BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF APPLICATION)
FOR PERMIT NO. 63-32573 IN)
THE NAME OF M3 EAGLE LLC)
_____) VOLUME VII

(Pages 1470 through 1740)

BEFORE

HEARING OFFICER: GARY SPACKMAN

Date: May 5, 2009 - 8:38 a.m.

Location: Idaho Department of Water Resources
322 East Front Street
Boise, Idaho

REPORTED BY:

JEFF LaMAR, C.S.R. No. 640

Notary Public

APPEARANCES:

For M3 Eagle LLC:
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APPEARANCES (Continued):

Also Present:
Jerry Peterson
Jason Smith
Nick Vandyke

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WITNESSES

EXHIBITS

NO.	MARKED	ADMITTED
285	1681	1689
850	1648	1648

THE HEARING OFFICER: All right. We're recording again. Today is May 5th, and the hour is approximately 8:40 a.m. in the morning.

Welcome, everyone. This is a continuation of the M3 Eagle hearing, and we just finished cross-examination. We conversed before beginning recording at the end of the day yesterday. Some information was distributed regarding some limited statistical analysis of the geochemical data that was gathered and analyzed by Mr. Glanzman and was, again, given to the protestants. And there was some concern there was some desire to perhaps question Mr. Glanzman about that information.

Mr. Thornton, you have indicated that you've looked at the data or the information and don't have any questions regarding what was given to you.

MR. THORNTON: That is correct.

THE HEARING OFFICER: Okay. So my understanding is cross-examination's complete. And we'll come back to you, Mr. Fereday, for redirect examination of Mr. Glanzman.

MR. FEREDAY: Thank you.

THE HEARING OFFICER: Thank you.

RICHARD K. GLANZMAN,
having been called as a witness by M3 Eagle LLC and previously sworn, testified as follows:

REDIRECT EXAMINATION
BY MR. FEREDAY:

Q. Mr. Glanzman, do you recall during cross-examination when Mr. Thornton asked you about connections determinable from your review between the PGSA and an overlying, undifferentiated aquifer? Do you recall commenting about that?

A. I recall that.

Q. I think you indicated that you saw no connection.

What kind of a connection were you referring to there?

A. Specifically the irrigation built up of the water level above -- in the alluvial aquifer above the PGSA.

Q. So is it accurate to say that you were not seeing the irrigation return-flow water, if you will, getting into the PGSA at the location of M3?

A. Yes.

Q. Would it be accurate to say that you did not see any geochemical connection between that overlying aquifer and the PGSA?

A. No connection.

Q. With regard to page 6 of your PowerPoint, there was a question, as I recall, about the apparent complexity of this trilinear diagram.

Do you recall the question about complexity?

A. I do. And actually, it looked like a very complex, when we add all of the data together in one place.

Q. So just to -- just to review this -- and I know we did go over it in direct, but it was asked about on cross, so I wanted to make sure that the Hearing Officer understands this. And I'll wait for him to get to page 6 of that Power --

It's of the PowerPoint.

THE HEARING OFFICER: Right. I have it.

Q. (BY MR. FEREDAY): Are you saying, sir, that this appears complex because this is a complete composite containing all data from all 84 sample points?

A. That is correct.

Q. And did you testify also that once this is separated out into its various aquifer groups that it becomes more simple?

A. As demonstrated with the remaining trilinears.

Q. Thank you.

There was also a question to you, sir, about the mineralogy in the aquifer and whether that was changing. And you, I believe, indicated that the mineralogy in the aquifer does not change. I was unclear as to whether the questioner was referring to the matrix -- the structural matrix, the rocks or sands in the aquifer, or to the mineralogy in the water itself.

Can you help illuminate what you meant by your answer.

A. I understood mineralogy, and that is a solid phase. And the solid phase in the aquifer does not change. But it changes over millions of years. It isn't going to change over a few hundreds, certainly not with these conditions.

When we talk about the mineralogy of the groundwater, that's a misnomer. It should be total dissolved solids. We're going to be talking

about the total mineral composition of the dissolved ions in that water.

And that did change, and it changed considerably in total dissolved solids. But the major ion chemistry does not change. So it's exposed to the same mineralogy and just increases in that concentration, not major ions proportionately.

Q. Do you recall the questions about ancestral and geologically ancestral today -- or yesterday on cross-examination?

A. Several times, yes.

Q. And I believe you suggested that the -- your definition is that someone has suggested that it could be as old as a thousand years -- the water, that is -- in the aquifer.

Do you recall that?

A. That was for the geologically ancestral. The ancestral I said just meant that it wasn't water.

Q. Okay. But doesn't this definition someone has suggested it could be as old as a thousand years mean that, first of all, it's not modern; would you agree with that?

A. Certainly.

Q. And second of all, it could be as old as a thousand?
A. The carbon in the water could be as old as a thousand, yes.
Q. But the carbon date is something that's separate from the date or age of the water; is that --
A. They're very separate, yes.
Q. With regard to the questions you received on -- the question of stable isotope studies, do you recall that you were questioned on that?
A. Yes, I do.
Q. I'd like you to refer, please, to page 23 of your PowerPoint.
A. Yes.
Q. I want to make sure that I understand this, Mr. Glanzman, with regard to your response to those questions. I think you responded that there was not enough variation between the stable isotopes that you studied and evaluated in these various water sources to provide any meaningful information as to the different -- a different source for the PGSA; is that -- would that be accurate, or could you help me understand that?

A. I think we'd want to go to 24 rather than 23.
Q. Okay.
A. That's where I made a comparison of the regional source aquifer distribution that had a very narrow deuterium range of minus 133 to minus 125 in deuterium, and minus 17.4 to minus 16.3 in the oxygen-18. That's an 8 per mil deuterium contrast and a 1.1 per mil oxygen-18 contrast. That's not sufficient to really give credible quantification of source for mixing.
Q. Did you do an isotope -- I think you testified you did some of the stable isotope evaluation in your work?
A. That is slide 23.
Q. And why did you do that? Were you asked to do that, or was that your idea?
A. Initially, we were -- I was asked if we wanted to do it, and I said no, I didn't think it would be necessary, since we already had an abundance of evidence -- a weight of evidence that indicated that the water -- groundwater in the PGSA was from the Boise River.
But in reflection, thought, Well, that's another piece of evidence we don't have.

Let's get it. Went out, and they -- HLI went out and sampled three of the wells in the M3 area. And we got that distribution, as shown on 23, clearly indicating and supporting the other weighted evidence that the groundwater in the PGSA is from the Boise River.
Q. And is it accurate to say that this isotope evidence also indicated that further isotope studies were not warranted?
A. I believe so.
Q. Is the data that you analyzed in putting together Exhibit 43 and your PowerPoint, I believe Exhibit 71 here, the kind of data you find acceptable for use in your profession?
A. I do.
Q. Do you have any comment on the quality of the data or data gathering that was involved in this project?
A. Data gathering was excellent, and the water quality from the lab was much better than I find typically in databases. Databases are the bane of my existence.
Q. And I understand that you did some statistical analysis as well. I think this came up late yesterday.

Do you typically do statistical analysis to evaluate your work in any way?
A. Always.
Q. Always?
A. Always.
Q. Why do you do that?
A. There's two things. And there was a question about we're looking at average values. Average values from a number of different sampling points across the area of interest gives us a better idea of what the bulk water, groundwater chemistry is going to be if we produce water from that aquifer. So that's the reason for the averages being used and compared.
It's a -- I also use -- the statistics give me the range to give me an idea of how things are changing, also to tell me where I need to look, what things are changing the greatest. I needed to understand why.
In that sense, the statistics are both giving me a value that I need to know from a standpoint of the groundwater condition itself, but it's also asking me questions that I need to go answer.
Q. In this case did your statistical

analysis support or undercut your conclusions in Exhibit 43, your report?
A. Very supportive.
Q. Was your statistical analysis carried out in a complete and professional manner?
A. I believe so.
MR. FEREDAY: I have no further questions.
THE HEARING OFFICER: Okay. Mr. Thornton, recross?
MR. THORNTON: Yes.

RECROSS EXAMINATION

BY MR. THORNTON:
Q. Mr. Glanzman, I believe that you've testified that the -- there's no irrigation water connection with the Pierce Gulch Sand Aquifer?
A. There is no evidence.
Q. Okay. And I believe you stated that the recharge area is just that, an area somewhere upgradient, maybe of the Capitol Bridge area or someplace; is that correct?
A. Somewhere off the area that we've studied, I believe, and partially in the area we've studied where the Boise River is coming through.

Q. Coming through where?
A. On the map that we have in our --
Q. Yeah, you refer to the --
A. The Goddard and HP is on one side of the Boise River across --
Q. Okay. All right. Okay. So can you explain to me why you can't find evidence of that based on -- the question is based on irrigation returns, storm drainage runoff from lawns, people applying fertilizer on their lawns and draining into the Boise River up above that and some irrigation above that, why aren't you able to find any source of irrigation connection?
A. The why of what the data is telling me, I can only speculate upon. What I do know is what the data is telling me.
Q. Okay.
A. And that is I see no evidence of fertilizers. Nitrate is very low. The deuterium is telling me there's been no evaporation. So it hasn't been applied to a field for irrigation purposes in any fashion.
The water chemistry is quite similar, as we pointed out. It's a cluster in the PGSA. You would not see that at any effect from the

circumstances you've just outlined.
Q. So are you aware that there is irrigation return to the Boise River upstream from this recharge area?
A. I'm aware.
Q. Okay. If we could go to the Exhibit 33, the Treasure Valley Hydrologic Report. I'm not sure of the tab, but it's the one we had -- I should have written it down yesterday. It's a geochemistry and isotope study --
A. Yes, sir.
Q. -- portion.
MR. LAWRENCE: I believe that's 33G.
Q. (BY MR. THORNTON): Do you have that, then?
A. Oh, yes.
Q. Okay. Good. Then on the executive summary, so on Roman numeral III.
A. Yes, sir.
Q. And there's a paragraph in the center that starts with "The results from the study show distinctive relationships between groundwater chemistry and the unique depositional environments of the principal aquifers."
And the second bullet underneath that

states that "Specific conductants, by inference total dissolved solids, is greatest in shallow aquifers and decreases with depth."
Do you agree with that finding?
A. I'll agree with that wholehearted.
Q. Okay.
A. That's what we were just talking about.
Q. Okay. And then it says, "This finding indicates that water in deeper aquifers did not enter groundwater regimes through the carbon-rich sediments found in the Treasure Valley soils."
A. That's supportive of what we just discussed.
Q. And does not the Boise River overflow the rich -- carbon-rich sediments in the Treasure Valley soils up above the recharge area?
A. I do not know the frequency of it. I'm sure it does occasionally.
Q. Okay. Then on the fifth bullet near the bottom of the page talking about "Resident times of the Treasure Valley groundwater generally increase with depth and with distance along a regional east to west trending flow path."
Do you agree with that?

A. No, I don't believe I do.
Q. Okay. And what's your evidence for that?
A. Because when we were talking regarding my residence times of Treasure Valley groundwater -- we're not talking about carbon now.
Q. Right.
A. We're talking about groundwater. I don't think that's going to qualify.
Q. Okay. And your basis for that is?
A. How this report from 30 indicates anything less than 5,000 years, we don't know.
Q. Okay. And then if you go to the Roman numeral iv, the next page, small Roman numeral iv, or lower case. In there it states, again, "The youngest waters entered the subsurface a few thousand years ago along the northeastern boundary." And then it goes on to say, "The oldest water entered the subsurface between 20- to 40,000 years ago." I didn't hear a talk of 40,000 years ago.
Do you agree with these figures in here, the age of the water?
A. I think the age of the water may be in that range because it's been greater than 5,000

years. But again, we're talking about the carbon. And having entered the subsurface 20- to 40,000 years ago, I don't know about that --
Q. Okay.
A. -- whether that was the time it entered. But I do know that's probably a comparable age of groundwater in the deeper parts of the basin along a very long flow line.
Q. Okay. And you testified yesterday the groundwater appears to be moving -- you used the term "rapidly," in the M3 area.
How do you describe -- how do you use the term "rapidly" when I believe I just heard you say that the water farther out in the middle of the basin may be quite old? How do you say rapidly moves through, and then water is quite old in the center of the basin?
A. Ed Squires has outlined the geology. And they get very clay rich as you go out, which means as you get further out in the valley and deeper into the valley, you're getting into those old lacustrine mudstones. And they're very, very thick.
Water isn't going to move very fast through that. And so the water that's out there

is highly probable to be thousands of years old.
As I testified yesterday, the water -- and Ed Squires has also testified to the effect that groundwater is moving fairly rapidly, for a groundwater, between the recharge area and the M3. So I'm basing that on both the water chemistry, which indicates this water is not hanging around, it's not -- it is not stalled, it is not being cut off. It is actually flowing through that system with a relatively constant average total dissolved solids.
So I see no barriers to flow through that system. I see no chemical changes that would indicate that there is any slowing along that whole flow path. It's the same water moving right on through.
So both water chemistry and the hydraulics are saying that this is a highly permeable aquifer that is moving to the west.
Q. Okay. Then on the first bullet statement on that Roman numeral page iv, it says, "Contemporary seepage from rivers and/or irrigation diversions is not the primary source of recharge for most deep regional aquifers."
Do you agree with that?

A. I agree with that.
Q. And then what did you just state the source of recharge was for the Pierce Gulch?
A. The Boise River.
Q. And could you explain to me what appears, at least in my view, to be a difference in that statement.
A. Contemporary seepage from rivers and/or irrigation diversions.
Q. Okay.
A. It's the "or/and." I agree with the rivers. I do not agree with the irrigation.
Q. Okay. And so you don't agree with this statement where "Contemporary seepage from rivers is not the primary source"; is that correct?
A. That's correct.
MR. THORNTON: Okay. All the questions.
THE HEARING OFFICER: Okay. Mr. Smith?
MR. ALAN SMITH: I just have a couple here.
THE HEARING OFFICER: Before you do, let me ask a question here, not of you, but Mr. Fereday. I see Mr. Whitney has walked in today.
MR. FEREDAY: Yes, he has.
THE HEARING OFFICER: He may have been

subject to a subpoena that was issued to him, and I don't want him to sit here if he's not being called.

Will you reiterate, or perhaps something has changed?

MR. FEREDAY: Yes, I will reiterate on the record and make an apology to Mr. Whitney.

Rob, we had thought we would be calling you today, but I neglected to call you last week to let you know that that's not going to be necessary.

However, as I said yesterday, we anticipate that after the protestants' case, we may still call Mr. Whitney with respect to well construction and related issues. But that is at an indeterminate time in the future. So I don't know when that will be. But if we need Mr. Whitney, we certainly would like to keep him available. But again, I apologize for not contacting him and letting him know that he need not be here today.

THE HEARING OFFICER: Okay. Thanks.

Okay. Mr. Smith?

MR. ALAN SMITH: Yes, sir. We would like to at this time object to Mr. Whitney being called

as an expert witness. He was not on their expert witness list. I have it right here. I believe he was listed on the interrogatories as a possible witness, but he's not on the expert witness list.

THE HEARING OFFICER: Okay. Well, let's hold that particular objection, because he's not being called right now, and I'll allow you to bring that up if he is called in the future, Mr. Smith. That may give the applicants an opportunity to prepare some response as well.

Okay. Do you have questions of Mr. Glanzman?

MR. ALAN SMITH: I just have a couple.

THE HEARING OFFICER: Thank you.

RECROSS EXAMINATION

BY MR. ALAN SMITH:

Q. Mr. Glanzman, as I understand your testimony, you don't find any evidence of any irrigation leakage or seepage from canals at all?

MR. FEREDAY: Objection. I don't think that was his testimony. He talked about irrigation after it was applied to the land, not irrigation seepage from canals.

THE HEARING OFFICER: Okay. I'll overrule

the objection. Let's let him answer the question.

THE WITNESS: The answer to the question is the very same thing as he has indicated. Canals, if they're carrying Boise River water that is dominated and overrides any signature from the irrigation, then that's true, then there is some recharge from that that would be -- because it would be Boise River water. I am still going back to what I have been continually testifying: The geochemical signature is the Boise River.

Q. (BY MR. ALAN SMITH): But you don't find any indication of any irrigation runoff going into the recharge?

A. No, sir, there is none. In every different way that I've looked at it, there is none.

Q. Let me ask you this: If the PGSA water is moving so rapidly, why aren't the geochemical analysis detecting any irrigation water?

A. My understanding is we've got a hundred years, perhaps, or 150 years, that it takes for water to get to M3. It may be on the way. I have no idea, sir.

MR. ALAN SMITH: That's all I have.

THE HEARING OFFICER: Okay. Mr. Glanzman, I have a few questions.

EXAMINATION

BY THE HEARING OFFICER:

Q. And I'd like to start with Exhibit 71, if I could. That's your PowerPoint presentation. And just as a preface, I want to try to understand how you approached sampling and the analysis. And I guess I would turn to page 5 first.

A. Yes, sir.

Q. In this slide is the first presentation of data or information in the PowerPoint presentation?

A. Yes, it is.

Q. Okay. And I see in the left-hand column five separate areas, groundwater areas, for which you analyzed samples.

A. Yes, sir.

Q. Okay. And my question for you is: How did you come up with these particular categories in the left-hand side?

A. I did not go through the physical conditions. Let me -- maybe even more so, it began with how did I collect the samples and have

them analyzed and now separate them in. They're all connected. And those were done by Ed Squires at HLI. Those were physical.

Q. So you were told what areas samples were to be categorized in?

A. Oh, no. I apologize. That isn't what it is. That -- these various units were identified as physical conditions from which those water analyses were derived. And all I did is say, "Okay. Well, okay, is this PGSA?" So I took all the data that goes into the PGSA and start analyzing that; all the waters that were from the Terteling Springs, start analyzing that as a separate unit.

And did -- now we're looking at it saying, "Does that make sense? Does the water chemistry say these are discrete units as well as the physical condition?"

Q. Okay.

A. I'm sorry.

Q. So you were told where the boundaries of the PGSA were?

A. I was told for each analysis if it was in the upper or lower PGSA, or we just didn't know and it was unidentified, or the bulk of the PGSA.

Q. And then the wells that were sampled within the TSF, Terteling Springs formation, you were told which wells were within the TSF; right?

A. Which chemical analysis for those wells were actually in that aquifer, yes.

Q. Okay. So your analysis didn't determine which of these units that particular well or sample was revealing; correct? I mean your analysis didn't -- wasn't the initiation of where that water was located?

A. No, absolutely not.

Q. And Mr. Squires told you where those samples were located?

A. And what unit and where, yes.

Q. Okay. So you assumed initially that those samples were located within each of those units?

A. Yes, sir.

Q. Okay. And so I look at this particular summary -- and I guess I go back to Mr. Thornton's question. I see a range in the PGSA of 82 to 404 in the TDS.

A. Yes, sir.

Q. And I see a range of -- in the TSF of TDS of samples that fall within that -- those

larger boundaries of the PGSA.

A. Yes, sir.

Q. Why couldn't a sample in the TSF have been included within the PGSA?

A. Based only on the total dissolved solids, you have a valid question. But we went into it later into the trilinear diagrams.

Q. Right.

A. And they have very different major ion chemistry. Those are not the same water.

Q. Okay. And so let's look at some of those Piper diagrams. And I guess let's turn to page 6. And you described this as a very complex diagram, as I recall.

A. There's a wide scattering of data within that trilinear, yes, sir.

Q. And there is a very tight grouping in the diagram in and around the leader line labeled "Boise River"; correct?

A. It envelopes the Boise River, yes.

Q. Okay. And a number of those, as I look at the key or the legend, are "Pierce Gulch Undefined." It says square.

A. Yes, sir.

Q. But then I see intermingled in there

others. For instance, there's an asterisk that's fairly close, "Willow Creek Aquifer." It's not far from the others.

Do you see the one that I'm pointing to?

A. Yes, I understand.

Q. And there are others mixed in there as well.

Why would those not be included within the Pierce Gulch Aquifer, as opposed to the other aquifers that were identified?

A. First is the physical condition where it is, both geologically and locationwise, puts it in the Willow Creek Aquifer. Second of all, it does lie outside the general boundaries and clustering of the Boise River -- or excuse me, of the PGSA.

First, the physical condition says that that is what that is. The total dissolved solids says that it can't be PGSA water. It's way too dilute. Couldn't move that way. So other pieces of evidence are indicating that that is not PGSA.

Q. But there is an assumption on your part that it is PGSA before you do the analysis;

correct? You've been told that it is within the PGSA, so there's an assumption on your part that it --

A. I'm sorry. Are we talking about the Willow Creek?

Q. I'm sorry. I have not asked that question.

There is an assumption that the squares are within -- the square indicators are within the PGSA; right?

A. Identified as the aquifer of source, yes, sir.

Q. Yes. And there's also an assumption that the asterisk is within the Willow Creek Aquifer; right?

A. That is correct.

Q. And if you move -- if you move through that cluster that almost turns black where the leader line goes to the Boise River, on the upper side of that you will see others near that grouping. I know there's at least a couple, it appears, are Spring Valley Ranch indicators.

A. That is correct.

Q. Okay. And but there's an assumption that those are Spring Valley Ranch wells, not PGSA

from the outset; right?

A. No. From the outset, we know those are from the Spring Valley Ranch.

Q. Well, from the outset why? Because Mr. Squires told you they were?

A. That's the well location from which this water analysis came.

Q. Okay. All right. I have a couple of other questions. They have to do with exposure to mineralogy. And I understood you to say, Mr. Glanzman, that time or time of residence is not as important as the mineralogy itself.

A. Yes, sir, that's true.

Q. Okay. So time of residence within the aquifer material is not necessarily -- does not necessarily change the chemistry of the water; correct?

