ISSUES CONFERENCE VOLUME 15

In the Matter of the Applications of

CROSSROADS VENTURES, LLC

for the Belleayre Project at Catskill Park
for permits to construct and operate pursuant to
the Environmental Conservation Law

Margaretville Fire House
Margaretville, New York
July 30, 2004

B E F O R E:

HON. RICHARD WISSLER,
Administrative Law Judge

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(WATER SUPPLY, GROUNDWATER, SURFACE WATER ISSUES)

(July 30, 2004)
(9:37 A.M.)

P R O C E E D I N G S

ALJ WISSLER: Good morning, folks. It is July the 30th. This hearing is continued.

If I can have the appearances of counsel for the record, please.

MR. GERSTMAN: Marc Gerstman for the Catskill Preservation Coalition.

MS. KREBS: Carol Krebs for the Department staff.

MR. RUZOW: Dan Ruzow and Terresa Bakner for the Applicant.

ALJ WISSLER: Okay. Ms. Bakner.

MS. BAKNER: We are ready to go.

ALJ WISSLER: Okay.

MS. BAKNER: We're going to be addressing Applicant's Exhibit 98, which is the response drafted by Alpha Geoscience to the comments of Mr. J.A. Habib dated July 28th, 2004.

Mr. Trader, the first thing I would like you to address is can you describe what this letter of July 28th does.

MR. TRADER: This letter is trying to

explain a little bit of what we had talked about the last time this issue came up, which was after Mr. Habib's testimony. And we just wanted to try to clarify some of that testimony for the record.

MS. BAKNER: All right. You have also provided here Applicant's Exhibit 100, which I think you may have in front of you, regarding the calibrations of the flow meter. Can you please describe how this is relevant to Mr. Habib's comments.

MR. TRADER: The first version of Table 1A contained flow measurements that were made with a Global Water flow meter, stream flow meter. It was uncalibrated. This correspondence here relates because it tells how you can correct the data collected from the uncalibrated meter. You can actually correct that by hand in-house. It's a simple conversion.

MS. BAKNER: Okay. So that's covered on the fax cover sheet from Global Water from one of the engineers. And it says basically, you can multiply the flow data set by 0.4056?

MR. TRADER: That is correct. And

that was confirmed in an e-mail from the president of the company.

MS. BAKNER: All right. And that e-mail is dated December 14th, 2001, and I'm assuming that John Dickerman is the president of Global Water?

MR. TRADER: Yes, reportedly to me.

MS. BAKNER: Okay. So in correcting the data set, did you use the methods set forth in here?

MR. TRADER: Yes, I did.

MS. BAKNER: So are you confident that the numbers in the revised Table 1A are an accurate reflection of the flows?

MR. TRADER: Yes.

MS. BAKNER: Okay. We've also attached the Global Flow Probe Instruction Manual, and we have the probe itself here.

Steve, could you pick that up and just explain how it works and what led to it being out of calibration in the first place.

MR. TRADER: Sure. The flow meter has a propeller that spins when you put it in the water that's flowing in a ditch or stream. The rate that that is spinning is converted by

this little widget here at the top, which needs to be calibrated. When I just put it on here, it should be already calibrated. It doesn't come from the factory in a calibrated sense. You have to manually lower it according to the instruction manual.

ALJ WISSLER: How do you calibrate it?

MR. TRADER: You calibrate it by going through the menu options on the computer readout here. And there's a calibration number, and it's 83 -- 82.13 is the way that it comes, and I have to actually show you. Let me bring up the manual.

The "V" is velocity if water was actually moving through here. What I'm looking for is the calibration, how to maneuver through the menu.

Here is where it says your probe calibration, so let's get to that here. If you change your batteries, you will have to reset this number. So when you change the batteries, the number that will be showing at this point is actually 82.13, and you have to decrease it downward to 33.31.

ALJ WISSLER: When you put in a new

battery, it says 82.31?

MR. TRADER: Right. It defaults to that.

ALJ WISSLER: Where does it say that in the instruction manual?

MR. TRADER: It doesn't say that in the instruction manual, but if I take the batteries out --

MS. BAKNER: Go ahead.

MR. TRADER: Let's go through this and let's see what it says right now.

MS. BAKNER: Okay.

MR. TRADER: Right now it says "mi," and it stands for miles, which means you're in feet. Enter the setup sequence by holding both buttons down for 80 seconds. Now we see the "mi" right there. Now we see calibration, so it's calibrated right now, 33.31. All right. What I'm going to do now is just go ahead and turn this off. I'm going to take the battery out. (Indicating)

I've taken the battery out.

MR. GERSTMAN: So noted.

MR. TRADER: Now we see the calibration says 82.13. So now I'm going to

calibrate it and bring it where it should be. So I pressed the right button.

ALJ WISSLER: Now, let me just ask you this: When you were out in the field taking the reading, you started with 82.13; is that what you're saying?

MR. TRADER: Apparently so.

ALJ WISSLER: Who is it apparently? You did not take this --

MR. TRADER: Sam and I started the readings.

DR. GOWAN: Your Honor, when we first started using this flow probe, we had the proper calibration. And then through time, we don't know when, we removed the battery because we were actually having some difficulty with the probe, and we didn't realize that when we took the battery out and put it back in that we changed the calibration.

So we went through a period of correct calibrated readings, and then all of a sudden, we started making recordings over a period of months where we had an uncalibrated probe. We actually discovered this when we loaned out

the meter to a competitor of ours, and they came back and said, "Hey, these numbers aren't making any sense," and that's when we looked at it.

MR. TRADER: I press the left button when the arrow is pointing down and we see it. Now I have to stand here until it goes down to 33.31. (Indicating)

We started at 82, we're down to 75 now. So we have to go all the way to 33.31 if we really want to do that.

ALJ WISSLER: But in any event, you changed the battery, but you didn't go through the calibration?

MR. TRADER: No, because we didn't realize it.

Down to 64.

56.

45. (Indicating)

ALJ WISSLER: Is there a low battery indicator on that thing?

MR. TRADER: No, not on this version.

MR. RUZOW: Each time you start, you could check the calibration number?
DR. GOWAN: Yes.

ALJ WISSLER: So that -- and the reason why you would do that is because as the level of the battery decreases -- there will come a threshold where it doesn't operate the unit anymore. But the purpose of the calibration is that whatever your battery strength is, you can calibrate it to the level of that strength and take readings off of that battery until it's dead; right?
DR. GOWAN: I don't believe the calibration has anything to do with the battery itself.
MR. TRADER: Yes.
ALJ WISSLER: Keep your voices up.
MR. TRADER: The calibration doesn't start changing as the battery life goes away. It stays wherever you set it. What it's doing is it's making a conversion for you in the field so that the data you're reading is exactly what you want to see. If you don't make the conversion in the field automatically, you have to convert all the data by multiplying by that coefficient.
ALJ WISSLER: All right. So when you turned this instrument on, it gave you that

reading of 82 -- whatever?
MR. TRADER: 82.13.

ALJ WISSLER: On the calibration it did that, or it gave you a reading as zero? When you started taking the flows, it's zero; correct?

MR. TRADER: I don't recall what it said when we first started. It's either going to say 82.13, or it will be calibrated to 33.31 just like I did.

DR. GOWAN: See, it defaults. When you take that battery out --

ALJ WISSLER: -- and you put a new one in, it defaults to the 82. I understand that. But when you turned that instrument on, it's only in that calibration mode that you're going to get that reading of 82 or 33, whatever it is; am I right?

MR. TRADER: You won't see that unless you manually go through the menu to get to that point.

ALJ WISSLER: To get to the calibration.

So when you turn it on, it comes up zero?

MR. TRADER: It comes up in a different menu option, which is just measuring flow.

ALJ WISSLER: Which, when you just turn it on and you haven't stuck it in the water yet, it says zero?

MR. TRADER: Correct.

ALJ WISSLER: Okay. So in order to know whether or not it was giving you accurate readings in the field, you need to scroll through the menu to the calibration number and say is this thing at 33.31, and if it isn't then my numbers are suspect. If it isn't, then I take that difference and that ratio to 33.31 and multiply that times the factor, and that should adjust the flow reading that I got; is that what we're saying?

MR. TRADER: That's right. The ratio would be 33.31 divided by whatever that calibration set that was --

ALJ WISSLER: But for each of those readings for that period of time, the readings you've taken with it -- and this was the same instrument that was used all 14 months?

MR. TRADER: Yes, it was.

ALJ WISSLER: Okay. So for all the readings that were taken during that 14-month period, at no time did we check the calibration of this instrument?

MR. TRADER: I don't recall checking that calibration until we realized that something had gone wrong with it after the battery change.

ALJ WISSLER: What made you realize something had gone wrong?

MS. BAKNER: Dr. Gowan, if you could explain that again.

DR. GOWAN: Yes. We loaned that

instrument out, and actually, it was on a project that we were supporting a competitor, and they took some stream flow measurements. And I don't know how they knew this, but if they had known the discharge into a stream, and the numbers just didn't correlate to what they had expected them to be, and they said this isn't reading right. And that's when we looked into it to evaluate why it wasn't reading right and discovered the calibration problem.

ALJ WISSLER: But in any event,

obviously, this calibration was not done for each of the times you went out during that 14-month period?

MR. TRADER: That's right.

MS. BAKNER: Now, to the legal side of the argument for just a brief second. In the Applicant's Exhibit 98, Mr. Trader has attached to his letter a letter of August 5th, 2002. The letter of August 5th, 2002 went from Whiteman, Osterman & Hanna to Alec Ciesluk to respond to comments that were submitted, public comments that were submitted on the application for a water supply permit modification on behalf of Pine Hill Water Company.

Directing your attention to --

ALJ WISSLER: What letter are you talking about? I'm looking at Applicant's

100, or 98 rather?

MS. BAKNER: Applicant's 98. It's the second to last attachment at the back.

ALJ WISSLER: Letter of August 5th, 2002?

MS. BAKNER: Yes.

If you look at page 3, you'll see on

page 3 under the paragraph entitled, Redactions in Monitoring Data.

MR. RUZOW: Reductions.

MS. BAKNER: I'm sorry. It's a bad copy, I apologize.

It says in here, "During the two-year monitoring period, the batteries in the flow meter were changed. Without a constant source of power, the meter calibration resets to the default number." And it goes through in detail exactly the difference between Table 1 -- the original Table 1A and the revised Table 1A. And this was given to the Department in response to comments that were actually submitted by Mr. Habib, and this was in the year 2002.

When DEC made their determination to issue a permit in this matter, they had this information in front of them. Department staff looked at all the responses to public comments and took them into account in issuing the permit.

After the permit was issued, a number of parties sued the Department in connection with the issuance of the approvals, and the

results of that lawsuit are included as exhibits from yesterday. There's a Memorandum of Decision by Albany County Supreme Court, which is Exhibit 112, and it's dated 4/25/03. And then there's an amended decision dated July 16th, 2003, and that's Exhibit 111.

So while we're quite happy, of course, to answer any questions that your Honor has about this, I think I just want to make it very clear for the record that these issues were all addressed previously in the context of that previous permit proceeding which was then challenged additionally, and the decision was of course upheld by the Court.

ALJ WISSLER: Let me just ask you, the letter of August the 5th, that third page, the paragraph that you directed my attention to, Reductions in Monitoring Data -- redaction. Redaction?

MR. TRADER: Reduction.

ALJ WISSLER: Is that an A or a U?

MS. BAKNER: I can't tell, your Honor.

ALJ WISSLER: Looks like redactions.

MR. TRADER: I think it's reductions.

ALJ WISSLER: But anyway, that

paragraph specifically addresses the table that Mr. Habib spoke about and the changes that were made in that table. So when this paragraph talks about the monitoring period, it's talking about the period in which that table was compiled; am I right?

MR. TRADER: Yes. The initial version of the table was, I think, April of 2001.

ALJ WISSLER: Okay. So that's what this paragraph -- I mean there's no other data sets out there, is what I'm saying?

MR. TRADER: Oh, by the time this letter came out, the flow study was completed, December of 2001.

ALJ WISSLER: Okay. But this paragraph is talking about an explanation of the apparent problem that Mr. Habib highlighted, which is now what is Table 1A, derived from an earlier set of field observations that needed to be corrected?

MR. TRADER: Yes.

MS. BAKNER: Is there anything else we want to add to this particular issue?

MR. TRADER: No.

MS. BAKNER: Mr. Trader, could you go

through the method again of how you took the flow measurements, the three different methods, and just explain where those are affected by the flow meter, where they were not affected by the flow meter, in relation to Table 1A.

MR. TRADER: Sure. Stream flows were measured with the Global flow meter that I just brought forth. Most of the springs were measured using a bucket method or a tub method. We had a calibrated 5-gallon capacity bucket. We would measure the flow out of the pipe from one of the springs and measure how long it would take to fill the bucket. We calculated the rate of the discharge that way.

MR. RUZOW: Is that a standard methodology?

MR. TRADER: Yes. We also had an 18-gallon capacity metal tub for the larger-producing springs that had a pipe discharge that we could direct the flow into the tub. Measuring, again, with a stopwatch, we could determine how long it took and got our rate of discharge in that method.

One of the springs, Railroad Spring,

is not conducive for either of those two bucket or tub measurement methods. The spring is coming out of a rock face coming into a ditch, so we have to use the Global flow meter for that.

So those are the three different methods.

MS. BAKNER: Okay.

MR. TRADER: I guess one of the points there is that the spring flow methods for Silo A Spring, Silo B Spring, those are not affected by the calibration problem on the flow meter.

MR. RUZOW: Because they used the

bucket method?

MR. TRADER: Because they used the 18-gallon metal tub.

And at Bonnie View Springs, there's a side ditch that has overflow, or flow that's not captured by the spring collection boxes. The flow in that ditch is actually water that's coming from Bonnie View Springs that does not enter the water supply system there. That is in a ditch that's measured with the flow meter, so that portion of Bonnie View

Springs data was affected by the calibration problem.

The rate at which the flow measurements are going through the in-line flow meter at Pine Hill is not affected, neither is the measurement of the overflow when the valve is closed and the reservoir is not filling. The overflow from that is not affected because that was measured with either an 18-gallon tub or bucket.

MR. RUZOW: You use an 18-gallon tub where the flow rate would fill a 5-gallon bucket too quickly to be comfortable that you got the time correctly?

MR. TRADER: Yes.

ALJ WISSLER: And all of this flow data is now contained in what is Table 1A?

MR. TRADER: Yes.

ALJ WISSLER: Okay. If I understand what you're saying, some of the entries in

Table 1A used that flow meter and some of
those readings did not?
MR. TRADER: That's right.
ALJ WISSLER: Does Table 1A break that
out and tell you which is which?

MR. TRADER: Which method was used,
no.
ALJ WISSLER: Can you tell me which
method was used?
MR. TRADER: Sure. Why don't you look
at --
MS. BAKNER: And, actually, your
Honor, there's an easy way to tell what method
was used because if you compare the original
version of Table 1A and the corrected version
Table 1A, which actually has a different
footer, which has in the footer "calibrated,"
then you can tell which was used for what. So
we can pull those out and go over it really
easily.
ALJ WISSLER: That would be helpful.
MR. TRADER: The numbers that have
changed are the ones that were --
ALJ WISSLER: -- flow-metered.
Numbers that were taken from buckets
and so forth were not changed?
MR. TRADER: Exactly.
ALJ WISSLER: Because you didn't have
to calibrate the bucket.
MR. TRADER: Well, we calibrated it by

dumping 5 gallons of water in it initially.

MS. BAKNER: If you give us a second, we can find those.

MR. RUZOW: So that's in Exhibit 98.

MR. TRADER: Attachment 2.

MS. BAKNER: And, your Honor, if you look at the bottom, it says -- of Version 2, it says, 00109, Flow Table C-a-l-i-b-r-a- it says calibrated, Calibrated Flows.

MR. RUZOW: On the footer on the far right.

MS. BAKNER: Right here. (Indicating)

ALJ WISSLER: Show me.

Okay. And which of these values are the --

MS. BAKNER: Steve, why don't you come up and do that, but point it out in a way so that the --

ALJ WISSLER: This is the version that appears in 51B; right?

MS. BAKNER: That's correct.

ALJ WISSLER: Okay, Version 2 is that version of Table 1A which appears in Applicant's 51B.

MR. TRADER: What I will do is just go

down the list and tell you which ones were measured or had a component of measurement using this Global flow meter.

ALJ WISSLER: Okay. Why don't you give me a little checkmark.

MR. TRADER: Woodchuck Hollow Spring. Railroad Spring, Crystal Spring Brook above Bonnie View Spring, Bonnie View Side Ditch, Crystal Spring Brook above Cathedral Glen Brook, Cathedral Glen Brook above Crystal Spring Brook, Crystal Spring Brook below Silo A, Station Road Ditch above and below Depot Spring, that's two of them. The Depot Spring total is affected because it's a calculation using some of the other components. Bailey Brook above Crystal Spring Brook, Crystal Spring Brook above Birch Creek, Birch Creek above and below Crystal Spring Brook.

MR. RUZOW: These are two different entries?

MR. TRADER: Yes. And that's all.

MS. BAKNER: Okay. Steve, in your opinion, all of the issues that were raised by Mr. Habib in his most recent comments

regarding how the measurements were taken, what the mistake was, all of those comments, were they in your opinion previously addressed to the Department in the Pine Hills water supply permit modification application?

MR. TRADER: All of them, no.

MS. BAKNER: Okay. Which ones were not addressed?

MR. TRADER: I can direct you to the numbered comment.

MS. BAKNER: Okay.

MR. RUZOW: This is in Applicant's 98, Exhibit 98.

MS. BAKNER: Yes, it is.

MR. TRADER: Comment number 7.

MS. BAKNER: Okay. Can you please go over that comment. It said, "Mr. Habib spends considerable time pointing out apparent mathematical errors in the calculation of average flow and low flow values for Bonnie View Springs." Can you explain what our response is to that?

MR. TRADER: Sure. The initial engineering report for the Pine Hill Water Company, which was put out in April of 2001,

there was an incorrect formula for the calculation of flows at Bonnie View Springs. The incorrect formula arose from the engineers' misunderstanding of the hydrological components that were used in the estimation of the Bonnie View Springs' total yield. The formula should not have referenced flows at Crystal Spring Brook in the estimation -- in the estimation of flows at Bonnie View Springs. The formula did, in fact, result in elevated low flows and average flows for Bonnie View Springs. These elevated flows were exacerbated at the time due to the Table 1A uncalibrated measurements that existed up until that point.

ALJ WISSLER: Exacerbated lower?

MR. TRADER: Higher.
ALJ WISSLER: Higher?
MR. TRADER: Right. The uncalibrated measurements were higher.
ALJ WISSLER: Okay.
MR. TRADER: In February of 2002, the engineering report for the Pine Hill Water Company contained the correct estimate of flows, but the method of calculation that was

presented there was held over from the previous report and was still incorrect.
MR. RUZOW: So the narrative description was incorrect?
MR. TRADER: Yes. The numbers were correct, but the narrative description at the time was still incorrect.
That February of 2002 engineering report contained Version 2 of Table 1A, the correct version of Table 1A. Most recently, the conceptual design report for Big Indian Plateau, which is Exhibit 51B, May 2004, that contains a proper accounting of the Bonnie View Springs water supply system on pages 13 and 14, shows the proper method of calculating the flow.
Mr. Habib, along these same lines, was confused about the low flow calculations that existed. As of April 2001, the low flow measured at Bonnie View Springs had at that time been in September of 2000. Year 2000 was

not a particularly dry year, so at the time, the engineers had used a multiplier of 0.7 to reduce the numbers to estimate a low flow period. September 2000 was the lowest flow to

that point, so they just reduced the numbers artificially to try to simulate a drought or a low flow condition.

Our flow study continued through the rest of 2000 and 2001. And as has been stated before, the latter half of 2001 was a dry year. The flows measured during that time took advantage of this to see what the dry season flows actually were. In the latter part of that year, November was a drought watch for Ulster County, December was a drought warning for Ulster County. The flow measurements at Bonnie View Springs -- I'm sorry.

Since the August 2001 measurement, which was the lowest measurement of the flows at Bonnie View Springs during that dry season and into the drought, that value was used, and the 0.7 multiplier was no longer necessary to reduce any data because we had a dry season, drought-type measurement now, so they used that number in the most recent --

MS. BAKNER: I just want to refer to Applicant's Exhibit 56, which was the permit that was issued by DEC to the Pine Hill Water

Company, and I want to specifically note that the permit was issued by DEC on September 13th, 2002. And the corrected estimate of the low flow amounts as is set forth in Applicant's Exhibit 98 references the February 28th, 2002 engineering report for the Pine Hills Water Company. So unless I've -- so it's clear that the corrected information was before the Department before they issued the permit, February coming before September.

I think that's pretty much it in terms of the response of Mr. Habib, unless there's anything else that you'd like to say. This may be your last chance to respond to these comments which we have responded to previously.

MR. TRADER: No, I don't think I have anything else.

MS. BAKNER: Okay.

MR. GERSTMAN: Since Mr. Habib is not here today, we request the opportunity, once we receive the transcripts, to submit his written reply. We will submit Exhibit 98 and Exhibit 100 to him, and I'd like to see the transcripts if I could. Thank you.

ALJ WISSLER: Okay.

MS. BAKNER: Next, we would like to move back to some of the issues that were raised yesterday. And specifically, I think what we need to do at this point, if we can, is go back through some of the tables that are included as our exhibits regarding the pumping tests and the history of the pumping tests for the Big Indian Plateau as they can be very confusing.

So what I'd like you to do is start with Applicant's Exhibits 101 and 102, which we have up on the board, and I'd like you to address it up there if you can, Steve. I think it will be easier for people to follow. They can at least see where you're pointing. What I'd like you to do is go through the chronology and exactly which of the Rosenthal wells were tested when, and the methods of pump testing the various wells.

I just want to mention for the record that the various reports and information are all set forth at one place in Applicant's Exhibit 51A, but I think we would like to explain it just a little bit further.

Go ahead, Steve.

MR. TRADER: Well R2 was the first well that was tested. We did an individual test on Well R2 in November of 2001. It was a 72-hour constant rate pumping test.

ALJ WISSLER: We're referring to Applicant's 102.

MR. TRADER: That is for Well R2.

The next test that was performed was on Well R1. We did a 72-hour constant rate individual test on Well R1, September of 2002.

MS. BAKNER: And, Steve, can you just

take a second and explain to us what you mean by a constant rate pump test. What is a constant rate pump test?

MR. TRADER: This was a pumping test which we started at a specific pumping rate. At Well R1, we used 77 gallons per minute, and we maintained that discharge rate throughout the entire test.

MS. BAKNER: And what were you trying to show from that constant rate pump test?

MR. TRADER: Trying to show if the pumping test could show that Well R1 could produce 77 gallons per minute to make sure

that that could help meet the demands of the project.

ALJ WISSLER: Because it would be helpful for me, where in 51B is that stuff summarized?

I mean, I think, Ms. Bakner, you indicated that it was --

MS. BAKNER: Your Honor, could we have five minutes so we can --

ALJ WISSLER: Sure. I think that would be helpful.

MS. BAKNER: All right.

ALJ WISSLER: Five minutes.

(10:20 - 10:27 A.M. - BRIEF RECESS TAKEN.)

ALJ WISSLER: Let's reconvene.

MS. BAKNER: Before Mr. Trader starts,

we will tell you the locations of all of the pump test reports in the record so far. The most recent pump test, simultaneous pump test of Well R1, R2 and R3 can be found as an attachment to Applicant's Exhibit 51B, which is the conceptual design report for the Big Indian Plateau Water Supply Treatment and Distribution. And it is located at Exhibit E

to that document, and it's dated May 2004. The test was actually conducted in April of 2004.

ALJ WISSLER: Exhibit or appendix?

MS. BAKNER: It's actually called Exhibit E. Here is where it is in our version here. It's right after these slippery maps.

ALJ WISSLER: I have Exhibit B.

MS. BAKNER: No, that's water quality field report.

ALJ WISSLER: I understand that.

MS. BAKNER: All right. The other tests can be found in Volume 3 of the Draft Environmental Impact Statement, and it is Volume 3, Appendix 7, which is all the water supply reports. The new conceptual design report, which is Applicant's Exhibit 51B, only contains the most recent simultaneous well pump test for R1, R2 and R3. Volume 3, Appendix 7, of the DEIS has Exhibit E which is "Report and Testing of Well R2," and it's tabbed, at least to my knowledge.

ALJ WISSLER: You know what, I do have

this. Let me take a minute and go get my
copy.

MS. BAKNER: Okay.

(10:31 - 10:36 A.M. - BRIEF RECESS TAKEN.)

ALJ WISSLER: Do we someplace have where 51B supersedes Appendix 7?

MS. BAKNER: It actually doesn't, your Honor.

ALJ WISSLER: Is that broken out somewhere?

MS. BAKNER: Yes. Well, I can break it out for you, but no, it's not broken out anywhere. I can show you which part of it has been superseded, and it's a very small matter.

ALJ WISSLER: If it's a matter of just telling me where it is.

MS. BAKNER: Yes. Your Honor, it's merely the December 2002 conceptual design report narrative. That's the only thing that has been superseded here. So it's just the first couple -- it's just the report itself.

ALJ WISSLER: The first tabbed section inside the Big Indian Plateau water supply tab?

MS. BAKNER: Yes. And it's pages 1 through 25, essentially.

ALJ WISSLER: Right. Okay. And then there were a couple of tables?

MS. BAKNER: Analytical results. Those are all good. Those are all good things. What we did when we revised the report that's Applicant's Exhibit 51 is we had to change the narrative to update the project and also to reflect the new simultaneous well pump tests of 1, 2 and 3 together.

So that's what's happening, and I apologize for the confusion. We didn't mean for it to be confusing.

So Exhibit E --

ALJ WISSLER: It happens easy for me.

MS. BAKNER: Well, we were having a little trouble planning it. "Installation, Development and Testing of Well R1," and it's a report prepared by Alpha Geoscience dated January 2002.

