just asked.

MR. FITZGERALD: You refer in your answer to statements from the state of New Jersey, to statements from the Tennessee Valley Authority, to statements from the Connecticut Department of Public Health. Those statements do not relate to safety buffer zones, they are simply statements that tell people how far away from a

line you need to be to be relatively confident that you're not seeing any magnetic fields from the line.

CHAIRMAN KATZ: Alex Trebek.

MR. FITZGERALD: Isn't that right?

DR. BELL: If I can answer that, I mean, the Health Department fact sheet says at 300 feet there should be no cause for concern. So they relate it to health concerns.

MR. FITZGERALD: Did they relate it to safety, do they say you're safe here, you're not safe there?

DR. BELL: They say, no cause for concern.

MR. FITZGERALD: Okay. Let's start with the state of New Jersey. The first thing you mention in your answer, you say for any transmission line you quote the state of New Jersey as saying, for any transmission line in the state of New Jersey at a perpendicular distance of 400 feet from the center of the line configuration the magnetic field level and the ground from the line will be approximately 1 mG or less. I've read that correctly, didn't I?

DR. BELL: Yes sir.

MR. FITZGERALD: Are they talking about a safety buffer zone?

DR. BELL: Actually the paragraph that it's taken from is in the context of experiments and cells showing increased DNA mutation in cells. So the context by which that sentence is extracted was discussion about the potentially adverse effects of EMF. It did not conclude whether there were adverse effects of EMF, but the section of the document was discussing potential adverse effects of EMF.

CHAIRMAN KATZ: But in New Jersey they don't call it a safety buffer zone, correct?

DR. BELL: That's correct.

MR. FITZGERALD: Would you suggest that the Council adopt the EMF power line regulations for protection from magnetic fields that have been adopted by the state of New Jersey?

DR. BELL: Being consistent with the newly passed Public Act in the state of Connecticut? You know, there are --

MR. FITZGERALD: Any way you want. You can answer it any way you want. Which --

DR. BELL: -- well, the answer is no. I suggest that the Connecticut Siting Council adopt a regulation consistent with the newly passed Public Act.

MR. FITZGERALD: -- yes. And Doctor, I'm

asking you about the testimony that you have given here. Again --

DR. BELL: Yes.

MR. FITZGERALD: -- you quote the Tennessee Valley Authority in this answer to the question, what is the minimum distance generally believed to provide sufficient distance for a safety buffer zone? And do you maintain that the Tennessee Valley Authority has adopted a 300 foot safety buffer zone for protection from magnetic fields?

DR. BELL: Mr. Fitzgerald, the testimony that we provided clarifies and qualifies all the statements you're reading and states a variety of calculations have been made supporting a range of minimum distances required to achieve background levels of EMF from overhead power lines.

MR. FITZGERALD: Okay. That's, you know, I agree. Excuse me. Yes. And so one might say -- one might say then that the question should have been stated, what calculations support the minimum distance required to achieve background levels of EMF from overhead power lines?

DR. BELL: Except for that it was Dr. Rabinowitz stated the state of Connecticut, which happens

to have a little more import since that's where we're located, stated that 300 foot also provided no cause for concern making a link between background level as the objective and also the health and safety.

MR. FITZGERALD: And by the way, you're not suggesting -- before we leave the TVA, you're not suggesting that the Council follow the TVA's magnetic field buffer zone requirements?

DR. BELL: My understanding is the Attorney General's office initially asked for a listing of schools within 1,200 feet of the power lines. I'm not sure how that was constructed though. How that interrogatory was --

MR. FITZGERALD: I don't think that was responsive. You're not -- the question is, you're not suggesting that the Council adopt the TVA's magnetic field --

DR. BELL: -- no. We're suggesting the Council adopt what we provided, which is the 300 foot, .6 mG after undergrounding.

MR. FITZGERALD: -- okay. Now --

MR. TAIT: Excuse me. The 300 foot that you suggest that the Connecticut -- recommended, did Connecticut do any studies to back up that 300 feet?

Where did they get it from?

DR. BELL: In Dr. Ginsberg's testimony he stated that -- he gave a reference which, you know, sort of -- I can't remember the exact pamphlet or the exact document now, but it shows a decrease in distance width the decrease in EMF width -- from various configurations of the power lines. And he goes on to say that even 300 feet out you would be relatively close to background below a round of milligauss. So that's the basis I think Mr. Tait.

MR. FITZGERALD: So --

VOICE: And I think there's also reference to that Professor Tait in the brief filed by Ezra Academy.

MR. FITZGERALD: -- now all of these general statements and fact sheets that you reference here about being 300 feet away from high voltage transmission lines these are just that, they're general statements about high voltage transmission lines in general, right?

DR. BELL: The fact sheets, I think that's correct, yes.

MR. FITZGERALD: Yeah. And these statements do not specifically address transmission lines that are constructed with low magnetic field design strategies as far as you know, do they?

DR. BELL: In the state of Connecticut, as we just went through with Professor Tait, that they looked at how 300 foot to obtain background levels. So I think you're right and that's what we provide for in certain cases and that we've provided the Siting Council that could be less than 300 foot just as you're suggesting. As long as the background level of .6 mG is obtained. I think it's less preferential for the reasons we stated because of the ease of implementation of policy, the reduction in EMF from harmonics, but certainly as you're suggesting we provide as our third alternative prior to kicking it out of the siting algorithm that could be .6 mG and not be 300 foot.

MR. FITZGERALD: Now does any of the health research that you have reviewed provide information with respect to suspected health risks associated with exposure to direct current magnetic fields?

DR. BELL: I think that, you know, Peter and I were talking about it. I think we come pretty close in this rare instance with agreeing with Dr. Bailey's restricted testimony in this regard. We're certainly familiar with some laboratory study showing effects of DC electromagnetic fields on cells that are adverse, but certainly as Dr. Bailey stated quite accurately and

succinctly, and I'll just restate it, all of the large epidermiologic studies have focused exclusively on alternating current.

MR. TAIT: To us lay people what's the difference, is a milligauss a milligauss? I mean --

DR. BELL: I think what --

MR. TAIT: -- AC cycles and DC doesn't. Does that have an effect on health?

DR. BELL: -- I think from a risk point of view, and I think that this comes right down to the lack of absolute, there's human data, you know, demonstrating at a continuous level and at certain thresholds further increase highly significant increases in leukemia based upon exposure to AC EMF. That same data does not exist.

MR. TAIT: Would you suspect DC would have higher levels than AC or lower levels? Just in order of magnitude.

DR. BELL: I think we talked about the fact that the DC field of the earth is many times higher than some of the AC fields that we've been talking about. And we're talking about, you know, 60, 100 more and more milligauss of direct DC magnetic field from the earth's field.

MR. TAIT: But are you saying the AC

studies are irrelevant when we're looking at DC?

DR. BELL: As an empiricist it doesn't let you conclude that DC is associated with the same significant increased risk in leukemia in children. Leaving out the empirical piece -- I apologize Professor Tait. Go ahead.

MR. TAIT: It says we just don't know, it could be higher or lower?

DR. BELL: I think that's correct. If it's something that the Council desires, you know, that could be something that we could look at in some detail and try to provide some opinion on. But as I said, I think that there's laboratory data suggesting adverse effects of DC magnetic fields in a laboratory. There is no -- as I'm aware of today, no human data either pro or con. I just don't think it's been examined carefully.

MR. TAIT: But there is laboratory which -- we're getting into DC tomorrow and I would say we're going to be very interested in --

DR. BELL: As are we.

MR. TAIT: -- EMF levels.

DR. BELL: Yes. I agree with your concern and without being certain -- so one thing -- so hypothetically if the DC laboratory data were highly

persuasive, you know, equal to and greater persuasive than the current AC data then I think that's something we should be concerned about. If it's not then I would sort of ratchet it down. I would use that in the event that we don't find any human data.

MR. TAIT: But we need to know.

DR. BELL: I agree with that. I think that's a correct assessment.

CHAIRMAN KATZ: Mr. Fitzgerald, we're going to interrupt your cross examination, but we're going to give you a little flexibility in the next five or so minutes if there comes to be a logical point to interrupt it then we'll have you go till then or --

MR. FITZGERALD: I wouldn't mind doing it right now.

CHAIRMAN KATZ: -- okay. Being interrupted. Okay. You've got it. We will interrupt that. At this point we are going to suspend cross examination and I understand from Mr. Phelps we will take a two minute break and we will resume then.

(Off the record)

CHAIRMAN KATZ: We will resume the hearing. We've had some members of the Legislature who have asked to come and speak to the Siting Council. We'd like to

welcome you. We have a Court Reporter here, so before you speak I'm going to ask you to give your name and spell your name for the Court Reporter so that we can have a record of your remarks. And who would like -- who will be going first? Representative Adinolfi?

MR. AL ADINOLFI: I think this is on? Yes. I think they have all the data --

CHAIRMAN KATZ: If you --

MR. ADINOLFI: -- they came and got the data from us --

CHAIRMAN KATZ: -- if you could start with your name and spell your name?

MR. ADINOLFI: Representative Al Adinolfi, A-D-I-N-O-L-F as in Frank, I.

CHAIRMAN KATZ: Gail, did you get everybody? Oh, you did? Oh, I'm sorry. You have more recent information than I do.

MR. ADINOLFI: Thank you Madam Chairman for inviting us here today. The last few days I've sat here and listened to the hearings and I think yesterday I expressed an opinion. And basically what I'm going to do is reiterate what I said yesterday. In the last Legislative session we passed legislation that accomplished two major things. One, I think it took away

the need for the Siting Council to determine the health hazards associated with electromagnetic fields and the link to childhood leukemia. We did that in our legislation by simply saying that in certain designated areas, and I'll repeat them if we will, you know, schools, playgrounds, educational institutions and so on. We know what they are. That the lines would go underground, very plain and simple.

And in the event that it was proven, and in my mind beyond a reasonable doubt, that these lines could not be put underground then we would come up with buffer zones and ways of mitigating the EMF to bring them down to safe levels. For the last few days I've sat here and I've listened to mitigation, I've listened to split phasing, I've listened to taller towers, all different ways. But I have not heard a discussion yet on the need for mitigating. We have not determined that underground it is not feasible. We've heard hearsay, but I haven't seen any concrete evidence that this is a case where we can't go underground, that they can't find alternate means of going underground and give an honest attempt to come up with a way to do it. I'm sure it could be done. We can do anything we want if we want to do it.

I haven't seen any effort in that area.

All I've seen is negativism against undergrounding. And I think we're putting the cart before the horse. I think that we are spending right in the back of me here, the local municipalities are spending thousands of dollars a day with people here in this room, consultants and attorneys, listening and discussing things that I don't think should be discussed now. We must first prove that undergrounding is not feasible and then get to the point where we will talk about mitigating it, buffer zones, or whatever. But until we get to that point as far as I'm concerned we're wasting taxpayers dollars out there. The Siting Council for your expenses is reimbursed from the Applicants. Your consultants and so on, they have to pay for that. The town don't get reimbursed. We're taking money away from very needy programs to protect our constituents and to protect the residents of our towns. And I think that what we should be doing is not put the cart before the horse and let's get down to see if we have to mitigate at all.

In my opinion I don't think we have to. I think we could find a solution, whether it be AC or DC underground that would be satisfy everybody over the long term. When I say, long term, the life of the project. And that's about it. Thank you.

CHAIRMAN KATZ: Thank you. Senator Smith?

MR. WIN SMITH, JR.: Thank you Madam Chairman. Again, my name is Win, that's my first name, W-I-N, last name Smith. And I'm the State Senator from Milford, Orange and West Haven. And I'd like to thank the Siting Council for giving us this opportunity and for taking the time to go into all these grinding details that you've had to be subjected to.

We're not going to be detail people here, because that's not what we do. However we are here because we have some concerns about what we've read and heard with respect to how the legislation we recently passed, PA4246 is being characterized and treated in these proceedings. Building on what Representative Adinolfi had to say, I think it's fair a broad reading of this Public Act would lead one to the conclusion that we intended this presumption to have meaning. That it is presumed that these lines are going to go underground unless it can be demonstrated that they can't.

I'll get into that technological unfeasibility that we had in mind in a moment. But it seems to us as though rather than trying to take the statutory mandate and spending time, effort and frankly the taxpayers' and ratepayers' money, on figuring out a

way to comply with that statute our concern and the reason we're here today is because it seems as though people are trying to find a way to circumvent the statutory mandate. They're trying to go above ground when we told them, that's not what we want you to do.

So we're here because we think that this legislation is being marginalized, if not ignored. And I think if you, again, if you get down into the what does this exact term mean, or that exact term mean, sometimes you can get lost in a little bit of, you know, all the stuff that went on. But I think it's fair to say that the Legislature was very concerned about EMFs and the health and safety of the public and that's what drove us to this legislation.

