ORIGINAL

ILLINOIS POLLUTION CONTROL BOARD
OCTOBER 20, 2010

IN THE MATTER OF:	)	
	)	
WATER QUALITY STANDARDS AND EFFLUENT LIMITATIONS FOR THE CHICAGO AREA WATERWAY SYSTEM AND THE LOWER DES PLAINS RIVER: PROPOSED AMENDMENTS TO 35 ILL. ADM. CODE PARTS 301, 302, 303, AND 304.	) R08-9)) Rulemaking-Water)))	

REPORT OF PROCEEDINGS at the hearing of the above-entitled cause, taken before Rebecca A. Graziano, Certified Shorthand Reporter within and for the County of Cook and State of Illinois, at the Bilandic Building, C-500, Chicago, Illinois, commencing at the hour of 9:00 a.m., on the 20th day of October, A.D., 2010.

A P P E A R A N C E S

ILLINOIS POLLUTION CONTROL BOARD:

Mr. Gary Blankenship
Ms. Andrea S. Moore
Ms. Carrie Zalewski
Mr. G. Tanner Girard
Ms. Marie E. Tipsord
Mr. Anand Rao
Ms. Alisa Liu
Ms. Thomas E. Johnson

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BY: MS. ANN ALEXANDER

MS. TIPSORD: Good morning. My name is Marie Tipsord. I've been appointed by the board to serve as a hearing officer in this proceeding entitled Water Quality Standards and Effluent Limitations for the Chicago Area Waterway Systems and Lower Des Plaines River, Proposed Amendments to 35 Il Admin Code 301, 302, 303, 304, docket number R08-9. This is Sub Docket B, and also the economic hearing on Sub Docket A.

With me today to my immediate right is acting chairman, G. Tanner Girard. To his right, Board Member Carrie Zalewski, to her right, Board Member Gary Blankenship, and Board Member Andrea Moore will be joining us shortly. To my far left is Board Member Thomas Johnson. To my immediate left is Anand Rao, and to his left, Alisa Liu from our technical staff.

This is the fourth day of hearings in Sub Docket B specifically, and the 43rd day overall in this hearing. We're going to continue from yesterday's hearing discussing the CHEERS -- the Chicago Health Environmental Exposure and Recreation study, known as CHEERS. The CHEERS report is in the record as public comment 478, and

the errata sheet is public comment 484.

Today's hearing, as well as yesterday's hearing, will also satisfy the requirements of Section 27B of the Environmental Protection Act for Sub Docket A. Section 27 B of the act requires the board to request the Department of Commerce and Economic Opportunity to conduct the economic impact study on certain proposed rules prior to adoption of those rules.

If DCEO choses to conduct the economic impact study, DCEO has 30 to 45 days after such a request to produce a study of the economic impact of the proposed rules. The board must then make the economic impact study, or DCEO's explanation for not conducting the study, available to the public at least 20 days before a public hearing on the economic impact of the proposed rule.

In accordance with Section 27 B of the Act, the board requested by a letter dated August 11th, 2010, that the DCEO conduct an economic impact study. The board received a response letter on September 27th, 2010, indicating that none would be conducted. A copy of the board's letter and DCEO's letter are available at the back of the room.

We will accept comments concerning the economic impact study this afternoon. I note no one signed up yesterday to comment on DCEO's decision. I have placed the signup sheet at the back of the room. If you would like to comment on DCEO's decision, please sign it before you leave today.

Today we will continue with Dr. Granato and the questions from the National Resource Defense Counsel. We will then move on to the Illinois Environmental Protection Agency, and finally the People. After completing the questions for the District, we'll move on to Dr. Marc Gorelick and the questions from the District, and we'll finish with Sharon Bloyd-Peshkin and the questions from the District.

The testimony will be marked as an exhibit and entered as if read. As always, anyone may ask a follow-up question. You need not wait until your turn to ask questions. I do ask that you raise your hand, waiting for me to acknowledge you. After I have acknowledged you, please state your name and who you represent before you begin your questions. Please speak one at a time. If you're

speaking over each other, the court reporter will not be able to get your questions on the record.

Please note any questions asked by the board members or staff are intended to build a complete record for the board's decision, and not to express any preconceived notion or bias.

Dr. Girard?

DR. GIRARD: Good morning. Welcome to hearing day 43. Let's get to work. Thanks.

MS. TIPSORD: Thank you.

MS. ALEXANDER: Good morning, Dr. Granato.

DR. GRANATO: Good morning.

MS. ALEXANDER: I believe when we left off yesterday it was with pre-filed question five. So I would like to turn to that and ask you to please tell me what is the basis for the cost estimate for disinfection presented in your testimony at Page 5. And specifically, I'm referring to the statement that disinfection is estimated at a 20-year total present worth cost of $919.6 million.

DR. GRANATO: The basis for that was the testimony that was submitted by David Zens in

the record previously.

MS. ALEXANDER: And can you clarify whether that figure is for UV with or without filtration?

DR. GRANATO: That's UV without filtration.

MS. ALEXANDER: And could you also clarify please whether that cost is capital only, or is that capital plus present worth?

DR. GRANATO: Capital plus present worth O and M.

MS. ALEXANDER: And when you say, "present worth O and M," can you clarify the numbers that were calculated?

DR. GRANATO: I can't elaborate too greatly. It's in the record in Zens' testimony.

MS. ALEXANDER: Can you summarize what you mean by 20-year present worth O and M?

MR. ANDES: I'll object. These questions were asked of Dr. Zens. He's the one who developed the statements. Dr. Granato simply incorporated those into his testimony. This is not the right witness for that.

MS. ALEXANDER: Dr. Granato has made a

statement about the cost of disinfection. I'm allowed to find out how much he knows. If he knows nothing about it, then perhaps he shouldn't be testifying about that number.

MS. TIPSORD: I think that's -- he's repeating Dr. Zens' testimony. To the extent that you can answer, if you can refer back to Dr. Zens, a response is appropriate.

DR. GRANATO: Well, I mean, generally it takes into account the annual O and M cost, and it is based on a presumed inflation rate and interest rate on the funds that are required to finance it.

MS. ALEXANDER: So essentially what you did, if I understand correctly, is you added up 20 years of O and M costs and gave us the present worth of that?

DR. GRANATO: Well, I didn't do it, no.

MS. ALEXANDER: Dr. Zens did -- Mr. Zens?

DR. GRANATO: (Nodding).

MS. ALEXANDER: Okay.

DR. GRANATO: I believe that's what he

did, but it's in his testimony. All you have to do is refer to it.

MS. ALEXANDER: I would like to have marked, please, a copy of a letter to the Chicago Tribune from Terrence O'Brien dated February 23rd, 2009.

MS. TIPSORD: If there's no objection, I've been handed, "Voice of the People, Monday, February 23rd, 2009, Chicago Tribune, Water Treatment, Terrence J. O'Brien, president, Metropolitan Water Reclamation District of Greater Chicago. If there's no objection, we will mark this as exhibit 411. Seeing none, it's Exhibit 411.

MS. ALEXANDER: Mr. Granato, have you seen this letter before?

DR. GRANATO: I don't think so, no.

MS. ALEXANDER: I call your attention to the reference about midway down. Do you see the paragraph that starts with, "The proposal to require," and it states, "The proposal to require specific additional treatment of effluent from our water reclamation plants comes with a price tag that could exceed $2 billion." Do you see that?

DR. GRANATO: Yes, I do.

MS. ALEXANDER: Do you have any knowledge as to the basis of that statement?

DR. GRANATO: I do not have any direct knowledge, no. I would presume that this is referring to the overall cost of the rulemaking, but I don't know that directly.

MS. ALEXANDER: Okay.

MR. ANDES: So Dr. Granato, when you mean the total cost of the rulemaking, you mean not only disinfection, but also DO requirements and requirements for other pollutants?

DR. GRANATO: That's one explanation on how they could arrive at that figure, yeah.

MR. ANDES: But you don't know whether this is -- what present value -- whether it's a present value number or what it includes?

DR. GRANATO: No, I do not.

MS. ALEXANDER: And you don't really know one way or the other whether it's a correct number?

DR. GRANATO: Well, it's a statement that is -- it says it could exceed $2 billion. I suppose it could. If we do the -- if our pilot testing and our ultimate design requires filtration,

for instance, ahead a UV disinfection, it could very well exceed $2 billion.

MS. ALEXANDER: And what do you base that on, that it could very well exceed $2 billion?

DR. GRANATO: I'm basing that on recollection. I have of study that AE Com did that looked at with and without filtration UV costs. And I believe that with -- and I'm going by memory now. I don't have the documents to refer to in front of me, but I believe that the with filtration roughly doubled the cost of the disinfection.

MS. ALEXANDER: Do you have a basis to believe that filtration will, in fact, be necessary with UV?

DR. GRANATO: Well, a lot of tertiary plants do filter ahead of their disinfection systems. In fact, that's very common.

MS. ALEXANDER: Okay. But my specific question is: Do you have basis to believe that will be necessary?

DR. GRANATO: That's my basis.

MS. ALEXANDER: Okay. I'm sorry. Could you please state again which study it is you're referring to?

DR. GRANATO: This was a study that AE Com did. It's one of the engineering studies that were conducted as part of the UAA program of engineering studies the District undertook. It's probably attached to Zens' testimony.

MS. ALEXANDER: I would like to have marked as the next exhibit a document and a cover of a letter dated November 8th, 2005, to Mr. Toby Frevert from the Water Reclamation District.

MS. WILLIAMS: Can we clarify whether this is already in the record? I don't know what it is.

MS. ALEXANDER: It may be an attachment to his testimony. I'm not sure. If it is, then we don't need to mark it, but I did want everyone to have it.

MS. TIPSORD: Did we establish -- it does not look familiar to me.

MS. WILLIAMS: There's several of these -- I'm not sure if -- I can't be 100 percent sure if one W2 is in there. There's several similar documents. I won't object if it's already in there.

MS. TIPSORD: Just to be on the safe side, we will mark this as Exhibit 412, if there's

no objection. Seeing none, it's Exhibit 412.

MS. ALEXANDER: Dr. Granato, is this the document and cover of this letter, the AE Com report that you referenced?

DR. GRANATO: Yes, it is.

MS. ALEXANDER: Could you please show me in here where the $2 billion figure is supported?

DR. GRANATO: Well, I would go to table 1.26, and added up at the bottom of the table there's, "Total present worth, in millions, costs for north side Stickney, Calumet," and it comes to over $2 billion if you add up those costs.

MS. ALEXANDER: And just to clarify, table 1.26 is for UV with filtration. Is that correct?

DR. GRANATO: Yes, that's correct.

MR. ANDES: So is it correct, Dr. Granato, just to clarify, when you're talking about the $2 billion between UV and ozone you're actually -- you're picking the UV numbers of $379 million, $1,326,000,000 and $448 million.

DR. GRANATO: That's correct.

MR. ANDES: And at least my addition comes up to $2.153 billion for that. Does that

sound right?

DR. GRANATO: That sounds right.

MS. ALEXANDER: Okay. I would like to present as the next exhibit an article from the Chicago Tribune dated May 15th -- I need my reading glasses.

MS. TIPSORD: That's all right. I'll read it in.

MS. ALEXANDER: Okay. Sorry.

MS. TIPSORD: I'll save you the trouble. Mine are built in. May 15th, 2006, "From the Archives: Cleaner But Not Clean."

MS. TIPSORD: Off the record for just a second.

(Whereupon, a discussion was had off the record.)

MS. TIPSORD: Back on the record. If there's no objection, we will mark this article as Exhibit 413. Seeing none, it's Exhibit 413.

MS. ALEXANDER: Dr. Granato, have you ever seen this article before?

DR. GRANATO: I'm trying to skim through it to determine that.

(Witness peruses document.)

MR. GRANATO: I don't think I have. I don't recall it.

MS. ALEXANDER: I want to call your attention to the paragraph you see right in the middle. There's a break that says, "Register with the Chicago Tribune," and right below that it says, "Top officials at the Metropolitan Water Reclamation District estimate they would need $623 million to meet tougher water quality standards, including $541 million to disinfect sewage."

Do you have an understanding as to where those numbers came from?

DR. GRANATO: Not for certain. The $541 million sounds like the capital cost for the disinfection, but I'd have to check that. And the $623 million, I'm not sure where that came from.

MS. ALEXANDER: Okay. And would that capital cost be based on the AE Com report?

DR. GRANATO: Yes, most likely that's what we've been using. I'm not sure though. I didn't write this, or I don't know who wrote it, to be frank.

MS. TIPSORD: Michael Hawthone, Tribune reporter.

DR. GRANATO: I don't know where he got his information, I guess, or who gave him the information.

MR. ANDES: Well, let me -- Dr. Granato, if you look at the table 1.27 on Page 80 of the report, in the capital cost numbers without filtration, and correct me if I'm wrong, but I believe these for UV are 83, 358, and 100, which I think adds up to just about 541.

DR. GRANATO: That's correct.

MR. ANDES: And that's capital cost only?

DR. GRANATO: Capital cost without filtration, correct, for UV disinfection.

MS. ALEXANDER: For the next exhibit, I would like to present a document entitled, "The Disinfection Debate" from the Water Reclamation District.

MS. TIPSORD: Is this the disinfection packet you were talking about?

MS. ALEXANDER: Yes, this is.

MS. TIPSORD: Just wanted to be clear. "The Disinfection Debate, Understanding the Science and Facts About Effluent Disinfection and the

Chicago Area Waterway System." This is an WMRD pamphlet. I don't see a date on it. I don't see a date. If there's no objection, we will mark this as Exhibit 414. Seeing none, it's Exhibit 414.

MS. ALEXANDER: Dr. Granato, have you seen this document before?

DR. GRANATO: Yes, I have.

MS. ALEXANDER: Did you take any part in preparing it?

DR. GRANATO: Yes, I did.

MS. ALEXANDER: Okay. I want to call your attention to the -- these don't have any page numbers, but the second to last sheet that is headed, "What about the cost to taxpayers."

DR. GRANATO: Okay.

MS. ALEXANDER: I see a reference to a cost of about $500 million. Can you clarify the basis for that?

DR. GRANATO: That's the figure we just looked at for capital cost of disinfection at the three plants.

MS. ALEXANDER: And that is capital cost without filtration. Is that correct?

DR. GRANATO: That's correct.

MS. ALEXANDER: So would it be fair to say that it's now the District's position, given that you have this in your pamphlet, that UV without filtration would be an appropriate technology?

DR. GRANATO: At this point in time it looks that way, but we really won't know for sure until we do testing and have more specific information on the effluents from the three plants.

These figures are based on preliminary engineering estimates. You know, as I said, it's very common for filtration to be installed prior to UV disinfection. That's why it was part of the original estimate.

MR. ANDES: So Dr. Granato, is it fair to say that in making these public statements, the District has actually estimated on the low side?

DR. GRANATO: That's correct.

MR. RAO: Can we ask follow-up questions before we move on? In the past when the District submitted economic impact information to the Board back in October of 2008, there was a lot of cost information that was submitted to the board, but we had not seen anything in terms of impact on the Cook County taxpayers, like this Disinfection

Debate document presents that information, and you just mentioned that this information is based on disinfection, and it may be a low-end estimate, the 15 percent property tax increase.

Would it be possible for the District to estimate what the cost impact would be on Cook County taxpayers for -- you know, to comply with the proposed regulations in terms of, you know, a percent increase? And also, what would be the increase if you calculated, in terms of dollars per $100, of equalized SS value? Is that a possibility?

DR. GRANATO: I think that can be done. Mathematically it can be done.

MR. RAO: Because we have heard these figures anywhere from $1 billion to $2 billion being talked about. And to get a good handle of what exactly it is costing in terms of how it's going to effect the taxpayers, it would be helpful for the Board to see the numbers.