A. It does in the context that the mineralogy as -- certain minerals just take longer to dissolve than others. So the longer it is in contact with that aquifer, the more they will bring their composition into the dissolved phase.

So the time is important, but in the context of the PGSA that we're talking about, the time is so minimal -- from the standpoint of the

mineralogy that we have, it is not important.

Q. And so the -- the mineralogy in the PGSA is not really an indicator of time of residence within the aquifer?

A. The residence time, as we understand it, is so short anyway, from the standpoint of geologic considerations, thousands of years, that the mineralogy is relatively inert and it pretty much stays the same.

Q. And I understood you to say that the mineralogy within a material of the PGSA is rather nonreactive or inert anyway.

Was that not your response?

A. I really don't know what the mineralogy is. But from the standpoint of its transport over a 15 mile lateral interval, I don't see any additional significance of the mineralogy being dissolved.

From that context, I would say yeah, that if the groundwater were trapped in some way, I'm sure that the mineralogy would be more impressive and change that water chemistry if it were impounded in any way by any fault, confined, compartmentalized, it would have an indication from that aquifer mineralogy.

Q. But again, I understood you to say that time of residence was not nearly as important as the mineralogy itself.

A. That's right.

THE HEARING OFFICER: All right. I don't have any further questions.

Mr. Fereday, more?

MR. FEREDAY: Yes.

FURTHER DIRECT EXAMINATION

BY MR. FEREDAY:

Q. Mr. Glanzman, the Hearing Officer just asked you about the information that you got from Hydro Logic with regard to the locations of these well samples.

Do you recall that?

A. I do.

Q. Isn't it a fact that what you initially received from Hydro Logic were these 84 samples, or the information about these 84 samples?

A. There were various pieces that came to me, yes.

Q. And didn't you look and analyze these samples before you found out where they were from,

in terms of being from the Willow Creek or the PGSA?
A. Yes.
Q. And did you see trends or similarities between certain groups of these before you even knew where they came from?
MR. ALAN SMITH: Objection. Leading.
THE HEARING OFFICER: Overruled.
THE WITNESS: When I first get data, I plot them up on these trilinears, I see things happening. And I have a well name. I may have an -- I certainly may have the depth on it. I have a location. So I know that information, even if I don't know what aquifer it's from. And I will call -- and it's an iterative process, my questioning.
I have this series of wells here, what aquifer is that in? And Ed and I will go back and forth on that procedure, his letting me know what it is.
Q. With regard to your questioning of him, were you asking him what -- what location certain samples came from based on what you were seeing on the trilinear diagram?
A. Absolutely. Absolutely.

Q. And when you questioned him about the locations of these various sample -- samples, did his responses line up with the type of clustering you were seeing?
A. Absolutely. What we did is -- finally, I sent him a list and said, "Okay. Tell me what aquifers each one of these is from, and let's see if we can differentiate upper and lower."
And Ed went ahead and filled those out for me, and then that is what I used as a base for what you see in front of you today.
Q. But you had already done trylineals on those, hadn't you?
A. Oh, absolutely. And I had seen some trends that I had a curiosity about. In other words, I'm trying to interpret all of that complex data in that first trilinear, and say "I see this series that looks like a trend here. What is that from?" So it's an iterative process.
Finally, it's just "Here's the list of things I don't know. Could you tell me what those are in the physical sense?"
Q. Did anyone at Hydro Logic or anywhere else tell you at the get-go "This group of samples

is from the Pierce Gulch Sand Aquifer, and I want you to plot them on a trilinear"?
A. Absolutely not. They sent me the data, and they said, "This is from the M3 area. We got a pump test. This is the analyses from the pump test." That's the kind of information I would be receiving.
Q. So would it be fair to say that when you received these samples you were blind to where they might have come from, other than you knew they were in the north Ada County area somewhere; would that be accurate?
A. That is accurate. I didn't have a map either to have the additional points.
Q. Okay. With regard to the question about irrigation water, do I understand your statement to be -- your response to Mr. Thornton to be that you see water in an irrigation canal such as the New York Canal to be the same as Boise River water?
A. No, I didn't say that. I said that I cannot see anything in the water chemistry in all the parameters that we've got that there is an irrigation signature to the PGSA water. Whether it's in a canal, whether it's applied, I don't

know that. All I know is that the water chemistry that we see is Boise River water, wherever that recharge.
MR. FEREDAY: No further questions.
THE HEARING OFFICER: Okay. Mr. Thornton, further questions?

FURTHER CROSS-EXAMINATION
BY MR. THORNTON:
Q. Mr. Glanzman, had you ever analyzed the data -- we have 84 chemical analyses that were completed. Did you ever analyze those in a full -- in a statistical analysis where you throw all the data together, regardless of what well it came from, to look at how they scattered and how they grouped up?
A. An intimate part of the interpretation of the data, yes. I've got a stack of analyses that these depict.
Q. And as the result of that, what is depicted on -- an example -- on page 6 of Exhibit No. 71?
A. That's the trilinear.
Q. Okay. And did you do another analysis other than this to -- regardless of knowing where

that data came from to group similar results, to cut down the noise, so to speak?
A. Oh, absolutely. I go to factor analysis as part of my primary means of doing that.
Q. And that's not displayed on this Exhibit 71; correct?
A. No, this is just a trilinear diagram.
Q. Right. Okay. And that is potential information that could be looked at in your full Exhibit No. 43 of your report; correct?
A. Oh, no. That didn't go in there.
Q. Okay. And where is that information? Is that information available?
A. I have it at home.
MR. THORNTON: Okay. No further questions.
THE HEARING OFFICER: Mr. Smith?
MR. ALAN SMITH: Thank you, sir.

FURTHER CROSS-EXAMINATION
BY MR. ALAN SMITH:
Q. Mr. Glanzman, were there any water samples taken from the western edge of the PGSA?
A. You've seen the map that has the distribution of samples from the PGSA. That is

the distribution. West, I'm not sure I know.
Q. As far out as Star?
THE HEARING OFFICER: I thought we had an exchange about this yesterday, Mr. Smith.
MR. FEREDAY: We did.
THE HEARING OFFICER: And I think we resolved that there were none to the west.
MR. ALAN SMITH: Okay. Very well.
Q. Let me ask you this, then: Would there be a difference in the deeper water that's been there for a much longer time than the eastern edge of the PGSA where the water has only been there a short time, a hundred years or so?
A. You're asking me to speculate if further down the groundwater flow path in the PGSA the groundwater may change a little bit, water chemistry. That's possible, certainly.
MR. ALAN SMITH: I believe that's all I have.
THE HEARING OFFICER: Okay. Mr. Edwards?
MR. EDWARDS: No questions.
THE HEARING OFFICER: Okay. I think we're done. Thank you, Mr. Glanzman.
THE WITNESS: Thank you.
MR. FEREDAY: Do you want to take a short

break before we --
THE HEARING OFFICER: Yeah, let's break. Let's take ten minutes.
(Recess.)
THE HEARING OFFICER: Mr. Utting, if you'd stand please.

MARK UTTING,
having been called as a witness by M3 Eagle LLC, was duly sworn and testified as follows:

THE HEARING OFFICER: Thank you. Please be seated.
Mr. Fereday, you may examine.

DIRECT EXAMINATION
BY MR. FEREDAY:
Q. Please state your name and give your business address.
A. My name is Mark Utting, U-t-t-i-n-g. Business address is 1002 West Franklin, Boise.
Q. You work with Hydro Logic, do you?
A. Yes, I do.
Q. Please describe your background, your education, and your employment experience.

A. Okay. I have a bachelor's in geology from the University of Washington, 1974. I worked the next couple years in various geologic jobs, then I went to the University of British Columbia where I received a master's in hydrogeology. I studied under Al Freeze, who wrote "Freeze and Cherry," a commonly-accepted textbook in groundwater.
I started in February of 1979 in groundwater consulting at a firm called Hart Crowser in Seattle, Washington. In 1987 I co-founded/started Pacific Groundwater Group, which is a groundwater and environmental specialty consulting firm, where I was principal and rotating president for 13 years.
I have done numerous groundwater studies throughout the western United States, Mexico, the Middle East, and I've done studies from a distance of projects in Asia.
Q. Exhibit 32B contains your resumé. Is this still an accurate resumé, Mr. Utting?
A. Give me a moment. I'll find it. Is this your copy?
THE HEARING OFFICER: Yeah, it is. You

should have a book, but you can use mine.
THE WITNESS: Here we go. Thank you.
Yes, that is.
Q. (BY MR. FEREDAY): How many years have you been associated with Hydro Logic?
A. I've been associated with Hydro Logic for approximately two-and-a-half years.
Q. Do you have experience constructing and using groundwater models?
A. I have, indeed. I have created numerical models using the USGS MODFLOW. I've created numerous analytical models. I've analyzed artificial recharge products. I've done groundwater basin analysis using these models and other aspects of groundwater development.
Q. Could you give us an overview of your work for the M3 Eagle project that you've done with Hydro Logic.
A. Well, when I started with Hydro Logic in September of 2006, my mandate was to try to prove Mr. Squires wrong. He had some concepts on groundwater flow, and I was to challenge and discuss and try to find flaws. And so during the course of that time, I contoured groundwater flow data, aquifer position, I conducted numerous

pumping test analyses, I managed and directed development of the numerical model, I created analytical models, I reviewed all the data and synthesized the various pumping sets of data, of common chemistry, to pull the pieces together.
Q. Did you have contact with the Idaho Department of Water Resources staff during this period?
A. Yes. We met both in the field and when we toured the site and discussed various aspects of the project, also with staff as part of the North Ada County Technical Advisory Group.
Q. Okay. I'd like you to refer to Exhibit 12, which is now familiar to this proceeding, entitled "Reanalysis of 16 Aquifer Tests." I notice that you are the principal author on this.
A. That is correct.
Q. Why reanalyze previous aquifer tests? And in that connection, perhaps you can expand to tell us what this is -- what this document is all about.
A. That's a good point. These tests -- many of these tests have been conducted since the early '90s, done by a variety of people. But the

main reason for reviewing, revising, and re-analyzing was the fact that we had a new understanding of the Pierce Gulch Sand Aquifer. We now know that it's a regionally extensive aquifer, it dips toward southeast, it's present over numerous areas, it has enduring properties.
And so knowing the new three-dimensional understanding of the aquifer, we also recognized that the analyses for transmissivity should probably be different to incorporate that. We also recognize that it's unconfined toward the northeastern areas and more confined toward the more southwestern areas.
And therefore, with this new understanding we would analyze the data with that in mind, and also realizing that many of the methods that have been used were incorrect because they did not have that understanding.
Q. Was there an understanding in those earlier aquifer tests of potential spatial distribution of transmissivities in the aquifer?
A. No. It was really seen as that there were these -- a deep confined aquifer, an intermediate confined aquifer, a shallow unconfined, each having different properties.

There was nothing really tying that all together.
Q. Did some of the earlier analyses evaluate different depths, say moving toward Star, as being different aquifers, when in fact they were in the PGSA all along?
A. Yes. In fact, I think that came from the Treasure Valley Hydrologic Project. So it was envisioned that Star, which has a bottom of the aquifer -- Star 3, as I recall, the bottom is around 700 feet, was viewed as a different aquifer than, say, the Eagle field well, or even the Lexington Hills well, which has a bottom of the aquifer, as I recall, somewhere around 325 feet. So they were seen as different systems. But in fact, we now know it is all one system.
Q. You mentioned that the analytical methods used in these previous aquifer tests were not all correctly applied, or something to that effect.
Could you elaborate on that, please.
A. Yeah, there were several aspects. One of them is that many times they use the Cooper-Jacob method, which is a good method when applied correctly, but oftentimes the observation wells were too far away for the method to be

correctly applied.
There were situations where -- especially with the Lexington Hills test, where the drawdown curve would flatten off, which then indicated that it was an unconfined system, something we call delayed yield, and that they incorrectly did not recognize that.
Barometric corrections were mentioned as important, but not applied. Water-level trend corrections were noted as having an effect on the data, but not applied.
Q. What are water-level trend data, and how do you use them in an aquifer test?
A. When we look at our long-term monitoring data we take on a continuous basis, we realize that the water levels vary. And Mr. Squires testified to this earlier. They vary. They are higher in the winter during December, January, February, and they're lower at the end of the irrigation season as a result of pumping. Water levels go down, pumping ceases, the recharge compensates, the water levels go back up.
So even if you weren't pumping, the water levels would be changing. And therefore, correcting for that change allows you to see the

real properties of the aquifer and the effects of pumping.
Q. Did the earlier aquifer tests that were analyzed in Exhibit 12 rely on the Theis equation, did they rely on some other evaluation package, or something like that?
A. Yeah, basic --
Q. How did they approach this?
A. Typically, the Theis equation, which is really the grandfather of all well analysis equations, everything has evolved from that, and then the simplified version of Cooper-Jacob were used, but more sophisticated methods that recognize water table behavior or variations in aquifer property were not applied.
Q. So what were the contributions of the 16 aquifer test reanalysis?
A. Well, I think the main contribution, a big contribution anyway, is recognizing the extensive, continuous nature of the Pierce Gulch Sand Aquifer, that it has a transmissivity that's greater than recognized before. Many of the analyses assumed a 100-foot thick aquifer, when in fact we know it's 270, and in some places effectively 500 feet thick.

We recognize -- and this is a major contribution, is the confined nature to the west, the less confined and unconfined nature to the northeast, and the fact that it's a single continuous aquifer.
Q. Okay. What about transmissivities in the aquifer? I think you mentioned that. What did you find there?
A. Well, we found that the average, the mean, is a 210,000 gallons per day, per foot, which is higher than previously believed. It indicates that it's a very transmissive aquifer that water can flow, through the system quickly.
Q. I'd like you to refer to Exhibit 12, page 238, please -- or 237. I note that that section is entitled "Summary of Regional Aquifer Characteristics."
And I would just like to ask you, Mr. Utting, whether this is still what you consider to be an accurate summation of the regional aquifer characteristics, as determined in this study?
A. Yes. The only slight exception I would make is we have conducted the SVR-7 aquifer test, which actually indicated a higher value than

this mean. And we would therefore increase it slightly higher.
Q. And where are you referring, sir?
A. Well, we talk about the conclusions of the transmissivity averaging 210,000.
Q. Which page are you referring to?
A. This would be on page 238, conclusion No. 4. And we have an average mean here in that sense. "The average mean of all meaningful transmissivity values for the Pierce Gulch Sand Aquifer listed in table 3 is 210,000 gallons per day, per foot, rounded to two significant figures."
Q. Do you believe that is still correct, or how would you --
A. I would suspect it's going to be slightly higher now, because we have one more value to add to that since this report was done.
Q. And what value would that be?
A. That would be the 410,000 gallons per day, per foot that we included as the average transmissivity from the SVR-7 test, which I can discuss later, if you want.
THE HEARING OFFICER: Okay. Let me jump in.

MR. FEREDAY: Okay.
THE HEARING OFFICER: Could I ask that this examination be just a little more deliberate, so --
MR. FEREDAY: A little slower?
THE HEARING OFFICER: Yeah.
THE WITNESS: I'm sorry.
THE HEARING OFFICER: Mr. Utting, you're almost cutting Mr. Fereday off and jumping to the answer. Count to one or two, and then respond, if you would.
THE WITNESS: Thank you for reminding me. I appreciate it.
THE HEARING OFFICER: Thanks.
Q. (BY MR. FEREDAY): You have mentioned, Mr. Utting, the Treasure Valley Hydrologic Project.
Did the 16 aquifer test report, Exhibit 12, shed any light on what the Treasure Valley Hydrologic Project had previously determined or speculated about the aquifers in this area?
A. Yes. I believe that they were in error in their description of the three layered aquifers of the deeper confined, intermediate

confined, shallow unconfined aquifer. That is in fact correct -- incorrect.
We have now the knowledge that what is deeper in the Star area is now shallower in the Lexington Hills or in the M3 area; and therefore, their model is incorrect. It's one extensive Pierce Gulch Sand Aquifer, overlaying in some areas by unnamed alluvial aquifers that are in hydraulic communication in areas, and other areas separated, by low permeability silt and clay areas.
Q. Could you repeat that last statement.
A. They are connected in some areas -- hydraulically connected, like in the northeast areas, but separated in the southwest areas by low permeability silt and clay areas.
Q. Okay. Did you hear Dr. Wood's testimony with regard to the Treasure Valley Hydrologic Project selection of a model boundary?
A. Yes, I did.
Q. I believe Dr. Wood indicated that the TVHP selected a model boundary somewhere around the -- I believe the hydrologic surface water divide between the Payette and the Boise Rivers, and he suggested that that was not correct.

Do you agree with that?
A. I agree that that is incorrect.
Q. When you indicated that overlying aquifer units may be connected to the PGSA, what do you mean by "connected"?
A. I mean that especially in the eastern areas where the PGSA comes up closer to the ground surface, and in fact under the M3 site where it comes up to the ground surface, there is not a thick layer of silt and clay separating the PGSA from overlying zones. And there is some degree of hydraulic connection such that when you pump a well in the PGSA, there is potential for some flow of water between the zones.
Q. In addition to re-analyzing these previous aquifer tests, 16 in all, you oversaw two major aquifer tests of your own, did you not?
A. That is correct.
Q. And isn't it also true that the Kling test, the first of these two, was part of what you analyzed in the 16 aquifer test document?
A. That is correct.
Q. Could you describe what you did with regard to the Kling irrigation well aquifer test.
A. The Kling test was an opportunistic

test of the existing irrigation well which was on the property, which had been installed for supplemental use. We had the opportunity to pump-test that well and measure water levels in 15 different discrete data point locations, a total of seven wells all together. And we had opportunity to pump it for a couple days.
There was a limitation imposed proceeded on us by the -- the Farmers Union Ditch Company for the use of their ditch. But we knew that we could have two days of a carefully controlled aquifer test.
So we pumped the well for a little over two days. And we pumped it at a very constant 900 gallons per minute, and we measured drawdown both by hand and electronically in that well and in 14 other wells.
Q. Were those 14 other wells completed in the PGSA?
A. They were all completed in the PGSA with the exception of a few shallow zones that were in the overlying alluvial aquifer, unnamed alluvial aquifer.
Q. And these are the same monitoring wells, I take it, that Mr. Squires previously

described briefly in his testimony; is that right?
A. That is correct.
Q. And how long was the Kling test?
A. We pumped for 50 hours, 3,000 minutes.
Q. And why did you end at 50 hours?
A. Well, we had a limitation on the use of the ditch.
Q. And that limitation was what?
A. Well, they were reluctant to let us use it. They were --
Q. Use it for what?
A. Oh, sorry. To discharge our water into a storage pond, that then discharged into the irrigation ditch. We had to get rid of the water. We had to get rid of it in such a way that it flowed away from the well site and did not cause damage.
Q. I'd like you to refer to Exhibit 12, figure 80, please. And once again, figure 12 is the 16 aquifer test study.
A. You mean Exhibit 12?
Q. Exhibit 12, figure 80.
A. Figure 80.
Q. That's page 219.
A. Thank you.

Yes.
Q. Could you describe what this is, please.
A. This is a map of the M3 property. It shows the outlines of the property. It shows the well that was pumped, the Kling irrigation well, as a red diamond. It shows the observation well locations as green diamonds. It shows the distances between the pumping well and the observation wells, and lists the names of the observation wells.
Q. What was the water-level monitoring schedule that you carried out for this test, Mr. Utting?
A. We had electronic data loggers that were measuring every minute. And we started before the test for a couple days, we pumped, and then we had up to nine days afterwards of recovery water-level information.
Q. What did the Kling pumping test show?
A. It showed a very -- well, a couple things. It was very productive. The well, even though it was a poorly constructed irrigation well -- I have to add that it was quite plugged. We had to do a lot of work to get it to actually

work as a well without the well screen being plugged. It also seemed to have other construction flaws, such as the screen was actually higher than it should have been.
But in spite of that, we were able to pump municipal quantities of water, so we were getting 900 gallons per minute. Water quality analyses indicated municipal quality of water.
We came up with a transmissivity of that zone of about 39,000 gallons per day, per foot. And we saw no indication of any hydraulic barriers.
Q. Was that transmissivity a little bit lower or was it higher than other transmissivities you've measured in the PGSA?
A. Yes. That -- that value of transmissivity was lower than our average by quite a bit. But it's also consistent with the depositional model of having the more permeable materials closer to the source, which would be the Willow -- excuse me, the Terteling Springs formation sand deltas that were then reworked to form the Pierce Gulch sands. And the understanding from that process is that as you get further away, things will be lower in

permeability, and therefore lower in transmissivity.
Q. Which wells responded to the Kling pump test?
A. The only well that responded beyond the pumping well would have been the set of four wells completed at test well 1. When I say a set of four wells, we had discrete zones of completion within the one borehole so that we could look at the various response within the different portions of the Pierce Gulch Sand Aquifer. None of the other wells monitored during the test showed a response to pumping during that 50 hours.
Q. Would you expect the Kling well pumping to have shown up in, say, the SVR-7 well?
A. No, SVR-7 and the other wells were too far away from the pumping well. When you pump a well, it takes time for the cone of depression to move outward. We know that further wells respond later.
We took the values of transmissivity and storitivity that we calculated from the test and did a prediction of what we should have seen at those wells. And none of those other wells should have responded, using those values, within

the time period of the test. So therefore, that was consistent with the analysis, a verification of the analysis.

Q. Did your prediction predict that test well 1 would respond?

A. Yes. And it responded in the range that we expected it should have.

Q. Did you hear Mr. Vincent's testimony that perhaps there could be some sort of boundary or blockage in the aquifer in that panhandle area near the Kling well?