And I think it's also fair to say that what we wanted you to do, the power we delegated to you on our behalf was to err on the side of caution in this whole thing. To not try to take a scientific risk or gamble with the people in our districts or their children, our children, but to make it safe for everybody. And erring on the side of caution I do want to just go to some of the Legislative history on this.

Of course in the Senate it was unanimous, which we hoped sent a message to all of you. In the House

it was lopsided. And the House when they had their debate, I'm quoting Representative Backer (phonetic) here and I know you can grab pieces of legislative debate to prove different things and I've got some concern that I've heard and read that some of the folks in this hearing have been trying to do exactly that. But I think Representative Backer fairly characterized where we were headed with this caution and concerned about EMF when he said that what the Committee did and what the working groups have done is to take a look at this and decide to err on the side of caution for the people of the state of Connecticut and it's children. And later in the same dialogue Representative Adinolfi said, and of all the words I heard here tonight the words that stick most in my mind is that we're erring on the side of caution.

That's what we want you to do. That's what we intended all of you to do is to err on the side of caution. And this presumption that we built into this bill is supposed to provide you the mechanism to do that, not to circumvent it. And there's a lot of talk about buffer zones. We didn't intend all of you and all of them to get bogged down in what a buffer zone means and how big it's got to be. If you bury it you don't have to worry about these buffer zones. And the few limited

circumstances in which you absolutely find that they can not put it underground then and only then do you need to even consider what these buffer zones are supposed to be all about.

And we want you to make buffer zones that create -- so that there's no risk to the health and safety of the people who are outside of those buffer zones. There's a lot of technical data. We want you to decide -- we've decided you're the best placed people to do that. But from our perspective minimally, if someone is standing outside the buffer zone they should not be subjected to any health and safety risks.

And we've heard some talk about how if -- whatever the EMFs are today on the existing lines if we use that as a baseline what are the new lines going to do? That's not what we intended. If the new lines based on the technology that we've got and the new studies that we know about are a health and safety risk we don't want you to take that baseline and say, well, you're already subjected to that much risk now, make it safe so that when these new things are put in and those few limited places where it must go above ground that it's safe for people generally, children in particular.

And from our perspective cost, you know, I

hear a lot of about cost, cost was not supposed to be part of this. We all sat in on these working groups. Senator Crisco, Representative Klarides, Representative Adinolfi, myself, Representative Backer, Senator Peters, and we were told at that point in time by the utility companies that burying things would be two, three, four, five times more expensive than going above ground. And that didn't matter to us. And isn't supposed to matter to you.

And I think again, reading from some of the transcripts of the debate Representative Backer said that in response to a question from Representative Minor, this bill is silent on cost however, it's silent on cost in terms of how they would make their choices. So without being able to have an exact situation I would tell you Representative Minor the costs should not be a consideration. It doesn't matter what it costs, bury it.

Now you can take the cost argument to a reductio ad absurdum. If you run into some underground thing that'll cost you a hundred times or two hundred times what it would normally cost, if it was going to cost $1,000,000 a mile to put above ground and then 5,000,000 underground and you run into something where it's going to be $100,000,000 a mile underground, that was the thing that we had in our minds, we were talking about

technologically infeasible. It was only in the reductio ad absurdum that if it couldn't be done except in some extreme circumstance only then can you consider allowing them to come above ground. Not that they can prove that it's some kind of a discomfort to them, or that they have to use some kind of technology that they've never used before.

Representative Backer goes on later again in his Legislative discussion and says -- and he says, in other words we might require them to bury the lines in certain areas that might not otherwise have been buried. We might tell them to use certain types of technology that might not have been otherwise used. You can tell them to do things that they might not want to do, that they haven't done before that might cost them a lot of money. We intended you to do that.

As well there was a distinction made, and I want to make sure that it's brought before all of you in our working group models. I didn't necessarily agree with the distinction but it came into the Legislation itself where there was a difference between the medical community and the scientific community. Senator Peters in particular thought this distinction important. She's a licensed nurse, that's what she does in the real world.

And we intended for all of you to collaborate with the Department of Public Health and if you've already been doing that, that's great. If you haven't done that, I hope you do. Apparently there are studies in the Department of Public Health where in the medical community has a fairly substantial argument that links the EMFs with health and safety concerns, especially with respect to children. There's a scientific community that apparently says that that link either can't be established or there's some difficulty. We wanted you to look at the two different sides to that. Reconcile if you could, but err on the side of caution. Create for us a safe situation if you're going to have to put these things above ground. But only if you have to put them above ground. Again, I keep coming back to that, that should be a very limited circumstance for all of you.

I think I may have touched on most of -- we specified these facilities where people congregate, especially where children congregate, but we expect you all as well to use, you know, your experience and common sense in determining what those things are. The list wasn't designed to be exclusive. If there's another thing that we forgot to list we would hope that you all would recognize that. We intend you to think about recreation

areas as well, not just necessarily schools, residential areas, especially high density residential areas. We are not trying to be limiting in what we're doing.

And then there was some talk about the right of way, and I hope you all have resolved the issue as to whether or not the buffer zone can exceed the right of way because there was provision in there that minimally the right of way would serve as a buffer zone. To read that the way some people have suggested it would be constructed would be to read this Public Act out of existence to say that the right of way will serve as the buffer zone and we can all go home after that. That's not to suggest that we spent all this time and effort on this legislation so we would simply have the existing right of way as the only buffer zone would be insulting to all of us and insulting to your own intelligence. I assume that you're not going to be reading it that way. We don't have to spend a lot of time on that.

Site specific -- although we didn't consider it we have this list of different places where people congregate and different types of facilities that we want you to take a look at. I don't think it would be possible for you to discharge the mandate that we've asked you to discharge without having detailed maps, A-2

surveys, something that would designate all of these facilities within a reasonable expanse on either side of the right of way. I realize that's going to be an imposition on the Applicants or somebody, but you're not going to be able to do what we're asking you to do unless you know exactly where all these facilities are.

You've hired an outside expert I understand. We envisioned that and we applaud that. It was also our hope that that outside expert would not simply be used for analyzing data provided to the outside expert. You know, if the Applicants say, do things have to be done X and other folks, parties and intervenors say they have to be done Y, it was clearly our intention that you all and your independent expert might come up and say, you know what? Z is the right way to do it and we're going to give you all something different than what you thought you were going to get. We want you to do that.

In short, we have delegated to you the duty to meet the concerns that we have. We are looking to you to do that. We don't come to these hearings all the time. We're here because this matters to a lot of us. It matters a lot. And how you discharge this duty that we've given to you under this new law is going to be watched closely by us because we intend it to be a test as to how

well we can delegate things to all of you when we see problems developing that just technically the Legislature is not well positioned to deal with.

I thank you for the time today and I'm going to pass this on to Representative Klarides.

CHAIRMAN KATZ: Thank you Senator. Representative?

MS. THEMIS KLARIDES: Thank you very much. Representative Themis Klarides, 114th District and I represent Woodbridge, Orange and Derby. I'd like to also thank you for taking time to hear us today. I know this has been a very arduous process and, you know, on all of our parts and it is your job, but that doesn't make it any easier when you do it. So I applaud that.

There's really not much for me to add because Representative Adinolfi and Senator Smith obviously have hit on most of the points and we've all submitted testimony and we've all been before you before at our local public hearings, so I don't mean to be redundant. I just wanted to hit on a couple different points that I think were important.

I know Representative Adinolfi and Senator Smith mentioned about the underground presumption and I think that it's important for all of you to understand

that when we initiated this legislation there are certain things we do up in the Legislature that we feel are important, but we don't -- we don't necessarily know if they will have teeth as we would like them to have. This is not one of those pieces of legislation. We did this because we saw it was an issue. We had enormous constituent concern about it and we did something about it. And with the respect and the trust we have in the Siting Council and the seriousness by which you take your charge we felt very confident in the fact that when we -- with all the time we put into developing this legislation and it was bipartisan, it was house incented, it was people with all different backgrounds from engineering background to medical backgrounds to business backgrounds, you know, so we certainly understand all sides of this argument.

We felt confident that after all those months of work on this that we would be able to put something together that was comprehensive enough, yet workable enough that you as the Siting Council would be able to say, okay, we can do this. This is why we're doing it. And it's important to understand that the reason why we're doing it is for the health and safety of the people, of the State, of our districts.

And so having said that we've just heard a lot of things about circumvention. And I understand that we all, whether it's the business community, the legal community, the political community, the Siting Council, we all try and get done what we need to get done in a way that we maybe walk -- walk a fine line in doing it. And there's nothing wrong with that as long as the ultimate goal is realized. And that's what I think we want everybody to understand that our ultimate goal and the reason behind this legislation is because we saw a serious need for it. We saw a serious problem with causal links. We saw causal links between the EMFs and the childhood leukemia. We saw all these things and people with serious problems because of it. And I for one, and I know I can speak for my colleagues on this one, and I'm sure that I can speak for all of you, do not want to take a chance with people's lives. And that's why we decided to err on the side of caution.

We did this for a reason. We know you -- all -- every single one of you serve on this Commission for a reason, because you believe in it and you believe you can add something to it. You believe that you're doing it to make the state of Connecticut better. We did this for the health and safety of the people of this state

and we just want to make sure that you understand that there is a very strong and compelling reason for doing it. That it's not to make a company happy, or to make a person in a town happy, or because somebody doesn't like the way the lines look, or somebody's not making enough money. The overriding concern and the compelling reason for us, and hopefully for you, is what is safest for the people in this state. Thank you.

CHAIRMAN KATZ: Thank you. Senator?

MR. JOSEPH CRISCO: Thank you. Senator Joe Crisco, C-R-I-S-C-O. 17th Senatorial District. I want to thank the Council for the opportunity to appear before you today and commend you. And I say that not to be patronizing of the awesome task that you have, which you're aware of, in regard to making sure that our needs for energy are met and at the same time, you know, protecting of the health of the citizens of Connecticut.

I just want to associate myself with the remarks of my colleagues, but more importantly while I'm aware that you are aware of the stakes are extremely high. The decision that you render in the future cannot be automatically shut off like a light switch. The stakes in regards to the health of children and generations to come are basically what we're talking about. And so I just

plead to you in your deliberations to take into consideration the intent of the Legislation that bipartisan Legislators met together to come up with a vehicle that we thought would get the job done. It could have been stronger, we realize that. We wanted to be stronger, but it was important that we get the message across and the legislation accomplished.

So without sounding additionally, you know, to be too trite I just beg of you to consider your considerations in regards to legislation and the health of the community, in particular the children, because everything that I have read and spoken to an outstanding group of citizens and, you know, from my communities leave no question in my mind that there is, you know, potential danger here and to err on the side of not protecting the health of these children I think is just too great of a risk and I ask you to while it's not the main decision for you to consider to take that into consideration. Thank you.

CHAIRMAN KATZ: Thank you. We appreciate you taking the time out of your busy schedules to come and we'd like to extend the invitation from the Council for you or your staff to attend any of our public hearings, evidentiary hearings on this matter. We'd be always glad

to see you and your staff to come and we'll be having hearings in September and probably October also as well as tomorrow. So we'd like to just extend that invitation to you and thank you for coming today and sharing your thoughts with us.

MR. CRISCO: You're welcome.

CHAIRMAN KATZ: Thank you. And we'll take a two minute adjournment -- recess.

(Off the record)

CHAIRMAN KATZ: I think we'll continue.

MR. FITZGERALD: Before we continue with the cross I'd like to point out that there is in the record -- this relates to the town and State road issue. There is in the record Applicants' Exhibit 9, Applicants' memorandum concerning their eminent domain powers and their franchise rights to install facilities in the highways.

CHAIRMAN KATZ: Yes. I've read it.

MR. FITZGERALD: It only seems that that was filed in Docket 217 because it was -- it's dated December 22nd, 2003. We are preparing a supplement to it that deals specifically, or more specifically than that memorandum does with the who trumps issue that you asked about.

MR. TAIT: We would ask all parties to brief that.

CHAIRMAN KATZ: Yes. But even if the consensus is that we have trumping powers we still urge the effected parties to work together.

MR. FITZGERALD: Yes.

MR. TAIT: If you can resolve your differences.

CHAIRMAN KATZ: Yes.

MR. TAIT: If you can't, you can't.

CHAIRMAN KATZ: Right.

MS. RANDELL: We hear you.

MR. TAIT: It's like redistricting. Do you want the judge to make the decision or do you want to make the decision yourself?

CHAIRMAN KATZ: Right. Well put. Okay. Let's resume cross examination. Category is?

MR. FITZGERALD: Category is -- category is the attachment to this most recent set of pre-filed testimony that is the executive summary of the electric and magnetic field exposure assessment of power line and non-power line sources for California Public School environments. And in particular page S-23 thereof, which I invite the Doctors to turn to since they may want to

refer to it in answering the next set of questions. First of all, do you know, or can you explain what net currents are?