DR. GRANATO: Well, yes, but there is a complication. There's two complications, in that part of the limitation that we face is that we're operating under a tax cap, so that it may not even be possible to levy the increase that would be

necessary to fund the O and M increase that would be brought on by these facilities, and it's also not clear whether the -- our capital appropriations would support this added burden and still enable us to maintain our current capital improvement plan, which is required to maintain the aging infrastructure and maintain the -- for instance, if we were unable to maintain the current effluent quality, that would call into question the engineering studies that currently are showing that filtration is not necessary. So all of these things are interrelated and complex.

MR. RAO: Yeah, that's why we are trying to get accurate information here.

MR. ANDES: So can you repeat -- I think the District can and will provide the analysis. Can you repeat that, so we make sure to get the specific information that's being requested?

MR. RAO: Yeah. Basically, if you can describe how the District arrived at this 15 percent increase in property tax, and Dr. Granato just now mentioned that it's low-end. So if you can provide an analysis which gives us a clear picture as to what this increase could be, and also submit into

the record any documents or reports that you prepared to come up with this estimate, you know, about how much it's going to cost in terms of complying with the rules.

And if you can estimate the break down in tax increase in terms of dollars per $100 of equalized assessed value of properties, and also if you could estimate increase in user fees for tax exempt organizations and industrial users in some way, if it's possible.

And we also have some related questions, because in earlier testimony, the District had also expressed some concerns about the cost that would be involved in nutrient control, which you may have to comply with those regulations when they come down.

Regarding that, it would be helpful if you could comment on the current status of that nutrient control program and any potential timetable for implementation of those rules. And I think the District had estimated -- given us a rough estimate for nutrient control at $2.8 billion, and if you could comment on whether the $2.8 billion estimate is a preliminary estimate, or is it a

detailed cost analysis.

DR. GRANATO: That's a preliminary estimate, and it's highly dependant on the ultimate nature of the standards that are promulgated for nutrients and the level of treatment that will be required to meet those standards.

MR. RAO: If you can update the record in terms of what's the status, and when you think it would come down on the district to comply with those standards. We know that we haven't received any rulemaking from the Agency.

MR. ANDES: And I believe -- I'm sorry. Mr. Rao, I believe that -- and we'll refer back to Dr. Kunice's testimony, but I believe he alluded to even significantly higher cost estimates. Based on the Chesapeake Bay example, it's much higher costs. So we'll go back and provide the information on the various cost estimates and the current status of the regulatory activities.

MR. RAO: And also, if you can talk about the funding mechanisms for the nutrient control, whether you will be faced with the same kind of situation that you've faced with disinfection, or if you'll have some funding from

the USEPA or any other sources for nutrient control.

MR. ANDES: We wouldn't count on that.

MR. RAO: Okay. I figured as much. And also, if you can estimate the impact on the Cook County taxpayers as to what that cost could be. And in the same way, if you can give also in terms of dollars per $100 of equalized SS value. And also, if you can discuss how the increase in property taxes and user charges change over time after the capital costs of the bonds are paid off, if there's continuing costs in the long-term.

DR. GRANATO: So for the nutrient issue, do you want the impact of that on the tax exempt users as well as --

MR. RAO: Yeah, just give us an idea of what the taxpayers are in for over the next 15 or 20 years.

And finally, we also wanted to know if whether nutrient removal would have any collateral benefits for reducing fecal coliform in your effluent. If so, you can discuss that aspect of it also.

DR. GRANATO: Okay.

MR. RAO: That's pretty much what we

have related to the economic impact.

MR. ANDES: And we need to submit all that by December 31st?

MR. RAO: It will be helpful if you can submit it as soon as possible.

MS. ALEXANDER: And I would just like to add that we're going to want an opportunity to respond to whatever is submitted, so I think the timing needs to be such that the environmental groups -- and I can't speak for the state -- will have the opportunity to review that and comment.

MS. TIPSORD: We'll discuss scheduling soon. Ms. Williams, did you have a follow-up?

MS. WILLIAMS: Yeah, I'll save it for my questions.

MS. TIPSORD: Okay.

MS. ALEXANDER: I would like to present as the next document to be marked this report entitled, "Review of a Technical Memorandum 1WQ - Disinfection Evaluation," prepared on behalf of the Metropolitan Water Reclamation District of Greater Chicago, final report dated October 26th, 2006.

MS. TIPSORD: If there's no objection,

we will mark the report discussed as Exhibit 415. Seeing none, it's Exhibit 415.

MS. WILLIAMS: Okay. Wait a minute. This I think is already in the record twice.

MS. TIPSORD: Okay.

MS. WILLIAMS: And that would be -- so I object. Is it too late?

MS. TIPSORD: No, that's fine, if it's already in the record and you can give me an exhibit number.

MS. WILLIAMS: Let me check and make sure.

MS. ALEXANDER: And if it is, I will withdraw it.

MS. WILLIAMS: I believe it was Exhibit 12 the first time, and I lost exactly where it was entered a second time.

MS. TIPSORD: That's all right. Exhibit 12 works. So it's already in the docket as Exhibit 12?

MS. WILLIAMS: I think so. There's not a date on Exhibit 12, but it says, "Review of Technical Memorandum 1WQ by SAIC."

MS. ALEXANDER: Same date,

October 26th?

MS. WILLIAMS: It doesn't have a date on Exhibit 12.

MS. ALEXANDER: Because there were several drafts going around.

MS. WILLIAMS: Maybe the second one is the later one. That might have been the first one. And then Exhibit 148 is the October 26th for sure -- or October 2006, excuse me, for sure.

MS. TIPSORD: Okay. We'll refer to this as Exhibit 148.

MS. ALEXANDER: 148. Thank you. Dr. Granato, have you seen Exhibit 148 before?

DR. GRANATO: Yes, I have. It's been a long time though.

MS. ALEXANDER: I'm going to call your attention to table three on Page 9.

DR. GRANATO: Okay.

MS. ALEXANDER: Isn't it a fact that the total capital cost for UV that USEPA's independent consultant, SAIC, came up with was $242 million, which is less than half the figure in the District's report?

DR. GRANATO: It looks that way, yes.

MS. ALEXANDER: Okay. Do you have any basis for saying that's incorrect?

DR. GRANATO: No, I don't.

MS. ALEXANDER: Have you made any effort to work the conclusions and the observations from this SAIC report into your cost estimate to try to revise it accordingly?

DR. GRANATO: I believe that AE Com has taken a look at this and did not feel that the content was worthy of revision of their estimates.

MS. ALEXANDER: Did they tell you why they believed it wasn't worthy?

MR. ANDES: You know, I'll have to object. Dr. Zens was here. You had every opportunity to ask him these questions. He was our presented expert on this issue. So to ask these questions of Dr. Granato based on what Dr. Zens may have told him is really improper. If you want to call back Dr. Zens, we can bring him back and he can answer these questions.

MS. ALEXANDER: I am entitled to find out what he knows. If he doesn't know, he can tell me. I think we've established that now. I'm going to pose -- the question is pending.

DR. GRANATO: I don't recall having a conversation with Dr. Zens on this.

MS. ALEXANDER: Do you recall having a conversation with AE Com about it?

DR. GRANATO: I didn't personally, but the District did, yes.

MS. ALEXANDER: Do you have any knowledge of the nature of that conversation?

DR. GRANATO: No, I don't.

MS. ALEXANDER: Do you know if anything was ever generated in writing by AE Com?

DR. GRANATO: I don't recall. It may have, but I don't know.

MS. ALEXANDER: I'm going to call your attention to Page 15, table six. I'd like you to look on the vertical axis at cost per household per month and go over to the second column to the right. Do you see that?

I call your attention to the fact that SAIC, USEPA's independent consultant, estimated that the cost per household for disinfection without filtration using UV would be $1.94 per household per month. Do you have any basis to believe that's incorrect?

DR. GRANATO: Do I have a basis to believe it's incorrect?

MS. ALEXANDER: Yeah.

DR. GRANATO: No.

MS. ALEXANDER: Okay.

MR. ANDES: Is it your understanding, Dr. Granato, that --

DR. GRANATO: I don't know how they derived it, so I have no way of knowing if it's incorrect.

MR. ANDES: Is it your understanding that District staff and AE Com have reviewed these numbers and have determined that these are not accurate?

DR. GRANATO: That's my understanding, yes. For one thing, it's based on a household. The District does not collect rates based on household payers. So I don't know how households translates to property owners that pay taxes, for one thing.

MS. ALEXANDER: Do you have an understanding --

DR. GRANATO: Not knowing the methodologies of how this is based, I can't really comment on its correctness.

MS. ALEXANDER: So you're telling me there's a different methodology but that does not -- does that have any bearing on the actual correctness of that figure?

DR. GRANATO: It could.

MS. ALEXANDER: How?

DR. GRANATO: If you use the wrong method, it will be indirect.

MS. ALEXANDER: Can you be more specific, though, about how -- the difference between property owners and households could bear on whether the $1.94 figure calculated on the household basis would be correct or not?

DR. GRANATO: Well, if you take a cost of disinfection, let's say, and say there's just -- for a round number, say there's 1,000 households. You're going to divide the cost by 1,000 to get a per-household cost. But if only, say, 300 of those 1,000 households pays property tax, the cost of those 300 is going to be 3.3 times higher than the cost you calculated per household, because you're taking the cost and dividing it by 300 instead of 1,000. It's a matter of how many people you're apportioning the cost to.

MS. ALEXANDER: I'm going to move on to pre-filed question six, which is: What is the basis for your statement that, quote, "Effluent disinfection would result in substantial environmental impacts in the form of energy usage, air emissions, and power generation and transportation of raw and waste materials and land usage," on Page 5.

DR. GRANATO: Yes. That is based on the testimony of Steve McGowan.

MS. ALEXANDER: Were you present for or have you reviewed that cross examination of Mr. McGowan by Susan Headman, who was then representing the people of Illinois?

DR. GRANATO: Yes, I was present.

MS. ALEXANDER: Okay. Did you consider any of the information and analysis presented during that cross examination in restating that figure? Did you make any attempt to recalculate it?

DR. GRANATO: The statement I made is based on our current state of knowledge of the impacts.

MS. ALEXANDER: The current state of

knowledge at the time of Mr. McGowan's testimony, or now?

DR. GRANATO: I would say now.

MS. ALEXANDER: And my question is: Did you consider any of the input from the cross examination by Ms. Headman in --

DR. GRANATO: We did consider it, but it didn't make any really significant change to the magnitude of the environmental impacts.

MS. ALEXANDER: Moving on to pre-filed question seven, regarding your testimony that, "IEPA specifically asked me if CHEERS would provide information that would enable them to identify an appropriate indicator organism and set ambient criteria that would be protective of incidental contact and noncontact recreation, and I informed them it would." That's on Page 6.

Is it your review that the CHEERS study should be used by IEPA to identify an indicator organism and establish ambient criteria based on it?

DR. GRANATO: Yes, that's what we've been saying throughout the hearings.

MS. ALEXANDER: Can you clarify when

IEPA made that specific ask of you?

DR. GRANATO: They asked it during the October 28th hearing. It's in the record.

MS. WILLIAMS: Can I ask a follow-up at this point? Isn't it correct at that hearing that your response to the question was actually, "I think it could."

DR. GRANATO: Well, the hearing was two years ago. I don't remember my exact response though, Deborah.

MS. WILLIAMS: May I approach the witness?

MS. TIPSORD: Sure.

MR. ANDES: Just not too close.

MS. WILLIAMS: Could you repeat the statement from his testimony that you are asking him about, Ms. Alexander?

MS. ALEXANDER: Sure. "IEPA specifically asked me if CHEERS would provide information that would enable them to identify an appropriate indicator organism and set ambient criteria that would be protective of incidental contact and noncontact recreation, and I informed them it would."

MS. WILLIAMS: Mr. Granato, I'm going to hand you Page 186 from the transcript of that hearing, and I'd like you to read the question I had marked and your answer.

MS. TIPSORD: Specifically, that's the 10/28 hearing?

MS. WILLIAMS: 10/28/2008.

MS. TIPSORD: A.m., p.m.?

MS. WILLIAMS: I'm guessing p.m. It was a long day.

DR. GRANATO: Yeah, I think it was p.m. The question is, Ms. Williams, "Do you think the study that's being conducted is going to tell us what indicator organism could be used for setting an ambient water quality standard? Mr. Granato, "I think it could, yes."

MR. ANDES: Keep going, please.

DR. GRANATO: Ms. Williams, "How?" Mr. Granato, "Same way all other epidemiologic studies do."

MR. ANDES: Keep going, please.

DR. GRANATO: Mr. Andes, "I think Dr. Dorevitch explained that." Ms. Williams, "I don't think he did. I don't think he explained that

a study would accomplish that. I'm trying to understand." Mr. Andes, "I think he answered that question and actually said that it would form a basis for a water quality standard."

MS. WILLIAMS: Thank you.

MS. ALEXANDER: Generally speaking, do you have an understanding of what the indicator bacteria levels in the CAWS look like during dry weather, how high they get?

MR. GRANATO: Yes, generally speaking.

MS. ALEXANDER: Would you agree they often go over 1,000 colony forming units per 100 milliliters?

DR. GRANATO: Yes.

MS. ALEXANDER: And that they sometimes go over 10,000?

DR. GRANATO: Yes.

MS. ALEXANDER: Okay. In dry weather. Is it your view that the CHEERS study results so far suggest that any indicator criteria that might be set by IEPA should be as high as what's reflected in current sampling, the numbers that you just cited?

DR. GRANATO: Could you repeat that?

MS. ALEXANDER: Would it be your view

that no lower standards should be set by IEPA in the current ambient numbers?

DR. GRANATO: Well, I'd have to wait and see the supplement. The CHEERS supplement is going to address that.

MS. ALEXANDER: So you have no view on that one way or the other now?

MR. ANDES: I'm sorry. Any other --

MS. ALEXANDER: You have no view on that one way or the other then now?

MR. ANDES: Is that a question?

MS. ALEXANDER: Yes. Is that correct?

DR. GRANATO: Well, I think what I'm saying is that the CHEERS study will address that, but we don't have the information yet from the study to assess it. So I'm --

MS. ALEXANDER: Do you -- I'm sorry. Continue.

DR. GRANATO: I'm not going to formulate an opinion on it until I see what the CHEERS study is going to say.

MS. ALEXANDER: Would there be any way to reduce these dry weather fecal coliform numbers, other than through disinfection?

DR. GRANATO: Yes, there are ways.

MS. ALEXANDER: Such as?

DR. GRANATO: Filtration, for one thing, could reduce them.

MS. ALEXANDER: Filtration as an added stage in the treatment process you mean?

DR. GRANATO: Mm-hmm.

MS. ALEXANDER: By how much of filtration would reduce that?

DR. GRANATO: I can't really say off the top of my head.

MS. ALEXANDER: Does the District have analysis on that question?

DR. GRANATO: We have looked at some plants that currently filter.

MS. ALEXANDER: Which plants are those?

DR. GRANATO: All the plants that currently disinfect.

MR. ANDES: The District's plants that go to general use waters?

DR. GRANATO: That's correct.

MR. ANDES: Is it true, Dr. Granato, that one of the possible options for addressing

nutrients, if and when that comes due, would be filtration?

DR. GRANATO: That could be required, yes, depending how low the nutrient standards are.

MS. ALEXANDER: Now, the portion of the CHEERS study that's been completed found approximately 12 additional illnesses per thousand in the CAWS. Is that correct?

DR. GRANATO: That's correct, relative to the unexposed group.

MR. ANDES: Can we be clear? Are we talking about acute GI symptoms?

MS. ALEXANDER: Yes, acute GI symptoms. And isn't it also a fact that USEPA's current benchmark for risk is eight illnesses per 1,000 for fresh water?

DR. GRANATO: For primary contact recreation, yes.

MS. ALEXANDER: Right. But the acceptable risk, to the extent that's an appropriate, term is eight per 1,000. Is that correct?

DR. GRANATO: Acceptable to who?

MS. ALEXANDER: To USEPA in setting

its standards.

DR. GRANATO: Well, for primary contact. I don't know what their acceptable level is for secondary, because they don't have anything for secondary.

