

0001

1 ILLINOIS POLLUTION CONTROL BOARD  
2 IN THE MATTER OF: )  
 )  
3 WATER QUALITY STANDARDS AND ) R08-09  
EFFLUENT LIMITATIONS FOR THE ) (Rulemaking-  
4 CHICAGO AREA WATERWAY SYSTEM ) Water)  
AND THE LOWER DES PLAINES )  
5 RIVER: PROPOSED AMENDMENTS )  
TO 35 Ill. Adm. Code Parts )  
6 301, 302, 303 and 304 )

7 REPORT OF PROCEEDINGS held in the  
8 above-entitled cause before Hearing Officer Marie  
9 Tipsord, called by the Illinois Pollution Control  
10 Board, taken before Laura Mukahirn, CSR, a notary  
11 public within and for the County of Cook and State  
12 of Illinois, at the Thompson Building, 100 West  
13 Randolph, Chicago, Illinois, on the 10th day of  
14 September, 2008, commencing at the hour of 1:00 p.m.  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24

0002

1 A P P E A R A N C E S  
2 MS. MARIE TIPSORD, Hearing Officer  
MR. TANNER GIRARD, Acting Chairman  
3 MR. ANAND RAO  
MR. NICHOLS MELAS  
4 Appearing on behalf of the Illinois  
Pollution Control Board  
5

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
6 1021 North Grand Avenue East  
P.O. Box 19276  
7 Springfield, Illinois 62794-9276  
(217)782-5544

8 BY: MS. DEBORAH WILLIAMS  
MS. STEPHANIE DIERS  
9 MR. ROBERT SULSKI  
MR. SCOTT TWAIT  
10 MR. HOWARD ESSIG  
11 BARNES & THORNBURG  
One North Wacker Drive  
12 Suite 4400  
Chicago, Illinois 6606-2833  
13 (312)357-1313  
BY: MR. FREDRIC P. ANDES  
14 Appearing on behalf of the Metropolitan  
Water Reclamation District  
15

16  
17  
18  
19  
20  
21  
22  
23  
24  
0003

1 HEARING OFFICER TIPSORD: Good  
2 afternoon. I hope everyone had a nice lunch.  
3 And I believe we are ready to turn to the  
4 IEPA's questions. There are prefiled  
5 questions for -- we finished with  
6 Dr. Petropoulou, so we're ready for Dr. Gerba  
7 or Dr. Tolson.

8 MS. DIERS: Dr. Gerba, I'm going to  
9 start with Question 3 of our prefiled  
10 questions. On Page 2 of your prefiled  
11 testimony you state, the indicators selected  
12 are those which have been traditionally used  
13 and those recommended by the United States  
14 Environmental Protection Agency and the World  
15 Health Organization for assessment of  
16 recreational water quality, NRC 2004.

17 First, could you please  
18 explain which organisms were chosen because  
19 they were traditionally used?

20 DR. GERBA: Okay. On our list  
21 judicial ones would be fecal coliforms, E.  
22 Coli, enterococci. Some European countries  
23 actually have used salmonella as an indicator  
24 in recreational water quality and viruss.

0004

1 MS. DIERS: And the next question,  
2 which organisms were chosen because they were  
3 recommended by U.S. EPA for assessment of  
4 recreational water qualities?

5 DR. GERBA: Basically enterococci and  
6 E. Coli, although fecal coliforms have been  
7 used, of course.

8 MS. DIERS: And which organisms were  
9 chosen because they were recommended by WHO  
10 for assessment of recreational water quality?

11 DR. GERBA: The World Health  
12 Organization recommends a number of organisms  
13 and criteria and for potentially selection of  
14 different organisms. But fecal coliforms,  
15 E. Coli, and enterococci are also on that  
16 list.

17 MS. DIERS: I'm going to jump down to  
18 No. 6.

19 MR. ETTINGER: May I ask one question  
20 about that? Do you like any of those  
21 indicators?

22 DR. GERBA: Do I like them?

23 MR. ETTINGER: Yeah. Do you think any  
24 of them are -- indicate whether pathogens are  
0005

1 present or not?

2 DR. GERBA: No. There's no -- I mean  
3 many studies have shown there's really no  
4 direct correlation between the various  
5 pathogens, particularly the viruss, I should  
6 say, and the protozoa and parasites and the  
7 indicators. That's -- the traditional ones I  
8 mentioned, the fecal coliform, the E. Coli  
9 and enterococci. It's one of the reasons  
10 pathogens were actually done as part of this  
11 study.

12 MR. ETTINGER: So are you aware of any  
13 indicator that you would use?

14 DR. GERBA: There's pluses and minuses  
15 to use of any indicator, but one of the big  
16 problems with any of the indicators currently  
17 in common use is they don't necessarily  
18 relate to the occurrence of various pathogens  
19 in the water. For example, if I chlorinated  
20 sewage effluence, cryptosporidium or Giardia  
21 are fairly resistant to chlorination. These  
22 indicators are not. So it's hard to  
23 establish a correlation with it. If I used  
24 UV light -- adenovirus, they're resistant to

0006  
1 UV light where the bacterial indicators are  
2 very susceptible. So you can have situation  
3 with hardly any indicators with a lot of  
4 pathogens.

5 MR. ETTINGER: And I think you said  
6 none of the traditional indicators, they all  
7 have problems -- are there any -- I'm  
8 sorry -- untraditional indicators that you  
9 like better, or is there anything you would  
10 use other than correctly measuring pathogens?

11 DR. GERBA: I think in the future a  
12 combination of actually looking for certain  
13 pathogens which might create the greatest  
14 risk that some of my colleagues propose using  
15 adenoviruses because they're in greater  
16 abundance than a lot of the other water-born  
17 pathogens, particularly the enteric viruss.  
18 Other people in the past have even suggested  
19 enteroviruses as better indicator of the  
20 risk. To give you -- bacteroides has been  
21 suggested, another bacterial group, anaerobic  
22 bacteria that occurred in the human gut, for  
23 example, and other types of anaerobic  
24 bacteria have been suggested as potential

0007  
1 better indicators because they're more  
2 associated with fecal pollution; and some of  
3 them, more specifically, with human  
4 intestinal tract, an indicator of human fecal

5 pollution. And they've also been suggested  
6 and studied a lot. But, unfortunately,  
7 they're anaerobic organisms and are more  
8 difficult to work with. Bacteriophages have  
9 been suggested and coliphages which are  
10 bacterial viruses have also been suggested as  
11 indicators of the recreational water quality.

12 MR. ETTINGER: Independent of what has  
13 been suggested, is there any of them that you  
14 like? If you were stuck with some sort of  
15 indicators, are there any of them that you  
16 like?

17 DR. GERBA: You know, not that I can  
18 really pick out without -- you know, not  
19 offhand I couldn't really say, pick one.

20 MR. ETTINGER: Thank you.

21 MS. DIERS: As I said, I'm going to go  
22 to Question 6 on the prefiled questions. On  
23 Page 4 of your prefiled testimony, you state  
24 that levels of pathogens found in the CAWS

0008

1 were equal to or lower than values you have  
2 observed in other places with both  
3 disinfected and undisinfected effluents. Is  
4 it your professional opinion that the common  
5 practice of effluent disinfection at  
6 wastewater treatment plants in the United  
7 States is unwarranted based on the science?

8 DR. GERBA: I think that's really a  
9 policy and management question rather than a  
10 science question.

11 MS. DIERS: Okay. Question 7: On  
12 Page 5 of your prefiled testimony, you state  
13 that disinfection is warranted in situations  
14 where direct human contact in the immediate  
15 vicinity of an outfall is possible or where  
16 effluent is discharged to areas involving the  
17 production of human food. And I believe you  
18 answered our first one. So I'm going to ask,  
19 what do you mean by areas involving the  
20 production of human food?

21 DR. GERBA: I think I covered that. I  
22 was talking about shellfish in the marine  
23 environment.

24 MS. DIERS: Is that all, just the

0009

1 shellfish?

2 DR. GERBA: Yeah. Because shellfish  
3 concentrate viruses, and particularly viruses  
4 from the -- maybe 1,000 times above levels  
5 you find in the ambient environment. So they  
6 are a particular issue.

7 Other types of seafood  
8 could -- and also consumed raw by a lot of  
9 people. That's the other consumer -- other  
10 types of seafoods are usually cooked.

11 HEARING OFFICER TIPSORD: If I may,

12 Dr. Gerba, what about water that might then  
13 be used for irrigation, would that be --

14 DR. GERBA: Do I think it should be  
15 disinfected?

16 HEARING OFFICER TIPSORD: Yes.

17 DR. GERBA: If it's food crops,  
18 definitely. And that's a decision in the  
19 United States by the individual states. In  
20 California, I believe it -- or maybe not.  
21 You don't disinfect -- you don't have to  
22 disinfect the sewage effluent if it's  
23 nonhuman food crops that are being irrigated.  
24 And that's done in practice in California.

0010

1 But if it's human food crops, not only should  
2 it be disinfected, but it also should be  
3 given tertiary treatment and filtered. There  
4 are a lot of steps before -- The situations  
5 where I've seen that done, usually it's  
6 advanced tertiary treatment using -- going  
7 through ultrafiltration membranes and that.  
8 The assurance here is because it's going to  
9 be used for human consumption has to be very  
10 high that there's no pathogens. And  
11 oftentimes pathogen levels are monitored in  
12 the at least the initial phases of those  
13 types of situations.

14 HEARING OFFICER TIPSORD: And, to your  
15 knowledge, there's no shellfish or use of  
16 CAWS waterway system for irrigation; is that  
17 correct?

18 DR. GERBA: No, not that I'm aware of.

19 MS. DIERS: Question 8: You state  
20 that it is not clear that wastewater  
21 disinfection always yields improved effluent  
22 or receiving water quality. Is it your  
23 testimony that disinfection should only be  
24 required when it is demonstrated to yield

0011

1 water quality improvements?

2 DR. GERDA: It depends on the  
3 objectives on what the water is going to be  
4 used for and the impact. That's really, I  
5 think, more management decisions, because it  
6 depends on how the water is going to be used  
7 in discharge or what impact might be to the  
8 users of that water and how that impact takes  
9 place.

10 MS. DIERS: Based on your -- this is  
11 Question 9. Based on your experience, do you  
12 have an opinion one way or another what  
13 indicator organism or organisms would you  
14 recommend to U.S. EPA to use in the  
15 establishment of water quality criteria for  
16 the protection of primary and secondary  
17 contact recreational activities?

18 DR. GERBA: I really don't have an

19 opinion on that right now which one might be  
20 better than another.

21 MS. DIERS: And my last one is  
22 Question 11: Page 5 of your prefiled  
23 testimony you state, therefore, it is  
24 uncertain if disinfection designed to remove

0012  
1 indicators can be effective in the removal of  
2 pathogens and in the reduction of pathogen  
3 risk. Could you please explain what you mean  
4 by this statement?

5 DR. GERBA: Yes. One example would be  
6 cryptosporidium, and the levels of chlorine  
7 usually apply in a lot of wastewater  
8 treatment plants I've seen. It would have no  
9 effect on the cryptosporidium because it's so  
10 resistant to chlorine. In fact, a lot of the  
11 outbreaks we see in swimming pools today are  
12 due to cryptosporidium because it can  
13 tolerate the one, three and four milligrams  
14 per liter of chlorine that are in swimming  
15 pools. So that would be one example. If we  
16 go to ultraviolet light, certainly in our own  
17 research and others, using UV light systems  
18 for disinfection wastewater, you'll find a  
19 lot more adenoviruses being released into the  
20 environment than would be if you were using  
21 chlorine. So, yeah, you'd have a situation  
22 where you would almost -- you certainly could  
23 meet standards, and other people have shown  
24 this, and still have a lot of adenoviruses

0013  
1 being present in the water because they're so  
2 resistant to ultraviolet light.

3 MS. DIERS: I think that's all I have  
4 for Dr. Gerba.

5 HEARING OFFICER TIPSORD: Let's move  
6 to your questions for Dr. Tolson.

7 MS. WILLIAMS: Okay. Dr. Tolson, I  
8 think it might have been Mr. Gerba who said  
9 earlier that low is a relative term. So I'm  
10 going to ask you a couple of questions about  
11 your use of the word low. You conclude -- in  
12 Question No. 2 for you it says you conclude  
13 that risk for gastrointestinal illness  
14 associated with recreational use of the  
15 Chicago area waterway are low. So can you  
16 tell us what would be a high rate, high risk  
17 of illness, high rate of risk of illness?  
18 Sorry.

19 DR. TOLSON: Dr. Gerba is right. It  
20 is a relevant term. And the benchmark we use  
21 to sort of set that is the acceptable risk  
22 for primary contact recreation of eight per  
23 1,000.

24 MS. WILLIAMS: So you rely on the

0014

1 eight per 1,000 in the U.S. EPA 1986 National  
2 Criteria Document as a dividing line between  
3 low and high or acceptable and unacceptable?

4 DR. TOLSON: No. We're not saying  
5 anything about that particular standard.  
6 What we're just saying is that here is a  
7 number, and you put that number in  
8 perspective. We're comparing it to this  
9 screening standard, this number that's out  
10 there just to give the reader a sense for  
11 where that would fall within risks that are  
12 otherwise reported.

13 MS. WILLIAMS: So it's low relative to  
14 eight, the numbers you counted --

15 DR. TOLSON: And four and, yeah, and  
16 six.

17 MS. WILHITE: So it's low -- I guess  
18 that's my question. Would six be low?

19 DR. TOLSON: In order to -- either I  
20 could report the number as two, or I could  
21 put it in context of it's a high or low. And  
22 to put in context of high or low, you need to  
23 come up with a threshold, and there's not  
24 many out there. One of them is the

0015

1 U.S. EPA primary which is the lowest that EPA  
2 has come out with of 8 per thousand. So it's  
3 low relative to that number.

4 MS. WILLIAMS: I have some other  
5 questions related to that, but I guess I'll  
6 go in order for now.

7 No. 3, you also conclude that the  
8 risks associated with recreational use of the  
9 CAWS are mainly due to secondarily loading of  
10 the waterway under wet weather conditions  
11 from CSOs and other dischargers, unquote.  
12 What do you base this conclusion mainly on?

13 MR. ANDES: Can I clarify something?  
14 On that -- That's a conclusion for the whole  
15 report, so.

16 MS. WILLIAMS: But it's quoted from  
17 his testimony. That's where the quote is  
18 from.

19 MR. ANDES: I'm just trying to figure  
20 out. You could say he bases it on everything  
21 in the report --

22 MS. WILLIAMS: What in the report does  
23 he base it on?

24 DR. TOLSON: We've covered a lot of

0016

1 this previously. But I think if you look at  
2 Exhibit 71, Table 5.9 as a summary result  
3 table, and I believe this was actually in my  
4 prefiled testimony also as Exhibit 1. I'm  
5 sorry. It was not. But it's in the report.  
6 And this shows risk from dry weather and  
7 combined dry/wet weather.

8 MS. WILLIAMS: 5-9? Am I looking at  
9 the wrong thing?

10 DR. TOLSON: Let me change that. I'm  
11 sorry. I had the wrong one. Let's go with  
12 5-14. Because that shows disinfection versus  
13 nondisinfection. So Exhibit 71, Table 5-14.  
14 And there it shows, for example, North Side  
15 we have a 1.53 illnesses per 1,000 or 15 per  
16 10,000 or 153 per 100,000. And compare that  
17 to including disinfection by, for example, UV  
18 which was the most efficacious in this case  
19 was 1.32 per 1,000.

20 MS. WILLIAMS: So it was the  
21 difference between the risks that you  
22 calculate for undisinfected versus  
23 disinfected that you base the statement on  
24 primarily?

0017  
1 DR. TOLSON: That was the whole goal  
2 of the study, and that's the essence of the  
3 results are there is a decrease, but the  
4 decrease is minor because of major  
5 contributors to the waterway are other  
6 sources other than the effluent from the  
7 wastewater treatment plants.

8 HEARING OFFICER TIPSORD: Off the  
9 record for a second.

10 (Off the record.)

11 HEARING OFFICER TIPSORD: Back on the  
12 record.

13 MR. ETTINGER: Let me ask one  
14 question. Did you calculate what the risk  
15 would be to swimmers?

16 DR. TOLSON: No. Swimmers was not an  
17 intake and ingestion rate scenario for which  
18 we developed any risk numbers.

19 MR. ETTINGER: Is it safe to swim  
20 there?

21 DR. TOLSON: We have no basis to make  
22 any assumption.

23 MS. WILLIAMS: Could you calculate  
24 what the risk to swimmers would be?

0018  
1 DR. TOLSON: I can calculate a lot of  
2 things, yes. There are going to be inherent  
3 uncertainties associated with that that will  
4 probably be greater than the uncertainties  
5 associated with the recreational use for  
6 which we have a considerable amount of  
7 background data on.

8 MR. ANDES: My objection is swimming  
9 isn't even part of the proposed uses here,  
10 so.

11 MR. ETTINGER: Well, we might want to  
12 reform the proposal since it seems so safe to  
13 go in there, you know. In fact, we may want  
14 to move that maybe next week.

15 MR. ANDES: Can't wait.

16 MR. ETTINGER: Can we take our  
17 canoeing numbers that are on 5-4 and use an  
18 exposure based on swimming and come out with  
19 numbers?

20 DR. TOLSON: We have not performed any  
21 of those calculations, and I can't really  
22 even speculate on what the result would be.

23 MR. ETTINGER: If I wanted to do that,  
24 could I just basically take this table of 5.4

0019

1 and use the exposures that are for swimming  
2 as opposed to the ones for canoeing and come  
3 out with that number?

4 DR. TOLSON: It's not quite that  
5 simple. You would have to actually go  
6 through the Monte Carlo simulations with  
7 different input assumptions for not only the  
8 ingestion rates for swimming, but also how  
9 long someone swims and --

10 MS. WILLIAMS: Well, I think this sort  
11 of goes to my next question. I ask in the  
12 next question how did we come up with the  
13 estimated doses for each activity in this  
14 table -- I mean they're listed in the table  
15 that Albert is referring to, right, 5-4? And  
16 you have them in terms of milliliter per  
17 hour.

18 DR. TOLSON: Yes. We've gone over --

19 MS. WILLIAMS: I understand, and you  
20 may have answered some of these. I think my  
21 questions are very general, so don't feel  
22 that you have to give a lot of specifics.  
23 But I would like to -- you to answer  
24 generally where these came from the

0020

1 literature or did you make them up? Can you  
2 tell me where these came from? Maybe I  
3 should understand that from having listened  
4 to your testimony already, but I don't, so.

5 DR. TOLSON: We did actually spend  
6 quite a lot of time going through how we  
7 derived these ingestion rates.

8 MR. ANDES: They weren't made up. I  
9 think we can --

10 MS. WILLIAMS: Do you think this has  
11 been asked and answered? I don't feel that I  
12 understand the answer, so.

13 HEARING OFFICER TIPSORD: Could you  
14 give us just a --

15 DR. TOLSON: Okay. I'll give you  
16 another summary. For example, for canoeing,  
17 there are assumptions that one needs to make  
18 on the ingestion rate. What we're looking at  
19 what that range would be for those ingestion  
20 rate numbers, we have to say, well, what's --  
21 what is -- let me back up.