DR. BELL: The answer to the first question is, partially, and the answer to the second question is probably not.

MR. FITZGERALD: Okay. Well --

DR. BELL: I think it actually has to do with poorly grounded wiring and the result in current that arise from not being properly grounded in a system which is notorious in schools.

MR. FITZGERALD: -- fine. And is a -- the current flowing on internal wiring and how it gets there we can leave out for the moment. But we were -- we can agree that --

DR. BELL: I'm willing to go with your analysis, whatever it would be almost.

MR. FITZGERALD: -- okay. Okay, fine. And this report says that 70 percent of the classroom exposure of school children to magnetic fields could be eliminated if net currents were fixed, right?

DR. BELL: I think actually, you know, just quickly looking at the figure and I'm sure you're much more familiar with it than I am, but I think it actually

speaks broadly to the EMF across all the schools are sampled in California, but not necessarily to the -- it says 458,000 school areas. It doesn't, I believe, specifically address those schools who have markedly elevated EMF. So I'm not sure that the conclusion applies equally to all schools.

MR. FITZGERALD: It applies to all school children?

DR. RABINOWITZ: Taken as a whole.

MR. FITZGERALD: As a whole, yeah, right?

DR. BELL: It doesn't apply to whether, for example, schools that have EMFs that are markedly elevated or schools that have maybe .2 mG it doesn't apply equally to all of those and it doesn't assert that it does apply equally to all of those. I believe.

MR. FITZGERALD: What it says however is that by eliminating net currents 70 percent of school children's classroom exposure to magnetic fields could be eliminated. We can agree with that much, can't we?

DR. BELL: It doesn't say from what level it's reduced, alright? It says that basically broadly taking a population. So for example, as we look at, you know, the number of classrooms with markedly elevated EMFs, which obviously is going to be a very small fraction

as we see on page S-5 and S-6. Right? There's only a few percent, five percent above -- so five percent above 2 mG, so we don't really know -- and two percent above 3 mG, we don't know whether the 70 percent reduction is focusing on -- which probably is focusing on the 39 percent that had very low levels as opposed to those with high levels.

MR. FITZGERALD: Now of course I'm not -- I haven't asked you to concentrate on exposures above 2 mG. We're talking about -- I think the context that we're speaking about right now involves .6.

MR. ROSENTHAL: I object Your Honor. That's not a question.

DR. RABINOWITZ: You haven't provided context.

CHAIRMAN KATZ: Well, why don't we just ask the question and we'll get an answer.

MR. FITZGERALD: I did. I tried to. I tried to get an answer.

CHAIRMAN KATZ: Well, try again.

MR. FITZGERALD: The study concludes that by eliminating net currents 70 percent of the exposure can be eliminated period, close quotes, correct?

CHAIRMAN KATZ: It's a yes or no question.

DR. BELL: It's an accurate reading of the

sentence.

MR. FITZGERALD: Okay. The study goes on to say that modification of distribution lines is the second most efficient work for reducing magnetic field exposure in classrooms, correct?

DR. BELL: For whatever type of classroom it's referring to that's what the sentence states.

MR. FITZGERALD: Okay. Now in the record of this proceeding we have the Woodbridge Jewish Organization's Exhibit 3, which is their interrogatory response appended to which are measurement results that were taken inside the buildings of the Jewish Community Center and the daycare center and also measurements that were taken in 1993 at Ezra Academy. And many of these measurements are multiples of .6, for instance there is a measurement recorded on the racquetball court at the JCC racquetball entry door, 14.4 mG. Should these schools be required to reduce these internal field levels to your .6 level in order to avoid excess health risks to the occupants of the buildings?

DR. BELL: Are you asking my opinion, or whether it's a law, or what context are we talking about?

MR. FITZGERALD: No. I'm asking -- well, let me put it this way. You have testified that in order

to avoid as far as is prudent the excess health risk from transmission lines the fields for those transmission lines should be reduced to .6 mG at a point where children may encounter them, correct?

DR. BELL: Yes sir.

MR. FITZGERALD: Is the same thing true for sources such as wiring in schools where children spend the day?

DR. BELL: You're asking my opinion whether I think that should be true?

MR. FITZGERALD: Yes.

DR. BELL: Having served on a board of education and recognizing that in the state of Connecticut there is a statutory responsibility for boards of education, at least for public schools, to look after the safety of the children in the school, I think it would be part of their responsibility, yes. I would agree with that. I can't speak actually more specifically than that, but from my experience, having served on a public school board of education, yes I would agree actually. If I were still on that I would see it as part of my responsibility.

MR. FITZGERALD: To reduce the internal fields within the schools to .6 mG?

DR. BELL: If I was convinced -- if I was

convinced that it was a health and safety risk to children that I was responsible for, sitting on a board of education as I have done in the past, I think that's probably what my conclusion would be.

CHAIRMAN KATZ: Dr. Bell, could you just elaborate? You said if you thought it was a health and safety risk.

DR. BELL: If I -- I'm not on a public school board of education, so I'm not in a position that I have that responsibility.

CHAIRMAN KATZ: Right. But is it your --

DR. BELL: But if I were --

CHAIRMAN KATZ: -- I'm sorry. Finish.

DR. BELL: -- I apologize. I'm sorry.

CHAIRMAN KATZ: Is it your testimony that all conditions where children may be exposed over 0.6 mGs are an unacceptable risk?

DR. BELL: The answer as a physician --

CHAIRMAN KATZ: Yes.

DR. BELL: -- and having studied the data --

CHAIRMAN KATZ: Yes.

DR. BELL: -- and there's separate issues --

CHAIRMAN KATZ: That's why you're here.

DR. BELL: -- separate issues being boards of education and the responsibility to do it or not --

CHAIRMAN KATZ: Yes.

MR. TAIT: Your professional opinion.

DR. BELL: -- and all I'm saying, having done -- being a physician and having served on a public board of education since I would have a responsibility to look after health and safety, yes I would --

MR. TAIT: No, no, no. We're not --

DR. BELL: -- I would actually believe that it's appropriate for me to guide that down towards .6.

MR. TAIT: -- I'm not interested in your position on the board of education. Would you advise the board of education, what's your professional opinion?

DR. BELL: If I were asked, yes.

MR. TAIT: Yes. No matter where it is, not just power lines, wherever that rating is excess of that level it should be remedied?

DR. BELL: And I think actually there are programs actually that are assisting -- as I understand the Applicant has programs that assist schools in addressing their wiring and so forth and I commend them for that.

CHAIRMAN KATZ: But Dr. Bell, why don't you think we should be going for zero milligauss?

DR. BELL: Because I think it's unobtainable in an industrialized society. If we wanted zero milligauss I think it's in your prerogative, my own view, you know, running a public company and so forth and having quite a bit of experience with technology and businesses, I don't think it's obtainable. I don't think it's a realistic objective that I actually would advocate.

CHAIRMAN KATZ: Okay. So one of your criteria is whether it's practical -- obtainable is one of your criteria of whether something should be --

DR. BELL: Actually the -- also reality in the United States is if, you know, it's a pie. So if you want -- I think a reasonable objective is to be no worse off than half the children in the United States as opposed to being no worse off than 99.9 percent of the children in the United States, which would be zero if that were the objective. So I put it within the class of the population. You want to treat the whole class as best we can, the class being in this case, susceptible target population, children. And I think that the best that we can do -- I would recommend to see is to be, you know, no worse off than half of them.

CHAIRMAN KATZ: But if being obtainable is part of the criteria, follow me on this thought process.

DR. BELL: Sure.

CHAIRMAN KATZ: First let's say our goal is to underground, let's agree on that. But if for some reason we cannot underground and this has to be above ground and to be above ground and to get to 0.6 mGs then we have to require the utility to take a lot of houses in Woodbridge for example. Then do you see a cost benefit ratio of maybe trying to have a goal be 1 mG and taking less houses?

DR. BELL: Well, absolutely. I think that you certainly in your prerogative you have -- and what we suggested was an algorithm, one could adjust the algorithm however they were, it's a way of making -- decision making in a tree as you described. And you can decide, to say we're willing to take this much risk and you go up to one, or you go up to two, or you go up to five, or you go up to 20 mG and say, okay, we'll take this kind of risk.

CHAIRMAN KATZ: Okay. Where -- at what point do you think the risk is unacceptable, that southwest Connecticut should just do without the power because the risk to the younger population -- is there a milligauss level where you just think the Legislature

should just decide, you know, forget, you know, we're just not going to do this power line?

DR. BELL: You know, the first comment would be as that as we discussed last month, you know, this is a little bit like squeezing a balloon, alright? The Siting Council is being squeezed. The Applicant is being squeezed. The Committees are being squeezed to see what's actually obtainable. And you can never really tell what's obtainable sometimes unless you know all the key pieces, which I certainly don't know. And I'm not sure actually that, you know, how well that's described. So from a management point of view I think that's the prerogative you have is to obtain what you want. But certainly, you know, at .6 mG, at .8 mG, at .9 mG, at 1 mG and lower I think those are defendable positions from a public health and safety point of view. I think where there's clear evidence for example that there is a highly significant increase in risk of cancer in my opinion I wouldn't want to be in a position defending that.

CHAIRMAN KATZ: Now do you think 3 mGs is documented in the literature as being that level of highly susceptible childhood leukemia?

DR. BELL: The first level that I think has been highly documented in the literature is 2 mG. 3 mG is

highly demonstrated, 4 mG is highly demonstrated. So if I were looking to create a defensible position for example, one can say that at 1 mG no one has proven that there's a risk. I'm laying it right out as clear as I could possibly say. At .6 mG I've laid out a rationale that's defensible. At 1 mG you have another rationale that's defensible. At 2 mG you lose most of the defenses I can anticipate. I'm just taking it in a tactical kind of way. And I would -- from my end obviously, you know, I think it will probably be apparent from these proceedings, I would assert that in and out of the proceedings.

And I think that that's a way to make defensive positions, you know, tactical decisions on how to work through an algorithm I suppose. I think it would be very hard at for example, at 3 or 4 mGs as we discussed earlier to say, you know, can you defend a one in 1,000 change that there's not an 80 percent increase in cancer? I think that would be a tough position to defend. I wouldn't want to be -- I'd much prefer to assert it in some other setting than I would to defend it.

MR. ASHTON: In a similar vein supposing the cost of -- let's again assuming that we have to go overhead. Assuming that there is a defined public facility in conflict with the proposed line and the cost

of relocating a line to avoid that was X and the value of that public facility is $1/10^{th}$ X, would you recommend buying out that public facility as opposed to relocating the line at a cost 10 times higher?

DR. BELL: I think we've actually reviewed this in the past, but I don't think maybe as candidly. In the pharmic-economics and medicine and so forth, determining the pharmic-economic value of something it turns out every single time, as ironic as it is, is that death is a cheap way out. So you can't make -- I would not look to assert here a positive -- a positive economic argument for having fewer children have leukemia, because it's cheaper quite frankly.

MR. ASHTON: No, I didn't ask that. You're way off base.

DR. BELL: I apologize Mr. Ashton. I'm sorry.

MR. ASHTON: I've got a choice --

DR. BELL: Okay. I should focus.

MR. ASHTON: -- I've got to define public facility, whatever it is --

DR. BELL: Yes.

MR. ASHTON: -- I've got a situation where I cannot bring down the magnetic fields at that facility

to whatever acceptable level we choose to land on. My choices are relocate the line to get it out of the way, to get it so --

DR. BELL: Yes, I understand.

MR. ASHTON: -- so the magnetic fields are low enough, or the value of the facility is 1/10th the cost of relocating the line. I could buy out the facility theoretically.

DR. BELL: Sure.

MR. ASHTON: What would you do?

DR. BELL: I apologize, I didn't understand. It's a very different question. I apologize for my previous response. I think what I would do actually in that setting, as again, we spoke about last month, is you have a -- I don't know, maybe five, 600 decisions you need to make, you know, all the way through.

MR. ASHTON: Well, there's thousands of them.

DR. BELL: No, no, I'm just saying. Okay. I apologize. So there's thousands of decisions to make in a geographic sense and what I would do if I were in charge of that organization and had to make the investment decisions, which actually you know, is sort of a shared Connecticut investment and New England investment, is I

would identify meeting the criteria the least investment to get there. But I wouldn't do it based on a single -- a single situation because that actually obscures the fact that you have another, as you say, 999 decisions to make. I think you need to find the best fit. And I say that from an --

MR. ASHTON: Well, I'm posing this as a best fit in a defined geographical area.

DR. BELL: -- yes.

MR. ASHTON: Those are the two choices. I could either relocate at X dollars or buy it out at 1/10th X.

DR. BELL: Right.

MR. ASHTON: And you were -- I think I heard you were saying is you'd go the buy out route and that is -- obviously it's --

DR. BELL: Well from a statutory point of view we just had, you know, Representative Smith -- Senator Smith describe that cost is not an issue that should be considered as part of the statute. He was explicit about that. So I'm not -- I'm not really sure what position I'm sitting here --

MR. ASHTON: I'm achieving -- I'm achieving -- I'm achieving the requirements of the law --

DR. BELL: -- yes.