ALJ WISSLER: You're looking at Exhibit --

MS. BAKNER: Exhibit E after -- go past the green, and I'm reading the front page.

ALJ WISSLER: It says, installation,

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what?

MS. BAKNER: "Installation, Development and Testing" --

ALJ WISSLER: -- of Well R2?

MS. BAKNER: -- of Well R2, that's right.

Now, we're going to the next report that is the well testing report. Now we're going to the test, Tab F, "Simultaneous Testing Report of Wells R1 and R2," and that's prepared by Alpha Geoscience dated November 2002.

ALJ WISSLER: Tab F.

MS. BAKNER: The next tab we're going to is Tab I, which is Roman numeral I, "Well R1 Report."

ALJ WISSLER: I'm sorry, we're going to which now?

MS. BAKNER: We're going to Tab I, Roman numeral I. That's "Step Rate and Constant Rate Testing of Well R1." And that's dated November 2002 by Alpha Geoscience. Okay? And that's all of them.

Now that we have located all of the reports, what I would like you to do, Steve,

is go through the history of the pump testing and describe what type of testing was done.

MR. TRADER: In November of 2001, Well R2 had a 72-hour pumping test done on that well. It was a constant rate pumping test. The test was pumped at a constant rate of 82 gallons per minute throughout the test.

The next test was at Well R1 in September of 2002. It was a 72-hour constant rate pumping test. We pumped it at 77 gallons per minute throughout the test.

A combined test with Well R1 and Well R2 pumping was performed in September of 2002.

It was a constant rate test where Well R1 was pumped at 57 gallons per minute and Well R2 was pumped at 71 gallons per minute. Those two values are not shown on this table.

ALJ WISSLER: Why the lower values?

MR. TRADER: We had initially tested -- the individual tests were at 77 and 82. We wanted to make sure we -- at the time, would meet what the demand was. And with 57 and 71, we felt that was more decent pumping rates that we could achieve a successful pumping test and meet the demands.

ALJ WISSLER: The demand being 114,817?

MR. TRADER: I don't recall what the demand at the time was, if it was the same or different.

MS. BAKNER: We will go over the demands later.

MR. TRADER: The most recent test was in April of 2004. It was a simultaneous test of Wells R1, R2 and R3. It was not a constant rate pumping test. The results of that test show that the individual rates for R1, R2 and R3 were 63 gallons per minute, 74 1/2 gallons per minute, and 11 1/2 gallons per minute, respectively.

MS. BAKNER: And this is when all three wells are pumping simultaneously?

MR. TRADER: That's correct.

MS. BAKNER: All right. So that shows

that there's some interconnection amongst
those wells in that well field?
MR. TRADER: Yes.
MS. BAKNER: The next thing I would
like you to cover is what is the difference
between the first simultaneous well pump test

that you did and the -- R1 and R2, and the
second simultaneous well pump test that you
did, which was R1, R2 and R3; what was the
difference?
You have described one as a constant
rate test and the other one as not a constant
rate test and I would just like you to explain
the technical difference.
MR. TRADER: The constant rate test
was exactly that, a constant rate. Both wells
were pumped from start to finish at the same
rate. The most recent test was the -- it's a
well yield test. We pumped them initially at
a higher rate. I don't recall right offhand
what exactly those rates were, but they're in
the documentation.
MS. BAKNER: Was there a reason why
you pumped them at a higher rate at the
get-go?
MR. TRADER: Yes. Based on the
results of the R1 and R2 simultaneous test, we
knew at what point in time that the graph of
that data appeared to approach -- started to
approach stability. We knew how much water

had been removed from the system at that

point, so we pumped -- in R1, R2, R3 test, we pumped at a higher rate to get that same volume out of the system. That was the reason for pumping it at a higher rate.

MS. BAKNER: And why did you want to get the volume of storage out of the system?

DR. GOWAN: Because on that steeper part of the curve, that's the storage, and what we really want to get to is when we have a cone spread out far enough where we're going to reach out to the recharge that's going to sustain a stable level, stable pumping level at a constant rate of pumping. So we wanted to remove that storage and get it out to stress that system as quickly as possible. We knew how much water it would take to do that, and we wanted to get that out of the system and then get closer to that point quicker.

MS. BAKNER: Right. And you weren't guessing where that point was. You knew where that point was?

MR. TRADER: No, that's when we backed off the pumping rate.

DR. GOWAN: We knew how much volume, how much water we needed to get out of there

to get to that point, and that's how we determined that.

MS. BAKNER: On your constant rate test, what method did you use of recording your data? How did you plot your data?

MR. TRADER: The data was plotted up on a semi-log graph.

MS. BAKNER: The purpose of that was to show the reaction of the well when you pumped it at a constant rate?

MR. TRADER: Correct.

MS. BAKNER: Okay.

ALJ WISSLER: Where is that graph in the materials?

MS. BAKNER: It would be in the reports, the pump test reports for the different wells, so it will either be in the --

ALJ WISSLER: Those sections of Appendix 7?

MS. BAKNER: That's correct. All right?

ALJ WISSLER: I want you to show me that graph.

MS. BAKNER: Okay.

MR. TRADER: Sure. Which test were we speaking of?

ALJ WISSLER: The semi-log graphs you just referred to.

MR. TRADER: Okay.

MS. BAKNER: They would have done semi-log graphs on each of them.

ALJ WISSLER: As you speak of them, I want you to show me.

MS. BAKNER: Here they are. Here is the constant rate test graph for Well 2.
MR. TRADER: Exhibit I shows the individual tests for the R1. (Indicating)
MS. BAKNER: Right, go ahead and just flip through the graphs.
MR. TRADER: We have a linear plot of the data and a semi-log plot of the data. That's R1. (Indicating)
MS. BAKNER: Okay. And now you want to flip to R2, which is Exhibit E, which is toward the front.
MR. TRADER: Okay.
MS. BAKNER: We're doing the individual ones first. The words "appendix" and "exhibit" are not particularly helpful in

this context.
Is that everything now?
MR. TRADER: That's where they are.
MS. BAKNER: Okay. That's where they are. All right.
MR. TRADER: Not necessarily the one page but associated pages.
ALJ WISSLER: I can handle it.
MS. BAKNER: Okay. Why don't we go ahead and get that open for the simultaneous pump tests for this one. Let's mark those there too. (Indicating)
MR. TRADER: Good point.
MS. BAKNER: Now that we have tabbed everything, okay, so we can compare all the

logs.

You have discussed the constant rate test, which there were three, and you have discussed the simultaneous Well R1, R2 and R3, and you've gone over why you didn't pump that at a constant rate at the beginning.

And I think, Dr. Gowan, you explained the reason -- were you relatively confident, based on your previous test of R1 and R2 simultaneously, that you knew that magic point

in which you should pump to?

DR. GOWAN: I wouldn't call it a magic point, but we had a good understanding of the amount of water we needed to remove, and we knew when we had to remove that water.

MS. BAKNER: And you knew that based on empirical evidence?

DR. GOWAN: Yes, from our previous tests.

MS. BAKNER: So the next question I have for you is, can you describe the further progression of that test and show us why the criticisms that Mr. Rubin made of your test are exaggerated or inappropriate? And say what you're referring to.

MR. TRADER: I'm referring to Exhibit 51B, Appendix F.

MS. BAKNER: I think it would be helpful for the Judge if you could describe that graph that shows the progression of this test and relate it to the requirements -- the test method, the standard test method that was approved by DOH.

MR. TRADER: The first page there in Appendix F, as you look at that curve, we had

an average flow rate from the first nearly 3000 minutes of the test of 78 1/2 gallons per minute. You can see the curve of the water level that was generated by pumping at that rate.

The end of that portion of the test, as we said, was due to -- we knew that so-called magic point where a certain volume of water was removed from storage and we were going to step rate back. We moved it back to 70 gallons per minute and watched to see it, looked for stabilization at that point. We knew what kind of flow rate we needed for the project, so we wanted to -- we were trying to run a 72-hour test, at least 72 hours to meet what the DOH asked for.

So we figured that instead of waiting for that pumping rate to stabilize, we could suffice to back the pumping rate off a little bit more and it would stabilize quicker, and we wouldn't have to pump for days and days and days. We could get it in a short time after 72 hours. So that final rate showing 63 gallons per minute, we stuck on this well -- R1, for example, we stuck with that rate until it stabilized. That was after 75 hours.

According to DOH protocol, that was accepted, where the last six hours at a constant rate of discharge had to meet certain qualifications regarding fluctuations of the water level based on how much water was in the well to start with. And that graph is shown, I believe, on the next page.

ALJ WISSLER: This first linear graph is just created -- well, you've got a well log someplace that you have been keeping and you just entered that data on this and got this?

MR. TRADER: This data was recorded by a transducer. It automatically records the water level. These are all at ten-minute intervals. (Indicating)

ALJ WISSLER: Okay. But I mean that's -- the transducer collected the data for you, but, I mean, the point is that somebody drew this on the map here?

MR. TRADER: This was done in a program.

DR. GOWAN: There's no manual.

ALJ WISSLER: But there's some

spreadsheet someplace and the data points are collected and are represented here?

MR. TRADER: Right. They're automatically collected by the transducer and downloaded.

ALJ WISSLER: Okay.

MR. TRADER: The last six hours of this graph at 63 gallons per minute is shown on the following page, I believe. And that shows the final six hours of pumping at Well R1, and that was at 63 gallons per minute.

What you see there are ten-minute intervals. You see where each of the points are taken that represent a water level at a ten-minute interval during that six hours. The two horizontal lines you see there, it says 0.995 feet, that is in order to show the fluctuation amount that was allowed by the DOH protocol. So based on the total amount of water in the well, there is 0.5 feet fluctuation allowed for every 100 feet of water in the well at the start of the test.

So based on those parameters, you end up with 0.995, and what this graph is showing

is that these data points generally plot right in between those two brackets, and it's fluctuating up and down.

The Ulster County DOH personnel were on site during the last two hours of this test and agreed this met with their qualifications as well.

ALJ WISSLER: This was at 63 gallons per minute?

MR. TRADER: Right.

DR. GOWAN: And one thing we'd like to

point out on this example is Well R1. At the end, the last several readings, it's relatively level. There's no downward trend at the tail end of that.

ALJ WISSLER: From about 4300 minutes to 45, the last couple hundred minutes in there? Is that what you're looking at?

DR. GOWAN: Yes.

MS. BAKNER: Can you please now go to CPC's exhibits which are put up there and explain how -- give us your opinion of those representations.

DR. GOWAN: We're talking about Exhibit 82A.

ALJ WISSLER: Which one are we looking at?

DR. GOWAN: We're looking at 82A.

ALJ WISSLER: 82 and 82A?

DR. GOWAN: Yes. And these represent Mr. Rubin's plots for test Well R1. And these are semi-log plots. That's different from what we were just looking at which is a linear plot.

ALJ WISSLER: Okay. But it's the same data, only plotted differently?

DR. GOWAN: That's correct.

ALJ WISSLER: Okay.

DR. GOWAN: And what this does, of course, is as you get further on the test, the X axis becomes tighter for a different interval of time, so the data is scrunched up together.

ALJ WISSLER: It's a semi-log.

DR. GOWAN: That's right, correct.

And what has happened here is you really mask that end. You can't see very well the end point where it's leveled off or stabilized. And actually, in two of our wells it actually came up a little bit. It's very

hard to see on here. And unfortunately, what Mr. Rubin has done is he has plotted these blue lines showing a steep renewed aquifer drawdown, which is actually covering over that tiny little tail of stabilization, so you can't really see it on these curves.

MS. BAKNER: So in your opinion, would a graph like that have been useful to the regulatory agencies who were trying to look at whether it stabilized during that last six-hour period?

DR. GOWAN: No. They would not -- from this graph, the way this is plotted, there's no way they would have been able to make that determination.

ALJ WISSLER: Which format did they require, the linear or semi-log?

DR. GOWAN: The linear plot.

ALJ WISSLER: I mean, that's what the regs require?

DR. GOWAN: No, that's not required.

MS. BAKNER: Let me repeat my

question. Here is my question to Dr. Gowan. It was: If you used the semi-log plots like Mr. Rubin did here, would it have been any

help to the agencies who have to review your report, would it have been any assistance to them in looking at that critical last six-hour period?

ALJ WISSLER: I understand that. But my question is just a more general question, is when you make application for these things, does DOH or somebody require that the format you use is a linear format with this or you use a semi-log format?

MS. BAKNER: There are no regulatory requirements related to that.

ALJ WISSLER: Okay.

MR. TRADER: I would also like to point out, this is from Well R1, the final six hours. What you're seeing here, this entire time period is condensed into basically the width of this thick blue line. You take the entire interval here and put it down almost to one dot. It's almost impossible to see. (Indicating)

ALJ WISSLER: Referring to CPC 82A.

MR. TRADER: Right.

ALJ WISSLER: The set of data points most to the right side of the graph.

MR. TRADER: Correct. This data is

not displayed on this graph, only the last maybe 1/16th of an inch is shown. And that represents the same interval of time.

MS. BAKNER: To Dr. Gowan and Mr. Trader, Mr. Rubin indicates that stabilization was never achieved during your April 2004 test. Do you agree with that statement?

DR. GOWAN: No, we disagree with that.

MS. BAKNER: Can you explain why you feel stabilization was reached.

DR. GOWAN: Because the graphs either show that it's level, the linear plots show that it's level, or actually climbing. Two of them, I believe the R2 and R3, I believe, the water level was actually rising at the end of the test.

MS. BAKNER: There was some suggestion made yesterday that you were cutting back on the pumping throughout the course of your test in some way to manipulate the water levels so that stabilization could artificially be achieved. Can you explain why that is not the case?

DR. GOWAN: I have previously explained that we were trying to remove the storage, trying to stress, get the tests further along so we're stressing the aquifer, and that's what we did.

MS. BAKNER: So you're confident that this is a stabilized pumping rate that can be achieved using these three wells?

DR. GOWAN: Yes.

ALJ WISSLER: 63 gallons per minute?

DR. GOWAN: 63 gallons per minute for the one.

Steve, could you say what the other rates were?

MS. BAKNER: It's on the chart.

MR. TRADER: Yeah, it's on the chart.

We have 74 1/2 gallons a minute and 11 1/2 gallons a minute for Wells R2 and R3, respectively.

DR. GOWAN: And that's the total 149 gallons a minute for the well field.

ALJ WISSLER: Not counting Silo A?

DR. GOWAN: Correct.

MR. RUZOW: And pumping all those three wells simultaneously.

DR. GOWAN: Correct.

ALJ WISSLER: At those rates?

DR. GOWAN: Yes.

MS. BAKNER: Does your Honor have any more questions about that?

ALJ WISSLER: No.

MS. BAKNER: I want to move now to Dr. Michalski's discussion of Well Point 1, and your monitoring of Well Point 1 during the simultaneous R1, R2 and R3 well pump tests.

Specifically, he seems to indicate that there was a half-foot drop of water in

Well Point 1 during the simultaneous pump test and he that attributes that to the pump test. Do you agree with that?

MR. TRADER: No.

MS. BAKNER: Can you explain why?

MR. RUZOW: If you're going to reference a document, you need to direct the Judge to it.

MR. TRADER: We're looking at Exhibit 51B, the pumping test report for Well R1, R2, R3 which is Exhibit E, and specifically Figure 4 of that report.

The figure shows when the pumping test

was conducted, between April 7th and April 10th of 2004. You can see that by the arrowed bracketed margins there. The well point in question is a monitoring point of the water table. The upper two series of data points show the Birch Creek gauges. That's SG1 and SG2. These are approximately daily measurements that were collected at those points. You can see now it's falling and rising and going along. (Indicating)

There was a precipitation event on April 1st of 2004 of 1.4 inches. You can see the response of Birch Creek. It rose a little bit after that. You can see that in the SG1 and SG2 data, which is the blue diamonds and the pink squares. The precipitation event is also reflected in the data points on this figure for the shallow well points, namely well points WP1 and WP3. The water levels in those well points began to rise as well in response to the precipitation event.

Well Point 1 continued to rise all the way up until April 5th. After April 5th, the water level in Well Point 1 began to fall. There are two triangles for WP1 shown on

April 7th. One of those triangles was collected before the pumping test started. Those two triangles almost totally overlap each other. You can see there is a little bit of the bottom of the triangle, looks a little thicker. There's actually two triangles there. I have to refer to the table that that data actually exists in. (Indicating)

Table 2, which is three pages back from there, that shows the Well Point 1 data. And if you look down at the data point for April 5th, you'll see it says 6.8. It began falling. April 6th, it says 6.85. That means it's further down to the water. April 7th has two entries there, one was collected 30 minutes prior to the pumping test, and the water level in that well point had dropped to 7.2. It continued to drop from that point forward in time until April 10th -- through April 10th, it dropped. There was no measurement collected on April 11th. The last one showed here shows it to have come up slightly. (Indicating)

So WP1 was already dropping in its
water level prior to the pumping test.

There's no reason to expect that that was in relation to the pumping test.
MS. BAKNER: What do you expect that it was in relation to?
MR. TRADER: Well, Well Point 1 of the well points actually had a larger response to the precipitation event. It's also the same well that has the most drop in water level after the precipitation event. So I don't know the exact reason for that. It may have to do with its proximity to the creek.
MS. BAKNER: Dr. Gowan, are you confident that that drop in Well Point 1 was not related to the simultaneous well pumping test?
DR. GOWAN: Yes, I am. And it's not only looking at the data and having the reason, being the precipitation and the changes in creek level, but also the geology supports this because we know we have got a very thick sequence of low permeable material between those well points in the water table and the deep aquifer system for the pumping tests.
ALJ WISSLER: How do we know that?

DR. GOWAN: Based on the geologic logs from the drilling of R1, R2 and R3.
MS. BAKNER: During the course of the

testimony yesterday, I believe that both Dr. Michalski and Mr. Rubin made the statement that we are mining water for this project. Can you explain what that means.

DR. GOWAN: Yes. Mining of water, it's a term just like what you use in mining of, say, sand or gravel or rock. It's a removal of a resource that is not going to be returned. It's a permanent, or in the case of some water table aquifers, it's a great enough removal so that that resource is going to be taken out of or reduce the point where it will no longer be usable. And there's some really good examples of this in the country. For example, the Ogallala Aquifer. That's a major aquifer in the High Plains in which there's a tremendous amount of extraction going on. And that extraction -- that water is being extracted at a higher rate than the recharge, so water levels are dropping and there's going to be a point in time when that resource will no longer be available. Of course, it does

have recharge. Once that's reached a reduced level, it may take hundreds of years. And I don't know the exact -- I know people studied this -- I don't know the exact amount of time, but it will take a very long time for those water levels to get back.

This also happens in combined aquifers. For example, the Wilcox Aquifer in

Texas, which has been the major resource for the City of Houston. They have been overpumping that aquifer for many decades, and in that case, being a confined aquifer, it yields its water through compression of the aquifer, and it's actually squeezed together. They're having tremendous settlement problems in Houston. That aquifer will never recover that.

That's not the situation that we see here at the Rosenthal well field. This aquifer does receive recharge, and in fact, we ran a pumping test in 2002, the combined R1 and R2 tests, and the water levels -- at the time we ran the three well tests in 2004, the water levels had come up over 4 feet above where they were at the start of that test in

2002. So we had full recharge, plus additional recharge. And it was back onto its normal cyclic variability that an aquifer goes through, depending on natural recharge and discharge.

After running the test in April 2004, we've since had full recovery. And I know Mr. Frisenda has been collecting his water level data ever since we ran the test. I don't know what those numbers are. I haven't looked at them, but I understand we've had full recovery since April. It took a fair amount of time because we removed storage and we don't get that direct vertical recharge.

The recharge has to come from beyond that confined area. So it takes time for that water to move in, but it does. It receives a constant recharge.

ALJ WISSLER: Is it recharged now? I mean, how long did it take to recharge?

DR. GOWAN: I haven't looked at the data, so I don't know how long it took. We know that it was taking a considerable amount of time because we only got --

MR. TRADER: -- days.

MS. BAKNER: Three days after, how much had it recharged to? I believe you have that number here. Eighty --

MR. TRADER: It depends on the well.

MR. RUZOW: Each well is different.

MS. BAKNER: Each well is different.

ALJ WISSLER: One was about 3700 minutes, and the other one was about 4400 or something like that.

MS. BAKNER: Okay. Here you go.

DR. GOWAN: We can take some time and put that together.

MR. RUZOW: Well, let's come back -- here, let's go back to that.

ALJ WISSLER: I mean, it exists somewhere within the materials, correct, the recovery time?

MS. BAKNER: Up to a certain point.

ALJ WISSLER: The recovery time?

MR. TRADER: To a point.

As an example, one of the wells might have recovered 87 percent by a certain date. That kind of information is in there.

ALJ WISSLER: But beyond that, no?

MR. TRADER: Correct.

ALJ WISSLER: Okay.

MR. TRADER: But with the digital levels, it could be calculated.

MS. BAKNER: I just want to point out Applicant's Exhibit 125, which are these photographs of the Pepacton Reservoir levels in December 20th, 2001. They were taken from the DEP's website. And they basically show conditions in the reservoirs at roughly the time we undertook some of our well testing. And that's just to show that it was indeed during a time of stress for the environment generally because of lack of water.

And in your experience then, was it a fortuitous or a good thing that we did the simultaneous well pump tests and a lot of this testing during a drought period?

DR. GOWAN: Yes.

ALJ WISSLER: When exactly were these tests done, the date?

MR. TRADER: The simultaneous test for Well R1 and R2 was done in September of 2002, 72-hour simultaneous test of Well R1 and R2. That was a constant rate test in September of 2002. Ulster County was under a drought watch at that point.

The earlier tests at R2, the individual test at R2, was performed in November of 2001, which was also a drought watch. I believe these pictures were from December of that same year.

Well R1, the individual test performed on that was in September of 2002, and that was also a drought watch.

MR. RUZOW: Alpha Geoscience's involvement and Delaware Engineering's involvement in measurements of stream flow and wells for the project site have extended over a several year period of time and continuing, it continues up to this year as well; is that correct?

MR. TRADER: Flow measurements generally were from between -- throughout January of 2000 through December of 2001. We do have some data that's collected during pumping tests that would represent flows of some of the springs and streams.

MR. RUZOW: But my question goes to sort of the length of the study. This is not a job, if you will, where you come in for a

couple of months, look at some data, do a test and rely on that particular test or particular segment of data that's been collected. You've had an opportunity to review this information over a fairly long period of time; is that correct?

MR. TRADER: That's correct, yes.

DR. GOWAN: Yes.

MR. RUZOW: And over cyclical periods of time in terms of levels of precipitation and groundwater levels changing due to the changes in precipitation both in drought watch/warning periods of time, as well as in a more heavily -- more normal season. Does that help you in making judgments about the adequacy of the supply for purposes of the project's demands?

DR. GOWAN: Yes, it does.

We can see the behavior of the aquifer in the springs and everything under all these various conditions, and that really goes to answering these questions. In fact, I know we have given a few examples in the last two days. A good example, I believe, would be Silo A where we projected a lower flow.

And correct me if I'm wrong, Steve, but we projected a lower flow, but we were able to measure this during a drought period, and we realized that a higher flow would be sustained during a drought.

MR. TRADER: And that would be Bonnie View Springs.

MS. BAKNER: No, Silo A.

DR. GOWAN: Silo A, at 69 gallons a minute.

MR. TRADER: Oh, I see what you're saying.

MR. RUZOW: And your involvement in the review of data for the Pine Hill Water Company and Delaware Engineering's review of both Pine Hill Water Company data in an active sense, not simply getting a set of data and reviewing it from a critique point of view, and involvement in the Fleischmanns water system and understanding that system, does that help you reach a judgment also with regard to the adequacy of those supplies over an extended period of time for a project like this?

MR. TRADER: Yes.

DR. GOWAN: Yes, it does.

MR. RUZOW: Is this unusual in the sense of the kind of work that is done for projects or even municipal supplies in terms of the overall length of time extending several years now in a project review?

DR. GOWAN: Yes, it is. Typically, when we're doing municipal work on very limited budgets, we do a proposal. We come in, whatever it is, pumping tests, evaluate their system, turn in a report, and that's essentially the end of the project. Those are often a snapshot in time.

MS. BAKNER: Okay. Just to get back to the issue of mining water for a second.

You have mentioned that this area draws from a very large area for a recharge of water for this bedrock aquifer. What are the sources of recharge that are associated with this project that makes you confident that we're not just taking water out of the system?

DR. GOWAN: Recharge occurs, of course, through the whole basin, and in that particular area where the well field is, we have recharge that's coming through the

bedrock and valley side walls. We have got groundwater moving down the valley from all of the upland areas and valley areas up valley, and we're also going to get recharge spread out through the streams and so forth in the surface water that's passing through the system.

MS. BAKNER: And what about the recharge from the water that we're sort of taking and moving up to the top of the mountain, in what ways are we going to use it that contribute to recharge?

DR. GOWAN: That water, of course, and I -- maybe others can speak to it a little better than I. Wildacres, for example, water is going to be used, effluent is going to be used for irrigation purposes, and some of it, I understand, is going to be released. I believe it's in Belle 5. And this water will either recharge the groundwater or it will flow off as surface water, and both will help

to maintain or actually increase the baseflow for the groundwater and surface water issues.
Big Indian will have the same kind of situation. We're recycling that water that's

already passed out of that part of the basin, if you will. We're bringing it back into the head of the basin.
MR. RUZOW: And that example, that condition, is also true for the Belleayre Ski Center; is it not?
DR. GOWAN: That's correct.
In their case, of course, it's primarily with the snowmaking period, and that water adds significantly to recharge and -- in the spring, both surface water and groundwater. Of course, the water that enters the surface water system is going to leave fairly quickly in the spring, but groundwater takes a considerable amount of time to move through the system.
MR. RUZOW: And does that benefit the Pine Hill water system, the municipal water system as well?
DR. GOWAN: Yes.
MS. BAKNER: Yesterday there were some discussion of things called S and T. And I just wanted you to address, given the characteristics of the geological setting, how useful are those concepts for this project?