A. Yes, I did.

Q. What is your view about the boundary? And I recognize you've already mentioned this, but could you clarify it in response to what you heard Mr. Vincent say.

A. Well, there was some concern because Dr. Wood, in his testimony and in presenting a material to us, indicated that there was magnetometer data that -- within the deep-seated bedrock that there was indication of a fault.

So our policy on this project has to be very transparent and look at all the possibilities, consider everything. So we looked to see if there was a hydraulic indication of a

fault. And we did not see it.

Q. I'd like you to refer to figure 81, please, on page 220 of Exhibit 12.

Do you see that?

A. Yes.

Q. Could you tell us what this shows?

A. This is the drawdown plot in the pumping well during the test. And it shows the difference in water level from the initial static water level. And it's on what's called a semi-log plot, such that time is shown logarithmically, over on the vertical axis it's shown in a linear scale.

Q. What type of a plot is this? What technique did you use to make --

A. This would be --

Q. -- this plot?

A. -- a plot used for a Cooper-Jacob analysis.

THE HEARING OFFICER: Okay. Once again, I want to remind you, Mr. Utting, count to one or two after Mr. Fereday asks his question because he almost doesn't have the words out or doesn't and you're responding. And I appreciate you're anxious to get it out. But it messes up our

record. Thanks.

MR. FEREDAY: Thank you, Mr. Hearing Officer.

Q. Could you explain the Cooper-Jacob method?

A. Yes. When you pump an aquifer, at least during the initial portions of pumping, it behaves such that the cone of depression is moving outward. And if it moves outward through a uniform aquifer, you get, after a short time, a straight-line plot on a semi-log graph such as this one.

When you have a straight line, that straight line can be used to calculate the aquifer transmissivity. When you see that line changing, say becoming steeper, that would indicate a no-flow boundary.

Q. On the other hand, if it turns the other way and --

A. Then --

Q. -- begins to flatten out or becomes less steep, what does that indicate?

A. That would indicate what we call a positive or a recharge boundary.

Q. On this Cooper-Jacobs plot, figure 81,

we have two lines, a very steep line, essentially 45 degrees down to the right, then a much shallower line down to the right.

What causes these two lines?

A. The first portion that you refer to as a line, which would be occurring in the first two, three, four, five -- six to eight minutes would be the effect of the pump removing water from both the well casing and the aquifer. We call that well bore storage effects, such that the drawdown doesn't go down as fast as it would otherwise.

When those borehole effects have ceased to be significant, we get the remainder of this graph, which is pretty much a straight line, which shows the behavior of the aquifer.

At the very end, we might be able to say the data are rising slightly off that straight-line plot, which could indicate positive boundary and would be consistent with the cone of depression intersecting a higher transmissivity zone within the aquifer, which is what we found is the case in the SVR-7 pumping test, which we'll talk about later.

Q. Yeah, we'll get to the SVR-7 test in a minute.

So what is your conclusion, Mr. Utting, with regard to the potential existence of boundaries in the vicinity of the Kling irrigation well, based on this pump test?

A. This pump test indicates no definitive boundaries in the vicinity of the Kling irrigation well within the Pierce Gulch Sand Aquifer.

Q. I'd like you to refer to the text on page 204 of Exhibit 12, if you would, please. Paragraph 2.

A. 204? Paragraph 2, meaning the one immediately after drawdown after -- are removed or the one following that, complete paragraph?

Q. The second full paragraph, I believe. Does that address this question of boundaries? And perhaps it doesn't. And if not, perhaps you could show me where it does on that page.

A. Actually, it would be the first full paragraph on that page.

Q. Thank you.

A. And that --

Q. Is your testimony consistent with what was stated back when this report was done?

A. Yes, it is.

Q. Could you refer to figure 80, the map. I believe it's on page 219.

A. I have it in front of me.

Q. Okay. And could you show us, Mr. Utting, on that map where that deep fault was located by the magnetometer study.

A. We have a dashed red line here through what we've referred to as the panhandle.

Q. Yes.

A. And this would be the location of the fault described by Dr. Wood in the bedrock.

Q. With regard to the potential positive boundary from the Cooper-Jacob's plot on figure 81 out to the far extreme of that line, how does that relate to your conceptual model of the Pierce Gulch Sand Aquifer?

A. It's totally consistent in that the slight rise -- I'll try not to blind you with the pointer here -- near the end here where the water levels rise slightly above the projection could be the beginning of a flattening of that drawdown curve that would be indicative of the cone of depression moving toward this higher transmissivity zone, which is totally consistent with my understanding and the understanding

presented by Dr. Wood and Ed Squires on the depositional history of the Pierce Gulch Sand Aquifer.

Q. Was the Kling pumping test and data analysis performed in a scientifically sound way, Mr. Utting?

A. Yes, it was. It was the first pumping test that I saw of all the 16 of the Treasure Valley that had such precision on data measurement, that corrected for barometric efficiency, that was done at the time of year where water-level trends were not significant, and that used a thorough set of analyses to consider any of the possibilities of hydraulic boundary effects.

Q. What did the Kling well test show us as to the quantities of water that might be available under the M3 property?

A. Well, it verified that the Pierce Gulch Sand Aquifer is highly productive in the panhandle area, and that municipal quantities of water with municipal quality standards being met are entirely feasible.

Q. At the end of the Kling test, in your analysis of it, what was your view as to whether

Mr. Squires was on the right track in his concept of the aquifer?

A. My belief at that point was he was entirely on track and that the conceptual model that was being developed was entirely correct.

Q. Let's move now to the SVR-7 aquifer test, please. And could you describe your role in that test and what it was.

A. My role in the test was to participate in the startup of the test, was to work with staff in reducing the raw data and -- to Excel spreadsheet format. I was then able to correct for both barometric effects, calculate water-level trend effects, take those data and calculate drawdowns, calculate the hydraulic parameters of the aquifer, look at boundary effects, and write up the report.

Q. What exactly was done in the test? How long was it, and what did it involve?

A. This was a nine-day test. And we used what had been constructed as a temporary test well, which was well SVR-7. And it was a well that we developed so that it could produce water. And it was pumped at 917 gallons per minute at a very precise controlled rate for nine days.

We measured water levels in 26 different wells. Two of those were dry, because one of the issues was the potential for recirculation of water during pumping. And by measuring those dry wells completed in the gulch, it helped verify that didn't occur.

We measured water levels before, during, and after, and those wells also continued as part of our monitoring program. So we have data from beginning of March through the end of May for these wells in '08.

Q. That's March of 2008?

A. 2008.

Q. Could you refer to Exhibit 44, please. Could you describe to the Hearing Officer what Exhibit 44 is, please.

A. Exhibit 44 is the Hydro Logic report, "A Nine-day Constant Rate Discharge Aquifer Test of the SVR No. 7 Test Well, Big Gulch, North Ada County, Idaho."

Q. And did you author this study?

A. I wrote the first draft, and then worked with Mr. Squires through an editing process to prepare this document. I produced a number of the figures. Hydro Logic staff produced some of

the figures. But I had a major role.

Q. Let's look at figure 2 in Exhibit 44. I believe it's right after page 72.

A. I'm there.

Q. Is that an accurate description of the locations of the various wells that were used as monitoring wells during the SVR-7 test, as well as the SVR-7 well itself?

A. Yes, that is correct.

Q. Why was this aquifer test done, Mr. Utting?

A. Well, I think the main reason was we knew that the panhandle area of the Pierce Gulch Sand Aquifer was productive. And we knew that areas to the south of the M3 property of the Pierce Gulch Sand Aquifer were productive, but we wanted to verify both quantity of water and quality of water from the Pierce Gulch sand beneath the more central portions of the property; and lastly, to obtain more data on aquifer properties.

Q. Did you also want to determine aquifer water quality data?

A. Yes. We wanted to verify that the water that would be pumped from the Pierce Gulch

Sand Aquifer had the same high quality that was contained from other wells, such as United Water of Idaho, City of Eagle, Star.

Q. Didn't you get some of this same information already from the previous Kling test?

A. Well, we had some of the information. We were able to see what occurred in terms of pumping response, water quality, and productivity from the panhandle region. But because it takes time for a cone of depression to move outward and because of the limited time that we could pump the Kling well, we wanted to do a longer term test monitoring more wells -- in fact, it was one of the recommendations that we made in the 16 aquifer tests, that we do a long-term test in the upland area.

Q. In Exhibit 44, your report on the SVR-7 aquifer test, was it reviewed by other researchers and other hydrogeologists, other than Mr. Squires?

A. Yes. Dr. Jim Osiensky from the University of Idaho reviewed my work on this, reviewed all our work, also reviewed work on the 16 aquifer tests. So he was an essential reviewer professional.

I also discussed matters with the developer of Aqtesolv, an application of the software and some of the aspects there. I also asked a few questions and got some good feedback from Dr. Butler, the Kansas Geological Survey. So others were involved reviewing our work and getting it done.

Q. Was Dr. Wood also involved in reviewing the SVR-7 aquifer test report?

A. He had a role to play in the geologic portion. I don't recall if he reviewed and gave input on the hydraulic portion.

Q. Did Dr. Osiensky indicate to you that this report was competent or had any problems? Or what did he indicate to you?

MR. ALAN SMITH: Objection. Hearsay.

THE HEARING OFFICER: Not yet.

THE WITNESS: Dr. Osiensky told me that it was --

MR. ALAN SMITH: Objection. Hearsay.

THE HEARING OFFICER: Well, technically, this is, I guess. But let's --

MR. FEREDAY: Mr. Hearing Officer, if I could respond.

THE HEARING OFFICER: Yeah.

MR. FEREDAY: I believe this is the type of input in terms of peer review that is normally used by scientists in this field, and I think it would be appropriate. If necessary, we can bring Dr. Osiensky here, I suppose. But I think it's an appropriate area of inquiry.

MR. ALAN SMITH: It's still hearsay, Judge. We object.

THE HEARING OFFICER: Mr. Smith, I'm impressed by your recognition of certain evidentiary matters. And you've done this several times now, and you're astute in your observations.

One of the -- one of the hallmarks of an administrative hearing, however, is that the rules of evidence are relaxed. And this is particularly true, in my opinion, with hearsay. I regularly allow hearsay into the record, provided that I think it's reliable and comes from a source that I think is believable.

My sense is, Mr. Smith, in my long-ago study of hearsay is that it was developed primarily to protect juries and not necessarily the administrative hearing officer.

So I'll allow at least some questioning, and we'll see where it goes. So

overruled at this point. Anyway, I do appreciate your recognition of hearsay, and I don't want to squelch it. Okay. Thanks.

Now, the question again, maybe, I --

Q. (BY MR. FEREDAY): Did Dr. Osiensky -- what was the nature of Dr. Osiensky's feedback, Mr. Utting?

A. His feedback was positive on the methods of analysis and the results. He suggested some wording changes, which we incorporated. But all in all, it was a very positive review.

THE HEARING OFFICER: Now, just an interjection, Mr. Smith. What Mr. Utting just said, in my opinion, is not hearsay.

MR. ALAN SMITH: Very well.

THE HEARING OFFICER: So let's go on.

Q. (BY MR. FEREDAY): Was the SVR-7 aquifer test of a long enough duration to provide scientifically sound conclusions, Mr. Utting?

A. Yes, it was. We monitor all the data that's being collected in the field as we proceed. So we're plotting up the data as we go along so that we know what we're getting.

About seven days into the test, we realized that the responses we were getting -- in

other words, the increase in drawdown -- was getting smaller and smaller, yet we were having to deal with barometric effects and water-level trends that were relatively large.

So pumping longer would not have given us any additional information. We did, however, extend it for two days beyond that seven days, just to verify that that was in fact the case. So pumping longer would not have given us any additional data for analysis.

Q. Did the tests reach, in your opinion, a steady-state condition?

A. Steady state in terms of the changes being so small. From a practical point, yes.

Q. Do you understand that the Department of Water Resources staff has suggested that an even longer aquifer test on the M3 property might be appropriate?

A. I have heard that suggestion, yes.

Q. What is your comment with regard to that?

A. My comment with regard to that is that longer would not give us any additional data, especially when you're running a test when the irrigation season is just beginning and

water-level drawdowns are going down.

We got the values we needed for transmissivity, storitivity. We saw the effects of the unconfined zone toward the northeast. We obtained all the data that we needed. Pumping it longer, doing a longer test would not give us any additional information.

Q. How expensive are these aquifer tests? And I understand that Mr. Squires has already commented from his point of view on this. But perhaps you could give us your views on the expense involved in an aquifer test.

A. We are talking many thousands of dollars a day. The cost for the diesel fuel alone was a thousand dollars a day. We also had to rent a huge motor generator to run the specialty pump that was in the well. That cost was huge.

We had to maintain on-site staff, both to operate the pump and generator assembly, as well as field staff who work around the clock to obtain data. So we're talking about many thousands of dollars a day.

And if you'll recall, a lot of times we plot these with logarithm to time. So we get one week's worth of data, you'd have to go another

month to get sort of the next little increment, and therefore it's just prohibitive to go longer, especially when there would be no additional benefit.

Q. You mentioned that this test was done in March of 2008.

Why was it done in March, rather than, say, in February or January?

A. Well, we would have loved to have done it in the cold of winter. There are many advantages. The advantages being the water level remaining stable, frozen ground for transit to get to wells.

But we filed -- Hydro Logic filed a prospectus with the Department of Water Resources in October to do a major aquifer test. We had proposed at that time, and M3 and willing to fund, a large-diameter production well near the M3 test well 4 site.

The purpose of the prospectus was to get comments and an understanding from Water Resources that the procedure was, in fact, the correct one.

Unfortunately, we did not hear back from Water Resources until late January, as I

recall. And by that time it was far too late to then drill a well, develop a well, and get going on an aquifer test. We would have had to have waited at least a year to do that.

So we recognized we had this one well that, with the proper development and the proper pump, could produce municipal quantities of water. And that would be SVR-7. And so the large-diameter casing that had been sealed in for the production well that was going to be -- this large-diameter production well, we converted that to an observation well so that we could see water-level drawdowns. And we proceeded to develop SVR No. 7 so we could use it as a pumping well, secured the necessary equipment to make the test happen. And that was a rush to get it in to start by March 10th when we did start pumping.

Q. Thank you.

I'd like you to refer to Exhibit 45, please. And figure 5 of that exhibit is what I'm going to inquire about.

A. I'm at figure 5.

Q. Could you describe what figure 5 shows.

A. Figure 5 shows the water levels that

we have been measuring in M3 Eagle test well No. 1, which was the first purposefully constructed monitoring well that Hydro Logic put on the M3 property. It shows water levels that we have been measuring since November of 2006. It also shows the water levels that we've been measuring in M3 Eagle test well No. 4 and that those water levels start in early March. And that's because that's when that well was completed.

Q. With regard to the figure -- I believe it's figure 3 of Exhibit 44, the map --

A. Yes.

Q. Figure 2. Excuse me. Could you just point out to the Hearing Officer where test well 1 and test well 4 are.

A. Test well 1 is down here in the panhandle (indicating). Test well 4 is at this location (indicating). It's about halfway between test well 1 and the pumping well SVR-7.

Q. So these are on opposite sides of that inferred deep fault; is that correct?

A. That is correct.

Q. Now, with regard to the orange line on figure 5, test well 1 and its hydrograph, could

you tell us what is going on with what appears to be a seasonal down and up trend on that well. Could you describe what that is.

A. We see on this figure water levels that are much higher during December, January, February, and March, and then declining to much lower water levels that we see July, August, and September.

These water-level changes occur because of seasonal pumping from the Pierce Gulch Sand Aquifer. People are pumping harder in the summer for a variety of reasons, irrigation would be a main one. So water levels do go down.

When pumping stops at the end of the irrigation season, people use less water. Water levels rise back up during the winter months.

Q. So just to make sure I'm clear on this, I see January 2007, the orange line is up to, oh, let's say -- almost up to the 90 mark at the top. And then in January of 2008 it's up even higher.

Does that indicate an even higher ground water level?

A. Yes, it does.

Q. And the figures on the left, I take

it, are depth to water below ground; is that correct?
A. That is correct.
Q. And the overall amplitude appears to be about -- what? -- 15 feet? Would that be accurate from, let's say, January/February down through July/August?
A. That is correct.
Q. With regard to test well 4, is it graphed on the same vertical scale?
A. No. There's a different vertical scale. And you can see that on the right side of the diagram where the depth to water below ground level is shown on this scale.
Q. With regard to the March/April/May period, and looking at the left side of figure 5, I note that there's a rather steep decline beginning in March -- mid-March, perhaps, and running down very rapidly through early April and then up a little bit and then continuing down rapidly in May to June.
Is that an accurate description of what we're seeing here?
A. Yes, it is.
Q. So when you testified that you would

have preferred to do this test in January and February, can you tell us why, based on what you see on this graph, you testified in that way?
A. When we do a pumping test, we want to see how water levels change relative to nonpumping conditions. The best way to do that is when the water levels within the aquifer remain steady.
During the period December, January, February we had the most constant water levels within the aquifer. That is the best time to do the test because during that time you don't have to correct the changes that we're estimating. And therefore, there is less potential for introducing an inaccuracy. There's less -- it's more accurate.
Q. We may come back to this figure 5 in a minute, but before we do, could you tell us what you had to do to the SVR-7 well to prepare it for pumping. And perhaps you could also describe what that well looks like, how big it is, and so forth.
A. It's an 8-inch diameter well. It has a louvered well screen, which means there are basically gaps within the casing that are not the triangular wire wrap which is typical for a high-quality well. It was put in as part of the

original investigation done by SunCor. And so it was done fairly on the cheap.
So instead of a grated filter pack, it's crushed rock. And in fact, it never was developed. Mr. Squires consulted with the driller who put the well in, confirmed it wasn't developed, because I had noted during the SVR-6 -- excuse me, the 16 aquifer tests, that the well water levels during pumping were actually rising through portions and not falling, indicating that it was developing. And therefore, to be a useful well, we had to develop it.
Q. What is meant by "developing"? Excuse me.
A. That's a good question. When you drill a well, there is damage done to the formation, to the aquifer materials outside the well, both through the drilling process and through drilling fluids, which may penetrate into those materials.
Developing is the process of removing the drilling fluids, removing the fines in the vicinity, fine-grained material in the vicinity of the well screen such that you don't have an impediment to flow at the well bore that you can

draw water into the well as unrestricted as possible. So we did that development process.
We also recognized that an 8-inch well, at least from my experience before this, if you can get 500 gallons a minute, 550 out of an 8-inch well, you're doing really well.
Mr. Squires, however, has many good experiences with various types of pumps and was able to find a special what he calls an "oil patch pump," one that is meant to pump high quantities of water from small diameters.
So he was able to construct an assembly with this specialized pump that would do municipal quantities of water from a domestic size well. So we were able to get this 917 gallons per minute at a steady rate out of a well that really wasn't constructed for that at all, but was capable of it.
Q. How many wells did you monitor during the SVR-7 test?
A. We had 26 individual wells, some of them were multiple completions, well nests, where you have small-diameter tube wells completed in the same borehole. Of those 26, two were completed in a dry, unsaturated sand zone that had

there been water there, it would have been these overlying, undifferentiated alluvial aquifers that Mr. Squires has referred to earlier, that I've referred to earlier.

So we also had 24 that had water in them. And we measured those with electronic data loggers and by hand.

Q. Did you account for barometric effects or other effects that could affect water-level readings during this test?

A. Yes, we did. We calculated the barometric efficiency, which tells us how atmospheric changes, pressure changes, affect water levels in the well. We calculated these barometric efficiency coefficients, so that we could then correct the data to remove those effects.

MR. THORNTON: Mr. Hearing Officer, could we take a short break at this point? It's 10:30, a little after.

THE HEARING OFFICER: Yeah, let's make this our morning break.

MR. FEREDAY: Okay.

THE HEARING OFFICER: Let's take 15 minutes.

MR. FEREDAY: Okay.

THE HEARING OFFICER: We'll be back at quarter till.

(Recess.)

THE HEARING OFFICER: We're recording again.

Mr. Fereday.

Q. (BY MR. FEREDAY): Mr. Utting, before the break, you were discussing corrections for barometric effects in aquifer tests. I would like you to refer to Exhibit 44, figure C-3. And I believe that's on page C-5 of that Exhibit 44.

A. I'm there.

THE HEARING OFFICER: Okay. What page? I'm sorry, Mr. Fereday.

THE WITNESS: It's in the appendix, so it would be near the end. It's Appendix C. It's on page 5.

THE HEARING OFFICER: Okay. Thank you.

Q. (BY MR. FEREDAY): Could you describe what this graph shows.

A. Yes. This is a plot for the Big Gulch stock well and its linear plot or arithmetic plot, so that the time scale is arithmetic across the top. And the water level below ground level is

the vertical scale.

We also have a barometer plot on the right side of the diagram to show the barometric pressure. And this is an example of the barometric correction analysis that we did for each and every well as part of this test. And you can see the black line, which is along the bottom, which is the barometer, moving up and down. If you look at the gray line above that, that would be the water level in the Big Gulch stock well.

And you can see that it moves up and down. And some of those movements are pretty similar to that of the barometer. And that, in fact, would be the barometric effect.

So by calculating the barometric efficiency, which we did with the pre pump-test data and correcting that water-level data that you see in gray, we end up with the water-level plot which is blue.

And that water-level plot shows a nice, steady drawdown curve during the pumping portion of the test, with a classic response recovery curve occurring after the pumping stopped, as indicated on the graph by "pump on" and "pump off."

So by doing this analysis for each well, we were able to get a water-level drawdown that we believe is representative of the barometric effects being removed.