22 HEARING OFFICER TIPSORD: Excuse me,  
23 Dr. Tolson. I don't mean to interrupt you,  
24 but I think perhaps you just started with

0021

1 what Miss Williams is getting at. You said  
2 there are assumptions that have to be made.  
3 Are those assumptions from -- how did those  
4 assumptions, how were those assumptions made?

5 DR. TOLSON: Right. So it's the  
6 assumptions are that the range of the inputs  
7 there. And then once --

8 MS. WILLIAMS: So you made them up?

9 DR. TOLSON: One assumption is that --  
10 Let me say this. One assumption is the  
11 ingestion rates vary over a range, and that  
12 they probably don't vary with the symmetrical  
13 distribution. In other words, the center,  
14 the most likely ingestion rate is probably  
15 not the center of that. There's probably  
16 some people that get much more, and those  
17 would happen less frequently. So you'd get a  
18 nonnormally distributed distribution of  
19 ingestion rates. So we have a lognormal  
20 distribution there. Then we have to sort of  
21 ground truth that to what we understand about  
22 literature citations for ingestion. So you  
23 look at things like, well, on those high end  
24 exposures, how bad can they be? We looked at

0022

1 the U.S. EPA's swimming data or ingestion  
2 rates under that activity and said, you're  
3 probably not going to canoe down the river by  
4 holding onto the canoe and swimming down. So  
5 that's actually the concentration, the  
6 ingestion rates that we assumed for those  
7 high-end exposures. They were way out there  
8 on the tail.

9 MS. WILLIAMS: So if we wanted to see  
10 another line in your table that said  
11 swimming, milliliters per hour, could we find  
12 that directly from U.S. EPA?

13 DR. TOLSON: U.S. EPA has actually got  
14 a number of very good studies on swimming and  
15 ingestion rates. They come from pool  
16 exposures where we've got a great tracer,  
17 cyranic acid, which is the chlorine  
18 stabilizer. And they put a bunch of kids in  
19 the pool and then you can measure their pee.  
20 And you can find out how much they drank by  
21 how much cyranic acid comes out on the other  
22 end. And we find that EPA sort of uses a  
23 15 mls per event as a swimming exposure.

24 There are other literature that

0023

1 cites some other numbers, but that's pretty  
2 typical is 15 mls per event. Now we derived  
3 ours as per hour. So if you look at a

4 high-end exposure of, say, 20, and you assume  
5 that there's going to be there for three  
6 hours, that gives about 60 mls per event  
7 which is actually higher than the swimming  
8 ingestion assumed by EPA as a point estimate.

9 MS. WILLIAMS: But event means to them  
10 an event of ingesting water or no? It  
11 doesn't mean a time of going swimming. It  
12 means a time of --

13 DR. TOLSON: Right, right.

14 MS. WILLIAMS: -- accidentally --

15 DR. TOLSON: Typically it's event  
16 driven. So if you were out there for eight  
17 hours, you may have gotten that entire 50 mls  
18 on five minutes within that, or it could have  
19 been disbursed out along -- they don't care  
20 about that. They just do it per event. Here  
21 we're doing it per hour, and we're also  
22 incorporating a time aspect because we  
23 realize that the different recreational  
24 activities are different in the amount of

0024

1 time that people spend with the water.

2 MS. WILLIAMS: Did you want to follow  
3 up, Albert, or were you just clearing your  
4 throat?

5 MR. ETTINGER: I was just clearing my  
6 throat. I'm writing the new petition.

7 MS. WILLIAMS: So in deriving these  
8 numbers in Table 5-4, what assumptions were  
9 made regarding how frequently canoers or  
10 hand-powered boaters would capsize? I mean  
11 how did --

12 DR. TOLSON: So we didn't really  
13 incorporate any of that. This is a  
14 distribution of exposures that goes to  
15 high-end activities. Those people that we  
16 categorize from the UAA as having higher  
17 contacts, which includes the canoers, which  
18 is our representative sort of perceptor. The  
19 distribution is a continuum. There are some  
20 people that, on their event, they consume 30,  
21 there are some that are going to consume 32,  
22 some 50, some 20, and some 1. There's a  
23 whole continuum of what's going to happen out  
24 there. We don't say that we've got a

0025

1 capsized person or a noncapsized person and  
2 then define them in one group or another.  
3 Somebody may capsize and actually ingest very  
4 little. Others may not capsize and ingest  
5 much more.

6 MR. ETTINGER: Are there --

7 MS. WILLIAMS: Well, I'm just trying  
8 to understand then is if the person who  
9 capsized and ingested quite a bit, you would  
10 assume that would be somewhere in the 50

11 milliliter per event range, correct?  
12 DR. TOLSON: I would not assume that.  
13 I -- actually, we have no data on how much  
14 people ingest when they capsize. My  
15 speculation is that when you capsize, you're  
16 probably going to ingest some water. And we  
17 wanted to try to capture that within the  
18 continuum, the full distribution of what's  
19 out there. The way that we did that is we  
20 said here is some data on swimming, an  
21 activity where people are immersed. Let's  
22 use that as sort of our high end of our range  
23 for distribution.

24 MS. WILLIAMS: And I do understand

0026

1 that. I guess, looking, though, at your  
2 numbers, they seem quite low.

3 MR. ANDES: On what basis?

4 MS. WILLIAMS: Compared to -- well,  
5 I'm looking at, for a canoer, the range you  
6 give is 5.21 milliliters, per hour, right,  
7 234. But is the highlighted line 50  
8 percentile, what you're relying on?

9 DR. TOLSON: Yes.

10 MS. WILLIAMS: So 7.52 milliliters per  
11 hour. And based on your distribution of the  
12 number of hours, I understand you use  
13 statistics and include a lot of things, but a  
14 typical canoer we'd be looking at something  
15 quite a bit less than an event, as U.S. EPA  
16 looks at it for a swimmer, right?

17 DR. TOLSON: Correct. So we're  
18 getting in a ballpark estimate of 19 mls per  
19 event which is -- compare that to 50 mls from  
20 swimming. I think we're actually being very  
21 conservative. I don't think many would argue  
22 that canoers get less. You would argue.  
23 Okay.

24 MS. MEYERS-GLEN: If I may have a

0027

1 quick follow-up. So you're equating the  
2 experience of someone swimming, that  
3 activity, with someone either falling out of  
4 a canoe and being submerged or flipping in a  
5 kayak upside down and then needing to right  
6 themselves? That's the same kind of activity  
7 and less of a dose? Is that what -- is that  
8 what you're -- I'm trying to understand --  
9 Please answer.

10 DR. TOLSON: We didn't specifically  
11 look at capsizing and immersion from any  
12 particular activity. We just tried to define  
13 a continuum, a range, a full range that might  
14 incorporate all the possibilities that would  
15 happen from canoeing. Within that we needed  
16 to debound it somehow. It's not as much as  
17 you would have for drinking water. There's

18 got to be some sort of reality check on that.  
19 So our high end, our reality check on that  
20 was to say, well, if somebody was swimming  
21 their entire time that they were out on the  
22 river, how much ingestion would you get  
23 there? And we used that to sort of frame our  
24 distribution of ingestion rates.

0028

1 MS. WILLIAMS: And by frame, do you  
2 mean that we would just make sure it was less  
3 than that? I guess I'm still trying to  
4 understand when you say frame.

5 DR. TOLSON: That's a reasonable  
6 characterization of it. I mean swimming, do  
7 you ingest more when you swim or when you  
8 canoe?

9 MS. WILLIAMS: And that's -- the  
10 assumption is you ingest more when you swim  
11 than when you canoe?

12 DR. TOLSON: Correct. And I'm saying  
13 that we've got a distribution here that  
14 extends beyond what you would have for  
15 swimming.

16 MS. WILLIAMS: And I -- sorry.

17 DR. TOLSON: Go ahead.

18 MS. WILLIAMS: We have a distribution  
19 that goes beyond because why?

20 DR. TOLSON: If swimming is 50 mls per  
21 event, we have a distribution that can give  
22 values up to five hours at 34 mls per hour,  
23 150 mls. So the highest end of this range  
24 here is three times what EPA recommends for

0029

1 ingestion rate for swimming.

2 HEARING OFFICER TIPSORD: Dr. Girard?

3 CHAIRMAN GIRARD: Dr. Tolson, in the  
4 Geosyntec report which is Exhibit 71. Do you  
5 have your copy there? Could you look at  
6 Page 100 and take a look at the last  
7 paragraph on Page 100 and tell us if that  
8 sort of summarizes some of the answers you've  
9 been giving to these questions?

10 DR. TOLSON: And I hope it does.

11 CHAIRMAN GIRARD: I hope so too.

12 DR. TOLSON: It's written in  
13 mathematicalese here, so excuse that. But  
14 for canoes, a lognormal distribution of a  
15 mean of five and a standard deviation of  
16 five.

17 HEARING OFFICER TIPSORD: If you're  
18 reading, you need to -- the court reporter.

19 CHAIRMAN GIRARD: You can summarize  
20 it.

21 DR. TOLSON: So remember this is a  
22 lognormal distribution, so what that mean of  
23 a log of five gets you a distribution that  
24 looks like the figure in 5 point -- 5-2 of

0030

1 Exhibit 71.

2 CHAIRMAN GIRARD: Go to like the third  
3 sentence which starts on Line 4 where you're  
4 talking about ingestion rates for your upper  
5 end.

6 DR. TOLSON: Got it. It says for the  
7 90th to 100th percentile ingestion rates  
8 range from 14 to 34 mls per hour which  
9 implies that 10 percent of the population may  
10 be exposed to water ingestion rates  
11 approaching those observed in swimming or  
12 accidental gulping.

13 CHAIRMAN TANNER: Maybe the next one.

14 DR. TOLSON: The next one is this is  
15 consistent with the observation in Fewtrell  
16 1994 study in which 8 percent of canoeists  
17 report capsizing, an event what that may  
18 result in ingestion rates similar to swimming  
19 or gulping.

20 HEARING OFFICER TIPSORD: Miss Dexter?

21 MS. DEXTER: In the ingestion rate  
22 studies that you cited, were any of the  
23 subjects under duress? Was that -- I mean --  
24 I'm not -- no. I'm saying did they study

0031

1 what happens, how much water is ingested when  
2 somebody is drowning?

3 DR. TOLSON: If you're drowning on the  
4 CAWS, you've got a lot more issues than  
5 micro --

6 MS. DEXTER: I'm just saying in an  
7 instance when somebody capsizes a canoe -- or  
8 a kayak and is inexperienced, that's a panic  
9 situation. I'm wondering if there's a  
10 correlation between the swimming studies  
11 where people are playing and when somebody is  
12 actually in a stressful emergency situation.

13 MR. ANDES: Just a moment.

14 DR. TOLSON: Actually, I think we may  
15 have the Fewtrell paper here that might  
16 address some of those comments. The Fewtrell  
17 study did not come up with ingestion rates  
18 associated with their 8 percent capsizing,  
19 but it did come up with a conclusion. Let me  
20 read this. Has this been admitted to the  
21 record yet?

22 HEARING OFFICER TIPSORD: I don't  
23 think so.

24 MR. ANDES: I believe a partial copy

0032

1 was introduced by Ms. Alexander.

2 DR. TOLSON: There are two Fewtrell  
3 papers: One, a 1992 study which has been  
4 admitted to the record, and this one would be  
5 a separate study, a 1994, which is quoted  
6 within the paragraph that I just read out of

7 the report.

8 HEARING OFFICER TIPSORD: Okay. Yes,  
9 Exhibit 74 is the other Fewtrell study from  
10 the effects of white water canoeing.

11 DR. TOLSON: That one is a 1992 study  
12 on white water canoeing. This one is 1994  
13 study on marathon canoeing. And I would like  
14 to point out within the conclusions of the  
15 study, Conclusion 2 says the apparent lack of  
16 identifiable health effects in these studies  
17 suggest that it may be appropriate to use a  
18 relatively polluted water for low contact  
19 recreational activities.

20 HEARING OFFICER TIPSORD: And do we  
21 have a copy of that we can enter into the  
22 record?

23 MR. ANDES: We do.

24 MS. MEYERS-GLEN: Can I ask a  
0033  
1 follow-up question to that, because it  
2 dovetails something else I was going to ask  
3 on that report anyway.

4 THE COURT: Go ahead.

5 MS. MEYERS-GLEN: Thanks.

6 HEARING OFFICER TIPSORD: But you need  
7 to speak up and ask one question at a time.

8 MS. MEYERS-GLEN: Thank you. In  
9 quantifying the amount of water ingested by  
10 canoeists Geosyntec relies on a report, I'm  
11 assuming it's that one, that in studies of  
12 rowing and marathon canoeists, approximately  
13 8 percent of the canoeists at fresh water  
14 sites reported capsizing, and 16 percent of  
15 rowers reported ingesting some water. And  
16 that's actually in your Attachment 3 in the  
17 microbial risk assessment report, Pages 99 to  
18 100.

19 DR. TOLSON: I agree.

20 MS. MEYERS-GLEN: My question to you  
21 is do you know the mean level of experience  
22 for the marathon canoeists and rowers  
23 questioned about capsizing in this study?

24 DR. TOLSON: Clearly no.

0034  
1 MS. MEYERS-GLEN: And what is the  
2 spectrum of experience for the people that  
3 canoe and kayak on -- or jet ski on the CAWS?

4 DR. TOLSON: I have no knowledge of  
5 that either.

6 MS. MEYERS-GLEN: Thank you.

7 MR. ETTINGER: I'm sorry.

8 HEARING OFFICER TIPSORD: Wait a  
9 minute. Before we get too far away. I am  
10 marking as Exhibit 79 the health effects of  
11 low contact water activities in fresh and  
12 estuarine waters, E-S-T-U-A-R-I-N-E, by L.  
13 Fewtrell, et al. as Exhibit 79, if there is

14 no objection. Seeing none, it's Exhibit 79.

15 Mr. Ettinger, go right ahead.

16 MR. ETTINGER: I'm just trying to  
17 follow-up on Tanner Girard's question  
18 regarding this paragraph on Page 100 of the  
19 report. I understand you had the swimming  
20 figure, and then there's some sort of  
21 mathematical formula. I'm not as well  
22 educated as journalists, so I don't  
23 understand all the math here. But how do  
24 you -- You just shape the bell curve?

0035

1 What's -- How do you shape that?

2 DR. TOLSON: It's a lognormal  
3 distribution. I teach a problemistic risk  
4 assessment class. And one of the activities  
5 I do is a couple of days where we work on  
6 this, is I have all the students record the  
7 time that they shower and the time that their  
8 spouse or significant other showers in the  
9 morning and bring it into class next day.  
10 And every year we get the same results; when  
11 you plot all those out, they're not normally  
12 distributed. There are a few people that  
13 have the 20 minute shower, and it's almost  
14 always a lognormal distribution that comes  
15 out of that. Natural processes tend to  
16 produce a lognormal distribution. It's a  
17 multiplicative process associated with a lot  
18 of natural events. If you look at a lot of  
19 indicator data, historically from the  
20 district they tend to follow a lognormal  
21 distribution. So a lognormal distribution is  
22 what we've assigned as sort of the underlying  
23 mathematical expression for how different  
24 people may ingest water. We don't have data

0036

1 on every one of those to develop those  
2 probabilities, but that fits what we  
3 understand for a lot of natural processes.

4 MR. ETTINGER: Do you have any data  
5 other than this Fewtrell study and the  
6 swimming data?

7 DR. TOLSON: Mm-hmm.

8 MR. ETTINGER: What other data is  
9 there?

10 DR. TOLSON: Well, if you have the two  
11 points, if you have a point within that  
12 distribution and you have an assumption of  
13 what the distribution is, you can fill the  
14 rest of the distribution in.

15 MR. ETTINGER: I only see one point.  
16 The one point is the swimming. Where is the  
17 other point?

18 DR. TOLSON: Zero. We know that  
19 everybody is going to have some ingestion,  
20 incidental ingestion or otherwise. So we

21 know it doesn't go any lower than that. So  
22 we bounded that -- we've bounded that intake  
23 and then we fit a distribution between those  
24 points.

0037

1 MR. ETTINGER: So I've been canoeing  
2 for 20 years. I've never capsized a canoe.  
3 Would you say that I had a same chance as  
4 someone who --

5 DR. TOLSON: I'd say you have a better  
6 canoe record than I do, for one.

7 MR. ETTINGER: I'm just very cautious.

8 DR. TOLSON: I would say our estimates  
9 are probably over -- an overestimate for you.  
10 So you are on the left half of the bell  
11 curve, I'm sorry to say, left half of the  
12 distribution.

13 MR. ETTINGER: So let me get this  
14 right then. You've just got the swimming  
15 point, and then you just put a bell curve on  
16 that with no other data other than this  
17 Fewtrell study that says 8 percent of the  
18 guys capsize.

19 DR. TOLSON: It's not quite that  
20 simple. I mean you've got -- we can bound  
21 what the numbers are. We know it goes  
22 between zero and something high approaching  
23 swimming. So if you just have that data and  
24 you put a lognormal distribution in, you will

0038

1 get a picture that looks like the figure  
2 that's in Exhibit 71 of incidental ingestion  
3 rate while for canoeists which is figure 5-2.

4 MS. WILLIAMS: Did U.S. EPA use a  
5 similar process, or did they use actual data  
6 in correlating their swimming figure?

7 MR. ANDES: In correlating the  
8 swimming? I'm not sure -- in taking what  
9 action?

10 MS. WILLIAMS: So, for example, Albert  
11 gave the example of his canoeing. Well, I do  
12 not like to put my head under the water when  
13 I swim. I like to swim with my head out of  
14 the water. I suspect I have less events of  
15 ingesting water than the typical swimmer.  
16 How is the estimate of 50 milliliter per  
17 event translated into the 8 in 10 illnesses  
18 risk of swimming by U.S. EPA? Do you know?

19 DR. TOLSON: They did not consider  
20 that at all within their 8 per 1,000. But  
21 the way that -- the value that they were  
22 looking at there was a point estimate, their  
23 50. They also add considerable conservatism  
24 with most of their ingestion inputs. And

0039

1 this is one where I'm sure they did the same.  
2 But it comes from empirical data where

3 they've got 20 kids, they put them in the  
4 pool, they measure the cyuranic acid, back  
5 calculate how much pool water they ingested,  
6 took the average of that or took the 95th  
7 percentile of that, and that was the number  
8 that they're using for their ingested rate  
9 point estimate of 50 mls per hour.

10 MS. WILLIAMS: So they did not have to  
11 perform the statistical analysis like you  
12 did?

13 DR. TOLSON: I don't know how they did  
14 that. My guess is that they would have used  
15 an upper percentile of the range of the data  
16 that they had. So a little bit different of  
17 a statistical one, but a conservative one for  
18 their estimates also.