DR. GOWAN: All right. The S stands for storativity and T is transmissivity, and these are aquifer parameters. We heard some testimony yesterday about how these can be used to determine drawdown of distance and you've got to make an assumption. They're best used when you've got a fairly uniform system. In other words, if you've got a fractured bedrock system, it works best if you've got the same water-bearing capability, both in storage and also in the ability to move water throughout that system if you've got a regular pattern and it's a very broad-based system. Under that kind of condition -- and actually, I should say that sand and gravel aquifer is the best way to use these terms, but you can also apply them in a bedrock with that assumption, uniformity.

Well, in this particular situation, we don't have uniformity at all. We know we've got large variations and the ability of fractures to transmit water, and we know that just because we have a fracture at one well in the well field, that same fracture may not appear in one of the other wells, so we don't

have good continuity across this system in fractures.

And in the physical parameters of this aquifer, we have an aquifer that occupies a moderately narrow valley, and it's elongate up and down valley. And at the edges we've got, again, differences in fracture density.

So when you go to apply these values of storativity and transmissivity through trying to calculate drawdown, you're not going to come up with anything that's real. You're not going to get a number that you can say, all right, I'm going to go out 3000 feet, I predicted the drawdown is going to be such and such. It would be an accident for you to go out and put a well down there and find that amount of drawdown because we just don't have that kind of continuity in this system. So it's not a very useful tool in this particular aquifer setting.

MR. RUZOW: Are pump tests a better tool?

DR. GOWAN: Yes, pump tests and direct observations.

I know there were some comments

yesterday about lack of observation wells. We had observation wells. We had observation wells close and at great distance, and we are very comfortable that that information is giving us at least a sense of what kind of drawdown characteristics we have.

And again, admittedly, if we moved one of these wells over, we may see a different pattern, but we feel very confident in what our assessment of the impacts will be on this system based on the pumping that we did.

MS. BAKNER: Dr. Gowan, could you go back up and go through, sort of, where you agree and disagree with Dr. Michalski's characterization of the geology of the setting.

DR. GOWAN: I believe the best place to start is in this diagram that Dr. Michalski included in his submissions. It's Exhibit 80, page 4.

This is the diagram out of the Reynolds publication, and this diagram shows the stacked system, the sandstones and the shales, intervening shales, and I agree with this concept. This is a representation,

reasonable representation, schematic of the geology we see in this area.

And one thing I'd like to point out is that on this diagram, he's actually, in a conceptual format, Reynolds, he's showing a higher density of fracturing near the surface, closer to the surface than at depth. That's really where your primary flow is going to be. So I agree with that concept.

ALJ WISSLER: That's consistent with your exhibit right there?

DR. GOWAN: Yes, it's consistent with ours.

What we didn't do is we don't show it conceptually, we don't show those shale areas. We're just lumping all the bedrock together. And we also conceptually show that higher density of fractures at the top.

ALJ WISSLER: At this point, you're referring to Exhibit --

MR. RUZOW: 99B.

DR. GOWAN: One of the primary areas of disagreement between us and Dr. Michalski is he hypothesized the presence of this deep-seated bedding plane fracture that passes

through the Highmount area that would connect the wells at Fleischmanns with the Pine Hill water system and Crystal Spring Brook and also Birch Creek.

ALJ WISSLER: Are we looking specifically at page 18 of Dr. Michalski's report? Is this what you've been referring to?

MS. BAKNER: No.

ALJ WISSLER: When you're talking about that shale?

DR. GOWAN: No, I'm referring to -- I don't know if in his discussion and one of his text diagrams or --

MR. TRADER: This is part of it right here, Sam. (Indicating)

ALJ WISSLER: What page is that?

MR. RUZOW: That was page 18.

ALJ WISSLER: Yes. That's not what you're talking about when you talk about this?

DR. GOWAN: Page 18 is really talking about -- that's -- 18 is representing down by

our Rosenthal test, and that's not --
ALJ WISSLER: You're talking about a geologic formation, a shale layer which is --

DR. GOWAN: He's talking about -- not necessarily about a shale layer in specific; he's talking about a bedding plane separation that would extend through the Highmount and connect the systems, such that when you're pumping water over here at Fleischmanns, you see one of these big walls, and when you increase the pumping over here, you're going to draw down the water out of Crystal Spring Brook and also from the Pine Hill water supply system.
MS. BAKNER: That's addressed on page 12 of Dr. Michalski's document where he refers to coalescing cones of depression all the way from the Rosenthal wells through to Fleischmanns.
ALJ WISSLER: Is that right, Doctor?
DR. GOWAN: Yes.
ALJ WISSLER: Okay.
DR. GOWAN: And we strongly disagree with that because of the lack of permeability in any fractures that are at depth underneath that Highmount area.
MS. BAKNER: Because the lack of permeability at depth?

DR. GOWAN: Because of the lack of permeability at depth, any fractures that may

even appear at depth, because we know that
even if they are there, they're very tight.

ALJ WISSLER: Because they're being
compressed by the land above it.

DR. GOWAN: Being compressed and they
also haven't been subjected to weathering or
stress relief. Our evidence for this, which
is consistent with our model of a thinner zone
of fracturing in your highland areas, deeper
penetration of fracturing and more fracturing
at depth is the fact that the wells that we
see in the highlands are very low producers.
In fact, many of these are very deep wells,
and they're drilled deep in many cases just to
add storage. And I know some of these only
produce 2 to 3 gallons per minute. They're
very low producers.

As you proceed down, let's say we're
going towards the east through the Pine Hill
system towards R1 and R2, you're seeing a
progressive increase in your ability of your
wells to yield higher quantities of water.
We're seeing better fracture connection.

And we see the same thing as you go
over towards Fleischmanns. The wells are able
to produce much higher quantities of water
because of better fracturing, deeper
penetration of the fractures and better access
to recharge. So that's a basic difference in
our opinion.

MS. BAKNER: Okay. I just wanted to add also for the record that Dr. Michalski's comments on groundwater issues of DEIS for Belleayre Resort, which was attached to the CPC petition, also contains the theory that he discussed yesterday regarding this connection, and that's on page 3, Paragraph 2.

ALJ WISSLER: Exhibit B?

MS. BAKNER: Yes. Page 3, paragraph 2.

ALJ WISSLER: An anomalous depth of water of -- that paragraph?

MS. BAKNER: Yes.

DR. GOWAN: In this paragraph, he also relates the ski wells to this withdrawal. The Belleayre Ski Resort wells are on the east side of this Highmount divide.

MS. BAKNER: Dr. Gowan, does that also

represent the divide between the Delaware River Basin and the Birch Creek and the Esopus Basin?

DR. GOWAN: Yes.

MS. BAKNER: Is there anything else you would like to add to that, or are you all set?

DR. GOWAN: I think I'm all set.

MS. BAKNER: Your Honor, we'll move ahead to how we calculated water demand so that we know from an engineering perspective how much water we need and if we have enough water to supply it.

And, Gary, if you could come up briefly and explain how water demand was calculated and how it relates to the quantity of water that's going to be supplied by the wells.

MR. KERZIC: What I have for today, your Honor, are Table 1 from the conceptual design reports, which I believe are Applicant's Exhibit 51 -- there's one for Big Indian and one for Wildacres.

ALJ WISSLER: Which one are we looking at?

MR. KERZIC: The methodology for petroleum demand.

MR. RUZOW: 51B and 51D.

MS. BAKNER: Yes.

Why don't you point out to the Judge where you are.

MR. KERZIC: These are enlarged versions of those tables. (Indicating)

The way we calculated the potable water demand for each of the resorts is by -- it's best to explain it using this table going from left to right across the table as I can explain what the different columns represent.

The first column is a listing of all the different types of facilities at each resort that would use potable water. For instance, a lodge, restaurants, retail stores, spa, pool and so on. The next column from the left is a listing of the different types of units within these facilities where potable water would be used. For instance, a lodge, it's a room; restaurant, it's a patron; in the case of meeting space, it's square footage.

If you look at the third column, we list the total number of units in each of

these facilities. And I want to stress that is the total number of units in each of the facilities.

The fourth column is the daily demand or the daily amount of water that each one of those units would use. And we derive that number from a New York State Department of Health publication entitled, Rural Water Supply. And in that publication, they had a table which lists a number of different types of facilities. And if you were to look at that table, you would see that they list facilities that don't exactly line up with what we have here. For instance, they don't list a lodge, they list dwellings and apartments. So what we had to do was we had to use our judgment and determine which listings in that table were most closely related to the types of facilities that we will have.

ALJ WISSLER: There's no listing there for hotels or anything like that?

MR. KERZIC: No, but there's a listing for apartments, which was very similar based on, you know, what we felt was a reasonable

daily water usage. And that's represented in the rightmost column. If you were to look at the table out of the Rural Water Supply publication, you would see these references that we show in the rightmost column.

And the fifth column from the left is an estimate of the water demand, and that's simply the product of the total number of units times how much water each unit would consume in a day. For instance, the lodging units for Wildacres, there are 200 units without kitchens. Those would use approximately 120 gallons per day. When you do the math, it comes out to 24,000 gallons per day.

And the same thing with lodging units. There would be 50 units with kitchens. Those would use a bit more water at 150 gallons per unit per day. And when you do the math, it comes out to 7,500 gallons per day for those units.

If you look at the bottom of the tables, the numbers are all totaled down to give you a total potable water demand on a daily basis. And because we've used the total

number of units in this estimate, we're calling this estimate an average daily demand, but it is, in fact, a maximum daily demand

because we're using the total number of units. We're not assuming that a certain occupancy -- we're assuming it is going to be 100 percent occupancy, and we're calling that total number our average daily demand. That's the common methodology for both resorts, both tables.
We estimate a maximum daily demand by then putting a multiplier of 1.65 on that, and that's a common multiplier that's used. So you can see from this that our estimates, what we're calling an average daily demand or maximum daily demand, are pretty much exaggerated. And that gives us a comfort level that we are more or less overestimating how much water we will need.
MS. BAKNER: Mr. Kerzic, can you explain how the age of the data is relevant relating to water-saving fixtures?
MR. KERZIC: Yes. The information that's provided in this publication, Rural Water Supply, is several years old. I think it dates back to the early '90s, or possibly

before then. And it doesn't reflect modern day plumbing fixtures. This will be a new resort. It will be required to use what's called water-saving fixtures.
As an example, an old style toilet would use anywhere between 3 to 5 gallons for flush, but a new toilet by code can only use 1.6 gallons. So these numbers, we don't feel reflect modern day construction. And because

of that, it is an overestimation again of what the actual water demand would be.

In some cases, we would make an adjustment to these numbers and say that whatever we total here, we would say you're only going to use 80 percent of that because you're going to realize a savings of as much as 20 percent if you use water-saving fixtures.

MS. BAKNER: Just to be clear, we did not do that.

MR. KERZIC: We did not do that. So our numbers are overestimation based on the fact that we're calling average day assuming total occupancy of units, and also we don't make an adjustment for the fact that

water-saving fixtures would be used.

MS. BAKNER: During the course of the review by the Department of Health and the Department of Environmental Conservation, did you or anyone in your staff look at actual occupancy rates for resorts to verify that this overestimation was existing?

MR. KERZIC: Yes. We received some data from a resort association that tracks that type of information. I believe they gave us some actual information from five or six resorts in this part of the country. And from that data, we were able to determine that a facility such as this would have an average

occupancy of between 60 and 70 percent. So we're assuming 100 percent, but in reality, it would be much less than that.
MS. BAKNER: Any questions, your Honor?
ALJ WISSLER: No.
MR. RUZOW: Your Honor, I think that information is consistent with the offers of proof from HVS International, I believe Erich Baum's testimony about the variations in occupancy rates, and what their stabilized --

I believe they used the expression of stabilized rate of occupancy, was around 65 percent for their projections, so the water usage is consistent with the levels of occupancy rate.
MS. BAKNER: Thank you, Mr. Kerzic.
ALJ WISSLER: So if you had 60 percent occupancy, are you saying that in the bottom line total figure, you would be taking 60 percent of that, or would that only affect the lodging units?
MR. KERZIC: I would say you could take 60 percent. The lodging units, sir, would use the most amount of water, but I would say you could take 60 percent of the total because you could assume that's a spa --
ALJ WISSLER: That everything else would be proportionately less.
MR. KERZIC: Exactly.
MS. BAKNER: Mr. Franke, if you could

come forward for us and briefly review the
manner in which we are using the same water
supply for both irrigation and potable water
purposes.
MR. FRANKE: The information I'll be

referring to comes from Section 3.2,
Applicant's 51B, Conceptual Design Report, and
specifically page 7, the accompanying table is
behind the blue divider sheet. I'll refer to
Table 2, entitled, "Irrigation Water Supply
and Demand, Big Indian Country Club."
As Ms. Bakner mentioned, there will
not be a separate or different source for
irrigation water for either the Big Indian
Resort or the Wildacres Resort. Both will
have, as their ultimate supply, the potable
water supply.
As we mentioned previously, we're
proposing to use recycled or treated effluent
for irrigating the golf courses. In analyzing
the irrigation water supply, we looked at
three factors. We looked at supply, we looked
at demand, we also looked at storage that's
available within the irrigation ponds.
On the supply side of the equation, we
used the values that Mr. Kerzic was just
speaking of, the average daily demand. For
the Big Indian Plateau, that equates to
115,000 gallons per day of potable water that
would then be treated within our wastewater

treatment plant and would be pumped to the irrigation ponds. On those days when our actual occupancy may create a demand that is lower than 115,000 --

ALJ WISSLER: So you're at 60 percent occupancy?

MR. FRANKE: Right. We still have a system that's capable of meeting that full demand.

So we've set up the piping system so that the amount of water below that 115,000 gallons a day that's not being used for potable can be piped directly to the irrigation pond, raw water. So it's still using the same total capacity of the system; it's just that that water isn't being processed by humans or by the treatment plant, so to speak.

So you would have the processed water of the 60 percent occupancy, plus the unused water from that 115,000 gallons a day.

MR. RUZOW: If you needed it.

ALJ WISSLER: As you needed it.

MR. FRANKE: Exactly. That's the supply side.

On the demand side, we looked at two different sources, the first being a publication by the Toro Company, T-O-R-O, they're one of the leading manufacturers of irrigation equipment in the United States.

They have a publication that deals with all United States and Canada and provides climate data. It provides rainfall amounts and your evapotranspiration amounts on a monthly basis.

ALJ WISSLER: For what? For the whole country?

MR. FRANKE: For the whole country.

And for New York State, they have ten different regions. So New York State itself is broken into ten different regions. So we would fall within the Hudson Valley region within New York State.

As I mentioned, they have monthly rainfall totals and evapotranspiration totals.

ALJ WISSLER: Did you rely on those totals?

MR. FRANKE: Initially, just to figure out what months evaporation was exceeding precipitation, and those months turned out to be, as expected, June, July and August. And

we have specific values for the rainfall and pan evaporation data.

ALJ WISSLER: Reflected in Table 2.

MR. FRANKE: Reflected, correct, in Table 2.

Armed with this, we consulted the Northeast Regional Climate Data Center and obtained the 30-year or nearly 30 years' worth of data for pan evaporation, precipitation, for the nearest station that had both sets of data. That turned out to be the Downsville NOAA station, which is on the Pepacton Reservoir approximately 26 miles from the site.

And using those long-term more local data, we also calculated the amounts that evapotranspiration exceeded rainfall or the irrigation demand for those months. It turns out that the period was a little bit longer than the Toro data. It was actually May through August, instead of June through August. But the actual amounts in each one of the months, amount that evapotranspiration exceeded precipitation, was somewhat less. A slightly longer period but a slightly less

amount.

So using the supply numbers for Big Indian, 115,000 gallons a day, extrapolating that for a full month, you get a monthly total of what's available. Using the weather data, and irrigating 100 acres of golf course, we basically ran a balance sheet to supply your demand, along with the 7 1/2 million gallons of storage that are in the irrigation ponds, and that's what's summarized in Table 2.

Depending on whether you use the Toro data, which is in Scenario 1 of Table 2, or whether you use the Downsville data, which is Scenario 2 in Table 2, basically the balance sheet shows that with supply and demand and the available storage, we will have enough water to irrigate the golf course throughout the growing season.

Scenario 1 under the sum, there's a net deficit of about 4.5 million gallons, but given our storage of 7 1/2 million gallons that we're starting with -- in balance, we will have enough water.

Using Scenario 2 with more local Downsville data, there's actually an excess

amount. You see the positive number of approximately 2.5 million gallons. So our system has the ability to supply 2.5 million gallons more than actually what would be required over the course of the summer.

MS. BAKNER: Just a couple of quick questions. Can you explain -- in your opinion, are you going to have enough irrigation water available to you during the grow-in of the golf course?

MR. FRANKE: Yeah, because as we discussed previously, construction will be phased over a number of years. We won't be growing in the entire golf course or 18 holes at one time since it will be nine holes at a time. Establishment can use more water typically than what happens during your operational phase, but that's only if you're growing in the entire 18 holes at once.

MS. BAKNER: What demands in terms of people drinking them will there be at that time?

MR. FRANKE: Right. There will be no demand for potable water during the grow-in phase, so that water also will be available.

MS. BAKNER: And the first things that are to be built are limited totally to the hotel, so that all of the capacity to be provided to the lodging units for the first three to --

MR. FRANKE: Three to eight years.

MS. BAKNER: -- eight years won't be being drunk by people. It will be available for irrigation?

MR. FRANKE: Regardless, the full total amount of that average daily demand will be available one way or another, either as raw water or as processed water.

MR. RUZOW: And the irrigation ponds are part of the first phase of the project; correct?

MR. FRANKE: Yes. They will be built and filled prior to construction so that water will be there ready and waiting.

MS. BAKNER: Did the Department of Health make any request or the Department of Environmental Conservation with respect to only taking irrigation water out of the irrigation ponds?

MR. FRANKE: Correct, yes. That is, I

believe, a condition of the permit. If not a condition, it certainly was discussed. That's the way the system has been designed. Any water for irrigation will come from the ponds, will not be taken directly from the wells, and put on the golf course. It will always come out of the ponds.

MS. BAKNER: And, Mr. Kerzic, at what point or how is the irrigation system completely separate from the potable water distribution system?

MR. KERZIC: Water will be -- water for irrigation will be pumped from the sources to the ponds, and then a separate pumping system will pump it into a separate irrigation distribution system.

MS. BAKNER: From the wet well where the Rosenthal wells -- where the water is being gathered, do you have a separate pipe going up to transfer the irrigation water?

MR. KERZIC: Yes. In the case of Big Indian in the Rosenthal well field, water will be pumped from the Rosenthal wells into a concrete basin, and from there the water could be pumped either through a treatment system,

disinfection system, into a potable water distribution system, or it could be pumped directly without treatment into the irrigation system. It's a separate series of pipes, no interconnection whatsoever so there's no possibility for untreated non-potable water being mixed with treated potable water.

MS. BAKNER: Were the regulatory agencies also concerned about effluent, treated effluent in the irrigation ponds somehow being drawn out for potable water purposes? Is that another reason why the systems are completely separate?

MR. KERZIC: Yes. There's no physical connection between any potable system and any non-potable system, so there's no chance for any non-potable water being drawn into the potable system. And that's both with the irrigation water that would come from the wells as well as the effluent recycled from the wastewater treatment plant.

MS. BAKNER: Both you gentlemen, we heard several times yesterday from Dr. Michalski that we were going to be pumping this system at a constant rate of 149 g.p.m.

while this resort is up and operating, and we were going to -- everyday we were going to be pumping that. And I'm hearing a totally different description from you guys. Can you explain to me?

MR. FRANKE: I guess to start off, the 115,000 g.p.d., gallons per day, average daily demand at Big Indian equates to approximately 80 gallons a minute, as opposed to the 149 number that's been talked about before.

MR. KERZIC: In the case of the potable water distribution system, the system will consist of a series of pipes as well as a storage tank. And the storage tank for each resort will be sized so that it will be able to store more than two days' worth of water. And that's assuming an average daily demand at numbers that are on the table.

So at that usage, the tank would only be filled every two days or so, so the pumps would only be on every two days. The way it works is the pumps kick on automatically, they fill the tank, and then water is drawn in and the pump go off when the tank is full. And the water level just drops until it hits a low

level mark and then the pumps are then signaled to kick back on again. So you'll have more than two days' worth of storage available. And once that's drawn down to the lower level, then the tank will be refilled. And that storage amount is more than two days.

MR. RUZOW: Mr. Franke, you have familiarity with other golf courses that utilize effluent for irrigation purposes. Can you just explain that? You're comfortable that the irrigation water as a source will meet the golf course's needs, and therefore, it will not need to put a greater demand on an alternate potable line?

MR. FRANKE: Right. There's two courses that come to mind right away, both in the northern part of the state; a golf course in Lake Placid, New York, and also a golf course in Canton, New York. Both utilize tertiary-treated wastewater as their primary irrigation water supply. Lake Placid was the first of the two courses to use it, and there has been, I believe, DEC-sponsored studies of quality in the area that demonstrate the safety and the efficiency of using treated

wastewater on golf courses in New York.

MS. BAKNER: Is there anything else you two would like to add?

MR. KERZIC: No.

MR. FRANKE: No.

MS. BAKNER: Any questions that you have, your Honor?

ALJ WISSLER: No.

MS. BAKNER: Then that would be all that we have.

ALJ WISSLER: And that would take us to noon. Do we want to break for lunch?

MR. GERSTMAN: Whatever is convenient, Judge. We certainly want to complete today. I understand DEC staff has half an hour to an hour response.

MS. KREBS: A half hour, 45 minutes probably.

MR. GERSTMAN: And we have another hour and a half to two at the most, so we should be okay.

ALJ WISSLER: Why don't we break now -- do we want to break now?

MS. KREBS: That will be fine, your Honor, whatever you prefer.

ALJ WISSLER: Why don't we come back at 12:45.

(12:04 - 1:00 P.M. - LUNCHEON RECESS TAKEN.)

MS. KREBS: I'll mark these exhibits.

("DRAFT PERMIT #2 - 6/25/04" RECEIVED AND MARKED AS DEC EXHIBIT NO. 9, THIS DATE.)

(LETTER DATED 5/10/04 FROM STATE OF NEW YORK DEPARTMENT OF HEALTH RECEIVED AND MARKED AS DEC EXHIBIT NO. 10, THIS DATE.)

(AMBIENT STORMWATER AND MONITORING REQUIREMENTS RECEIVED AND MARKED AS DEC EXHIBIT NO. 7, THIS DATE.)

ALJ WISSLER: Ms. Krebs.

MS. KREBS: Thank you, your Honor.

Yesterday I handed out Exhibit Department Staff 7 to your Honor and counsel. I just want to note for the record, it's entitled, "Ambient and Stormwater Monitoring Requirements," and it's a smaller version of a larger chart which Mr. Bill Mirabile had used during his testimony regarding stormwater.

In addition, your Honor, I have two

other exhibits to put into evidence. Department Staff 9 is an update of the draft water supply permit for the Big Indian Waterworks Corporation, which I have given your Honor and counsel.

There are a few minor changes, your Honor, based on some Department of Health input, and they're highlighted in red.

And Department Staff Exhibit No. 10, your Honor and counsel already have this. It's sent with a cover letter of May 21st, 2004 from me to your Honor and counsel. It's regarding the Ten State Standards. I just wanted to have that in the record.

ALJ WISSLER: Okay. We'll receive those. With respect to Staff's 9, the draft permit, as an Office of Hearings Exhibit, I think we took in water supply permits for both facilities.

MS. KREBS: Yes, we did, your Honor, but there are only changes in the Big Indian.

ALJ WISSLER: Okay. So Office of Hearings 11 remains as to Wildacres, but as with respect to Big Indian, it is now superseded by Staff's 9?

MS. KREBS: Yes, it is. Thank you.

We're going to have three witnesses, your Honor. First of all, I'll turn to Mr. Michael Holt.

Mr. Holt, if you could indicate where you work and your title please.

MR. HOLT: I'm an Environmental Engineer II with the New York State Department of Environmental Conservation in Albany. I'm a licensed professional engineer in New York State. I have a Bachelor's Degree in Biological Sciences from SUNY Oswego, and a Bachelor's Degree in Civil Engineering from Union College. And I've been working in the public water supply permit program for approximately 15 years.

MS. KREBS: Okay. Can you please state your work duties regarding the water supply permits.

MR. HOLT: My colleague and I coordinate the program from Albany. We assist the different regions and review all sorts of water supply applications. In this particular case, because of the complexity of it and the size of it, we were asked to spend a little

more time on it, and that's what we're representing here today.

MS. KREBS: Okay. I understand you reviewed the DEIS and other application materials?

MR. HOLT: That's correct.

MS. KREBS: And then you also wrote the draft water supply permits for Big Indian and Wildacres?

MR. HOLT: I did.

MS. KREBS: And did you consult with -- other than other Department staff, did you consult with anyone else regarding the permits?

MR. HOLT: Yes. When I drafted the permits, we had several meetings prior to drafting the permits with both the state and county departments of health. The PSC was involved to a lesser extent also, and we collaborated with Mr. Dunn's office, with the state health department, on basically every -- the entire permits.

MS. KREBS: Since there are actually no direct questions concerning the draft water supply permits, I was just going to point out

two conditions, one of which, I guess, has already been addressed. Silo A condition, it's on page 3 of 5 of Department Staff 9. It's regarding the Crystal Spring Brook. I think it's already been commented on, but could you just briefly summarize what that's about.

MR. HOLT: Right. There was basically two concerns here, that the use of Silo A would possibly adversely affect the Pine Hill water district sources, and there is also concerns by the department fishery staff that the use of Silo A would lessen the flow in Birch Creek or Crystal Spring -- Birch Creek -- Crystal Spring Brook, I'm sorry, in that vicinity.