Q. Did your work with regard to barometric analysis completely correct for that barometric effect, in your opinion?

A. It didn't totally correct for a barometric effect, which is probably a result of the barometric efficiency based on fairly short term data. And there are some longer term effects, so the linear regression -- this is getting very detailed, but the linear regression for the barometric effect does leave some effects that are unaccounted for in terms of barometric. But there's also a water-level trend effect that needs to be taken care of too.

Q. Let's refer, then, to the previous page, page C-4, and this is figure C-2, entitled "Posttest water-level trend analysis for SVR-7."

Could you tell us what that shows, please.

A. Okay. On this figure we have across the top, the date, and then we start in January of the year, and we go through the end of May. And

the year being 2008, the year of the test.
On the vertical scale we have the water level, which on this scale is only a 1 foot difference between the top and the bottom. So it shows the water levels within well SVR No. 7. And the thing that we use this graph for was to develop a water-level trend correction.
And as you can see from mid-April through the end of May, the water levels generally follow a straight line. And that straight line we then calculate the equation for and project it through to the start of the test, which intersects with the water levels that occurred before the test. And that shows us that a linear correction for water-level trend is a pretty good approximation.
We then use that equation, which you can see written on this graph, to correct the drawdown data so you remove -- effectively remove the trend from the data during the test.
Q. Just so I understand this, Mr. Utting, does this graph show us how you corrected the recovery water level in the well to see whether it would match up with the existing regional trend in the aquifer? Is that what you were doing?

A. Yes. Because if we just relied on uncorrected data, it would look like the well never recovered. In fact, it would look like a month after the pumping stopped it continued to go down after rising, which of course would not occur in a pumping test.
So we are trying to see how the water level returns to nonpumping conditions. And this figure shows that by mid-April that in fact had occurred.
Q. Let's refer back, if we could, to figure 5 of Exhibit 45, which was the comparison of water-level responses in test well 1 and test well 4. I'd like to ask you a couple of questions about that.
A. Okay.
MR. FEREDAY: And, Mr. Hearing Officer, that is located in Exhibit 45, and it's a fold-out sheet.
THE HEARING OFFICER: Figure 5?
MR. FEREDAY: Correct.
THE HEARING OFFICER: Yeah. Thank you.
Q. (BY MR. FEREDAY): Mr. Squires, with regard to the 2008 time period there in March, I see two blue vertical lines and in between words

"SVR-7 aquifer test."
Could you tell us what that is.
A. I presume you meant Mr. Utting.
Q. I'm sorry. Mr. Utting.
A. Yes. What we notice on the hydrograph, the water-level plot, are a series of what we call hydraulic events. And that would be a water level going down and then rising up in response to something that occurred in the aquifer. This something would be pumping.
Q. Okay. Now, before we get to those -- and I take it you're referring to these symbols, the asterisks, the X's --
A. Yes.
Q. -- and so forth?
There is a denotation in there of the SVR-7 aquifer test, a period of time.
Could you -- is that when the aquifer test was taking place?
A. Yes.
Q. It was taking place, I see, in March. And as you've previously testified, that is during a period when the groundwater levels are dropping in the -- in the entire area; correct?
A. That is correct.

Q. So when the observation well is trying to recover from that drawdown induced by the SVR-7 aquifer test, it is trying to recover not to some seasonal high line, but it's trying to recover, is it not, to a declining water level regionally?
A. That is correct.
Q. And is that what you're showing back on Exhibit C-5 -- or excuse me, C-4 of Exhibit 44?
A. Yes.
Q. Okay. Now, with regard to figure 5 of Exhibit 45, you had mentioned hydraulic events.
Could you tell us what this comparison of test well 1 and test well 4 shows with regard to these symbols, the square, the circle, the asterisk, and so forth?
A. The symbols are placed on this figure to show similar events occurring in the water levels of both of these test wells. And the purpose of that is to show where the hydrograph of test well 1, which indicate in some cases a rise and a fall, would also be similar to the hydrograph of test well 4, which would show a rise and a fall.
And so by placing these symbols, there are a number of different hydraulic events which

would be associated with pumping shows up in both of these wells, even though they're far apart from each other.

Q. Okay. And I recognize that these are on different scales. But in your opinion, do these show consistency between these two wells as to response to these outside hydraulic events?

A. Yes. And that's, in fact, why we use the different scales, so that we could see that they're showing up in the water levels in both wells.

Q. I take it, then, that the difference in scale is due to the distance of these wells from potential pumping centers; would that be right or --

A. That is one of the factors. The further you are away, the smaller the response would be.

The other factor is the fact -- is the fact that we know that the aquifer is unconfined up near the green line that Mr. Squires has testified about, that Dr. Wood has testified about. In that area the aquifer is unconfined, and therefore you get a smaller response to an event. It has to do with the physics of the

concept of storitivity. I'm happy to go into detail. But I think everyone's eyes would glaze over.

Q. Understood, and I appreciate that. Did the fact that water levels recovered to a trend line after the SVR-7 aquifer test tell you anything?

A. Well, that tells us that we're not pumping out of some compartment that has no recharge. It tells us that there's recharge to the system. The water level is recovering in the well back to the level it should based on theory and the amount being pumped and the time being pumped.

Q. By the way, did any of the 16 aquifer tests that you analyzed in that Exhibit 12, did any of those tests, other than the Kling test, include an analysis of the recovering well returning to a trending line?

A. None of them did that.

Q. Except for the Kling test?

A. Well, the Kling test, we didn't need to do that because we did the test during the time period where the water level was relatively stable. We also pumped for a shorter period of

time, therefore the recovery occurs in a shorter period of time. So we got that recovery.

Q. Uh-huh.

A. And in fact, you can see that in this figure 5 where the water level -- the Kling pumping test is shown beneath the January 2007 time, and we have test well 1, which was the responding test well.

And at the risk of not blinding you, you can see that here's the test -- excuse me -- and the water levels came back up to the rising trend. And in fact, because we're still at the portion where it's rising slightly, one might mistakenly conclude that it recovered early. But in fact, if you look at the trend, and that's actually an aquifer-like trend.

Q. So in figure 5 of Exhibit 45, over on the far left where it says "Kling irrigation well test," just so I understand what you just told us --

A. Yes.

Q. -- what we see there is a stress on the aquifer with a steep downward spike of maybe 8, 10 feet, something like that, and then the well shut off; correct?

A. That is correct.

Q. And then we see a recovery, and then we see a slight drawdown.

What causes that slight drawdown then?

A. You're referring to the drawdown that occurs after the February -- this little drawdown right here (indicating)?

Q. Yes, after the February tick.

A. I'm guessing that has to do with other pumping in the area. We don't know. But we see the classic drawdown response that must be pumping in the other area. For example, when you look at similar time the next year, you see a nice drawdown curve and recovery here on the graph beneath the January 2008/February 2008 area. And we were not doing any testing at the time, so someone else is pumping in the area.

Q. And then as we follow that orange line, it goes up quite steeply, does it not, up to about mid-March to a high point?

A. That's correct.

Q. And then from there, is that the trend that you're -- the regional trend that you're talking about, the steep decline as irrigation comes on?

A. That is correct.
Q. So it's interesting to me that looking at this figure 5 that test well No. 1 recovered to a higher level in January of 2008 than it did in January, February of 2007.
Can you speak to that, please.
A. Well, when we look at the long-term monitoring data, we see that there are seasonal variations. Each year the water levels recover during the winter. They go down at the end of the irrigation season. And so I've looked at other wells and seen a generally subtly rising trend in properly completed monitoring wells. This could well be part of that that we see the water levels are slowly recovering and rising during the last few years.
Q. Mr. Utting, in your opinion, would this sort of trend between -- just in this one well, I recognize it's only one well, but between January of 2007 and January 2008 on test well 1, would this be consistent or inconsistent with what Mr. Dittus testified in terms of what he sees in his wells?
A. This would be totally consistent, because Mr. Dittus testified that his water level

seemed to be subtly rising the last few years. And we certainly see that in this hydrograph.
Q. You've noted with respect to this figure 5 of Exhibit 45 that test well 1 and test well 4 are on opposite sides of the inferred deep fault; correct?
A. That is correct.
Q. Do you see hydraulic connection between test well 1 and test well 4 showing up in this graph? In your opinion, is there hydraulic connection?
A. Yes, there is hydraulic connection I see in this graph. When I see hydraulic events that show up in both of these water-level plots, it tells me that the aquifers are connected, and we're seeing the same hydraulic events. There's no disconnect or barrier shown on there.
Q. Is it your opinion that they are in fact in the same aquifer?
A. There's no doubt in my mind that they are in the same aquifer.
Q. What is your view, Mr. Utting, of the results of the SVR-7 test? Can you give us an overview of your conclusions with regard to the SVR-7 aquifer test.

A. Well, the test gave us very valuable data on many fronts. I suppose the main thing is that it showed us that a high-capacity well of municipal-quality water is entirely feasible from the Pierce Gulch Sand Aquifer in this middle vicinity of the M3 property.
Q. When you say "large" or high-production well, how many gallons a minute would you say that this could --
A. You could easily --
Q. -- that this aquifer could support from this area?
A. Individual wells can produce over 2,000 gallons per minute. And we could have a number of those wells each producing 2,000 gallons per minute.
Q. Anything else that you've concluded from this test?
A. Well, the aquifer is highly transmissive. We came up with an average value of 410,000 gallons per day, per foot, which is very transmissive. We came up with quantifications of storitivity, which are totally consistent with the unconfined nature of the aquifer to the northeast and confined nature to the southwest.

And we concluded that there are no compartmentalization or no barriers that would cut off this portion of the aquifer, or anywhere else, with the exception of the green line at the north, which is a boundary to this aquifer.
Q. How would you rate the SVR-7 aquifer test in terms of its quality and its reliability, Mr. Utting?
A. Well, I started groundwater consulting 30 years ago. And I had my own company. I was president for 13 years. And this is the best test that I have ever participated in. The most thorough, the most comprehensive, the most detailed analysis. It is a superior test, superior results.
Q. Have you seen a better test in the Treasure Valley?
A. I -- of all the tests I've looked at, which go beyond the 16 in this report, plus the 17, this is by far the best. I've never seen anything close to it.
Q. Do you believe that another aquifer test is needed to determine water sufficiency for the M3 Eagle project or the effects of pumping municipal well or wells on the M3 property?

A. I do not.
Q. So, Mr. Utting, could you give us your conclusions on these two aquifer tests that you have overseen, the Kling and the SVR-7 -- and I'm not asking you to repeat yourself, but if there's something else that you've concluded from these, I'd like to know what it is.
A. Well, maybe I am repeating myself, but it's the same high-quality Pierce Gulch Sand Aquifer water that we see being produced from the south, is entirely feasible and possible from the Pierce Gulch Sand Aquifer beneath the M3 property. And it's highly transmissive. It's capable of large quantities of good-quality water.
Q. In any of the data that you've reviewed or any of the tests that you've done with regard to -- especially with the SVR-7, the Kling, and the 16 aquifer test review, have you seen any indication that there is insufficient water available to support a water right for 6500 acre-feet of pumping annually?
A. I have seen no data to contradict that. Only data to support that.
Q. What about your view about the long-term impacts to the aquifer in general, the

surrounding areas, even several miles to the south or southeast where the protestants' wells are, what's your view, just based on these aquifer tests, of the likely effects of this pumping at full build-out?
A. Well, I believe there are -- will be some measurable effects likely in the Pierce Gulch Sand Aquifer. We have seen high-transmissivity aquifer, and that means that the effects are generally smaller, but they're spread out. So I believe that within the Pierce Gulch sand we may see some of those effects.
They may be less than I suspect, based on Mr. Dittus' testimony, where they've been pumping for at least 15 years, maybe 20 years on some of those wells, with water levels remaining essentially the same, showing the recharge is quite robust and counteracting those pumping effects.
So there will be some effects, I believe. But they may be relatively small. Very likely to be relatively small.
Q. What about your conclusions about any other boundaries, other than the green lines -- the green line that you may have detected in any

way through these tests? Did you detect any other boundaries?
A. I detected no other boundaries.
Q. Have you relied on any other data with regard to water flow through the aquifer?
A. Yes. The water table contour maps or the potentiometric surface maps that we made earlier and submitted to IDWR also show that groundwater flows through this region without being affected by a no-flow barrier. If there were a no-flow barrier, groundwater would not pass through it. It would have to go parallel to it.
The contour maps that we made show that groundwater is flowing to the west-northwest through this region, and not being shunted by a no-flow barrier.
Q. I'll refer you to Exhibit 18, figure 1.
MR. THORNTON: And that number? I didn't hear, Jeff.
MR. FEREDAY: Exhibit 18, figure 1.
MR. THORNTON: Thank you.
THE WITNESS: Oh, here we are. Exhibit 18.
Q. (BY MR. FEREDAY): Mr. Utting, do you see the contour map that's figure 1 of Exhibit 18?

A. Yes, I do.
Q. Did you have a hand in preparing this?
A. I prepared this figure.
Q. On what was this figure based?
A. This figure is based on a number of wells that we went out and measured water levels to a hundredth of a foot, wells that were selected based on a previous year's analysis where we had 160 wells but we had no ground surface control.
So these wells were based on surveying the elevation of the wellhead and measuring carefully to a hundredth of a foot, and excluding wells that had evidence of being recently pumped and therefore giving misleading numbers, with the exception of a Caldwell test well and a well up in the northwest corner where we did not survey those wells, but we relied on the fact they were so far away that any errors in their wellhead elevation would not be significant in terms of controlling the contours that we placed on this figure.
Q. When you say you surveyed the wellhead locations, what do you mean? Did you survey their elevation?
A. Idaho Survey Group was contacted. They survey the X/Y position and the elevations so

that we have an accurate representation of their position in space and therefore could have accurate water levels to within a few hundredths of a foot.

Q. Does this figure 1 of Exhibit 18 accurately portray, in your opinion, groundwater flow through the Pierce Gulch Sand Aquifer, based on the best available data?

A. This accurately portrays our understanding of flow where the lines are solid. Where they become dashed, we're less certain. But certainly in the Eagle/Star/M3 area, this is a good portrayal.

Q. You mentioned a minute ago that if there were a boundary, the groundwater flow would turn and run parallel to that boundary.

Is that an accurate depiction of what you said?

A. That is correct.

Q. And do you see any boundaries anywhere in the direction of flow from these contour lines?

A. Well, you'll see along the fault down in the corner where we have an elevation of water level 2600, you see the contour comes in at right angles to that boundary, which is as it should.

If we look at the green line in the middle of the M3 property, we see the 2550 contour comes in at right angles, which it should, according to theory.

When we look to the area where the deep-seated bedrock fault that Dr. Wood testified to earlier, we can see that the contour lines are unaffected by that line. If that had been a no-flow boundary, the flow would have been directed toward the northwest in that area, but it's not. It's pretty much westerly and crosses right through at that area.

Q. Mr. Utting, I'd like to turn now just to a couple of questions about recharge.

In your opinion, is the Pierce Gulch Sand Aquifer receiving recharge?

A. Yes, it is.

Q. And is it a little? Is it a lot? Could you describe it in any qualitative way?

A. I believe the recharge is robust. I believe that there's a significant amount of recharge occurring. And I -- when I review -- listen to Mr. Dittus testify, I saw the recovery of his wells without any decline, that confirms that belief.

When I see the fact that wells have been pumping in this area and water levels haven't been changing, to me, it's a slam dunk. There's a lot of recharge occurring.

Q. In your experience, is defining the input locations of recharge in an aquifer typically a part of your work in evaluating water right applications in Idaho?

A. No.

Q. How much water do you calculate flows through -- and maybe you can refer back to figure 1 -- flows through the roughly 3 1/2 mile swath of the middle of the M3 property depicted on figure 1?

A. I calculate that 36 cfs, cubic feet per second, or approximately 23 million gallons per day, flow through a line that would be pretty much the western boundary of the M3 property between the green line and the panhandle. So a little over 3 1/2 miles, maybe 3.7 miles. And that calculation was based on the transmissivity results calculated from the pumping test. It's based on the gradient that we see from these contours, and from the flow width indicated by those flow factors.

Q. That aquifer flow is under nonpumping conditions in that location, or is it under pumping conditions?

A. That would be under -- I'm saying generally nonpumping. There are probably some small wells to the west that are pumping that. But in terms of M3, that's nonpumping.

Q. How would you expect that to change under pumping conditions?

A. Well, you would obtain a higher flow toward that property because the wells would pump, and therefore draw water toward them, lower the levels near the wells, and cause an increase in gradient. As Mr. Squires testified, the only way you get water to a well is by lowering its level. So that amount would increase. 36 is what's flowing now without pumping.

Q. Mr. Utting, what methods have you used to predict impacts to aquifer water levels due to pumping at the M3 Eagle project?

A. I've used three methods. I've used simplified Theis analysis, I've used an analytical model, and I have used a numerical computer model.

Q. We've heard quite a bit of testimony already about using the Theis example or the Theis

equation.
Is it your view -- and would you agree, I guess, with Mr. Dittus -- that using Theis tends -- at least in this area, tends to overstate the predicted drawdowns?
A. Yes, it does overstate drawdowns.
Q. What is an analytical model?
A. An analytical model is one that is based on equations like the Theis equation, or similar derivatives of that, to take into account more of the features of the aquifer. Again, it's a pretty simplified way of doing the analysis.
But the analytical model that I developed allowed me to put in multiple pumping wells that M3 might have planned, and the effects of the edge of the aquifer so that they can be incorporated into the analysis.
Q. And what is a numerical model?
A. A numerical model is one that breaks the region up into a number of layers and cells where you can assign the hydraulic properties to each of those cells. And those properties are based on testing.
You then can incorporate a lot of variation within the properties of the system.

You can incorporate geometry of the aquifer. You can include recharge, which is not included in the Theis or the analytical model. You can include the effects of rivers. You can include the effects of drains, irrigation canals. You can replicate the system much more completely.
Q. You created a numerical model in this matter, did you not?
A. I worked closely with Pacific Groundwater Group, which was the company that I co-founded, and specifically with a Peter Schwartzman, so that we worked together. I would come up with many of the concepts, translate the hydrogeology. He would do some of the number crunching. We discussed the results. We would then work interactively. So I was project manager on that and played a key role.
Q. What is your experience with modeling with Mr. Schwartzman? You said you were his partner. Have you worked on models with him before?
A. I have worked with Peter on numerous projects over the past 20 years, which include modeling, interaction, pumping test analysis, all aspects of hydrogeology.

Q. Could you describe the difference between the traditional tools such as Theis and numerical modeling projections. Give the Hearing Officer a feel for what differences he's likely to see there.
A. Well, a numerical model allows you to do calibration. And calibration is very important because you can take the existing data and see how well the model replicates the existing data. And when you see areas where there's a discrepancy, you can go back and say, "Okay. What do we need to know more about this area?" Collect additional data, modify the data with the understanding that you have.
So the numerical model will allow us to incorporate many more hydraulic aspects of the system and be able to give us confidence that it's able to replicate what has occurred in the past, so that increases our confidence in what we predict to occur in the future.
Q. Could you refer to Exhibit 16, please, and tell us what that is.
A. Exhibit 16 is a modeling report that I was the senior author on which reviewed five numerical models of the greater Eagle/Star/M3

vicinity that have been completed over several decades, which includes the Treasure Valley Hydrologic Project, U of I model, and the most recent model, which we call the M3 model, which I was the project manager on that one.
Q. Is the M3 model which is contained in Exhibit 16 a realistic representation of the aquifer system in this area?
A. I think it's a very realistic representation in that it takes into account what's now known about its 3D spatial position. We know it's a dipping system. This model was set up to incorporate that. It has the results of the 17 aquifer tests, which have been conducted in the general area. So we have input to the transmissivity and storitivity of that area.
We, I think, have a very good understanding. We have also taken pumping test data from those previous tests and used that in the calibration so that we know it can replicate those pumping tests so that when we use it to predict what M3's effects might be we have increased confidence.
Q. Does the M3 model go beyond previous groundwater models in the Treasure Valley, in your

opinion, in terms of its reliability or accuracy pertaining to this part of north Ada County and its groundwater regime?

A. I believe it to be the most accurate and most representative groundwater model developed to date for this area.

Q. When you speak of the dipping strata or layers in this model, what do you mean? And how did the model approach the dipping nature of this aquifer?

A. Well, the -- as Dr. Wood has testified and Ed Squires has testified, we have a good understanding of the spatial positioning, especially in the project area, and especially in the Eagle/Star area of the Pierce Gulch Sand Aquifer.

And we know that it dips to the southwest and rises to the northeast. We know it has boundaries. And so this model is constructed with dipping layers. We have three layers that incorporate the Pierce Gulch Sand Aquifer, so that as we learn more about it, we can vary the properties within the model.

And in fact, many of the pumping tests that we use in the calibration process were

conducted with a pumping well in the upper part of the aquifer, with an observation well in perhaps the middle or the deeper portion, so this model can replicate that.

Q. You mentioned that we know the boundaries of the PGSA or that -- you mentioned boundaries of the PGSA.

Could you describe what those might be.

A. Okay. We know that we have what's been referred to as the green line, which is the edge of the aquifer as it comes up and intersects the ground surface, and that forms the northern boundary of the aquifer on the M3 project site.

We have the West Boise/Eagle fault, which forms a boundary along the eastern portion diagonally down toward the Garden City area. We know that the aquifer extends up to the Payette Valley. We know it extends to the Snake River Valley, and we know it extends downgradient down the Boise River Valley. So we know it's present in all those areas.

In terms of the actual boundaries, our model on the southeast corner did not incorporate a physical boundary to the aquifer.