19 MR. ETTINGER: Did you do fishing and  
20 boating the same way?

21 DR. TOLSON: Fishing and boating are  
22 also input distributions that will follow  
23 some sort of lognormal pattern. For fishing  
24 we took the canoeing median of -- and we

0040

1 essentially halved it. We said for fishing  
2 you would get maybe half of the intake that  
3 you would get for canoeing.

4 MR. ETTINGER: How do you figure that?

5 DR. TOLSON: There is like no data out  
6 there to calculate this. So this is a  
7 professional judgment. We think it's a  
8 conservative judgment based on my experience  
9 with fishing.

10 MS. WILLIAMS: Your personal  
11 experience as a fisherman?

12 DR. TOLSON: I won't say we're basing  
13 it completely on my personal experience as a  
14 fisherman, but from what I've seen on TV,  
15 that's --

16 MR. ETTINGER: My personal experience  
17 is I get my hands all over the fish trying to  
18 get the hook out. But I've never capsized a  
19 canoe, so I guess I would have doubled the  
20 other way, right? Oh, well.

21 DR. TOLSON: Again, there are some  
22 professional judgment evaluations that go  
23 into here. We're using the fishing and the  
24 canoeing and the boating as sort of

0041

1 representative of groups of high, medium, and  
2 low exposure. So your fishing is more of a  
3 high exposure, I guess, and your canoeing is  
4 a low. I think what we're we've done here,  
5 we've tried to capture in a conservative  
6 fashion the potential for ingestion from  
7 these three exposure events.

8 MS. WILLIAMS: So in Question 14 I  
9 ask, and I may jump around a bit here. I'm

10 trying to be chronological, but I don't think  
11 it's working. You testified that select --  
12 quote, selection of input distributions  
13 relied on literature derived sources,  
14 site-specific use information, and  
15 professional judgment. So which of these  
16 sources was used to estimate how long a  
17 canoeist or kayaker will be out in the water?  
18 And so I'm referring to, I guess, now to one  
19 of the tables. Do you have a table?

20 DR. TOLSON: It might be helpful go to  
21 Figure 5.3. It's a pictorial sort of  
22 representation to it as opposed to the  
23 tabular form of Exhibit 71. That's a  
24 probability density -- you have it? That's a

0042

1 probability density function for exposure  
2 duration for canoeists. Again, we need to  
3 sort of bound the range of what's possible  
4 out here, somebody is there for probably more  
5 than zero and less than twelve all day,  
6 probably make a better guess than that. If  
7 you're going to go out and go canoeing, we  
8 assume that you're out for at least an hour  
9 and we assume that you're out there for no  
10 more than five hours. That seemed like a  
11 reasonable range.

12 MS. WILLIAMS: So that answer to the  
13 question would be -- would it be it's not  
14 literature derived.

15 DR. TOLSON: No. I'm getting to some  
16 more specific data, I think, that will inform  
17 the --

18 MR. ANDES: I do have copies of that  
19 figure if anyone needs that. Do you have  
20 that?

21 HEARING OFFICER TIPSORD: Actually,  
22 we --

23 DR. TOLSON: For this particular input  
24 there actually is survey data. This is much

0043

1 easier to conduct. So there is survey data.  
2 And I believe EPA exposure factors handbook,  
3 the activity factors handbook which is one of  
4 the chapters in this huge volume of survey  
5 information that EPA has collected, has data  
6 on use statistics for parks and recreations  
7 around lakes, streams, and rivers. And the  
8 distribution that you see here which is a  
9 triangular distribution fits fairly nicely  
10 with the 10th and 90th percentiles of the  
11 recreational use for rivers and lakes. So  
12 there we have the exposure factors handbook  
13 data to sort of inform our decision. The  
14 problem with that data is we don't know if  
15 they were actually out there canoeing or not.  
16 So they were just used, they were recreating

17 in parks that had streams and lakes. So it  
18 may have included the time that they were in  
19 the parking lot before they got on the water.  
20 There was a lot of other uncertainties  
21 associated with that.

22 MS. WILLIAMS: So you're saying only  
23 10 percent of the people would have been  
24 recreating for more than five hours?

0044

1 DR. TOLSON: Correct. That's their  
2 total recreation there based on that survey.  
3 There were -- I think there was some in the  
4 survey there that had 24 hours for their  
5 recreation time. So they may have included  
6 homeless and such that were in the parks.

7 MS. WILLIAMS: Campers are not  
8 homeless.

9 DR. TOLSON: I'm sorry. It may have  
10 included campers in there, but probably not  
11 people that are out on canoes. So I'm not  
12 sure how -- It's not directly relevant to  
13 fitting this distribution or we would have  
14 used that direct information. So what we've  
15 got here fits within the 90 -- 10th to 90th  
16 percentile. Because of the uncertainties  
17 associated with time that was not canoeing  
18 but also in the park, this probably  
19 overestimates the time that one would be in  
20 canoes based on that data. It's also  
21 interesting to note that the mean that we've  
22 got, 2.67, which is the mean of that  
23 triangular distribution, is also greater than  
24 the mean of the data from that survey

0045

1 information which is like two and a half  
2 hours or something like that.

3 MS. WILLIAMS: How did you get your  
4 mean?

5 DR. TOLSON: How did we generate our  
6 mean?

7 MS. WILLIAMS: Yes.

8 DR. TOLSON: It's a triangular  
9 distribution. You can analytically calculate  
10 what the mean is or you can probabilistically  
11 do it by just doing simulations and averaging  
12 up what the simulations are and dividing by  
13 the number of simulations.

14 MS. MEYERS-GLEN: Can I ask a  
15 follow-up?

16 MS. WILLIAMS: Yes.

17 MS. MEYERS-GLEN: Question No. 12 for  
18 you, this is right in line with that.

19 HEARING OFFICER TIPSORD: Stacy, we  
20 cannot hear you at all.

21 MS. MEYERS-GLEN: On Page 101 of the  
22 microbial risk assessment report, that's your  
23 Attachment 3 to Dr. Tolson's testimony, I

24 would ask Dr. Tolson my question 12 for him,  
0046

1 since it seems kind of relevant: According  
2 to the report, that would be the microbial  
3 risk assessment, Geosyntec set exposure  
4 duration based on time for the Flat Water  
5 Classic, a canoe and kayak race in the  
6 Chicago River. And the report states that  
7 according to friends of the Chicago River,  
8 race times in 2005 range from approximately  
9 1 to 3.5 hours with majority times between  
10 1.5 and 2.5 hours.

11 DR. TOLSON: Correct. I'm sorry. I  
12 should have also included that in your  
13 answer. We used other sources besides the  
14 EPA.

15 MS. MEYERS-GLEN: Well, the report  
16 concluded, though, that based on this  
17 information and professional judgment, again,  
18 triangular distribution was assigned to this  
19 input with a minimum time the canoeists must  
20 be in the water one hour, and the likeliest  
21 time in water for two hours. And my  
22 questions to you are, first one: If  
23 Geosyntec was aware that the average time of  
24 a race, and this is where people are trying

0047  
1 to paddle as quickly as possible to reach the  
2 finish line, is between 1.5 and 2.5 hours,  
3 why did the team select an even faster range  
4 between 1 and 2 hours as the time a person  
5 would normally spend in a canoe and kayak on  
6 the CAWS?

7 DR. TOLSON: I think you might have a  
8 little bit of misinterpretation of the ranges  
9 there. If you go back to Figure 5-3 of the  
10 report, and if you look, the majority of the  
11 Flat Water Classic canoe racers were between,  
12 what did we say, one and a half and two and a  
13 half hours.

14 MS. MEYERS-GLEN: Right.

15 DR. TOLSON: One and a half and two  
16 and a half hours. And you can see we  
17 actually estimated that exposure to the river  
18 is much longer, out to five hours. So if we  
19 were using that as a basis, then we've  
20 certainly overestimated, probably  
21 overestimated by a factor of two.

22 MS. MEYERS-GLEN: I'm a little  
23 confused, though. Because the next statement  
24 says here, "The training and distribution

0048  
1 that signed this input was a minimum time the  
2 canoeist would be in the water of one hour."  
3 And I'm confused as to why that one hour was  
4 chosen when during a race the average time --  
5 the quick time for that average was 1.5, and

6 the fastest time that anyone could even  
7 paddle would have been an hour, when you're  
8 talking about a regular occurrence on the  
9 CAWS.

10 HEARING OFFICER TIPSORD: You keep  
11 asking compound questions. You need to stop  
12 after a question.

13 DR. TOLSON: Can we back up. And the  
14 first question then again was?

15 MS. MEYERS-GLEN: Yes. The minimum  
16 time a canoeist would be in the water chosen  
17 here on Page 101 of your report is an hour,  
18 right?

19 DR. TOLSON: Yes. That is correct.  
20 And it's obviously the shorter the exposure,  
21 the lower the ingestion, potential ingestion,  
22 so yes.

23 MS. MEYERS-GLEN: Right. And you  
24 chose that from the Flat Water Classic; is

0049  
1 that correct?

2 DR. TOLSON: We did not chose our  
3 input distribution on ingestion based solely  
4 on the Flat Water Classic. I think we  
5 informed our choice based on information from  
6 EPA surveys on recreational use around lakes  
7 and parks, and we also looked at the Flat  
8 Water Classic which is clearly people  
9 canoeing on the waterway, something we should  
10 look at. When we look at it in context of  
11 the Flat Water Classic, we find that our  
12 distribution that we're using here certainly  
13 incorporates those people and actually  
14 overestimates through the entire range the  
15 length of time people are there compared to  
16 the length of time people were on the Flat  
17 Water Classic.

18 MS. MEYERS-GLEN: Well, did you use  
19 any other information about recreation on the  
20 CAWS other than the race, the Flat Water  
21 Classic, to determine the average amount of  
22 time that recreators are normally out on that  
23 water -- on those waters?

24 DR. TOLSON: Yes, we did. I'm trying

0050  
1 to recall the specifics on this. But we  
2 actually contacted some boat rental  
3 facilities on renting boats, and I believe we  
4 got information that they had half-day boat  
5 rentals and one-hour boat rentals, and that  
6 was just sort of ancillary information that  
7 we put into our potential for recreating.  
8 Somebody was going to rent a boat for an  
9 hour, they're going to be out there for  
10 probably an hour.

11 MR. ANDES: Can I follow up?

12 MS. MEYERS-GLEN: Sure.

13 MR. ANDES: First, Dr. Tolson, let me  
14 ask: By using one hour's lower bound, if you  
15 had included smaller time periods of  
16 exposure, would those have shown less risk?

17 DR. TOLSON: That is correct. By  
18 truncating it at the one hour, we've  
19 increased our -- the exposure time and  
20 increased the ingestion rate and potentially  
21 overestimated risk for those recreators who  
22 were out there for less than one hour.

23 MR. ANDES: And then in terms of the  
24 first question here which says that the team

0051

1 selected a range of between one and two  
2 hours, is that right, or -- in fact, can you  
3 explain what the two hours -- when you say  
4 the likeliest time in the water is two hours,  
5 can you explain what that represents and then  
6 explain to us what the range really is that  
7 you're using?

8 DR. TOLSON: Sure. The likeliest time  
9 is just the mid point on that, the one is the  
10 beginning point. But we don't talk  
11 specifically there in that sentence about the  
12 high end, which is five hours. So I think  
13 the misinterpretation is that you're taking  
14 the minimum and the mean, median, or the most  
15 likely number, and comparing that to the  
16 range of the median for the race.

17 MS. MEYERS-GLEN: You want your  
18 minimum, though, to reflect what truly is a  
19 minimum out in the water, though, correct?  
20 You don't want it to be --

21 DR. TOLSON: The minimum amount in the  
22 water may be five minutes. We did not  
23 reflect that. So in that respect we probably  
24 overestimated the risk for those people.

0052

1 MS. MEYERS-GLEN: Based on the  
2 information, though, that you've collected,  
3 based on the Flat Water Classic, the EPA  
4 study, as well as rental locations, that's --  
5 what was the minimum that you found from  
6 those three sources out in the water?

7 DR. TOLSON: We don't have any  
8 specific -- We do not have any specific data  
9 on the rental times exactly how long people  
10 were on canoes. For the Flat Water Classic,  
11 I do not recall who the winner, what the  
12 winner got as far as time. You may know. Is  
13 it less than one hour? And, if so, then his  
14 risk would be even that one person would be  
15 overestimated with the evaluation as we've  
16 done it here.

17 HEARING OFFICER TIPSORD: Dr. Tolson,  
18 did you testify also that there are rental  
19 places that rent boats for merely an hour?

20 DR. TOLSON: I believe there are, yes.  
21 At least in 2005 when we --

22 HEARING OFFICER TIPSORD: Thank you.

23 MS. MEYERS-GLEN: Well, did you  
24 consider, and I guess I don't know if you

0053

1 would, because I didn't realize that you had  
2 this other information, but did you consider  
3 other tour events such as Windy City Kayak  
4 Symposium, which offers numerous kayak  
5 trips --

6 HEARING OFFICER TIPSORD: Slow down,  
7 slow down, slow down.

8 MS. MEYERS-GLEN: -- that take from  
9 three to six hours. And actually the range  
10 from Friends of the Chicago River, who was  
11 instrumental in the Flat Water Classic where  
12 you got your other information, and all of  
13 their kayak trips last at least from three  
14 hours and mostly between three and six hours.

15 MR. ANDES: And I assume at some point  
16 that would be offered as evidence, because we  
17 don't have that to date.

18 DR. TOLSON: I do not have any survey  
19 data from them, any published reports or  
20 anything from them.

21 MS. MEYERS-GLEN: So you're not aware  
22 of any of that and that wasn't taken into  
23 account?

24 DR. TOLSON: That's correct. Long

0054

1 time periods were taken into account within  
2 our distribution up to five hours. There may  
3 have been people that can canoe out there all  
4 day. I can't hold my bladder that long.

5 MS. MEYERS-GLEN: Those sources were  
6 not taken into account, correct?

7 DR. TOLSON: I have not looked at any  
8 data, any survey data from alternative sort  
9 of races or events that have been on the  
10 waterway. However, I believe our  
11 distribution that we've included for our  
12 ingestion rate takes into account a wide  
13 range of potential exposures on the waterway  
14 that, in my opinion, are a conservative  
15 estimate of time that people spend on the  
16 waterway in canoes.

17 MS. MEYERS-GLEN: Thank you.

18 MS. WILLIAMS: Did you, by any chance,  
19 review the testimony from the June 16 hearing  
20 yet in this matter?

21 DR. TOLSON: I'm sorry. I did not.

22 MS. WILLIAMS: Yes or no is fine.

23 That's fine.

24 CHAIRMAN GIRARD: Could I ask a quick

0055

1 follow-up?

2 MS. WILLIAMS: Yes.  
3 CHAIRMAN GIRARD: Dr. Tolson, looking  
4 at your Figure 5-3, you say you've -- you  
5 have a mean duration of two -- well, 2.67 or  
6 two hours and 40 minutes. Just eyeballing  
7 your graph there, what do you think the  
8 median would be in terms of half the people  
9 spend less time and half above? Would it --  
10 would the median be somewhere around three  
11 hours?

12 DR. TOLSON: The median would be lower  
13 than that.

14 CHAIRMAN GIRARD: Okay. So it would  
15 be -- but somewhere between two and  
16 two-thirds?

17 DR. TOLSON: Yes.

18 CHAIRMAN GIRARD: So still you're  
19 saying that even though your range is one to  
20 five hours, you've got a lot of individuals  
21 there in the mid range in terms of two to  
22 three hours' time in water?

23 DR. TOLSON: That is correct. There  
24 are more people that are in the two to three

0056

1 hour than there are between the three and the  
2 four and the four and the five. And as in  
3 most of these skewed distributions, the  
4 tails -- less and less frequency in the upper  
5 tails.

6 CHAIRMAN GIRARD: Thank you.

7 HEARING OFFICER TIPSORD:  
8 Miss Williams, I think we're back to you.

9 MS. WILLIAMS: I guess I'm looking at  
10 question ten now. On Page 3 of your  
11 testimony you state that recreational survey  
12 studies were used to provide insight on the  
13 types and frequency of recreational exposure  
14 expected in the waterway. Now, this is  
15 referring to something different than what  
16 we've been talking about previously, correct?  
17 What surveys are you talking about here?

18 DR. TOLSON: We relied solely on the  
19 UAA as the survey for that.

20 MS. WILLIAMS: And did those surveys  
21 consider the length of time or how -- or the  
22 frequency of recreation or anything?

23 DR. TOLSON: To my knowledge the UAA  
24 did not contain that information.

0057

1 MS. WILLIAMS: And do you know who  
2 conducted those surveys that were in the UAA?

3 MR. ANDES: It's in an Agency  
4 document. You're asking him --

5 MS. WILLIAMS: I'm asking him if he  
6 knows who conducted those surveys.

7 DR. TOLSON: There were notes on the  
8 observation pages, but I don't remember,

9 recall the names of those that were involved  
10 with that.

11 MS. WILLIAMS: Okay.

12 HEARING OFFICER TIPSORD: And, for the  
13 record, the UAA we're talking about is the  
14 one that is Exhibit B to the Agency's  
15 proposal.

16 MS. WILLIAMS: I'm sorry. Attachment  
17 B?

18 HEARING OFFICER TIPSORD: Attachment  
19 B. Sorry. Only because there are two of  
20 them in the record, I thought we should  
21 specify.

22 MS. WILLIAMS: Yes. And you  
23 haven't -- you weren't able to look at any of  
24 the work that's being done by Dr. Dorovich

0058

1 (ph.) regarding recreation in the CAWS. That  
2 wasn't -- there's nothing available from his  
3 work about frequency or types of recreation,  
4 correct?

5 DR. TOLSON: This study was concluded,  
6 I think, before we had sufficient data to  
7 even consider that.

8 HEARING OFFICER TIPSORD: Have you had  
9 a chance to review his findings?

10 DR. TOLSON: We were not privy to -- I  
11 haven't seen it, so.

12 MS. WILLIAMS: So when you were  
13 testifying yesterday, Ms. Alexander, I think,  
14 understood better than I do, about -- I think  
15 one of the witnesses referred to the fact  
16 that's like gambling; going out more often to  
17 recreate your risk, it's not additive, but  
18 it's more like gambling. Can you explain  
19 what that means?

20 DR. TOLSON: You leave with less  
21 money. Yeah. It's important to understand  
22 that the cumulative risk or the risk from  
23 repeated exposures, there's a lot of other  
24 caveats that had to be considered in here.