MR. ASHTON: -- by one of two ways. Relocating or buying out, which one would you choose?

DR. BELL: I guess if you're saying there's only a single decision and there are no other decisions that compound it I suspect you actually have other perimeters that effect your decision other than just the cost in relocation. You probably in that case you're focusing on a single community. You have other concerns, other dislodgment concerns that you need to focus on. Those might also tip you in the balance.

MR. ASHTON: I'm keeping it as simple as --

DR. BELL: I know. I'm just saying -- I understand.

MR. ASHTON: -- because things are going to become -- I'm making your answer -- I'm asking a question as simply as I can phrase it.

DR. BELL: Yeah.

MR. ASHTON: There may not in this instance my example there are no complicating decisions. It's a buy out or relocate issue. What would you do?

DR. BELL: I guess if I had a budget that I was looking -- I had assigned a hardcore budget that I wasn't looking to move from I'd run up to that budget and

stop. If I couldn't get past that budget that would be my decision. So usually in a project there's an overall -- from a corporate point of view there's a budget, you're looking to accomplish something, you allocate your resources. In this case, capital resources that you're describing, to look to see whether it accomplishes it. So it's never for me Mr. Ashton in my experience in making these types of decisions a single, you know, in vacuolar type of decision. I understand what you're saying, but the real world isn't like that from a decision making point of view.

MR. ASHTON: Well, the real world, this Council is faced with that kind of a dilemma and the real world is that somewhere along the line we may have to make that type of decision. I'm asking for your input on that, not complicating it.

DR. BELL: I would just say, you know, we don't want overstep our bounds in terms of what assistance we can provide. I mean, from a health point of view whether you buy it or relocate the lines doesn't make a difference from a health point of view. So I would leave that up to you, how it would be best feasible for you to do that from a health point of view. It's an even swap.

MR. ASHTON: Thank you.

CHAIRMAN KATZ: Back to you Mr. Fitzgerald.

MR. FITZGERALD: No questions.

CHAIRMAN KATZ: Thank you. We'll go through the list. Ms. Randell, I assume that covers you also?

MS. RANDELL: It does.

CHAIRMAN KATZ: Representative Adinolfi, any questions for this witness panel?

MR. ADINOLFI: No.

CHAIRMAN KATZ: Mr. Adinolfi said no. Attorney Knapp (phonetic), questions for the witnesses? Absent. Mr. Boucher, questions for these witnesses? No. Attorneys Frank and Kohler, questions for these witnesses?

(Off the record)

MR. O'NEILL: Dr. Bell, if we were to address the existing right of ways and buffer zones and if we were to adopt a .6 standard, or 0.6 standard, how would you suggest we address the property owners that are along existing lines who are exposed to higher levels, distribution lines included, as well as transmission lines? How would we respond to those people?

DR. BELL: The question would be -- sorry. The question would be?

MR. O'NEILL: In matters of exposure to EMFs --

DR. BELL: Yes. Right.

MR. O'NEILL: -- property owners, residents, along existing power lines and distribution lines who may be exposed to higher than your .6 standards, how would -- how should the State respond to those property owners in your scenario?

DR. BELL: I guess the first concept is that this is outside the Docket obviously, it seems like in this case. But leaving that aside, I think with Mr. Fitzgerald's discussion regarding classrooms and whether in general once you look to mitigate the risks to children I think the principle actually holds and it holds, you know, in distribution lines as well as overhead transmission lines. The -- you have no statutory authority as I understand it in the obligation only bespeaks new 345 kV lines and this Docket only speaks to that. But my own recommendation would be in general and in many places this is the case is that the option of homeowners for example, with running undergrounding of distribution lines.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Okay. Attorney Frank, are

you up?

MR. FRANK: I am. Thank you Madam Chairman. Dr. Bell, you've opined that .6 mG is an acceptable level of risk, right?

DR. BELL: Actually, I guess as it came out with Chairman Katz's clarification is we've opined that it's acceptable, but also defensible.

MR. FRANK: Okay. And were you here when State Senator Smith provided some comments to the Council?

DR. BELL: During part of it. I had a stretch for part of it as well.

MR. FRANK: Were you here when he stated that the intent of the Public Act is to err on the side of caution?

DR. BELL: Yes. Yes, I was here for that.

MR. FRANK: Okay. And does your opinion that the appropriate background level of .6 mG, does that err on the side of caution?

DR. BELL: Yes, I think it does sir.

MR. FRANK: Now yesterday Chairman Katz asked the utilities to provide data concerning the number of structures impacted assuming a level of EMF at 3 mG. Do you recall that?

DR. BELL: Yes.

MR. FRANK: And what is the risk to children at structures or facilities at 3 mG as compared to .6 mG?

DR. BELL: There's a highly statistically significant 80 percent increase in the risk of acute lymphocytic leukemia, or childhood leukemia at 3 mG.

MR. FRANK: And in your --

DR. BELL: As opposed to background.

MR. FRANK: -- and in your professional opinion would providing -- would a level of EMF at 3 mG err on the side of caution?

DR. BELL: Well, actually it would accept a substantial amount of risk.

MR. TAIT: Dr. Bell?

DR. BELL: Yes Professor Tait?

MR. TAIT: So you disagree with the Connecticut Health Department person that says prudent avoidance is 3 mG?

DR. BELL: I think actually looking at it very carefully maybe Dr. Rabinowitz would like to address this as well. He gave quite a bit of guidance.

DR. RABINOWITZ: Dr. Ginsberg really spoke, I think in response to the question from one of the Council about, you know, how big a risk are we talking

about here and is this something that we should worry about. And he was trying to put some actual numbers on the types of risk that we're talking about. If we talk about the incidents of leukemia being one in 10,000 among kids roughly and that if you're talking about an 80 percent or 100 percent increase in risk we're talking about a doubling of the risk and sort of adding for every 10,000 people exposed another case of leukemia. So we're talking there about basically one times 10 to the minus fourth risk of cancer when we talk about -- so one in 10,000ths risk, whereas Dr. Ginsberg said that when you remediate chemical hazards in Connecticut it's very customary to actually remediate to a cancer risk of one in a million. So that I think he was just saying that to show that we're talking about a substantial risk in terms of how we consider environmental risks here and he said that, you know, usually it's unusual for us to remediate cancer risk in the environment to one in 10,000. Usually we like to go to one in a million or one in 100,000.

So in terms of the -- the three -- I think Dr. Ginsberg was saying that when you talk about 3 or 4 mG, or when you talk about a doubling of the risk wherever you want to set that, then you're talking about a substantial risk. So --

CHAIRMAN KATZ: But didn't Dr. Ginsberg also say that he would be comfortable with two-fold times the 3 mG?

MR. TAIT: Yeah. Isn't that 100 percent?

CHAIRMAN KATZ: Didn't we have that testimony?

DR. BELL: At the same time, as we all know, he also provided that he was comfortable with 300 feet, which provided as he said in his testimony with 1 mG or less.

CHAIRMAN KATZ: Right. We realize that, but --

MR. TAIT: Yeah. I'm sure he's comfortable with 1.6.

DR. BELL: So I think, you know, as I said, you need to decide how much risk you're looking to take and just take it.

MR. TAIT: Okay.

CHAIRMAN KATZ: Thank you.

MR. FRANK: But if you were to err on the side of caution you would select a .6 mG level?

DR. BELL: Well, as Dr. Rabinowitz just stated, actually the level that's previously discussed here of 3 mG provides a 10 fold to 100 fold higher level

of risk than the State normally takes in it's focus on environmental matters. So that's -- it would be a tough position to defend I would think.

MR. TAIT: Would you say that prudent avoidance is the same as err on the side of caution?

DR. BELL: No, I wouldn't necessarily say that. Prudence avoidance has a lot of other functions associated with it.

MR. TAIT: Okay. Are either of those in the statute?

DR. BELL: I think it's as Senator Smith described the Co-Chair of the Committee clearly stated several times about err on the side of caution was their intent.

MR. TAIT: The statutory language doesn't distinguish between err on the side of caution and prudent avoidance.

DR. BELL: I'm not actually -- as I understand here actually providing my medical, scientific, and to some regard policy, but I'd be glad to try and interpret the statute as well.

CHAIRMAN KATZ: No, that's alright.

MR. TAIT: We have that job.

DR. BELL: It may go further than any of us

want.

CHAIRMAN KATZ: We have others who will do that. Thank you.

MR. EDWARD WILENSKY: Madam Chairman?

CHAIRMAN KATZ: Yes Mr. Wilensky?

MR. WILENSKY: Are there any studies out there that show that 3 mG cause leukemia or cancer in children, are there any cancer clusters for 3 mG anyplace in this country that you might know of? Or any studies that you might know of Dr. Bell?

DR. BELL: Yes, absolutely. That's -- some of the material that Mr. Fitzgerald was questioning previously, I guess it was the -- is that the Greenland study that's the 3 mG? It's the -- so for example the -- actually I think it's the Greenland study actually, which is a very well established and as Mr. Fitzgerald was asserting a superior study.

MR. WILENSKY: Which you agreed with?

DR. BELL: Excuse me?

MR. WILENSKY: Which you agreed with?

DR. BELL: I don't remember how we ended that one actually.

MR. WILENSKY: I don't either.

DR. BELL: But nonetheless, he asserted it

that it was a superior study and that it showed actually a highly significant increase in the risk of cancer in children at 3 mG. It was an 80 percent increase in risk and the likelihood of that being due to chance was somewhere around one to two in 1,000. And so that would be the study.

MR. WILENSKY: Dr. Bell, there's the risk, but are there any cancer clusters and are there any areas where this is showing up that children got leukemia because of 3 mG?

DR. BELL: I apologize Mr. Wilensky. In that study the way they came to that conclusion by showing more cancer in children who were exposed to 3 mG than in children who were not exposed to 3 mG. It's not a model, it's not an estimate, it's not a projection. It's actually they observed more cancer, more leukemia in children who were exposed to 3 mG than in children who were exposed to background. So they're not guessing, they're not projecting, but there was more. In fact there's certainty that the more was really true was, you know, one in 1,000 chance of it not really being more, but they observed more.

MR. WILENSKY: Thank you Dr. Bell.

CHAIRMAN KATZ: Dr. Bell, how do you feel

about new transmission lines should have no net increase over existing transmission lines?

DR. BELL: I think that the, you know, as we sort of discussed in part that the current EMF levels associated with a variety of lines, and as Mr. Fitzgerald and I discussed in a variety of different settings, have been shown now to pose an increased risk of childhood leukemia. So like lots of different settings, like lead abatement and so forth there are many settings where, you know, one may choose to keep something status quo. In the event that one does that one asserts affirmatively an increased risk of cancer in the event that it's over background. So in my own view it would be inconsistent with any of the numbers that we've discussed of .6, which would be the majority or 1 mG looking -- I think that's something that one could defend. I think a status quo that was in the -- above 1 mG, above .6 mG would be increasingly difficult to defend as providing safety and health to the children.

CHAIRMAN KATZ: Mr. Frank, back to you.

MR. FRANK: Thank you. Dr. Bell, the utility company that provided EMF calculations for the 27.7 New England-wide gigawatt peak load, which may be achieved when the line goes into service in 2007. They've

also provided EMF calculations for the 15 gigawatt New England-wide average load today. In your opinion what level of load should be considered in determining safety levels with respect to EMF?

DR. BELL: Normally in settings where one looks at trying to determine a safe human exposure level one wants to of course have the evidence of safety to be much higher than level one allows. So we know currently that based upon the Applicants' data that only about a quarter of the hours in 2003 were spent at 50 percent of peak load. So in fact, actually, you know, it describes actually that the market skewing of the data and as they themselves asserted so they would expect the load to increase over a time. So the average load of 15 gigawatts, which is only seen in roughly, you know, 25 to 30 percent of the time according to their own data would suggest that most of the time it's going to be substantially greater than the average 15 gigawatt load.

We already have identified that the expected life of the lines that are under consideration now are at least for one if not two generations of people in the state of Connecticut. And they refuse to provide us the maximum capacity system-wide load. Whatever that maximum capacity, which is surely higher than 15, which is

present in the minority of the time now is surely higher than 25, since they assert 27 gigawatts will be reached in 2007 and they suggest that 30 gigawatts will be reached in 2010. So it's somewhere north of 30 gigawatts. But we can't actually obtain the data identifying what the maximum capacity is across the New England system to be able to answer that question correctly.

MR. FRANK: Okay.

VOICE: Mr. Frank, would you just turn that microphone toward you?

MR. FRANK: Is that better?

VOICE: There you go.

MR. FRANK: Okay. Let's break that down. First, what is the problem with focusing on just the 15 gigawatt average load case that exists today?