Q. And the reason for that was what?

A. Well, when we're doing a model, the purpose of this model was to help us to predict with confidence the impacts of developing water from beneath the M3 project site in the Pierce Gulch Sand Aquifer. So what we needed to know is how far those pumping effects would occur.

So we need a boundary to the model which is far enough away so that we have an understanding of how much water is flowing through there, but pumping of the wells doesn't cause any change in the flow within that area.

So we developed, which initially was called general head boundary, and then converted that to a constant flow or constant flux boundary, as we learned more about the system.

Q. Could you refer, please, to Exhibit 16, figure 6, and perhaps figure 7 as well on the next page, pages 50 and 51 of Exhibit 16. And while you're looking at that, let me ask you another question about boundaries.

Would there be a lower boundary of the aquifer as well, Mr. Utting?

A. You mean physically on the bottom?

Q. Yes.

A. Yes. In this case we used the bottom boundary as the Terteling Springs Mudstone, the low permeability silts and clays that Dr. Wood discussed and that Ed Squires discussed. And so that forms the bottom of our model.

Q. And with regard to the green line boundary. Is -- is that the boundary that has been previously described as the area where the aquifer comes up dip and essentially breaks the surface, and as it gets closer to that green line, it becomes less and less confined, ultimately becoming unsaturated? Would that be a good description?

A. That's a very good description.

Q. With regard to figure 6 on Exhibit 16, it says "The domain of the M3 model."

Is there anything more we need to know about that? Is it the square, dark line that describes the domain?

THE HEARING OFFICER: Okay. Let me find that figure.

THE WITNESS: Sure.

MR. FEREDAY: Sorry.

THE WITNESS: So it would be page 50.

MR. FEREDAY: Page 50 of Exhibit 16.

THE HEARING OFFICER: Okay. Not in the appendices?
THE WITNESS: Not in the appendices.
THE HEARING OFFICER: So figure 6. Okay. Very good. Thanks. I have it.
Q. (BY MR. FEREDAY): Are you on figure 6 now?
A. I'm on figure 6 now, yes.
Q. Mr. Squires testified about a -- briefly about this model. I believe he mentioned the term "headgate."
Do you recall that?
A. I do indeed.
Q. Could you elaborate on that with respect to either figure 6 or figure 7?
A. Well, figure 7 will show -- on the right-hand side, it says "layers 5-7." These are the layers that simulated the Pierce Gulch Sand Aquifer.
On the lower right-hand corner, we see blue lines on the bottom and on the side, which would be the southeast area. If you want a better geographic orientation, you can look at figure 6, where we can see Interstate 84 going through and some of the other features of the area. But

basically, it's in the Meridian area.
Q. So it appears that that boundary, that inlet boundary, is the -- down at the right-hand corner going up through the Flying Y of I-84 there; correct?
A. That is correct.
Q. And are these boundary conditions, or a model on boundary conditions, appropriate, in your opinion, as a modeler?
A. Yes, they are. And I can explain why, if you'd like me to.
Q. Yes, please.
A. We know from preparing contour maps, both from this project and working for the City of Meridian, that -- in fact, the Treasure Valley Hydrologic Project, I believe, also shows this, that groundwater in that area flows toward the northwest.
So we know that within the Pierce Gulch Sand Aquifer, water is entering this region. It's coming from outside of the region, but it's flowing into this region. And by using transmissivities and using gradients from those contour maps, we can calculate how much is flowing into this portion of the Pierce Gulch Sand Aquifer

from outside of the model domain.
So we pick this area because (a) it's far enough away from the pumping centers at M3 such that pumping would have no significant impact thereby artificially inducing additional flow, and (b) allowing us to calculate the flow at that boundary and then convert that to a fixed amount in the modeling simulation so that we weren't artificially saying "Hey, there's more water here than is actually flowing there."
Now, in truth, long-term pumping huge amounts from either areas in there could cause more water to flow through there. But for the sake of this model prediction of M3, we're seeing no more is allowed to, in effect, occur.
Q. With regard to the boundaries that you have identified for the PGSA, would you say that the boundaries are reasonably well-known in comparison to other aquifer studies you have done?
A. Especially for water rights for a single project, yes.
Q. Did you incorporate information in putting together your model from the Treasure Valley Hydrologic Project?
A. We incorporated to a large extent the

recharge information from the Treasure Valley Hydrologic Project. We did not incorporate their interpretation of the geology.
Q. That would include the TVHP's failure to at least fully account for the dipping aquifer; would that be one thing?
A. The dipping aquifer, the properties of the aquifer, all those things. We knew that we have much more and extensive database of better data for that.
Q. Would that also include the TVHP's selection of the hydrologic divide between the Payette and the Boise as a groundwater divide as well, or a boundary?
A. Yes, absolutely. Our contour maps, contour maps prepared by the USGS from 1980s data, maybe even late '70s, show that there is not this hydrologic -- this no-flow boundary that the Treasure Valley project used or that Dr. Wood testified was not present there.
So we looked to a much larger area so that we did not have to put an artificial boundary in, that TVHP put in.
Q. How about the model that was described by Mr. Squires as the University of Idaho model?

Are you familiar with that one?
A. Yes, I am.
Q. Could you describe to us some things about that model? And I believe it's Exhibit 41, if you would like to refer to that.
A. Okay. I'm on Exhibit 41, and there is probably another figure in the Exhibit 16 that we were referring to that I could also use to show some aspects that are from Exhibit 41.
Q. Okay. So is that then accurate to say that in preparing your model you used some information from the University of Idaho's model?
A. Yes. In fact, we looked at all the previous models and learned from them and applied what we thought were the best understandings and features. But we learned a lot from the U of I model and were able to incorporate that learning into the development of the M3 model.
Q. Who produced the U of I model? Do you know?
A. It was a master's thesis developed by Stacy Douglas under the direction of Dr. Jim Osiensky.
Q. And do you find their model useful?
A. It was useful on many fronts. We

worked -- we interacted pretty much in a one-way direction with Stacy and Dr. Osiensky in that we provided hydrogeologic information and data as we were collecting it. They didn't really tell us back much what they were doing. Their intent was to be an independent model, not directed by us.
And so when it came out, there was some things that we would have incorporated differently. But on the whole, what we really liked to see, was an independent confirmation of the groundwater flow from portions of the Boise Basin to portions of the Payette Basin, which of course was shown on previous USGS studies too.
Q. In Exhibit 41, would you please turn to page 44. Exhibit 41, again, is the U of I model report.
Could you tell us what exhibit -- or page 44 shows. There's a figure 17 there.
A. Figure -- are you there? Yes.
Figure 17 is a water table or a potentiometric surface map constructed by Ms. Douglas as part of her modeling study here. So this incorporated the raw water-level data that Hydro Logic obtained. And I believe it was put in to the program server, which produced these

contour lines.
Q. What is your opinion about those contour lines in figure 17 of the U of I model?
A. Well, I think there's a major flaw in one aspect in that it combines all the aquifer zones together as if they were one aquifer. Everything was contoured. And it shows that there is flow from the M3 site into the Willow Creek Aquifer, which we have not seen any indication of that because of the extreme head differences, the geochemistry is different. We just don't see that that flow exists.
Generally speaking, though, with a flow from the southeast corner with a portion of it flowing to the Payette Valley, I would agree with, and other portions where some remains in the Boise Valley, I'd also agree with.
Q. Now, Mr. Utting, you just mentioned that this Stacy Douglas effort with Dr. Osiensky was produced using data from -- water-level data from HLI.
Didn't the University of Idaho also collect some of its own groundwater-level data?
A. They participated in the collection effort that Hydro Logic made in the summer of

2006. They also obtained other miscellaneous hydrogeologic data that I don't really know what they collected. But they certainly were part of the program collecting it in 2007, 2006.
Q. I would like you to refer now to Exhibit 50, figure 3, please. This is the staff's memorandum of March 2nd. They predict drawdown after 50 years of pumping at 10 cfs in the vicinity of the M3 Eagle project.
A. Is that figure 3?
Q. Correct.
A. Yes, I see that.
Q. That is page 22 of Exhibit 50.
Mr. Utting, do you know whether 10 cfs is the average amount of pumping that's projected for the M3 Eagle project?
A. Well, it's roughly 10 percent over. I believe the target is 9.03 cfs, which would represent the average pumping at full build-out after the project is completed.
Q. Okay. How does figure 3's drawdown contours as projected by staff compare to those that you found in your modeling effort?
A. Well, the predictions shown in figure 3, they predict much greater drawdowns than

the numerical model that we had previously shown.
Q. Which do you think is more accurate, Mr. Utting?
A. The numerical model is a much more accurate and simplified analytical model, I thought.
Q. Did the staff use a simple Theis analysis in producing figure 3, or did they use some other analysis? Do you know?
A. I believe they used a Theis solution, as it states on the figure. And they simulated the boundary with an image well. So it was a simple Theis solution, yes.
Q. Mr. Utting, is a groundwater model ever definitive?
A. No. Never.
Q. Can it come relatively close?
A. Some can be quite close, yes.
Q. Do you expect your model here to be quite close?
A. I expect it to be quite close because we've gone -- for the prediction for the area that we've really focused on, I expect it to be quite close because of the calibration.
Q. What else would you do to evaluate the

potential effects of the M3 Eagle pumping on area wells?
A. Well, I'm not sure if additional modeling would help or additional testing. I think the most valuable thing would be to continue monitoring with properly designed and constructed monitoring wells, and use that information from pumping to see what's really going on.
We can predict that there will always be the question of how accurate it is. Well, the way to find out is to predict -- I mean not to predict, but to monitor and see what's really going on in the system.
Q. With regard to your efforts to evaluate the Pierce Gulch Sand Aquifer through a model, did you find the geochemistry report, Exhibit 43, to be helpful?
A. I found it one of those great moments where someone doing something independently confirms what I've been doing. So I've been looking at the physical flow system. I've been looking at pumping test data that tell me we have an unconfined aquifer in this area.
And when I saw Mr. Glanzman's figures that showed that we had some rainfall as part of

the recharge water in wells SVR-9 and test well 2, that just made me smile because that's the area where I would expect to see some rainfall coming in, because the aquifer is near the surface, it's unconfined, that's where the rainfall could get in. So to me, that was really good.
The other thing that I really liked was his interpretation that the geochemistry shows rapid transit time through this area where we believe has high transmissivities and with those gradients would have rapid travel times.
Q. That's rapid travel time below the so-called headgate at the southeastern border of your model; correct?
A. Well, from the headgate on up through the M3 property, that's where I see a rapid travel time.
Q. On up or on down?
A. It would be physically to the northwest. It would be downgradient.
Q. Does your model provide support, Mr. Utting, or does it undercut what your conceptual view, your pump-test experience, your water-level studies, or any other work show about the Pierce Gulch Sand Aquifer? Is it

confirmatory, or is it --
A. It's confirmatory. It's one of the many tools, and it confirms what we've seen through the other methods of analysis.
Q. In your opinion, is there sufficient water in the Pierce Gulch Sand Aquifer to support M3 Eagle's proposed pumping at full build-out?
A. Yes.
Q. Will M3 Eagle's pumping cause significant drawdowns in the Pierce Gulch Sand Aquifer?
A. I guess it depends on what "significant" is. Our model predicts 10 to 15 feet. Based on what Mr. Dittus has observed, that's probably an overprediction. It's only significant if 10 to 15 feet is considered significant.
Q. And that's 10 to 15 feet how far away?
A. That would be a mile, mile and a half away.
Q. And that would be after 50 years of pumping?
A. 50 years of pumping.
Q. Did you also use a 10 cfs number as an assumed annual average amount of pumping?

A. I did. I used the 10 cfs just to be conservative, to have a slightly larger number in case somebody accuses me of trying to trim it too far.

Q. Mr. Utting, would you conduct additional studies of the Pierce Gulch Sand Aquifer that focused on doing additional seismic work?

A. Well, from my understanding of what that work is projected to be now, no. As I understand, initially it was going to be down Big Gulch so that we could use our good understanding based on wells and geophysics to help calibrate the seismic data, so that when we looked at other areas, such as Luke Gulch or Willow Creek, that we would have a better understanding of what was going on.

From what I now know because of budgetary cuts, only the Big Gulch line is planned. And I don't see how doing that in the area that we have the best information is really going to add anything.

Q. What's the difference between running a single line and running more than one line?

A. Well, when you run a line in an area

with good control. And by good control, we have a number of wells with good downhole or bore hole geophysics, we then are able to take the seismic data, which is just when sound waves return, and be able to calibrate that on known geology. Then we can take that information to areas where we don't have those wells to give us that calibration and have confidence.

But if we are only doing the seismic in the area where we know it's going on to the best of our knowledge, it's not really going to add anything.

Q. Do two lines also help you to orient the direction or structure of a fault?

A. Sure. If you have only one point and you see some indication of a fault, there's no way to know the direction or whether it continues unless you have a second or a third or a fourth or a fifth point to line those up.

MR. FEREDAY: Mr. Hearing Officer, I have a few more questions. But it might be appropriate to take a break now for lunch and come back --

THE HEARING OFFICER: Okay.

MR. FEREDAY: -- and conclude. I'm not quite sure how much time I need with him, but

probably not too much. But I think it would take us well into lunch.

THE HEARING OFFICER: Is that acceptable to everyone?

MR. THORNTON: That's fine.

THE HEARING OFFICER: Okay. Let's come back five minutes after 1:00.

MR. FEREDAY: Thank you.

(Lunch recess.)

THE HEARING OFFICER: We're recording after the lunch recess.

Mr. Fereday, I assume you have some more questions of Mr. Utting.

MR. FEREDAY: Yes.

Q. Mr. Utting, with regard to the M3 model, I'd like to ask you some questions about the sensitivity analysis, if any, that you may have conducted in connection with this model.

A. Yes. We did fairly standard analyses to look at the various properties and values we might not understand. We also coupled that with calibration statistics. Those are both related.

Q. Now, what is sensitivity analysis --

A. Sensitivity --

Q. -- in this context?

A. It says "wait."

A sensitivity analysis is varying the values of a parameter within the model. By a parameter, I mean the transmissivity, the vertical leakage, some other factor that we don't know exactly everywhere in the model. So we vary that --

MR. VANDYKE: Gary.

THE HEARING OFFICER: Oh, I'm sorry. We didn't recognize we were near the end of this tape. We should have looked.

MR. FEREDAY: Should we go off the record?

THE HEARING OFFICER: Yeah.

(Recess.)

THE HEARING OFFICER: Okay. We are recording again. And again, I apologize for the interruption.

Mr. Utting or Mr. Fereday, I think we were talking about a sensitivity analysis.

MR. FEREDAY: Correct.

Q. Mr. Utting, you did conduct some sensitivity analyses with respect to the modeling you did for M3; isn't that right?

A. That is correct.

Q. And could you again describe for us

what a sensitivity analysis is.
A. A sensitivity analysis is where we vary the value of one of the parameters within the model to see how it affects the model results. And if we can change a value of a parameter such as vertical leakage by a factor of ten and see very little difference in the output, then we know it's not very sensitive to data. Therefore, we don't have to refocus on defining our knowledge of that value.
If, on the other hand, we vary a value and discover the model is radically different, then we know it's very sensitive to that value and therefore we need to make sure we know that as precisely as possible.
Q. Which values did you find the model most sensitive to?
A. Well, they are listed on page 14 of the appendix in Exhibit 16, which if you want to turn the page -- this is within the first -- the first PGG report, which is --
Q. Now, Mr. Utting, while we're going to page 14 of that appendix, I note that the report of the model which is Exhibit 16 contains within it a June 2008 document with a tan cover from

Pacific Groundwater Group.
Is that the appendix you're referring to?
A. That is the appendix I'm referring to, yes.
Q. And was this prepared in consultation with you?
A. Yes. I worked closely with Pacific Groundwater Group. We have, in fact, four separate Pacific Groundwater Group reports contained within this appendix. Each one documents a different stage of the model development.
Q. Do you agree with the results and methods used to produce this appendix?
A. Yes, I do. I had a hand in this.
Q. Perhaps now you could go to page 14 and make the reference that you began a minute ago.
A. Okay. On page 14, the top of the page, it says, "Steady-state sensitivity analyses." And the way we developed the model is we first tried to generate a steady-state match of the water levels calculated by the model to those that we've measured in the field.

And the ones that we measured in the field would be the contour map that I referred to in my testimony just before lunch. And those water levels are the most precise set of water levels that we have. So we're trying to get the model to replicate those water levels.
So we come up with our best match, and then we vary some of the parameters to see, "Well, what if we don't know this very much, very exactly, and we change the value, how does it affect things?"
And we discovered that the calibration was sensitive to the vertical hydraulic conductivity of the aquitards. So by that I mean the property of those silt and clay zones separating the aquifers, and therefore how much water can flow through them.
Q. Excuse me. Were those the zones separating the lower from the upper zone in the PGSA itself?
A. No. Those would be the zones separating the PGSA from overlying undifferentiated, unnamed alluvial aquifers, and in some cases between that zone and the overlying Boise River gravels and other Payette River

gravels in that area.
So it's an interesting sensitivity in that we discovered that when we increased the vertical hydraulic conductivity, it was sensitive, it wouldn't calibrate very well. But when we reduced it, it didn't make much difference.
And so we kept it at the level where it didn't make much difference, was the value that we felt was the best representative, and in many ways the most conservative value, because then when we predicted impacts in the PGSA, we wouldn't be relying heavily on that leakage to counter those drawdowns. So we picked a value based on that sensitivity value that was also conservative.
Some things it wasn't sensitive to? It wasn't very sensitive to the hydraulic conductivity or the conductive material in the riverbeds. And it wasn't very sensitive to the one factor called conductance with the headgate, the general head boundary.
It was sensitive to the water levels that we assigned there, but we had good data from good measurements in the Meridian area, so that gave us a confidence we picked good numbers to use in the model.

Q. When you say it was not very sensitive to that headgate or model inlet area, what do you mean?

A. Well, the way we calculated the flow into what we're calling the headgate, which would be the southeast boundary, was initially with what's called the general head boundary. And by that, we look at the difference in water levels just inside the model with those at a known distance and we figure --

Q. With those at a known distance outside the model?

A. Outside the model. So up toward the recharge area where we have water-level data from various wells. We calculated the distance between those wells and the difference in water levels, and came up with a gradient -- or the model does that, rather. We assigned it that difference in levels, and then using transmissivities from pumping tests, we calculated this conductance term, which is a term that's a function of the distance and hydraulic conductivity that comes out of those tests.

Q. Did you also calibrate the model?

A. Yes. So it's calibrated to the steady

state, which is trying to get the best match. Now, in that process -- and this is a type of sensitivity analysis -- we recognized that the transmissivity or the hydraulic conductivity in various zones made a difference to trying to match the water levels generated by the model to the water levels measured in the field.

And we recognized that if we stayed exclusively close to the transmissivity values measured in the field and estimated from driller's logs in areas off to the west, that we couldn't get as good a match as if we let ourselves vary those more.

So the initial criteria was to allow a variation of plus or minus 50 percent from the measured value. We couldn't get as good a match as we thought was possible.

So we then allowed ourselves to vary those more using a three times to a one-third times, and ended up with essentially two models: One that we called the T-match model, which we developed, which had a narrower range of how much we'd allow ourselves to vary the transmissivity; one called the H-match, or the head-match model, that generated better calibration results to the

measured data.

We did that because we wanted to show, you know, in a transparent process, okay, we are varying it, and this is what we think happens. But if we want to, quote, "honor" the original transmissivities by varying them less, this is what would result.

So we ended up with parallel models that were very similar, but one more honoring the transmissivities, one more honoring the heads. The net effect in the long run wasn't big because the predictions were all very close to each other. So that is a type of sensitivity analysis that shows that within that range of variation didn't make a huge difference in terms of the predictions of impacts from pumping at M3.

Q. So do the T-match and H-match versions of model bracket values or --

A. They bracket a range of uncertainty in that known transmissivity, because we don't know that value everywhere within the model. But this gives us a pretty good idea that within this range, it's got to be pretty close, because we're getting similar predictions.

Q. I'd like you to refer to -- with

regard to calibration, to pages 58 and 59 of Exhibit 16, please, and tell us what these show, please. I see four --

A. Yes.

Q. -- different plots there in figures 14 and 15.

A. After we get the steady-state calibration where it matches this series of what was measured basically in a snapshot during the summer of 2007, we then did what's called a transient calibration.

And a transient calibration is trying to show how the model will respond to a pumping event. So the simulated pumping event generates a change in water levels at some point. We want to see how those match the actual measured changes in the water level.

So we have pumping test data, which show drawdown curves, and we have the model generating drawdown curves.

Q. So the model generates a drawdown curve based on the parameters that you inserted into the model; correct?

A. That is correct.

Q. And the idea is that the model is run,

and then it is intended to simulate reality; is that correct?

A. That's correct.

Q. And then in calibration you compare the simulation with the field-measured reality?

A. It's more than a comparison. It's actually using that reality to adjust some of the values within the model to better replicate that reality. And we try to adjust, mostly with the storage coefficient -- because that is a factor that shows how the aquifer responds to changes in water levels, but we also adjust the transmissivity, or more specifically the hydraulic conductivity, to get that match.

Q. And what do these four graphs, figures 14 and 15, show us with regard to what we've been discussing here concerning calibration?

A. These are a series of calibration graphs for two of the three pumping tests that we used in the calibration process. If, for example, you look at figure 14, which is on page 58 of Exhibit 16, we have -- the upper figure, for example, has got dark blue and light blue. I guess all the figures have dark blue and light blue.

And we have figure A and figure B on -- as part of 14 that show the T-match model and the H-match model. And through this process we show the light blue is the model-generated drawdowns, and these would be drawdowns measured at test well 4 during the pumping test from pumping at SVR-7 to -- the measured versus the model-generated ones. And this shows the degree of match that we were generating and able to get with the two models.