0059

1 One is there's immunity, and immunity may  
2 influence the probability of getting infected  
3 on repeated exposures. And we didn't take  
4 that into account. That's an uncertainty  
5 that I think we've discussed to some extent  
6 within here. The other is how one would take  
7 five exposure events that may have a  
8 1 percent chance of risk of illness and  
9 figuring out at the end of that one what was  
10 the probability that I would have gotten sick  
11 somewhere along that time. And there it's  
12 not just 5 percent which would be 5 times 1  
13 percent. If you can think about it in terms  
14 of -- let's talk about in gambling. Say that  
15 you had a deck of cards and you wanted to get

16 hearts. That was your outcome that you  
17 were -- you were wanting to get a red card.  
18 That was your outcome that you were  
19 interested in. If you were to be dealt one  
20 card out, there's a 50 percent chance it  
21 would be a red card and 50 percent chance it  
22 would be a black card. So if you were to be  
23 dealt two cards face down, if it's 50 percent  
24 chance on the first one and a 50 percent

0060

1 chance on the second one. Then you would  
2 conclude that I'm going to get a red card out  
3 of those two, and that's not the case. So  
4 it's not just strictly additive. Does that  
5 address it?

6 MS. WILLIAMS: It's not strictly  
7 additive.

8 DR. TOLSON: It's not additive at all.  
9 It's independent events.

10 HEARING OFFICER TIPSORD: Can I just  
11 try to --

12 MS. WILLIAMS: Do you have a good way  
13 of asking it?

14 HEARING OFFICER TIPSORD: Let me try  
15 this. So, in other words, if I go out every  
16 single day and swallow a milliliter of water  
17 from the CAWS, my chances of getting sick are  
18 the same every single day, but they don't  
19 increase every day?

20 DR. TOLSON: Yeah. It's a little bit  
21 more complicated than even that, because  
22 actually your chances of getting sick are  
23 actually less after each day.

24 HEARING OFFICER TIPSORD: Because you

0061

1 begin to build an immunity?

2 DR. TOLSON: That is correct.

3 MS. WILLIAMS: But still somehow if I  
4 just go out and take a milliliter one day, my  
5 risk must be lower than Marie's over the  
6 whole summer, right?

7 DR. TOLSON: I'll agree with that,  
8 yes.

9 MS. WILLIAMS: But your report doesn't  
10 account for --

11 HEARING OFFICER TIPSORD: But that's  
12 because if I'm going out every day, my  
13 exposure is more often; not because the  
14 increased quantity of water.

15 DR. TOLSON: Absolutely.

16 MS. WILLIAMS: But when you are giving  
17 a risk level --

18 DR. GERBA: Basically that's what the  
19 EPA does in setting -- based on their  
20 epidemiological data. Your risk of getting  
21 ill is an independent event. When they set  
22 those enterococci or E. Coli standards based

23 upon the number of days they get ill, that's  
24 every time they go out. That's the event.

0062

1 They don't consider it's a cumulative process  
2 because it's not additive. That's based on  
3 one time swimming event each time.

4 HEARING OFFICER TIPSORD: We have  
5 another follow-up back there.

6 MS. HEDMAN: Susan Hedman from the  
7 office of the Attorney General on Behalf of  
8 the People of the State of Illinois. I'd  
9 like to follow up with Dr. Gerba on this  
10 exchange about risk. Isn't it true that from  
11 the perspective of the recreational user of  
12 the CAWS this is much like a game of Russian  
13 roulette only with pathogens instead of  
14 bullets?

15 DR. GERBA: Right. It gives it -- The  
16 events are independent of each other every  
17 time you play Russian roulette, right?

18 MS. HEDMAN: And you've over the years  
19 I think frequently invoked that analogy; is  
20 that right?

21 DR. GERBA: That's right.

22 MS. HEDMAN: Is it true that you said  
23 that every time you go to the bathroom you're  
24 playing Russian roulette?

0063

1 DR. GERBA: It depends whose bathroom  
2 you use.

3 MR. ANDES: Can we cite where he said  
4 that?

5 DR. GERBA: I'm sure I have.

6 MS. HEDMAN: I mean if I can enter the  
7 article into evidence as an exhibit.

8 HEARING OFFICER TIPSORD: Absolutely.

9 MS. HEDMAN: It's a 1997 article from  
10 the Arizona Daily Wildcat, and I believe it  
11 is about a study that Dr. Gerba did relating  
12 to use of bacterial infections from use of --  
13 and pathogenic infections from use of public  
14 bathrooms.

15 DR. GERBA: That's sort of the analogy  
16 we're using here, actually.

17 HEARING OFFICER TIPSORD: I'm going to  
18 mark this as Exhibit 80 if there's no  
19 objection. Seeing none, it's Exhibit 80.

20 MS. HEDMAN: And I also would like for  
21 you to tell me if you recognize the following  
22 statement, this is from a transcript of an  
23 interview you did on the Today Show in 2005,  
24 and you were talking about --

0064

1 MR. ANDES: Can I ask why these  
2 couldn't have been provided earlier so we  
3 could see them before he has to answer  
4 questions?

5 MS. WILLIAMS: Are these articles  
6 cited in his --  
7 MR. ANDES: No.  
8 MS. HEDMAN: This morning when he was  
9 testifying he used the phrase the right spot  
10 at the wrong time, and I recalled him using  
11 that same phrase in a discussion of risk  
12 assessment in a Today Show interview I read  
13 about him. And I would just like to -- we're  
14 trying to clarify what is this risk  
15 assessment model. And we talked a lot about  
16 Monte Carlo models. We talk about all kinds  
17 of simulations. We've talked about all kinds  
18 of sophisticated risk assessment models. And  
19 we're trying to pin down this question of  
20 what is the risk to the recreational user.  
21 And --  
22 MR. ANDES: And I don't think that  
23 addresses my question of why these materials  
24 couldn't have been provided earlier.

0065

1 HEARING OFFICER TIPSORD: Because she  
2 found them as a result of his testimony this  
3 morning as a follow-up.  
4 MR. ANDES: You only found those  
5 today?  
6 MS. HEDMAN: Yes, I did. In fact, you  
7 can see that I printed them out today. I  
8 have -- when I saw his testimony, as with all  
9 the witnesses, I did a fair amount of reading  
10 of other statements that they made.  
11 MR. ANDES: So his prefiled testimony?  
12 MS. HEDMAN: Yes.  
13 MR. ANDES: That was certainly  
14 available before yesterday.  
15 MS. HEDMAN: That's true. I didn't  
16 know that it would come up.  
17 HEARING OFFICER TIPSORD: We can go  
18 ahead. He can certainly answer them to the  
19 best of his ability without being  
20 reacquainted with them.  
21 MR. ANDES: Fine. Okay.  
22 MS. HEDMAN: Well, I just have one  
23 more question, and that is whether you recall  
24 saying in that Today Show interview, and I

0066

1 will enter this into evidence as well,  
2 talking about exposure to pathogens in the  
3 workplace.  
4 DR. GERBA: Right.  
5 MS. HEDMAN: Quote, it's sort of like  
6 germ roulette. You know, you touch the right  
7 spot at the wrong time and you bring your  
8 fingers to your nose, mouth, or your eyes,  
9 you can pick up colds that way. Eighty  
10 percent of the infections you get you're  
11 going to pick up from your environment.

12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
0067

DR. GERBA: Right.

MS. HEDMAN: I thank you. That's it.

HEARING OFFICER TIPSORD: Let's enter that as an exhibit as well.

DR. GERBA: It's a lot more dangerous to go to your office than to go canoeing on the CAWS.

MS. HEDMAN: But from the perspective of the recreational user of the CAWS?

DR. GERBA: Right. It's a matter of your exposure and how much you're exposed to the concentration. So that's a good -- in fact, we use that -- I use that as a classic

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14

example in teaching about risk and risk assessment about how it's all -- how it's a gamble and how you calculate what your odds are. The whole thing with any type of exposure is always to keep your odds in your favor and not in the organism's favor.

15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
0068

HEARING OFFICER TIPSORD: If there's no objection, I will mark that as Exhibit 81. Seeing none, it's marked as Exhibit 81. I would, however, note that both Exhibit 80 and 81 contain markings in both a yellow highlight and also asterisks in black pen that were on the documents when I received them.

MS. WILLIAMS: Okay. So, Dr. Tolson, the risk in the three segments you studied was significantly lower in the -- I believe the Calumet. That was the lowest.

MR. ANDES: Which particular risk are you referring to?

MS. WILLIAMS: I guess we can look at Question 17. You conclude that the Calumet Waterway was the lowest illness rate compared to North Side and Stickney?

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18

DR. TOLSON: Yes. I'm with you.

MS. WILLIAMS: And the question is why, but I guess to refine it more is that because there are fewer recreators primarily or because the pathogen levels are lower.

DR. TOLSON: The number of recreators is not important here. It's what kind of recreational activity they were doing. If they were doing recreational activities with somebody who is in the category of high exposure group, then they would ingest more water; couple that with the fact that the Calumet tended to have lower levels of pathogens, including viruses which are mostly responsible for the secondary illness, that's why you get both low incidents of primary -- when I say primary, I mean the actual recreators getting ill from the Calumet, and

19 you get lower incidents of secondary illness  
20 from Calumet exposure.

21 MS. WILLIAMS: Did one of those  
22 factors have more influence over the other,  
23 the type of recreation versus the pathogen  
24 level?

0069

1 DR. TOLSON: Give me a second. I  
2 might be able to give you an exact answer.  
3 Yes. Actually, we did a quantitative  
4 evaluation of that. The receptor type input  
5 was responsible for 38 percent of the  
6 variance in the distribution of the  
7 exposures.

8 MR. ANDES: What table is that?

9 DR. TOLSON: This is Table 5-16 in  
10 Exhibit 71. So here it kind of ranks the  
11 sensitivity of the model to the various  
12 inputs. You can see for Calumet we have .38  
13 for receptor type, .05 for weather type, .02  
14 for fishing ingestion rate, how that  
15 distribution affects it. And you had asked  
16 about what was it, duration.

17 MS. WILLIAMS: Pathogen levels. I  
18 don't think that's on here.

19 DR. TOLSON: Well, pathogen levels are  
20 not included within this sort of sensitivity  
21 analysis because they were handled in a  
22 bootstrapping scenario. So the pathogen  
23 levels are what they are.

24 MS. WILLIAMS: Do you know why they're  
0070

1 lower in Calumet?

2 DR. TOLSON: Why pathogen levels are  
3 lower?

4 MS. WILLIAMS: Yes.

5 DR. TOLSON: We base that on our  
6 analytical data which is probably the most  
7 robust pathogen analytical data --

8 MR. ANDES: So your answer is --

9 MS. WILLIAMS: Did you say the most  
10 robust what?

11 DR. TOLSON: Pathogen recreation --  
12 recreational water pathogen microbiological  
13 survey that, you know, I can think of based  
14 on that data.

15 MS. WILLIAMS: Robust in terms of the  
16 number of samples or the variety of pathogen  
17 sampled for?

18 DR. TOLSON: We have a number of  
19 pathogens, we have a number of sampling  
20 locations, we have wet and dry weather  
21 events. All of those really signify that  
22 this is a study that has taken into account a  
23 number of the different factors that have  
24 been missed in other surveys of pathogens.

0071

1 MS. WILLIAMS: So other surveys have  
2 fewer numbers of samples?  
3 DR. TOLSON: There are some literature  
4 citations out there of pathogens and  
5 waterways that were single events. I think  
6 if Fewtrell's study was pathogens on a single  
7 day, so, yes.  
8 MS. WILLIAMS: Okay. But going  
9 back -- so Calumet had by far the lowest  
10 percentage of canoers, right, in table 5-11  
11 of the three samples?  
12 DR. TOLSON: That is correct.  
13 MS. WILLIAMS: So presumably if there  
14 were more canoers in Calumet, their risk  
15 would have been higher, correct?  
16 DR. TOLSON: That is correct. In  
17 fact, if you go to Table 5-12 and we were to  
18 put everybody in a canoe on the Calumet, the  
19 risk there is .52. So even including  
20 everybody in the highest exposure group, you  
21 can see that the risks are still fairly low  
22 compared to either North Side or Stickney  
23 which had higher pathogen levels. Mind you,  
24 they're all much lower than the 8 per 1,000

0072

1 that we have been talking about as kind of  
2 our benchmark.  
3 MS. WILLIAMS: So you're saying the  
4 point -- wait. I didn't understand what you  
5 meant by if we put everyone in a canoe.  
6 DR. TOLSON: On Table 5-2 we've  
7 stratified the risk. We've assumed that  
8 every recreational event out of 1,000 there  
9 was a canoeing event in the Calumet. The  
10 risks for that would be .52 illnesses per  
11 1,000 recreational users.  
12 MS. WILLIAMS: So this table reflects  
13 the difference in pathogen levels across.  
14 Would this table be --  
15 DR. TOLSON: Yes, it does.  
16 MS. WILLIAMS: Okay. Thank you.  
17 MR. ETTINGER: Just to be clear, you  
18 have no idea why the pathogen levels varied  
19 from one site to another?  
20 DR. TOLSON: I do not.  
21 DR. GERBA: Why it varies from one  
22 sampling point to the other?  
23 MR. ETTINGER: Yes. Do you have any  
24 idea?

0073

1 DR. GERBA: It would be speculation.  
2 It's based on flow rates, how much water --  
3 what the per capita water consumption is in  
4 the various wastewater plants. Some plants  
5 may have more industry that uses more water  
6 than another, so that would affect the final  
7 dilution in the pathogens that might be

8 present, efficiency of the plant. That's a  
9 good one. Those are among a lot of other  
10 factors.  
11 MR. ETTINGER: Efficiency of what  
12 plant?  
13 DR. GERBA: How well the sewage  
14 treatment processes are being operated by the  
15 plant.  
16 MR. ETTINGER: Do we think the  
17 pathogens are coming from sewage treatment  
18 plants?  
19 DR. GERBA: Some of them could be,  
20 yes. That's what the outfall data suggests.  
21 MR. ANDES: If I can follow up on  
22 that. And there is some reduction of  
23 pathogen levels --  
24 DR. GERBA: Just in sewage treatment

0074

1 itself you get significant reductions of  
2 pathogens than most of them in it. An  
3 example, helmet worms (sic.) would be a  
4 classic example. You'd probably remove  
5 almost all of them in the sewage --  
6 MR. ANDES: Can you repeat that and  
7 speak up a little bit.  
8 DR. GERBA: Helmet worms would be a  
9 classic example of that. You probably remove  
10 almost 100 percent of them in the sewage  
11 treatment process. It varies with the  
12 individual pathogens. Some you remove more  
13 and some you remove less.  
14 MR. ETTINGER: That's with secondary  
15 treatment you would remove 100 percent of  
16 that particular pathogen?  
17 DR. GERBA: That particular one, yeah.  
18 But it varies with other pathogens. Some you  
19 might remove only 90 percent.  
20 MR. ANDES: You're not talking about  
21 with disinfection specifically? You're  
22 talking about --  
23 DR. GERBA: No. This is without  
24 disinfection.

0075

1 MR. ETTINGER: I understood that.  
2 MR. ANDES: I want to make sure  
3 everyone did.  
4 MR. ETTINGER: Okay. And when we have  
5 these high pathogen levels or higher pathogen  
6 levels during wet weather events, that could  
7 be or I guess -- well I'll ask you. Do you  
8 think that is because we're then seeing raw  
9 sewage going in from the CSOs?  
10 DR. GERBA: That's what I presume  
11 since there are CSOs present that discharge  
12 into the waterway during the wet water  
13 events, yeah.  
14 MR. ANDES: Are there other sources as

15 well?

16 DR. GERBA: There could be other  
17 sources, too. Animals could contribute,  
18 birds can contribute, large numbers of  
19 pathogens, for example, like kafla bacter  
20 (ph.).

21 HEARING OFFICER TIPSORD: Mr. Harley,  
22 follow-up?

23 MR. HARLEY: Keith Harley. I  
24 apologize I had to be in and out today, and I

0076

1 know that Mr. Andes will interrupt me if  
2 you've already answered this question. I was  
3 trying to understand some differences in  
4 testimony between General Superintendent  
5 Lanyon and what we heard yesterday on this  
6 very point. General Superintendent Lanyon  
7 indicated that he believed that there were  
8 pathogen levels 10 to 200,000 colony forming  
9 units at the point of discharge. Yesterday  
10 you testified that that did not correspond  
11 with the levels that you saw and you used, as  
12 an example, the North Side plant. Am I  
13 correct so far?

14 MS. PETROPOULOU: I think he was  
15 referring to fecal coliform concentrations.

16 MR. HARLEY: My point is still this:  
17 You testified that there were 42,000 and  
18 56,000 colony forming units during dry  
19 weather at the North Side plant; is that  
20 correct?

21 MS. PETROPOULOU: I can verify that  
22 for you. I think I was reading from the  
23 report, right?

24 MR. HARLEY: You were reading from the  
0077

1 report.

2 MS. PETROPOULOU: And I think I was  
3 reading fecal coliform concentrations, not  
4 pathogens.

5 MR. HARLEY: Oh, okay. My question is  
6 this: Were your subsequent risk assessments  
7 based on a particular level of pathogens  
8 being in effluent at the point of outflow?

9 MS. PETROPOULOU: Pathogens you said?

10 MR. HARLEY: Yes.

11 DR. TOLSON: I don't -- we discussed  
12 in some -- we discussed quite a bit about how  
13 we developed pathogen concentrations in the  
14 waterway. The concentrations that  
15 Mr. Lanyon -- Dr. Lanyon discussed were not  
16 pathogenic fecal coliform. If you want to  
17 characterize the range that he gave compared  
18 to the range that we found in our study. Is  
19 that the question?

20 MR. HARLEY: It's part of the  
21 question, yes.

22 DR. TOLSON: Well, if I were to look  
23 at people's heights, that would be my thing  
24 that I'm looking at, and if I were to take a

0078

1 sample by looking at this room and developing  
2 a range for U.S. citizen heights, I would get  
3 some numbers that would balance between  
4 something. This is a representation of  
5 potentially the U.S. population. But if I  
6 were to go out and look at everybody in the  
7 Thompson Center here, I'd probably find  
8 people that were on the extreme. So what you  
9 see is you see records from the district that  
10 are 20 years, I don't know how long they've  
11 been measuring there, but probably quite a  
12 long time --

13 MR. ANDES: And I think -- if I can  
14 stop you there. We could read back  
15 Mr. Lanyon's statement, but I think it was a  
16 general statement in terms of what's in  
17 effluent. It wasn't specific to a facility.

18 MR. HARLEY: I guess my question then  
19 is this: In the absence of a numeric permit  
20 limit -- in the absence of a numeric permit  
21 limit on either pathogens or indicators, what  
22 is to prevent any plant from discharging an  
23 amount of pathogens or indicators far in  
24 excess of what's contained as your assumption

0079

1 and your risk assessment?

2 MR. ANDES: That's a legal question.  
3 I'll object. He's asking what's to  
4 prevent -- in the absence of a numeric limit.  
5 They're scientists. They're not lawyers.