So what I attempted to do here is, if you look at the description of the permit, it allows them to take up to 69 gallons a minute, but I have further limited it here in consultation with the Department of Health and with our fisheries staff to try and ratchet down how much water would be available from that Silo as a drought would occur, and it's basically based on the Tennant method of flow

in the stream. As the stream flow is dropped down, the ability for the Applicant to take water from the Silo is decreased accordingly. And it finally drops down to no more than 10 gallons per minute if the flow in the creek falls below 797, which is 30 percent of the Tennant flow to that creek in that vicinity.

ALJ WISSLER: What does Tennant flow mean?

MR. HOLT: I'm not really the expert on that, but basically, it's a percentage of flow based on average, I believe, that optimizes cold water fishery habitat. So the 30 percent --

ALJ WISSLER: Why is it called Tennant flow, after Harry Tennant who invented it or something like that?

MR. GERSTMAN: That's correct.

MR. HOLT: I also wanted to point out that in the case where the flow did drop below 30 percent, we were in the 10-gallon-per-minute range. I put in additional conditions that would require for the flow to increase for a period of time so you wouldn't be flip-flopping back and forth,

to try to get it up to an established level for an established period of time. So that you wouldn't one day be a 10 and then go to 34, and then you drop back to 10, something like that. So I tried to work that into the condition too.
ALJ WISSLER: Is there specific data that you looked at in the Applicant's application for this water permit that led you to make those adjustments in withdrawal rates?
MR. HOLT: Well, on the fishery side, they had concerns about the flow in the creek, and they wanted us to minimize the use of Silo A during these low flow periods as much as possible.
ALJ WISSLER: Do you know where in the Applicant's application that that data that fisheries may have been concerned with is located, if you know?
MR. HOLT: I couldn't point it out right now. But the Applicant and -- either in DEIS or I think in some of the subsequent documents -- talks about the necessity to cut back flow when flow in the creek -- taken from the Silo, when the flow in the creek drops,

that they would reduce their take from the Silo.
Now, I also corroborated with the Department of Health on that because they had

concerns about the Silo being at least available for some extent during -- if in fact, one of the larger wells at the Rosenthal wells was out of service. It's one of the Ten State Standard requirements. So that's why we -- so that's how we came up with the 10. That was the number that they felt was the minimum amount that they would be comfortable with in a drought, and that was the number that the fisheries people were comfortable as being a minimum amount that they would be taking so that the effect on the creek would be minimized.

MS. KREBS: Understand, your Honor, that the 30 percent Tennant flow, that's not a rigid number. That's the ideal point below which, I believe it's trout, can be affected.

But if your Honor has further questions on that, we can supplement the record or address it during the aquatic habitat portion.

ALJ WISSLER: Okay.

MS. KREBS: And the only other condition I was going to have you speak to, there was a question concerning pumping of wells and the possible effect it could have on residential water supply wells. And I'd just point you to Special Condition No. 14 on page 5 of 5 of Department Staff's Exhibit 9.

MR. HOLT: This is pretty much a

standard condition that we put in all permits
that approve wells where there are private
wells in the vicinity that, you know, there's
a possibility there could be some adverse
effect on. And as you can see, I've tried to
change the wording a little bit to try and
clarify what our real purpose is here. If
somebody's well is lowered by a foot and they
have a 300-foot well, then even though
theoretically it's diminished, is that really
significant. So I tried to change the wording
to be a little bit more clear as far as that
goes.
So basically, what we're telling the
Applicant is that if for some reason you do
significantly make somebody's well

nonproductive, that they need a water supply,
then you have to either provide them water
directly from your service or drill them
another well, or come up with some sort of
other alternative to make sure that they're
not harmed.
ALJ WISSLER: Who makes the
determination that Condition 14 has been
tripped, and what kind of protocol does the
Department have in place to insure that
residents receive the potable water supplies
they need to receive?
MR. HOLT: Basically, if somebody was
affected, they would petition the Department
and say, you know, there is a condition in

this permit and they violated that condition, the Department needs to take action on it. We would contact the permittee and say: What's your position on this. First, we would have to determine whether or not it was a legitimate claim or not, and then we would have to say: Well, okay, what is your proposed remedy of solution now.

If the proposed remedy of solution is acceptable to us; in other words, they say

we'll run a main over to you and connect you up and provide you potable water, not necessarily for free, but I mean we will provide you with a source of supply, and that resident goes: Well, I don't want to buy, I don't want to drink chlorinated water, I want you to redrill my well, then from our standpoint, we would say that that condition had been met. In other words, they had provided a solution. If they did not agree on that type of solution, then they could take further legal action through the court system.

MS. KREBS: Okay. I know, Mr. Holt, you worked in conjunction with other Department staff about the adequacy of the water, so I won't get into that right now. But based on the review of the DEIS, the application and other materials, do you believe the Big Indian and Wildacres permits meet Part 601 requirements?

MR. HOLT: I do. But I would like to say I reserve the right to look at some of this information we have just received in a little bit more detail and possibly -- probably not make any changes in my decision,

but I would like to be able to review that a little bit more closely. Obviously, again, this is a draft permit. Certainly possible modifications could be proposed by either party that we could consider. Certainly if somebody sees something that I left out or I missed out or something, that would make either of them better permits, then we'll certainly consider that too.

ALJ WISSLER: Do you at this point have some notion of what those conditions should be?

MR. HOLT: No, no. I mean, but --

ALJ WISSLER: Okay.

MR. HOLT: I'm saying I'm open to any other suggestions if there are any, but basically, this is -- the modification or the second draft was basically in response to a comment letter by the Applicant. Some of the comments, I didn't feel warrant a change, and some of them I made some minor changes.

ALJ WISSLER: In evaluating these permit applications, you look at the Applicant's application, in this case the DEIS and other studies and so forth that were done;

am I correct?

MR. HOLT: Yes.

ALJ WISSLER: So other than the package that is presented to you, essentially that's what you look at when you make your permit decision in a case like this?

MR. HOLT: Yes, but in this case --

ALJ WISSLER: You corroborated with Health in Ulster County?

MR. HOLT: Exactly. But in this case, because of the Pine Hills situation and the permit, I also drafted that permit that was issued about two years ago, we looked at that situation in correspondence with this too. But typically, you're right. We would get an application, we would look at it --

ALJ WISSLER: And that's the package you would look at?

MR. HOLT: Pretty much, yes.

ALJ WISSLER: In terms of present future growth and future needs for the water supply system and so forth, what did you look at?

MR. HOLT: Basically the information that was submitted in the application, the

projections of the total buildout in the Pine Hill area and the charts that Gary showed us there as far as demands.

And I also -- if you look in here, there's a condition that limits the area of the water serviceability which is less than if you look at the maps, you see these larger areas of ownership, but I said we want to restrict the size of this system down to basically what it is. So if you want to expand it, in other words add another section of condos or something like that, you would have to reapply to the Department and we would reevaluate, you know, your conditions at that time.

ALJ WISSLER: Show me what conditions you're talking about.

MS. KREBS: I believe it's Special Condition 10, your Honor, on page 4.

MR. HOLT: That's 10 in the Big Indian permit and 5 in the Wildacres permit.

ALJ WISSLER: And 10 is what? The service area map is basically the borders of the proposed Big Indian and the proposed Wildacres?

MR. HOLT: No, actually it's a smaller area. I mean, I could attach those maps to the permit. I mean that's a possible thing we could do, but I mean, that's not necessary. It was referenced into the application papers.

ALJ WISSLER: I'm just trying to pick up on something you said. Do we have the map? Do we know the map we're talking about here?

MR. HOLT: I'm not sure if I have it with me, your Honor.

ALJ WISSLER: LA Group -- I assume

it's one of the maps that was submitted; correct?

MS. BAKNER: Your Honor, it shows the area of proposed development, not the land that's supposed to be preserved. That is what Mr. Holt is commenting on.

MR. HOLT: Okay. The approved area for service is smaller than the larger --

ALJ WISSLER: And the approved area for service is essentially what we're talking about developing?

MS. BAKNER: Exactly.

MR. HOLT: Yes.

ALJ WISSLER: Okay. But now my

question is if the number -- so whatever construction happens, whatever development happens, as long as it happens within the borders of that water district, that this permit covers that?

MR. HOLT: The private water company, yes.

ALJ WISSLER: Okay. So if we had 50 condos called for and over time we added a hundred, we could still -- we wouldn't have to come back to you for another water permit?

MR. HOLT: If they stayed within the borders.

ALJ WISSLER: Within the borders.

So it's about the borders and not necessarily the density of use within the borders?

MR. HOLT: Not normally, although there are cases where we have specifically limited that you can build within this area and you can build up to 1500 units or just to pick a number. And you could do that too.

ALJ WISSLER: But in this case, as long as you're within the borders of that district, you're fine?

MR. HOLT: Right.

ALJ WISSLER: Okay.

MR. HOLT: And obviously, you know, it's all limited on how much water they're approved to take too. If they try to double the size of their service area and they needed to take more water, they would have to come for a permit for that. They can't go beyond what we have allowed as a maximum taking.

ALJ WISSLER: Thank you.

Ms. Krebs.

MS. KREBS: Thank you, your Honor. If you don't have any questions for Mr. Holt, I will turn to Mr. Garry.

Please state your name and where you work for the record, please.

MR. GARRY: My name is James D. Garry. I work at the Department of Environmental Conservation, Division of Water in Albany. I've worked as a geologist for about 26 years, the last 20 or so with the Department. I am a licensed professional geologist in the State of Pennsylvania, New York doesn't have a licensing program. And I'm also a member of the National Groundwater

Association.

In my time with the Department, I have worked on a wide variety of tasks, from wellhead protection to contaminant trackdown, remediation to water resource investigation. And the water resources investigation part is something I have done all along, so that's where I have my most experience. I have reviewed, in terms of numbers, hundreds of pump tests, and I've personally been involved in a couple dozen. I think that's good for background.

MS. KREBS: Okay. And I understand you assisted in the review and the evaluation of the application materials for these permits?

MR. GARRY: That's right.

MS. KREBS: Okay. And how did you go about that generally, or what did you review?

MR. GARRY: It's a process that goes back and forth. Obviously, I get information and I review all the information I get. If I see something that I need, I get back with the Applicant and ask for that information. And that did happen a couple of -- a couple times

I needed a better map, I wanted some

information broken out from the EIS. Since the EIS was so huge, I wanted to make sure I had everything pertaining to a particular topic.

In this case, or in all cases, one of the first things I do is to make sure that the tests were properly run, that they were the tests that we need and that these were properly set up and executed. And then I take a look at the raw material. I also take a look at the results that are written up by the Applicant, and I evaluate accordingly.

MS. KREBS: And did you review -- I think the Applicant has gone through the test results this morning and yesterday. Did you review those also?

MR. GARRY: Yes, I did.

MS. KREBS: And did you accept -- on which tests did you approve?

MR. GARRY: Well, I, all along have felt the R1/R2 combined test in 2002 was quite sufficient, and I approved according to that. Department of Health had some concerns based on protocols they've used for many years, and

I had no objection to them doing another test, and as a matter of fact, we needed to do another test because in that time, another well had been added to that well field that had to be evaluated.

ALJ WISSLER: That was Rosenthal Well 3?

MR. GARRY: That was Rosenthal 3, right.

So in 2004, I reviewed the protocol, it was okay, and they went ahead and did that other test. And that test is --

MS. KREBS: When you say the other test --

MR. GARRY: The R1, R2 and R3 tests in April of 2004. That gave good information also.

And the final numbers for the permit were based on that test, although I do want to talk a little bit about the R1/R2 tests and the fact that that was a constant rate test helped in being able to establish that long-term, six-month numbers with drawdown, and you really do need a constant rate test for that. The 2004 test was --

ALJ WISSLER: Which test supports that?

MR. GARRY: The September 2002 test where they did a simultaneous pumping of R1 and R2. When they did that at a constant rate for three days, they were able to extend the drawdown line on the semi-log plot to find out whether there would be enough water in the wells if they pumped at full capacity for six months with no recharge, which is a doubly conservative number. It's very conservative. And if it makes that test, you know that you have a good producing well because, first of all, there will be recharge, and second of all, the well will not be pumped at full capacity 24 hours a day, seven days a week for six months. Wells are turned on and off, and recharge does occur.

So I liked that test because it showed the long-term consequence of pumping. The R1, 2 and 3 tests in April of this year was a good test because it showed some stabilization and it showed what R3 was capable of pumping while R1 and R2 were also pumping. So I used all the tests.

ALJ WISSLER: Have you been involved in tests that may have been run in Pine Hill or in other wells in this bit of a valley where the Rosenthal well group is?

MR. GARRY: I did look at the Pine Hill tests, but I wasn't involved in that test as it was being conducted.

ALJ WISSLER: Are you familiar with the geology of that specific area?

MR. GARRY: Certainly.

ALJ WISSLER: Certainly, meaning what?

MR. GARRY: Well, the geology was covered in all of the information the Applicant had, so I'm familiar with what they presented, and I'm generally familiar with basic geology across the state.

ALJ WISSLER: You seem to have been to -- similar in a lot of ways but different in some ways to points of view presented by Dr. Gowan and Dr. Michalski. Do you have any specific knowledge with respect to this valley where these wells are all located with respect to what is the underlying geology there?

MR. GARRY: Based on the well logs that we have, it is -- this exhibit, what is

this?

MR. RUZOW: That's 99B, Applicant's 99B.

MR. GARRY: I accept this as the geology as we know it. Certainly there is what's been termed "stacked aquifers" due to various sedimentation, and they do have some control over what's happening. But I certainly would find it, or do find it, highly unlikely that pumping on one side of Highmount is going to affect pumping, you know, a mile or two away on the other side.

ALJ WISSLER: But the suggestion that there may be stacked aquifers in this area around the Rosenthal field and so forth in Pine Hill, you would say yes, that could be, in fact, the case?

MR. GARRY: I would say that there's certainly layers of shale that add -- that are controlling the movement of groundwater, but we don't know how continuous those layers are and the exact amount of --

ALJ WISSLER: -- flow.

MR. GARRY: -- flow that they're
stopping or allowing. Certainly there are

fractures -- there have to be fractures in there, and I would not think that water would flow down to a particular shale layer and then just completely be diverted and moved along. There's flow all through, and that the fractures -- this has been documented in this area by USGS -- fractures down lower in the valleys, or especially lower in the valleys, are mostly near the surface. And that's the major controlling factor for groundwater movement in the bedrock.

ALJ WISSLER: Okay.

Ms. Krebs.

MS. KREBS: There was a question raised regarding month-long pump tests versus the 72-hour pump tests. I don't know if you could address that.

MR. GARRY: I would just address it on the fact that it's not something that New York State has ever asked for, as far as a 30- or 60-day pump test. And I'm fairly familiar with the adjacent states, and they don't require that. And also, while -- in writing some of the protocols for our section, for instance, the pump test protocols and the well

decommissioning protocols, I've done some research from states all around the country and I've never seen any state -- I'm not saying it doesn't happen -- but I personally am not aware of any state that requires more than a three-day pump test.

MS. KREBS: So you regard our Department's acceptance of the 72-hour test was appropriate?

MR. GARRY: Yes.

MS. KREBS: I think that's it, your Honor, for Mr. Garry, unless you have any other questions?

ALJ WISSLER: No.

MS. KREBS: And finally, I have Mr. John Dunn from the State Department of Health to speak.

Mr. Dunn, if you could please state your name and where you work for the record.

MR. DUNN: Sure. My name is John Dunn, you can call me Jack, with the New York State Department of Health. I graduated from Union College with a Bachelor's Degree in Civil Engineering many years ago. I'm a licensed professional engineer in New York

State, have been for 30 years. I should note that I got my license when I was nine years old, so I'm a lot younger than I look. With the Bureau of Public Water Supply Protection, I've been with the water supply program with the New York State Department of Health for 26 years. Currently, I'm the assistant director of the Bureau of Public Water Supply, and I've been in that position for six years.

Prior to that, I was the supervising engineer for the design section for seven years, and the design section is involved with basically reviewing and accepting and approving these type of projects, new source takings, new treatments, operating water systems. And prior to that, I worked as a senior engineering staff member of the design section for about 13 years prior to that.

MS. KREBS: Okay. Can you describe your involvement with the water supply permits at hand, the Big Indian and Wildacres, please.

MR. DUNN: Sure. I and my staff have reviewed the project, and as we do with any water supply permit and application, we deal with DEC. We look at the estimated demands of

the system, and in fact whether we should accept them or not. We also look at the yields that have been documented or intend to be documented. We look at conceptual designs as well.

MS. KREBS: Okay. And that's what you did in this case also?

MR. DUNN: Yes.

MS. KREBS: I believe you had some comments on the DEIS and the proposed resort itself.

MR. DUNN: Well, we met obviously with the Applicant, with Mike Holt's staff earlier on in the year, but we also issued a letter dated April 23rd, '04 on overall issues of the project, many issues, but within that, also water supply issues that we wanted to have addressed or had questions about.

ALJ WISSLER: Is that part of public comment, or is that part of --

MS. KREBS: Yes, it's in the public comment letters, but I could put it in the record, your Honor.

ALJ WISSLER: I want you to, please.

MS. BAKNER: Your Honor, I think it's

already been entered into the report.

ALJ WISSLER: Is it? It might be, I don't know. If it is, just tell me where it is in the record.

MS. BAKNER: We entered it for another purpose earlier, your Honor.

MS. KREBS: I can enter it into the record now, your Honor.

ALJ WISSLER: Some time somebody tell me where it is.

MR. DUNN: We also wrote a letter dated March 23rd regarding specific pump test protocol that was proposed for the simultaneous pump testings on R1, 2 and 3 earlier this spring, and basically endorsed what they were intending to do, but it, in fact, did meet our protocol.

MS. KREBS: Okay. But before we get to that, and we will get back to that, your

Honor, to your knowledge, were the other comments addressed with regard to water supply? I believe you wrote that letter in conjunction with Ulster County Department of Health.

MR. DUNN: Yes, we reviewed --

actually, when we say we, the State Health Department also works with our field structure in this particular case on Big Indian, and it's Ulster County Health Department. We provided comments. We asked questions. At this point, we're satisfied that our concerns are addressed or will be addressed as the Applicant has indicated.

MS. KREBS: And then turning to those pump test results, simultaneous test results for 1, 2 and 3, you mentioned a protocol that you had approved?

MR. DUNN: Right. And this is interesting, I'm glad it was brought up because I think there were a couple misstatements yesterday by both the Applicant and CPC on our protocol for rock testing. The protocol we require this Applicant to use is the same protocol we've used for the 26 years I've worked for the Health Department. It is not a new protocol.

Basically for rock wells, we are looking for at least a 72-hour pump test, and we're looking for stabilization. And that is what was performed. It hasn't changed in the

26 years I've worked for the Health Department, so it's not a new protocol.

The reason why we look for at least a 72-hour test is that rock wells are unique animals compared to other wells. You can be relatively comfortable with a shorter pump test in an unconsolidated sand and gravel formation. You can come up with transmissivity and stuff like that. Rock wells are unique.

ALJ WISSLER: How so?

MR. DUNN: It takes a while to get the, quote/unquote, storage down out of the rock to really determine what the inflow is and compare that with the pump tests which is the outflow and reach stabilization. We have a lot of applicants over the years -- they still argue, especially small villages and towns, that 72 hours is too onerous, but the 72 hours has served us well and we have actually -- very comfortable in that a 72-hour pump test with stabilization at the end will document a sustained yield.

MS. KREBS: Mr. Dunn, did the Department of Health accept the R1 R2, 3 pump

tests results?

MR. DUNN: Yes. Verbally, we have done that working with Mike Holt in drafting -- in fact, it's a good lead-in --

typically, what we will do is write an endorsement letter to Mike's office saying that we are now satisfied. As you asked earlier what do we review, we review all the material that DEC is reviewing, at least as it pertains to water systems.

We certainly ask additional questions or have concerns. We had concerns with the demands that were originally proposed to us back in early spring. We did not buy into the reduced water conservation. It may come to fruition, but based upon our input, the average daily demands for the system were upgraded to approximately 80, 82 gallons per minute which we're satisfied with.

We should probably take a minute to determine how the Health Department fits in with the whole process. We regulate public water systems in New York State. Basically, at the very end of this process, we will approve plans and specs for the construction

of this water system, including the wells, including transmission mains, treatment, including disinfection, storage, and whatever other components of the water system. Before they can go to construction, they have to have our plans and specs approval. Once constructed before they can utilize it, they have to get our completed works approval that we're satisfied it was built in conformance with those plans and specs.

However, this is an earlier conceptual stage. At this point, the permitting process is DEC. They are the water resource managers of the State. We act as technical advisors to them, and we've had an excellent relationship over the last 26 years. I've worked at the Health Department -- over the last 26 years, they will not issue a permit until we are satisfied. Now, who we are, basically any new source taking, our office actually gets involved in, but we do use the county health departments. The county health departments are our field structure.

DEC has a very strong regional office. They are the one-on-one with the regulated

parties. In the Health Department structure, the county health departments are the one-on-one with the water systems using our policies, our regulations. So when we review these projects, basically we're tapping into Ulster County, Alan Dumas or Dean Pallen from Ulster County. We will incorporate their comments and concerns into our comments until they're resolved and satisfied.

In the case of Wildacres, there is no full county health department. In that case, we have a district office, which is located in Oneonta. They act in lieu of a county health department. And that's the whole process.

But basically, at this conceptual

stage, Mike is not going to write a permit until he knows that we're satisfied; one, that we're satisfied with the estimated demands; and also that we're satisfied that the quantity is there to meet not only current demands but also future demands, buildout; and also that the quality is satisfactory with or without treatment. In this case, there will be treatment.

ALJ WISSLER: When you look at

buildout, you look at what?

MR. DUNN: We look at what they propose and what the application material is, what the buildout is. And you raise an interesting question. What if down the line they want to build more. Well, there's some interesting trigger mechanisms because if they were to build either residential homes or temporary residences, hotels, motels, it triggers another but different health department code. They have to have a permit for a temporary residence if they want to build a motel up there, which Ulster County Health Department gets involved in, but that would trigger a review again of all the components of the systems. They would trigger a review of the water supply. It would trigger sewage, effluent treatment issues.

If, in fact, we're satisfied that the water supply would be there, then those permits would be issued and life could go on.

If we had concerns about that, we would say: You don't have enough yield, you don't have enough sustained source of supply, and that would trigger another water supply

application, and they wouldn't be able to go forward until we're satisfied that either new sources were developed to meet those increased demands that weren't included in the original proposal.

ALJ WISSLER: Either some new permit or modification of the old one?

MR. DUNN: Exactly.

MS. KREBS: Okay. And finally, Mr. Dunn, there were some questions raised yesterday regarding stabilization, and they were detailed in CPC Exhibit 81 where they quoted from a letter of yours. The quote is there in CPC Exhibit 81.

MR. DUNN: Actually, this whole draft regs for new well construction is in truly draft. It's probably clouded the issue more than it's resolved it. I wrote a couple sentences in that paragraph dealing with fluctuation in response to an Applicant who raised an issue about fluctuation.

Certainly over the last 26 years, the design staff, especially if you're reviewing rock well testing, will see bouncing around, fluctuation, if you would, once the well has reach a stabilized pumping rate. It's just the nature of the beast. It will go up and down. It's not like a sand-and-gravel act for which there would be an almost steady state. So we always take that into consideration.

Our main concern is that over a period of time, whether it's looking back 6 hours or 10 hours or 20 hours, that during whatever time we look at, that stabilization has occurred. So the whole issue of fluctuation, again, that's draft regs. I have actually, since this come up, have recommended dropping them from the proposed regs. But here again, they're draft. They're probably creating more confusion the way they are written. I don't even know how they got out to the public comment. But having said that, we do look at fluctuation. But the main concern, as I tried to pose in that paragraph, is the stabilization. And we're satisfied looking at the ten-minute data points throughout that it will have occurred.

Basically, if you look at the three wells, there's approximate sustained yield of 149 gallons per minute in the rock aquifer in

the vicinity of Rosenthal 1, 2 and 3. We're quite satisfied comparing that, whether it's off a couple g.p.m -- if you compare it with the average daily demand which would be the long-term steady state usage, a PD-2, we're satisfied that that will have been met.

MS. KREBS: Were you also satisfied with the pump tests results for the Wildacres site, I assume?

MR. DUNN: Yes. Although some have to be -- and as we've discussed yesterday, there's one well that's been out of service since the flood of '96. And I think the condition of the permit, and what the Applicant has agreed to, or hopefully will be, that that well has to be rehabilitated, put on-line, and a yield test performed to document yield.

MS. KREBS: Thank you, your Honor. I think we're done.

MS. BAKNER: We checked the exhibit list and the Department of Health letter is not in there, so, Carol, if you want to introduce it, I have a copy.

MS. KREBS: Yes, your Honor. I can

introduce it and provide copies to counsel.

ALJ WISSLER: It will be 11, Staff 11.

(LETTER FROM JOHN M. DUNN TO ALEC CIESLUK DATED 4/23/04 RECEIVED AND MARKED AS DEC EXHIBIT NO. 11, THIS DATE.)

ALJ WISSLER: And it is a letter of what?

MS. KREBS: It's a letter from John M. Dunn, P.E., to Alec Ciesluk dated April 23, 2004.

MR. RUZOW: Your Honor, just a point

of information. In response to Mr. Holt's comment about the service area, in Applicant's Exhibit 51B, after the second blue -- Figure 5 is the figure that he referred to for Big Indian.

ALJ WISSLER: Okay.

MR. RUZOW: And in the Applicant's 51D, which is the Wildacres, there is a Figure 1 which is comparable for the Wildacres Resort with the blue line.

ALJ WISSLER: Do you need a minute or what?

MR. GERSTMAN: Judge, in terms of the Tennant threshold, I refer you to our

Exhibit J to the petition, Mr. Piotr Parasiewicz. Piotr is P-I-O-T-R; Parasiewicz is P-A-R-A-S-I-E-W-I-C-Z. Mr. Parasiewicz has referred to the Tennant threshold just for your reference, Judge, on page 3.

ALJ WISSLER: CPC exhibit what?