DR. BELL: The first problem is that not even for today, for last year we know the majority of the time is spent in substantial excess of 15 gigawatts. So as far as understanding what the exposure is to the children we know that was inadequate a year ago. We understand it's going higher now so we know it's an inadequate level of current in the system to project the level of EMF that we'll be exposing our children to.

MR. FRANK: And if you were to err on the

side of caution, in your opinion is it more appropriate to focus on the 27.7 gigawatt case than the 15 gigawatt case?

CHAIRMAN KATZ: You asked that already.

MR. FRANK: I don't believe I asked that question.

CHAIRMAN KATZ: Okay.

DR. BELL: Only given those two as the choice I'd pick the 27.7 and the reason for it is that more approximates the exposure that we can expect our children to receive.

MR. ASHTON: What is the basis for making that statement? I really don't understand it.

DR. BELL: Mr. Ashton, I would appreciate any assistance you can provide here. My understanding is as provided in testimony that one of the many days I sat here was describing that the average -- the loads actually are going up year in and year out and so that what's described as an average load for example represents only a minority of the time.

MR. ASHTON: Okay. Your comments I think are --

DR. BELL: Yes.

MR. ASHTON: -- predicated on the assumption that line loading is directly and

proportionately related to system load, is that a fair statement?

DR. BELL: No, it's not a fair statement. Only that I would expect that one goes up the other, but not necessarily directly and literally related.

MR. ASHTON: Let me postulate this as an example of what I'm trying to get at. Suppose I have a system where around load -- area A I have a lot of hydro, which is seasonal, peaking type hydro. The other is a -- at the opposite end on B is a lot of peaking generation. The economics of power generation would say you'd run your hydro to the extent possible so that if I had peaking generation I'm only going to call on that at the time of peak load. In the meantime I've got to move the generation from hydro down to that bus B. Southwest Connecticut is by analogy that sort of situation. It's got a lot of old generation, which is less efficient, and the more efficient generation lies elsewhere in the New England system.

So as you get down to lower loads, get down to 50 percent load and below, it's entirely possible that the load on the line might actually increase far higher than it will be at peak load. And this is where a lot of discussion and a lot of confusion from my perspective that

loading on the system drives -- is proportionate to loading on the line. It may well be inversely proportionate.

DR. BELL: Mr. Ashton, I think that's very helpful. I have three specific comments predicated by the first most important assumption is that the data that we've been provided is universally from the Applicant and so I can't be in a position to vouch for it's accuracy. But I don't know of any -- so my first comment would be, I don't know of any circumstance whereby the model 27 gigawatt load across the system provides an EMF in any section under this Docket that is not greater than the model 15 gigawatt.

MR. ASHTON: But remember as it was testified to, the 27 gigawatt loading was driven by the fact that the Applicant for this exercise had assumed that generation in great quantity, much greater than normal was not available in southwest Connecticut. He was -- they were deliberately stressing the system to see whether the 345 connection could stand -- support southwest Connecticut in that unfortunate aberration of an instance.

DR. BELL: You may recall that as the -- hopefully silent sidekick of Attorney Schaffer (phonetic) in his attempt to cross examine a few months ago, we

attempted to identify the detailed assumptions that went into each calculation and were unsuccessful in that. But your points --

MR. ASHTON: They're in the record. That generation dispatch is in the record.

CHAIRMAN KATZ: Why don't we do this because the witness does not purport to be an electrical engineer.

MR. ASHTON: No, I understand that. I'm trying to --

CHAIRMAN KATZ: So he has told us what assumptions he made his medical opinion on and why don't we go from there and when we have the Applicant back up here we can reestablish the electrical part of it, how does that sound?

MR. ASHTON: Can I just --

DR. RABINOWITZ: We'd certainly like to see estimates that deal with what's expected in the future. We're assuming that we're talking mostly about line load and what we care about is on transmission lines near schools.

DR. BELL: One aspect in evaluating safety of course is that, you know, when there is something that's locked and loaded you expect it all to fire. And

that's actually how you gauge the safety of the situation. So quite frankly from a -- and that actually happens commonly throughout development. There's no sort of I'll only give it at this dose. There has to be safety that's substantially higher than levels of 10 fold, 100 fold what's anticipated. So in any setting that I can anticipate given my experience in looking at thousands of patients in human safety, one wants to in this case identify the maximum amount that can be provided and then provide a level on top of that as providing for safety. But that's your risk that you're going to need to take. It's your determination.

MR. ASHTON: Well, this is what we're -- we're trying to get our hands around this whole risk area. I have one question which relates to this kind of thing that -- is the 6 mG value you're suggesting --

CHAIRMAN KATZ: 0.6

MR. ASHTON: -- 0.6, right. The value that you're suggesting the average or peak value, even if the peak only occurs for a short time, how -- what is it's value?

DR. BELL: The 0.6 mG, which is the generally found level amongst children, or in schools, or in homes throughout the United States and thousands of

samples have been looked at, we would look to apply in this case as that being the highest level that can be reached at the highest anticipated or possible current load. Mr. Ashton, so that would actually be again, from the err on the side of caution that would be the 60 Hz EMF level at the maximum capacity that could be provided in the system. And that way you and I would know each night that the EMF level provided and exposed to children would be that level or less at any time that I could possibly anticipate.

MR. ASHTON: Okay. You've used a term again that troubles me because I don't understand it, and that's maximum capacity of the system. If you'll allow me for a second a transmission line part of a network typically carries as it's average peak load, the normal peak load, something -- somewhere 35 to 50 percent of it's thermal rating. That is, it has a thermal rating of 1,000 amperes the load typically -- peak load will typically run three to 500 amperes. And that's driven by the economics of the situation. These lines all have this thermal capacity and then they even have a short-term thermal capacity to allow for contingent operations. The kind of situation that occurred last August 14th where lines rated 1,000 amperes actually carried a couple thousand for a few

milliseconds.

And this is why it's important to understand this term -- what you've used as maximum system rating and perhaps what I'm using as these peak load ratings as to what -- how they translate then into the magnet field limitations. Are we designing it for that couple of hundredths of a second where the Southington to New York lines carried 2,000 amperes or are we designing for what appears hour in, hour out, day after day after week after month after year?

DR. BELL: It's certainly not the latter. I think the latter actually as we can see here as that sort of what is projected as the day in and day out quite frankly at the low that's described by the Applicant occurs less than a quarter of the time. So that obviously, you know, doesn't provide any sense of comfort. I think it would be much closer to the thermal capacity.

MR. ASHTON: Okay. Thank you.

DR. BELL: And in that setting one would always be in a position to be able to defend that the magnetic field exposed to children would be less than the level that you've asserted.

MR. TAIT: Are you through Phil?

MR. ASHTON: Yes. Thank you.

MR. TAIT: Mr. Heffernan?

MR. HEFFERNAN: No. No questions.

MR. TAIT: Ed?

MR. ASHTON: He's got some -- I think counsel --

MR. TAIT: I'm sorry.

MR. FRANK: Thank you Professor Tait. Dr. Bell, you heard Dr. Bailey's testimony this morning about measurement of existing EMF levels, do you recall that testimony?

DR. BELL: It was quite confusing actually. I think I recall part of it.

MR. FRANK: Okay. Do you have any concerns about the accuracy of the EMF measurements that have been provided?

DR. BELL: Well, you know, I currently operate in a heavily related industry. Far more regulated than the one that you're focusing on regulating. And the quality assurance and quality control that we need to have in this heavily regulated industry and in the pharmaceutical and medical or biotech industry, you know, assures us that the data that we provide to a regulatory agency has been QA'd and QC's ad infinite item. So based upon the discussion that I was present listening to today

I can't assert that that's actually occurred in this case. So yes, I would actually voice some level of restraint based upon the interpretation until it's all been quality assured and quality controlled.

MR. FRANK: And how does this concern impact your opinion on what the proper buffer zone should be?

DR. BELL: It unfortunately makes it much more difficult to be reliant on data that is unclear. The meaningfulness of it is unclear the modeling assumptions whether they provided sufficient probability of how many hours a day the EMF levels actually would be projected exist. It makes us also more focused on identifying a distance, which is much more easily verifiable, which is part of why we've included that in our algorithm of 300 feet.

MR. FRANK: Okay. Chairman Katz gave a homework assignment to the Applicants in which she asked the Applicants whether they could design a 345 kV overhead line with no net increase in EMF at the edge of the right of way, do you recall that?

DR. BELL: Yes sir.

MR. FRANK: Okay. And she prefaced the homework assignment by asking the Applicants to assume

that there is no adverse health impact based on the lines that currently exist, do you recall that?

DR. BELL: Yes I do.

MR. FRANK: Okay. Is that a correct assumption?

DR. BELL: I think in the event that it's above background that would not be supported by data and it'll be a difficult to defend position.

MR. FRANK: Okay. Why?

DR. BELL: And the reason for it is that data that's been described asserts and demonstrates a significant 40 to 100 percent increase in the risk of acute lymphocytic leukemia, many of those levels of which would be the same levels that current lines actually operate at in the state of Connecticut, which it would currently then provide an unacceptable risk inconsistent with the statute which requires health and safety buffer.

MR. FRANK: Okay. And that wouldn't err on the side of caution in your opinion?

DR. BELL: No, actually that would defend the status quo.

MR. FRANK: If I could please direct your attention to Exhibit 1, to Dr. Bailey's supplemental testimony? I think it's right next to your right elbow.

Exhibit 124.

DR. BELL: Okay. Yeah, I got it.

MR. FRANK: If I could direct your attention please to cross section eight, south segment for the 27 gigawatt case?

DR. BELL: Yes.

VOICE: What page is that?

MR. FRANK: I think it's the last page. I didn't staple it, but --

MR. ASHTON: On the bottom it lists the pages.

MR. FRANK: Page 26 of 26. Do you have that in front of you Dr. Bell?

DR. BELL: Yes sir.

MR. FRANK: Now let's start directly underneath the transmission line, okay?

DR. BELL: Yes.

MR. FRANK: Now assuming that split phasing works as represented and for purposes of my question also assume the validity of the calculations that have been provided, okay?

DR. BELL: Yes.

MR. FRANK: Under the existing calculations for EMF it is 66.9 mGs, is that correct?

DR. BELL: Yes.

MR. FRANK: And under the proposed 345 kV overhead with split phase and a higher tower the EMF reading -- or measurement -- I'm sorry, the EMF calculation is 21.3, right?

DR. BELL: Yes. The final line, yes.

MR. FRANK: Now while 21.3 is certainly less than 66.9, is 21.3 acceptable from a public health standpoint?

DR. BELL: Each of the numbers represent a markedly and substantially increased risk of childhood leukemia if there was prolonged exposure to the population, particularly including children.

MR. FRANK: Okay. And assuming that children congregate underneath the line are any of these calculations safe?

DR. BELL: One couldn't conclude based upon the data that any of these numbers under the line here would be safe. One would conclude in each of the settings that you'd expect them to be associated with a marked and significant increase in the risk of leukemia if there was prolonged exposure to congregating children.

MR. FRANK: Now Ezra Academy is located within this cross section, right?

DR. BELL: I'll go with you.

MR. FRANK: Okay. Now assume for purposes of my question that the building is 15 feet off the line on the southeast edge of the right of way, okay?

DR. BELL: I think we have it.

MR. FRANK: Okay. As I read this, assuming again that split phasing works is represented and that you have a higher tower, at the edge of the building the EMF calculation is 4.6 mG, right?

DR. BELL: That's correct.

MR. FRANK: Okay. And does that pose a health risk to children?

MR. TAIT: I think you're asking questions that have been answered repeatedly. Dr. Bell testified that .6 -- anything above that is unacceptable.

DR. BELL: Certainly as Professor Tait mentions you'd expect 100 percent increase in the risk of leukemia at that level of 4.6.

MR. TAIT: Do we need to go through each of these to get at that same question?

MR. FRANK: Well, I'd like to ask one or two more and then I'll move on.

MR. TAIT: Are they the exact same answer that Dr. Bell will say that if it's over .6 it will be an

unacceptable risk? If so I think we can move on.

MR. FRANK: Okay. Fine. Just so we can move on I'm going to ask you the same questions with respect to the JCC, which is located in the -- I'll do it quicker, in the middle segment of cross section eight for the 27 gigawatt case.

MR. TAIT: Mr. Monte, we're intelligent human beings and can understand the line of reasoning that you're doing. Do we really need to go through this?

MR. FRANK: I don't need to go through it, no. I think it would be helpful to the Council to understand the levels of EMF. If you're telling me that you don't need me to do it I'll move on.

VOICE: I don't think you do.

MR. TAIT: I don't -- we understand Dr. Bell.

MR. FRANK: Fine. Then I'm happy to move on.

MR. TAIT: Thank you.

MR. FRANK: In connection with Public Act 04246 you've outlined an algorithm for assisting in the determination of site decisions, right?