6 MR. HARLEY: Would your risk  
7 assessment change if the level of pathogens  
8 from an unregulated search --

9 MR. ANDES: I'll object to the  
10 characterization. They have a permit.  
11 They're not unregulated.

12 HEARING OFFICER TIPSORD: Why don't  
13 you try it this way -- or let me, Mr. Harley,  
14 if I might.

15 MR. HARLEY: I think you know exactly  
16 where I'm going.

17 HEARING OFFICER TIPSORD: Would your  
18 assumptions change if there was a discharge  
19 of pathogens in excess of what you've seen in  
20 the sampling? Is that close enough?

21 MR. HARLEY: That's -- it's a  
22 hypothetical.

23 HEARING OFFICER TIPSORD: What if the  
24 pathogens -- what if somebody discharged

0080

1 double the amount of pathogens you saw in  
2 your sample?

3 DR. TOLSON: Yes. Clearly that's the

4 case. If you change the numbers, you change  
5 the risks. I mean our risks are based on our  
6 measured pathogen concentrations in the  
7 waterway which, as I stated before, is a very  
8 robust sample. It has a number of samples  
9 along the waterway, it includes dry and wet  
10 weather. So, yes, if our representation of  
11 the waterway is different than a different  
12 representation, the outcome risk will change.

13 MR. HARLEY: To your knowledge, in the  
14 absence of a numeric permit limit, could such  
15 an elevated level of pathogens discharge  
16 occur at one of these sewage treatment  
17 plants?

18 MR. ANDES: Objection again. They're  
19 not qualified to opine on what happens in the  
20 absence of numeric permit limit.

21 HEARING OFFICER TIPSORD: I'll sustain  
22 that.

23 MR. HARLEY: Another question I have  
24 is you mentioned disparity between very high

0081

1 levels and low levels. Is it possible that  
2 you could have an extreme event that is  
3 outside the range of what you observed in  
4 your risk assessment in terms of pathogen or  
5 indicator loading from a sewage treatment  
6 plant?

7 DR. TOLSON: We tried to capture that,  
8 to some degree, qualitatively by actually  
9 sampling the outfalls. While it's possible  
10 that we could have a drinking water epidemic  
11 within the city that may cause effluent  
12 levels to change for some of the pathogens,  
13 there are lots of things that are possible.  
14 So yes.

15 MR. HARLEY: Thank you.

16 HEARING OFFICER TIPSORD: Go ahead.

17 MS. WILLIAMS: Well, let me ask, you  
18 have said this a couple times about the  
19 robust sampling, so let me go to Question 22.  
20 On Page 7 you testified that the weather and  
21 waterway sampling relied on a representative  
22 of the entire recreational year. And my  
23 question was how was the representativeness  
24 of the data determined? And I guess what I'm

0082

1 asking at this point, Mr. Tolson, is did you  
2 rely on Miss Petropoulou for the  
3 representedness of data? Did you make your  
4 own conclusion about this data?

5 MR. ANDES: Can you address weather  
6 and then waterway separately?

7 MS. WILLIAMS: That's fine.

8 DR. TOLSON: Tell me which question  
9 you're on.

10 MR. ANDES: Twenty-two.

11 DR. TOLSON: So the weather as we  
12 discussed yesterday is representative because  
13 we actually used meteorological data from  
14 that year. So are we good with that?

15 MS. WILLIAMS: Yes. Let's talk about  
16 the pathogen sampling.

17 DR. TOLSON: The pathogen sampling, we  
18 constructed a sampling program that would  
19 capture both dry and wet weather events.

20 MS. WILLIAMS: And you were involved  
21 in that as well?

22 DR. TOLSON: I was involved in the  
23 discussions leading to that sampling event.

24 HEARING OFFICER TIPSORD: I'm sorry.

0083

1 That was the protocol we discussed with  
2 Dr. --

3 MS. WILLIAMS: So you agree then that  
4 just two years' worth of data is sufficient  
5 to be representative?

6 MR. ANDES: Representative of what?  
7 All recorded time?

8 MS. WILLIAMS: Of all years.

9 DR. TOLSON: I'm going to punt to  
10 Dr. Gerba, because he probably has more  
11 experience in looking at other waterway  
12 sampling data.

13 DR. GERBA: Without the data, I can't  
14 say that. I mean I don't know what the  
15 pathogens were ten years ago or are going to  
16 be ten -- in the future probably.

17 MR. ANDES: Let me follow up on that.  
18 You looked at wet weather events and you  
19 looked at dry weather events. And reasonably  
20 is there anything else you should have looked  
21 at?

22 DR. GERBA: Those would have the --  
23 wet weather events would have the biggest  
24 impact on water quality within the waterway.

0084

1 MS. WILLIAMS: I think the question is  
2 whether the wet weather data and the dry  
3 weather data you looked at were  
4 representative of all wet weather and dry  
5 weather data?

6 DR. TOLSON: From a purely statistical  
7 standpoint, it's a representative sample from  
8 the 2006 waterway concentration. So, yes, it  
9 is representative samples.

10 HEARING OFFICER TIPSORD: If I may, I  
11 think -- So when you state in your testimony,  
12 Dr. Tolson, that it's representative of the  
13 entire recreational year, you mean for the  
14 years of the study?

15 DR. TOLSON: Correct. For the years  
16 in the study and the weather types within the  
17 study; the dry weather days, the wet weather

18 days.  
19 HEARING OFFICER TIPSORD: But not  
20 necessarily for --  
21 DR. TOLSON: I can't for the things  
22 for which we have no data.  
23 HEARING OFFICER TIPSORD: Not for the  
24 entire 2000s. Just for those two years.

0085

1 MS. WILLIAMS: We've -- I think we've  
2 already established 2005 wasn't a typical  
3 year, correct?

4 DR. TOLSON: It was a dry year,  
5 correct.

6 MS. WILLIAMS: Would you say 2006 was  
7 a typical year?

8 DR. TOLSON: I don't have the data to  
9 characterize 2006. However, whether it was  
10 atypical or not, I don't think it would have  
11 made a big difference in our assessment  
12 because we selectively went for wet weather  
13 days whether it was a wet weather day that  
14 happened as a one-time event in a year where  
15 it didn't rain, or whether it had rained the  
16 week before I don't think would make much of  
17 a difference in our assessment.

18 MS. WILLIAMS: Did you, in making this  
19 statement in your testimony that this  
20 sampling is representative, did you consider  
21 the actual methodology that was used to  
22 collect the samples? Or I mean did you --  
23 are you --

24 MR. ANDES: You mean the sampling

0086

1 methodology?

2 MS. WILLIAMS: Yes. Are you speaking  
3 to the sampling methodology as well?

4 DR. TOLSON: I'm not speaking to that.  
5 The data is what the data is.

6 MR. ANDES: I may be able to clarify  
7 it with a follow-up. To the extent that your  
8 waterway sampling was focussed near the  
9 sewage treatment plant, it would actually be  
10 conservative in terms of the levels that you  
11 would have seen; is that right?

12 DR. TOLSON: That is correct.

13 MS. WILLIAMS: But if it was closer,  
14 it would have been higher, right? I mean I  
15 don't understand why that --

16 MR. ANDES: They were -- As I  
17 understand it, you focussed particularly on  
18 areas close to the plants?

19 DR. TOLSON: Under dry water  
20 conditions they were within 10 to 15 waterway  
21 widths from the outfalls the Stickney, North  
22 Side, and Calumet.

23 MS. WILLIAMS: And when you stick the  
24 dry weather samples you sampled in three

0087

1 locations in the stream and put them together  
2 as a composite, correct?

3 MS. PETROPOULOU: No. We sampled  
4 actually at one upstream location at two  
5 depths, one meter and the surface. And then  
6 one downstream location.

7 MS. WILLIAMS: So at your upstream and  
8 downstream locations, you did not take  
9 samples both at the each bank and in the  
10 center?

11 MS. PETROPOULOU: What we did, we  
12 actually composed it across the width of the  
13 channel. With one on the left side, we  
14 collected one-third of the volume, then both  
15 moved to the center of the channel, they  
16 collected a third of the volume there, and  
17 then on the right side of the channel.

18 MS. WILLIAMS: Did you do the same  
19 thing with the wet weather samples?

20 MS. PETROPOULOU: No. We didn't do  
21 that during the wet weather sampling because  
22 Dr. Gerba surveyed the waterway. And based  
23 on his experience with sampling, he didn't  
24 think that the channels were wide enough to

0088

1 provide information.

2 MR. ANDES: You can have him  
3 perhaps --

4 MS. WILLIAMS: Can you explain,  
5 Dr. Gerba, why you recommended they sample  
6 differently during wet weather than they did  
7 during dry weather?

8 DR. GERBA: You mean the number of  
9 samples? I'm not sure differently, what --

10 MS. WILLIAMS: The methodology --

11 MS. PETROPOULOU: The sampling that we  
12 did during the dry weather that included the  
13 sides of the channel. And then the center,  
14 during wet weather, we did it in the center  
15 of the channel.

16 DR. GERBA: Because there wasn't  
17 really -- I think maybe you should answer  
18 that. There wasn't any difference in data  
19 statistically.

20 MS. PETROPOULOU: Well, we looked at  
21 the difference -- yeah. We looked at the  
22 difference at one meter and the surface.  
23 During wet weather we went to the center of  
24 the channel.

0089

1 MS. WILLIAMS: Because?

2 MS. PETROPOULOU: Because the width of  
3 the channel, it wasn't a very wide -- the  
4 width of the channel, based on the  
5 discussions with Dr. Gerba, was not wide  
6 enough to -- worth the extra effort to

7 composite from the sides and the center. So  
8 what we captured during wet weather, it was  
9 what we measured in the center of the  
10 channel.

11 MR. ANDES: Would that logically be  
12 the maximum for a higher --

13 DR. GERBA: We have a high flow in  
14 there, yeah. It's going to be flowing in  
15 there rapidly.

16 MR. ANDES: In the middle in  
17 particular?

18 DR. GERBA: That's right.

19 MS. WILLIAMS: Isn't it possible you'd  
20 have more input of pathogens at the sides?

21 DR. GERBA: That's a small channel. I  
22 mean relative mixing and flow rates and boat  
23 traffic, the large barge traffic, that water  
24 gets stirred up a lot. So --

0090

1 MS. WILLIAMS: So you concluded it  
2 was --

3 HEARING OFFICER TIPSORD: Let him  
4 finish.

5 DR. GERBA: In the large inflow of  
6 water in there. I have based also on the  
7 data sampling, you know, at different depths  
8 in the channel it seems to be fairly well  
9 mixed of what we can see, at least relative  
10 to pathogen levels.

11 MS. WILLIAMS: So you extrapolated the  
12 degree of mixing from dry weather to conclude  
13 that in wet weather it would be well mixed as  
14 well?

15 DR. GERBA: It would probably be more  
16 mixed because there is so much flow of water  
17 in there. Water is flowing in there, there's  
18 mixing taking place all the time.

19 MS. WILLIAMS: Does that conclusion  
20 reflect temperature differences when you have  
21 an influx of wet weather flow?

22 DR. GERBA: I don't believe this  
23 channel is stratified, to my knowledge.

24 MS. WILLIAMS: In wet weather do we

0091

1 know? I mean we don't know, do we? How do  
2 we know?

3 MR. ANDES: Do you have any basis for  
4 believing that?

5 MS. WILLIAMS: I'm trying to  
6 understand his basis for believing it's not.  
7 And it sounds like it's -- there isn't one.

8 DR. GERBA: I don't believe, based on  
9 my experience in the last 30 years of doing  
10 field work on sampling, it should be any  
11 different. And the data in the dry weather  
12 events seemed to certainly confirm that, and  
13 previous studies I've done on different

14 locations and depths of small channels  
15 doesn't seem to be a big difference.

16 CHAIRMAN GIRARD: Could I ask just a  
17 clarifying question or summarizing it then?

18 So do you believe that in the wet  
19 weather, based on measurements and other  
20 information the District might have, there's  
21 a higher flow rate in those streams?

22 DR. GERBA: Well, if there's more  
23 water input, I would expect that during the  
24 wet weather event I would think that would

0092

1 increase the flow rate in those channels.

2 CHAIRMAN GIRARD: How does the flow  
3 rate then impact mixing?

4 DR. GERBA: There might be more  
5 mixing. There's probably being sediment  
6 material thrown in there, water is being  
7 dumped on the top of the -- or on the bottom,  
8 and so there's going to be a lot of mixing.  
9 And also the boat traffic that goes there  
10 creates mixing events, too.

11 CHAIRMAN GIRARD: So basically you  
12 assumed faster flow rate, more mixing, so you  
13 only needed one sample point. Is that --

14 DR. GERBA: Well, based on the  
15 previous data and my experience, too. I  
16 didn't necessarily say that you might have  
17 different levels of pathogens and different  
18 levels -- but I thought that was  
19 representative of the risk, let me put it  
20 that way. I don't think you can have 1,000  
21 times difference in pathogen loading at one  
22 location versus another. Certainly in the  
23 dry weather event there wasn't much  
24 difference between the top water and one

0093

1 meter depth. You would expect less mixing in  
2 those dry weather conditions. We didn't  
3 really see a difference on that. So I didn't  
4 really actually expect there to be a  
5 difference. I was one of the people who  
6 questioned whether we should be sampling at  
7 one meter depths, because I didn't think  
8 there would be as much difference. And it  
9 turned out there wasn't.

10 MR. ANDES: There was not?

11 DR. GERBA: Was not, no.

12 MS. WILLIAMS: I think you've  
13 answered -- Do you have anything else?

14 CHAIRMAN GIRARD: That's it. Thank  
15 you.

16 MS. WILLIAMS: I think you've answered  
17 it pretty well. There's just one piece that  
18 I'd like to make sure I understand. By  
19 choosing to sample only in the center and  
20 also sampling quite a bit downstream from the

21 actual com stations themselves -- I mean I  
22 understand you sampled as close as you  
23 thought you could, but they were certainly  
24 not right there. There was a distance.

0094

1 MS. PETROPOULOU: It wasn't where I  
2 thought we could. It's, as mentioned, it was  
3 the captain of the boat that decided that --

4 MS. WILLIAMS: Okay. What I guess I'm  
5 getting at is are you -- Were you concerned  
6 at all that by not also taking some volume  
7 from the banks that there was input from  
8 gravity CSOs that we missed by going just  
9 into the center that would have been captured  
10 by taking a composite sample from the banks  
11 and the center? Do you understand?

12 MS. PETROPOULOU: Yes. I don't have  
13 any reason to believe that we overestimated  
14 or underestimated the concentrations of  
15 pathogens. What you are implying is that  
16 during wet weather the concentrations at the  
17 sides could be even higher than what we  
18 measured in the center of the channel. I  
19 mean --

20 MS. WILLIAMS: It's possible, right?

21 MS. PETROPOULOU: I have no reason to  
22 believe one way or the other.

23 MS. WILLIAMS: Thank you. I think  
24 that's --

0095

1 DR. TOLSON: Let me add one thing to  
2 that. If that were the case, then our risk  
3 estimates would be biased high. So if we  
4 find a -- I'm sorry -- risk estimates in  
5 terms of the effect of disinfection on  
6 decreasing risk to recreators would be biased  
7 high.

8 MS. WILLIAMS: But the actual risk to  
9 recreators in wet weather would be low,  
10 correct?

11 MR. ANDES: I think what he's trying  
12 to say is if he didn't capture enough of the  
13 wet weather --

14 MS. WILLIAM: I understand what he's  
15 trying to say. So I'm asking the risk to wet  
16 weather recreators, though, would be higher  
17 if that were the case, right?

18 DR. TOLSON: That would be correct.

19 MS. WILLIAMS: I'm almost done, I  
20 think.

21 MR. ANDES: I have a follow-up. And  
22 the risk to dry water recreators would be  
23 lower?

24 DR. TOLSON: It would be unchanged,

0096

1 but relatively it would be lower, yeah.

2 MS. WILLIAMS: I'm going to ask

3 Question 11. I know we sort of touched on  
4 this yesterday, but I'd like to try again.

5 On Page 6, Paragraph 4 of your  
6 testimony it states, quote, "Disinfection  
7 results in effluent pathogen risk decreasing  
8 from a low level to essentially zero from the  
9 water reclamation plants but has little  
10 impact in waterway pathogen concentrations  
11 affected by current or past wet weather  
12 conditions."

13 And my question is as TARP is  
14 contemplated and CSO events happen  
15 infrequently, will disinfection have more of  
16 an impact on the waterway pathogen  
17 concentration?

18 MR. ANDES: I think we've already  
19 objected to other questions about TARP.

20 HEARING OFFICER TIPSORD: Actually,  
21 they asked and answered this yesterday.  
22 They're not familiar with TARP, so they  
23 couldn't answer the questions.

24 MS. WILLIAMS: Okay. Can I try to

0097

1 rephrase it?

2 HEARING OFFICER TIPSORD: Sure.

3 MS. WILLIAMS: I believe Mr. Lanyon  
4 testified that TARP was expected or hoped to  
5 reduce CSO events to one to two per year.

6 MR. ANDES: I don't think that's -- he  
7 mentioned one to two, but I don't think your  
8 characterization is complete.

9 MS. WILLIAMS: Can you correct it for  
10 me? That would be fine. Would you like to  
11 characterize --

12 HEARING OFFICER TIPSORD: I think his  
13 comment was in his highest hopes it would be  
14 one to two.

15 MS. WILLIAMS: No. Highest hope was  
16 relation to my once in every five years. I  
17 thought he expected --

18 HEARING OFFICER TIPSORD: Let's  
19 just -- How about we do it this way. Why  
20 don't you say what if they were reduced to  
21 four years.

22 MS. WILLIAMS: Four? That sounds  
23 good. What if the CSO events are reduced  
24 from, I think 43 is what we have now, to

0098

1 four. How would that --

2 MR. ANDES: How would that do what?

3 MS. WILLIAMS: Will disinfection have  
4 more of an impact on the waterway pathogen  
5 concentrations?

6 DR. TOLSON: The effect of dry weather  
7 in disinfection and overall risk of the  
8 waterway are low under dry weather  
9 conditions. It's below the 8 per 1,000, and

10 it would stay there. It's very difficult to  
11 try to interpret what the overall effects of  
12 CSOs and of other potential inputs that might  
13 be affected by the completion of the TARP  
14 would be. So I really can't speculate on  
15 that.

16 MS. WILLIAMS: Let's move on to  
17 No. 18. You state on Page 5 of your  
18 testimony, quote, "It is important to note  
19 that the U.S. EPA has not developed any  
20 secondary contact water quality criteria.  
21 However, the U.S. EPA has proposed a range of  
22 primary contact acceptable risk thresholds,  
23 and currently has primary contact water  
24 quality criteria protective of emersion

0099

1 activities, that is based on an acceptable  
2 risk threshold of 8 illnesses per 1,000  
3 swimmers."

4 Do you agree that this 8 in 1,000  
5 risk levels expressed is a water quality  
6 criteria E. Coli value of 126 CFU per 100  
7 milliliters?

8 MR. ANDES: I'm sorry. Does he agree  
9 with what?

10 MS. WILLIAMS: Does he agree that that  
11 8 in 1,000 risk level is expressed as a water  
12 quality criteria E. Coli value of 126 CFU per  
13 100 milliliters in the criteria document?