MR. GERSTMAN: Exhibit J to the petition. And page 2 and 3 refers to the Tennant threshold as basically the person who established both the optimum, reasonable and catastrophic stream flow levels as they relate to aquatic habitat and survivability, not just fish but all aquatic organisms. And we will be dealing with that during the aquatic habitat section.

Also additionally, I just want you to note that the representations that have been made about irrigation and the contribution to recharge that we have heard both yesterday and today by Crossroads are counterintuitive in terms of the statements made in the letter provided. I think it's Exhibit 98.

Basically, they're suggesting that the irrigation will actually provide a surcharge to groundwater to stream flow. For that to

happen, there would have to be a significant amount of contribution from the irrigation. Irrigation, if it's applied in accordance with best management practices, is not going to result in a significant amount of runoff from the golf course. It's not going to result in a significant amount of recharge. It's going to be used for the primary purpose of growing grass and sod for the golf course. So the notion that's set forth in, I believe it's the July 28th letter -- I have to find which exhibit it is from Crossroads -- is really countered by the notion that irrigation is going to be used for a particular purpose using best method practices to maintain the sod. It's also been the premise of Crossroads, essentially, evaluation of the impacts of the golf course and runoff throughout the entire discussion on stormwater and pesticide impacts.

What we have at this point, Judge, is a fairly significant disagreement among the experts concerning the hydrogeology of the site. You have heard offers of proof from the Applicant. You certainly heard offers of

proof by Dr. Michalski, which we believe are backed up by the evidence that has, in fact, been provided by the Applicant on the record to support that the analysis prepared at this point by Crossroads does not support their conclusion, and we will identify, even after the rebuttal that we have heard today, those issues which remain outstanding.

We are pleased to hear that Dr. Gowan is in agreement with several of the issues between yesterday and today that were raised by Dr. Michalski, including the issue of one of the areas for recharge of the R1, R2 and R3 wells would be surface water. That's a very significant concession. It's very important in the construct of what the impacts would be from drawing down R1, R2, R3.

We will also talk to the issue of whether or not the simultaneous pumping from R1, R2 and R3 really achieve stabilization. We contend that nothing you have heard today indicates that stabilization has been achieved, and we'll show that as we go through the process.

What we have here, Judge, is a

potentially stressed water supply. We have the introduction of a significant water user into the area where there's a potentially stressed water supply. And we believe under the circumstances, based upon the offers of proof from Dr. Michalski and Mr. Rubin, that there's a need for very close scrutiny of what the impacts will be. Dr. Michalski has backed up his conclusions with evidence from the record, will continue to do that now in response to the information we have heard from Crossroads.

Why don't we start, Judge, if we could, with the log that was presented by Crossroads, which is Crossroads Exhibit 99B. What we have done is to take the original, and using our limited resources, to make some copies. We'll refer to Exhibit 99A, 99B and 99C.

Can we go off the record for a second.

ALJ WISSLER: Sure.

(2:08 - 2:09 P.M - DISCUSSION OFF THE RECORD)

DR. MICHALSKI: This is a hydrogeological section which is supposed to

show not only geology of the area but also hydro element of this groundwater occurrence and movement of the system. And as we heard yesterday from the Applicant, the conceptualization actually includes -- groundwater occurs in shallow bedrock within a zone, 200, 300 feet, which is parallel to the top of bedrock, and that the water table follows topography. That's generally the statement. (Indicating)

So essentially, we have a gray mass. That's just what it is, because all these fractures are just artistic conceptualizations. They don't have any site-specific meaning here. So this is how the Applicant portrays it. And the groundwater flow is just downhill. (Indicating)

And when the Judge asked the question about stacked aquifer yesterday, it does not apply to the conceptual model. Today we hear, okay, it's possible -- stacked aquifer system may exist. However, we don't see any place when it would be manifested on this cross section, so it's just pure verbal. Okay. It

can be, but it has no site-specific location, where the stacked aquifers are located.

The only thing you see here is the geologic contact would correspond to bedding. This is a geologic contact between two geologic formations which has different names. So this could be a stratigraphic boundary, kind of what I could consider a bedding plane. What I said in my testimony is that actual groundwater flow is controlled primarily by bedding fractures consistent with Heisig concept, so it does not undermine. So those aquifers actually reduce aquifer to fracture, and I will come back in a moment to this.

Now, what I want to show is if you use the conceptual model proposed by the Applicant, you cannot explain certain things which actually happens in the system. For example, you cannot explain occurrence of high elevation springs, why they occur. If groundwater follows, it is uniform. Springs, high elevation, it's set on elevation, and a series should not occur because that would be very unusual.

The stacked aquifer, yes, we have

bedding -- in a stacked aquifer constant, this situation is possible because the constricting layers intersect with topography created so-called contact spring. But this require -- does require acknowledgment of heterogenities and you have to locate it because spring will -- contact spring occur, has a contact. So this mapping has not been done in this kind of situation. It's based on just topographic assumptions and that everything will flow down.

So this conceptual model actually, which is pretty unique because bedrock is something very -- it's just bedrock. It does not explain this thing. It would not explain disjointed water levels in some of the wells. Like for example, in this well, which is Well number 3, which is Fleischmanns Well number 3,

the Applicant says that the water level was
water table. Water level is at, if I recall,
240 feet below ground surface, or 120 feet
below the Emory Brook. So it's really low.
And why is it? If the groundwater follows
topography, why do you have water level of
240 feet? It's not exactly following the

topography.

So the system is -- this model does not explain those things. This model does not explain why you have cross flows, vertical flows. Because the cross flow are between when you have something at different water level. The Applicant even does not show the water level in the well. So if you have well's location as projected on the section, I would expect at least to show those water levels, average typical for the wells. They are not. So in this sense, it is not hydrogeology cross section, it's just a verbal representation showing a very few broad strokes.

MR. GERSTMAN: Mr. Michalski, in your review of the Draft Environmental Impact Statement in Exhibit, I think it's 51, and the other documents, did you find any data to support the conceptualization or this artistic rendering of what's a cross section essentially, in essence?

DR. MICHALSKI: Yes. So the first thing I did, I just look at the boring holes, and I did the same yesterday during our --

during my presentation. And if you look at my Exhibit 80, and go to pages 6 and 7, you may recall that I spent considerable amount of time to establish in this well which is Pine Hill, PH-1 well, which was 444 feet deep. The only significant water level -- actually water-bearing zone fracture was found at 99 feet, and I can probably use a copy just to mark it, maybe on the judge's table. So that was roughly well number -- one-fourth of it, roughly here somewhere. (Indicating)

ALJ WISSLER: What we're doing is marking up Exhibit 99B actually. We'll make it a CPC exhibit.

DR. MICHALSKI: So that 60 percent of water pumped from this well came from this single one zone, which is probably a fracture. So it tells you about discrete nature of occurrence. Such transmissivity is not evenly distributed within the section, just at certain discrete zones which are typically associated with bedding, bedding planes.

And I go back to Pine -- to Rosenthal wells situation. And in my presentation yesterday, I try to establish by looking at

well log for R2, which was in my Supplemental 80, Exhibit 80A on page S5, to show that the Applicant logged the fracture, not as a drill, not as a fracture, 186, with substantial production of water. If I mark a section then, in my exhibit, page 18 -- (Indicating)

ALJ WISSLER: Which well is that?

DR. MICHALSKI: It's R2.

MR. GERSTMAN: I think we'll make a separate copy.

DR. MICHALSKI: (Indicating). And now for this well, I can assume that the angle of dip, I assume two degrees.

ALJ WISSLER: Between the bedding planes?

DR. MICHALSKI: Yes, bedding plane and show it. I'm simply trying to draw something parallel to that line. So the same dip because it says structure behaves, dips in one direction here. So what we have, we have this line which I also show on one of my exhibits yesterday. What it does show is that wells number 1, 2, 3 and Residential well number 4 would be along the same -- within the same

stratigraphic intervals exactly within the same bedding.

ALJ WISSLER: And you're saying that bedding plane can be identified by page S5 as being at 186 feet?

DR. MICHALSKI: Yes.

ALJ WISSLER: So that 186 feet would go from one strata to the next, from one plane to the next; is that right? Will it cross the plane at that point?

DR. MICHALSKI: It will cross, as I indicated, it will go like this. So it will have its subcrop under the Birch Creek, so it is exactly what I'm trying to draw now is just repeat of my figure from my Exhibit 80, what I already show on page 18, so it's exactly the same situation. I'm only slightly modifying the dip angle. So instead of like using 2 degrees which would be 35, 35 feet per thousand feet, so I'm using 1 degree, it will be like 20 feet per thousand feet.
(Indicating)

ALJ WISSLER: Are you giving me new exhibits?

MR. GERSTMAN: If you would like,

Judge.

ALJ WISSLER: When you're done here?

MR. GERSTMAN: Yes.

DR. MICHALSKI: So this would be one of those what I would call transmissive fractures associated with bedding. The evidence for the continuity comes from the pumping tests performed by the Applicant, specifically response to pumping both on drawdown time graph and drawdown distance plots which I prepared.

And if we look at -- in my Exhibit 80 on page 11, this is a drawdown distance plot which I discussed yesterday. What it does show, it shows response to pumping of two pumping events they conducted. They conducted four. They pump R1, then when the other wells were used as observation wells, so there's three observation wells left which responded to the pumping test, which was R1, R2, R3 plus Residential Well 4. And each of these wells are shown as a point plotted on distance, drawdown graph, and they project nicely on one line, the three points. And as I mention, I determine aquifer parameters based on this

situation.

Then the second one, I could not -- the second one corresponds to simultaneous pumping tests in two wells, S1 and S2. When I was left only with two observation wells, S3 -- sorry, R3 and R5 -- and R4.

MR. GERSTMAN: Residential 4?

DR. MICHALSKI: Residential 4 and R3.

MR. GERSTMAN: Let's go back to that again just to identify the wells because you started to say S. I think you --

DR. MICHALSKI: No. R, residential well. As I mentioned yesterday, this drawdown distance plot is another way of analyzing pumping test data, and it is much better than drawdown versus log of time plots used for pumping wells because it combines effects of pumping in several ways together, so it allows them to see the cone of depression, whether it makes sense or not.

And as you can see for pumping test number -- for the first pumping tests, those three points really go along one line as it theoretically should, so it indicate that the

cone of depression extends for certain distance, and this distance was approximately about 3,000 feet. What it means, that when you go beyond 3,000 feet from the pumping center within this transmissive fracture, you cannot see effect of pumping during this three-day pumping test because you did not pump long enough. Had you pumped for a longer time, then you would engage the other wells, observation wells.

In this case, it would be probably Pine Hill wells, and it is just based on principle hydraulics. Because during the pumping tests performed, cone of depression grew and grew. It never stabilized, as indicated by sustained drawdown sections. And so you really need more time to see the effect of pumping on other water users.

And I want to make this point very clear, that you're claiming that there's no interference of other materials. It's simply artifact of pumping time which was too short in relation to the problem at hand. What comes handy here, maybe this test, which was previously performed, not by -- I did not analyze this, this test.

MR. GERSTMAN: That represents CPC --

DR. MICHALSKI: This is Exhibit CPC 84.

This is a test performed in Station Road Well, so it's a test performed on Pine Hill water supply wells. So the pumping well was Station Road Well, which I'm pointing out, so this is the well. And two other wells, pumping wells number 1 and 2, were monitored during the test as observation well, so they were not pumped, they were using observation well. And the distance between those two sets of well is 1800 feet. So less than 2000. (Indicating)

And as you can see on this section, Well PH-2 is not shown because it is very close. Probably that was the reason, you project it was pretty close to PH-1. So what this graph show that you needed to pump for -- this is logarithmic time versus drawdown plot. You needed to pump for about 1,000 minutes to engage fracture, to engage fracture which was found at 90 feet in this -- probably PH-2 well by pumping well. So if you pumped a shorter

time, you say: I see no impact. But when the cone of depression reaches another fracture set, another bedding plane, which is quite transmissive, then this is what you get. You get a very fast response after a long delay.

So this time delay is very important.
(Indicating)
When you pump this well, those wells -- Station Road Well, the other wells responded after one day of pumping, distance was 1800 feet. Now, when you pump those wells, R1, R2, all three together, because the distance is much larger and the relationship is not -- you would have to pump a much longer time to see this effect, but the effect will surely come as indicated by this analog because of the leaky nature of the system.
Stack aquifer means, what I tried to plot here, that we have one -- this is one bedding of those transmissive zone identified. Another one I spent some time was at 90 feet in this well, so it is about -- as you can see, those two -- and I'm trying to plot it to project it -- those two are not connected, so you have pumping tests and give you two time

of responses. One response is the well which intersect the same bedding fracture. It is relatively fast response. But your pumping can impact another system above it.
ALJ WISSLER: In another plane?
DR. MICHALSKI: In another plane, after some time.
And when it reaches one, it actually engages to it, and then it propagates quite fast. My point is here, not all fractures are

created equal. You cannot plot all of them. In this system, you have like three sets of fracture. This is based on literature. One is parallel with bedding, that's one. Two other are perpendicular to it. It must be at right angles, so one follows a straight and the other follows -- and actually, the Applicant tried this. So one would be not necessary because it doesn't follow.

So right here, one would follow bedding and two are -- those which are perpendicular to bedding fracture sets, they don't go throughout the system. Normally, those fractures are ends at the bed boundaries just as you can see. Normally, the thinner

the bed, the more densely fractured. The thicker, the most loosely fractured, greater distance the fracture, but they rarely go throughout the system. So those vertical fractures have limited extent, vertical extent. They contribute to leakage because they create communication between bedding fractures.

But bedding fractures, some of them, have hydraulic advantage over other fractures because they are more extensive by their very nature because they mark boundary in deposition. So when the stress relax because of some reason, say it has created a little separation, bedding separation, and this separation is larger aperture than in other fracture. (Indicating)

And the rule of hydraulics says that flow in a fracture is proportional to the third power of fracture. So if you have one fracture, which is only -- which has aperture, envision its fracture, idealize as just parallel plates and spaces in between them represents aperture wedge, one has only two times greater aperture than the other, so that

one with two times greater aperture can transmit eight times more flow than other fractures, and it has advantage of continuity.

ALJ WISSLER: Because 2 cubes is 8?

DR. MICHALSKI: Yes. So what it means, that certain bedding fracture becomes like master fracture. It automatically can transmit a lot of water because of the height of aperture and all other fracture becomes service, because they provide flow, leakage to this fracture. And this is how the system works based on hydraulics.

But you cannot exactly say which fracture is transmissive. You have to just test it because not every fracture -- out of the probably hundred of bedding planes of fracture you see in a well, only one or two become transmissive. So that is why it is important to recognize existence of fractures. And some of them probably serve as aquifer.

So what I'm saying essentially is that

those bedding fractures which have this peculiar property, more open than other, function as aquifers. But a special type of aquifer with very little storage, but they

have to take water, connect -- hook to some source of water. That is why if you do a pumping test and your wells are located within the transmissive fracture, you have a fast response, and cone of depression just grows and grows. And then it gets leakage into this fracture. And this leakage may propagate over time and impact another system as we see documented in all those pumping tests.

Generally, you have, like, direct response to pumping and indirect. Direct, you can do a short-term pumping test to see whether there's a connection. And you need to do a very long pumping test to see impact of pumping.

MR. GERSTMAN: Dr. Michalski, there was a suggestion yesterday that the methodology that you had used, that you suggested using geophysics for boring to calculate the characterization of boring holes -- I'm sorry, I'm not saying this properly -- to take the evaluation of well holes, bore holes, through geophysics was some academic exercise. Do you agree with that evaluation?

DR. MICHALSKI: Geophysics has been

around for a long, long time from the '60s actually used, and it was recognized to be the only method useful for fractured bedrock. If you don't use bore hole geophysics, if you don't even use water level measurements, you are left with nothing. So this is -- you can characterize the system if you see something you want to see, you have proper tools. If you are left without tools of hydrogeology exploration, characterization, all you can see is just a very generic drawing, gray mass, as I say.

ALJ WISSLER: Those tests you talked about the other day about cameras, sound, whatever, there's no need to -- you don't have to bore new holes already?

DR. MICHALSKI: No.

ALJ WISSLER: You can do it in the present well?

DR. MICHALSKI: Absolutely not. They are standard. You can hire a geophysical contractor or hire a probe and do it yourself. You just go down -- and it is automatically -- there's a logging system, the entire logging

system. There's something visual needed, such as a digital camera. But you can use only downhole TV, and it is not expensive. Another set of tools contains temperature conductivity.

What's your objective? If you have

big holes like this somewhere here and this hole penetrates, intersect two transmissive zone or three. That's what happens. And each of these zones is at a different pressure. You have a crossing. So that hole, open bore holes becomes like a pumping well, which is at the same time injection, so you have coming something from above, and drawdown.

And the water level you see represents like kind of composite of water levels in all this fracture. So because of this mixing effect, if you go with temperature conductivity probe, you will see that water entering from a transmissive fracture into a bore hole have a different chemistry slightly in orientation or temperature, therefore you get an inflexion on your log. It changes chemistry or mineralization of water. And this inflexion is informative like little

change, little thing. And such inflexion identifies location of such a transmissive fracture. And this works very well. It doesn't cost a lot.

ALJ WISSLER: It identifies where the boundaries of the bedding --

DR. MICHALSKI: No, where the bedding plane is located in the holes.

And when you go with downhole TV, you can see seepage above the hole where the true water level is because those holes are big. Some of those transmissive zone don't provide many water, therefore all you see is a wet wall, water just dripping down the wall. It happens.

But once you start using tools, your perception of that is completely different. You just cannot say, oh, this thing goes in 200 feet or so because there's no basis. Sometimes it dips, sometimes -- then you can see whether they go at the same stratigraphic elevation. You need to test this hole, that hole, the other hole. You will see their location. Can you connect them along the bedding plane or not? So you do your

hypothesis that they are transmissive fracture.

And then what remains to be done is to test whether they are truly connected hydraulically. And this connection test is done, you start pumping in one well and you see very quick response in other wells which are connected directly, which is intercepted. If they're not directly connected, you have to wait sometimes to get those.

So the system can be characterized, and it can be characterized in a very inexpensive -- it doesn't cost a lot of money, and it's very practical, what I'm suggesting. It's not a research project.

Do we need it here? That's the question. And my answer is yes because this aquifer is very stressed. It's not aquifer hole -- two little watershed. What we have is a ridge. If you look from a bird's view, the area, in fact, is just a narrow valley, a little topographic divide and another valley, so you have a very small area in which your cone of depression develops, and it develops quite fast.

You have one pumping center here, another pumping center here, and you are going to pump, not for three days as the Applicant did and then extrapolate it all, but it's going to be pumping indefinitely. So really you have what we call a sink hole or depression of drawdown. You have impact on other water users. And ultimately, your water will come from surface water from the stream. This is how it's -- in the long run, the recharge will determine how much water you actually can pump on a sustained basis.

MR. GERSTMAN: Dr. Michalski, yesterday, I believe -- I'm sorry, this morning, it appeared that the Applicant agreed with your characterization in trying to dismiss the use of transmissivity data, the Applicant agreed that, in fact, there's a large variation in the ability of the fractures to transmit water, the same fracture may not appear elsewhere, and basically the Applicant was referring to various physical parameters as being variable and heterogeneous, as I believe you previously characterized the aquifer here. Would you

agree with that characterization?

DR. MICHALSKI: It is heterogenous definitely, as I told from the very beginning, and it is not only my saying, but it is based on what is known south and north of this area. Because this is heterogeneous in fracture, it doesn't mean it cannot be characterized, because it is not crystal in bedrock. It is not made of, like, granite with fracture type. There's certain order in it.

Question of transmissivity; whether it makes sense, I'll go with parameters. I'm going back to my drawdown distance plot. The first test, the uppermost line, which is based drawdown versus distant graphs when only one well, R1, was pumped, 77 gallons, and three others were used for observation. As you can see, you have a nice line, and this line determines the size of the cone of depression, assuming that it will be circular because that's the assumption. It's a logarithmic curve, like a champagne-glass type of curve. And I could determine transmissivity and storage coefficient. What is the meaning of this? This transmissivity is average for the

tested area, for the whole area. And because I know that this fracture at 186 acted as a principal aquifer, what I can say, that most of this transmissivity is related to that fracture.

Of course, when you go along this bedding fracture, transmissivity may change from one location to another in real world because it is not a parallel plane, but there are some contact between upper and lower rocks. So as a result, the flow is in bedding and is more tortuous, but nevertheless, it is a privilege hydraulically located. So this average tells me something, and this transmissivity value is low. The storage coefficient -- I determined the storage. Because the whole average for the whole -- is extremely low, that is why the value. That is why this cone of depression has to grow for long distances, because as you can see from other type of plot, there was no recharge indicated because the pumping rate -- whatever recharge occur was not able to keep pace with the pumping rate.

Every test they performed, and if you

look at drawdown versus log of time graphs, none of them shows stabilization when you show time in logs. Everybody is just -- either negative boundary or downward is the end. So what it means, it means that the whole system was overpumped, that if you keep going on beyond three days, you will pay price later on. You will see boundary.

MR. GERSTMAN: Dr. Michalski, so you would -- it's your opinion that the data concerning storativity and transmissivity is actually useful for evaluating the availability of the water resources for this application?

DR. MICHALSKI: Yes, they are useful. You can look at things from two perspectives. One perspective is a well perspective. Can the well give us this production in the short time. And I think that the Applicant and DEC were preoccupied with this aspect. Simple, can this well, simultaneous pumping, can we get this -- yes, we can. And I'm not denying that. It's only can you sustain it in the long term.

And what would be consequences of

this? And to answer this question, you have to look in the entire flow system, into this whole little watershed. And regardless from what perspective you say, was it from general hydrogeologic evaluation, little valley, little overburden deposit. It is not -- no, actually hydraulically nothing. Or you extend your boundaries because your conclusion is it cannot be sustained, and the impact on this will be significant.

MR. GERSTMAN: Dr. Michalski --

DR. MICHALSKI: So this is what should be done because of potential impact and poor water resources of this watershed, is that the question of good stewardship require you to look at the system, at the whole watershed, not only whether I can get this rubber stamp. Okay, you can, just because of this apparent stabilization. So it's clearly insufficient, and it invites problems.

MR. GERSTMAN: You've looked at the pump tests that have been referred to previously by the Applicant, the simultaneous R1, 2 and 3 that was done in April of this year. There were several done in prior years;

an individual R1 pump test, an individual R2 pump test and a simultaneous R1 and R2 pump test. In your opinion, do they show stabilization?

DR. MICHALSKI: No, they don't. And actually, yesterday, I went through some of those as examples. And on my slide in Exhibit 80, if you look at Slide number 9, you see a time drawdown, drawdown versus log time, the graph of the pumping wells. So this is for R1. And clearly, the first negative boundary was achieved after 100 minutes of pumping. This is a negative boundary. It was the first indication that your pumping rate is still high with regard to recharge you are getting from that. And then it follows a straight line. There was no diversion to the right, as I indicated on those theoretical plot one slide before. So on page 8, so recharge stabilization would require your data to bend upward, so that is an indication. But it is recharge at a given rate. (Indicating)

So I'm not saying you can't find a rate at this site for which recharge would keep pace for it, but it won't be 122 gallons

a minute as previously proposed, or definitely not 149 gallons per minute the Applicant now proposes because the last line is insane in this situation.

ALJ WISSLER: Dr. Michalski, you heard earlier today that justification for the simultaneous pump tests for R1, R2 and R3, that the reason that there was a higher rate of pumping was to get water out of the system in order to find out whether or not pumping at lower rates could be sustainable. Does that make any sense to you?

Is it consistent with sound science and technology?

DR. MICHALSKI: No. I would say what is consistent when you start with higher rate, just to get the effect of partial recovery when you lower the rate. So you get temporary relief, temporary appearance of drawdown stabilization. It is well-known hydraulically. So if you have confined aquifer and you lower -- choke it slightly. As I indicated, that such a constant drawdown test should go beyond three days, and then you would get a true pumping rate at this drawdown

to keep it stabilized.
MR. GERSTMAN: You examined the recovery time for the simultaneous R1, R2, R3 pump test and the simultaneous R1, R2 test, and you also heard the discussion of the concept of mining water you had mentioned yesterday, the Applicant came back and discussed it today. Can you relate the concept of recovery after a pump test or during the end of the pump test to the concept of mining water, what either the difference is, whether one correlates to the other. Can you explain that to the Judge?
DR. MICHALSKI: Yes. So in every test conducted at the Rosenthal wells, and there are four of them, time of recovery was much longer than the pumping time. This is a clear indication that the drawdown, that the recharge was not sufficient. It is a classical example of overpumping for a given hydrogeologic situation.
If you look at the situation from the outside, not from your pumping well, and it happened in other situations. So you have a case of overpumping, mining means -- and we

had this situation after three days of pumping, three days of pumping -- one week recovery sometimes was needed to get a recovery. If you continue with this pumping indefinitely, okay, or say for a year, and if another pumping center here, and I believe that there can be a connection between those two, I just didn't go through this in my rebuttal. So what happens is that either the system will be completely just -- your pumping rate -- everybody will have reduced pumping rate because the recharge is clearly insufficient to sustain this pumping rate. Not only at one center, but at several.

MR. GERSTMAN: I show you Applicant's Exhibit 103, I believe it is -- it's Crossroads Exhibit 104. There's a depiction of recharge areas that are shown on Crossroad's Exhibit 104 and those are surface water recharge areas; is that correct, Dr. Michalski?

DR. MICHALSKI: This is area for springs, that is only for different springs. But it is based, those areas are based on assumption that -- just topography which is

only controlling factor. It doesn't take into account stratigraphic structure aspect, because as we heard yesterday that is not very relevant. So to date, the testimony of Applicant change, so this recharge area should be reevaluated. And thank you for reminding me because when I look at this cross section now, I notice some discrepancy -- in Pine Hill area, it's the only area which I had a chance to visit. So when we go to Railroad Spring, Railroad Spring just above Bonnie hills --

MS. BAKNER: Bonnie View?