DR. BELL: Yes, we've proposed an algorithm.

MR. FRANK: Okay. And can you please describe that algorithm?

DR. BELL: What we've proposed actually is that there be the first priority --

MR. TAIT: Isn't this asked and answered? Isn't this rehashing your direct? This is --

MR. FRANK: I have some questions that follow from it, but just for purposes of background --

MR. TAIT: This is re-cross examination -- re-direct examination I understand.

MR. FRANK: -- it's cross.

MR. TAIT: It's your testimony.

MR. FRANK: It's not my testimony.

MR. TAIT: I'm sorry. Go ahead.

MR. FRANK: Describe briefly what the algorithm is?

DR. BELL: I'll try not to speak too quickly but be brief in any case. We proposed a three part algorithm to provide a system by which the Siting Council can make decisions siting across the 500 to 1000 decisions that have to be made. The first one stemming from the Act would provide that of course they be undergrounded. We also note that it should be provided that the undergrounding should expose children the

susceptible target populations to no more than background or .6 mG at the highest capacity current that be provided.

In the event that that fails because it's technologically infeasible we also provide this second tier, the back up system, which is that a 300 foot safety buffer be created for overhead lines, 300 feet from the edge of the transmission line provided that 300 foot is sufficient to provide at the edge of that 300 foot safety buffer a reading at maximum current of .6 mG or less. Should the Siting Council fail to be able to fit a particular situation to the second tier we'd fall to the third tier where we'd accept and propose a less than 300 foot safety buffer provided at 0.6 mG as provided at that then safety buffer. The minimum in this case then would of course be the right of way by statute. And in the event that third tier should fail we propose that the Siting Council not site the line at that setting.

MR. TAIT: To elaborate, is the last one that we not site it or that we expand the right of way or --

DR. BELL: To fit into one, two, or three. Right.

MR. TAIT: -- or get a new right of way?

DR. BELL: Right. Right. To re-conform

the analysis that you'd fit into one, two, or three, on an interim basis until you get there.

MR. FRANK: Dr. Bell, can you apply this algorithm to Ezra Academy and B'nai Jacob?

DR. BELL: Oh boy. Well, certainly at Ezra Academy the undergrounding would be the first setting that one would look to identify whether it's technologically feasible to run it in that setting. In the event that one could also provide a buffer with no more than .6 mG around that setting.

The second setting would be to clearly expand the current right of way to obtain a safety buffer of a minimum of 300 feet provided that 300 feet was associated with a 0.6 mG or less magnetic field reading at 60 Hz at optimal maximum current. In the event that that's not possible by in this case I guess we'd be moving the lines further away from the building the third possibility would be to have less than a 300 foot buffer such that it would be minimally the right of way, but one would have to obtain a 0.6 mG reading at maximum current through that line, the maximum thermal current that's possible through that line at the edge of that then current safety buffer.

MR. FRANK: And I take it the same analysis

would apply to the JCC?

DR. BELL: The JCC actually is far more challenging since the JCC -- all of the proposed lines, at least I saw briefly this morning all run directly over statutory facilities of playgrounds and ball fields. So in that case actually there is no sense of one creating a safety buffer because all of those -- all of those facilities would be in the safety buffer in the current right of way, or the ones that I've seen proposed. So to have to be moved separate from where it is to then create a new right of way and a new safety buffer such that the safety buffer did not include -- I mean the statutory facilities did not include a pool, did not include playgrounds, did not include at the edge of the building either.

MS. KOHLER: Julie Kohler for the city of Milford. At the risk of incurring the ire of the Vice Chairman, Dr. Bell I'd like to ask you a couple of questions about a couple of different locations in Milford.

DR. BELL: Yes.

MS. KOHLER: You have the cross section peak load self-segment? Milford happens to share the same segment as Woodbridge.

DR. BELL: That's fortunate, yes I do.

MR. TAIT: This is again page 26 of 26?

MS. KOHLER: Again, 26 of 26.

MS. TAIT: Ms. Kohler, you're allowed one question on that topic. Include all your locations. I assume it's a .6 question?

MS. KOHLER: You'd like me to include all of my locations in one?

DR. BELL: That's okay.

MR. TAIT: Or any of those above that level and what is his opinion.

MS. KOHLER: I think the difficulty is is that the Council has asked us to paint a picture of the areas of concern for each of the individual towns and we're just simply trying to do so.

MR. TAIT: What we don't need --

MS. KOHLER: I'm sorry?

MR. TAIT: -- as I just mentioned to Mr. Frank that we didn't need one by one the same answer when it's all deprivicated on Dr. Bell's clear testimony that in his opinion anything over .6 is unsafe. I'm sure you've provided us with a list of where it is and you're going to read it from the document in evidence. So I'll let you ask one question if you want to get it on the

record that those things in his opinion exceed acceptable levels.

MS. KOHLER: I will try and do so. Dr. Bell, is it your expert opinion that in any area of a recreation such as Eisenhower Park, any residential backyards or any residential homes in which children are located that exposure to levels above .6 mG would be dangerous?

MR. TAIT: Excellent.

MS. KOHLER: Thank you.

DR. BELL: It's -- Attorney Kohler, it's my opinion that based upon enormous amount of research and evaluation in the area that any of the levels that you -- any of the areas that you describe should there be children that congregate in those areas the children would be provided with a risk of acute lymphocytic leukemia in excess to the children in the majority of the United States and that would be a higher risk then, yes.

MS. KOHLER: Thank you.

MR. TAIT: Thank you.

CHAIRMAN KATZ: Oh, okay.

MR. FITZGERALD: I do have a --

CHAIRMAN KATZ: Redirect?

MR. FITZGERALD: -- well, not a redirect,

but I do have a couple of questions if we're about to -- if you're about to end for the day then I'd like --

CHAIRMAN KATZ: Do you want to wait until we go through the list?

MR. FITZGERALD: Sure. Yeah, yeah.

CHAIRMAN KATZ: Okay.

MR. TAIT: Go through the list and you might have --

CHAIRMAN KATZ: Mr. Stone, do you have questions for this witness? Witnesses? We might have to have Dr. Ginsberg back. We're thinking about that one. Tomorrow.

MR. STONE: Brian Stone, town of Orange. And I'd like to welcome the Chair back.

CHAIRMAN KATZ: Ut-oh. What happened?

MR. STONE: I am not going to follow the same line of questioning, notwithstanding the return of the Chair. I want to follow some questions -- follow up on some questions actually that Mr. Zak had asked you and that related to the California study and you had a back and forth concerning this issue of net currents -- the reduction of net currents would reduce 70 percent of exposure to EMF. And the bottom line of that ultimately was that you agreed that that's exactly what was said in

the statement. But if I understood that you disagreed that there was significance to that particular statement, is that -- well, is that a correct reading of what you were trying to state?

DR. BELL: Yes. The reading actually is that there -- as the article states, the article is a -- as Mr. Fitzgerald, you know, obviously aptly pointed out that the thrust of the article obviously is focusing on the economics of how one would mitigate the electromagnetic fields in schools in the state of California. And if focused on both net currents and transmission lines and distribution lines and talked about the cost effectiveness of the various approaches, the thrust of it was that it was a worthwhile public endeavor to reduce the electromagnetic fields and that was the overwhelming thrust of why the study was commissioned.

MR. STONE: Why did -- in your opinion do you feel that that particular stand alone sentence that you can reduce -- that the reduction of net currents by 70 -- could reduce 70 percent of the exposure lacks the force with which obviously Mr. Fitzgerald seemed to --

CHAIRMAN KATZ: No characterizations. Just ask the question.

MR. TAIT: No characterizations. Save your

argument for the jury.

MR. BELL: Yeah. No, I think that the -- for all of our dialogue it was probably very effective dialogue. And I think that the fact actually is is that the majority of schools in the state of California obviously have very low currents. They have well less than 1 mG -- excuse me, 1 mG of electromagnetic field. So when one talks about the application of a particular technique, for example reduction of that current, which as Mr. Fitzgerald points out is exactly the right thing to talk about, it's very appropriate. It really has the largest application to the schools with already, you know, close to background type levels of electromagnetic fields. But I'm not deterring it. Mr. Fitzgerald's point was that it's something that should be done and I concurred with that.

MR. STONE: Thank you.

CHAIRMAN KATZ: Thank you Mr. Stone. Assistant Attorney General Wertheimer?

MR. WERTHEIMER: No questions.

CHAIRMAN KATZ: Mr. Wertheimer says no questions. Ms. Bradley says no questions. Mr. MacLeod?

MR. ANTHONY MacLEOD: No questions.

CHAIRMAN KATZ: Mr. MacLeod says no

questions. Mr. Walsh, Ms. Meskill?

MS. MESKILL: No questions.

CHAIRMAN KATZ: DOT says no questions. Mr. Lord?

MR. ANDREW LORD: No questions.

CHAIRMAN KATZ: No questions. Mr. Burturla?

MR. RICHARD BURTURLA: No questions.

CHAIRMAN KATZ: Is there any party or intervenor that I missed? Mr. Cunliffe? Oh, I'm sorry.

MS. ELIZABETH GILSON: The city of New Haven has no questions.

CHAIRMAN KATZ: Oh, I'm sorry Ms. Gilson. And we have a intervenor in the back. Yes? Can you --

MS. HANKS: The town of North Haven has no questions.

CHAIRMAN KATZ: -- the town of North Haven has no questions. I am sorry I missed you. I will not do that again. Attorney Hanks, correct? You will stay on the radar, thank you. Okay. Mr. Cunliffe?

MR. CUNLIFFE: No questions.

CHAIRMAN KATZ: Mr. Emerick?

MR. EMERICK: I do have a couple of questions with respect to I believe this was attached to

Dr. Bell's testimony?

DR. BELL: No.

MR. EMERICK: Again, this came separated in a package in a lot of testimony that was filed and it was at the back of yours, so I was assuming that it was yours.

DR. BELL: No. It looks like what --

MR. EMERICK: It's an aerial photograph of the JCC, which shows in yellow the power line easement and then in pink proposed alternate power line route.

DR. BELL: I saw it literally when we were discussing it earlier.

CHAIRMAN KATZ: Mr. Cunliffe, can you help us here on whose exhibit this was?

DR. BELL: I notice it looks like the JCC's -- that's what was corrected before that was filed previously. I just happened --

MR. CUNLIFFE: My understanding is that was part of the filing, but I didn't come -- it didn't come with mine when I was at my office and during cross they kept referring it to Dr. Bell's --

CHAIRMAN KATZ: Okay. Mine did come separated from anything else also, so I'm in --

VOICE: (Indiscernible, too far from mic.)

CHAIRMAN KATZ: -- thank you. It's JCC

testimony.

DR. BELL: Mr. Emerick, I'd be glad to look at it. I'm just not -- as I said, I saw it enlarged sitting on the table there briefly before.

MR. EMERICK: Well, maybe I'll ask my question and you can tell me if you can't answer them. Again, I'm still not sure who sponsored this. The area photograph colors different objects on this aerial photograph. And again, the existing line is shown in yellow, a proposed alternate route is shown in kind of a pinkish red and there's some existing facilities that are colored blue. And then there's a lighter blue that doesn't seem to correspond with the property line. What is the lighter blue?

CHAIRMAN KATZ: Why don't we take a moment and they're going to get him a copy, is that correct?

VOICE: We have a copy.

CHAIRMAN KATZ: Thank you. Dr. Ginsberg is on vacation this week but we may be having him back later in this proceeding to clarify his testimony.

DR. BELL: I think Mr. Emerick and perhaps the Applicant can assist with this, but my understanding actually is that some of this is outlined as CL&P property on this version here. Some piece of this. Mr. Emerick, I

can only -- I can't assist you with what the light blue, although I would imagine at this point it looks like the extent of the day camp would be my best judgement at this point, which is where I assume the children move about across the ball field, the pool, the nature trails and then move back and forth from the main building. That would be my judgement looking at this. It looks like it lines up well with that, but other than asserting that, I can't do any better. I'm sorry. It looks like the path of children basically.

MR. EMERICK: And it indicates -- it indicates a base camp, which is the dark blue, which is partly within the power line easement. What is the base camp?

DR. BELL: I'm pretty far from a JCC expert in any case, but I believe as is being whispered behind me is that this is the drop off where children congregate at the beginning of the day, have meetings and the like.

MR. EMERICK: So it's not -- is it a structure or is it just a meeting place?

DR. BELL: I think there is some structures that would probably fall -- my guess is given the discussion yesterday as non-significant structures though I would suspect.

MR. EMERICK: Is this one of these non-significant structures that appear?

DR. BELL: As I'm saying, I would imagine that's the case. That these are, you know, structures that kids congregate in. They have bunks and the like I think, you know, where they keep their clothes and so forth, you know, in cubbies and whatnot, but not a substantial structure as opposed to the day camp building and of course the pool, which would then be fixed structures that are, you know, substantial in nature.