MS. ALEXANDER: So you're suggesting it would be acceptable for more people to get sick if they're engaged in other kinds of recreation?

DR. GRANATO: I can't speak for USEPA.

MR. ANDES: Is it accurate to say that when EPA, at an earlier point, had a rule of thumb for secondary contact, which now has been recognized as not valid, they were saying it ought to be five times the primary number?

MS. WILLIAMS: Objection. The attorney is testifying.

MR. ANDES: I'm asking if it's true.

MS. TIPSORD: He can ask if it's true.

MS. WILLIAMS: If what's true, Mr. Andes, that there's a guidance document that wasn't final?

MR. ANDES: Right.

MS. WILLIAMS: Okay.

MR. ANDES: Did EPA suggest --

MS. ALEXANDER: I object to this, because it's really not clear what that five-time standard refers to, because it is not my belief that it's a five-time standard in the sense that it's appropriate for five times as many people no get sick. It's more a way of adjusting the primary contact standard.

MR. ANDES: So is that your testimony now?

MS. ALEXANDER: Well, I'm objecting to your asking him a vague question about a document that we don't have in front of us.

MS. TIPSORD: Let's let him answer the question, and if you want to follow up with more specifics on the question, then you can.

DR. GRANATO: Well, to answer Mr. Andes' question, yes, there was a five-times guidance in the -- USEPA did issue that.

MR. ANDES: So EPA seemed -- so is it your impression then EPA was recognizing that different numbers would be justified for secondary contact, perhaps due to the infectious dose issues that Dr. Dorevitch mentioned?

DR. GRANATO: It's possible, yes.

MS. ALEXANDER: Go ahead.

MS. LIU: Dr. Granato, in your update to the Board on USEPA's status of establishing water quality criteria for bacteria, would you please address why the USEPA is also planning to include inland waters when it establishes criteria?

Would you also please address how USEPA, in its past implementation guidance, draft or otherwise, has handled giving states flexibility in setting secondary contact water quality standards, and the direction that USEPA is headed now with new implementation guidance for secondary contact?

For example, is USEPA now considering giving states the flexibility to consider local conditions and epi studies, like CHEERS, to establish secondary contact standards, rather than a national one-size-fits all criteria?

DR. GRANATO: We'll certainly do that. I know they are contemplating more flexibility on this new approach.

MS. WILLIAMS: Can you explain that a little bit more, Mr. Granato, what you're aware of as far as the flexibility being contemplated?

DR. GRANATO: Well, I'm not first-hand

involved in the process, but I recently attended a meeting on the Water Environment Research Foundation, a pathogen challenge. That challenge is winding down, and WERF, which is the Water Environment Research Foundation, is in the process of packaging all the findings from that program area of research, and it was explained.

And let me back up and say USEPA has been a very active member in this challenge. The challenge was designed to develop data and information that would be immediately useful to USEPA. In their quest to develop the database and tools by December of this year, they have a deadline to complete their studies, and by December of 2012, I believe it is, they have a deadline to propose a new approach to this.

And it was explained at this workshop that they had -- they were using the term -- they were going to build a lot of off-ramps into the process, so they would have a main national route, and then various off-ramps where local conditions could be considered and site-specific criteria could be developed. And they were looking quite a bit at quantitative microbial risk

assessment as a cost effective and efficient tool for doing that.

But certainly epidemiologic studies would be even better, but they're most costly and probably impractical for everybody to conduct. They're also looking at rapid methods, QMRA, not only to get rapid results but also to do --

MR. ANDES: QMRA is?

DR. GRANATO: Excuse me. QPCR. Thanks for correcting me. QPCR.

MR. ANDES: Which is a method for detecting --

DR. GRANATO: It's an analytical method. It's a DNA-based analytical method for quantitative polymerase chain reaction is the -- what that stands for. And that would also enable some source tracking, so in local conditions to determine sources of indicators. So we can provide a much more detailed update than that, but that's what I know at this time.

MR. ANDES: There are materials available from the webinar and we can certainly provide those.

MR. RAO: It would be helpful if you can provide any slides or other information.

MS. TIPSORD: And that's -- if anyone else wishes to comment on these issues that the USEPA may be examining, obviously the Board would invite to you do so as well.

MR. RAO: And along the same lines, we had a few more follow-up questions, if you don't mind.

MS. ALEXANDER: Go ahead.

MR. RAO: Dr. Granato, you testified yesterday and also today that the supplemental report and the CHEERS study supplemental report basically would be providing more information that would be helpful in establishing bacterial water quality criteria. We were wondering if -- is the District also planning to propose water quality criteria for bacteria for the three recreational use categories the Board has proposed in its first notice regulations, or just provide information that may be used to establish such criteria?

DR. GRANATO: We have not really decided whether we would propose numerical standards, but it was certainly our intent to

provide the information to the Board and the Agency for their use.

MS. LIU: Would you be willing to consider putting together a proposal?

DR. GRANATO: Yeah. We'd be willing to consider that, yes.

MR. RAO: That would be helpful. And also, if you can work into that, if you can come up with the criteria for wet weather use category that you had proposed.

DR. GRANATO: Certainly.

MR. RAO: And regarding the wet weather use category, also it would be helpful if you can propose specific language as to how this category would be implemented.

And yesterday in your testimony, you had stated that the District will accept effluent limits based on water quality standards, such as water quality-based effluent limits, rather than technology-based standard proposed by the Agency. So if you're going to propose the water quality criteria for those different use designations, would you also be willing to propose effluent-based limits based on that criteria that

may apply to the District's three wastewater treatment plants?

MS. WILLIAMS: I would just -- from the Agency's point of view, just for the Board's understanding, I would -- they certainly can provide information on how they would see that work, but typically water quality-based effluent limits are a decision that's implemented in the permit, by the permit right, or by analyzing -- looking at what the criteria is and --

MR. RAO: Yeah, we recognize that. This is just for information to see what those limits could be.

MS. WILLIAMS: Okay. That's great. I just wouldn't want to see a regulation that try to establish a water quality effluent limit in the Board's regulation.

MR. RAO: This is just information.

MS. LIU: Would the Agency be willing to work with the District on deriving a water quality-based effluent limit for the plants based on a proposal the District may provide for water quality criteria so that you can come up with a number that you both agree, at least on the

mathematical principal of?

MS. WILLIAMS: My understanding -- and the technical staff is not here, and we'll certainly work with them on anything they're willing to do to come to a compromise. We always have been willing to do that. I think the testimony has shown that once you have a number that requires disinfection, you disinfect.

But the number that we've proposed as an effluent limit is a number to show that disinfection is working. So I'm not sure, once it's determined, based on the water quality standard, that disinfection will be required. Typically the effluent limit then is not that difficult of a decision to make.

MR. ANDES: If I understand the request, it would be first the District has said it's willing to consider suggesting possible water quality standards, including a wet weather provision. And obviously, the process of developing effluent limits from that would be a complicated one to deal with the variety of sources, but those would then be limits based on the water quality standard, not based on a disinfection requirement.

And are we willing -- you know, assuming that we provide the information and we can suggest proposed water quality standards, are we then willing to sit down with the Agency and talk about what the effluent limits might be? Yes, we're certainly willing to consider that.

MR. RAO: Yeah. As far as we are -- in terms of the information that we are looking for was, first of all, whether, you know, you'd consider proposing some numbers for water quality criteria. And if you are doing that, then give us some information as to what that would mean in terms of the effluent limits.

And we are in no way going on the Agency's turf about permitting or suggesting -- it's just for this rulemaking record. Because all this information is in there, and we need certain specific information to, kind of, clarify some of the, you know, data.

MR. ANDES: For informational purposes, I think that's certainly something that we'll take back and consider carefully.

MR. RAO: That would be very helpful. And also, it would be helpful if the Board -- if the

District is willing to update its economic analysis based on the water quality criteria that you may propose and any effluent limits.

MS. LIU: As you take this back with you, when you're working on the effluent limits, it will obviously depend on the use designations and your criteria. The Board has proposed, at first notice, a set of use designations, and the District has an alternate proposal. If you can take a look at both scenarios and present that information, that would be very helpful.

MR. ANDES: So present the --

MS. LIU: The scenario of the first notice use designations proposed by the Board, and the scenario of the District's ultimate proposal for use designations.

MR. ANDES: And the two scenarios would include suggested standards and suggested effluent limits, based on those two alternate scenarios, and then cost impacts of each?

MR. RAO: Yes.

MR. ANDES: Is that --

MR. RAO: Correct.

DR. GRANATO: Including wet weather?

MR. ANDES: Including wet weather.

MR. RAO: Yeah.

MR. ANDES: Okay.

MS. WILLIAMS: And we are hoping that you have this information by December.

MS. TIPSORD: Mr. Harley?

MR. HARLEY: To clarify the request --

MS. TIPSORD: Excuse me, Mr. Harley. Identify yourself.

MR. HARLEY: I'm sorry. For the record, Keith Harley, attorney for the Southeast Environmental Task Force.

Is the request for uniform standards across all District facilities, or because this could be based on public health factors, could it be facility-specific in terms of the standards and effluent limitations that might apply? I just want to clarify the nature of the request.

MS. LIU: I think that was the question.

MR. ANDES: Would it be based on the specific standards suggested for particular regions, would be my understanding.

MS. TIPSORD: Based on the proposed

uses, the water quality standards you would propose. So obviously if one plant does something that the Board has proposed for noncontact recreation -- so it would be based on the use proposals.

MR. HARLEY: Okay. And -- okay. Thank you.

MS. LIU: And the limitation obviously would be different for each plant?

MR. ANDES: Right, or it could be.

DR. GRANATO: Possibly, yeah. We don't know.

MR. ANDES: Okay.

MR. RAO: Thank you very much.

MS. LIU: And if you can't do it by the end of December, we'll be very disappointed.

MR. ANDES: We will take this back and assess and provide a timeline in terms of how we can get it done as soon as possible.

MS. TIPSORD: Thank you.

MS. ALEXANDER: I'd like to return now to the topic of this USEPA -- by informal unofficial five-time standard, just to be clear, by five times what's meant by that is five times the end stream level of 200 colony forming units of fecal coliform

per 100 milliliters that's applicable in general use waters. Is that correct?

DR. GRANATO: Right. I think it was five to ten times was the guidance.

MS. ALEXANDER: So five times would be 1,000. Is that correct?

DR. GRANATO: Mm-hmm.

MS. ALEXANDER: And just to be clear, you testified earlier, as is elsewhere in the record, that the end stream water quality does exceed, at times, 1,000 colony forming units of fecal coliform.

DR. GRANATO: Yes.

MR. ANDES: Dr. Granato, you're not suggesting that we adopt the EPA rule of thumb, correct?

DR. GRANATO: No, I'm not suggesting that.

MR. ANDES: Is your point simply that EPA has different recommendations for secondary contact than for primary?

DR. GRANATO: At one time they did, yes. They don't have any recommendation currently for secondary contact.

MS. WILLIAMS: So just to be clear, is your testimony that this rule of thumb, as Mr. Andes was calling it, was withdrawn by USEPA and is no longer a recommendation?

DR. GRANATO: I don't know officially if it's been withdrawn.

MS. WILLIAMS: But it's your understanding that it's no longer a recommendation of the USEPA?

DR. GRANATO: That's my understanding, yeah.

MS. ALEXANDER: And would it also be your understanding that that this withdrawn rule was never a change in this benchmark of eight illnesses per thousand?

DR. GRANATO: It was what?

MS. ALEXANDER: Was never actually a change in the ultimate benchmark risk criterion of eight illnesses per thousand.

DR. GRANATO: Well, I think there was -- in that guidance document, I think that there was -- and I have to admit that I have not looked at that in a very long time, and I don't want to quote an exact number, but I believe they did have a

different risk number in there for secondary contact than they did primary contact.

MS. ALEXANDER: But wasn't the concept of the risk number that if people were engaging in primary contact activities, which they wouldn't be because it's secondary contact, then there would be more illnesses?

DR. GRANATO: I don't know.

MS. ALEXANDER: Okay.

MS. WILLIAMS: Would it refresh your recollection, Mr. Granato, if I suggested that they may have offered flexibility to chose a range of illnesses from 8 to 14? Does that sound familiar?

MR. GRANATO: That might be right. Like I said, I haven't looked at that in a long time, and I don't want to represent exact knowledge of that at this time, because I don't have it at my fingertips.

MS. WILLIAMS: But is it your recollection that there was a cap of a number of illnesses around 14?

DR. GRANATO: That sounds --

MS. WILLIAMS: About right.

DR. GRANATO: Right. But that -- is

that for primary contact or secondary?

MS. WILLIAMS: I'm not -- I'm actually not sure myself either. So if you don't recall, that's fine.

MS. ALEXANDER: Just a couple of quick follow-ups on earlier questions. Dr. Granato, are you familiar with the six factors derived from Clean Water Act rest regulations that were used in the Use Attainability Analysis process for setting essentially subcategories of a use, or the designated uses in this case?

DR. GRANATO: Am I familiar with the six categories?

MS. ALEXANDER: Yes, the six factors.

DR. GRANATO: The six factors, yes.

MS. ALEXANDER: Are you aware that the sixth factor is for --

DR. GRANATO: Widespread economic.

MS. ALEXANDER: -- controls more stringent than those required under Sections 301 B 306 of the Act with a result of substantial and widespread social economic impact?

DR. GRANATO: Yes.

MS. ALEXANDER: Has the District done

analysis to determine whether such substantial and widespread social and economic impact would occur in the event disinfection was required?

DR. GRANATO: No. We have not done that.

MS. ALEXANDER: Okay. The last question, I want to go back to pre-filed question six. Referring again to Ms. Headman's questions, isn't it a fact that she presented information concerning the sources of power that would be used by the District for disinfection that were substantially different from the sources presented by Mr. McGowan?

DR. GRANATO: She presented some information, yeah, about the sources of power.

MS. ALEXANDER: And isn't it a fact that her information as to where the power would come from to generate to power disinfection were quite different from the sources presented by Mr. McGowan?

DR. GRANATO: Quite different?

MS. ALEXANDER: Yes.

DR. GRANATO: I don't know about quite different.

MS. ALEXANDER: Significantly different?

DR. GRANATO: I don't think that we agreed with her analysis at the time of the hearings.

MS. ALEXANDER: Based on what? What did you disagree with?

MR. ANDES: He wasn't testifying. If you want to bring Dr. McGowan back to talk about it we can, but he can't recall what happened in Dr. McGowan's testimony a year ago.

MS. ALEXANDER: We are here because Mr. Granato has made a statement reaffirming previous testimony. I'm entitled to find out what he knows. Now, if he wants to say that he knows nothing, then that's his answer.

DR. GRANATO: Well, I'll answer your question on this basis: The way it appears right now from what's in the record, disinfection will have no benefit, no health benefit. On that basis, and looking ahead at the current concern about climate change and initiatives to limit carbon emissions, I would go so far to say anything that's done frivolously that's going to increase carbon

emissions is an unreasonable environmental impact.

Now, what Ms. Headman presented will change a little bit -- if you accept her premise, it will change a little bit the emission numbers, but they still were very large. And at that time when perhaps policy makers are looking to limit and even reduce -- turn the clock back on emissions going back to 2005, or in some cases 1990 levels, and some significant percentage of emission below those levels, it makes no sense whatsoever to contemplate some type of action that's going to have no benefit and increase emissions. How are we ever going to reduce emissions if we layer on additional treatment that's going to substantially increase emissions? How are you going to offset that?

MS. ALEXANDER: Let me go back to my question, which is: Sitting here today, do you know of any basis to disagree with any of the information Ms. Headman presented?

DR. GRANATO: I would have to go back and review that, to answer your question.

MS. ALEXANDER: Okay.

MS. TIPSORD: Mr. Harley, you have a follow-up?

MR. HARLEY: I have a follow-up. Keith Harley, Southeast Environmental Task Force.