Q. Is this degree of match good, very good, excellent? How does it rate, in your view, as a hydrogeologist and an expert modeler?

A. Well, I would say it's very good. And I won't say excellent because you'll notice on both those graphs, the test well 4 -- oh, I should have also pointed out we had Big Gulch. The Big Gulch one matches very well.

The test well 4 doesn't match quite as well because I believe we didn't -- we were not able to entirely correct for some of the effects going on that were outside of pumping during that test. So you see the drawdown curve, the measured one, goes down and then comes back up, which is probably indicative of something beyond pumping,

because during the pumping test that's going at a constant rate, you don't get the drawdown to go up, down, and up again.

So the match isn't perfect there. But we can see the beginning part is good, and at the end it's coming back up to match. So I would rate that as good and the one above as excellent.

Q. With regard to test well 4 observed, we note that it goes upwards at a fairly regular curve, then, as you noted, curves down just a bit, and then goes back up.

Were you saying that this apparently was caused by some let's call it a third-party effect, an outside effect, a pumping well or well center that you didn't know about or couldn't know about? Would that be accurate?

A. I don't think it was a pumping center. I believe it was some incomplete removal of either barometric and/or the water-level trend effect, just because that well had been completed just before the test, and we were unable to get as solid a BE, barometric efficiency correction, to analyze that.

But the significant thing to note here is the first two days we get a good match. And

during the first two days, the trend would not be significant and the barometric effect was relatively small. So that's really important in terms of T&S getting that match. It's the early time data.

Q. Mr. Utting, what do you conclude by the fact that in that same test well, test well 4 and its simulation -- the end points are actually fairly close together. What does that tell you?

A. That tells me that -- long term that the calibration is working well too.

Q. Are these acceptable -- acceptably close calibrations, in your opinion?

A. Yes, they are.

Q. What about the next figure, figure 15?

A. Figure 15 is a hydrograph for the Lexington Hills well as part of its 30-day test. And again, we have the H-match model on top and the -- excuse me. I have to look at this carefully.

Q. Isn't figure 15 --

A. Sorry.

Q. -- comparing what your model would predict with Lexington Hills in the upper case and with the Eagle field No. 2 in the lower one?

A. Yeah, that is in fact correct. These are the H-match models showing the match -- the model with the measured drawdowns in the fields.
Q. Lexington Hills well is completed in the PGSA, is it not?
A. That is correct.
Q. And how about Eagle field No. 2?
A. That is also correct, completed in the PGSA.
Q. And both of these wells, Lexington and Eagle field, had aquifer tests conducted for them by others?
A. That is correct.
Q. And were both of those aquifer tests evaluated in your 16 aquifer test exercise which is Exhibit 12?
A. Yes.
Q. You can continue and explain to us what these calibration exercises show in figure 15, if you would.
A. The upper figure, Lexington Hills, shows the observed and simulated drawdowns. And these are not actually in the Lexington Hills well, this is in an observation well, which was the golf course well, which is -- if we need to

get the exact details on its depth and distance, it would be in the 16 aquifer test report. I'm happy to get those details if you'd like.
But two things are apparent here: One is we get a good match of the curve throughout the 30-day period, and the other is we can see a lot of variation in water level that occurred in the field data because there was no correction for barometric efficiency. You can see it bouncing up and down and bouncing up and down.
And it may be that the variation of the curve is in part of the water-level trend analysis, which did not occur in that well.
The lower figure is the Eagle field well No. 2. And in this case, this is the comparison of the data recorded in the well that Mr. Dittus testified on, known as the State and Linder test well. So we know we have a high-quality, well-sealed monitoring well that these water samples were collected from.
Q. So the more wavy curve, the darker one on the lower graph, Eagle field No. 2, is the actual drawdown calculated in the State and Linder monitoring well as a result of the Eagle field test; is that correct?

A. That is correct.
Q. What do you conclude with regard to the model's ability to calibrate, based on these two graphs?
A. Well, this particular version, the H-match did an excellent job of calibrating in the transient mode.
Q. Now, the model, I think you testified earlier, is a tool; correct?
A. That is true.
Q. And the tool can be used for a variety of different -- asking a variety of questions, can't it?
A. That is correct.
Q. And I'd like to know what questions you have asked of this particular model. Could you run us through some of these.
A. Well, the ultimate question that we wanted to know would be the predictions of impacts from M3 pumping. But before we were confident in that, we needed to look at a number of other things.
One was the issue of whether upwelling water from the bottom of the system, which in this case would be the Terteling Springs, it would be

the hot water, the geothermal water coming in, if that would make a significant difference in terms of our predictions.
So we used the model by applying a flow on the bottom that would simulate this seepage. We calculated that rate of flow, which is not known, but we calculate it by looking at a head gradient that we saw within paired wells where we had the water level in the sand aquifer or the Terteling Springs and the Pierce Gulch.
So we'd have a gradient. We then estimated hydraulic conductivity typical of a clay, which we got values out of Freeze and Cherry where they have a range of values. We applied that to the modal and said, "What if this water were all flowing in throughout the whole model domain?"
And we consider that to be conservative in that the higher rates of flow were going to be closer to the foothills. Far out in the basin, we would expect less. But we applied that rate everywhere, and found that it made no significant difference in the predicted drawdowns of pumping at M3. That was one of the things we did.

Q. So that was a model run you actually conducted?
A. Yes.
Q. And is that reflected in Exhibit 16?
A. Yes, I believe it is. On that same page that we talked about, sensitivity analysis -- and if you'll refresh me on that page number.
Q. I think it was 14 --
A. 14?
Q. -- of the appendix?
A. Yes. We have a paragraph on page 14 of the appendix -- I'll wait until the Hearing Examiner is there.
THE HEARING OFFICER: Thank you.
THE WITNESS: So the last paragraph under section 5.3, discusses this analytical run. And it lists the values that we use in the simulation for the vertical hydraulic conductivity of the clay that's within the Terteling Springs Mudstone, an estimated value of 10 to the minus 8 centimeters per second.
And this was also in the same range as some values that I was able to obtain on some laboratory tests of samples that had been collected.

So we calculated the gradient, we calculated this hydraulic conductivity, and used that as a vertical flow rate for each of the cells in the bottom of the model. And it states here, the maximum increase anywhere in the model head was less than a tenth of a foot. So we considered that to be not significant.
Q. (BY MR. FEREDAY): Would it be accurate to say that the model's use in this connection to model potential geothermal and other water upwelling is grounds for concluding that if there is such upwelling into the PGSA, it is minor?
A. That is correct.
Q. What other model runs did you do? Did you evaluate, for example, changes in inflow to the model through the so-called headgate in the southeast? And if so, could you explain it.
A. Yes. From reviewing the Treasure Valley Hydrologic Project, it was recognized that somewhere to the southeast of our model outside of our model boundary and perhaps beyond the Pierce Gulch Sand Aquifer, and as Mr. Squires has testified, in an area that is not the Pierce Gulch Sand Aquifer, there is recharge that occurs

through leakage of the Boise River and from the New York Canal.
So I knew that water was flowing in through the headgate. And we had a calculated value based on measured water levels and pumping test transmissivities.
So we then said, "What if, for who knows what reason, perhaps they've lined the canal, perhaps they've pumped out more water, who knows, we've reduced that flow in by 20 percent, what does that do? How does that affect the predicted drawdowns from M3? How does that affect water levels within the PGSA?"
Q. So you did that kind of a model run --
A. Yes, we did.
Q. -- presuming that there would be a reduction of some 20 percent --
A. 20 percent.
Q. -- in canal seepage and therefore any commensurate reduction in any recharge that was occurring from canal seepage; is that right?
A. And we use the term "canal seepage" because we're not saying what's really causing a reduction, just if there is any reduction. It could be canal seepage. It could be anything

else. But we just used that because that is, I think, a concern in people's mind that canal use will be changing.
Q. Do you recall Dr. Ralston's memorandum that he prepared for the protestants where he raised the canal seepage issue?
A. Yes.
Q. And was this model run done, at least in part, in response to that?
A. Yes.
Q. With regard to let's say the New York Canal, do you consider the water in the New York Canal the same essentially as the water in the Boise River?
A. Yes, I do.
Q. So what were the results of this model run that made this assumption about reduced recharge?
A. Well, let us look at a figure in this exhibit, and we will see.
Q. You are in Exhibit 16. And where --
A. Exhibit 16, and I'm looking at figure 11 and figure 12.
Q. Could you give us a page number.
A. Page 55 and page 56.

Q. Of the main report?
A. Of the main report.
Q. Could you describe what pages 55 and 56 shows. I see we've got figures 11 and 12.
A. Figures 11 and 12. Figure 11 is a T-match model generated simulation, the change in water level that would be caused by a 20 percent reduction in recharge from the southeast model domain boundary.

And it says "higher pumping rate model" because that's another aspect that we looked at with this model, is what if our estimates of pumping from all the wells in the area were wrong. So we increased those by 30 percent just to be conservative.

So in this version of the model, we used this higher pumping rate, we used all the recharge coming in at the surface, all -- we ran the model to its essence, a steady state. So it had water levels that were not changing with time.

We then recorded those levels. We then reduced the flow at what Mr. Squires called the headgate, the southeast boundary of the model by 20 percent, and said, "How do these water levels change?"

And we did it with both versions of model. Figure 11 is the T-match model. Figure 12 on page 56 is the H-match model. The point being we wanted to use both verses of the model to see what sort of water-level changes in the PGSA, especially those in the Eagle/M3 area that might occur from such a reduction.

Q. What do you conclude from figures 11 and 12, then, as to those changes? Can you describe what we're seeing here.
A. Right. What we're seeing are contour lines that radiate out of the southeast corner of the model. And each of those blue lines represents a water-level decline of 5 feet.

So we have a 5-foot, a 10-foot, a 15, and 20, and the beginning of a 25-foot contour on figure 11 and also on figure 12.

Now, what's important to note here is I testified earlier that we wanted model boundary conditions that were far enough away from the M3 site so that changes that were occurring in the model, such as pumping from the M3 site, wouldn't affect the boundaries.

Well, here we are changing the boundaries. And so the biggest changes are going

to be right at those boundaries. In fact, if there was a decrease in flow, that will occur further upgradient, further toward the southeast, and therefore right near the model boundaries these effects are going to be overexaggerated. So our intent was really to look at what's going on north of the Boise River.
Q. So in summary, doing this model run with regard to reduced recharge showed what? Was it a big -- did it show a big change?
A. It showed in the area of interest north of the Boise River that there could be a 5-foot decline in water level caused by reduction of flow in the southeast, but it's probably quite a bit less.

And we can see that as you get further and further toward M3, we're further from the 5-foot contour there, and the impacts would be a change in water level of perhaps a foot, 2 feet at most.
Q. And was this model -- that's steady state, I think you said. So this would be out at some future time --
A. Future time.
Q. -- after all the pumping or all that

reduction in recharge had been experienced throughout; is that correct?
A. Yes, that's correct.
Q. What other model runs did you do to check your model against other assumptions? For example, did you evaluate what would happen if the northern boundary of the PGSA were as projected by the Treasure Valley Hydrologic Project?
A. Yes, we did.
Q. And what did you do to make that model run?
A. We took the figure from the Treasure Valley Hydrologic Project which showed the northern boundary of the model, which is interpreted as a no-flow boundary. In fact, by default, it had to be. It was the boundary.

So we then said, "Well, what if that line, which was coincident with the surface water divide, actually was a no-flow boundary, cut off all the flow to the north?" So we took the existing model, and we ran a steady-state version. We then put in that boundary and ran the model, and then we did the simulation of pumping at M3 Eagle.

What we discovered is that the

predicted drawdowns varied by less than a tenth of a foot in the area of M3 and to the south and toward Eagle. Certainly to the edges where that boundary would occur, things were quite different because we weren't allowing groundwater to flow as it would naturally want to flow.

Q. What about a model run that evaluated increased pumping in the area? Did you do that?

A. Well, we did that. And I mentioned that briefly with figure 11 and figure 12. We decided to be more conservative to just increase all the pumping in the area to help counter any errors we could have potentially made in estimating pumpage and increased pumpage that might occur.

So we increased that pumping by 30 percent, and used that in all the simulations that occurred, which included the -- the latest simulations, I should say, which included the prediction of impacts from reducing flow in the southeast and the latest versions, which I would consider the most up-to-date ones of predicted drawdown impacts in the area that the protestants are concerned with.

Q. So are you saying you combined, I

guess, the worst-case conditions that you could model and put them into one run?

A. Well, not exactly. We kept the high pumpage for those simulations, but we did not keep the reduced flow from the southeast. So the simulations that we have in this report in the last PGG memorandum are with the higher pumping but with the flow that the model calculates.

And I would like to state there was one issue that was raised in the Department memo about this boundary being affected by pumping. And I do want to go on the record as stating that we did convert that boundary from a general head to a specified flux or specified flow so that we were not allowing any pumping to increase flow through that boundary.

Q. Which boundary are you speaking of?

A. The southeast boundary that initially started off as a general head boundary, and then in the final simulations and from here on out will be a specified flux or specified flow rate.

Q. That's at the so-called headgate?

A. Yes.

Q. So did you then calculate actual drawdowns that you could predict -- or drawdowns

that you would predict -- excuse me -- to occur based on this model?

A. Yes, we did.

Q. With regard to Exhibit 16, would you refer to pages 60 and 61, please.

Could you describe what these show.

A. We have on figure 16 both the T-match and the H-match model with the lower pumping rate version of the model.

On figure 17, we have the T-match and the H-match model with this increased pumping that I referred to, about 30 percent more pumping.

Both of these models show the ultimate drawdown that we are predicting after 50 years of pumping. Earlier on we did a series of steps of pumping at increments of the predicted wells going online with increasing pumping. And we did not do that in this simulation because those simulations showed that after about 20, 25 years, you're pretty much at total steady state and nothing much is happening after that.

So let's just look at the worst case, what could happen after we're all dead, most of us are dead. 50 years from when the project is fully built out, so this could be 80 years in the

future. But this is the predicted drawdown that we see, based on the model.

Q. This predicted drawdown relied on a pumpage that I think you testified earlier is close to 10 percent greater than what M3 actually projects to pump; isn't that right?

A. That is correct.

Q. So what's next for this model? What do we do with this model from here?

A. Well, it has -- I think it's a valuable tool. And it is a tool. It's one of many tools. As we -- presuming the water right is granted, presuming the project goes forward and wells are put in and we gather more data, presuming that the Department of Water Resources gathers more data, we could continue this calibration process.

This model represents a series of improvements in four different reports. So as we incorporate more data, especially in areas that are further away -- we might have questions that we want to answer in other areas -- we can calibrate the model further.

We can use the model to look at different aquifers after we have more data

collected. It's basically one of many tools that helps explain what's going on. And as we have more data to put into the model, we can improve it and use it as a tool.

Q. I'd like to ask you a question about the Treasure Valley Hydrologic Project and its assumed water budget.

Are you familiar with the water budget in the TVHP?

A. Yes, I am.

Q. Given that it's your testimony, as well as that of others, that the PGSA flows not only along and potentially to the Boise River, that it also flows to the Payette Basin, what is your opinion as to the accuracy of the TVHP water budget for the aquifers that it evaluated?

A. Well, since the TVHP did not recognize flow to the Payette, it indicates a portion of the water that's not recognized in the budget. And if that water budget doesn't include that water going out of it at some point, it must not recognize water coming into the area at some point, because there's a balance. It's all determined through what goes in, what comes out, change in storage.

So it makes me think that there is

likely to be more recharge into this area than conceived of as part of the TVHP because they didn't recognize that amount was leaking before.

MR. FEREDAY: I have no further questions.

THE HEARING OFFICER: Okay. Mr. Thornton, are you ready to cross-examine?

MR. THORNTON: Yeah, we've got lots of questions. I was wondering if we could just maybe have a five-minute break or ten-minute break. It's going on two o'clock.

THE HEARING OFFICER: Yeah, let's break.

MR. THORNTON: Okay.

THE HEARING OFFICER: Give you a chance to regroup.

(Recess.)

THE HEARING OFFICER: We're recording. Mr. Thornton.

MR. THORNTON: Okay.

CROSS-EXAMINATION

BY MR. THORNTON:

Q. Hello, Mr. Utting. How are you doing?

A. I'm doing well. Thank you.

Q. Good. If we can have you start by turning to Exhibit 42. That's the second amended

application. And tab I believe it's A4.

A. Okay. 42?

Q. Yeah.

A. This goes --

Q. 42 is M3 Eagle second amended application for water right permit.

A. Yes, yes. And what tab?

Q. A4.

A. There we are. Yes.

Q. Okay. And on this exhibit -- and I see your name and print down there "M. Utting" on the cover of this sheet behind tab A4; is that correct?

A. That is correct.

Q. So you were one of the primary authors, I'm assuming, of this model -- I mean of this document?

A. Yes, that's correct.

Q. Okay. And if you go to, let's see, page 1, and then on about the fifth line down in the overview -- actually, it starts, and I'll read this sentence, "Because the Payette Valley near Leatha is almost 300 feet lower than the Boise Valley near Eagle, groundwater flows out of the Boise Basin and into the Payette River Basin

through the sands of this aquifer."

And do you agree with that statement?

A. Yes, I do.

Q. Okay. Thank you.

And a little farther down in that same paragraph, maybe a little more than halfway down, there's a sentence that starts "The groundwater proposed to be withdrawn."

Do you see that sentence?

A. Uh-huh.

Q. And that sentence states, "The groundwater proposed to be withdrawn by M3 Eagle for its development will be from subsurface flow that has already departed the Boise Basin on its way to the Payette Basin so that impacts to existing area users in the lowlands near Eagle are predicted to be small."

Would you agree with that?

A. Yes.

Q. Okay. Then if you could refer to Exhibit No. 16, which is the M3 model that we've been talking quite a bit about.

A. Yes.

Q. And I lost my place here. And then if you go to figure 9.

A. I am there.
Q. You beat me.
THE HEARING OFFICER: Page 53.
Q. (BY MR. THORNTON): Excuse me for the interruption here. Page 53.
And apparently on page 53; is that correct, Mr. Utting?
A. That is correct.
Q. Thank you.
A. Figure 9 is on 53.
Q. And the figure 9 indicates flow to the Payette Valley and flow to the Boise River with different colored arrows.
Do you agree with that?
A. It says the Boise River Valley, not necessarily to the river, but the Boise River.
Q. And I would agree, to the Boise River Valley and to the Payette River Valley?
A. That is correct.
Q. Okay. And then how do you reconcile this with Exhibit 42, which we just discussed, that identifies water flowing only to the Payette Valley?
A. Well, I believe it doesn't say -- it doesn't say it only flows to the Payette Valley.

It says the water flowing beneath the M3 site proceeds to the Payette Valley. If you'll look at the figures with both legends of the model, you can see that the portions of groundwater that flows under the M3 site does, in fact, continue toward the Payette Valley.
And there are certainly portions of the water within the Pierce Gulch Sand Aquifer that, as Mr. Squires testified earlier, does flow to the Boise valley. And in fact, there aren't arrows drawn here, but there could be some drawn that would then continue toward the west where it would, in fact, discharge into the Snake River.
Q. Okay. And do you have information that identifies a percentage, an approximate breakdown of the amount of water flowing through the Boise Valley, how much goes to the Boise -- indeed stays in the Boise Valley, how much goes to the Snake River, and how much goes to the Payette?
A. I do not.
Q. Okay. Okay. And then what is the main hard evidence that you have that you used in your model to show that water flows to -- in the PGSA to the Payette Valley? Could you explain that again, please.

A. Well, the hard evidence would include our understanding of the geology that shows the presence of the Pierce Gulch Sand Aquifer in the Meridian/Eagle/M3/Star vicinity, and extending through all locations within this model domain, as evidenced by the deep gas exploration wells and other deep wells throughout the basin where the geophysical signature shows the presence of the Pierce Gulch Sand Aquifer overlying the Terteling Springs Mudstone.
That, in combination with the water levels that we measured in the field and surveyed, would push the water through the aquifer, as we understand it to be configured, in that direction. In fact, that was also shown by contour maps the USGS produced Lindholm and in Newton's, from water-level data collected in the '80s.
Q. Okay. And then I believe it's been testified to that the Treasure Valley model had a no-flow boundary on the north-northwestern margin inhibiting flow to the Payette Valley; is that correct?
A. That is correct.
Q. And I believe I just heard you testify that based on that model no-flow boundary that you

assumed or thought that it underestimated actually the amount of flow through the -- through the Pierce Gulch Sand Aquifer because it did not have an exit point in the Payette River; is that correct?
A. No. What I speculated on is that there was probably an error in the water budget because they did not recognize this component of water flowing toward the north, that they must not have accounted for it somewhere else in the budget. And it could be that they did not account for it coming into the model. So whether it's specific to the PGSA or other areas, I don't know.
Q. Okay. So you're not sure of the fact that it did underestimate the flow?
A. Well, since they did not -- your question was directed to the PGSA?
Q. Right.
A. They did not direct -- they did not even recognize the PGSA, so I can't say where they might have made this error.
Q. Did they recognize a deep regional aquifer in the Treasure Valley?
A. They had a deep regional aquifer, yes.
Q. Okay. And would that be assumed to be

the Pierce Gulch Sand Aquifer?
A. Well, some areas, I would assume that was the assumption that would be made.
Q. Okay. All right. If you would -- again, on Exhibit 16, and on page 27. And if I could back up. Page 26 in your mass balance, amount of water pumped by wells. And then the second paragraph, in about the -- maybe it's the second sentence it states, "The total average annual pumping from the entire model domain was calculated to be about 90 to 144 cfs, while the total input to the groundwater system recharge at surface seepage from the Boise River, New York Canal, and other surface water sources is calculated to be about 1,030 and 1,040 cfs."
And do you agree with that statement?
A. I agree with that statement. I'm just trying to recall whether that included the increase we did later. So yes, I will say I agree with that.
Q. Okay. And in those estimates of pumping from the entire model domain, that was again within your 520 square miles; is that correct?
A. Yes.