DR. MICHALSKI: Bonnie Spring. I'm referring to -- yeah. So Bonnie here. And there's a railroad bend, and just at the bend, you have water issuing, coming from the bedrock. And it's probably -- (Indicating)

Was it you who testified today and said water was coming from the rock at this elevation? Classical contact spring, seepage from the bedding plane just going down the rock face and just going into a ditch. And it was exactly at this location which is that bedrock railroad here. (Indicating)

And what I see in this cross section

is overburden, and it is quite thick overburden, so I'm really surprised how it happened when you have site-specific knowledge.

And if you look at the location of this, here is the spring coming from the sandstone, and if you look at the Fleischmanns spring which are here, there's another railroad cart and springs, just if I may show Judge. (Indicating)

ALJ WISSLER: So you would say that a straight line -- are you saying that a straight line drawn between those two springs would define a bedding plane?

DR. MICHALSKI: They seem to be at the

same horizon, bedding plane, or the same stratigraphic position. That doesn't mean that they're connected because the system is three-dimensional up there just beyond the section. But what it means, it means that this would be one of those stack aquifers which manifested because you don't have -- spring causes drainage from center area of these bedding fractures. So it's a concentrated effort rather than seepage all

over the place.

MS. BAKNER: Your Honor, a point of information. Steve, the railroad that Dr. Michalski is pointing to there -- Dr. Michalski, if you could point to that word, "railroad" --

DR. MICHALSKI: (Indicating)

MS. BAKNER: Steve, what does that mean?

MR. TRADER: That's the railroad. That's not Railroad Spring. The cross section --

DR. MICHALSKI: Yeah, but this -- because you have Pine Hill water supply over here, Bonnie hill is next to it, and I'm referring to the map, which is -- and I've been in this area so I rely on my memory. And exactly there, that was the location, so there was not overburden. (Indicating)

MR. GERSTMAN: You can draw it here.

DR. MICHALSKI: Okay.

MR. GERSTMAN: So if we can just clarify, in terms of the recharge areas, you would say that while they may reflect surface water drainage area, they bear no relationship

to what's happening under the earth under the ground?

DR. MICHALSKI: Yes. Not necessarily.

MR. GERSTMAN: Let me ask you about the issue of, I think it's electroconductivity that you've mentioned yesterday, in the issue of Fleischmanns well number 3. Do you need some documents for that?

DR. MICHALSKI: Yes.

MR. GERSTMAN: I'm referring to Applicant's Exhibit 51D.

DR. MICHALSKI: Yeah. And I'm referring to Appendix C, which is field water quality data, which shows measurements, field measurements of electrical conductivity. In this case was specific conductance, so it was electrical conductivity corrected to a standard temperature for all those monitoring points, springs and wells in Fleischmanns area. And what it shows, that Well number 1, typical conductivity values are on the order of less than 100.

MR. GERSTMAN: Showing the Judge the exhibit you just referred to, 51D, Appendix C, the first page after the --

MS. BAKNER: Okay, wait a second. We can't find it.
MR. GERSTMAN: Appendix C, dated November 2000.
DR. MICHALSKI: So it has very anomalous electrical specific conductance values of 950 and 996. So the first number refers to the start of step drawdown pumping in this shallow, 70 feet well. And the latter through end of the pumping -- so you see that by end of the pumping, during which probably couple of volumes of well and storage were evacuated, you have 966 unit which is milli -- microsiemens [sic] per centimeter.
What it means, there's a very close correlation between specific conductance and dissolved solids because it's an ion concentration and ionic concentration with water which determines this value. So this would correspond to total dissolved solids on the order of 6, 700 milligrams per liter based on typical relationship, so this is clearly anomalous.
Now, water sample was collected allegedly from this well. And if you go some

20 page later into Appendix D, there is a laboratory results for this well which says -- which is entitled, "Fleischmanns Catch Well number 1."
ALJ WISSLER: Dated November 27th,

2000.

DR. MICHALSKI: And I looked, collected by --

ALJ WISSLER: Which one do you want me to look at?

DR. MICHALSKI: Fleischmanns Catch Well number 1. It's after 3.

So the results of this analytical sample are totally inconsistent with what we know about the well in the sense that it shows total dissolved solids, 55 milligrams per liter, so at least ten times more than it's supposed to be based on this very strong correlation. Total dissolved -- suspended solids, 11, so some suspended. And if you look at the top, information collected by -- missing, received by "SW". It could be just an abbreviation.

MR. GERSTMAN: To the lab.

DR. MICHALSKI: To the lab. So it's

really -- and the title is not Fleischmanns Well number 1, but Catch Well number 1.

The Applicant offered testimony yesterday, said it was because of iron. It was excessive iron turbidity. This is not a good explanation because iron precipitates at concentration of 3.3 milligrams per liter when you have iron in water. So concentration of iron could not explain the difference. And suspended solids generally do not contribute to electrical conductivity. So I think that

the explanation is not --
ALJ WISSLER: So iron would be at about 5.0 milligrams per liter or 3.0 as opposed to 5?
DR. MICHALSKI: No, no, no. I'm not questioning the determination for iron. I'm talking about explanation offering --
ALJ WISSLER: I understand.
DR. MICHALSKI: But, no, normally, it's a standard for iron of like 0.3, whatever, is based on aesthetics [sic] -- so if you have excessive iron, you open your top and you have staining. But it cannot, at this level, it cannot contribute to the salinity.

Iron is never a compound which causes problem.
MR. GERSTMAN: So it's your opinion that the conductivity is a result of the salinity as opposed to the explanation offered yesterday?
DR. MICHALSKI: Yes. I could -- but those -- the conductivity measurements and lab results do not square up, so it's clearly the first thing I would flag out. They're very inconsistent.
MR. GERSTMAN: Let me ask you a question about the issue of recharge from precipitation. There was a suggestion yesterday that, and I hope I didn't hear this wrong, that an average rainfall of 40 inches in this area, and I think there's been some

discussion about that, but I understood the Applicant to say that 25 percent of that is available for recharge. Is that your opinion?

DR. MICHALSKI: No.

MR. GERSTMAN: What do you base your opinion on?

DR. MICHALSKI: There are several ways of determination which none of them perfect. The best is based on stream flow measurement,

an estimate of baseflow; how much. You know your size of your watershed, small one; you know how much flow is at the base. I mean it's a very low flow. An assumption is that this base constitutes groundwater contribution. So if you divide it by the size of the area, you get amount of actual recharge which equals stream flow, baseflow, and this is a method used by USGS, and everything else is a guess.

At this location, the recharge is not controlled by the amount of rainfall. Because we have low permeability to start with, the recharge is controlled by capacity of bedrock to take, to absorb water, infiltrate water. So low permeability -- recharge cannot be have. Even if you have rainfall, it would be rejected. And recharge cannot occur during wintertime when ground is frozen.

MR. GERSTMAN: So would you say, in your opinion, 25 percent of precipitation is available for recharge is a gross overestimation?

DR. MICHALSKI: It's a gross overestimation. In my testimony, I indicated

that it was based on estimate, based on your calculation done in like 15 other small watersheds in the region. It's a true value for summer based on -- works out to be like 0.5 and 1 inch. I could double-check this but it's in my previous testimony. And it is based on stream flow measurement. It's a real number.

MR. GERSTMAN: I'm going to refer you to CPC Exhibit 80. I believe that's where you included the table -- it might have been in the supplement. Let me just check.

I refer you to page 16 of CPC 80 which refers to the WP1 response data. Your indication was that the drawdown of a half foot was due to simultaneous pumping of R1, R2, R3. You heard the response today of the Applicant. Does that change your opinion in any way?

DR. MICHALSKI: No, it does not. The behavior, if you look at the whole record, the behavior of this WP1, shallow well point during -- before, during and subsequent to the test, it's clearly anomalous if you compare it with other well points and its record prior to

pumping. So I think the record speaks for itself.

MR. GERSTMAN: You heard an offer of proof concerning the issue of the water budget analysis, and I believe there was a submission today, CPC Exhibit 122, which goes through the purpose of the water budget analysis and what it can do and can't do -- Applicant's 122, I'm sorry.

On page 2, first full paragraph, there's a sentence that says, "The water budgets were not designed to predict the quantity, quality or yield of the water resources available to the project." In your evaluation of availability of water for this project, how would you distinguish the analysis that you would want to perform given the climactic changes in the seasons with respect -- and the water budget analysis that was submitted as Applicant's 122? Do you need to look at this?

DR. MICHALSKI: I understand from what you've read, the objective of the water budget analysis was not to estimate recharge to groundwater system.

MR. GERSTMAN: I think that was the objective.

DR. MICHALSKI: That was the objective? It was not.

MR. GERSTMAN: Not to evaluate quantity, quality and yield of water, but in fact, just to review whether or not the project would increase or decrease recharge. It was limited to the recharge issue.

DR. MICHALSKI: So it was limited to the high plateau area effect of the golf course, but it's not -- they stated that it's not relevant, the objective was not to estimate the use of groundwater sources.

MR. GERSTMAN: And you had mentioned to me earlier that you consider the evaluation an annualized effort, and what your concern is, and I believe you have stated this yesterday, is the concern of the dryer seasons of the year and the impact the project would have in the dryer seasons of the year and in drought conditions. Was that a fair assessment?

DR. MICHALSKI: Yes, because this late summer, fall is a peak season in Catskills --

I love New York. So probably they would be full occupancy. It's a time when recharge is very limited. So you have low flow in the brook, so the demand for water would be the greatest. I believe the full 150 gallons would have to be utilized at that time, so irrigation needs are the greatest. Flow and impact to the brook, to Birch Creek, would be the greatest because of environmental impact. And the system, because it's a small watershed and small groundwater system, it responds very fast to changes.

Remember that if you have a rainfall event, a big one, after a week, it's actually -- its effect is completely dissipated because the flow rate can drop by two orders of magnitude. So you cannot -- keep in mind, something from low country, big aquifer system, and apply your thinking to this very peculiar on-the-top-of-the-water kind of situation.

MR. GERSTMAN: In your evaluation of pump tests, is it standard for your profession to use semi-log or linear plots?

DR. MICHALSKI: Semi-log.

MR. GERSTMAN: Why is that?

DR. MICHALSKI: Because semi-log allows you to see the pumping test data in the real light and evaluation, determination of aquifer parameters and determination whether a recharge occurs or not, so determination of aquifer boundaries. And all those determination of aquifer boundaries are done normally at a later time, while aquifer parameters should normally be determined based on area data. And because of relationship with passage of time -- if I can refer to my -- in Exhibit 80, Slide number 9, which shows a typical drawdown for this site, drawdown versus log of time response. This is for a pumping well. What we can see is that theoretically, where you have the sloping section, sloping lengths of the arm of the drawdown curve, that to have the same so drawdown between, say, 100 and 1,000, meaning decrease by certain amount -- or drawdown increase by certain amount -- to have the same increase, you have to pump for another log cycle. That means from 1,000 to 10,000 minutes. It is because of this logarithmic

curve. When it grows, it's a certain measurement. So that it's still growing volumetrically, but distance-wise, it increases slightly. So you have to transform it for log scale to see those things.

You don't need to take observations as frequently as those. You can skip some of those. But you do need to continue observation for another logarithmic site. That is why they ask me a question: How long? As I say, you have a test for three days, just go to the 30 days, which would be logarithmic -- one log cycle further, so that you would grow your data extending only by this amount but you would have a better judgment for your approximation.

MR. GERSTMAN: And in these circumstances, you're not suggesting that a 30-day test would be applicable across the board, but in these circumstances, it would be a reasonable test to do based upon the claims that the Applicant has made concerning no impact to surrounding water users and the data that shows, in fact, there is no stabilization occurring with some of those pump tests?

DR. MICHALSKI: Correct. Where the Applicant admitted that there's really lack of stabilization -- if the Applicant really evaluated data in the sense it should, in my opinion, then you would not need to extend the test because you could follow the analysis of where the impact would fall. Because Applicant says there would be no impact, but evidence is to the contrary.

What I suggest, the only way to resolve those things is just to extend the test, then you would see whether you would impact the other users or not. This is because of differences of opinion.

MR. GERSTMAN: Thank you, Dr. Michalski.

I want to point out for the record a few things. While we don't believe that there's sufficient information for DEC or the Commissioner to determine that the permit can be issued under the appropriate standards of the Environmental Conservation Law, if a permit were to be issued, we would hope that the replacement water supplies for those impacted wells would be supplied for free and

would not be a charge against the property owners who suffer that damage without regard -- we can't predict what the cost might be to replace those water supplies that are currently functioning and viable. And we think a permit condition ought to be added by DEC that reflects that.

We also believe that the statement that there are some limitations on growth within the developable area of either project is, in fact, not what turns out to be the case showing the map that's been referred to by Ms. Bakner. We believe that a condition ought to be imposed that would restrict any further development within the developable area based upon the significant concerns we have about the available water resources.

We also want to point out that in Exhibit C and D to CPC petition, while we have not offered proof today concerning the issue of precipitation data, we have suggested that the use of Slide Mountain records was inappropriate based upon the evaluation of other comparable records. Slide Mountain would disproportionately reflect a higher rate

of precipitation because of its location and elevation. We don't believe that that is an appropriate use.

We also note that for stormwater evaluations done by the Applicant, they didn't use Slide Mountain because that was the higher precipitation range. So we are not quite sure which one the Applicant wants to go with. We think that there are concerns with respect to Slide Mountain for these purposes, offering at this point suggestions as to what might be appropriate.

Judge, can we go off the record in terms of scheduling for a second?

ALJ WISSLER: Fine. Take ten minutes.

MR. GERSTMAN: Thank you.

(3:20 - 3:33 P.M. - BRIEF RECESS TAKEN.)

MR. GERSTMAN: We have a few more issues with Mr. Rubin and also Mr. Schaedle who you have been introduced to previously. Start with Mr. Rubin, if we could.

Mr. Rubin, refer you to exhibits, I believe they're CPC 82 and 82A. Mr. Rubin, you heard the Applicant's criticism of your

exhibits. What is your opinion of whether the exhibits that you prepared represent the actual circumstances with respect to the simultaneous pumping test that was done for R1, R2 and R3 vis-a-vis stabilization?

MR. RUBIN: I believe that I have correctly depicted, especially in Figure 82A, the blowup of Exhibit 82, that the combined pumping test at Wells R1, R2 and R3 has not stabilized. In fact, I think what we're seeing here is what we might term perhaps, "apparent stabilization" that was presented by Crossroads just a little while ago.

When we talk about the term "apparent

stabilization," that would be something that occurs as the cone of depression expands and deepens more slowly. Because we increase with horizontal expansion, a larger volume of stored water becomes available. And short-term apparent stabilization, which would result from that, can lead some observers to conclude that stabilization occurred. In other words, the cone of depression develops more slowly as more and more of the aquifer is tapped.

So what we're looking at in terms of the very last few data points, which were discussed by Crossroads in the end of Exhibit 82A, stated that those points were evidence that, in fact, things had stabilized. First, if that was really true, and we had only a few data points perhaps represented, maybe half an hour, then that certainly wouldn't be a six-hour stabilization, would it? So what we need to do is recognize that in the broader scope of the expansion of the cone of depression, that this couple of points, whether they happen to be the last, you know, 10, 30 minutes, whatever -- not doing much drawdown -- that's just a blip in the overall decrease in the amount of water -- in the amount of drawdown that's going on.

So I would say that my Exhibit 82A quite accurately depicts the fact that the renewed aquifer drawdown is occurring and will continue to occur, and I think the only way to -- and we can talk about this. If you wanted to know, what you do is you go out and you run the test at your constant rate that you're selecting -- whether that's 63 gallons a

minute -- go out, start your test at that constant drawdown that you want, 63 gallons per minute. Run it until, in fact, you do or you do not see a stabilized cone of depression as indicated, not on arithmetic plotting, but rather on a semi-logarithmic plot, as is routinely done.

Many hydrogeologists out in the field want to have a good idea: Should I end my test? Have I hit the equilibrium conditions? They can do a quick plot in the field, not with an arithmetic plot, but rather on a semi-log plot.

So I would say if you want to know the answer, just go out and do it, do it right. Do it at the rate you plan on using for the duration of the test. Let's see if the water is there. Run it out, do it.

MR. GERSTMAN: Now, Mr. Rubin, you examined the pump tests that we've been talking about, specifically the individual R1 and R2, combined R1 and R2, and combined simultaneous R1, R2 and R3?

MR. RUBIN: Yes.

MR. GERSTMAN: In your examination of

those, were they able to achieve stabilization in any of those tests, in your opinion?

MR. RUBIN: No. In fact, if you look at all the exhibits that were presented to your Honor earlier, it showed these tests plotted both on arithmetic paper and on semi-log paper. We see, in a way, the arithmetic plot is almost deceiving. It tends to show much more, not totally horizontal end to the graph, but it looks much more horizontal. And to point out perhaps, if you want an example, here is the graph, simultaneous testing of Wells R1, R2, on a linear scale. We see --

MR. GERSTMAN: Excuse me for a second. We're looking at Appendix 7 and we're looking at the -- let's see.

ALJ WISSLER: Appendix B?

MR. GERSTMAN: I had Exhibit F, but you're probably right. Exhibit F, the simultaneous testing report.

ALJ WISSLER: Simultaneous testing of Wells R1 and R2, Well 1 linear? That's what you're looking at?

MR. RUBIN: Yes, R1-linear.

Still we don't see anything that looks horizontal at all, even in the arithmetic plot, although it certainly looks much more horizontal than we would see if we would portray it the way it is normally done on a semi-log plot shown two pages forward.

Here we see, at the end of the test, a significant increase in the slope of the plot indicating that the rate at which water is being pumped from the aquifer far exceeds the amount or volume of water that is coming into the cone of depression. So if we would keep going at this rate, with time, we would completely dewater the aquifer surrounding the well.

What would this look like, this plot, if -- we've been talking about, has a well stabilized? First, I would comment, we are looking in these plots at a graph that represents the area around the well hole. Ideally -- this isn't really what we want to look at. What we really want to look at is a good, complete, comprehensive set of data, not from the pumping well, but preferably from one or more observation wells. Because out in the

observation wells, we're getting out into the aquifer beyond impacts of the actual production pumping well, that we get a real handle on what's going on in the aquifer. So ideally, rather than looking at these plots of the well itself, this pumping, we want to look at that observation well.

So there, if we were to have stabilization conditions, certainly we couldn't use arithmetic plot because six

hours, sometimes even a day is minimal in
order to see whether we have stabilization.
So we would want to look at the semi-log plot,
and we would want to see -- what would it look
like if the well is stabilized. It would
look -- it would come down like the normal
steep slope we see here, and it would
literally flatten out.
A good example, if you ever want to
refer to a textbook, classic example, here's a
textbook used by a lot of hydrogeologists, one
of many. This one is called Groundwater Wells
by Driscoll, Second Edition, 1986. On
page 225, it's just as an example. You can
just draw a straight line on any of the plots

we've been looking at. You can see here, here
is an area where we haven't achieved
equilibrium at the beginning of the plot, much
like the beginning of our plots. Then the
line pretty much comes across. That's what a
stabilized well looks like. And again, I want
to point out --
MR. GERSTMAN: Judge, we will provide
a copy to counsel and to your Honor.
MR. RUBIN: Again, we should
differentiate, ideally since we're looking at
a major water supply, we don't really want
only the graph of the well itself that's being
pumped.
MR. GERSTMAN: Could you show the

Judge that.

ALJ WISSLER: That's logarithmic?

MR. RUBIN: As almost all the plots are here. That's how it's done.

ALJ WISSLER: So when the data begins to run parallel to the X axis like that, a point of equilibrium has been reached -- a point of equilibrium has been reached where the rate at which you're pumping is the rate at which recharge is flowing back into the

aquifer?

MR. RUBIN: Same amount --

ALJ WISSLER: Same amount I'm pulling out is coming back in?

MR. RUBIN: That's exactly right. And when that happens --

ALJ WISSLER: That is the number that I know is the steady state that I can pull out of this aquifer.

MR. RUBIN: Steady state equilibrium conditions, right. We don't have it in the last six hours of data from any of these tests. It's not best plotted on an arithmetic scale because we really can't see it. There's apparent stabilization that might be inferred by the last few points -- certainly not even six hours, is unknown.

What is the basis of this six hours of stabilization? I haven't a clue. And I don't know when they're using the six-hour stabilization number, what is the basis of it?

Who came up with the method? Is it approved by the National Groundwater Association? Were there hydrogeologists involved in it? Why does it conflict with standard texts like this

used by hydrogeologists in the National Groundwater Association? Where is this method from? Where is it documented? Why are we using a draft standard? And the data itself does not at all show any kind of stabilization.

So at this point I would say I would be uncomfortable, if it was me that was hired, to say there's enough water for this project -- I would sure hate to hang my hat on it without actual testing at a constant rate for a longer period of time to know what was going on. You can't change the rate in the middle and say that that applies to an initial rate, goes faster and then a reduced rate somehow applies. This is a big enough project that you should do the test for the rate you plan on using.

ALJ WISSLER: Or do the test -- if you can't achieve equilibrium at the rate you want to pull water, know the rate you can pull water; is that what you're saying?

MR. RUBIN: Exactly, sure. Many municipal water supplies never achieve equilibrium. It's not to say you have to achieve equilibrium, but you have to have the data that can support how much water is available in terms of the transmissivity factors and storativity of the aquifer. Some aquifers never achieve equilibrium that are used by municipalities. But when you do a prediction of how much water you draw down for a certain period of time, you make the determination that it may be sufficient, but you need the data to back it up.

MR. GERSTMAN: Judge, do you have any further questions for Dr. Michalski or Mr. Rubin?

ALJ WISSLER: No.

MR. GERSTMAN: I think, Judge, we want to ask Mr. Schaedle to identify some of the issues that have been represented by Crossroads at this point, and we want to clarify the record on some of those issues. It won't take very long.

Judge, I'd like to introduce you again to Mr. Rich Schaedle.

MR. SCHAEDLE: There were several points brought up yesterday and this morning about the Pine Hill water supply. I

specifically didn't address very much about this earlier, but since it was brought up yesterday, I want to clarify several points.

First of all, in the 1970 DEC permit number 5889 that was referred to yesterday by Delaware Engineering, while it does not set a takings limit as was stated, that's true, it does reference the fact that the system used approximately 300,000 gallons per day in the summer, and only about 25,000 gallons per day in the winter. This would seem to indicate that the 300,000 gallons per day in the summer was not due to leakage or anything else. It was actual demand. Otherwise, if it was leakage, you would have it all year round.

Furthermore, just for the record again, historically, the Pine Hill water system has and did use all the sources; that is, Bonnie View Springs, Crystal Springs, Station Road Well, Station Road Springs, the old Pine Hill Well number 1, throughout the years 1950 through 1991 that I can directly relate to.

MR. GERSTMAN: That's in times of drought?

MR. SCHAEDLE: In times of drought, in times of special needs, fire, something like that, when the hydrants did work in Pine Hill which only lasted until about 1960 or so and they became obsolete. So I just want to point out we did use all those sources.

In a letter to the DEC submitted by Whiteman, Osterman & Hanna --

MR. GERSTMAN: That's Crossroads Exhibit 117?

MR. SCHAEDLE: Right. It was

presented yesterday, I believe. It states that the Town of Shandaken zoning restrictions provide minimal opportunity for development in the hamlet. The same letter includes calculations of water use for vacant units of 450 gallons per day. First of all, the Town of Shandaken zoning law allows hotel developments in Housing/Residential, which is found in Section 116-10.

MR. GERSTMAN: Referring to the Town of Shandaken Town Code, and I believe --

ALJ WISSLER: I think that's in.

MR. GERSTMAN: That's part of the record, yes.

MR. SCHAEDLE: So it does provide for significant more growth than what the LA study in this letter identifies.

Furthermore, the LA study incorrectly in Exhibit -- Attachment C misrepresents the zoning in Pine Hill in this exhibit, which is Attachment C to the August 2001 letter, August 7, 2001 letter. It lists "Hamlet Residential" for the area south of Main Street along Elm Street and over to Route 28. Whereas a map, which is a little hard to read but which we will submit as a document, clearly shows that the area is zoned "Hamlet Commercial" which allows hotel development.

And not only is it just east -- or south of Main Street, it is also north of Main Street. In other words, it's both sides of

Main Street. So the development of Pine Hill could be a lot larger and demand a lot more water and bring it back to the levels that it was, up to 1970, let's say, when the demand was 300,000 gallons per day. So I just want to point out that, again, there's misrepresentation in the document presented by the Applicant.

The estimates of water consumption provided in all of the Crossroads' materials are really just estimates, and they use different estimates in different documents. The ranges run from, anywhere from 60,000-odd gallons per day to 113,000 gallons per day. Given that the Ulster County Department of Health required the Pine Hill sewer plant, again I think I mentioned this, had to be built to serve a maximum historical use of 4,000 people, and that was referenced yesterday again by Delaware Engineering, it seems reasonable that Pine Hill should also have a water supply to feed that sewer plant with their wastewater.

MR. GERSTMAN: The growth accommodated by the wastewater treatment plant should also be equivalent growth that's accommodated by available water supply?

MR. SCHAEDLE: Right. And in my earlier statement, I said the average usage was 75 gallons per day -- per person per day, was 75 gallons per day per person. Yesterday, I think Delaware Engineering referenced it as 100 gallons per day per person, which means we

don't need 300,000 gallons, we need 400,000 gallons to bring us back to that 1930 standard.

A final point I want to make, and this wasn't referenced before by myself, but several times Ten State Standards has been mentioned as a standard for water supply systems. It is my understanding that Ten State Standards states that two independent sources have to provide water to a system such that if one source is taken out of service, the other source will be able to provide water.