Do you know if any of the District's facilities generate power for on-site use through the combustion of bio gas, which comes out of the wastewater treatment process?

DR. GRANATO: Yes.

MR. HARLEY: Which facilities generate power on site through the combustion of bio gas?

DR. GRANATO: Stickney and Calumet.

MR. HARLEY: Was that taken into account in Mr. McGowan's testimony?

DR. GRANATO: I don't recall.

MR. HARLEY: Thank you.

MS. ALEXANDER: I have no further questions for this witness.

MR. ANDES: I had a couple of follow-ups.

MS. TIPSORD: Okay.

MR. ANDES: Dr. Granato, let's go back for a second to the risk assessment done by Geosyntec, and I want to ask you to explain something.

As I understand it, the risk

assessment identified a risk -- an estimated risk due to bacteria levels, and that was in, say, the two to three per thousand range. And now in the CHEERS study, it identifies a risk due to water recreation, both on the CAWS and general use waters, of 12 or 13 per thousand. How do you explain the difference between those numbers?

DR. GRANATO: Well, as I stated yesterday, the CHEERS number is based on -- it's an epidemiology derived number. So it's based on an observation of all cases that exhibit acute gastrointestinal illness symptoms.

The risk assessment study, by virtue of its model, is only able to compute illnesses due to exposure to and subsequent infection from pathogenic organisms. So one would expect that because there are potentially factors other than pathogenic organisms that can cause gastrointestinal illness symptoms, that an epidemiologic study would find a higher level number of cases per thousand than a risk assessment study.

MR. ANDES: So what do you think are some of the other factors that could involve water recreators having more risk than non-water

recreators, besides pathogens?

DR. GRANATO: Well, besides pathogens, there's a potential for a chemical ingestion to produce those symptoms, algal toxins. It could be things such as motion. Even motion on powerboats can cause nausea and vomiting. Alcohol was mentioned yesterday by Dr. Dorevitch. It could even be other environmental microbes that are not cultured for that may not even emanate from treatment plants but that are present in the environment.

MR. ANDES: If the difference -- if the 12 or 13 were all due to bacteria levels, would that be consistent with the CAWS and general use bacteria levels observed?

DR. GRANATO: No, it wouldn't, because the CAWS has higher bacteria levels than general use waters.

MR. ANDES: So if bacteria were the main component of the 12 or 13 per thousand, you would expect the CAWS would have a higher risk, and it doesn't?

DR. GRANATO: That would be the expectation, yes. It does not.

MR. ANDES: And even if you put aside the risk assessment for a moment and its modeling of risk and just look at the CAWS -- at the CHEERS results, comparing the CAWS versus general use recreators, what does that tell you in terms of the benefit of disinfection?

DR. GRANATO: It doesn't appear there would be any benefit. The general use waters receive disinfected effluents. The CAWS waters do not, and risks are equal.

MR. ANDES: Thank you.

MS. ALEXANDER: I have some follow-up questions on that.

MS. TIPSORD: Ms. Williams had her hand up though.

MS. WILLIAMS: I just want to understand, Dr. Granato, I'm not an epidemiologist and I don't think you are either. But didn't Dr. Dorevitch tell us that we don't have the information yet to correlate the levels of microbes in the water when people got sick? I mean, isn't that the next phase of the study? How can you make this conclusion that there's no benefit to disinfection until we see the next phase of the

study?

DR. GRANATO: Well, I'm basing it on the comparison of illness rates in the CAWS and general use waters.

MS. WILLIAMS: But doesn't he need to do the next level then and compare what the level of pathogens were in the water at the time --

DR. GRANATO: Well, not for this analysis. I'm basically looking at two systems. One system has disinfected effluents.

MS. WILLIAMS: But we don't know what levels -- they don't necessarily have lower levels of bacteria in the cases where people got sick, do they? We don't know that, do we?

DR. GRANATO: Well, the water quality data suggests that the bacteria levels are lower in the general use waters. What you're talking about in the supplement that if we want to know -- see, both cases have increased incidents of illness relative to unexposed individuals, but those incidents of illness are equal in both systems. Now, what the supplement will tell us is what levels of water quality are responsibile for various levels of increased rates of illness, but that will not

attribute the cause of that increased level of illness to pathogenic organisms.

I can give you an example from my background of expertise, which is soil science and agronomy. If you take a corn field and you fertilize it with ammonium sulfate fertilizer, I can generate a graph for you of sulfate -- applied sulfate and corn yield, and you will see if I split it into plots with different rates, that as the sulfate concentration applied increases, the corn yield increases, okay, and that's a valid relationship. But it is not a causal relationship, because it's the nitrogen, the ammonium, that's causing the yield increase.

The same thing is true in the waterways. When you make a chart of indicators versus illness, you're relating those mathematically, and there's a relationship there that can be discerned, but that relationship does not prove -- because the indicators themselves are not the cause of the illness. It does not prove or enlighten what the cause of that relationship is.

MS. WILLIAMS: I can understand what you're saying that it doesn't prove. Are you -- is

it your testimony that the levels of indicators are not going to enlighten us?

DR. GRANATO: They'll enlighten you in terms of being able to predict illness rates.

MS. WILLIAMS: And is that our goal here? Is the District going to provide us information that will help the Board know what levels of indicator organisms would be protective of recreational uses in the CAWS?

DR. GRANATO: Yes, we just said we would. We were asked to do that and we will do that.

MS. WILLIAMS: I want to -- just one last follow-up. I want to understand what you're trying to say about the difference between the risk assessment and the CHEERS study. The risk assessment is a model, correct?

DR. GRANATO: Yes, it is.

MS. WILLIAMS: And input into the model was information for epidemiological studies, correct?

DR. GRANATO: Input into the model was -- say that again.

MS. WILLIAMS: Didn't the model rely

on epidemiological studies, just like the CHEERS study, in order to determine when people will get sick?

DR. GRANATO: Yes. Some inputs into the model did, yes.

MS. WILLIAMS: I just -- I'm really having trouble understanding on a common sense level why there's validity to a model when you can compare it to actual data, especially when the model used similar actual data in order to come up with the calculation. In fact, similar but inferior data, right? We had these studies on white water rafting in Colorado. That's what the model had to rely on because that's all there was, correct?

DR. GRANATO: I'm sorry. You said something about Colorado?

MS. WILLIAMS: Prior to the CHEERS study, there was very limited epidemiological data for the model to rely on?

DR. GRANATO: What was your original question? I didn't --

MS. WILLIAMS: Do you want her to read it back?

DR. GRANATO: Yeah, would you do that?

(Whereupon, the record was read as requested.)

DR. GRANATO: Well, I mean, I agree with you. The epidemiological study is the highest form of evaluation, and that's why it was undertaken as a follow-up.

MS. WILLIAMS: That's really what I was trying to get at. I appreciate it. Thank you.

MS. ALEXANDER: Okay. I have a couple of follow-ups. Going back to your specific comments about possible other causes of illness, you referenced chemical ingestion. I asked you this yesterday, but since you reiterated the testimony I'll ask you again. What chemicals are you referring to that can be ingested that can cause these symptoms?

DR. GRANATO: Well, I wasn't referring to any specific chemicals, just the fact that chemicals can cause symptoms of gastrointestinal illness.

MS. ALEXANDER: So any chemicals that might happen to be in the water?

DR. GRANATO: Sulfate, fluoride, algal toxins, metals at high enough levels.

MS. ALEXANDER: Do you have data to suggest that there might be fluoride or metals in the CAWS at high enough levels to give people GI symptoms?

DR. GRANATO: I haven't analyzed that.

MS. ALEXANDER: Same with algal toxins?

DR. GRANATO: I haven't analyzed it, no.

MS. ALEXANDER: What other microbes were you referring to that weren't studied?

DR. GRANATO: I wasn't referring to any specific ones, but there may be ones that are unknown to science even. There are not methods for analyzing every microorganism known to mankind -- in nature.

MS. ALEXANDER: Okay. I have no further questions.

MS. TIPSORD: Mr. Armstrong?

MR. ARMSTRONG: A couple followup questions.

MS. TIPSORD: And have you identified yourself for the record today?

MR. ARMSTRONG: Andrew Armstrong for

the Illinois Attorney General's office.

Yesterday we asked Dr. Dorevitch about a particular finding of the CHEERS study, which was really to the CAWS north area, which has some of the highest levels of pathogen concentrations, and people recreating tending to use some of the higher exposure activities, such as kayaking and rowing, yet displaying some of the lowest levels of illness, and I asked Dr. Dorevitch if he could explain these results. Do you recall that questioning?

DR. GRANATO: I recall that, yeah.

MR. ARMSTRONG: And do you recall his answer?

DR. GRANATO: Why don't you refresh my memory?

MR. ARMSTRONG: Well, let me just ask this question when I asked about the reason for his finding: Do you recall Dr. Dorevitch mentioning the possibility of people becoming ill from chemicals in the CAWS?

DR. GRANATO: Do I recall him saying that?

MR. ARMSTRONG: Yes.

DR. GRANATO: No, I don't recall it.

MR. ARMSTRONG: Do you recall him mentioning the possibility of people in the CAWS becoming ill from any reasons, other than pathogens?

DR. GRANATO: Well, he did say -- not specifically for the north area, but he did mention alcohol as one potential source of illness, yes.

MR. ARMSTRONG: Do you recall me asking him whether he had any data to suggest that alcohol was tied to any particular types of recreation?

MR. ANDES: Do you want to read back the testimony? We're trying to remember what Dr. Dorevitch said yesterday?

MS. TIPSORD: I think we can assume -- I would really prefer that we not repeat all of Dr. Dorevitch's testimony from yesterday, since it was just yesterday. Now, if we're talking about October of 2008 -- so if you can just ask your question and assume if he doesn't remember it then he can say that.

MR. ARMSTRONG: No further questions.

MS. TIPSORD: Anything else?

MR. RAO: We have one follow-up for

Dr. Granato.

Dr. Granato, would it be possible for the District to update the record regarding the status of TARP?

DR. GRANATO: Mm-hmm, sure.

MR. RAO: Basically, if you have any current time table as to a completion of phase two, and if there's a phase three, if you could provide that information?

DR. GRANATO: Certainly.

MS. TIPSORD: Mr. Harley?

MR. HARLEY: Again, your --

DR. GRANATO: Can I interrupt you for a second? I don't know if this is allowable, but it's been bothering me. Since you asked your last question, I think I misspoke when I answered him. Could we go back to that for a second?

MR. HARLEY: Sure. About the bio gas?

DR. GRANATO: Yeah. Did you ask me if we were using bio gas to generate energy? Isn't that what you said?

MR. HARLEY: Yes, that's correct.

DR. GRANATO: And I think I misspoke, because we're actually -- we're using it to heat

boilers. So we are using it, but it's not energy generation.

MR. HARLEY: Thank you for the clarification.

DR. GRANATO: I'm sorry for that. Go ahead.

MR. HARLEY: TARP may not be completed according to the same schedule in different regions. Is that correct?

DR. GRANATO: That's correct.

MR. HARLEY: And so your request for a friendly modification might be the schedule for TARP completion as it relates to individual regions within the District's authority?

MR. ANDES: That's fine.

MR. HARLEY: Because it would be very different for the Calumet region than it is, for example, for other areas.

DR. GRANATO: We would break that down by region, sure.

MR. HARLEY: Thank you.

MS. TIPSORD: All right. Then let's take a ten-minute break, and we'll come back and let the People talk to Mr. Granato.

(Whereupon, a break was taken, after which the following proceedings were had.)

MS. TIPSORD: Let's go ahead and go back on the record. We're continuing with Dr. Granato, and the IEPA has some pre-filed questions.

MS. WILLIAMS: Dr. Granato, I'm going to start with question 11, the final one. On Page 2 of his pre-filed testimony, Dr. Granato states, quote, "The District funded the CHEERS study, in part at the request of IEPA." Who at IEPA asked MWRDGC to fund the CHEERS study?

DR. GRANATO: Okay. For that, I guess I'll start by saying that I don't think that -- I don't have any documentation that it was specifically asked for by a person at IEPA.

MS. WILLIAMS: Do you --

DR. GRANATO: I'm sorry.

MS. WILLIAMS: You don't have any documentation of it?

DR. GRANATO: I don't have, like, say a letter or some minutes of a meeting where it was specifically asked that it fund CHEERS. My basis

for that statement was my understanding that the -- that there was an expectation that the District, under its obligation, I think it was in the 2002 renewal of the MPDES permits, there were special conditions that required the District to participate in and support the UAA.

And as a result of that, as a stakeholder process evolved, the District and the Agency entered into an understanding that the District would undertake various programs of study, including the engineering studies.

MS. WILLIAMS: Right. And I really just want to get at this -- we talked last hearing about the more general stuff. It's just this very specific -- would you agree that no one at EPA specifically asked you to fund an epidemiological study that turned into the CHEERS study, specifically?

DR. GRANATO: Yes, right.

MS. WILLIAMS: That's really all that question was getting at. It's very straightforward.

MR. ANDES: Let me follow-up on that. Dr. Granato, can you explain the process, to the best of your understanding, that led to the District

funding the CHEERS study?

DR. GRANATO: Well, that was what I was starting to explain, is that we -- under our obligation in the permits, we -- and over time through the stakeholder process, we arrived at an understanding with the Agency that we would undertake program of research and information gathering, including the engineering studies, assessment of risk for recreating under disinfected and not disinfected conditions, evaluation of the USEPA criteria, and other matters, and that -- the epidemiological study was an extension of that risk analysis that started with our quantitative microbial risk assessment study. It flowed from that.

MS. WILLIAMS: Are you done?

MR. ANDES: Sure.

MS. WILLIAMS: Question ten, similarly just gets at a very specific statement from your testimony. At the bottom of Page 4 of this pre-filed testimony, Dr. Granato states, quote, "There was no suggestion that water recreation CAWS use, or water ingestion was associated with gastrointestinal illness." Would you agree that

statement is a little bit misleading?

DR. GRANATO: Yeah. I looked at that after I saw your question, and I think basically we write things or communicate things as an incomplete expression of what we meant, and I think it should contain -- the sentence should end with the phrase, "due to waterborne pathogens," to answer you very succinctly.

MR. ANDES: And specifically, Dr. Granato, were you attempting on Page 4 of the testimony to summarize the stool sample results?

DR. GRANATO: Yes, that was the basis for that statement, the fact that within the stool samples, that aspect of the study, one of the study objectives, was to try to determine the causes of waterborne illness with respect to clinical pathology.

The stool sample analysis yielded a result that 90 percent of the stool samples did not yield any identifiable pathogen where pathogens were present, they were present equally in unexposed general use and CAWS stool samples, and there were no findings of the E. Coli, salmonella, and shigella, that would be the most dangerous of the

pathogens, or highest calls of concern in the stool samples.

MS. WILLIAMS: Question nine is the last of the pre-filed questions that we didn't get to yesterday. On Page 6 of this pre-filed testimony, Dr. Granato asked the Board to direct IEPA to use the results of the CHEERS study, including the supplemental report that will be filed shortly, concerning the statistical link between micro concentration in the CAWS and actual illness rates to establish appropriate science-based criteria to support recreational uses.

I think it would be helpful for the Board and for the Agency for you to explain very specifically what actions you are asking the Board to direct the Agency to understand, step by step.

DR. GRANATO: Step by step?

MS. WILLIAMS: Yes.

DR. GRANATO: Well, the first step would be to take what's currently in the record in terms of the CHEERS report, the risk assessment study, testimony of Dr. Blatchley (phonetic), the District's fecal coliform study, some of the water quality information that's in there from Dr.

Melchin's (phonetic) testimony, and to determine that the effluent standard that's currently proposed is not reasonable, and to -- not to adopt that, but rather to request that a new analysis is made, which has been done this morning, using the CHEERS supplement climatological data, wet weather operations data, do flow modeling, risk assessment, water analysis, and various other pieces of information to develop water-based -- water quality-based criteria protective of the uses that are proposed.