Q. In that estimate how did you account for water right applications that were ahead of M3's application in time?
A. Well, they were not directly accounted for, but they could be considered part of the 30 percent increase when we did the increased pumping within the model domain.
Q. Okay. And then are you aware that for water right applications for groundwater that are for 1 cfs or more, applications for 1 cfs or more, ahead in time of M3's that there's approximately 90 cfs currently in front of Department of Resource in this area?
MR. FEREDAY: Objection. Foundation and also beyond the scope of direct.
THE HEARING OFFICER: Sustained.
Mr. Thornton, if you can lay some foundation.
MR. THORNTON: Okay.
Q. Your model in the mass balance, is it not important to identify what the pumping rates are currently?
A. Yes.
Q. Is it also not -- is it prudent to also look at what future pumping there may be for

this area, especially when the applications are prior in time to M3's application?
A. Although not directly done with the model, it's something that could be considered with the model. One could look at that. Whether it's prudent or not, it's hard to know because some of those water rights, such as municipal water rights, where you are granted a number which represents continuous pumping at the maximum rate for the full-time, and that just doesn't occur in most municipal systems.
So it's hard to know exactly how to address that because if a water right for a municipality is set to pump at the full amount, what are they going to do with that water in the winter? So the reality is they don't. They have to pump at a rate that meets their needs, which means they have to be able to meet a peak need, which is going to be far in excess of the average consumption over the long term.
So by increasing our pumpage by 30 percent, in part that is addressed, although not specifically.
Q. Did you address in your model the potential change in seepage from the New York

Canal?
A. We did.
Q. And why was that important?
A. It was raised as an issue in Dr. Ralston's critique. And we thought, Well, let's look at it. Let's find out what we think will occur should recharge decrease from the southeast.
Now, our model does not directly have the New York Canal in it in the model domain as a recharge source. But based on Treasure Valley Hydrologic Project, we believe that that is a source of water to the groundwater system in the Boise Valley.
Q. And so it was important to you to understand the potential change in outflow of the aquifer due to the reduction in seepage from the New York Canal; correct?
A. No. I would say reduction of inflow to the aquifer.
Q. Inflow. From the New York Canal; is that correct?
A. Yes.
Q. Would it not be important, then, to look at what is pending in terms of water rights

application in front of IDWR to make a decision on?

MR. FEREDAY: Objection. Asks him to speculate about what's pending and what might be approved.

THE HEARING OFFICER: Overruled. I think that's a legitimate question.

THE WITNESS: Could you restate the question, please, so I make sure I got it right?

Q. (BY MR. THORNTON): Yeah. In your opinion, is it important, then, to have an accurate model to understand what in the relatively near future could be appropriated for water rights out of the groundwater in this model domain area?

A. I think if one were to do a complete base analysis to really look at the whole basin, that would be appropriate. To look at an analysis for one water right, in this case, I think it's not necessary because when we looked at things that changed the overall water level, such as the reduction of the flow from the southeast boundary or altered the flow by not allowing flow to the north, the predictions of the impacts, which would be the amount of drawdown caused by pumping,

varied by so little that I would see that these other applications could, in theory, cause some lowering of the water levels in the PGSA.

Although what Mr. Dittus testified to is that even with their increase in pumping, they haven't seen that. But it would be more of a translation. And therefore, the concern would be if the whole water table dropped by 10 feet, let's say, for the whole area, could M3 get the water on their site? Well, the answer is yes. It's a highly transmissive aquifer.

Would they need an extra well? I don't know. Probably not.

Would the impacts predicted to other wells be different in terms of a change in water level? The answer to that would be probably very, very little, certainly that the difference would be less than precision of the analysis.

So then the question is, would these pending water rights affect the whole system so that senior water rights were affected? Well, that may be the case, but it wouldn't necessarily be because of the drawdown caused by the pumping there.

Q. So did you account for any of those

water right applications that are senior to your M3 application?

A. Only in terms of increasing the pumpage by 30 percent to assess what that would do in terms of overall impact to the system. In fact, if you'd like to look at those figures that we were looking at before, you can see that there's very little difference in terms of the simulated drawdown.

I'd like to look at those two figures that we were looking at just before we were done, which would be figures 16 and 17.

THE HEARING OFFICER: Okay. Just a minute.

Mr. Thornton, do you want him to go to that particular --

MR. THORNTON: I am perfectly fine with Mr. Utting doing that.

THE HEARING OFFICER: Okay.

THE WITNESS: We have these -- figure 16 shows the predicted drawdowns with the lower pumping rate. Figure 17 shows the predicted drawdowns with the higher pumping rate. And we can see that the predicted impacts -- that is, the lowering of water levels predicted after 50 years of pumping between the two versions of the

model -- is negligible.

So that shows us that increasing pumping in the area may lower the overall water levels for everyone, but in terms of the impacts caused by M3's pumping, there's no effective difference.

Q. (BY MR. THORNTON): Okay. And thank you.

On that same figure 16 and figure 17, would you help me understand where it says "Pumping at 4500 gpm"?

A. Yes.

Q. And on the next one it says -- the next figure 17 it says the same.

Are those correct?

A. That is correct. That number refers to the combined pumpage from three supply wells, each pumping at 1,500 gallons per minute, which is the 10 cfs that we used in the simulation, which would be 10 percent more than the average pumping rate we anticipate or applied for for this water right application.

Q. Okay. And then on those same two figures, 16 and 17, 16 identifies lower pumping rate and 17 represents higher pumping rate, but

I'm confused as to they're both pumping at 4500. Could you help me understand that.

A. The pumping from the M3 site is at 4500 gallons per minute from both of these simulations. The difference being we have a lot of other wells pumping during the simulation. The wells at Meridian, the wells at Nampa, United Water Idaho, Eagle, Caldwell, Emmett, irrigation wells, they're all pumping in this simulation.

We then say, let's increase the simulation -- the pumping of those other wells by 30 percent. That's the higher pumping rate we're talking about, from all the other wells in the model area, but we keep the same pumping rate for the M3 wells.

Q. Okay. And the approximate pumping rate in cfs -- from 4500 gpm is approximately how many cfs?

A. 10 cfs.

Q. 10 cfs. Go back to my original question of --

I'm not sure how to do this, Mr. Hearing Officer. But we have a document I'd like to enter as an exhibit, if I could -- again, I'm not sure the full process -- that identifies

from the IDWR website the amount of water -- groundwater applications in excess of 1 cubic feet per second that are prior in time to M3's, and it's approximate in 90 cfs.

If I could, the basis for that, if we're looking at 10 cfs in the area of impact cone of depression from M3 and this data is just showing 90 cfs, to me there appears to be a potential that I don't see how they built into the model, that potential effect from these other applications that are currently before IDWR?

MR. FEREDAY: Mr. Hearing Officer, we would object to this exhibit as being irrelevant, certainly misleading. I see that some of these water rights appear to not even be -- well, it's unclear whether they're proposed to be in the Pierce Gulch Sand Aquifer.

Many of them -- or some of them are not even in this area. I think one of them, for instance, 63-32499, is out on the Mountain Home desert, for example. It's certainly unclear how many of these, some of which go back 15 or 20 years in application date, have any likelihood of coming to fruition or what their effect might be on the aquifer.

I don't think there's an adequate foundation for this. And I would object to its entry into this record. If they want to put a witness on to testify about this, that might be different, in which case we could voir dire at that time. But we would object to it being offered as an exhibit into this record here.

MR. THORNTON: That's one of the witnesses that we lost out.

THE HEARING OFFICER: That you what?

MR. ALAN SMITH: Could we ask that the Department take --

MR. THORNTON: One of our expert witnesses that we were ruled against having.

MR. ALAN SMITH: Could we ask the Department take official notice of its own records?

THE HEARING OFFICER: Yeah, I guess I don't have a problem with receiving this into evidence if it's really -- it's not brought in through Mr. Utting. And I guess that's the struggle that I'm having, is Mr. Utting has already said he hasn't looked at this, other than the 30 percent increase in pumping throughout the area.

So the introduction through him I

don't think will do any good. I mean what more do we hope to accomplish through that, Mr. Thornton? Now, I'm willing to say it's a Department record and give it the weight that I guess it deserves based on the locations of the wells. But I think all of that needs some vetting in this particular hearing. I don't want to go back through and try to figure out where they're located and what might be proposed by them.

MR. THORNTON: The point that I'm trying to make is it does not appear that there was a rigorous, and even good-faith effort, in terms of what is -- two things: What is already being applied for for water rights applications, as well as what -- looking at the -- as Dr. Church talked to, the economic development in the future of the area that may come in right behind M3 in terms of having a sustainable groundwater provided to the area. I just didn't see that that was included in their model.

THE HEARING OFFICER: Okay. Here's a compromise I guess I'd like to strike and move on. And the compromise, I guess, Mr. Thornton is that I'll accept it into the record. And if you want to mark it, let's mark it with your next exhibit

number.
But the way in which I will view this -- or this document, unless there's additional information presented about it, is that it generally shows some broad-brush information about applications that are pending in the Treasure Valley, but probably has little value to me in determining how much of that really should have been included in some modeling.
And without any additional information, it probably has very little value to me, other than just to show that there are applications that are pending and that Mr. Utting did not look at that specifically as part of his modeling effort, which I think he's already testified to.
So let's mark it as the next exhibit.
And do you know what number that is?
MR. THORNTON: We had the exhibit. We had it as 850.
THE HEARING OFFICER: Okay.
MR. THORNTON: And if you wish to change it, that's fine.
THE HEARING OFFICER: So you have marked it as 850.

MR. THORNTON: Yeah, it was in our exhibits that we exchanged.
THE HEARING OFFICER: Okay. So you have it down?
MR. VANDYKE: Yeah, it's down.
THE HEARING OFFICER: And it's received into evidence. But specifically for the record, it has limited value to me as a Hearing Officer without some further clarification.
MR. THORNTON: Okay.
THE HEARING OFFICER: And I don't think it's appropriate that you try to clarify that with Mr. Utting. He's not the person to bring it in.
MR. THORNTON: Okay. And then do we need to give you a copy?
THE HEARING OFFICER: Yes. Why don't you put a sticker on that, Nick, and mark it as Protestant's Exhibit 850. Let's go off the record just a minute.
(Recess.)
(Exhibit 850 marked and admitted.)
THE HEARING OFFICER: We're recording again.
Mr. Thornton.
MR. THORNTON: Okay.

Q. Mr. Utting, we just reviewed Exhibit 42, page 1, which was the M3 hydrogeologic characterization year one progress report. And in that report we read -- and I'll restate it because it's a basis for some of my next questions -- that "The groundwater proposed to be withdrawn by M3 for its development will be from subsurface flow that has already departed the Boise Basin on its way to the Payette Basin so that impacts to existing area water users in the lowlands near Eagle are predicted to be small."
THE HEARING OFFICER: Okay. You are referring to Exhibit 42?
MR. THORNTON: Exhibit 42 and page -- tab 4.
THE HEARING OFFICER: That would be A4?
MR. ALAN SMITH: Tab 4.
MR. THORNTON: Tab 4. Thank you.
MR. ALAN SMITH: Page 1.
Q. (BY MR. THORNTON): And that is saying basically the impacts are predicted to be small in the lowlands near Eagle.
And if I could then have you refer to Exhibit 16, the M3 model. And on page 33.
A. I'm there.

Q. Okay. So on page 33, the second paragraph from the bottom, it identifies that "The M3 model not being calibrated to replicate responses in the unnamed alluvial aquifer overlying the Pierce Gulch Sand Aquifer. The model estimates that wells completed in this aquifer may have drawdowns that are on the order of two-thirds of those predicted for wells completed in the Pierce Gulch Sand Aquifer at similar locations." Then it goes -- it says that the M3 model -- I'm paraphrasing -- was not calibrated to aquifers other than the Pierce Gulch and cannot be used to accurately predict aquifer response from pumping in any aquifer besides the Pierce Gulch Sand Aquifer.
Do you agree with that statement?
A. I do.
Q. Okay. And then if you could refer to Exhibit 12, page 240 and 241 in Exhibit 12 -- let me make sure I have the right exhibit here -- is your analysis of 16 aquifers.
A. Okay.
Q. And on the page 240 at the bottom, No. 19 states that "Construction of additional high-capacity wells in the PGA appears feasible

throughout much of the Eagle/Star/M3 project area. These high-capacity wells will cause drawdowns that will affect other wells." It goes on to state that "There are more than 1600 wells in the greater Eagle/Star/M3 area, many of them poorly constructed." And then finishes by saying, "Development of additional municipal groundwater supplies and associated water table drawdowns may require some existing wells to be deepened and/or replaced."

Is that correct?

A. That is correct.

Q. Okay. And then the 20, on statement 20, on page 241, it goes on to say that "Development of additional wells and full development of existing municipal water rights will cause artesian pressure to decline over time throughout the Star/Eagle area. This decline of artesian pressure may cause some wells that flow at ground surface to cease doing so. Wells currently relying on artesian flowing conditions to provide water supplies may require pumps to produce water for use in the future."

And do you agree with that statement?

A. Yes, they may require pumps.

Q. And then going back to what we just read in Exhibit 42 where it states that since -- and I'm paraphrasing, that the water withdrawn from the M3 Eagle area is already on its way -- departing the Boise Basin on its way to the Payette Basin. Therefore, impacts to existing area users in the lowlands near Eagle are predicted to be small.

And you agree with those two statements?

A. I do.

Q. So help me understand how water-level declines, even in artesian pressure, are considered to be a small impact?

A. First year study, we predict that they're small. That evolves through additional testing, analysis, and development of a model to actually quantify those effects which we saw in those figures.

So in the protestants' area in the PGSA, we predict drawdowns ultimately after 50 years of 10 to 15 feet. If we have a poorly constructed well, a well that isn't deep enough, a well that's clogged, a well that isn't producing, 10 to 15 feet could cause a problem that that

poorly constructed or deteriorating well would require some work. So that's how I reconcile that.

In the statement on full development of municipal water rights, yes, if someone's well has got a water level that's just above ground surface and they're relying on its flowing and over time there is a decrease, they might have to have a pump.

So a 10 to 15 water level in the PGSA translating to a smaller water level in overlying aquifers, I don't consider that large. However, a well that needs some work may be impacted to the point where it will require that work to produce that water that it might just barely be able to produce now.

Q. And in your document here it states there to be 1700 wells in -- did you also hear the testimony of Mr. Squires that could be between 2,000, 2,500 wells in the same area?

A. I did hear that. And I agree with Mr. Squires' testimony.

Q. So did you hear Mr. Squires' testimony where he talked about many of the domestic wells being poorly constructed?

A. Yes.

Q. Do you have an idea of how many of those poorly-constructed wells, what percentage of them may be affected by these drawdowns?

A. I do not.

Q. Are there any documentation to that in your model or any other reports that you've prepared?

A. There is not.

Q. Okay. Okay. If we could turn to page -- in Exhibit 16, and go to page 27. And on page 27 there's a table 1, mass balance comparison of well pumpage volumes.

A. Yes.

Q. And did you have -- did you work on a portion of this? Are you familiar with this?

A. I am familiar with this, yes.

Q. And could you describe, looking at -- and as I understand, and is it correct to assume that the revised modeling results, November 14th, that column, is the appropriate one to be asking questions on?

A. It depends on the question, but I think that's the most appropriate.

Q. Okay. And could you describe in that

column "Revised model results" what inflow, what well outflow, and then below that with M3, could you describe what those figures for all of us are, what they represent.

A. In constructing a model, we have to look at where water comes in to and out of the model region. So inflow includes all the sources of water inflowing to the model.

We have a number of categories. We have surficial recharge. And that would include irrigation return flow, that would include precipitation. And we had a number of ways of analyzing that based on land use and rates that -- the rates we got from the Treasure Valley Hydrologic Project.

We did a GIS analysis of land use to convert that into surficial recharge. We discussed underflow in the southeast model corner earlier. I could reiterate that if you'd like. We looked at Dry Creek. We have indication on USGS gauging data that there's a small amount of water that goes into the groundwater system there.

We looked at a small amount of water leaking out of Lake Lowell, we looked at Boise River seepage, and we looked at Payette River

seepage. And both of those would have been calculated by the model. From that we come up with a total inflow to the system.

The outflow would be pumpage from the wells, the domestic wells, municipal, commercial, irrigation wells. So we compare all those numbers. We look at with and without M3 pumping to get some totals and some percentages.

Q. Okay. And then on your inflow, what appears like Lake Lowell, a small percentage, 1.6 percent.

And could you describe to me how that percent from Lake Lowell, in what I, a layperson -- I'm thinking that's miles across the valley. And if I understand that right, there's a small percentage of that seepage from Lake Lowell coming into your headgate of the model?

A. Not to the headgate of the model. Overall model domain. If you look at that figure that shows the whole model domain, Lake Lowell is in a portion of that model domain.

So by looking at the levels of the lake and the clay layers on the bottom, the head difference between the lake and underlying groundwater, the seepage that would occur through

that is calculated by the model flowing into the model domain.

Q. Okay. And would that flow from Lake Lowell into the model domain, that has some -- I guess there's some factor that -- percentage that then identifies this much available water for the Pierce Gulch Sand Aquifer; is that correct?

A. No. It's just largely into the system, into the model, so that we're accounting for all the known inputs and outputs into that model vision.

Q. And where does -- and you've said this before. Where does the -- what is the recharge, source of recharges for the Pierce Gulch Sand Aquifer?

A. Well, we have recharge coming in from the southeast model corner. We know that Pierce Gulch sand is there. We know we have water flowing in that area. We calculated that to begin with through this general head boundary, where we specified the transmissivity of the region upgradient from there and from known water rights. And that calculates the flow.

The other recharge to the Pierce Gulch Sand Aquifer would occur within the model,

depending on the head differences between the layers.

Q. Okay. And did you testify that some of that recharge is from the Boise River, some from the New York Canal, some from irrigation?

A. I believe that that water -- are you talking about the water in the PGSA?

Q. I'm talking about the flow into the Pierce Gulch Sand Aquifer.

A. That would come from upgradient. Based on TVHP, it seems that there's a source of recharge up there. So I'm assuming that that's part of it.

Q. From river, from the canal, and from irrigation?

MR. FEREDAY: Objection. I think he testified already that it was not from irrigation but from the canals. So if --

MR. THORNTON: I believe that he testified that it was from irrigation. We can go back and look at that.

THE HEARING OFFICER: Okay. Overruled.

THE WITNESS: I think what you're referring to is recharge to the overall model comes from irrigation. But the only place where we have the

PGSA right at the surface, there is no irrigation. So we do not have direct recharge into the PGSA from irrigation.

Q. (BY MR. THORNTON): Okay. And then if we could go to Exhibit 32B, which, Mr. Utting, is your kind of C.V.

A. Yes, there I am.

Q. And if you would turn to the -- I guess it's the third page there -- yeah, I don't see a page number, but it would be the third page.

A. Yes.

Q. And on five, statement five, it says, "Water within the Pierce Gulch Sand Aquifer beneath M3 Eagle property originates from a combination of seepage from the Boise River, New York Canal beneath parts of the city of Boise and Meridian, local precipitation, applied irrigation water, and probably infiltration of surface water from various creeks such as dry creeks."

So here I'm seeing you're saying it does come from applied irrigation, and then am I also hearing you say that it doesn't?

A. Well, I did state earlier that the only place we know recharge occurs in the model

area would be at the southeast boundary. I also stated earlier that in the northeast portions of the boundary Pierce Gulch becomes shallower and couples to upper zones.

So by this statement I mean in that area, say near Lexington Hills, it is theoretically possible for that to occur. I stated that recharge within the model to the PGSA would depend on the head differences or the water-level differences between the zones.

So it is possible at some portions that applied irrigation could be brought down into there, but I don't know specifically. Since this was written, I have to say I've now listened to Mr. Glanzman's testimony and seen his report, and realize that the geochemistry says that if that is occurring it's got to be pretty darn small or it would show up in the geochemistry.

Q. And so you heard testimony from Mr. Glanzman that he has seen no evidence of irrigation water going to the PGSA?

A. I have heard that, yes.

Q. And if we could go back to Exhibit 16, page 27. And on table 1 again. And underneath the column of "inflow." And you identified

earlier, Boise River seepage approximately 7.8 percent.

And essentially what is that telling me, Boise River seepage 7 -- approximately 8 percent?

A. It says that within the model regime there are places where the Boise River is seeping into groundwater -- the groundwater system, not necessarily PGSA, but somewhere within an aquifer.

And that would be the model calculating it by the difference in water levels in the river and the difference in water level within the aquifer underneath it. And where that's a downward flow, you would have seepage from the river into the model domain.

Q. Okay. And could you explain to me the Payette River seepage of 27 percent. Where is -- tell me how that Payette River seepage is accounted for in your model and what that means.

A. Well, for the same mechanism, where the water levels in the Payette River are higher than the groundwater levels in the underlying aquifer, you would have groundwater moving downwards into that gradient. And that occurs in the Payette Valley, generally upstream from

Emmett.

Q. And so the -- and that's, again, in your model domain?

A. Within the model domain, yes.

Q. And in your testimony you provided earlier about the running no-flow boundary example --

A. Yes.

Q. -- I believe that -- did you testify to that?

A. I did.

Q. Do you have information, such as this table, where we can see what amounts of seepage -- what the change was in that no flow? Have you presented that in this report? Perhaps it's there, and I didn't see it.