Now, using Rosenthal Well 1, 2 and 3, yesterday I think Ms. Bakner stated that, obviously, with the simultaneous pumping of Wells R1, 2 and 3, it shows that there's some interconnectivity because they had to lower the level of pumping from when they were pumping one well to the pumping of all three wells. If that's the case, in a layman's viewpoint, I feel that the wells are interconnected. If one well becomes contaminated and has to be taken out of service, it seems to me that all wells would

be contaminated, and therefore, there's no source of water for the project, except for

Silo A which would require backup and can only produce 10 gallons per minute in a dry period. So that's all I have to say.
MR. GERSTMAN: Judge, actually, Mr. Schaedle has one more thing to say.
MR. SCHAEDLE: Okay. I have one more thing to say. Sorry.
MR. GERSTMAN: That's just to reiterate, Judge, that in figuring out the available water for Pine Hill Water Company, and I believe we have previously provided through his testimony -- I don't remember what date that was -- a statement concerning the correction of the data concerning the connectivity of Station Road Spring.
MR. SCHAEDLE: Station Road Spring and Silo B.
In the water supply permit that was issued in 2002, September of 2002, it lists the Silo -- Station Road Spring having 28 gallons, and has the potential of bringing on Silo B with another 28 gallons. I think when you were -- I wasn't with you, but when

you were on your tour, you saw Silo B and you saw Station Road Spring. Station Road Spring does not have any water in it since Silo B has been dug. I mean, it has a residual amount of water, maybe a half gallon to a gallon per minute during wet periods. During dry periods, it goes completely dry, and all the water flows into Silo B, so there's only one source there for water. It's 28 gallons per minute during your dry period, and it's either -- it's Silo B. Station Road Spring is not a legitimate source of water. We have referenced this to the DEC in the past when we were fighting -- challenging the water supply permit, and they ignored us.

Can I just ask counsel a question?

ALJ WISSLER: Yes.

(MR. SCHAEDLE & MR. GERSTMAN CONFERRING PRIVATELY.)

MR. SCHAEDLE: What I'm saying here is that the permit for Pine Hill water system is inaccurate. It does not reflect that there's only one source of water of 28 gallons there.

MR. GERSTMAN: And that's been conceded at this point by Alpha Geoscience?

MR. SCHAEDLE: Yeah. They admit that Silo B and Station Road Spring are from the same source.

Furthermore, they also -- as I stated, they reduced the minimum flow on Bonnie View Springs to 67 gallons per minute from 85 gallons per minute, so that reduced -- between those two, it reduced the flow for Pine Hill of 66,000 gallons per day.

MR. GERSTMAN: That's available water resources for Pine Hill.

MR. SCHAEDLE: One final point I would like to make. I realize the DEC receives --

when we make comments to the DEC about fallacies such as Joe Habib's pump statistic reports --

MR. GERSTMAN: There was an earlier -- obviously, we heard from Mr. Habib and now heard the response from the Applicant concerning Mr. Habib's statements indicating that they were responded to in the context of the DEC issuance of the Pine Hill Water Company permit in 2002, which was subsequently challenged in Supreme Court. And I think what Mr. Schaedle is getting to here, and he can

supplement what I'm saying, is that there have been FOIL requests to the Department of Environmental Conservation for information concerning comments and responses that have been made in response to Mr. Habib's.

As far as Mr. Schaedle can tell, and he will let you know this, none of that was ever provided to the Pine Hill Water Coalition in their FOIL records. So whether that record obviously exists -- or existed someplace -- it did not exist as far as the public was concerned in terms of a response to a FOIL request; is that a fair evaluation?

MR. SCHAEDLE: That's a very fair evaluation. But it also seems that the flow of information was one way, from us to the DEC to the Applicant. But it never came back to us, any response to our challenges, especially when there was an error in the calibration going back to that infamous part. I'm not a lawyer, it just -- I'm frustrated that we never got any responses on these changes. And it's the first chance I've had to vent it, so I apologize.

ALJ WISSLER: That's okay.

MR. GERSTMAN: Thank you, Mr. Schaedle.

Judge, we would request that the protocol and the guidance that the Department of Health has relied upon to approve the protocol submitted by Crossroads be provided for the record, if it hasn't been already.

ALJ WISSLER: Is Mr. Dunn here?

MS. KREBS: He had to leave, your Honor. Whatever is available, we will provide. I'm not sure exactly which document.

MR. GERSTMAN: We're not talking about the protocol and approval, we're talking about the backup documents that supports that purpose.

MS. KREBS: I'm not sure there is one document, Marc, but I will check.

MR. GERSTMAN: Thank you very much.

You've got any further questions?

ALJ WISSLER: No.

MS. BAKNER: If we could have five minutes.

ALJ WISSLER: You got it. Five minutes.

(1:02 - 1:14 P.M. - BRIEF RECESS

TAKEN.)

MS. BAKNER: Your Honor, if it's okay, we'd like to respond to Mr. Schaedle first, just to go forward. I want to make it clear that we provided all the information regarding the Pine Hills water supply system for the following two purposes; one, we need to show in this proceeding that our use of Silo A will not have an adverse effect on the adjoining Pine Hills water supply system, we feel we have done that. And with the permit condition that DEC has put in place with respect to the usage limitations upon Silo A, we're confident that no water that we will withdraw from Silo A will have any impact on the Pine Hills water system.

Mr. Gowan, do you share that confidence? Is that the case?

DR. GOWAN: Yes.

MS. BAKNER: The reason, additionally, that I sort of dredged up all the history with respect to the permit modification, which was previously issued, is because several times during the course of the Issues Conference, people have raised issues which have already

been asked and answered in the context of that previous proceeding. As you will see from our brief, your Honor, all of these issues have been addressed. And under the legal concept of res judicata, they're not open for reexamination in this proceeding.

We sympathize with Mr. Schaedle if he never received our responses to his comments, but from the Applicant's perspective, we have responded a lot and we really feel that we have put Mr. Habib's comments to rest and done everything that we possibly can to make sure that they understand the difficulty that we had with the flow meter.

Mr. Schaedle has again attempted to interject an issue with respect to the water company, the Pine Hills water district, if you will, water supply, and that is in connection with the information that we included regarding the relationship between Silo B and Station Road Well. Neither of these sources are we proposing to use for the resort. Nothing that we do with Silo A has any effect on Silo B or Station Road Well.

In our alternatives evaluation, we

talked about the sources in the Pine Hills water district because by law, we're required to look at alternative public supplies even though we have no intention of purchasing water from the town as an out-of-district user as we're proposing to do so with the Village of Fleischmanns.

Steve Trader, if you could please, can you explain the question that Mr. Schaedle had regarding Silo B and Station Road well.

MR. TRADER: Yes. Station Road Spring.

MS. BAKNER: I'm sorry.

MR. TRADER: There may be some confusion on how Station Road Spring, Silo B, how these spring flows are measured.

Basically, once upon a time, there was this spring called Station Road Spring. Remnants of it are still in place.

Silo B was installed. This intercepts a portion of the water that would have flowed to Station Road Spring. Silo B now has a pipe that comes out. We saw this in our field trip. The discharge comes out to a ditch that runs along Station Road.

Station Road Spring at times has flow coming out across the ground and entering that same ditch. So at other times of the year, not only do you have Silo B contributing water to that ditch, but you have Station Road Spring contributing water. You also have water that's coming down the ditch that's already in the ditch -- flow coming down from further uphill.

We measured the flow in the ditch above and below the point where these springs enter that ditch, so we subtract out what's already coming down the ditch from the lower measurement. Then we take the difference between what we measure downstream. We know that whatever the difference is between that and the total of Silo B flow and Station Road Spring flow is, and that would tell us how much of that -- knowing what Silo B discharge is to the pipe, we could subtract it out and find out what Station Road Spring is producing still.

The lowest period that we measured that flow was in August 30th of 2001. The discharge pipe of Silo B was a yield at 27.5

gallons per minute.

ALJ WISSLER: Referring to Table 1A?

MR. TRADER: Referring to Table 1A.

At the same time, we measured the ditch flow downstream from where Silo B was discharging. We measured that flow to be 28 gallons a minute. Therefore, the total flow from Station Road Spring is 28 gallons per minute. You could say it was a half gallon a minute, but there was no seepage seen at that time coming out of the bank where Station Road is. So we have 27 1/2 gallons per minute measured in August from Silo B, downstream in the ditch we measure 28 gallons per minute.

So that's the reasoning for saying that the total, what we call Depot Spring, which is the combination of Silo B and Station Road Spring -- those two together form Depot Spring -- the low flow was 28 gallons per minute.

MS. BAKNER: Mr. Trader, Applicant's Exhibit 56, which is the modified Pine Hill water supply permit, are those numbers reflected in that permit?

MR. TRADER: Yes. I believe it says 28 gallons a minute.

MS. BAKNER: All right. So, your Honor, we're answering this because Mr. Schaedle had a question and we wanted to answer it. It's irrelevant to this proceeding, but we are trying.

The questions that we'd like to answer now are really comments that Dr. Michalski has made in sort of attempted rebuttal at the positions that we took late yesterday and earlier today. First of all, Steve -- Dr. Gowan, both Mr. Gerstman and Dr. Michalski have argued that you made some sort of concession regarding the geological analysis and the recharge of R1, R2 and R3. Is that your recollection?

DR. GOWAN: No. It's not a concession. I represented, and it's my belief that the recharge for those wells are not getting a direct recharge from the stream at the well field, but our recharge for the water coming into that well field is coming from both groundwater from the uphill side, it's from groundwater moving down the valley, as well as various areas in the valley where surface water is able to refiltrate into the ground. So it's all them together. I wouldn't call that concession.

MS. BAKNER: In terms of the point that you gentlemen made about irrigation yesterday, I don't think I heard you make the point that irrigation was going to add enormous extra quantities of water to the system. To the contrary, I think you made a much more subtle point regarding keeping the soil moist and able to continue to allow for infiltration. Can you explain that further?

DR. GOWAN: Yes. The water budget -- the first thing you have to do to get recharge to the groundwater, percolation of the groundwater, is you have to have 100 percent saturation. It's sort of like if you water plants at home and you have a water pot. If you water it from the top, you pour water in and you don't see any water appearing above, all of a sudden it starts to reach the point of saturation where water appears at the bottom of the pot. At that point, almost every bit that you pour at the top from then

on is going to appear at the bottom.

It's the same thing here. During the summer without irrigation, the soil dries up and you've got to get a period of rainfall, and usually that happens later in the year in the fall months before you get saturation sufficient to start moving down the water through the soil. But with irrigation, you're maintaining a more closer to full saturation throughout the dryer months because you want to maintain the vegetation growing and you want to maintain a good consistency for your soil, which is important for golfing. So it's that higher level of saturation, percent of saturation, that gets you closer to that point where when you do have rainfall, it doesn't take as long for you to start getting that recharge of percolation.

MS. BAKNER: Okay. Now, in your water budget analysis, I know you said several times, but I want to make sure it's clear for the record; in your water budget analysis, in an effort to be conservative, you did not add any inputs from irrigation, as I understand it; is that correct?

MR. TRADER: That's correct.

MS. BAKNER: So none of the irrigation gallonage was included as part of your pre- and postdevelopment recharge analysis?

MR. TRADER: No, it was not included.

MS. BAKNER: All right. And just for the record, did your recharge analysis focus somehow exclusively on the golf courses, or did it focus on the entire developed area?

MR. TRADER: Focused on the entire

developed area.

MS. BAKNER: Okay. So Dr. Michalski's statement that you were just looking at postdevelopment relative to the golf courses was, in fact, not correct?

MR. TRADER: And actually, not just the entire developed area but the entire project boundary is what we...

MS. BAKNER: So the area to be developed and disturbed and the area that won't be developed and disturbed?

MR. TRADER: That's right.

MS. BAKNER: Okay. In terms again of the Slide Mountain data, your sensitivity analysis which we submitted as Applicant's

Exhibit 122, you tested your sensitivity analysis to see if the use of the Slide data had somehow given you false results, and what were the results after using the Belleayre Mountain rainfall data?

MR. TRADER: The results showed that there was going to be a very slight increase in recharge to the groundwater system.

MS. BAKNER: What does that tell you? How is that relevant to your understanding of the hydrogeological regime?

MR. TRADER: That would tell me that even during a theoretical drought situation at the location, that the development of this project would not cause a decrease in the available recharge to groundwater.

MS. BAKNER: Sam, earlier today you indicated to me that the results of your water budget analysis in terms of its ability to predict the hydrology in the regime was very precise. Can you give me an example of how you found that to be predictive?
DR. GOWAN: When we looked at that and just generally looked at the area of the spring recharge areas, which we didn't

specifically do the water budget for there, but looking at the general kinds of numbers we were coming up with for the water budget, we saw that the discharges from those spring areas appeared to match fairly well with the amounts of groundwater that we would expect to be yielded from those areas.
MS. BAKNER: So your long study of this area and your analysis in terms of the water budget, in addition to the flow data and all the empirical data you collected over the years, would lead you to believe that you have correctly evaluated the regime?
DR. GOWAN: Yes.
MS. BAKNER: All right. To go back to the fractures here, Mr. Trader, I know you wanted to address this specifically. Dr. Miculcheck portrayed this cross section --
MR. GERSTMAN: Dr. Michalski.
MS. BAKNER: Michalski, sorry. Dr. Michalski portrayed this cross section as

some level of mumbo-jumbo, and I guess what I would like you to do is show how the fractures that are on there relate to your well boring logs or whatever information that you

collected through actual tests.

MR. TRADER: Sure. This isn't something we just drew together with a paintbrush. The locations of all these wells are fairly accurate based on the topographic map, and as best we know where all the wells are located, the depths are correct, the depth to bedrock is correct, where we know that information from drilling logs. The Ski Center wells, we have that information. Pine Hills -- PH-1, we have that information. Station Road Well, we have that information, depth to bedrock. The well field at Rosenthal, Residential Well 3, we have the information on that one, as far as depth to bedrock. Also the geology that's portrayed here is representative of the geologic logs that are available for each of these wells.

On the Fleischmanns side, up on the divide area, we have the Coachhouse well [sic] and we have the Rashad well. Those depths are accurate. I've estimated what the mantle of till thickness would be, knowing what we know from the various literature that's out there. These Fleischmanns wells here are at the

correct depth. Fleischmanns Well number 1 is

70 feet deep, 200 feet deep for Fleischmanns Well 2, and Fleischmanns Well 3 is 410 feet deep. (Indicating)

As far as the fractures go, I generally tried to portray what is shown in the Reynolds and Heisig publications that have been submitted. As far as the Rosenthal wells, I actually located -- I just put on there -- I don't know the exact orientation of these fractures, okay. I kind of tried to follow what Heisig and Reynolds showed. But wherever a fracture is intersecting one of our wells or any well that we have information on, I have actually shown a fracture at that depth. The 186-foot fracture that keeps being referred to is located on here as well. (Indicating)

Just because I don't show one of these fractures extending to another well or extending any certain distance, that doesn't mean they're not connected in some way. The well field R1, R2 and R3 are certainly connected. I don't necessarily show -- well, I do in this case -- I have a fracture coming

down here and there's another fracture that adjoins up with it. We know we have a connection with Residential Well 4. (Indicating)

How do we move water from Well 4 area out down towards the well field? Just because

I'm not showing a continuous fracture going there obviously doesn't mean that it's not occurring. You've got to remember that this is just a slice through the earth. There's a three-dimensional aspect to this. These fractures can extend out this way. There can be another connection coming over here. We just don't know. (Indicating)

DR. GOWAN: I don't know if he is making this clear. It doesn't have to be a single fracture connecting those wells. It can be one fracture going a short distance, connecting with a vertical fracture that connects with another horizontal fracture.

ALJ WISSLER: You made it clear, Steve.

MR. TRADER: Okay. Probably I'd like to point to this table here as well as the fracture here. (Indicating)

MS. BAKNER: Yes, that will be good.

MR. TRADER: That's a new exhibit, I suppose.

MR. RUZOW: We'll have to mark it.

ALJ WISSLER: Applicant's 126.

("WELLS AND FRACTURE YIELDS" RECEIVED AND MARKED AS APPLICANT'S EXHIBIT NO. 126, THIS DATE.)

MS. BAKNER: Steve, where does this Table of Wells and Fracture Yields -- from what information is it derived?

MR. TRADER: The information here is

derived from the actual geological logs that were contained in the reports for these wells. Alpha Geoscience is the geologist that was on site for Wells R2, R3 and PH-1 and PH-2. We are the ones who logged where the fracture depth were, it was not the driller. R1, in fact, was Titan Well Drilling. Alpha Geoscience was not present for that drilling investigation and the installation of that well. That comes from the Titan well log.

MS. BAKNER: Okay. And that's for R1 only?

MR. TRADER: That's for R1 only.

The rest of these on that upper table there all come from the geologic logs that were contained in Alpha Geoscience's reports.

MS. BAKNER: Okay.

MR. TRADER: I'd just like to point out that this fracture in R2 at 186 feet, the one that's shown to be 66 gallons per minute. (Indicating)

Now these gallons per minute are simply a blow test by the driller which was explained, I think, by Dr. Michalski. When they are drilling, whatever depth they're at, they're blowing air down there to help lift out the cuttings which come out in the water. They don't come blasting out of the air. There's water in the well, and the water brings the cuttings out.

So they can stop at any one point and measure if they know how much they're putting in there. And they can measure how much we're getting out as far as water. So the 66 gallons per minute at 186 feet is what that blow test revealed.

238 to 240 feet, what that is showing isn't that the whole thing was 40 gallons per

minute, that's the difference. So you have 66 gallons per minute, plus 40, that's 106 gallons per minute. You're picking up an additional 40 gallons per minute right there. This is just on a blow test. It's not necessarily going to be exactly what you're going to get in a pumping test. We didn't pump at those rates. (Indicating)

So this fracture that was at 186 feet in Well R2, I have shown that right here at the approximately 186 feet, I have drawn a fracture through there. Admittedly, I don't know the exact orientation of that fracture. (Indicating)

ALJ WISSLER: Is that labeled?

MR. TRADER: No, it's not. But there's a black line going through there, and if you're going to measure from the surface down to that black line, it's approximately 186 feet. Below that, if there's one that's estimated to be between 238 to 240 feet, somewhere in that range, and that's also shown on here. (Indicating)

ALJ WISSLER: Let me ask you that:

All those fracture lines that you show there
(WATER SUPPLY, GROUNDWATER, SURFACE WATER ISSUES)

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are to scale, laid out from some data source?

MR. TRADER: No. The data source from R1, R2 -- I'm only pointing out the ones that I specifically located just where to intersect a representative fracture. These are at R1, R2 and at PH-1. Those are the only three locations that I have a specific idea where that fracture was, because we were at the site and we knew what depth we were.

The rest of the fractures --

ALJ WISSLER: But those aren't indicated specifically?

MR. TRADER: I could put down here 186 feet. (Indicating)

ALJ WISSLER: In other words -- all I'm saying, is when you drew that line on that 99B, when you drew that line, you said: You know what, that's the 186-foot line, I'm going to remember that line. Is that what you're saying?

MR. TRADER: When I drew this line on here, I purposely drew it to intersect the well at 186 feet. (Indicating)

DR. GOWAN: That's a scale drawing, your Honor.
(WATER SUPPLY, GROUNDWATER, SURFACE WATER ISSUES)

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MR. TRADER: This is to scale, the depth is to scale, and so is the horizontal,

but the fractures are merely representative of what is known in the area to the south and to the north --

ALJ WISSLER: Where I see a fracture line intersecting a well, that's based upon well data that you have?

MR. TRADER: Only at three locations.

MR. RUZOW: Where you were present and observing the boring taking place?

MR. TRADER: Where we were present. So these are at PH-1, R1 and R2. The rest of the fractures --

ALJ WISSLER: Is there a reason why you didn't label that on this?

MR. TRADER: No reason. I just wanted it to be as accurate as I could make it.

MR. RUZOW: Based on the available information.

MR. TRADER: If I knew there was a fracture there and I didn't put one, someone would say: How come you didn't put a fracture at 186 feet? So I have one there.

I know that these other wells go

across fractures because they make water, so I showed these fractures on here. (Indicating).

MS. BAKNER: So you tried to make your cross sections as realistic as possible, and I guess what I would like to get back to now with Dr. Gowan is, we hear again that we have these transmissive fractures that are going to tie the Rosenthal wells, going to tie the Pine

Hill wells, going to go all the way through the mountain and over to Fleischmanns, and it's going to mean that everybody is trying to use everybody's else water and so there wouldn't be enough.

Can you address that again as specifically as you can.

DR. GOWAN: That's very unrealistic, and we know that based on, for one thing, the wells that Steve has placed on the Highmount area where they're very low yielding wells, I don't believe we know the fracture depth in those wells, but that's telling us that's a very, very tight rock, very, very low productivity as far as the fractures go.

Now, there was another statement that Dr. Michalski made and that is he's suggesting

that there's a fracture that connects Railroad Spring across Highmount to the Fleischmanns Spring. Now, if that was the case, then we wouldn't have water coming out of the spring up that dip out at Railroad Spring. That wouldn't exist. He's talking about this permeable fracture going all the way through. Well, that water would go to the west if that was the case.

And the reason that doesn't work is something that we discussed before, and that is as you get into the core of that hill, the weight of the overlying rock is going to tighten up and hold those horizontal fractures together. They're going to close that aperture. And we heard earlier testimony about the wider it is, that how much the dimensional increase in ability to flow. Well, they get pretty tight when they get at depth in those higher elevations.

MS. BAKNER: Dr. Michalski said that your conceptualization of this or your understanding of this cannot explain the high elevation springs. Can you address that?

DR. GOWAN: Yes. As a matter of fact,

I think that the record will reflect when I was discussing this earlier, I specifically talked about those springs at the higher elevation, and we observed those during the site walkover, particularly when we walked Wildacres. We started up at the springs and walked down and the water coming from the springs flowed on the surface water and then disappeared in the subsurface. And then they would come out again, you would see springs downslope. And in the previous discussion, I said that that is because you're hitting those tighter, shalier zones causing these contact springs to appear. So it's that -- all that same water that's coming down the hill, popping out of the springs and going back into the subsurface and then popping up again as it hits those tighter zones.

MR. TRADER: And then we actually kind

of demonstrate one right here, water coming down through the permeable upper fractured bedrock, some of that water seeping out as it hits the potential shale. I don't show a shale interval here. (Indicating)

MR. RUZOW: And you're looking at

Applicant's 99C, the Westfalls Group, the arrows in that area.

DR. GOWAN: And we're not representing that all the water comes out of the springs. Some certainly goes through those shaly zones that are also fractured. There's going to be vertical fractures through those. They don't move as much water -- they don't allow as much water to flow through as the sandstones would, so that forces some of that water out as springs.

MR. TRADER: Also, the fact that this is all one gray area, there's no intent to try to misrepresent what's here. We acknowledge there's shale present in here. We say that right in the descriptions of the geology; sandstone conglomerate shale. So shale just doesn't mix through hodgepodge, shale comes in layers. So it's in here. (Indicating)

MR. RUZOW: And in terms of the uniformity, you've expressed it, and I think Mr. Michalski acknowledged, there's a three-dimensional part of this. If you have a solidified layer or a uniform shale layer at a particular level, then presumably at the face

going around the entire mountain of that contour, you would expect to see seeps. It's, in fact, sealed it off? We don't see that.

MR. TRADER: One aspect to that is, the dip is to the southwest. So if water was flowing down and into a fracture and hits a bedding plane, if in fact the fracture went all the way through the mountain, it would pop out on the downward side of that fracture, which would be on the southwestern side of the hill, and you wouldn't have a spring popping out on the northeastern side of the wilderness, but in fact they do. You see that at Wildacres and you see that at Big Indian.

MS. BAKNER: Just before we forget about it, when Dr. Michalski was talking about the railroad and saying that this is obviously wrong because, you know, the Railroad Spring is here, can you just address that?

MR. TRADER: Sure. If you look at the cross section location map, which is --

MR. RUZOW: Exhibit 99B.

MR. TRADER: -- this cross section again is a specific slice along where that location is shown in red.

MS. BAKNER: This one, you mean?

MR. RUZOW: Yes, which is 99A.

MR. TRADER: Cross section starts at Fleischmanns, comes up over the Highmount divide. This is the origin of Crystal Spring Brook right by the ski center area, and it comes down, it's curving around. What we're drawing here, we're not yet crossing the brook, we're still over here at the ski center wells. Now we're following pretty much parallel to the brook. We come through an intersect, Pine Hill number 1. Bonnie View Springs are located south or southwest of that line. The springs are also popping out. (Indicating)

Railroad Spring is not located on this cross section, Railroad Spring is located approximately right here, which is somewhat south of the cross section line here. So the point that that's not on there, if I was to draw a different cross section line coming from some other location, you would not necessarily see as much thickness of this till here. But in fact, where I have drawn this cross section line is through the known wells

in the area. So Bonnie View Springs is not shown on there because the cross section line doesn't really pass through here. The springs are popping out nearby. (Indicating)

MS. BAKNER: And where you put the overburden or the pinkish-colored materials was based on the well drilling logs?

MR. TRADER: Yes, it was. At the ski center wells and also at PH-1. (Indicating)

MR. RUZOW: Remembering that the vertical scale is an exaggeration of seven times, so...

MR. TRADER: Yes, but the footage is correct, the depths are correct, the thickness of till is correct.

MS. BAKNER: Dr. Gowan, CPC Exhibit 80 contains that groundwater flow conceptualization by Reynolds, and I note here that Reynolds has artfully arranged the shale layers. What does that mean in fact?

DR. GOWAN: This is a conceptual drawing and --

MR. RUZOW: This is page 4 of CPC Exhibit 80.

DR. GOWAN: -- and he's essentially

showing, as we discussed before, he's essentially showing the concepts that we've been talking about, where the groundwater is essentially mirroring topography, it's following the topography.

And not only that, we heard some discussion earlier about Fleischmanns wells being several feet lower than -- the water level being several feet lower than the surface. We also see that in the Rosenthal wells, several feet lower than the surface.

Well, some of these are confined systems. Despite the fact they're confined systems, they're still mirroring topography. We're still going -- groundwater flow is still

in the direction of the topography, whether
it's the water table or that confined zone.

He is not representing, Reynolds is not representing uniform sandstone aquifers continuing underneath the mountain sides with uniform hydraulic characteristics. He's still showing that increased permeability in the near surface of the area.