MR. EMERICK: And help me understand who sponsors this?

DR. BELL: I believe as has already been stated this was the JCC that actually submitted this.

MS. RANDELL: It is our understanding. We received it from the Jewish Community Center and perhaps also Ezra Academy. We were going to suggest that since these witnesses are not familiar with the map perhaps they could be requested to have a witness come in who could answer your questions?

DR. BELL: I think the only things Mr. Emerick we can assist with is that it sounds like there's a proposed power line route right over open water in a pool. That's the only thing that's apparent to me.

MR. EMERICK: I can see that. Okay. Thank you.

MR. ROSENTHAL: We can provide that witness. I think it was suggested to me that may have been an attachment to the July 19th brief that was filed on behalf of the JCC and Ezra. It came the same -- it may have come in the same package that you received the testimony of Dr. Bell and Dr. Rabinowitz, but it would require a different party to be here and we can have that person here.

CHAIRMAN KATZ: All set? Mr. Tait?

MR. TAIT: No questions.

CHAIRMAN KATZ: Mr. O'Neill?

MR. O'NEILL: Dr. Bell, you're familiar with this report, you probably have seen a copy of it have you not? The low magnetic field transmission design options?

DR. BELL: The slide show from yesterday?

MR. O'NEILL: Yes.

DR. BELL: I haven't really reviewed it carefully, but I might have a copy. I'm not sure if I even have a copy.

MR. O'NEILL: Would you agree with the statement that as far as buffer zones, buffer zones could

be handled in a horizontal manner or they could be addressed through a vertical reconfiguration of the poles, would you agree with that?

DR. BELL: Again, I wasn't present at all during the presentation yesterday where my understanding is Dr. Bailey gave a very thorough presentation.

MR. O'NEILL: Well, don't you agree that --

DR. BELL: From a safety point of view, I mean, that kind of buffer zone?

MR. O'NEILL: -- yes.

DR. BELL: The ones that we're talking about here?

MR. O'NEILL: Yes.

DR. BELL: Yeah. I think that --

MR. O'NEILL: By raising the height of the poles you could modify the buffer zone in addition to expanding the buffer zone?

DR. BELL: -- I think that's -- I think that's correct. I think that of course, you know, one would worry about the fall zone around and the foundations required particularly if they were all around children congregating one might move it to another direction then.

MR. O'NEILL: Thank you very much.

DR. BELL: Thank you.

CHAIRMAN KATZ: Mr. Ashton?

MR. ASHTON: Nothing thank you. Nothing further.

CHAIRMAN KATZ: Mr. Heffernan?

MR. HEFFERNAN: No questions.

CHAIRMAN KATZ: Mr. Wilensky?

MR. WILENSKY: No questions Madam Chairman.

CHAIRMAN KATZ: Mr. Lynch?

MR. LYNCH: Just one question. It's more of a clarification. I have written down in my notes and I want to get the right number here. Two different age groups for a classification of what would be childhood leukemia and rather than have me go back and try to find it in thousands of pages what -- I've got 0-14 and 0-17. What are you classifying as the age group for childhood leukemia?

DR. BELL: My recollection Mr. Lynch from the discussion before is that the comments were made all of which were accurate as best I could recall by the Applicants' experts and by ourselves was really that it was zero to 19, but the greatest incidents of acute lymphocytic leukemia was in the zero to six range. So that the overall ALL designation is zero to 19 for fitting into childhood leukemia, but within that range the

greatest yearly incidents would be in the younger population of toddlers.

MR. LYNCH: Thank you. I just wanted the clarification. Thank you.

DR. BELL: Thank you.

CHAIRMAN KATZ: Okay.

MR. WILENSKY: Madam Chairman, I just want to --

CHAIRMAN KATZ: Yes.

MR. WILENSKY: -- to follow up on that Dr. Bell. Why -- why more so with children than to adults? Why do we talk about childhood leukemia and not just leukemia?

DR. RABINOWITZ: Childhood leukemia because that's what the studies have shown. I mean, that's where we've seen the increased risk of cancer with EMF. It's in the childhood age groups. There's the most compelling evidence that the different bodies have looked at has really come from the childhood cancer literature. And there's lots of biological reasons why that could be true in terms of kids being, you know, quickly developing organs and dividing blood cells and being at risk from cancer-causing agents in the environment in general.

MR. WILENSKY: In other words Dr.

Rabinowitz, they're more susceptible to it than the adults, is that --

DR. RABINOWITZ: That's the idea, yeah.

MR. HEFFERNAN: You're okay.

DR. RABINOWITZ: The tie in to this actually is children have -- we all keep some of our cancers under wraps, they never develop, by having immune system that screens them out and gets rid of the bad cells. Children, particular younger children who are, you know, a few years old, their immune system aren't all that competent to be able to screen out the cancers all the time. One of the things that ties it is in that some of the laboratory data has shown the electromagnetic fields, along with the ranges that are seen environmentally could effect the immune systems in cells and animals.

MR. WILENSKY: Thank you. Thank you gentlemen.

CHAIRMAN KATZ: Dr. Bell, your number of 0.6 mGs is that an average over a child's young, you know, zero to 17 years, is that an average over -- how does that number --

DR. BELL: It's a very good question and like most of these, and I think it's useful to understand what the details are. So there are several ways you get

to a number like that and I think it's useful to just understand it and then pick where you want to be kind of basically. The 1,000 home study as Dr. Bailey correctly assessed, or received a report on earlier today, looks at roughly a little bit less than 1,000 homes and shows that amongst all the homes 50 percent of the homes have a EMF level of 0.6. Similarly when you look at school age children, okay, which will actually be -- we're now coming back to the question that we just had, which is I think where you're going from, actually school age children 50 percent of those children will have EMF measurements of about .8 mG. If you look at preschool children it will be closer to 0.6 mG that 50 percent of the children will have.

CHAIRMAN KATZ: Over a 24 hour day?

DR. BELL: Yes. Schools in general is a little bit higher. In Canada it's about 0.66 mG as the median 50 percent have this. And in California, which we were discussing before, the median is 0.4 mG. So, you know, they all clump around there a bit and in general, you know, adults like us our exposure would tend to be higher, around 1 mG or so.

CHAIRMAN KATZ: So if a child only spends part of their day at a higher milligauss facility,

statutory facility, and spends another part of their day at a lower thing then you would average out their total exposure? For example, let's give an example. Let's say they go to Ezra Academy, which you said has basically an unhealthy milligauss level now, but they go home and they live in a place that's not even near this power line so they're basically at a much lower level those other hours of the day. Do we look at their average level?

DR. BELL: It's a tough spot to be in because from a risk management point of view I could position it just the other way. Say that they are at 1 mG in the school and their home is at 8 mG, so I think to be able to tie in on an individual basis I think will make it very difficult to actually execute out a policy and, you know, I think that the numbers are such that, you know, it's clearly there are some red flag type areas as we all would accept.

But aside from that I think that there's no way of knowing what that other area that that child lives in for example, there's no way of really knowing whether that other child -- that child lives in, you know, a high EMF house in close proximity to a power plant. I mean, there's no way of knowing that so I don't know how you could know that to make your policy. I certainly would

think it would be difficult to guess.

CHAIRMAN KATZ: Once we establish this buffer zone to keep kids out of this buffer zone, I mean, should this Council -- for example, do you recommend this Council order as a condition of construction of overhead transmission line that we sort of prevent fence off or prevent people from using the area under the lines so that we minimize their exposure?

DR. BELL: Well, certainly the first thing is the undergrounding lines as required by the statute --

CHAIRMAN KATZ: Yes, of course.

DR. BELL: -- and as we already opined that one of the most important aspects there as Mr. Ashton was describing as well is to make sure that we minimize the electromagnetic field exposure to children since you need to coordinate how deep that undergrounding is and where the buffer is run undergrounding. And in the event -- and in that setting actually I would anticipate there being a buffer since it's consistent with the intent of the legislation.

In the event there's an overhead line, so it's visible as well, you know, I would imagine that signage of some type would provide sufficient notice to -- and that's what other states do as well.

CHAIRMAN KATZ: But some uses under electric lines have shorter term exposure. For example, if you had a parking lot under an electric line people don't linger there, etcetera. Or, you know, playground people -- some playgrounds they only spend a few hours, etcetera.

DR. BELL: It's very clear for example that if you had a -- I won't say very clear, but it's highly likely that if you had a, you know, a basketball court under a power line and you only played an hour or two of basketball and you got exposed to 50 to 60 mG and you're a six to seven year old aspiring NBA player, it's probably not a healthy thing and there's animal data to support that short five to 10 minute exposures in animals can disrupt and damage DNA of animals. And quite frankly, in animals that are outside exposed to power lines.

So, you know, I think it's a tough spot. I think you need to use judgement in terms of asserting what qualifies as a congregation of children. I mean, that's really I think the critical piece. Once you get to identifying what the buffer is then the question is how do you implement it to sort of say, well, you know, this is statutory setting and we need to make sure that children don't congregate.

CHAIRMAN KATZ: We might as a condition want to restrict access to the right of way.

DR. BELL: Yes. I think that would be advisable.

MR. O'NEILL: If I may follow up Madam Chairman? Dr. Bell, it occurs to me this right of way has existed for many years, those electrical wires have been there for many years. Prudent avoidance, isn't it really a two way street? Isn't it incumbent upon municipalities and owners of property adjacent to power lines to use good judgement and prudent avoidance in order to avoid building playgrounds and so forth and swimming pools under these lines or in close proximity? At a certain point it seems we have to consider realigning a power line or moving a playground or moving a softball field as opposed to undergrounding it underneath a playground or underneath a certain area which may be sensitive. Isn't prudent avoidance a two way street?

DR. BELL: I absolutely agree that there's a concept right now as opposed to five to 10 years ago that knowledgeable and willful actions on the part of the Council as well as myself and other normal citizens, you know, we should be responsible for those. On the other hand, to the extent that one's not knowledgeable or that

one's not willful about it, and I can't speak to people's willfulness, but certainly 10 to 20 years ago knowledge -- there isn't nearly the knowledge there is today about the dangers of EMF. I wouldn't look to hold someone responsible for an action taken 10 to 20 to 30 years ago prior to all of the data that's come out. In the event that occurs now? Yes, I agree with that view for myself and others.

MR. O'NEILL: Thank you.

DR. RABINOWITZ: And it's true of health risks in general. You know, there's lots of things that relate to what we do in our personal lives and risks we take and then there's risks that we experience because of a policy decision of the government or something and I think the idea is that the policy bodies, the government bodies need to do everything that they can to minimize risk and people should be educated and do what they can to minimize risk too.

DR. BELL: It would be fair to say that with the a new statute there's a new slate here that everyone needs to be more focused and aware of it.

MR. O'NEILL: Well, you understand --

DR. BELL: And their -- and I'm saying and citizens have a responsibility that they may not have had

before.

MR. O'NEILL: -- you understand the limitations that we have as far as land use planning and zoning throughout the state of Connecticut. There are limitations. You acknowledge those?

DR. BELL: I realize you have a challenge here. Yeah.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Mr. Rosenthal, I'm going to invite your clients to either brief this, whatever, but my concern is that if we cannot underground in this area of Woodbridge and we have to go overhead, to protect these children we are going to disrupt the existing condition sufficiently at JCC and Ezra Academy B'nai Jacob because of the proximity of their facilities and their -- right now their willingness or -- they want to be able to cross the right of way and go back and forth to their various facilities. If we want to be protective of the children we do not want to do conditions that are going to be disruptive to everyday life there.

So it's a balancing act and if they have any thoughts that they want to brief us on this balancing act of protecting the children but not disrupting their use of their existing property -- because your witnesses

have just told us the existing condition is not good. So it kind of puts this Council in a quandary.

Okay. Are we complete with this witness panel?

MR. FITZGERALD: No. We haven't re-crossed.

CHAIRMAN KATZ: I'm sorry. Yes, you're right. Thank you for reminding me.

MR. FITZGERALD: Thank you. Doctors, you've made many statements today about increases in risk. Is it the case that a statement that a risk is increased is predicated on the fact that a risk exists?

DR. BELL: No. It's actually predicated upon a fact that you think leukemia is a risk. In other words, we might consider in some perverse way that leukemia is a benefit. If you disband with the idea of having cancer as a benefit I think everyone would agree it's a risk.

MR. FITZGERALD: If we are talking about increasing the risk of childhood leukemia through exposing children to transmission line fields aren't you necessarily incorporating in that assertion a predicate that transmission line magnetic fields cause leukemia?

DR. BELL: Well, in the state of

Connecticut there's a Public Act that has been passed that provides the obligation of the Siting Council to establish a safety buffer to protect children. So I think that's the predicate for this one.

MR. FITZGERALD: No. I'm not asking about the Act. I'm not asking about the public policy.

DR. BELL: I'm sorry.