14 DR. TOLSON: I didn't participate in  
15 that formulation of that, so I'm --

16 MS. WILLIAMS: So you don't know? Why  
17 don't you take a look at --

18 MR. ANDES: That's, in part, a legal  
19 question in terms of whether it's a water  
20 quality criterion.

21 MS. WILLIAMS: It's a legal question  
22 to ask a technical expert what the number is  
23 in a U.S. EPA criteria document? Is that  
24 what you're saying?

0100

1 MR. ANDES: You didn't refer  
2 specifically to the EPA document. You're  
3 asking about whether it's a water quality  
4 criteria, which is a legal term.

5 MS. WILLIAMS: Let's just take a look  
6 at Table 5-10. Maybe this will -- from  
7 Exhibit 71. I'm sorry. This is what I'm  
8 referring to when I'm asking. So I'm just  
9 asking if this number here where your table  
10 says 8, and then next to it under E. Coli, 8,  
11 and then 126.

12 DR. TOLSON: We pulled this out of the  
13 EPA guidance. And I believe it is what it --  
14 it is represented correctly from there, I  
15 believe.

16 MS. WILLIAMS: Can you tell us what

17 would be a corresponding ambient standard  
18 that would be protective of incidental  
19 recreational uses that occur in the CAWS as  
20 to 8 illnesses per 1,000 swimmers risk level?  
21 MR. ANDES: Let me first clarify  
22 something, because it's very clear in the  
23 testimony, that the EPA 8 illnesses per 1,000  
24 is not for incidental or noncontact

0101

1 recreational uses; it's rather a primary  
2 contact number. EPA hasn't developed a  
3 secondary contact number. And you're talking  
4 about swimmers in that statement. So I think  
5 you're mixing apples and oranges. And you're  
6 asking him about, again, an ambient standard.

7 MS. WILLIAMS: Is that an objection or  
8 a clarification?

9 HEARING OFFICER TIPSORD: Let him  
10 finish, please, Miss Williams. Go ahead,  
11 Mr. Andes.

12 MR. ANDES: I think you're also asking  
13 him something that's a legal issue and is  
14 well beyond the scope of their testimony.

15 MS. WILLIAMS: I don't think it's  
16 legal. That's for sure. If he doesn't know  
17 the answer, that's a different question.

18 HEARING OFFICER TIPSORD: I was going  
19 to say if -- Since he's already stated he's  
20 not familiar with 126 CFU per 100 milliliter,  
21 if he's unable to answer the next question, I  
22 disagree that it's a legal question also.

23 MS. WILLIAMS: What I would like to  
24 know, Dr. Tolson, is this: You are telling

0102

1 us that the risk of recreating this these  
2 waters is well below the risk level that U.S.  
3 EPA utilizes to develop criteria. I would  
4 like to know if we were going to protect  
5 recreators in these waters at that risk  
6 level, what ambient criteria would we have to  
7 establish?

8 DR. TOLSON: Using an indicator  
9 organism, I don't think we have any data here  
10 to support an indicator organism as being  
11 very related to pathogen and risk. I mean  
12 that's the whole --

13 MS. WILLIAMS: Okay. So is it the  
14 testimony in this panel that at this current  
15 time there's no good science to use to  
16 establish an ambient standard for protection  
17 of the recreation that's occurring in the  
18 CAWS?

19 DR. GERBA: Well, it was based on  
20 epidemiological studies that were done by the  
21 U.S. Environmental Protection Agency to come  
22 up with those levels. And they had -- and  
23 that's the basis of -- the scientific basis

24 for those primary contact recreational water

0103

1 standards.

2 DR. TOLSON: So in that respect it  
3 doesn't -- it wasn't produced in quantitative  
4 microbial risk assessment.

5 MS. WILLIAMS: What wasn't? You mean  
6 U.S. EPA criteria was not?

7 DR. GERBA: None of those studies, to  
8 my knowledge, or most of them did they look  
9 at pathogens. They only looked at  
10 gastroenteritis illness related to full body  
11 contact swimming.

12 MS. WILLIAMS: You understand, I'm not  
13 trying to be combative. I really wanted to  
14 know. I mean we are -- this is a state  
15 regulator. We're here to try to figure  
16 out --

17 MR. ANDES: And I guess to be helpful,  
18 I would say that we definitely have other  
19 witnesses who will help fill in the details  
20 in terms of how we think that such water  
21 quality standard could be developed and will  
22 provide some recommendations in terms of the  
23 path forward that will include Dr. Dorovich,  
24 that will include Dr. Grenado, and others.

0104

1 MS. WILLIAMS: But they're not talking  
2 about the risk levels, or are they?

3 MR. ANDES: They'll be talking  
4 about -- actually, Dr. Dorovich will be  
5 talking about risk levels, and Dr. Grenado  
6 will be talking about relations as to what  
7 the regulations should be.

8 MR. ETTINGER: Just to be clear,  
9 though, looking at 5-10, you've already said  
10 you don't like any of these indicators. So  
11 you don't really agree with the EPA E. Coli  
12 and enterococci numbers anyway?

13 DR. GERBA: I didn't say I didn't like  
14 them. I said that's what's used right now.  
15 I said in the future, I think, my  
16 professional opinion is that some pathogen  
17 like adenoviruses might be included in there,  
18 but the standards are what they are.

19 MR. ETTINGER: Well, I'm not asking  
20 you a legal question. I'm just saying as a  
21 scientist, you don't think these numbers are  
22 correct. You think EPA's numbers here are --  
23 that their correlators are not useful?

24 DR. GERBA: I think their data is

0105

1 correct. I think they did epidemiological  
2 studies on it. I'm not questioning their  
3 data or their -- I'm just saying in the  
4 future, additional parameters may be added,  
5 though, to assess the water quality in the

6 future. That's all I'm saying.  
7 MR. ANDES: If I can clarify.  
8 DR. GERBA: That's my opinion.  
9 MR. ETTINGER: If you want to clarify  
10 it, please do. Because I thought we went  
11 over this somewhat. And I took away from  
12 that that you didn't think that there was any  
13 particular relation between pathogens and  
14 E. Coli or pathogens and enterococci, and now  
15 I'm hearing something else.  
16 MR. ANDES: I think the first issue is  
17 is that the EPA numbers that have been  
18 discussed are with reference to primary  
19 contact.  
20 DR. GERBA: Right. That's correct.  
21 MR. ANDES: Okay. In terms of the  
22 questions that have been asked of you  
23 regarding secondary contact regarding the  
24 types of recreation that are being proposed  
0106  
1 here, the first question is do you see a  
2 clear link between any of these indicators  
3 and actual pathogen levels that would cause  
4 illness?  
5 DR. GERBA: No. Because there's --  
6 can't find a relationship between the  
7 indicators and the pathogen levels in the  
8 water.  
9 MR. ETTINGER: That was my point. As  
10 far as you're concerned, these numbers aren't  
11 even good for swimming.  
12 DR. GERBA: I didn't say that.  
13 MR. ANDES: He's speaking particularly  
14 about secondary contact uses with regard to  
15 the study at issue here.  
16 MR. ETTINGER: Why would the  
17 correlation or lack of correlation between  
18 enterococci and pathogens differ whether you  
19 were considering it for secondary use or  
20 primary use? I mean the bugs are there or  
21 they aren't. So I guess I'm just not  
22 following.  
23 DR. GERBA: It's related to the degree  
24 of exposure. Exposure is a lot less than a  
0107  
1 secondary contact.  
2 MR. ANDES: I don't think, Albert, I  
3 don't think that this group is here to defend  
4 EPA science behind their criteria.  
5 MR. ETTINGER: I'm not asking them to  
6 defend it. I'm asking them to say whether  
7 they agree with it or not as scientists.  
8 MR. ANDES: But are you talking about  
9 the levels or are you talking about the  
10 specific parameters? I think there are two  
11 different issues.  
12 MR. ETTINGER: If I had a higher

13 number of E. coli, would you say that I have  
14 a higher level of pathogens or not?

15 DR. GERBA: No, not necessarily.

16 MR. ETTINGER: And if I have a higher  
17 level of enterococci, do I have a higher  
18 level of pathogens or not?

19 DR. GERBA: No, not necessarily.

20 MR. ETTINGER: So you would conclude,  
21 I would think, that this chart, which assumes  
22 there is some relationship between these  
23 indicators and pathogens in the water, is  
24 misguided.

0108

1 DR. GERBA: That does not assume that.  
2 What that -- that standard is based on  
3 epidemiological data related to  
4 gastroenteritis among the swimmers, not the  
5 pathogen levels.

6 MS. WILLIAMS: Can I ask -- I don't  
7 want to interrupt, but I just -- you left out  
8 fecal. Can I just ask the same -- if you  
9 have a higher level of fecal coliform in the  
10 water, do you have a higher level of  
11 pathogens, just to complete the --

12 DR. GERBA: Not necessarily.

13 MS. WILLIAMS: Sorry, Albert.

14 MR. ETTINGER: Let's go back, just  
15 talk about swimmers here. Pathogens are  
16 making the swimmers sick, right?

17 DR. GERBA: We don't know that for a  
18 fact. It could be nonpathogens that make the  
19 swimmers sick because they didn't do any  
20 follow-up on whether it was illness. It  
21 could be they ate too many hot dogs on the  
22 beaches, it could be on some of the beaches  
23 and that; or it could be the air was  
24 different. Perhaps there are allergens or

0109

1 other substances people might inhale and  
2 react to on the beach. It's been brought up  
3 before that it could be made toxins from blue  
4 green algae aerosolized and inhaled. Because  
5 in this type of research they did not  
6 actually identify the agents causing  
7 gastrointestinal illness. So all of it may  
8 not be due to pathogens. The assumption here  
9 is that it is due to pathogens. What's  
10 regulated here is the probability -- the  
11 probability based on that 126. If you get  
12 gastroenteritis, it's not necessarily by  
13 swimming in these waters, not necessarily  
14 related to a pathogen; regulating swimming  
15 and diarrhea.

16 MR. ANDES: Let me take another shot.

17 MR. ETTINGER: Let me just -- It's my  
18 turn. There is some sort of statistically  
19 significant relationship between enterococci

20 and how many swimmers get sick. Is that true  
21 or false?

22 DR. GERBA: In terms of  
23 gastroenteritis, yes.

24 MR. ETTINGER: There is, okay. Unless  
0110

1 the -- maybe I'm confused. But unless there  
2 is some relationship between enterococci and  
3 the number -- in the water and the number of  
4 hot dogs they ate on the beach, that's  
5 probably not a factor that's driving that.

6 DR. GERBA: I wouldn't presume so.  
7 But, again, they did not identify that a  
8 pathogen actually caused that illness or  
9 which pathogen did, so that's still an  
10 unknown.

11 MR. ETTINGER: So your objection is  
12 really that this is a black box model. You  
13 go from enterococci to illnesses and you're  
14 not tracing the causation.

15 DR. GERBA: Right. At least in my  
16 professional opinion in the future people  
17 need to do studies on characterizing what  
18 caused the illness and what pathogens were in  
19 the water that bathers were exposed to.

20 MR. ANDES: I believe, correct me if  
21 I'm wrong, but I believe the reasons these  
22 numbers were used in this study simply as a  
23 point of reference that was available, a  
24 conservative point of reference, the lowest

0111  
1 risk threshold identified by the EPA to be  
2 used as sort of a screening level to identify  
3 where risks were low. Am I correct?

4 DR. GERBA: That's right.

5 DR. TOLSON: That's correct.

6 MR. ANDES: So there was nothing  
7 intended in terms of the report indicating  
8 the technical validity of those numbers,  
9 particularly with reference to secondary  
10 contact.

11 DR. GERBA: That's correct.

12 MR. ANDES: Thank you.

13 HEARING OFFICER TIPSORD: All right.  
14 This is probably a good point to take a  
15 break. It is my intention to stay this  
16 evening until we finish with this panel so  
17 that they don't have to come back in  
18 September. So you may want to get a snack  
19 depending upon how many questions we have.

20 (Short break taken.)

21 HEARING OFFICER TIPSORD: We can go  
22 ahead. And, Miss Williams, you wanted to  
23 make a motion on the record?

24 MS. WILLIAMS: I wanted to briefly

0112  
1 make a motion on the record to request an

2 additional two-week extension to submit  
3 prefiled questions for the Midwest Generation  
4 witnesses, and I have spoken to Midwest  
5 Generation. They're agreeable to that.

6 HEARING OFFICER TIPSORD:

7 Mr. Ettinger, you wanted to join in that? I  
8 would be inclined to grant that and give that  
9 to everyone. So just so you all know, I will  
10 do that in a hearing officer order. When I  
11 do the separate hearing order for the  
12 remaining five hearings we have scheduled;  
13 for now, the five hearings.

14 And with that, Miss Williams,  
15 you had one more question, I think you said,  
16 one or two?

17 MS. WILLIAMS: So when we left off we  
18 were talking about the different indicators  
19 and whether they are correlated to pathogens.  
20 So, Mr. Gerba, can you tell us whether  
21 pathogen concentrations are correlated to  
22 risk of illness?

23 DR. GERBA: That's what the dose  
24 response curve say that they generated in

0113  
1 human beings.

2 MS. WILLIAMS: Is that what you used  
3 to develop your risk assessment?

4 DR. GERBA: That's part of the  
5 process, but I didn't do the risk assessment.

6 MS. WILLIAMS: Okay. Is that what you  
7 used, Mr. Tolson, to develop the risk  
8 assessment?

9 DR. TOLSON: That is correct. We  
10 used established dose response curves for  
11 pathogens under this study.

12 MS. WILLIAMS: You were --

13 DR. TOLSON: Want me to repeat that?

14 MS. WILLIAMS: It was kind of hard to  
15 hear.

16 DR. TOLSON: We used established dose  
17 response parameters for the pathogens under  
18 investigation in the study. Mostly people  
19 tell me not to talk so loud.

20 MS. WILLIAMS: And you, in your  
21 testimony, say that you're a risk assessment  
22 specialist. Does that sound right?

23 DR. TOLSON: That is correct. That's  
24 one of the major components of my practice.

0114  
1 MS. WILLIAMS: Do you agree that an 8  
2 in 1,000 risk of illness is a good target for  
3 recreational activity?

4 DR. TOLSON: I really can't evaluate  
5 how or why EPA selected that. I just took  
6 the EPA promulgated established number of  
7 eight and used that to sort of characterize  
8 our risk within our report.

9 MS. WILLIAMS: If they change the risk  
10 assessment level they relied on, would you  
11 have an opinion on that?

12 MR. ANDES: Up or down?

13 MS. WILLIAMS: Either.

14 DR. TOLSON: We could characterize it  
15 compared to that new number.

16 MS. WILLIAMS: If they changed it to  
17 one illness per 1,000 recreators, would you  
18 have an opinion on that?

19 DR. TOLSON: If we use that as our  
20 benchmark, then we would compare our numbers  
21 to that number. Yeah, sure. It's just a  
22 benchmark number out there.

23 MS. WILLIAMS: I think that's all I  
24 have.

0115

1 HEARING OFFICER TIPSORD: Thank you,  
2 Miss Williams. Before we continue, I would  
3 note that these are prefiled questions that  
4 are mainly for Dr. Tolson.

5 MS. MEYERS-GLEN: That is correct.

6 HEARING OFFICER TIPSORD: As we  
7 discussed off the record, Dr. Gerba has a  
8 flight and must leave no later than 5:30. So  
9 basically what I'm trying to get at is there  
10 shouldn't be a problem with him going ahead  
11 if we're not through, do you think?

12 MR. ANDES: Depends on, I guess, some  
13 of those questions are being answered by the  
14 panel.

15 HEARING OFFICER TIPSORD: Let's start  
16 and we'll see where we're at.

17 MS. MEYERS-GLEN: I have no problem  
18 with that. Because my questions are  
19 predominantly --

20 HEARING OFFICER TIPSORD: Okay.

21 MS. MEYERS-GLEN: My name is Stacy  
22 Meyers, and I'm with Openlands.

23 HEARING OFFICER TIPSORD: Keep your  
24 voice up, please.

0116

1 MS. MEYERS-GLEN: Dr. Tolson, we were  
2 discussing different literature that you  
3 combined with UAA survey data on existing  
4 recreational uses. You named two of them,  
5 one being Flat Water Classic and then the  
6 other reference to some rental facility. And  
7 in Question No. 1, I was wondering if you  
8 could please cite to the literature that you  
9 combined with the UAA survey including those  
10 and in addition to those in formulating your  
11 parameters for recreational uses.

12 DR. TOLSON: The UAA was the principal  
13 study for which all the analytical or  
14 quantitative evaluation was performed. It  
15 was ground truthed with some other data that

16 we pulled in including the data that you  
17 cited there.

18 MS. MEYERS-GLEN: What is that other  
19 data?

20 DR. TOLSON: That would be Flat Water  
21 Classic, boat rental receipts that IEPA were  
22 able to provide us to show that, you know,  
23 these are all the activities that were  
24 ongoing within the waterway.

0117  
1 MS. WILLIAMS: Did that UAA data hold  
2 up to this ground truthing?

3 DR. TOLSON: Yes, it did. We had  
4 information that said that there was  
5 additional canoeists, and we've had data that  
6 said there were additional boating. And the  
7 UAA data said that there was canoeing and  
8 boating going on. It seemed consistent with  
9 that.

10 MS. MEYERS-GLEN: What boat rental  
11 facility was that?

12 DR. TOLSON: I do not recall the boat  
13 rental facility, but we actually received  
14 that information from someone at IEPA, and I  
15 believe we cited that as a communication or  
16 something to that sent in the report.

17 MS. MEYERS-GLEN: Is there any way I  
18 can find that out, the name?

19 DR. TOLSON: I'll find it out in a  
20 second.

21 HEARING OFFICER TIPSORD: Excuse me.  
22 Off the record for just a second.

23 (Off the record.)

24 HEARING OFFICER TIPSORD: Back on the

0118  
1 record.

2 MS. MEYERS-GLEN: I don't need it now.  
3 If you could just provide us with the name,  
4 that would be great, just to for expediency  
5 just to keep going.

6 MS. WILLIAMS: I think -- I mean do we  
7 think it was Rob Sulski? Is that it?

8 DR. TOLSON: I believe.

9 MS. MEYERS-GLEN: Can you just -- as  
10 long as I get the information that --

11 MR. SULSKI: It's one of the exhibits.  
12 It's the additional data beyond the UAA,  
13 Additional and Extra Recreational Data,  
14 Sulski IEPA, something like that.

15 HEARING OFFICER TIPSORD: And it's  
16 attached to the?

17 MR. SULSKI: It's attached to --

18 HEARING OFFICER TIPSORD: To Exhibit  
19 71?

20 MR. SULSKI: No. It's an earlier  
21 exhibit that is besides the UAA report. And  
22 it was a compilation of e-mails and

23 correspondence between various users, and it  
24 was a compilation of additional data.