MS. WILLIAMS: I need you to be a little more specific about how the District has thrown an enormous amount of information in the record, and then has said that somehow magically the Board and the Agency will take all this information and find a criteria, where, up until now, the USEPA has not been able to do that.

MR. ANDES: I don't think we mentioned magic.

MS. WILLIAMS: Right, but I need a little bit more of a road map of what you would like our staff to do with this information.

DR. GRANATO: Well, there's a

preliminary road map in Chapter 11 of the CHEERS report. I'm not prepared this morning to outline for you in, say, SOP detail exactly how to undertake that and arrive at final criteria. I haven't even seen the CHEERS supplement report yet. So until I see that, I can't really offer you a detailed step by step how-to.

MS. WILLIAMS: Would you agree that the science-based criteria would have to be based upon a particular illness rate and establishment of an ambient criteria respective of a particular illness rate?

DR. GRANATO: That's traditionally how it's done, yes.

MS. WILLIAMS: Would the District be prepared to say that it supports a criteria for the CAWS and Lower Des Plaines River based on an eight illnesses per 1,000 rate?

DR. GRANATO: I don't think I can speak for the District on that matter this morning.

MS. WILLIAMS: You can't speak for the District on what water quality criteria --

DR. GRANATO: Well, you're asking me if an acceptable rate of illness is eight per

thousand. Is that your question?

MS. WILLIAMS: Yes.

DR. GRANATO: I think we would like to see the supplement and see -- take into consideration all the information that's typically, as you mentioned, in the EPA criteria document, that there is a matter of flexibility there, and I think it's -- I think it's something --

MS. WILLIAMS: I didn't mention that there was flexibility, actually. I'm not sure there is. I would like to hear that there is. If you think there is flexibility, or if you have, from a policy perspective, a range of illnesses that the District is willing to accept, I would be happy --

DR. GRANATO: Well, the District hasn't considered that matter up until now, because it's just this morning that we're being asked to develop that information ourselves and provide it, which we're willing to do. But up until now, we have not been operating on the assumption that we would be doing that.

MS. WILLIAMS: So you don't have a policy of how many illnesses you think are acceptable?

DR. GRANATO: No.

MR. ANDES: Does Illinois EPA have a policy on that?

MS. WILLIAMS: I don't really want to testify. I will if you want to swear me. I think we've been pretty clear that we were unable, based on the uncertainty at the federal level, to propose something to the Board. We would have if we could, but the flexibility we thought we had was no longer available. Therefore, we relied on a technically feasible and economically reasonable technology-based requirement.

MR. ANDES: So we'll provide -- the District will provide the information that's requested that goes toward a development of a water quality standard.

MS. WILLIAMS: Okay. I'm almost done, I think. What about -- well, one last question on that point.

Would the District be supportive of a narrative bacteria criteria that required the waters in the CAWS and Lower Des Plaines River to be free from levels of bacteria that interfere with designated uses established by the Board?

MR. ANDES: Can you repeat that?

DR. GRANATO: Yeah, go ahead. Repeat it once.

MS. WILLIAMS: Would the District support a narrative bacterial criteria which requires the waters of the CAWS and the Lower Des Plaines River to be free from levels of bacteria that interfere with the designated uses?

DR. GRANATO: That's not something that we've considered up until now either. It's not clear to me what that would mean or what -- you know, how that would be -- how compliance with that would be verified or determined. So until that was clearer, I think I would withhold --

MS. WILLIAMS: So you want to know what actually it would mean at the plants before you can determine whether you would support it?

DR. GRANATO: Yeah, and how would it be verified.

MS. WILLIAMS: You were asked a few questions this morning about the cost of disinfection.

DR. GRANATO: Yes.

MS. WILLIAMS: Wouldn't the cost to

the District and to the taxpayers of disinfection decrease by over half if disinfection was installed over at the North Side and Calumet plants?

DR. GRANATO: Is that a hypothetical question? That's not --

MS. WILLIAMS: No, it's not hypothetical. The question is: Would the cost decrease by more than half if the two smaller plants only had the disinfection?

DR. GRANATO: Well, the total cost would, yes, but not the cost at those plants.

MS. WILLIAMS: Right. The total cost would decrease by --

DR. GRANATO: Yeah. You're asking if the Stickney plant disinfection cost is half or more of the total cost?

MS. WILLIAMS: Right.

DR. GRANATO: Yes.

MS. WILLIAMS: Would the District support installing disinfection at one plant, two plants?

DR. GRANATO: If it was scientifically justified, yeah, if there's a public health reason to do it.

MS. WILLIAMS: So you mean -- okay. You don't mean technically justified or economically reasonable. You mean if it was justified by a public health benefit?

DR. GRANATO: Yes.

MS. WILLIAMS: I don't have any other questions for this witness.

MS. TIPSORD: Do the People have additional questions for Dr. Granato? You indicated you might have one more.

MR. ARMSTRONG: No, we don't. Thank you.

MS. TIPSORD: Don't forget to identify yourself for the record.

MS. FRISBEE: Margaret Frisbee with Friends of the Chicago River.

Yesterday you stated that MWRD staff, including you, worked with the CHEERS team, Geosyntec study, and other reports. Can you tell me how many MWRD staff has been involved in this whole process?

DR. GRANATO: Oh, gosh.

MR. ANDES: You mean everything involved in the UAA?

MS. FRISBEE: Yes.

DR. GRANATO: I probably can't give you an exact number, but I can give you an idea of how much staff.

MS. FRISBEE: That would be great. Thank you.

DR. GRANATO: I would say -- basically this is entailed personnel from our research and development, now called our monitoring and research department, our engineering department, our maintenance and operations department, and our budget office and our law department. I'd say there's been at least a couple dozen people involved.

MS. FRISBEE: And for how many years?

DR. GRANATO: Well, I mean, a couple dozen haven't been involved, you know, on every single thing the whole time. But this has been going on for about eight years I guess, if you go back to the beginning of the stakeholder process.

MS. FRISBEE: Thank you very much.

MR. ANDES: So Dr. Granato, are you saying that over the last eight years, a couple of dozen people have been involved to some extent?

DR. GRANATO: Yes, that's what I mean.

MR. ANDES: Not that they have been involved with all of their time?

DR. GRANATO: No.

MR. ANDES: Thank you.

MS. TIPSORD: Are there any other questions for Dr. Granato? Seeing none, thank you very much Dr. Granato.

DR. GRANATO: My pleasure.

MS. TIPSORD: And with that, we move onto the testimony of Dr. Gorelick.

(Whereupon, a discussion was had off the record.)

MS. TIPSORD: Let's go back on the record. Can we have the witness sworn, please?

(Witness sworn.)

MS. TIPSORD: And with that, we'll enter his testimony as if read. If there's no objection, we'll mark the testimony of Marc Gorelick, M.D., as Exhibit 415. I think this is the third or fourth testimony.

MS. ALEXANDER: Third.

MS. TIPSORD: Seeing no objection, it's Exhibit 415. And I believe the only pre-filed

questions we have are from the District. So Mr. Andes, unless you had anything else, Ms. Alexander?

MS. ALEXANDER: No.

MS. TIPSORD: Mr. Andes?

MR. ANDES: Good morning, Dr. Gorelick.

DR. GORELICK: Good morning.

MR. ANDES: Starting with question number one, your testimony identifies a heterogeneity bias as perhaps the most potential bias in the CHEERS study. Can you identify the scientific definitions for a heterogeneity bias in a cohort study from a recognized scientific publication?

DR. GORELICK: I think part of the point of that question is in any effort to be succinct in wording and not sound too jargony, I probably created jargon that you think I meant as a specific term.

So what I should have said was information bias due to unaccounted for heterogeneity. So the term "heterogeneity bias" is not an epidemiologic term. But information bias is,

and the concept of heterogeneity, as a cause of that, is.

And since you asked for a publication, I'll site one, which is a textbook called Modern Epidemiology. The authors are Rothman and Greenland. It's a standard epidemiology textbook, and they refer to that concept in there.

MR. ANDES: Your testimony complains that the analysis treats the entire CAWS as one group. Do canoers and kayakers stay in one location throughout their time in the water, or do they paddle from place to place?

DR. GORELICK: That gets to this question of heterogeneity. You know, the CAWS is a long waterway, and we know from the information presented in the final report that quality of that water varies across -- from place to place on the waterway, as well as from day-to-day, at a specific point.

And so the issue here is that everybody who gets out, for example, even at a particular point, is treated as having been exposed in the same way, even though there may, in fact, be important differences, so somebody who goes in at

CAWS north and paddles around in circles versus someone who goes in at CAWS north, paddles five miles downstream and comes out down there and meets somebody who's kind enough to pick them up.

So by lumping them all together as exposed at CAWS north, or even exposed within the CAWS, there's a potential for grouping people together as the CAWS that might miss an ability to find an association with illness if that illness is only at certain points.

So an example from -- it may be a little extreme, but gets the point across. So I want to know if smoking causes cancer, and I'd say, "Well, let me ask if people ever smoked or never smoked." Well, never smoked is easy. Ever smoked could be my son in middle school smoked a couple of cigarettes when he was 12, or my grandfather, who's 80, has been smoking three packs a day for 60 years. And completing them all together as ever smoked is combining people who shouldn't be combined with regard to their risk. And I might not be able to find the correct association between illness and smoking if I do that.

It's the same thing with this

study. By putting all of the CAWS the same, although we know that there are enormous variations in water quality, it might lead to a biassed estimate of what is the association between illness and recreation on the CAWS.

And for studying one, which is what is the rate of illness in the CAWS, that estimate of 12 per thousand, it mainly is a problem if the way they sample those people isn't reflective of who's actually on the CAWS. Some of your other questions get to this, you know, where are they recreating, for example, the activities they're engaged in, and so on. And by lumping them all together, we might obscure the effect.

For the water quality aim, the thing that it's going to aim to, which is going to come in the future amendment, or whatever, to the study, it's potentially a much bigger issue, because there they've got water quality data, but it's the water quality where you get exposed or ingest the water that's the issue.

And so again, if someone goes in at CAWS North but their ingestion occurs four miles downstream, I'm associating water quality where they

went in with whether or not they got sick, and not water quality where they actually were exposed to it. So not having seen that, I don't know how they're going to account for that, but that's potentially a real problem when it comes to the issue of indicators and pathogens in the water and whether people got sick again for that same reason.

If they just take it as an average, people who went in on north and not account for the fact that some of them go downstream, some don't, might go upstream, that's going to group together people to make them look more similar than they really are.

MR. ANDES: So that pertains to the supplement in terms of when Dr. Dorevitch's group tries to make the association between water quality levels and illness rates?

DR. GORELICK: Right. With study one, the one that we're looking at now, it's an issue if, again, the sampling of participants doesn't reflect where they really came from, so I have heterogeneity and I haven't accounted for it.

MR. JOHNSON: You know, I would have answered that question, "They paddled from place to

place." That's the difference between teachers and lawyers.

MR. ANDES: Are you aware that the CHEERS analysis adjusted for type of recreational activity, which does vary, depending on the particular segmented issue?

DR. GORELICK: Right. To the extent there's confounding, because people tend to do an activity in one place and a different activity in another, that they've accounted for. The fact that they may have over or under represented some of those groups, that doesn't -- adjusting for it doesn't take that into account.

MR. ANDES: And we'll get to that in other questions.

Your testimony raises concerns about non-validated survey questions. Are you aware that the CHEERS survey questionnaire items regarding water ingestion have been validated?

DR. GORELICK: Well, that wasn't included in the report. So now that I've heard Dr. Dorevitch's testimony about the part related to how much they ingest, and they did attempt to correlate that with those chemical markers, that

part has been validated.

MR. ANDES: Are you aware that questionnaire used by EPA in its current NEER studies to develop the criteria for swimming waters have not undergone evaluation in their assessments?

DR. GORELICK: That's correct.

MS. TIPSORD: Excuse me. That's USEPA, by the way.

DR. GORELICK: That was my understanding. Yes, that's my understanding as well.

MR. ANDES: Have you validated every questionnaire used in the studies you've conducted?

DR. GORELICK: No, not everyone. It is, as Dr. Dorevitch pointed out, cumbersome and expensive and so on. And it depends a little bit on what you're measuring. There are some things where those measurements, especially when they're self-reported are more critical than others.

So it's a huge field of interest in dietary epidemiology, for example. Because if you want to figure out whether there's an association between what people ate and illness, it's really hard to measure that in a lot of ways.

And water exposure is more similar than others.

So for example -- again, my field is drinking water not recreational water. When we did our study looking at an association between drinking water and illness, we did develop and validate that survey before we administered it in the epidemiologic study so that we had some confidence that the questions we were asking about the kinds of water people used, the amounts of water they used, et cetera, were, in fact, accurate.

MS. ALEXANDER: I have a quick follow-up. Dr. Gorelick, is this document entitled, "Development and Validation of a Self-Administered Questionnaire to Measure Water Exposures in Children," the validation research you referenced?

DR. GORELICK: Yes.

MS. ALEXANDER: I would like to present this as an exhibit.

MS. TIPSORD: I've been handed "Development and Validation of a Self-Administered Questionnaire to Measure Water Exposures in Children," author Marc H. Gorelick, Duke Wagner, and Sandra L. McLellan. It's copyright 2008 by Academic Pediatrics. If there's no objection, we'll mark

this as Exhibit 416. Seeing none, it's Exhibit 416.

MR. ANDES: Were the same questions asked in this questionnaire of the CAWS recreators and the recreators on the general use waters?

DR. GORELICK: My understanding is the questionnaires were exactly the same. This is a point that's come up a few times and it's in a few of your other questions, and actually Dr. Dorevitch referenced it yesterday. The question you're asking is the same, "Is it biased?" And bias can occur in two ways.

One is if you ask information or you obtain information that's different between the two groups, it can make it appear they're different when they aren't really. It's because of the quality of the information. If the quality of information in general is just poor, but it's equally poor in both groups, that still creates bias. It's what we call non-differential misclassification, that is misclassifying people's exposure as the same whether they're in the CAWS or the general use, or whether they're sick or not sick.

And what that has the effect of

doing is making those two groups seem more similar than they truly are. And non-differential misclassification, whether of information of exposure or of illness, virtually always -- and in here there are some very technical exceptions to this, but virtually always creates a bias -- what we call a bias towards the null, which is making it look like there's no difference, when there might be.

And so non-differential misclassification becomes a critical issue to look at when a study doesn't find a difference between two groups. And that's where the concern about the questionnaires comes from, not that they are different between general use and CAWS, but that both of them might be of less than perfect quality.

MR. ANDES: Is it also accurate -- I guess we talked about this a little yesterday. One way to characterize the results and tables we've presented is that the two groups are similar. Another way of looking at it is --

DR. GORELICK: Similar with regard to what?

MR. ANDES: Similar with regard to

gastrointestinal illness.

DR. GORELICK: Okay.

MR. ANDES: Another way to look at it is both groups, when compared to unexposed, had an elevated risk, and those elevated risks, as compared to the unexposed, were similar, the 12 to 13 per thousand difference between that group and unexposed.

DR. GORELICK: Right. That is what the study found.

MR. ANDES: Your testimony raises as a possible source of selection bias, that the study did recruiting among organized recreational groups, such as rowing clubs. Would you recommend they not ask questions of rowing club members, who are among the most frequent users of the CAWS?

DR. GORELICK: No. My concern is taking whole groups of them at once. So you have a group of people that are fairly similar to each other potentially with regard to skill, risk taking, and so on, because they're all in a rowing club together, and not, therefore, including other people proportionally. So it's a question of are they over or under represented compared to who's actually out

there.

MR. ANDES: But if they are the most frequent users by far, and we had information presenting that yesterday, that they are a large group of people who account for most of the use of the waters, isn't it appropriate that those are the people you focus particular attention on in terms of determining illness risk?

DR. GORELICK: Well, it depends. They are the most -- they account for the most uses, but not the most users. So if you want to look at people who get sick, I'd want to know all the people out there and make sure the sample is representative of who is out there, not how often they're out there.