MS. BAKNER: So, in fact, you could put shale lines on there, beds, and it would

be no more reflective of some actual bed in reality than Reynolds has because no one knows where those are; is that correct?

DR. GOWAN: That's correct.

MS. BAKNER: All right. Has Dr. Michalski presented any independent evidence to support his interpretation of the geological regime? Has he done any study here? Has he done anything other than question the results that you have put together?

DR. GOWAN: I am not aware of any additional information that he has.

MS. BAKNER: Would it be feasible for a project like this, or is it even feasible at all, to somehow accurately characterize layers of shale or fractures in this large area? Is it possible to do it?

DR. GOWAN: It's possible, but is it feasible, no.

MS. BAKNER: Okay, it's not feasible?

DR. GOWAN: It's definitely not feasible.

MR. RUZOW: Because it would require what?

DR. GOWAN: A tremendous number of holes, lots of surface mapping. It would take a lot of time and a lot of resources.

MS. BAKNER: Have you ever done this in connection with a project such as this, a resort project, as part of a Draft Environmental Impact Statement?

DR. GOWAN: No. We have done large projects, different kinds of projects where we had extensive drawing but not in this kind of development, resort development, no.

MS. BAKNER: Do you think at this point that it would provide any more useful information to you than the numerous pumping tests that you have already done on the site?

DR. GOWAN: No. I think we have a pretty good understanding of what's going on at the site.

MS. BAKNER: I would like you to discuss, just for a second really, being responsive to both Mr. Rubin and Mr. Michalski -- Dr. Michalski, regarding the simultaneous well pump tests for R1 and R2 and what your result from that test showed projected out six months. Could you please

pull that out and go over it for us?
We've heard an awful lot about how we should just pump for a month. We've also heard from the Department of Health that that's never been requested of an Applicant. So what I'm trying to do is show how your test results there provided long-term information.
DR. GOWAN: Well, essentially, it's a -- looking at the drawdown in the last -- I don't know how many minutes, looking at that drawdown and just continue to project the drawdown for that 180 days, it showed that it was not going to drop below the pump intake. This is -- we heard earlier from --
ALJ WISSLER: Are you referring to a specific chart or something like that?
MR. TRADER: The chart is in Appendix E of --
MS. BAKNER: That's the simultaneous well pump tests for 1 and 2 in the DEIS.
You're in the right file.
Sam, why don't you go ahead and explain it up here. That way it will be clear.
DR. GOWAN: Yeah. This is taken in

the last 1440 minutes which is the last day, last 24 hours of the pumping test.
ALJ WISSLER: We're looking at Appendix E, the very first chart in Appendix E of --

MS. BAKNER: -- of F, simultaneous test report in Volume 3 --
ALJ WISSLER: -- Appendix 7 --
MS. BAKNER: -- of the DEIS.
DR. GOWAN: I'm glad you all got that.
That's the last 24 hours of the test. And what we did is draw a straight line through that data and continued that out --
ALJ WISSLER: That's the data right there? (Indicating)
DR. GOWAN: Right. That's right. And we tried to project that out for 180 days, or six months.
ALJ WISSLER: This is the six hours here?
MS. BAKNER: No.
DR. GOWAN: 24 hours. And project where the water level would be at that assumed continued drawdown. And that's -- and you heard Mr. Dunn say today that that's a

conservative approach.
MS. BAKNER: Mr. Garry.
DR. GOWAN: Mr. Garry, I'm sorry. Mr. Garry said it's a very conservative approach they like to see because it's assuming no recharge during that period, and that's a very unusual thing in this part of the world, where you do get recharge normally within six months.
And what this does is shows the projected level of the water in the pumping

well relative to the base of the well or the pump intake. (Indicating)

MS. BAKNER: So what does that tell you about whether -- or let me ask you differently: Does that tell you anything at all about the ability to obtain water from this source without adversely impacting other sources?

DR. GOWAN: Not really. You need to look at your observation wells. You need to look at the extent of your cone.

MS. BAKNER: Okay.

DR. GOWAN: And this is really just saying whether you think that this well

pumping is going to be able to be sustained. (Indicating)

MS. BAKNER: All right. So it's not -- so it's useful information, but the drawdown information is not a substitute for your actual 72-hour pump test?

DR. GOWAN: That's correct.

MS. BAKNER: There's been a suggestion by Mr. Rubin that during the 72-hour pump test, you should really be measuring drawdown not in your wells but in the observation wells. Do you agree with that?

DR. GOWAN: Yes, you should be observing drawdown in your observation wells, yes.

MS. BAKNER: Did you observe -- did

you do that?
DR. GOWAN: Yes.
MS. BAKNER: We're sort of back to the words that we can't say very well, which is the geophysics of bore holes, and I'm going to ask you again, we're talking about taking visual cameras down the holes, we're talking about trying to find out which way the water goes inside the holes. You know, what do you

think about? Is that useful information or necessary given what we know about this site?
DR. GOWAN: It's unnecessary for this site. And I would like to say that it was represented that this was common practice and this is the standard going back some considerable period of time --
MS. BAKNER: To 1960, I believe.
DR. GOWAN: -- Downhole geophysics was really developed for the petroleum industry and -- in recent years, and I also should say that I have supervised the geophysical logging of thousands of holes, and I worked in the energy fields and I have a considerable amount of experience working with geophysical logs. I would have to say that very few people that we work with and ourselves use downhole geophysics in water supply work. It's just not necessary, it's not done.
And as time is developing here, we're seeing a lot more promotion of this concept. And we're seeing a considerable promotion by

the US Geological Survey. They're doing a considerable amount of research in this area, and I know that they would very much like to

see us do this more. But in the practical application for water supplies, it's unnecessary. It's an unnecessary added expense.

Now, we do use downhole cameras when we're doing well rehabilitation because we want to know what's going on in the well. We pull the pumps, we look, we're concerned if we lose well capacity because of incrustations, bacteria growth, these sorts of things, and we want to know what it looks like, we want to know if our casing is damaged, these kinds of things, so that we can properly rehabilitate wells, or even know if we can rehabilitate wells. So that's really where we apply this kind of technology.

But logging these wells in the field, having a geologist on the well, paying attention to what the drilling conditions are and collecting the kinds of information that Steve talked about, that's the practical way to do this.

MR. RUZOW: Is there any guidance that you are aware of that either DEC or the State Health Department publishes that would outline

the requirement for this type of device

technology to be used?

DR. GOWAN: Not that I'm aware of.

MS. BAKNER: Dr. Michalski made the claim that if we pumped at this site beyond the 72 hours, that we would pay the price, that we're going to have just a terrible effect on the other wells in the area. Do you see any evidence of this?

DR. GOWAN: No. And I did hear some statements that this is a severely stressed system. And I, quite frankly, don't have any idea what the basis for that statement is.

And looking at our own pumping tests, combined pumping tests of R1, R2 and R3, we did achieve equilibrium or stability in the water level, and I know that Mr. Rubin did acknowledge that. He doesn't believe it was sustainable, but he did acknowledge that.

And what that tells me is that our cone has expanded and stabilized because we have now reached out far enough and we have flow gradients towards that well that are sufficient to bring the water in from those recharge areas. If we were in an unstable

situation where our gradients were too flat, and we were not able to draw that water in fast enough, then our well level in the pumping well would have to go down in order to steepen that gradient and drive that cone out further to get more sources of recharge, but what we're seeing is a stabilized pumping system or cone.

MS. BAKNER: Has either Mr. Rubin or Dr. Michalski presented any proof of the statement that this 72-hour study and the stabilization at the end was just the effect of partial recovery? Are they presenting any proof for that statement?

DR. GOWAN: Not that I'm aware of.

MR. TRADER: I just wanted to say Dr. Michalski is theorizing that there's this problem at hand, that we're already at a stressed situation where there's no groundwater around and that we just haven't pumped these wells long enough to find that. Well, nothing that we've seen shows that this problem exists. There's a lot of water at Fleischmanns, Pine Hills has got plenty of water. There's no evidence that this problem

exists. Springs are popping up all over the mountains that we have seen. Just trying to pump for days and months just to find out whether or not there's a problem seems a little out of hand.

MS. BAKNER: Well, you don't postulate that any problem exists?

MR. TRADER: Exactly.

MS. BAKNER: Okay. There was a free-flowing well, an artesian well that you monitored as part of this as well. Is that free-flowing well an indication of some kind of stress system? Does it indicate that there's water in the system? I mean, what about this system tells you that there's enough water for this project? I mean, people have said several times, without a lot of delicacy, that if they were the professional engineers on this job, they wouldn't put their licenses at stake, and you guys are. You're saying there's enough water for this development. And if they build it and it's not there, it's not going to be a good day for your malpractice carrier, so why are you so confident that the water is there?

DR. GOWAN: The pumping test, all the information -- I mean, it's really the whole database. Everything that we have looked at, our understanding of the geologic system, all of that together really gives us the confidence that what we're saying is, in fact, the case.

MS. BAKNER: And I think Mr. Ruzow had you go over yesterday how many years you have been out there collecting data and how many times you have been out on the site and all the analysis that you have done. At this point if the client said to you: I want you to do something else to show me that I have enough water out there, would you even recommend such an examination?

DR. GOWAN: No. We would say it's unnecessary. I think we have achieved the level of information that we need to render our opinion.

ALJ WISSLER: Let me ask you this: In your research here, with respect to the wells that you have depicted in 99B -- not Al's 8-foot well, but to your knowledge, have any of those wells failed in drought conditions?

DR. GOWAN: Not to our knowledge.

MR. TRADER: Not to our knowledge, no.

MS. BAKNER: Turning to the comments regarding the 70-foot well at Fleischmanns, there was some question regarding salinity again, and you had discussed the testing results in the 70-foot well that, to you, indicated not a saline issue but other issues. Could you go over that again and reference the data that the doctor was referring to?

MR. TRADER: That data is contained in the report from the Fleischmanns water supply evaluation. It's in appendix -- Applicant's Exhibit 51D, as in Daniel.

MS. BAKNER: And you're looking at the same data that Dr. Michalski was looking at with the Judge previously?

MR. TRADER: Yes. And I just would like to clear up -- he had some confusion about Fleischmanns Catch Well number 1. That confuses me too, but if you look at the chain of custody for that, it doesn't say that. It says Well number 1. And it's the fourth sample on the chain of custody and this is the fourth laboratory report in the package. So

it's Well number 1. There's no attempt to confuse anybody. This is the lab's doing. Sometimes they just get these names wrong.

MS. BAKNER: And the results that you looked at there, Dr. Gowan, you indicated that you felt -- indicated an iron issue, not a saline issue. Can you address that more?

DR. GOWAN: It does indicate that iron levels are higher than they are in the other two Fleischmanns wells. And the other important thing is it shows that the salinity is very low.

As to whether the iron is the source of high conductivity, there may be other aspects that are contributing to that, but salinity is not a factor in this conductivity.

ALJ WISSLER: What are the factors that you would expect to see if a system was stressed?

DR. GOWAN: Stressed system, I would expect to see chronically reduced water tables and water levels in the confined zone. I would expect to see this thing drawn down. I would expect to see the springs possibly drying up, see an overall reduction in the

water.

ALJ WISSLER: Increase in saline content and things like that too?

DR. GOWAN: Not necessarily. It really depends on the area. Some areas have higher salinities at depth, and that's not necessarily consistent everywhere.
ALJ WISSLER: Is there a way to take an area like this and to quantify how much water ultimately is down there? In other words, is there a limit to how many wells you can put down, or is that a bridge you don't cross until other wells start failing?
DR. GOWAN: No, there can be a limit.
ALJ WISSLER: How is that limit determined?
DR. GOWAN: We -- and we do this for clients, we'll look. For example, we did a project for an industry, happened to be called Interneting, and they asked us to help place wells because they had a couple of wells and they were low-yielding wells, and they said: Here is our property, and we need to put some wells in. So they asked us to come out and do a fracture trace analysis, which is looking at
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air photographs as far as to identify what we believe to be fractures and that's where the water moves in the bedrock. And so we spotted some wells.
But I said: You've got a limitation here because your recharge basin is only so big, and you're a big company and your demand is getting close to the maximum that this area

is going to be able to support. So you may drill a well here, you already have got a well over here, and you start drawing on this well, all you're going to do is draw from your other well.

ALJ WISSLER: So what you're saying, if you know the size of your recharge basin, you know your precipitation?

DR. GOWAN: Exactly.

ALJ WISSLER: And you can determine what your recharge is. Whatever that gallonage is, is the maximum number of wells that you can keep drilling wells until the wells are pulling out that much?

DR. GOWAN: Right.

ALJ WISSLER: Am I right?

DR. GOWAN: Right.

ALJ WISSLER: So that's how you would do it. That's one way you would do it.

DR. GOWAN: Yes. Now, if you've got a situation here where we got a vast --

ALJ WISSLER: Do we know the size of the recharge basin here for this project?

DR. GOWAN: I don't know it off the top of my head, but it's -- what's the number we --

MR. TRADER: I don't remember the number. I remember Birch Creek.

ALJ WISSLER: But we have this information?

DR. GOWAN: Oh, yes. It can be

obtained.

MS. BAKNER: Okay.

DR. GOWAN: I'd like to make sure --

ALJ WISSLER: I mean, do we have that in this record someplace, it's just a matter of calling it out?

DR. GOWAN: I know that in -- when we were doing an analysis of the stream flows and we're doing a comparison, we looked at the size of the basin from Allaben -- and maybe we can pull that out.

MR. TRADER: I'm thinking 60 square miles.

DR. GOWAN: 64 square miles is what rings in my head, but I don't know if that is the exact number at this point.

MS. BAKNER: Can we have a second, your Honor?

ALJ WISSLER: Sure.

(5:11 - 5:17 P.M - BRIEF RECESS TAKEN.)

DR. GOWAN: I just want to finish up what we were discussing. The water budget was helpful in that situation. But if I have a very large recharge area, then the characteristics of the aquifer would then become the primary thing that I want to look at to evaluate whether or not I could put numerous wells or I would be very limited. Even if you have a very large --

ALJ WISSLER: Characteristics of the aquifer, meaning it could be this homogenous bedrock or could be some heterogenous makeup?
DR. GOWAN: Heterogeneity can be okay if your fractures are very permeable. For example, we're looking at a particular area

where it's a shale bedrock, and the client is asking us to determine whether they can put -- what kind of density water -- can they get a municipal system in, or are they going to be limited to large lots with small wells.
Well, the recharge capability in this case, because they're on shale, isn't going to matter because the rock is just not a good enough aquifer reservoir so there's a real limitation just based on the characteristics of that rock.
MS. BAKNER: Did you come up with a number or location in the record where we say basically what the drainage area is?
MR. TRADER: I don't know what this exhibit is. This is Volume --
MS. BAKNER: Volume 1 of the DEIS, page 3-12; is that it? It's right there.
MR. TRADER: 3-12.
MS. BAKNER: 3-12, okay.
MR. TRADER: Which says that the overall -- right up here near the top in relation to Birch Creek, it says: "This perennial Class B stream has an overall watershed of 8,114 acres. That equates to

12 1/2 square miles."

MS. BAKNER: Based on your request, we will also supplement with some more information on this point.

Moving ahead, there was some discussion of anticipated amounts of recharge. You used a figure of, like, 25 percent. Can you address that?

DR. GOWAN: Yes. Actually Dr. Michalski said that that was unrealistic, that a half inch or an inch would be a number that he would use. I have never come across in all my investigations in the published literature or the work that we have done -- we have done numerous water budgets -- of a half inch or an inch being an annual recharge rate in this area or -- it's rare throughout the state in the work that we have done, so I'm not sure what the basis is for saying a half inch or an inch is a realistic recharge rate.

MS. BAKNER: And in terms of the alleged concession you made that there was a direct connection between the area you're pumping and the stream, did your pumping test show any such connections?

DR. GOWAN: Our pumping test showed no direct connection in that well field area.

MR. RUZOW: That's based on your observed readings?

DR. GOWAN: That's correct. And that's consistent, as I said before, with the geology.

MS. BAKNER: Is there anything else that you would like to add at this point?

DR. GOWAN: Other than to say that I feel like over the four years that we've been on this project, we have done an extensive amount of work, and it's very detailed. I feel like we've been very thorough, and anytime where we have made an inadvertent error such as the calibration of the flow meter, we have addressed that as quickly as we could because it's very important for us not to make mistakes. We don't like to make mistakes, and we try to correct them as quickly as possible.

MS. BAKNER: In terms of the water usage in the area and the stressers, we just wanted to mention for the record the tie-in to all the information that was submitted on

community character relative to the many, many people who used to be here, who are not, who undoubtedly drank water while they were here, and --

MR. RUZOW: The thousands of hotel rooms that you heard Mr. Schaedle -- the 4,000 people that were in Pine Hill, the thousands of people who were in Fleischmanns on the other side of the hill -- and while we don't know and don't have records of wells that were used, springs were used then, and presumably dug wells and other municipal supplies when this area was thriving. And at least in the literature that we have read and come across, we have not seen any indication of water shortages.

Indeed, there was also a Crystal Spring bottling plant that was nearby that was shipping water to New York City by rail. So the notion that this area either historically or presently is stressed, is a foreign one to at least any basis we can see. And that's from a lay perspective, your Honor.

MR. GERSTMAN: Your Honor, could we have just a minute?

ALJ WISSLER: Sure.

(5:25 - 5:29 P.M. - BRIEF RECESS TAKEN.)

MR. RUZOW: Your Honor, just one last comment. I just want to make a point that with respect to the error regarding the flow meter, that was corrected over two years ago. And while it's being raised in this proceeding in the comments, it is a matter of public record that it was corrected two years ago, as an Alpha Geoscience representative had indicated when they discovered it and provided it to the Department, so there was no delay, there was no effort. The problem apparently was, in the CPC various clients' understanding, that that had been corrected.

MR. GERSTMAN: Well, just to pick up on the theme, Mr. Schaedle said that he was never provided the documents that indicated that there was any correction made, notwithstanding his effort to obtain those documents, and I'm not suggesting that your client was involved in that issue.

Let me start by saying that Ms. Bakner has a tendency to rephrase the testimony or

offer of proof by Dr. Michalski in a way that either wasn't stated in his offer of proof, not intended, the record speaks for itself concerning his offer of proof. And I refer, your Honor, to the record.

ALJ WISSLER: We're going to have some time at an adjudicatory hearing if it happens.

MR. GERSTMAN: In your review of this record, we suspect and we understand that you're not going to rely on Ms. Bakner's characterizations of what Dr. Michalski said, but obviously what his offer of proof was.

In connection with the issue of irrigation, there is a clear narrative, a reliance on the narrative, July 28, 2004 letter, Crossroads Exhibit 122, on the issue of surcharge to the system, because in the words of the letter, the word "surcharge" is used because it represents a quantity of water introduced to the local groundwater system that is separate from the natural precipitation. The introduction of irrigation water will result in higher baseflow in the spring's downgradient from the golf course areas. A clear indication in this letter that

there is reliance on that issue, and it is counter to representations made elsewhere during this Issues Conference concerning the Applicant's use of irrigation water and the management of irrigation in connection with the turf. It's very clear from the record. We refer you to the record, Judge.

There was a suggestion that Mr. Rubin conceded that there was stabilization after the simultaneous R1, R2 and R3 pumping.

Mr. Rubin, could you address that?

MR. RUBIN: Quite the contrary. It's my belief, as I represented, that we have no evidence that stabilization has occurred. In fact, my graph indicates that is not true and I have discussed it at length.

MR. GERSTMAN: In connection with Crossroads Exhibit 99B, which we have spent a considerable amount of time on, the cross section that Mr. Trader and Dr. Michalski have referred to, the record is clear that many of the drawn-in fractures -- although this is suggested to be a site-specific cross section, in fact, much of the information other than those hatch marks that were pointed out to you, Judge, are the result of conceptualization from Heisig and Reynolds, and in fact not specific to this particular site. It's only after further inquiry that we find, and Dr. Michalski will comment on that, it's only after further inquiry not reflected on the map that we find there are some cross sections or cross hatches that are related to some level in the well that represents a fracture that encountered -- a water-bearing fracture. One would have never guessed by looking at this exhibit that that, in fact, was the case.

Dr. Michalski, I believe you wanted to address the issue of whether you stated this is a stressed system, or in fact is a potentially stressed system given the permitting of this resort.

DR. MICHALSKI: The pumping test results, so at the end of the three-day pumping, system is already becoming stressed. But my "stress" term applies to full pumping, long-term pumping, not only at one center but at several pumping center which would coalesce cone of depression. So this is when I talk

about stress system, this is the situation I refer to. It's already evidence that it's stressed at the end of three-day pumping, and if this pumping continues, it will be stressed.

MR. GERSTMAN: There was also an issue

concerning the potential recharge from precipitation. Are you fairly confident that under the geological conditions you find here, that recharge would be limited to approximately half inch to an inch a year?

DR. MICHALSKI: It's a summer recharge, it's a summer baseflow so it is during the summer. And it's 15 or 20. And all of them have the same small watershed in the Catskills, and it was in Reynolds' report, it's that table which showed it. So this is a very typical -- and there's no reason to believe that this would be different. When it comes -- when it comes to area, recharge area, recharge area is actually a cone of depression.

The drainage area for Birch Creek extend much further north, northeast, because it has branches coming here, so this would not

be packed. You can use data for drainage springs but only for the portion where the cone of depression would develop. So that would -- the term is so-called bottom line, and this bottom line would be at equilibrium, what is available; and it wouldn't be much because, it's still one inch over this area of cone of depression. What it is, it's a baseflow, so baseflow -- what it means, if you take this amount, there would be no flow in streams. That's what it means.

And of course, it cannot happen because there's a question of -- can you in fact assume that you would completely take water from Birch Creek. So this is the kind of situation, your Honor.

MR. GERSTMAN: Dr. Michalski, there's all sorts of suggestions being thrown around that you stated that there was some transmissivity between -- was it Fleischmanns and Pine Hill Well number 1, because you drew a plane that --

DR. MICHALSKI: No, no. It's one of these mischaracterization examples, you know, that counsel for the Applicant indicated that

I show that the Fleischmanns -- that Railroad Spring would go and drain to Fleischmanns. It's not what I said.

What I said, that it looks like, from this cross section, if you compare elevation of Railroad Spring, which is a bedrock spring, not overburden, and Fleischmanns Spring, they follow to the same stratigraphic interval. They are not exactly the same elevation, but they would be in the same stratigraphic zone. What I said, it would be in the same stack, if I may use the system.

And I didn't say -- if I recall, I didn't say that the Pine Hill would flow to Fleischmanns water. What I said is they may have common recharge area which is north and beyond this cross section.

So Judge may look to the original record.

MR. GERSTMAN: There's some suggestion that due to the lengthy -- or claimed lengthy record or work that Alpha has done -- is that that should provide some comfort level to the Judge and the Commissioner that this water analysis is sufficient to grant a permit.

Does that convince you?

DR. MICHALSKI: No, it does not. This section, what it shows on the table, it's on the geometry of the system, and it's filled with gray mass. Placing individual wells on a section doesn't mean that it's full research because the water level is not shown on any of the cross section.

The testing was done for two years, but I didn't see any hydrograph for single well during that time. You don't have measurements in wells, over time, how is it developed, which gives you idea of differences in water level fluctuation, which is a very standard procedure. So it was a pretty spotty kind of jumping from one situation to another.

MR. GERSTMAN: So, for instance, in order to rely on length of time, when you studied the area, you would want to see those hydrographs plotted, the water levels in the wells during various periods of the year?

DR. MICHALSKI: Yes, at least at

selected wells.

MR. GERSTMAN: What other type of information would reflect a long-term study of

the hydrology of the area? Is there something else that you can add to that, or is that primarily the issue that you wanted to address?

DR. MICHALSKI: The amount of hydrogeology information and time period do not -- are not related here because the amount is simply inadequate. It's not for this particular case of water supply in a system which will be stressed -- it's not an average water supply where we're talking about 150-gallons a minute for one area, and 250 for Fleischmanns. So these are significant additions to the system. The system water intake or this drawdown would change by hundreds, a couple hundred percent. So it's really just a significant change.

MR. GERSTMAN: Is there anything else, Dr. Michalski, that you want to address to the Judge at this time?

DR. MICHALSKI: I wouldn't want to take more time.

MR. GERSTMAN: You can take the time, it's okay. He's ready, willing and able to listen to whatever you have to say.

ALJ WISSLER: Thank you.

MR. GERSTMAN: Anything else?

(NO AFFIRMATIVE RESPONSE.)

I think we're probably done. Let me ask you the final question. Mr. Rubin and Dr. Michalski, based upon the analysis you have seen to date in the Draft Environmental Impact Statement and the Applicant's exhibits, would you feel confident that this aquifer system is sufficient to supply the proposed Big Indian Resort and Wildacres Resort without having significant impacts both on surface and groundwater in this basin?

DR. MICHALSKI: No. I'm convinced that it wouldn't create very significant -- first, this amount they propose is not sustainable; and the second, that whatever is sustainable would cause significant change.

MR. GERSTMAN: Mr. Rubin.

MR. RUBIN: I think additional testing is required at a constant rate, as I indicated before, so we can look at the data at the rate that is proposed starting at that rate and continuing; so that we can truly take a look at the semi-log graph in terms of the

observation wells so we would have a better feel for it.

MR. GERSTMAN: Judge, do you have any questions?

ALJ WISSLER: No.

MR. GERSTMAN: Thank you. I believe we're done.

MS. BAKNER: We are most surely done.
MS. KREBS: I have nothing further.
ALJ WISSLER: All right.
(5:41 P.M. - WHEREUPON, THE ISSUES CONFERENCE PROCEEDINGS ADJOURNED FOR THE DAY.)

C E R T I F I C A T I O N

I, THERESA C. VINING, hereby certify and say that I am a Shorthand Reporter and a Notary Public within and for the State of New York; that I acted as the reporter at the Issues Conference proceedings herein, and that the transcript to which this certification is annexed is a true, accurate and complete record of the minutes of the proceedings to the best of my knowledge and belief.

THERESA C. VINING

DATED: September 13, 2004.