0119

1 MS. MEYERS-GLEN: Is that the IEPA  
2 Attachment No. K, Recreational Data --  
3 MR. SULSKI: That is it.  
4 HEARING OFFICER TIPSORD: Attachment K  
5 to the proposal.

6 DR. TOLSON: I don't know if that's  
7 exactly the one or not, but I'll get the  
8 information on the data that I was referring  
9 to. I suspect that we're talking about the  
10 same thing, but you may have a larger data  
11 set than that was supplied to me. So I just  
12 want to make that clear that I don't know  
13 exactly that that's the right one, but I  
14 think is.

15 MS. MEYERS-GLEN: Thank you. Question  
16 No. 2, on Pages 2 and 3 of your testimony you  
17 state that, quote, "We assume that incidental  
18 ingestion by an individualist canoeing on the  
19 waterway will vary over a range and  
20 calculations that are performed account for  
21 all users even those that might capsize."  
22 Did you determine what risks were  
23 specifically attributable to the percentage  
24 of the people who capsized when canoeing or

0120

1 kayaking on the CAWS?

2 DR. TOLSON: I believe we covered  
3 this, but we developed an ingestion range  
4 that included the potential for high exposure  
5 and low exposure. But we did not develop  
6 specific risk estimates for a capsizing  
7 canoeist within the waterway.

8 MS. MEYERS-GLEN: Thank you. No. 3  
9 was partially answered. I know that you gave  
10 a breakdown yesterday of what stretches of  
11 the CAWS were included in each of the three  
12 segments in your study. Do all the waterways  
13 in each segment have identical  
14 characteristics?

15 DR. TOLSON: I would say that there's  
16 differences that are either continuous  
17 difference along every foot of the CAWS way,  
18 yeah. There are some differences, physical  
19 or otherwise.

20 MS. MEYERS-GLEN: And I believe it was  
21 your testimony as well that there were  
22 certain waterways that were combined into  
23 segments closer to outfalls?

24 DR. TOLSON: There are some areas that

0121

1 are closer than others, sure.

2 MS. MEYERS-GLEN: Did you average in  
3 waterways that are not proposed for  
4 incidental contact recreational use when

5 calculating risk for canoeing?  
6 DR. TOLSON: No. To my knowledge all  
7 of the data that was collected as far as  
8 analytical data of pathogens within the  
9 waterway and all the exposure data that we  
10 developed from the UAA was all within the  
11 waterway segments that we identified  
12 yesterday.

13 MS. MEYERS-GLEN: So you only assessed  
14 incidental contact waterways?

15 MR. ANDES: Want to specify which  
16 waterways you're talking about?

17 MS. MEYERS-GLEN: Well, what I'm  
18 asking is that did you break down all of the  
19 CAWS into three segments in the study, all  
20 the CAWS being all of the stretches of the  
21 Chicago area waterways at issue in this  
22 study?

23 MR. ANDES: Specifically you're asking  
24 whether he would include the few areas that

0122

1 were not proposed for incidental contact  
2 recreational use?

3 MS. MEYERS-GLEN: I'm saying did you  
4 include everything from the Wilmette pumping  
5 station on the North Shore Channel all the  
6 way down the Chicago Sanitary Ship Canal down  
7 to the Brandon Street Lock and Dam as well as  
8 the Cal-Sag Channel all the way out to the  
9 Calumet River extending out to the Lake  
10 Michigan? Did you include all of those  
11 waterways that are considered to be the CAWS  
12 total in the UAA?

13 DR. TOLSON: I don't think so. So we  
14 did not include the Grand Calumet, which I  
15 think would be included within what you're  
16 looking at there. We just included the  
17 little Calumet. There may have been some  
18 other branches in there that we did not  
19 include, but we based our use information and  
20 our sampling points, as we've shown, within  
21 the waterways that we're representing the  
22 risks that are presented in Exhibit 71. If  
23 there's a specific segment that you have  
24 there which is noncontact that you'd like me

0123

1 to address, just say it and I'll let you  
2 know.

3 MS. MEYERS-GLEN: Sorry. I was just  
4 looking at exactly where this starts and  
5 where this ends. Did you include the Chicago  
6 Sanitary and Ship Canal from the confluence  
7 of the Calumet Sag channel down to the  
8 Brandon Street Lock and Dam?

9 DR. TOLSON: We do not have any  
10 analytical data, any microbiological data  
11 from the confluence south. So, no, it does

12 not represent that. My speculation is that  
13 the pathogen loads are actually lower there  
14 than they are in other places just because  
15 they're further away from the city CSO  
16 outfalls, pumping stations, other things.

17 MS. MEYERS-GLEN: So it wasn't  
18 included in your study?

19 DR. TOLSON: No.

20 MS. MEYERS-GLEN: On Page 8 of the  
21 executive summary in the microbial risk  
22 assessment study -- this is Question 4. The  
23 Geosyntec consultants performed for the  
24 district, it states that the Chicago area

0124

1 waterways are used for recreational boating,  
2 canoeing, fishing, and other streamside  
3 activities. Can you tell us what other  
4 streamside recreational activities occur in  
5 the CAWS? What does that mean?

6 DR. TOLSON: Which question are you  
7 reading here?

8 HEARING OFFICER TIPSORD: Question 4  
9 on Page 2.

10 DR. TOLSON: So the other streamside  
11 activities, there were identifications within  
12 the UAA of passive recreation and other  
13 things, I imagine, that those would be other  
14 streamside activities; walking along the  
15 waterway would be one. But these are  
16 activities that one was not associated with  
17 actually contact of the water into the  
18 exposure groups that we identified as the  
19 high exposure characteristic of canoeing, the  
20 medium exposure, characteristic of fishing,  
21 the low exposure, characteristic of boating.

22 MS. MEYERS-GLEN: And you said earlier  
23 that you used the UAA study as the basis for  
24 recreational uses, what recreation uses you

0125

1 chose, correct? That was the foundation?

2 DR. TOLSON: That is correct.

3 MS. MEYERS-GLEN: And so in the UAA  
4 you would agree that would include canoeing,  
5 sculling, hand-powered boating, fishing,  
6 wading, skiing, tubing, swimming, diving, and  
7 jumping, correct?

8 MR. ANDES: Are you saying did they  
9 assess all of those?

10 MS. MEYERS-GLEN: That is what the UAA  
11 study reported as recreational uses along the  
12 CAWS. And since that is the foundation of  
13 the study as far as what recreational uses  
14 they determined were out there, I just wanted  
15 to verify that looking at the universe of the  
16 recreational uses.

17 DR. TOLSON: Right. We identified the  
18 secondary contact recreational -- incidental

19 contact recreational uses that were in the  
20 UAA. So we did not include swimming within  
21 our groupings that we assessed.

22 MS. MEYERS-GLEN: Okay. But it did  
23 include canoeing, sculling, hand-powered  
24 boating, fishing, wading, skiing, and tubing,

0126

1 correct?

2 MR. ANDES: Tubing.

3 DR. TOLSON: Tubing is not included in  
4 there. There is another one, jumping and  
5 something else. Skiing was in there, that  
6 was one that we didn't include within our  
7 grouping. Those are primary contact  
8 activities. We would associate those with  
9 primary contact activities.

10 MS. MEYERS-GLEN: I'm going to come  
11 back to that particular point.

12 So in your opinion, the  
13 activities listed in the UAA study are  
14 occurring on the CAWS then, correct? That's  
15 really not --

16 DR. TOLSON: We're not going to have  
17 any basis for that.

18 MS. MEYERS-GLEN: Now, the Geosyntec  
19 study refers to worse premise and I know that  
20 we covered this in some part, worse premise  
21 that disinfection is warranted in situations  
22 where direct human contact in the immediate  
23 vicinity of an outfall is possible. And I  
24 just wanted to be clear: People can canoe,

0127

1 kayak, jet ski, or tube past these wastewater  
2 treatment plant outfalls to your knowledge,  
3 correct?

4 DR. TOLSON: I think we covered that  
5 quite a bit with Dr. Gerba's explanation of  
6 it.

7 MR. ANDES: I believe this issue of  
8 what the direct contact is has already been  
9 covered by Dr. Gerba.

10 MS. MEYERS-GLEN: I didn't say direct  
11 contact at all. I just wanted to know if  
12 they could kayak, canoe, or jet ski past on  
13 these waterways the wastewater treatment  
14 plant outfalls.

15 DR. TOLSON: There is no physical  
16 limitations to people going down the  
17 waterway, to my knowledge.

18 MS. MEYERS-GLEN: And then on Page 96  
19 of the Geosyntec study it states that it is  
20 unlikely that users engage in nonemersion  
21 activities -- that users engage in  
22 nonemersion activities would be subject to  
23 levels of inhaled mists or sprays that will  
24 lead to a substantial increased ingestive

0128

1 dose. And I know that we covered that with  
2 Ann Alexander as far as how you all assessed  
3 ingestion. I believe your Attachment 3, the  
4 risk study, Page 96, is where that quote  
5 lies. My questions to you are that did you  
6 consider how spray could increase the  
7 ingested dose for jet skiers?

8 DR. TOLSON: We did not attempt to  
9 calculate ingestion for jet skiing and  
10 inhalation and subsequent swallowing of  
11 sprays.

12 MS. MEYERS-GLEN: And you also didn't  
13 consider that for people that tube on the  
14 CAWS, correct?

15 DR. TOLSON: Say that again?

16 MS. MEYERS-GLEN: And you also didn't  
17 consider that for people that are engaged in  
18 tubing on the CAWS either, correct?

19 DR. TOLSON: Tubing was not one of  
20 the --

21 MS. MEYERS-GLEN: Right.

22 MR. ANDES: I'd like to follow-up.

23 MS. MEYERS-GLEN: So, no, that wasn't  
24 considered, correct?

0129

1 DR. TOLSON: Tubing was not considered  
2 as one of the activities that was one of the  
3 exposure groups that we looked at.

4 MS. MEYERS-GLEN: Right. But yet it  
5 was listed in the UAA as one of the  
6 recreational uses out on the CAWS, correct?

7 DR. TOLSON: I believe it was listed  
8 in the UAA. It was not grouped in one of our  
9 exposure groups.

10 MS. MEYERS-GLEN: Right.

11 MR. ANDES: I'd like to follow-up on  
12 those two questions, and this could be either  
13 Dr. Gerba or Dr. Tolson. If you can give us  
14 your judgment as far as you believe that the  
15 dose the jet skiers or tubers spray would be  
16 at all significant?

17 DR. TOLSON: I do not believe so. We  
18 actually tried to estimate what that could  
19 be. And if you look at a cloud, which is a  
20 pretty high mist-containing environment, you  
21 get about a half a mil per cubic meter in the  
22 air. So if someone were to breathe about a  
23 cubic meter per hour, that would give you  
24 about half a mil per hour ingestion rate. So

0130

1 that is not nearly as high as some of the  
2 numbers we have as ingestion rates per hour  
3 for our exposures, and we felt that that was  
4 not really significant. We also don't think  
5 that there's mists out there to the level  
6 that would rise to a cloud.

7 MR. ANDES: Thank you.

8 MS. MEYERS-GLEN: I'm just going to  
9 ask one simple question. Jet skiing, though,  
10 can kick up spray, correct?

11 DR. TOLSON: Yes, it can.

12 MS. MEYERS-GLEN: I'm just going to  
13 introduce what has already been attached as  
14 Openland's attachment number -- may I?

15 HEARING OFFICER TIPSORD: We're going  
16 to mark this as Exhibit 82, if there's no  
17 objection. It's the attachment one to  
18 Openland's questions. Seeing none, it's  
19 Exhibit 82.

20 MS. MEYERS-GLEN: That's the one that  
21 was attached to my prefiled testimony, too.  
22 That's just showing the amount of spray  
23 actually kicked up by a jet ski. And that  
24 wasn't accounted for, correct, in the study?

0131

1 DR. TOLSON: There was -- We did not  
2 estimate dose for jet skiers within our  
3 analysis, nor did we estimate dose from  
4 sprays for any of our exposure scenarios.

5 MS. MEYERS-GLEN: Okay. So then it  
6 wouldn't -- You wouldn't know then the  
7 increased risk -- you didn't study the  
8 increased risk for respiratory infection from  
9 an activity like that?

10 DR. TOLSON: I think we've been over  
11 this. We did not evaluate respiratory  
12 infection within the context of our risk  
13 assessment. That was not one of our stated  
14 objectives here.

15 MS. MEYERS-GLEN: And I'm turning  
16 specifically to your Attachment 3, the risk  
17 study, Page 133 --

18 HEARING OFFICER TIPSORD: For the  
19 record, when you are talking about  
20 Attachment 3, Attachment 3 to Tolson's  
21 testimony?

22 MS. MEYERS-GLEN: That is correct.  
23 Thank you. Why did not did you not account  
24 for intimate exposure of your areas that

0132

1 might produce considerable mist such as  
2 aeration stations? It's Page 133.

3 DR. TOLSON: Okay. This is for  
4 respiratory illness associated with exposure  
5 to aeration stations. Is that what you're  
6 referring to?

7 MS. MEYERS-GLEN: That is correct.

8 DR. TOLSON: The study did not  
9 evaluate respiratory risks. The focus was on  
10 GI illness. In addition, the data on  
11 exposure associated with those aerosols that  
12 might arrive from the aeration stations is  
13 unknown. We do not have a way of quantifying  
14 a dose. So even to do the GI component of

15 that, it proves problematic. We believe  
16 based on our assessment of what you could  
17 potentially contain in a mist that you could  
18 inhale that a dose would be low even if you  
19 were immersed in it.

20 MS. MEYERS-GLEN: I'm going to, just  
21 second part of D, yet there is incidental  
22 contact activity such as jet skiing,  
23 kayaking, canoeing, tubing, and sculling in  
24 the stretches of the CAWS that could occur

0133

1 near the aeration standards, correct -- or  
2 the aeration stations. Sorry. Correct?

3 DR. TOLSON: Yes. I do not know.

4 HEARING OFFICER TIPSORD: For the  
5 record, Attachment 3 is Exhibit 71. It is  
6 the report that we've been discussing, and we  
7 should be clear on that. Because I, frankly,  
8 was a little lost.

9 MS. MEYERS-GLEN: Okay. Going with my  
10 prefiled questions and I --

11 MR. ANDES: To follow-up on the  
12 aeration station issue, and whether these are  
13 within your knowledge. If not, we may ask  
14 this question later of district witnesses.  
15 First, are you aware of safety issues in  
16 terms of use of canoes, kayaks, and other  
17 boats near the aeration stations in terms of  
18 the bubbling water in those areas?

19 DR. TOLSON: Actually, I do not know  
20 that. I've been told that, but I'm not the  
21 best witness for that. Sorry.

22 MR. ANDES: Okay.

23 MS. MEYERS-GLEN: No. 7, the report  
24 also -- the microbial risk assessment

0134

1 Exhibit 71 also states that jet ski use is  
2 typically thought to involve immersion, and,  
3 thereby, would not be allowed under the  
4 conditions of the waterway. However, large  
5 jet ski boats would be allowed, and I believe  
6 that is Exhibit 71 at Page 97. My questions  
7 to you are this: Are you aware that the IEPA  
8 did not list jet skiing in the UAA as a  
9 primary contact activity; and although  
10 borderline distinguished it from water skiing  
11 in its statements of reasons as having a  
12 lower likelihood of ingesting appreciable  
13 amounts of water?

14 MR. ANDES: Are you asking him to  
15 characterize the IEPA document?

16 MS. MEYERS-GLEN: Are you aware of  
17 that? No. That's actually out of the IEPA  
18 statement of reasons. And I was wondering,  
19 since he's stating that in calling jet skiing  
20 primary contact and relied on the UAA,  
21 whether or not he was aware that it lists jet

22 skiing as a primary contact -- it does not  
23 list jet skiing as a primary contact  
24 activity, and although borderline,

0135

1 distinguishes it from water skiing as having  
2 a lower likelihood of ingesting appreciable  
3 amounts of water.

4 MR. ANDES: I can read that, too. But  
5 I would disagree with your characterization  
6 of the statement from the statement of  
7 reasons. If we want to read him the  
8 statement from the statement of reasons  
9 verbatim, that would be fine. I think it  
10 says something very different.

11 MS. MEYERS-GLEN: Sure. Absolutely.  
12 I can read you both segments, if you can hold  
13 on one second.

14 MR. ANDES: While we're waiting, if I  
15 can follow up on one question. Is it your  
16 understanding primary contact activities are  
17 not included in the proposed uses as  
18 designated by Illinois EPA?

19 DR. TOLSON: That is correct.

20 MR. ANDES: Thank you.

21 MS. MEYERS-GLEN: Okay. And to follow  
22 that, if we can actually start on Page 42 of  
23 the statement of reasons. I'm going to read  
24 you the definition of primary contact from

0136

1 this, okay? Primary contact recreation is  
2 typically defined by states to encompass  
3 activities that could be expected to result  
4 in the --

5 HEARING OFFICER TIPSORD: You need to  
6 slow down.

7 MS. MEYERS-GLEN: Absolutely.  
8 Ingestion of or immersion in water such as  
9 swimming, water skiing, surfing, or any other  
10 activity where immersion in the water is  
11 likely. Now, we can agree that jet skiing is  
12 not included in that statement, correct?

13 MR. ANDES: I think you're --

14 HEARING OFFICER TIPSORD: But the  
15 Footnote 3 --

16 MR. ANDES: -- characterizing the  
17 testimony.

18 MS. MEYERS-GLEN: I'm about to get  
19 there. But in that list of primary contact  
20 they do not include jet skiing, correct?

21 DR. TOLSON: I'm not sure I -- I'm not  
22 sure I believe that. I think there's a  
23 footnote that's associated with that.

24 MS. MEYERS-GLEN: There absolutely is.

0137

1 But I want to take one step at a time. They  
2 list out primary contact uses; is that  
3 correct?

4 DR. TOLSON: There are probably a  
5 number of other primary contact uses that are  
6 not listed on there.

7 MS. MEYERS-GLEN: Okay. But in this  
8 list it does not include water skiing,  
9 correct?

10 HEARING OFFICER TIPSORD: Jet skiing.

11 MS. MEYERS-GLEN: Jet skiing. Thank  
12 you.

13 MR. ANDES: It includes a general  
14 statement at the end.

15 MS. MEYERS-GLEN: Yes. But we're  
16 going to get there one step at a time. It  
17 does not include -- It includes water skiing,  
18 though, right?

19 DR. TOLSON: I believe so. I don't  
20 have it in front of me, but, yeah, I take  
21 your word on it.

22 MS. MEYERS-GLEN: But it doesn't  
23 include -- even though it includes water  
24 skiing, it doesn't include jet skiing,

0138

1 correct?

2 HEARING OFFICER TIPSORD: That's the  
3 third time you've asked that and the third  
4 time he's answered it.

5 MS. MEYERS GLEN: I haven't gotten an  
6 answer yet.

7 HEARING OFFICER TIPSORD: Yes. He  
8 said that's correct.

9 MS. MEYERS-GLEN: Thank you. I didn't  
10 hear. Now, there is a footnote on Page 43  
11 that says kayaking and jet skiing may be  
12 borderline recreational activities that many  
13 lump into primary contact but likely do not  
14 involve its high likelihood of ingestion of  
15 appreciable amounts of water as swimming,  
16 water skiing, and surfing. Okay. Can we  
17 agree that that's what this says?