We know, for example, from some of the tables, that the sampling, who participated in a study, is not completely representative of the types of activities, for example. We talked about motorboating being over represented and so on. So again, the concern here is by going after groups of people, is your sample -- if you want to say, "What's the risk of illness from recreating on the CAWS," you need to make sure that the sample you

have represents the population that uses the CAWS.

MR. ANDES: Let me --

DR. GORELICK: I saw data about activities. I didn't see data about whether or not the sample is reflective of other people with regard to membership and rowing clubs or other organized activities.

MR. ANDES: Well, let me ask you, for a minute, about the motorboaters. Those -- that is the group that, as we've discussed, seems to have the highest risk for GI illness among the user groups on the CAWS, and it appears you're complaining we did not enroll enough motorboaters, relative to canoers and kayakers. I guess I'm wondering about that. Would you agree that, as a general matter, that motorboaters have less risk of water ingestion than canoers and kayakers do?

DR. GORELICK: Well, in this study they did report slightly less water ingestion. Of the motorboaters, 2.8 percent reported water ingestion, and it was 4.7 percent of the canoers. So most people in either kind of craft don't ingest water. But their rates were a little bit lower in the motorboaters. That's correct.

MR. ANDES: And the logic would be, certainly in this rulemaking, that the group that we've heard the most testimony about in terms of use of the water and concern about their exposure would be canoers and kayakers. Am I right?

DR. GORELICK: That's correct.

MR. ANDES: So are you recommending that the survey should have surveyed less canoers and kayakers and more motorboaters?

DR. GORELICK: I'm suggesting that the survey or the study should have enrolled users proportional to where they are in the population of interest. So the conclusion is that the risk of illness is 12 per thousand compared to unexposed. But if, for some reason, motorboaters really are at a higher risk of illness -- and we can talk about anomalous results and where those are -- but that's what they found, for whatever reason. I have no idea why. Maybe they washed for boat with water from the river. I have no idea. But let's just -- they found that.

If motorboaters are underrepresented in this study, then the real risk of illness may not be one per thousand, because the

group that gets sick more often, there's fewer of them in the sample. And so when I go to extrapolate who's actually out there on the CAWS, the risk of illness might be 13 or 14 or 15.

I don't know the answer to that. All I know is that the way the sample was enrolled, there were fewer people using motorboats than actually used them. So it's not that there are too many or too few motorboaters or too few kayakers. It's that there are -- it's not representative of who's using it, and so it gives you an answer that may be slightly different, or maybe substantially different, than the true answer of what is the rate of illness on the CAWS.

MR. ANDES: Given that the motorboaters do have the highest risk of GI illness among the surveyed groups, when that group has certainly less of a risk of water ingestion, I think from common sense and from the data you indicated, doesn't that indicate that there are other factors that are likely more important in determining whether these motorboaters suffer GI illness perhaps more important than their water exposure?

MS. ALEXANDER: Wait. Let's have a

clarification. The first thing you said was that they have less water ingestion, and then you talk about water exposure as a factor. That's two different things. I believe Dr. Gorelick just speculated one possible source of water exposure that's not ingestion specifically. We need to clarify that question.

MR. ANDES: Sure. I think I'm talking about both. I'm assuming, just because it seems like common sense, that motorboaters have less water exposure and water ingestion than canoers and kayakers. Assuming that, and seeing that that group has the highest risk of GI illness, doesn't that tend to indicate that the risk is due to other factors, or at least primarily due to other factors besides the water ingestion or exposure?

DR. GORELICK: So we have -- here's an example of an independent result that you look and you go, "It's not common sense." Common sense is we know from the germ theory of disease that pathogens cause illness, and the more pathogens you get the more likely you are to be sick, and there's a certain infectious dose you need on average, although for a given person it may vary. So it

would make sense that the more water you ingest, the more likely you are to get sick.

And here we have a finding in this study that that wasn't the case. We have a group that said they ingested less water and said they got less wet, and yet they got sick more often. That's a finding. What explains that finding? Because it's different than what other studies have shown. It's different from basic biologic principles of infectious disease.

So one hypothesis, which is something that Dr. Dorevitch raised yesterday, is that that relationship isn't linear. It's not that, you know, go up by one germ you increase by a certain amount of illness and so on, but that there's some threshold. There's an infectious dose. It's not that ingestion isn't associated with illness, it's that you have to cross a threshold. And if you look at it as more ingestion, more illness, you don't see that. The graph doesn't go like this, it goes like this. (Indicating). That's one hypothesis. That's a hypothesis that we tested.

One hypothesis is that something else is causing it. So Dr. Dorevitch mentioned

alcohol yesterday. Now, alcohol can cause GI symptoms, although it's typically vomiting and nausea not diarrhea, which you needed to get into the study. But that's certainly plausible. That's a hypothesis that can be tested.

My hypothesis is that alcohol interferes with your ability to report how wet you got or how much water you ingested. That's a hypothesis that can be tested. Maybe there's something else in the water, chemicals or something like that. We heard that testimony. It's a hypothesis. It's less plausible, but it can be tested.

The data in this study don't tell us which of these hypotheses is correct. And at least two of those hypotheses -- one is that there's a threshold effect, and one is that the quality of the data is bad because of a confounding variable that they didn't ask about, alcohol ingestion. And is that, therefore, masking a real association between water ingestion and illness. So at least two of those four hypotheses are consistent with an association between ingestion and illness, and this study doesn't provide any way to distinguish among

those four hypotheses. You would need to do another study to figure out which of those is correct.

MR. ANDES: In terms of the next question -- and I think your answer may be related -- your testimony mentioned that -- seemed to indicate that the CHEERS study surveyed too many people recreating in the CAWS North area. The basis of that concern was that area had the lowest risk of disease. You're aware, I assume, that this area had the highest level of bacteria indicators of any area in the CAWS?

DR. GORELICK: Yes.

MR. ANDES: Would you agree it makes sense to survey heavily in the area with the highest bacteria levels?

DR. GORELICK: One could -- if you wanted to -- if you thought it was important to make sure you got enough people at the area with the highest levels, because you think that's where the highest source of illness is. You could design your study so that you don't sample proportionally. You say, "You know what, we're going to take more people from the dirtiest areas than in other areas, because we want to make sure we get enough of them."

Because we want to make sure we get enough of them, because maybe people know it's dirty and they're going to avoid it. And if you just sample proportionally, you won't get enough to say anything.

You can do that, but then you have -- that's called stratified sampling. So I sample groups separately. It's done very commonly in pollings, for example. I want to make sure I have enough people from small, ethnic, and racial groups so I sample more of them. But I don't just add them up linearly and pretend they were actually 50 percent Latinos in my sample, when it was really only five in the population. I have to adjust for that.

So one could do stratified sampling. That's now what they did. What they did was they did what they thought what was random sampling and tried to extrapolate to the population. And again, my complaint isn't that they had too many in the CAWS North, it's that the sample doesn't reflect the recreation that's going on in the CAWS without adjusting for that disproportionate representation.

MR. ANDES: Let me move on to question number 12. Do the stool sample results suggest any relation between water recreation and CAWS use and risk of GI illness?

DR. GORELICK: Well, I was a little unsure about what to make of the stool sample results. Dr. Dorevitch testified yesterday that the purpose of the stool sample was to describe the pathogens that are found in people who are recreating out there, and not to look for associations between illness and recreation. So to the extent that that wasn't the aim of the study, I wouldn't expect to to show any relation in that sense.

What the stool samples showed was when they took people who were sick, and as Dr. Dorevitch testified, all the people who submitted stool samples who were sick, some of them were sick enough to count as ill for the study, to count as a case of acute gastrointestinal illness. Some had a lesser degree of symptoms, but they had something that made them go, "I don't feel well. I should give you a stool sample."

When they looked at those, as he

said he predicted, many of those were negative. Because Dr. Dorevitch knows, as a clinician, and I know, as a clinician, that most people who get sick with GI illness, first of all we don't routinely test their stool. But if we do test their stool, we frequently don't recover a pathogen. And the reasons for that are numerous. One is that most illness in humans is caused by viral pathogens. There are lots of viral pathogens. And we don't test for all of them, so it there may be ones we don't test for.

It's quite rare to get cryptosporidia, giardia, or bacterial pathogens that cause illness. Most of the illness is caused by the stuff you get because you are around somebody who's sick, or because your kid goes to daycare, and things that get passed from person to person through fecal contamination.

And what they found is that most of the people in this study had a negative stool test. And when they did test positive, it was usually for viruses, which is what I would expect, because if the illness is coming from feces-contaminated water, what you're going to get

sick from is the stuff in the feces. And I know the stuff in the feces is things like enteroviruses, adenoviruses, and the things that they found.

So I'm not sure they were actually looking to see if there's an association between water recreation and CAWS use and illness from the stool study, at least that's not what Dr. Dorevitch testified. And I wouldn't make anything from that, except to say that the things that are in the people who are sick are the things I'd expect to find in people who are sick if they got sick from a fecal contamination of some kind, whether it's waterborne fecal contamination, or person-to-person fecal contamination.

MR. ANDES: Your testimony states this study lacks the statistical power to fully evaluate the risks in potentially more vulnerable subgroups. Is there a test to determine how much statistical power is needed in order to say that a study has the power needed to fully evaluate a risk?

DR. GORELICK: Yes. So when you're calculating power for a study and you ask for a publication to discuss, I would refer you to the CHEERS protocol, because they did a power

calculation for this study.

There are a couple of things that you need to consider when you're deciding whether you have enough power. The first is how big a difference do you want to find between the groups, how big of a difference would be important. That's not a statistical question, that's a clinical question.

So, for example, if I were trying to find a difference in death rates, a very small difference might be very important, because it's kind of important to people if they're dead or alive. A difference in rates of a skin rash, I might be willing to find a bigger difference, because a really small difference wouldn't be as interesting to me clinically or from a public health perspective.

So one is how big a difference do you want to find. The other is how much of a margin of error are you willing to tolerate. As Dr. Dorevitch testified, we have, sort of, standards about what those margins of error are for false positives and false negatives, and then you calculate how many people you need. Now, if you --

and that's what they did for the CHEERS study. It was based on the full sample of all people taken together.

If, in advance, there is a subgroup that you think is particularly important to study, then you can design your study to do the same exact calculation. But it's not the number of all the people in the study that it refers to, it's the number of people in that subgroup that you need.

So if, for example, kayakers were very important and I wanted to find the same size difference with the same margins of error, my calculations wouldn't be that I needed 10,000 people, it would be that I need 10,000 kayakers. And the same would be true with any group you identify.

MR. ANDES: Among the potentially more vulnerable CAWS groups you discuss are anglers and powerboaters. I think we've talked about the powerboaters, but not the anglers. So the first question is: Do these groups ingest significant amounts of water while recreating?

DR. GORELICK: Again, in this study they reported less water ingestion than the other

groups.

MR. ANDES: So why would you say they're more vulnerable?

DR. GORELICK: Well, when I say "vulnerable," they have a higher risk of illness, which this study found that motorboaters and anglers had the highest rates of illness. Vulnerable means likely to get sick. In this study, they were more likely to get sick. The reasons behind that -- as I said, I can hypothesize why that is. I don't know, and I don't have the data from the study to be able to answer that. It would be speculation. But I'm just stating what they found.

MR. ANDES: All right. Let me go to question 17. Your testimony states the proper way to determine if a subgroup is at a higher risk to conduct interaction analysis. Are you aware that CHEERS researchers did do interaction analysis and found no statistically significant difference between user groups?

DR. GORELICK: Right. They did, and that's the proper way to do that. And again, the question comes to the power. Because by looking at an interaction, now I'm looking at subgroups based

on not one characteristic -- for example, kayaking versus other activities -- but two characteristics.

So, for example, children might behave differently in a motorboat than a kayak. Their risk of illness might be different, depending what activity they're doing and their age. Adults behave responsibly regardless, but children behave more responsibly on a motorboat than in a canoe, for example.

So I need to actually look at subgroups of children who canoe, or adults who motorboat, and compare them. And each time I do that, the number in each of those subgroups gets smaller and smaller and smaller. So I go from 10,000 in the whole study, to how many of them were children, to how many of them were children in a motorboat versus in a kayak.

And that's why it was pointed out in one of the peer reviewers that the test for heterogeneity, the tests for those interaction analyses, they tend to have low power. Because when we design a study, we design it to answer our primary question. And unless we've thought in advance that these interactions are particularly

important, and I want to design the study to be able to do them, we frequently don't have enough power to be able to find that there are statistically significant differences, even though there may be real differences.

MR. ANDES: In assessing risks in subgroups, isn't there a pitfall involving multiple comparisons, which can lead to finding associations by chance that don't really exist?

DR. GORELICK: Yeah, absolutely. So this is the balance between subgroups that you have clinical or policy reasons to think are important, versus just looking at things because you can look at them. And Dr. Dorevitch yesterday referred to subgroup subterfuge. Many of us call it going on a fishing expedition.

So I think of 50 different things that might cause you to get a certain illness -- and I ask about all 50 of them -- some of them might have some biological plausibility, but some are clearly ridiculous, but I thought of it anyway. And if I do the subgroup analyses, some of them will, as he testified appropriately, come up by chance as being associated.

My favorite example of this was a friend of mine, her niece had leukemia, and she found a study that showed if you ate more than two hot dogs a day while you were pregnant, your child had an increased risk of leukemia. Well, they asked, like 150 different dietary things, people going back 10 years, and they found three of them were associated. That's a perfect example of what you're talking about. But if you have a biological reason to think that an interaction is important or a subgroup is important, it can be included in advance. You don't have that problem with multiple comparisons.

So we did a study recently where we were interested in diagnosing head injury in children, and I testified about at the last testimony. We enrolled 42,000 children in the study. We knew in advance that children under the age of two were likely to be different from children two and older, and so we designed our study with the power to look separately at zero to two-year olds and two to 18-year olds. And that's not a problem with multiple comparisons, because it's what we call a prespecified hypothesis.

You can't do that with a lot of subgroups. But again, if there are groups that are important from either a biological or a policy perspective to say, "I really want to know about this subgroup," you can design your study that way, and that's not a problem at all.

MR. ANDES: Your testimony states that the CHEERS study did not address several possible confounders, including socioeconomic status, handwashing behavior, and duration of activity. I know we talked yesterday about handwashing and a subsequent analysis Dr. Dorevitch had done. Did the peer reviewers recommend any of these factors be addressed?

DR. GORELICK: I saw the peer review comments on the final report, and they didn't comment on anything there. I don't know if it was commented on at any other parts of the peer review process with regard to developing the protocol. But regardless of that, I know, as an editor who manages the peer review process for journal, that it is not perfect. And whether or not the peer reviewers of this study identified it, I believe they should have.

MR. ANDES: And the peer reviewers did accept the final report, correct?

DR. GORELICK: Well, I don't know. When I looked at the description of the peer review in that appendix -- this is from the appendix to the study, and there's --

MS. TIPSORD: How about 478, I think it is.

DR. GORELICK: This is an introduction to the peer review process, so this is appendix D. It says, "Peer review members provide technical advice." So a peer review can work in several ways. A peer review could be, for example, for a grant, peer reviewers review the proposal.

They usually have -- and I just got a review back for a grant, and I can tell you there's often a very big difference in opinion between the reviewers on the relative strengths and weakness of the study, which now I have to deal with, and then they come up with a consensus, and they vote whether to fund the grant or not.

The same is true for an article for a journal. Peer reviewers provide me comments, I have to weigh the differences between them, I have

to identify things they miss, and I decide whether to accept it or not. The peer reviewers don't decide whether to accept it or not, I do. So I, as the editor, decide whether to accept it. The peer reviewers don't accept it or not.

For something like this where they're asking for input, I don't know whether they did a majority vote of the peer reviewers, whether they asked for unanimity in the end, or if they just said, "Thank you for your comments, but we're going to put the report out anyway." I have no way of knowing whether they accept it. I don't know.