MR. FITZGERALD: I'm asking about your medical testimony over and over again today that has spoken of increasing a risk by an exposure.

DR. BELL: Yes.

MR. FITZGERALD: Let me put it this way, if in fact magnetic field exposure from transmission lines does not cause childhood leukemia it doesn't increase the risk of childhood leukemia, right?

DR. BELL: There's about a one in 1,000 chance in humans that there's not a significant association between childhood leukemia and elevated EMF.

MR. TAIT: Please try to answer -- if it's a yes or no question please answer yes or no. You can add to it later, but I'd like the answer to Mr. Fitzgerald's question.

DR. BELL: So you're asking -- I apologize. Mr. Fitzgerald is --

CHAIRMAN KATZ: Why don't you ask the question again Mr. Fitzgerald and then Dr. Bell will start with yes, but, or no, but.

MR. RABINOWITZ: Well, I mean, it's a common sense thing. We are talking about the fact that we are sufficiently concerned that there is a risk of cancer here.

MR. TAIT: Yes.

MR. RABINOWITZ: That's all we're saying.

MR. TAIT: And if the facts are otherwise --

MR. RABINOWITZ: If in 20 years we learn that those studies were wrong, that we were all wrong, then -- then there's no risk, yes.

MR. TAIT: That was a very simple answer.

MR. FITZGERALD: And let me -- and let me --

MR. ROSENTHAL: If I may -- for purposes of today we're dealing with a statute that is past that question.

MR. TAIT: But we're not talking about the statute. We're talking about this professional opinion and the basis for it.

MR. ROSENTHAL: I don't know why it's

relevant.

MR. TAIT: It's not relevant, the question wasn't about it.

MR. FITZGERALD: Well, I'll agree -- if you want to stipulate that their professional opinions aren't relevant we'll stipulate to that and we'll go home.

MR. ROSENTHAL: You should be so lucky. It's a given. It's a given that the Legislature says that this is a risk.

MR. TAIT: We know what the Legislature says and you can characterize it any way you want to. We know what it says and we can read the statute.

MR. FITZGERALD: That's all I have.

CHAIRMAN KATZ: Alright. Mr. Emerick, did you have a question or are you all set?

MR. EMERICK: I do have a question with respect to undergrounding. If we ultimately determine and everyone determines that some portion of this can be underground and if we look at the route, at least that's proposed to be underground, it goes substantially along Route 1. And there's a lot of mixed, high density use, a lot of commercial activity, parking lots, sidewalks, kids walking on it. You're saying we should apply whatever standard we develop, and you've suggested 0.6 as the

exposure level at the edge of some right of way. And I'm trying to imagine how we would go about establishing that buffer in that underground environment along Route 1?

DR. BELL: It's part of your prioritization and I understand you're in a very, very difficult spot with DOT, the community --

MR. EMERICK: No, forget about DOT. Let's assume it's going down Route 1 and --

DR. BELL: -- the reason why I mentioned it is actually it's a function of the depth, alright? So it will dissipate very quickly if it's buried sufficiently deeply as opposed to 24 inches or 18 inches or whatever the case may be. And so actually dissipation at the surface then, you know, mainly require 10 to 15 feet or so, virtually a two lane road and that's actually as opposed to some other way of positioning it.

MR. EMERICK: -- well, as we've heard in the past depth is not -- is in part driven by the operation of the line. And we heard yesterday from Dr. Bailey when the question came up, what were the levels, and I believe in round numbers for the HPFF we're talking two or three above the line, XLPE I think it was 26, 27. So, you know, the opportunity to keep burying this deeper to minimize EMF gets to technical feasibility. Sure, you

can bury it X number of feet to reduce EMF, but then is the line's still effective in terms of it's operation and I've heard I think to date that the deeper you bury it the rating on the line goes down and the basic purpose for installing the line is not achieved. So I think we're left with probably burying it somewhere in the order of four feet and I think the numbers that Dr. Bailey gave us yesterday are consistent with at least a depth that's been proposed in terms of the rating in the line and having it operable. So again, I'm perplexed as to how you establish a buffer zone along a corridor where we have commercial properties, the vaults are in parking lots --

DR. BELL: That'll be how you define --

MR. EMERICK: -- do you paint a yellow stripe down Route 1 that says this is the buffer zone? I mean, I --

DR. BELL: -- no. I think that comes down to the details of defining what a congregation of children qualifies as. And that's one of the things that you're going to have to wrestle with because you're looking for how to keep those exposures away from large -- not from people, it's numbers of children. And that's what the statute talks about.

MR. EMERICK: Well, so are you then

proposing when we apply that method to above ground that it's only the statutory structures that we can be concerned about?

DR. BELL: You have a statutory obligation you just obtain and, you know, having had some involvement with that I certainly wasn't looking to make assertions quite frankly that there are other dangers that we're looking to focus on. It really was the danger to children.

MR. TAIT: Well, it says residential areas.

DR. BELL: Yes.

MR. TAIT: It doesn't say children, it says residential areas. It says playgrounds.

DR. BELL: Playgrounds are pretty clear in that.

MR. TAIT: It could or could not be a youth playground it could be a professional ballpark.

DR. BELL: Right.

MR. EMERICK: And it doesn't say streets.

CHAIRMAN KATZ: It doesn't say elderly housing is exempt. It just says residential areas.

DR. BELL: As I said, my advice to you having had some involvement in that there was no impetus there other than to capture children in homes as opposed

to children only in schools. And the focus initially as we all recall was actually schools. And the answer is that schools is probably an inadequate assessment because as Chairwoman Katz is describing, certainly children spend a fair amount of their time, hopefully a lot of their time at home and asleep and so forth. So I think that industrial settings and so forth and commercial settings where the congregation of children would be expected to be minimal transient or in no way substantial I think actually doesn't qualify in my view for myself and my children and our families and my advice as a concern as opposed to where there's congregations of children should that be as they're describing in their homes, in their schools or in their playgrounds.

MR. EMERICK: But if we have one -- we have a sidewalk along it and the sidewalk is the vehicle by which a child goes to school, I mean --

DR. BELL: I think you should -- I think you should have to understand my sense is that I haven't heard any substantial empirical data described about the dissipation of EMF from different levels with different types of shielding, not aluminum of course because that would be incorrect, but steel shielding with different types of tubing. My recommendation is that you should

obtain the data and then you'll be able to help -- you'll solve the problems. But it's very difficult to solve without the data.

MR. EMERICK: Thank you.

MR. ASHTON: If you're not concerned with children in a transient condition why would you be concerned with an EMF level in an equally transient condition?

DR. BELL: So if I'm not concerned --

MR. ASHTON: If you're not concerned about children walking through an EMF field in a transient --

CHAIRMAN KATZ: Why are you concerned on the basketball court?

MR. ASHTON: -- right. Why are you concerned about transient EMF level on a basketball court?

DR. BELL: -- the focus there would be the congregation whether we know that children are really going or not and that's a risk assessment. So for example if there are children -- if you know that there is a school bus stop, okay, right on where you're going to build something and every day there's 10 to 15 kids that get on their bus to elementary school that would be of concern. If on the other hand there's, you know, a, you know, an adult bus stop or some other type of thing that

would be separate.

MR. ASHTON: That's interesting, but that really isn't germane to my question. You have children who walk through an EMF -- high density EMF field and you're not concerned about that. If the field walks through the child on a transient basis --

DR. BELL: Mr. Ashton, I agree with you. I'm just trying to help you make your risk -- you can't protect everything all the time. We've already conceded that. So if -- and I'm not sitting here telling you it's zero EMF because I don't think that's practical and I don't think it actually helps the Council to focus on settings that you can't obtain. So if you want me to say that I think it's, you know, some risk, the answer is yes. But can you address that in your --

MR. ASHTON: Is it the same risk do you think?

DR. BELL: -- as what?

MR. ASHTON: The transient -- movement of a transient child or the movement of a transient EMF field?

DR. BELL: I think the exposure would be the exposure. The question is how many children you're going to look to protect.

DR. RABINOWITZ: And how many minutes and

how high and all those things.

DR. BELL: Yeah. I think your point is fair, I'm just saying it's going to be difficult for you to implement if you -- how far you go.

MR. ASHTON: I've come to that conclusion.

MR. O'NEILL: Dr. Bell, perhaps for -- as a matter of clarity you could describe the word congregate and where children congregate. Is there a simple number that you can postulate? Children are everywhere as we know --

DR. BELL: Like a bunch of grapes issue, you mean?

MR. O'NEILL: -- no, for the sake of your argument.

DR. BELL: I'm not arguing, I'm trying to give advice. I, you know, I --

MR. O'NEILL: Okay. For the sake of your advice where would you draw the measure, is 10 a group of children that you would consider to be a congregation of children? I'm not trying to be cute about this, but I'm very interested to know for the sake of clarity.

DR. BELL: -- you know, I think it's sort of like -- I guess in this setting we shouldn't describe it, but you know, you know it when you see it. So I think

that the issue really is probably one is too low and 100 children in an area is obviously surpass what any of us will consider some congregation of children.

MR. O'NEILL: So a school bus stop would be too many?

DR. BELL: I threw out there, as you know, somewhere in the 10 to 15 range at that.

MR. O'NEILL: Thank you.

CHAIRMAN KATZ: Okay. We need to wrap up this panel. Are there any other final questions for this panel? Seeing none you're excused. Thank you very much.

MR. TAIT: Thank you Doctors.

CHAIRMAN KATZ: At this time we are going to -- Attorney Ball indicated that there may be no towns who wish to present their preferred routes at this time?

MR. DAVID BALL: Thank you. David Ball. Town of Woodbridge. As far as I know there are no other towns that are presenting any witnesses.

CHAIRMAN KATZ: You queried all the towns and --

MR. BALL: All the attorneys that I knew. If I'm wrong I'm sure someone will jump up right now, but I believe there are no towns. And just if I might for the record say a word about that? First of all, I do

appreciate the opportunity to do this and I think all the towns do and I understand the spirit of your notice on Friday.

There are a couple of points. One is that when you asked us for our preferred routes, overhead, underground, I think probably every single town did respond to that and certainly on behalf of the town of Woodbridge we spent a good deal of time trying to map out for you alternatives and as you've said, paint the picture in detail. And hopefully that will provide some guidance and that certainly on behalf of Woodbridge that was our intent to give you that input.

CHAIRMAN KATZ: Okay.

MR. BALL: I don't believe that any of the towns understood prior to Friday's memo that there was any expectation that the towns would actually be submitting witnesses. Neither the Applicants nor the towns had submitted any pre-filed testimony on this topic.

CHAIRMAN KATZ: So you would like us to treat those submittals as briefs and not have them verified exhibits, is that fair?

MR. BALL: I think that's fair.

CHAIRMAN KATZ: Okay.

MR. BALL: I would certainly also suggest

that the towns absolutely will want to present their cases and their direct cases at a future date. Keep in mind, we have suspended all of our studies at this point pending the result of the rock working group. Load flow analysis, harmonic studies, everything has been put on hold. So in that light we in good faith went forward and tried to comply with your request by submitting the briefs. And we would certainly ask that at a future date we'd have the right to present our direct cases.

CHAIRMAN KATZ: Okay. I know I feel like I'm being held captive by this Docket and we don't want this to sort of continue on forever, but I guess what we can do is after we know -- we'll know better after September where we are on underground and overhead and revisit this.

MR. BALL: I think that's fair. We will know a lot more on August 16th and certainly after the September hearings.

CHAIRMAN KATZ: Yes.

MR. BALL: I think we'll be in a much better position to have perhaps yet another process meeting to figure out how we're going to go forward.

CHAIRMAN KATZ: Okay.

MR. BALL: Thank you.

CHAIRMAN KATZ: Right. But getting back -- not you Mr. Ball, but getting back to Mr. Rosenthal. I really -- I really am concerned that -- I just want to make sure your school administrator part of the panel is talking to your medical part of the panel and we're getting -- and they're speaking with one voice.

MR. ROSENTHAL: I have a note and I'm going to convey it to those who need to prepare something to submit.

CHAIRMAN KATZ: Okay. I appreciate that because I've had -- I have concerns and I don't want to have this Council come up with conditions that are going to make life unlivable on these campuses.

MR. ROSENTHAL: Thank you.

CHAIRMAN KATZ: Okay. What -- I think that concludes -- do we have other procedural matters? Tomorrow morning do we need a pre-hearing conference? Tomorrow we are going to have perhaps report on any homework assignments? We are?

MS. BARTOSEWICZ: We are.

CHAIRMAN KATZ: Okay. So we will do that first. And then we will -- why don't we have a short per-hearing conference? Yes. At quarter of, 9:45? And then we will launch with Lackerty (phonetic) into DC. Tell

your friends and neighbors we're looking at DC. Anything else we need to do procedurally today before we adjourn? We're adjourned until tomorrow morning.

(Whereupon, the hearing adjourned at 4:45 p.m.)

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