18 DR. TOLSON: I believe that this is,  
19 in fact, what that says, yes.

20 MS. MEYERS-GLEN: So is it your belief  
21 then that IEPA, after hearing this, that IEPA  
22 considers jet skiing to be a primary contact  
23 activity?

24 DR. TOLSON: Based on the footnote

0139

1 where it says many believe, I guess I would  
2 include myself in the group of many.

3 MS. MEYERS-GLEN: Okay. So -- all  
4 right. So then why do you choose to restrict  
5 the study to use of larger jet ski boats when  
6 the IEPA did not place such a distinction on  
7 jet skiing?

8 DR. TOLSON: I've actually toured the  
9 waterway, and my one occurrence with a jet  
10 boat out there did not look like the picture

11 that you have here. And I'm --  
12 MS. MEYERS-GLEN: That's not my  
13 question, though. My question is why did  
14 you --  
15 HEARING OFFICER TIPSORD: Would you  
16 let him finish his answer before you  
17 interrupt him, please.  
18 DR. TOLSON: My observations of jet  
19 boats in the one occurrence that I did see  
20 one was a two-man boat. The guys were in  
21 collared shirts, I believe, and straw hats  
22 kind of stuff. And it made me think maybe we  
23 could be misinterpreting the UAA study. I'm  
24 not sure if they included these guys as jet  
0140  
1 skiers or not. So kind of to be conservative  
2 to make sure we captured all the uses we  
3 could out there, we just lumped the few  
4 observations of jet skis that we saw in the  
5 UAA, we put them under the boating so it  
6 would be included in there. Because we were  
7 really unsure whether they were this guy jet  
8 skiing or the guys that we'd observed on the  
9 waterway that were jet skiing in really kind  
10 of bigger boats.  
11 MS. MEYERS-GLEN: The jet ski in front  
12 of you, would you consider that to be primary  
13 or secondary contact? I'm referring, just  
14 for the record, to the attachment that I --  
15 HEARING OFFICER TIPSORD: Exhibit 82.  
16 DR. TOLSON: Primary contact, because  
17 the guy doesn't look very sure of himself. I  
18 think he may fall off at any moment.  
19 MS. MEYERS-GLEN: So it's not the  
20 activity, but the fact that that particular  
21 jet skier would fall off that's making that  
22 distinction?  
23 DR. TOLSON: I think the distinction  
24 is that the person on this boat is having --  
0141  
1 likely to have a high contact with water.  
2 We've grouped our exposures into those that  
3 have primary contact water that we've  
4 excluded from our analysis. This would be an  
5 activity I think that he has a life preserver  
6 on there, somebody who would have full body  
7 emersion, and it would not be one of the  
8 receptor scenarios that we've developed risk  
9 numbers for within our report.  
10 MS. MEYERS-GLEN: If somebody is  
11 wearing a life preserver on a two-seater,  
12 then that would be included as secondary  
13 contact?  
14 DR. TOLSON: I think, you know, I'm  
15 trying to characterize within our receptors  
16 to include those jet skiers. Because my one  
17 observation of a jet boat on the waterway was

18 one where the occupants certainly didn't look  
19 like they were going to have full body  
20 emersion. If you would like, I can provide  
21 you a picture of that. I actually took a  
22 picture of them as we went by them on the  
23 waterway.

24 MR. ANDES: I thought we had them.

0142

1 MS. MEYERS-GLEN: I'm just trying to  
2 understand where your line is as far as which  
3 jet skiers are included in secondary contact  
4 and which jet skiers are included in primary  
5 contact. That's all. Because it seems like  
6 there is some in one category and some in the  
7 other.

8 HEARING OFFICER TIPSORD: Is there --

9 DR. TOLSON: We did not try to  
10 characterize the specific activity where  
11 anybody was occurring. We developed these  
12 risk ranges that had ingestion rates that  
13 were kind of a big range. That being said,  
14 there were very few jet skis that were  
15 identified within the UAA. We included them  
16 in boating because there was a potential that  
17 if we didn't include them in boating, perhaps  
18 these -- we're talking about these two-man  
19 boats or larger boats that we didn't want to  
20 underrepresent within the study. I would  
21 characterize this particular activity that  
22 this gentleman is engaged in as a primary  
23 contact activity. But this is really outside  
24 of my realm of identifying primary contact

0143

1 activities and secondary contact activities.

2 It's not what I do.

3 MS. MEYERS-GLEN: You guys made a  
4 call, though, as to whether or not to include  
5 that activity?

6 DR. TOLSON: We had to take that  
7 handful of receptors and try to characterize  
8 them within the categories which we laid out  
9 within Exhibit 71, our risk assessment. We  
10 made the call that the boats -- that the jet  
11 skis could possibly be boats. We wanted to  
12 make sure we included anything that was  
13 potentially a recognized activity in the  
14 waterway, we included them within that group.

15 MS. MEYERS-GLEN: Yet if you're saying  
16 that you included it as a recognized  
17 activity, you also did not include swimming,  
18 correct, and that was a recognized activity?

19 DR. TOLSON: A recognized activity is  
20 more of a legal term that I probably  
21 shouldn't be invoking or else -- that's true.  
22 It was primary contact. We felt swimming was  
23 one that ought to be included.

24 MS. MEYERS-GLEN: But it was a

0144

1 recognized activity. It was something in the  
2 UAA as listed as occurring, correct?

3 MR. ANDES: I'm going to really object  
4 to this argumentative line of question. He's  
5 answered the questions. He told you what he  
6 included and why.

7 MS. MEYERS-GLEN: Well, I'm confused  
8 in that he stated that he included it because  
9 it was a recognized activity on --

10 MR. ANDES: That's not what he said.

11 MS. MEYERS-GLEN: That's exactly what  
12 he said. So I'm curious then as to why he  
13 then did not include other recognized  
14 activities such as swimming.

15 DR. TOLSON: Another reason is the RFB  
16 for which we were responding to developing  
17 this clearly stated and listed those  
18 activities and how we would categorize them.  
19 Jet skiing was not included within that list.

20 MS. MEYERS-GLEN: Thank you.

21 DR. TOLSON: Swimming was not  
22 including with that list. I'm not sure if it  
23 said anything about jet ski.

24 MR. ANDES: Did it say that primary

0145

1 contact activities were not to be included?

2 DR. TOLSON: That's correct. Primary  
3 contact activities was not included.

4 MR. ANDES: Swimming is clearly  
5 primary contact. You decided not to include  
6 it?

7 DR. TOLSON: That's correct. Swimming  
8 is primary contact. It was not included.

9 MR. ANDES: Because the two-person  
10 boats were unclear, you decided to include  
11 them as boats?

12 DR. TOLSON: That is correct.

13 MR. ANDES: Thank you.

14 MS. WILLIAMS: Can I follow-up,  
15 please? Just since I wrote Footnote 3, I'd  
16 like to follow up by making sure I understand  
17 what you said here. You are saying you  
18 consider yourself someone who generally  
19 considers jet skiing, at least as conducted  
20 in this exhibit, primary contact activity  
21 generally?

22 DR. TOLSON: That's my opinion.

23 MS. WILLIAMS: Thank you.

24 MS. MEYERS-GLEN: One more question

0146

1 along those lines. Although the resulting  
2 risk estimates do not account for such, did  
3 you seem to calculate how much more jet  
4 skiers likely to ingest appreciable  
5 quantities of water than a person canoeing?

6 DR. TOLSON: We did not include

7 primary contact jet skiing as an activity  
8 that we developed, no.

9 MS. MEYERS-GLEN: Did Geosyntec  
10 analyze exposure rates for kayaking, tubing,  
11 or sculling in comparison to tubing?

12 MR. ANDES: What kind of --

13 HEARING OFFICER TIPSORD: That's D.

14 MS. MEYERS-GLEN: 7D.

15 HEARING OFFICER TIPSORD: For the  
16 record, I think we've -- he's repeatedly  
17 stated that he did not consider tubing.

18 DR. TOLSON: That is correct. We did  
19 not consider tubing.

20 MS. MEYERS-GLEN: Then kayaking or  
21 sculling in comparison to canoeing.

22 DR. TOLSON: We didn't calculate an  
23 exposure rate for each individual activity.  
24 We developed a range of exposure rates for

0147

1 which canoeing could be kind of the  
2 representative activity, and that was a  
3 distribution that ranged from high  
4 potentially capsizing events to low.

5 MS. MEYERS-GLEN: Do you know whether  
6 or not the exposure, the risk of exposure is  
7 higher for kayaking or sculling than  
8 canoeing?

9 DR. TOLSON: We don't have any data to  
10 support that. So, no, I don't know.

11 MS. MEYERS-GLEN: Could somebody in a  
12 kayak have a higher risk than someone in a  
13 canoe of exposure?

14 DR. TOLSON: They think could have a  
15 risk for a number of reasons. That's  
16 correct. Somebody in a canoe could have a  
17 higher risk than somebody in a kayak.

18 MS. DEXTER: Why did you choose  
19 canoeing as the representative activity?

20 DR. TOLSON: I believe it was -- It  
21 seemed like a reasonable thing to call that  
22 high contact activity. I believe the UAA has  
23 canoeing and kayaking as one group there, so  
24 to eliminate a lot of dashes within the

0148

1 report, we called it canoeing.

2 MS. DEXTER: Did you have data on the  
3 canoeing? Was there -- Was there data to  
4 support the canoeing?

5 MR. ANDES: I think he already  
6 answered that question. It was ingestion  
7 rates; high, medium, and low ingestion rates.

8 MS. MEYERS-GLEN: Was there a  
9 difference in ingestion rates when looking to  
10 choose a representative for high contact in  
11 your study? Was there a difference in  
12 ingestion rates for canoeing and kayaking?

13 DR. TOLSON: Again, I think that

14 misrepresents what we're doing. We're just  
15 coming up with three sort of exposure groups.  
16 We've called that high exposure group  
17 canoeing which is sort of a representative  
18 recreational activity associated with the  
19 high. We didn't develop kayaking as, you  
20 know, 12.2 and canoeing as 12.3. There's no  
21 number that's associated with each individual  
22 thing and some together. We developed a  
23 distribution, a range, that incorporated all  
24 these sort of higher exposure activities.

0149

1 MS. MEYERS-GLEN: So you treat the  
2 risk as the same?

3 MR. ANDES: Same as what?

4 MS. MEYERS-GLEN: For canoeing,  
5 kayaking, and sculling; all of those  
6 activities, the risk is treated as the same,  
7 correct? It's all considered to be high  
8 contact of the same risk?

9 DR. TOLSON: The category of higher  
10 exposure activities along the waterway. And  
11 had we not looked -- I don't think sculling  
12 was specifically called out within the UAA,  
13 so there would have been no way for us to  
14 tease out sculling versus the canoeing or  
15 kayaking. So there's a necessity for sort of  
16 grouping activities together.

17 MS. MEYERS-GLEN: Do you know whether  
18 sculling occurs on the CAWS?

19 DR. TOLSON: I have not seen it. I  
20 understand it does.

21 MS. MEYERS-GLEN: And 8 is asked and  
22 answered.

23 Nine, in quantifying the  
24 amount of water ingested -- Wait a minute.

0150

1 Sorry. I'm going to stop. Nine is asked and  
2 answered. Withdraw.

3 Ten. I just need a second. I  
4 want to see if this is asked and answered.  
5 Ten is partially asked and answered.

6 You stated earlier that the  
7 ingestion rates for fishing and boating were  
8 adjusted downwards using professional  
9 judgment, is that right, from canoeing?

10 DR. TOLSON: That is correct.

11 MS. MEYERS-GLEN: And was that your  
12 professional judgment used to set the rate?

13 DR. TOLSON: We met collectively as  
14 the Geosyntec team and our expert panel and  
15 discussed these matters. I think it was  
16 arrived to by consensus.

17 MS. MEYERS-GLEN: 11, when discussing  
18 how the risk assessment accounted for  
19 exposure duration, the report states that  
20 assumptions regarding length of time an

21 individual might be on the waterway are  
22 required; activity based assumptions were  
23 developed for this exposure input based on  
24 waterway specific information where available

0151

1 and professional judgment guided by literary  
2 references. This is Exhibit 71, No. 101,  
3 Page No. 101.

4 DR. TOLSON: Okay.

5 MS. MEYERS-GLEN: Actually, I  
6 apologize. This was asked and answered.  
7 Well, no, it was asked and answered for  
8 fishing and boating. How did Geosyntec  
9 exercise professional judgment in setting  
10 exposure duration for canoeing? We just  
11 talked about fishing and --

12 DR. TOLSON: I'm pretty sure we  
13 answered that, because we had the triangular  
14 shaped figure up that had the one to five  
15 hours, the two --

16 MS. MEYERS-GLEN: Right. But that's  
17 off of data. Where did your professional  
18 judgment come into play?

19 DR. TOLSON: It's not completely off  
20 of data. We had data to sort of inform that,  
21 but we had to make some professional judgment  
22 decisions here.

23 MS. MEYERS-GLEN: And what were those?

24 DR. TOLSON: Well, we didn't go from

0152

1 zero hours. We truncated that distribution  
2 so it went from one to five hours. You know,  
3 selecting two hours as the median, it wasn't  
4 directly out of the data. We just picked two  
5 hours as a reasonable. It happened to fit  
6 pretty nicely. So the mean of that fit the  
7 EPA's exposure factor's handbook distribution  
8 of data for people that recreate around lakes  
9 and rivers.

10 MS. MEYERS-GLEN: But ultimately you  
11 used your professional judgment to arrive at  
12 that figure.

13 MR. ANDES: With data.

14 MS. MEYERS-GLEN: Excuse me. That's  
15 not his testimony. Please allow the witness  
16 to testify.

17 Is that ultimately how you  
18 arrived with --

19 DR. TOLSON: With data. Sorry.

20 MS. MEYERS-GLEN: That's all. I have  
21 no further questions at this time.

22 MS. WILLIAMS: Can I just ask one  
23 follow-up?

24 HEARING OFFICER TIPSORD: Absolutely.

0153

1 You can ask two.

2 MS. WILLIAMS: No. I hope not. Do

3 you have a copy of Mr. Stuba's testimony?  
4 DR. TOLSON: I do not. I don't think  
5 I've seen that either.  
6 MS. WILLIAMS: Do you have one that  
7 you can show him, or do you want me to show  
8 him?  
9 MR. ANDES: I don't think I have that  
10 handy.  
11 MS. WILLIAMS: Mr. Stuba's testimony  
12 is Exhibit 62, and I'm handing you a copy.  
13 And I'd like you to take a look at the back  
14 where he has charts.  
15 DR. TOLSON: Okay.  
16 MS. WILLIAMS: Where they list types  
17 of recreational activity. Did you look at  
18 those in developing your risk assessment, the  
19 data from the district on recreation from the  
20 boats that go out to --  
21 DR. TOLSON: We looked at this and we  
22 had some interviews with them, but we did not  
23 rely on this for any numerical computations  
24 for activities.

0154

1 MS. WILLIAMS: Do you understand where  
2 jet skiing is logged on those logs as a  
3 recreational activity?  
4 DR. TOLSON: Don't see a jet skiing in  
5 a column that's on the top of this. I don't  
6 know whether they hadn't seen one and that's  
7 the reason that they didn't start to log that  
8 and put it on here or not. But we relied on  
9 the UAA which was designed specifically to  
10 evaluate recreational use. And we felt that  
11 the strongest sort of data set to use to take  
12 proportions of recreational users in each of  
13 the modifications we were looking at.  
14 MS. WILLIAMS: And obviously this is a  
15 question I should have asked of Mr. Stuba, I  
16 just didn't really realize it was an issue  
17 until today. So if none of you know, then  
18 that's fine. But what I would like to know  
19 is he does say in his testimony that there  
20 were six jet skiers observed?  
21 MR. ANDES: If I can take a look.  
22 MS. WILLIAMS: I would like to know  
23 from the District, and if these witnesses  
24 can't answer, we'll try to bring it up next  
0155

1 week.  
2 MR. ANDES: I'm sure they can't.  
3 MS. WILLIAMS: Which category would  
4 the six jet skiers have been logged under?  
5 MR. ANDES: Skiing and tubing.  
6 MS. WILLIAMS: So jet skiing was  
7 considered a type of skiing and tubing?  
8 MR. ANDES: Yes.  
9 MS. WILLIAMS: Thank you. That's all

10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
0156  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
0157  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16

I have.  
MS. MEYERS-GLEN: May I ask one question that I forgot to ask?  
HEARING OFFICER TIPSORD: Sure.  
MS. MEYERS-GLEN: Thank you. Your risk assessment -- I think this will be pretty clear, but it doesn't account for the highest areas of recreational use in the waterway, correct?  
DR. TOLSON: I did not say that.  
MS. MEYERS-GLEN: Well, does your study account for -- Does it take into account where recreational use most commonly occurs in setting risk?  
DR. TOLSON: We may have -- we did not

tease out use within any particular point within the waterway. We assumed that risk -- we assumed that exposure could happen anywhere along the waterway. We did take data at specific points. Those points tended to be in the dry weather, at least, close to the District's outfalls. So they may have actually biased high the potential influence of the District's outfalls through the waterway, pathogen concentrations within the waterway.

MS. MEYERS-GLEN: Wasn't that averaged out, though, with other data that was also along the waterway farther downstream?  
DR. TOLSON: Or actually within 10 to 15 both lengths upstream, but yes.  
MS. MEYERS-GLEN: So what I'm asking -- Withdraw the question. I'm done.  
HEARING OFFICER TIPSORD: Anything further? Dr. Gerba, Dr. Tolson, Ms. Petropoulou, it has been a privilege and an honor. Thank you very much. And I will see all of us again on September 23, 9:00 a.m. here in this room where we will start

with Dr. Divorich. Thank you very much.  
We're adjourned.  
(At which time the hearing was continued to September 23, 2008, at 9:00 a.m.)  
\* \* \* \* \*

17  
18  
19  
20  
21  
22  
23  
24  
0158

1 STATE OF ILLINOIS )  
 ) SS.  
2 COUNTY OF COOK )  
3

4 I, LAURA MUKAHIRN, being a Certified  
5 Shorthand Reporter doing business in the City of  
6 Chicago, Illinois, County of Cook, certify that I  
7 reported in shorthand the proceedings had at the  
8 foregoing hearing of the above-entitled cause. And  
9 I certify that the foregoing is a true and correct  
10 transcript of all my shorthand notes so taken as  
11 aforesaid and contains all the proceedings had at  
12 the said meeting of the above-entitled cause.

13  
14  
15

16 

---

LAURA MUKAHIRN, CSR  
CSR NO. 084-003592

17  
18  
19  
20  
21  
22  
23  
24