MR. ANDES: I think we provided a document in the record concerning the agreement, but we can make sure to provide that if it's not already in the record.

MS. TIPSORD: Okay.

MR. ANDES: Are you aware of a study that asked questions about amount of water swallowed?

DR. GORELICK: Yes.

MR. ANDES: Shouldn't that be a more direct measure of water ingestion and a person's socioeconomic status?

DR. GORELICK: See, that's not the issue here with socioeconomic status. One of the things I've testified about is the possibility of confounded, that is, factors that may be related to your exposure, on the one hand -- in this case we're talking about the CAWS versus general use waters -- and, on the other hand, your risk of illness.

Now, it's very clear from a lot of the literature, including some of the studies I've done, that socioeconomic status is related to your risk of gastrointestinal illness. It or may not be related to where you chose to go recreate on the water, but it's certainly plausible that people from different neighbors, who may have a different socioeconomic status, may chose to recreate on the CAWS versus general use waterways.

If that is true, then there's potential confounding. If people from a lower socioeconomic status group that are at a higher risk of illness preferentially choose to recreate on the general use waters, it will make the general use waters more dangerous, not because of the amount of water they ingested or something else, but because there's something else that made them sick that has

nothing to do with the water.

So it's not the water ingestion that's the issue, it's the analysis of waterway versus illness where socioeconomic status has the potential to be an important confounder. And I know it's an important confounder for gastrointestinal illness.

MR. ANDES: Is there any reason to believe that -- I guess is there any reason to believe that the kayakers on the CAWS would have different socioeconomic status than the kayakers on Lake Michigan, considering the two locations close by?

DR. GORELICK: I don't know the answer to that. I mean, there are differences with regard to other things between them. People chose to go to one waterway or another. The only way to answer that question is to actually measure it. But it's certainly plausible that people from different neighborhoods would recreate in different areas. That happens. Whether or not they're recreating in these two areas differently, that I cannot answer, and neither can the CHEERS study.

MR. ANDES: I think we talked about

the stool sample results already, so I'll pass that by.

As to asymptomatic illness, your testimony expresses a concern that surveyed dozens of captured information about non-surveyed people who might have come into contact with recreators and gotten sick as a result. Isn't it true the study also included some recreators who suffered GI illness from other sources in recreation and attributed those illnesses to recreation, and wouldn't that balance off people who might have gotten illnesses but were not counted?

DR. GORELICK: It is true that they undoubtedly suffered illnesses from other causes that would be attributed to water. Whether or not they balance out is totally speculative, because I have no idea how many there are relative to each other. It's possible, but there's no way to answer that question.

And the point about the asymptomatic illness and spreading it to other people, it's really a matter of, again, if as Dr. Dorevitch testified, the study in one was to quantify what is the risk of recreating on the CAWS

with regard to various types of illness -- and I'll focus on acute GI illness here -- and they came up with an estimate of 12 per thousand exposure.

From a public health perspective, that's useful information. But if each of those people is then getting other people sick, if I'm, as a regulator, as a policy person, thinking, "Well, how bad is that," I would be underestimating the public health impact. That's the point I'm trying to make there. If anything, their estimate of 12 per thousand is -- with regard to regulation, because this is what the USEPA goes by, that's the data they need to have.

But this question of what's an acceptable risk came up from time to time. That 12 per thousand is a minimum estimate of the public health impact, which I think is an important question.

MR. ANDES: The same would be true of recreators on the general use waters, correct?

DR. GORELICK: Absolutely.

MR. ANDES: Do the EPA studies that are being done develop criteria for swimming waters consider non-surveyed people who may have contracted

a GI illness with contact with recreators?

DR. GORELICK: I believe that they don't. But as I've already said, from a public health perspective, it might make sense for them to try and do that. I understand that from an epidemiologic perspective, it makes the studies more complicated. So there's a tradeoff there.

MS. TIPSORD: Again, that's USEPA.

MR. ANDES: Sorry. Your testimony indicates that the CHEERS study incompletely addresses the issues of varying water conditions. Do you have any evidence that bacteria levels downstream of the treatment plants on general use waters vary substantially over time?

DR. GORELICK: Well, there's data in here to show that they do. So I'm just going to pull up --

MS. TIPSORD: Dr. Gorelick, you said there's data in here?

DR. GORELICK: Oh, I'm sorry. I'm looking at the CHEERS final report. Section 2 presents a lot of data on the indicators, and they present graphs of mean concentrations, and then ranges.

So, for example, I'm just going to pick a graph here, this is figure -- Roman Numeral II-5, "Patterns of Enterococci Concentrations by Location Group by Study. Year-to-year, they're relatively constant. But within a year, the range, for example, of CAWS North, 2007, goes from ten to over 10,000.

So within a year, there seems to be substantial variation over time. These figures don't provide the data to be able to say over what period of time, if it's two hours, six hours, two days, but there is variation over time.

MR. ANDES: And the water quality levels -- am I correct that the water quality levels don't tie directly in this report into linkage to illness, but that would be done in a supplement where you're trying to development an association between water quality levels and illness rates?

DR. GORELICK: That's where it would be of most concern, yes.

MR. ANDES: Okay. Are you aware of any other recreational illness studies that have collected as much water quality information regarding pathogens as this study?

DR. GORELICK: No. I mean, they've collected a lot of data.

MR. ANDES: I believe that's all the questions I have.

MS. ALEXANDER: I'll have a couple of quick follow-ups. I just need a moment with the witness.

(Whereupon, a discussion was had off the record.)

MS. ALEXANDER: I just have a couple followup questions for Dr. Gorelick. The first one is I would like to ask a portion of question 16 that was skipped by Mr. Andes, specifically the last sentence, which asks, "Are you aware that EPA, in developing recreational criteria for swimming waters, bases their criteria on protecting the general population, not these," which is actually referencing young and old people, "or other subgroups?"

DR. GORELICK: Yes. My understanding is that USEPA, in setting their criteria, has, in the past, focused on entire population, but that they are making a move towards looking specifically at what they consider to be vulnerable

subpopulation, and particularly age-based ones.

I know there was a meeting that was, I believe, held in Chicago last year where this was discussed, and the consensus was that age-based criteria should be used when there is data to support that. And that, to me, would suggest that studies that are designed to look at these associations should, in fact, be able to provide data based on age.

MS. ALEXANDER: I have two exhibits I'd like to present to follow up on that. The first one is a copy of a slide show entitled, "Discussion Topic One: Basing Criteria to be Protective of Children."

MS. TIPSORD: If there's no objection, we will mark as Exhibit 417 the slide show, "Criteria Protective of Children." Seeing no objection, it's Exhibit 417.

MS. ALEXANDER: And then I have Exhibit 418, which would be, "Current Thinking on Development of New Criteria."

MS. TIPSORD: And Exhibit 417, the presenter is Denise Keehner, K-e-e-h-n-e-r, Director, Standards and Health Protection Division,

USEPA.

"Current Thinking on Development of New Criteria," Elizabeth Doyle, OST, OW, USEPA, October 6th 2009. If there's no objection, we'll admit that as Exhibit 418. Seeing none, it's Exhibit 418.

MS. ALEXANDER: Dr. Gorelick, do these represent slides from the meeting that you referenced?

DR. GORELICK: Yes.

MS. ALEXANDER: Okay. Could you describe for the Board, please, the thinking of USEPA that you discussed as reflected in these slides?

DR. GORELICK: Again, I think if we look at -- is this 417? If we look at 417, I think it's summarized on slide two, which is that the existing criteria, the 1986 criteria, is that criteria based on concentrations that are protective of the general population, but that the goal for 2012 is that they would identify not only as a minimum recommendation based on concentrations protective of a general population, but, when the science sports it, recommend criteria to be

protective of children. And the -- you know, it's discussed in here, and I've testified to this before, about reasons why, from a biological perspective, children would be at higher risk potentially of waterborne illness.

Now, I understand that this CHEERS study found that the children had the lower rates of illness. And again, that's one of those anomalous findings where we go, "Hmm." There's other studies that show their higher risks. I have a study here that shows they're lower risk. Do I throw all the other ones out and accept this one? Do I come up with some hypothesis about why they may have found different results, whether that's due to differences in the way of the the studies or conducted, or some other hypotheses I talked about.

But in general, the consensus remains that children are at higher risk for reasons of potentially greater ingestion to protect them against infection. And it's based on those considerations that the USEPA would like to move towards an ability to set standards that are age specific to provide protection for vulnerable subpopulations.

MS. ALEXANDER: The second question, Dr. Gorelick, did you hear the testimony of Dr. Granato yesterday and earlier today concerning the reason or the potential reason for the different risk finding in the risk assessment by Geosyntec and the CHEERS study?

DR. GORELICK: Yes.

MS. ALEXANDER: Do you agree with that assessment that he provided?

DR. GORELICK: Well, as I said, you know, one could hypothesize that there are -- you know, that most of these illnesses that are in the study were, in fact, not infectious in origin, that they were caused by chemicals or something else. That would not be consistent with overall clinical experience or what we know about these things in general, but I can't say it's wrong. It's not especially plausible in my mind.

What's more plausible is in the risk assessment -- I mentioned earlier, there's, sort of, a hierarchy of studies if you want to understand the question. So if I want to understand the risks of illness in the CAWS, the best thing to do would be to do an experiment. I'd randomly

assign people to go in one place or another, and then I analyze them.

But I can't do that, so the next best thing is to do an epidemiologic study and an observational study and see people who happen to recreate on the CAWS, and happen to recreate in general use waters, and happen to recreate alongside the river, what happens to them. And if you can't -- and I applaud them for doing that, because it's hard to do that. They're expensive studies. They're logistically very challenging. My hat is off to them for doing this.

When you can't do that, then your next best thing is to do some sort of a model, where you have certain assumptions, "If people do this activity on average, they'll swallow this much water, and on average that water would have these kinds of germs in it, and on average you would get sick that often." And that can be very useful, depending on the quality of the data that informed shows assumption and how the model is constructed, but it's clearly the least best thing to do.

So when there's a disagreement between the two, the question is why. And one, I

think, more plausible explanation is they just didn't think of enough things in their model that might make you ill.

So as I mentioned, there are lots of viruses that can cause illness. They looked at some of them in their illness, but whether they looked at -- I mean in their risk assessment. But whether they looked at enough different ones and accounted for the fact that viruses are hard to measure, so that if I take a sample of water, I might mesh X number of viruses, but the real number is higher.

And again, knowing that most infectious gastroenteritis in humans is caused by viruses, I think that's a more plausible -- I can't prove it, but I think that's a more plausible explanation for why the risks of illness were different between what was predicted from the model and what was actually observed in experience.

So again, you know, the best thing to do would be to do an experiment. And the same is true for this question about disinfection. You know, Dr. Granato also testified that he would conclude that disinfection is of no health benefit,

basically because we have people recreating in disinfected waterways, and they get sick in this study at the same rate as people who recreated in waterways where the effluent is not disinfected.

And like any other epidemiologic study, that's a plausible hypothesis, but we don't really know that there's nothing else different about those two waterways. 70 percent of the people recreating in the general use waters are recreating in the lake, for example. The relationship between pathogens and illness might be very different in water that's moving versus not moving. Dr. Dorevitch has written about that. He said that's one of the things you need to account for is the fact that these water ways are all different.

You also don't know that that rate of 12 in the CAWS might not come down to six if you disinfected it. The only way to really answer that question would be to do an experiment. And people have done these kind of experiments for drinking water.

They've taken communities and they've -- and the best example, and it's not been published yet, is in Wisconsin, where they took

communities that don't disinfect their water, and they randomly assigned some of them to get disinfected and some not, and they crossed them over and they stopped disinfecting certain ones, and they tested for viruses in the water, and they found the rates of illness decreased by 14 percent. Almost all of that illness was viruses, which don't get measured as indicators.

But there's an example where they did an experiment to actually look at that cluster. You can try to answer those questions from epidemiologic studies, but you need to think very carefully about what else is different about the general use waters versus the CAWS that could potentially account for things or that might make you question whether or not the association between pathogen levels and illness and the effect of disinfection on pathogen levels and illness is going to be the same in Lake Michigan, for example, versus the Chicago River.

And I don't know that -- there's nothing in the CHEERS report that allows you to say that. All you can say is the rates in these two different waterways are similar. Whether that's

because of the disinfection difference or not is speculative.

MS. ALEXANDER: One more question. Dr. Gorelick, were you present yesterday when Dr. Dorevitch testified effectively that he would be surprised if another epidemiological study conducted on the CAWS with roughly the same scope came to a different conclusion or had different results concerning risk? Do you agree that would be very surprising if there was a different result in a different study?

DR. GORELICK: The most likely result would be a similar result to what they found. If you think back to the figures that -- I think they were entered in as exhibits, but the three posters that were presented that showed the rates of illness and the comparisons of the rates of illness. And I don't remember the exhibit number, but --

MS. TIPSORD: They weren't admitted as exhibits. They're part of public comment 478 in the abstract of the first figure.

DR. GORELICK: Thank you. That's what I'm referring to. There's an estimate of the rate of illness is 12 per thousand, and then there are

some error bars around that. Error bars are what we call the 95 percent confidence interval. And what that means is if I did exactly what you suggested, if I can convince the District to give me all that money to do the study again because they wanted to replicate the results, and I did it again, that I would -- 95 percent of the time if I repeat it, I would find a result that would be somewhere within that margin of error.

The most likely thing is it would be pretty close to what he found, but it would not be all that surprising if it were anywhere within that range. That's why we present those ranges. So he found a difference between CAWS and general use of 0.6, but the confidence interval went from anywhere from ten more in the CAWS to ten fewer in the CAWS.

If I did that experiment -- or if I did that study and I found a difference of six, that would be completely statistically consistent with the results of the CHEERS study because it falls within that 95 percent confidence level. Does that answer your question?

MS. ALEXANDER: It does. I have

nothing further.

MR. ANDES: I'm sorry. One follow-up. Let's go back for a moment on the USEPA thinking -- the current thinking on development of new criteria document you referenced from Elizabeth Doyle is from October 2009, correct?

DR. GORELICK: Yes.

MR. ANDES: Okay. Have you reviewed information from your current conferences and webinars concerning EPA's concern thinking?

DR. GORELICK: I have not.

MR. ANDES: We'll provide that information for the record.

On the discussion topic one slides, at the bottom of the second slide, it reads -- well, the 1986 criteria points out those are protective of the general populations. So subgroups were not considered in the 1986 criteria. Am I right?

DR. GORELICK: That's correct.

MR. ANDES: The 2012 criteria indicates that, at a minimum, EPA will base new criteria recommendations on indicator density protective of the general population, and to the

extent the science supports it, recommend criteria to be protective of children.

DR. GORELICK: Right. So this is analogous to what the FDA has done. In the past, there wasn't a lot of incentive for pharmaceutical companies, for example, to study whether or not -- to provide data that on whether or not drugs were effective and safe in children because there wasn't enough of a market.

The FDA said you have to do that, and now there are -- because we want the science to know whether or not -- because they're being used in children, we want the science to support it. So they now do the studies that provide that science.

So there is some science around subgroups of children. I would think, as an epidemiologist, that if the EPA says, "We want to develop criteria if the science supports it," they're asking for the science to be done.

MR. ANDES: Are you aware of studies that have been done or are in the process since October of 2009 regarding children and primary contact recreation?

DR. GORELICK: And recreation? I'm

not aware of exactly what's going on. I know the NEER study results are still being analyzed. Obviously CHEERS.

MR. ANDES: We'll provide, for the record, some documentation about those studies and concerns that have been risen. You agree that if science is not supported, EPA would not set criteria to protect -- to address the children. It's an issue of whether the information is there when they issue the proposed standards?

DR. GORELICK: Right. Their thinking is we want science-based criteria. In the past, we've only asked for science around everybody together. Now we'd like science based on vulnerable subpopulations based on age.

MR. ANDES: Based on age?

DR. GORELICK: That's what they're asking for here.

MR. ANDES: Okay. Thank you.

MS. TIPSORD: Anything additional for Dr. Gorelick? Thank you very much, Dr. Gorelick. It was a pleasure seeing you again.

Ms. Alexander, I understand your next witness is not available until 3:45. Is that

correct?

MS. ALEXANDER: That is correct.

MS. TIPSORD: All right. We're going to recess. I want everyone -- let's get back at 3:30, in case there's anyone who wants to comment on the DCEO for Sub Docket A.

(Whereupon, a short recess was had.)

MS. TIPSORD: Good afternoon. We're back on the record. I have checked the list yet again, and no one has requested an opportunity to testify regarding the Department of Commerce and Economic Opportunity's decision not to perform an ECIS on Sub Docket A in this rulemaking. Let me ask one more time does anyone wish to comment?

Seeing no comment, we have satisfied the requirements of Section 27 B of the Act for Sub Docket A. We had a discussion off the record, and I'll do a hearing officer order that notifies everyone that final comments in Sub Docket A are due by November 30th.

And with that, Ms. Alexander, you have one more witness?

MS. ALEXANDER: Yes, I have Sharon

Bloyd-Peshkin, and I have her pre-filed testimony to enter into the record.

MS. TIPSORD: All right. Could we have her sworn in, please?

(Witness sworn.)

MS. TIPSORD: If there's no objection, I will admit the testimony of Sharon Bloyd-Peshkin as Exhibit 419. Seeing no objection, it's admitted. Mr. Andes, whenever you're ready.

MR. ANDES: Good afternoon.

MS. BLOYD-PESHKIN: Good afternoon.

MR. ANDES: Let's start with question number one. If the District were to disinfect the effluents from its three treatment plants, would that do anything to effect bacteria being discharged to the Chicago area waterways from combined sewer overflows or municipal storm sewer systems or other systems of urban runoff?

MS. BLOYD-PESHKIN: Clearly, when there's a high rainfall event and there's a combined sewage overflow, there are going to be bacteria discharged into the water during those times. But what we're talking about with lack of the disinfection is four hours a day, seven days a week.

And I guess my response to that would be if you have one unruly neighbor who threw garbage in the street once a month, would you say everybody should throw garbage in the street every day?

MR. ANDES: So your answer is no?

MS. BLOYD-PESHKIN: Would it change -- no, of course not. No.

MR. ANDES: And are you aware that the facts of wet weather events can last for days or even weeks after the rainfall?

MS. BLOYD-PESHKIN: I'm aware of that, but it's not a 24-hour day, seven-day a week, contributor of pathogens to the cause.

MR. ANDES: Have you reviewed data on that issue?

MS. BLOYD-PESHKIN: I can't answer that.

MR. ANDES: Given that there would still be sources contributing bacteria levels to the CAWS even if the District were to disinfect its treatment plan effluents, would you change your behavior in terms of precautions you'd take when kayaking on the CAWS if disinfection were required?

MS. BLOYD-PESHKIN: Absolutely. I would say that we adjust our behavior really in proportion to the perceived risk on every waterway. And so if it were proportionately cleaner, we could be proportionately less concerned.

MR. ANDES: And if there were -- if you were kayaking within a few days after a wet weather event, you would -- because disinfection is required, you would basically take no extra precautions?

MS. BLOYD-PESHKIN: That's not actually what I said. I said we would be proportionately less careful, depending what we knew to be going on at the time. There are wet weather events that cause CSO overflows into Lake Michigan. If I paddle on Lake Michigan on those days near a beach that is closed, I'm more careful on those days than I am on other days. So I would say we remain quite cautious when a CSO event has happened recently.

MR. ANDES: So would you check whether CSO events have happened in the last several days or weeks before kayaking?

MS. BLOYD-PESHKIN: I do check.

MR. ANDES: And how do you check?

MS. BLOYD-PESHKIN: I do check, because of the need to do that even on Lake Michigan. It's public information. It's easily accessible on-line, and it's often distributed on kayaking reserves. So I'm pretty aware after a heavy rainfall to know what's going on in the local waterways.

MR. ANDES: So what's the difference between the precautions you take when you have checked and you've determined in the last several weeks there has been a wet weather event versus when there's not?

MS. BLOYD-PESHKIN: That's a great question. If there's been a wet weather event, and if there's been a CSO, we treat a lot of waterways more like the way we most routinely treat the CAWS, which is to say that we're extremely careful not to get wet.

MS. ALEXANDER: I have a follow-up to that. The question, I believe, specifically pertained to a CSO event in the last several weeks, and I'd like to ask you to clarify. Would there be a difference in how you behaved if there had been a

CSO event in several, say, three weeks earlier as opposed to two days earlier?

MS. BLOYD-PESHKIN: Yes, there would be.

MR. ANDES: So what's your dividing line?

MS. BLOYD-PESHKIN: You know, I mostly get my wisdom on this as a non-scientist from people I trust that have more knowledge of it than I do, and those are frequently sources of information distributed among kayakers that this is what we know, this is what we found from this source, this is what we know about bacteria levels now. I'd say I'm on the cautious side, but I've been trained as a kayak instructor to weigh the risks and weigh them as best I can with the available information to me.

MR. ANDES: And you believe most kayakers gather all that information and make those determinations based on information about CSO events that have occurred recently?

MS. ALEXANDER: You're asking her to speculate about most kayakers anywhere on the CAWS. Can we be a little more specific?

MR. ANDES: Are you aware -- in terms

of the kayakers that you encounter, is it your understanding that most of them consult records of CSO events to determine whether they should take extra precautions or not?

MS. BLOYD-PESHKIN: We have a former president of the Chicago Area Sea Kayakers Association who regularly monitors that information and puts it out on a list serve that goes out to, like, 400 local kayakers. So that's a lot of -- the way that this information gets out. So everybody is not individually going and doing that research themselves.

We have somebody who publicizes that to the group as a public service, because this organization, the Association of Sea Kayakers, is concerned with paddling safety. That's part of the mission of the organization. So he is the guy, the point person, who gets that information and puts it on the list serve for others.

MR. ANDES: And again, do you have a sense of what the dividing line is where if there was a CSO within two days that everybody is cautious, or three days, or a week?

MS. BLOYD-PESHKIN: I don't have a

precise number of days for you.

MR. ANDES: But when -- but your impression is when people believe that there are CSO impacts, or I guess wet weather impacts generally, they take the same basic precautions as they would in the CAWS due to -- because of the general nature of the CAWS?

MS. BLOYD-PESHKIN: In my experience, yes. And it's clearer on the beaches, because there are days when they are opened and days when they're closed, and that's a fairly good indication that there are higher bacteria levels, and that's useful information to us.

MR. ANDES: If you're concerned about risks involving kayaking on the CAWS, why do you still kayak on those waters?

MS. BLOYD-PESHKIN: Because they are a local treasure. They're one of the few places where you can see Chicago architecture, Chicago's infrastructure, the bridges, all these things up close from the water. There's no other such vantage point, and they're scenic in their own strange industrial and urban way. I mean, they're really part of what makes Chicago wonderful, is having this

ability to travel on the waterways and see the water from that vantage point. So we ought to be able to paddle on the CAWS. It's just -- it's an amazing local treasure.

MR. ANDES: And is it safe to kayak on the CAWS?

MS. ALEXANDER: I'm going to object. What do you mean by "safe?" Do you mean completely safe, relatively? Relative to what? That's kind of a vague word.

MR. ANDES: There a lot of vague questions here.

MS. ALEXANDER: There are.

MR. ANDES: If you kayak on the CAWS, I assume that means you believe it is safe enough to kayak?

MS. BLOYD-PESHKIN: I would say it's safe enough, given appropriate precautions. I have been trained to assess environmental risks and other kinds of risks before I take other people out for certain. I do the same for myself, just as you do. Is it safe to ride on the highways? Well, there's some risks and so you take some precautions. I would say I take considerable precautions on the

CAWS.

MR. ANDES: Your testimony states that you almost never teach kayaking skills in the CAWS, and have only led one sightseeing trip on the Chicago River. Are you aware that there has been testimony in this matter that there are many site-seeing trips on the CAWS by canoers and kayakers every year?

MS. BLOYD-PESHKIN: I'm aware that there are many such sight-seeing trips, and that's different than teaching kayaking skills. There's a fundamental difference there. And there should be sight-seeing on the CAWS.

MR. ANDES: Aren't there several high school and college rowing teams who train in the CAWS?

MS. BLOYD-PESHKIN: Absolutely.

MR. ANDES: Do the leaders of those activities, are you aware of them having a different opinion than you do as the risks involved?

MS. BLOYD-PESHKIN: You would have to ask them. I cannot answer for them.

MS. ALEXANDER: I have a follow-up. Is it your understanding that there would be a

different level of water exposure or likelihood of immersion in rowing than in kayaking, as you practice it in the general use waters.

MS. BLOYD-PESHKIN: Yeah. There's absolutely a difference. I mean, they don't intentionally get in the water, get wet, flip their rowing vessels the way that we do in general use waters. It's a very different use. We're trying to stay dry essentially.

MS. TIPSORD: Would that also not be true of CAWS -- in the CAWS, they don't tip it as kayakers do in the CAWS?

MS. BLOYD-PESHKIN: That's exactly right.

MS. ALEXANDER: I'm sorry. I think there may be some confusion here. Are you testifying that kayakers do rolls in the CAWS and immerse.

MS. BLOYD-PESHKIN: No. They do not immerse in the CAWS. Yes in the general use waterways, but not in the CAWS. So I would say that behavior of the rowers in the CAWS would be more similar to the sight-seeing trips by kayakers in the CAWS where the attempt is to stay dry, to not

immerse yourself.

MS. TIPSORD: You're unaware of any kayakers immersing themselves in the CAWS?

MS. BLOYD-PESHKIN: I'm unaware of any kayakers deliberately immersing themselves in the CAWS, yes.

MR. ANDES: When you lead kayak groups on waters other than the CAWS, what instructions do you provide group members about staying dry, touching the water, avoiding capsizing, washing hands, and other precautions?

MS. BLOYD-PESHKIN: In general use waters?

MR. ANDES: Yes.

MS. BLOYD-PESHKIN: I don't warn them to not get wet. I encourage them to get wet, repeatedly flip over, hang upsidedown, get out of their boats, get back in their boats. We frequently sit in an inch of water all day when we're paddling in general use waterways.

MR. ANDES: And do you monitor information in general use waters when bacteria levels might be high?

MS. BLOYD-PESHKIN: If I have that

information because of the list serve, or there's been a CSO event that particularly applies to Lake Michigan, then I'm going to change my behavior out there, as I said earlier.

MR. ANDES: So you would still go out there, but you would take precautions, similar to the ones you take in the CAWS?

MS. BLOYD-PESHKIN: Yes, as I said earlier.

MR. ANDES: Are you aware that there are data in the CHEERS report showing virus levels are higher in some general use waters than in the CAWS?

MS. BLOYD-PESHKIN: I have not read the entire CHEERS report. I've been a participant in the CHEERS study, and my study centers not on the results of it, which came afterwards, but some problems, I think, in comparing behaviors that are not comparable that were implicit in the data in the CHEERS study.

MR. ANDES: So assuming for the moment that those data are as I stated them, which is that virus levels in some general use waters are higher than in the CAWS, would you then follow the same

precautions for kayaking in those waters that you follow in the CAWS.

MS. BLOYD-PESHKIN: Viruses are not the only pathogens we're talking about here.

MR. ANDES: But they are pathogens, right?

MS. BLOYD-PESHKIN: They are a pathogen. But the problem is the exposure levels that they were looking at those viruses and -- that we're looking at in comparable. So I can't answer your question specifically about the CHEERS study not having that data.

MR. ANDES: I'm sorry. We're looking at water quality levels and viruses. If the virus levels in another water body are higher than the CAWS, wouldn't you then urge the same precautions you follow in the CAWS?

MS. BLOYD-PESHKIN: I would -- if I had that information -- and I don't. I don't have information about specific pathogens in specific bodies of water. I am always adjusting my exposure according to what I know. I don't have that information.

MR. ANDES: Your testimony indicated

that kayaking on the CAWS involves different activities and different degrees of water exposure between kayaking on other waters in the area. Are you aware in the CHEERS study the final risk numbers controlled for those factors?

MS. BLOYD-PESHKIN: I had questions about their ability to control for those factors based on the questions I was asked as a participant in the CHEERS study, and knowing that my responses and the responses of those other paddlers who were asked couldn't be neatly compared one for one based on -- and I don't know your term "control" to be -- I'm sure there's an epidemiological word -- usage of that word.

But what I do know is that it asks things like, "Did you swallow one or more mouthfuls of water." And I can tell you that out on Lake Michigan, I could never tell you how much water I swallowed. It would probably be one or more. I don't know. I don't know how much more because I'm not concerned. And I can tell you if I swallow a mouthful of water on the CAWS, I'm going to remember that for years.

So when I saw the way these

questions were asked, I realized that those one-for-one comparisons that were supposedly controlled for could not possibly be controlling for what they thought they were controlling for.

MR. ANDES: Are you aware that those specific questions on water ingestion were validated by comparison to actual levels in urine in tests of CHEERS participants?

MS. BLOYD-PESHKIN: As I told you, I'm not an epidemiologist -- I can't even pronounce the word -- and I don't know how they controlled for variables and verified them. I cannot answer that question.

MR. ANDES: Your testimony states that the questionnaire didn't allow respondents to distinguish between the repeated prolonged immersions and single quick immersions. Are you aware of the testimony of Dr. Gorelick concerning a possible recall bias, especially when answering detailed question?

MS. BLOYD-PESHKIN: I'm not aware of other people's testimony, no. I'm only aware of my own.

MR. ANDES: Are you aware that only a

small number of respondents indicated any type of immersion at all?

MS. BLOYD-PESHKIN: In where?

MR. ANDES: In any water.

MS. BLOYD-PESHKIN: No.

MR. ANDES: As to the question of whether people have been paddling then washed their hands before eating, are you aware that the questionnaire did ask whether the respondent had, after recreating, washed their hands before eating?

MS. BLOYD-PESHKIN: I don't recall. I don't recall being asked that question. I remember some of them well, but not that one.

MR. ANDES: If, as your testimony states, recreators risk illness every year due to the recreation on the CAWS, do you recommend those recreators pursue their activities instead on other water bodies?

MS. BLOYD-PESHKIN: No, for the reason I told you earlier. I really see the CAWS as being an important recreational asset here in Chicago. And just like I know people die in highway fatalities every year and I don't suggest that nobody drive their car on the highway, I suggest

that the highways get safer. I would suggest that the CAWS get safer for recreators.

MR. ANDES: Do you inform people when you're training them that they risk illness by recreating on the CAWS?

MS. BLOYD-PESHKIN: Yes.

MR. ANDES: And that they can avoid that illness if they take certain precautions?

MS. BLOYD-PESHKIN: Yes, absolutely.

MR. ANDES: Thank you. That's all.

MS. TIPSORD: Are there any additional questions? Thank you very much, Ms. Peshkin. And with that, I think we've concluded our business for today.

We do have an outstanding motion for the People, which we're expecting a response to in this sub docket. After the Board has ruled on that motion, I would anticipate a prehearing conference -- a conference being scheduled to discuss deadlines for comment. So keep watching your e-mails on the website. Thank you very much. We're adjourned.

STATE OF ILLINOIS)
) SS
COUNTY OF COOK)

REBECCA A. GRAZIANO, being first duly sworn on oath says that she is a court reporter doing business in the City of Chicago; that she reported in shorthand the proceedings given at the taking of said hearing and that the foregoing is a true and correct transcript of her shorthand notes so taken as aforesaid and contains all the proceedings given at said hearing.

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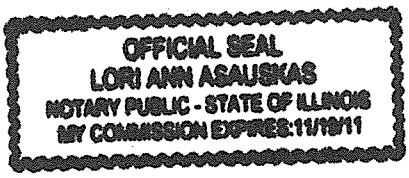

Lori Asauskas
Notary Public