A. We did not present that.

Q. Did you, in fact, on that no-flow boundary identify that the Payette River seepage would be zero?

A. What do you mean, did I identify that?

Q. Did -- let me restate the question.

I believe I just heard you said you ran a no-flow -- a model run showing a no-flow boundary.

A. I haven't looked at that specifically, but putting that no-flow boundary in the model still has the Payette portion of the aquifer system, it still has the difference in water levels. In the upgradient level above Emmett, it's highly likely to be changed by that, and therefore I don't think there would be a significant change.

Q. Would your -- it appears in your model domain if you -- is it true that if you had a no-flow boundary your model domain would have to change?

A. We just put a barrier in of -- we didn't actually move the model boundary in. We just put a wall of zero permeability from the green line, then following that surficial divide that TVHP speculated as a no-flow boundary. We put a vertical wall, said, "Hey, water can't cross it."

On the other side of the model, it can do whatever it's doing, but we don't care because that's irrelevant at this stage. But it just meant that this water was not allowed to flow to the Payette. It was forced to go to the west or southwest.

Q. And how do you reconcile -- what I guess resonates with me is that there's a discrepancy in the model domain when in a no-flow boundary that you ran you didn't adjust the boundary, you just simply said no flow to the Payette River. But perhaps you still said seepage into the model domain was 27 percent.

A. Well, we didn't come up with any results for that. We were just looking at predictive impacts. So we did not present a table of the differences in results because it's an artificial situation, but we were using it as a tool to examine the "What if water couldn't get to the Payette, would it matter?" And we concluded it made no difference in terms of the water availability beneath the M3 site pumping from the PGSA.

Q. Did you do any runs in terms of water table declines with that no-flow boundary, taking into account no seepage to the Payette River?

A. No.

Q. And if we could go to page 27 just below that table, it talks mass balance flow to Pierce Gulch Sand Aquifer from outside the model domain.

A. Yes.

Q. And about halfway down there's a sentence that starts "In the analyses -- in the transmissivities of the Pierce Gulch Sand Aquifer as calculated from numerous pumping tests in the Meridian area, we're assumed to also represent the regions between the model's southeastern boundary and the region beneath the Boise River upstream from the Capitol Bridge."

Do you agree with that?

A. Yes.

Q. What were your assumptions based on?

A. Assumptions were based on the fact that we see productive wells going up-valley, that the permeability of those materials were likely to be similar. When we look around the valley, we see this coarse sand deposit of both the Pierce Gulch sand and the sand unit of the Terteling Springs formation. So we extrapolated upgradient.

And as we found out in the sensitivity analysis, that was not highly sensitive to variations in that conductive -- in the Terteling. It's a function of that -- those transmissivity levels.

Q. And you're saying that the area

up-valley, I believe you said.

How is Meridian up-valley from the M3 area?

A. Well, Meridian's not up-valley, it's upgradient. It's at the edge of the model where we know the Pierce Gulch Sand Aquifer exists, where we know water is flowing to the northwest, and therefore it's coming in across the boundary that we showed in that figure within the Pierce Gulch Sand Aquifer.

Q. So you're saying that the -- if I heard you, that the Pierce Gulch Sand Aquifer underneath Meridian is flowing to the northwest?

A. Well, not the aquifer. But water within the aquifer is, yes.

Q. Water within the aquifer. Okay. So water within the aquifer in the Meridian area is flowing to the northwest?

A. That is correct.

Q. Okay. Probably come back to that in a bit. On your -- if we can go back to 27 again, the mass balance.

As I understand the first sentence in that paragraph, it identifies the M3 model calculated that about 102 cfs to 115 cfs of

groundwater flows into the southeast corner of the model through the Pierce Gulch Sand Aquifer; is that correct?
A. That is correct.
Q. Okay. Is that the amount of water that's going through as we've heard termed the headgate --
A. Yes.
Q. -- as you estimated that?
Okay. And if we could go to page 28. The amount of water going through your headgate, the 102 to 115, I believe is described in the top of page 28, the source; is that -- the origination; is that correct?
A. Let me read this for a second.
Q. Okay.
A. (Reviews.)
Yes.
Q. I believe it states, does it not, that "A significant portion of this general head flow into the model's southeastern boundary originated as seepage from both the Boise River and the New York Canal"?
A. That is correct.
Q. And then I believe you're citing

Urban -- and I believe that's from the Treasure Valley Hydrologic Report; is that correct?
A. That is correct.
Q. Okay.
-- reported a loss to the underlying groundwater system of 21 cfs during '96 and apparently 110 during 2000; correct?
A. That's correct.
Q. And both sets of those measurements were made over a reach upstream from Capitol Bridge; correct?
A. Correct.
Q. And then he, Urban, also reported from the New York Canal system over its entire length at an average rate of 13 percent indicating somewhere between an 80 to 150 cfs loss; is that a fair judgment?
A. The 80 to 150 were flow measurements that were reported in Hutchings and Petrich, I believe. Yes.
Q. Okay. And then at the end of that paragraph it states that the quantities of loss indicated in these three Treasure Valley hydrologic reports are similar, and therefore supportive of your inflow calculations; is that

correct?
A. That's correct.
MR. FEREDAY: Mr. Hearing Officer, I'm not sure where this is going. But I guess I would appreciate an instruction to ask a question here rather than just ask him whether he can read. I'm concerned about where this is going.
MR. THORNTON: If I could respond to that.
THE HEARING OFFICER: Sure, Mr. Thornton.
MR. THORNTON: Part of the reason I'm reading it is, as I understand the Hearing Officer has stated, that to be unbiased you haven't read through this information. So I think these are important points, concepts, assumptions, limitations or whatever that need to be understood, and the foundation for the question. That's why I'm going through reading them.
Most of us have read them here, but as I understand you have, as a matter of purpose, decided not to read those. That's why I'm trying to bring them up now.
THE HEARING OFFICER: Okay. The purpose of cross-examination, Mr. Thornton, I guess, is to impeach or to distinguish the testimony of the witness in some way, perhaps discredit it in some

way or to highlight inconsistencies.
So Mr. Fereday has presented information. And I think Mr. Fereday's question might be, what is the importance ultimately of the questions that you're asking. I mean I don't mind your going through it if at some point in time you say "Okay, Mr. Utting, based on these statements, then, why are you concluding such and such?" And I think that's probably the question that Mr. Fereday is waiting.
So if we're just reciting numbers that are supportive of what Mr. Fereday has put into the record, then it has no value to it. If you're attempting to distinguish in some way or highlight something that Mr. Utting has testified to by doing this, then it has value. But I guess I want to know where the ultimate question is in all this. And I think that's what Mr. Fereday has asked.
MR. THORNTON: Okay. And I think appropriate to bring that up. So I will work on trying to solidify that and shorten it up.
THE HEARING OFFICER: Okay.
Q. (BY MR. THORNTON): Mr. Utting, if we could have you go to Exhibit 33, the Treasure

Valley Hydrologic Report.
THE HEARING OFFICER: Exhibit what again?
MR. THORNTON: Exhibit 33.
THE HEARING OFFICER: 33.
MR. THORNTON: And it's the very first one, the executive summary, the overall executive summary. So perhaps tab A.
MR. FEREDAY: I believe that is Exhibit 33A.
THE HEARING OFFICER: Now, while we're looking, the other thing is, Mr. Thornton -- and maybe there was some misunderstanding -- when I come into a hearing, there are -- and I don't know how much time to spend on this. It probably is a waste of time. But there are documents that have been marked but they're not yet received into evidence.

And I don't have any idea as a hearing officer -- these documents have all been submitted as prospective exhibits, so I have no idea which ones will come in and which ones won't. I didn't even have any idea which were stipulated to for admission.

So number one, it's hard for me to get through all the information. Number two, I

shouldn't be reading exhibits that will not be part of the evidence.
MR. THORNTON: I agree.
THE HEARING OFFICER: It's inappropriate for me. So there are reasons why I don't go through that evidence beforehand. Now, I'm responsible for what's in the record at the present time, which is a rather weighty responsibility looking at what's here. But there are reasons why I don't preread those. Okay? All right.
MR. FEREDAY: Mr. Hearing Officer, if I could --
THE HEARING OFFICER: Yeah.
MR. FEREDAY: -- I believe this -- all of these exhibits, up through --
MR. LAWRENCE: 50.
MR. FEREDAY: -- certainly up through 50 were stipulated in and were received in evidence.
THE HEARING OFFICER: Right.
MR. FEREDAY: So those are a part of the record.
THE HEARING OFFICER: Right.
MR. FEREDAY: This would be one of those --
THE HEARING OFFICER: Right.

MR. FEREDAY: -- that is part of record and is in evidence.
THE HEARING OFFICER: So it's 33 what?
MR. FEREDAY: A.
MR. THORNTON: 33A.
THE HEARING OFFICER: Okay. I'm there.
Q. (BY MR. THORNTON): Okay. On 33A, page 18, at the top of the -- I guess it would be the third paragraph, in the Treasure Valley report -- and on the page 18, then, how do you account for what is stated on page 18, third paragraph, where it says that "The largest component of recharge to the shallow aquifer is a seepage from canal system and infiltration through irrigated agriculture" with what you have stated in the model in terms of the inflow coming from -- to the Pierce Gulch Sand Aquifer coming from the canal in the Boise River Basin?
MR. FEREDAY: We would object, at least to the extent that this asks Mr. Utting to comment on a study that isn't his study and that he did not testify about in direct.
THE HEARING OFFICER: Okay.
MR. THORNTON: I can re-ask, perhaps.
THE HEARING OFFICER: No. Overruled. I --

Well, go ahead, Mr. Utting.
THE WITNESS: They are totally consistent. Our model had a lot of recharge coming in through leaky canals and irrigation return flows that went into the shallowest aquifer, which would be the Boise River gravels and other unconfined zones. So it's totally consistent. It's not the Pierce Gulch Sand Aquifer. It's the shallower aquifer where this is.
Q. (BY MR. THORNTON): So what is the source of recharge to the Pierce Gulch Sand Aquifer? I'm confused.
A. Well, as I stated, we have flow coming in from the southeast. And where that actually comes from is to some area to the southeast because our contour lines show it flowing in from that direction.

We had the model calculate the throw rate based on gradient and based on transmissivity. There may be other sources of recharge where there are head differences where it's pulled in from other aquifers. But that's not direct recharge, that's not a boundary condition on the model.

There are some areas beneath the M3

site where the aquifer becomes unconfined, and it is in fact the shallowest aquifer, where some precipitation from, you know, rainfall and snowmelt will get into the aquifer.

And I think Mr. Glanzman's testimony showed that there were these two wells in that area that had precipitation recharge. So our recharge comes from the southeast, and that's the primary area where the direct recharge occurs in our model.

Q. Page 27 of the model, Exhibit 16, does it not say that for the -- underneath "Mass flow" that the M3 model calculated that 102 to 115 cfs of groundwater flows into the southeast corner of the model?

A. Yes, that's correct, through the Pierce Gulch Sand Aquifer.

Q. And then you go on to state lower down in that same paragraph that it is coming from the Boise River upstream, and also you have identified leakage from the canals, or at least the New York Canal; is that correct?

A. I have identified that, yes.

Q. I guess I'm still confused in terms of how you just said what -- let me try to ask a

better question.

Going back to the Treasure Valley report, Exhibit 33A, page 18, where in that study they said that the seepage from the canal is the largest component for the shallow aquifer.

How much of the canal water goes into the Pierce Gulch Aquifer?

A. I have no idea. We looked at the recharge coming into the model. My charge was not to assess where that recharge coming into the model came from. We've heard Dr. Wood testify and Ed Squires testify that the Pierce Gulch sand undoubtedly comes up and intersects the Boise River gravels somewhere upgradient from our model. So there's a source of water, of Boise River water.

We have seen that upgradient from the Capitol Street Bridge that they've measured seepage losses going into the groundwater system. We've also seen that seepage losses were measured from the New York Canal itself.

So we know there are places and ways this water can get into the model. We used the model to calculate the amount flowing in based on gradient and transmissivity.

Q. And on Exhibit 33A, page 18, on the sixth paragraph down, it identifies that recharge to the deep aquifer begins as downward flow through coarse-grained alluvial sediments in the eastern portion of the basin.

And you agree with that; is that correct?

A. I'm not exactly sure what they mean by the eastern portion of the basin, but they certainly have coarse-grained sediments and infiltration in this area, in the Boise area, yes.

Q. Okay. And then on the last paragraph on page 18 -- and perhaps you'll want to read through that -- is it not true that it says based on some of the water chemistry data collected, again, from shallow aquifers near the New York Canal -- and I'll paraphrase here. It basically says that it does not go into the deeper aquifer. If you can perhaps through that --

MR. FEREDAY: Objection. I think this has been asked and answered now a few times. Maybe I'm missing something, but that's what it looks like to me.

MR. THORNTON: The point I'm trying to bring up is I'm hearing several different answers

from several different people, even the same person, in terms of the source.

THE HEARING OFFICER: Okay. Are we referring to the last paragraph on page 18 --

MR. THORNTON: Yeah.

THE HEARING OFFICER: -- Mr. Thornton?

MR. THORNTON: Yes.

THE HEARING OFFICER: And this is a discussion of water chemistry data collected from shallow aquifers?

MR. THORNTON: Yeah, near the New York Canal.

THE HEARING OFFICER: Okay. And I guess I'll sustain the objection just on the basis that Mr. Utting has not testified about water chemistry at all. That's not his area of expertise. So I'll sustain the objection on that basis.

MR. THORNTON: Okay.

Q. Did you hear Dr. Spence Wood testify? He was here for, I believe, a day and a half or so.

A. Yes, I did.

Q. Hear that Dr. Spence Woods (sic) said nobody really knows where the recharge is to the Pierce Gulch Sand Aquifer?

A. I don't recall those words specifically, but I would agree no one knows the exact spot, put your finger here, this is where it's going in.

Q. Okay. If we could go to -- whatever one this is here -- to Exhibit 16, page 28. And then I believe you just testified that the recharge to the Pierce Gulch Sand Aquifer, a significant portion, is again from the Boise River and the New York Canal; correct?

A. Yes.

Q. Okay. And then are you familiar with a report by the U.S. Geological Survey titled "Stream flow gains and losses in the lower Boise River Basin, Idaho, 1996 and '97?

MR. FEREDAY: Who was the author?

MR. THORNTON: It was Charles Berenbrock.

THE WITNESS: I'm not familiar with that report.

MR. THORNTON: I would like to receive this into evidence in terms of their findings on seepage runs.

THE HEARING OFFICER: So you want --

MR. FEREDAY: Has this been previously marked and provided?

MR. THORNTON: Yes.

MR. LAWRENCE: What's the number?

MR. FEREDAY: What's the number?

MR. THORNTON: We have it as No. 285. This is information that was shared through the discovery process everyone had.

MR. JASON SMITH: That was No. 285?

MR. THORNTON: 285 is the exhibit number we have.

THE WITNESS: Mr. Thornton, I may have looked at that. I can't recall. If you could bring a copy forward, I could look at it.

MR. THORNTON: Yeah. I'm just nervous. I'm not sure if I'm supposed to do that or not.

THE HEARING OFFICER: Oh, you can present it to Mr. --

MR. FEREDAY: Yeah, please do. Yes.

MR. THORNTON: I think -- is that more than one there?

THE HEARING OFFICER: The parties did not stipulate to the admission of this document, as I recall.

MR. FEREDAY: Correct.

MR. ALAN SMITH: That has been admitted?

MR. THORNTON: Well, it was during the

discovery process, our exchange of documents.

THE HEARING OFFICER: But it's my understanding that it was not one of the documents that the parties stipulated to the admission of.

MR. FEREDAY: That's correct.

THE HEARING OFFICER: So, Mr. Thornton, you'll need to either establish with this witness or somebody what this document is, and then ultimately offer it.

MR. THORNTON: Okay. So at this point I'd like to offer it. I'm not sure the technical terms here.

THE HEARING OFFICER: Okay. I need to ultimately have a copy of it, and we'll mark it if it's not already marked.

Okay. So it's 285, Nick.

(Exhibit 285 marked.)

THE HEARING OFFICER: How soon do we want to take the next afternoon recess, folks, to push us through until 5:00?

MR. THORNTON: I have probably two or three questions regarding this. And for me it would be good to break then. I mean I could break now, whatever I want. But just a couple more questions on this document. I have more questions to go

through, but...

THE HEARING OFFICER: Okay.

MR. FEREDAY: Well, I would appreciate a break at this time so that the witness might have an opportunity to review this document.

MR. THORNTON: Sounds good.

THE HEARING OFFICER: Okay. That's fair. Let's break for 15 minutes.

MR. THORNTON: Okay.

THE HEARING OFFICER: Come back and finish the day.

(Recess.)

THE HEARING OFFICER: We are recording.

Mr. Thornton, further questions of Mr. Utting.

Q. (BY MR. THORNTON): And, Mr. Utting, we were talking about the M3 model in terms of the inflow or the flow to the Pierce Gulch as being 102 to 115 cfs; correct?

A. That's correct.

Q. And in the M3 model, it identified that that amount seemed -- or appeared to be supported by flow amounts identified in the Treasure Valley Hydrologic Report; correct?

A. That is correct.

Q. And the Treasure Valley Hydrologic Report that is identified in that paragraph states that there are some seepage from the --

THE HEARING OFFICER: Where are you referring?

MR. THORNTON: I'm sorry?

THE HEARING OFFICER: Where are you referring to?

MR. THORNTON: Okay. On document 16 and on page 28. Exhibit 16, page 28.

THE HEARING OFFICER: Okay.

Q. (BY MR. THORNTON): And in that paragraph is it fair to say that the inflow is --

MR. FEREDAY: Excuse me. We're not sure which paragraph.

MR. THORNTON: First paragraph. I'm sorry. Top.

Q. -- that the inflow to the model was based on seepage from the Boise River and from the New York Canal; correct?

A. Actually, no. The inflow for the model was calculated by the model based on the gradient and the transmissivity.

Q. Okay.

A. We looked at flow indicated in the

TVHP upgradient from that boundary just to -- as a check to make sure we were in the ballpark, that our numbers were reasonable, that our approximately 100 cfs flowing in was within the range of the 100 -- where are they coming up here? -- 100 to 260 cfs that they reported from these two potential sources.

Q. Okay. And those two potential sources were identified as seepage or losing reaches from the Boise River and/or seepage from the New York Canal; correct?

A. That is correct.

Q. And then in Exhibit 285, if you would turn to that, please. And on page 1, third paragraph, it identifies that during the --

MR. ALAN SMITH: I'm going to object here at this point. I don't think there's been a foundation laid for what this document is or how it relates to the M3 model or the model domain that Mr. Utting has been testifying about.

MR. THORNTON: Can I offer that now, then? Or I'm not sure the process, so...

THE HEARING OFFICER: You can attempt to offer the document at the present time, just offer it as an exhibit. You can attempt to lay a

foundation regarding what this document is, who produced it, whether Mr. Utting is familiar with it. So that's the prudent -- generally, that's the preliminary information that comes in about a document before it's offered.

MR. THORNTON: Okay. I will try to do that. Thanks.

THE HEARING OFFICER: Okay.

Q. (BY MR. THORNTON): So in the document titled "Stream flow gains and losses in the Lower Boise River Basin, Idaho, 1996, 1997" conducted by the United States Geological Survey, are you aware of that document?

A. I'm aware of it, yes.

Q. Okay. Are you aware that they did an assessment, an evaluation of stream-flow gains and losses in the Lower Boise River Basin as well as the New York Canal?

A. Only because I've looked at it briefly now, which you've handed to me. It was not a document I used to compare the calculated model input. I don't know if Urban used this in his analysis. But it does appear to be a regional assessment of flow on the Boise River.

Q. Are you aware that this document is in

the public domain?

A. If it's USGS, it would be, yes.

Q. Are you aware that the information in this document appears to refute the inflow assumptions based on the M3 model?

MR. FEREDAY: Objection. Foundation.

THE HEARING OFFICER: Okay. Let's -- see, that's not a foundational question now. Now you're going to the content of what's within the document.

MR. THORNTON: Okay.

THE HEARING OFFICER: So you either need to lay more foundation, Mr. Thornton, or offer the document, and then we can look at it.

MR. THORNTON: Okay. All right.

THE HEARING OFFICER: Okay. So it's up to you.

MR. THORNTON: Okay.

Q. The question is, is the amount of -- in your mass balance for flow to the Pierce Gulch Sand Aquifer, is it important to have an accurate amount of flow into the Pierce Gulch Sand Aquifer, in your model, based for your model?

A. I don't know exactly what you mean by "important." But we want the model to have

relatively accurate flow of water into it, yes.
Q. Is that one of the calculations of your model, one of the numbers or coefficients or variables in your model that is needed?
A. It is something that the model calculated based on the gradients from measured water levels and from transmissivities measured in pumping tests. So the model calculated that flow. We used TVHP numbers to see if it was in the ballpark.
Now, Dr. Wood testified earlier that he believes the PGSA comes up near the Boise River. So there may be some whole new source of water not accounted for in any of these studies. I don't know. I just wanted to make sure that the number we had wasn't highly unreasonable compared to what was measured in terms of known losses.
Q. Are you aware that this report by the USGS, Exhibit 285, was conducted in conjunction for information for the Treasure Valley Hydrologic Project?
A. I was not aware of that.
MR. THORNTON: I guess at this time I would like to enter or offer this as an exhibit based on what appears to be a very different view on the

assumptions that are in the M3 model in terms of the mass balance for inflow to the Pierce Gulch Aquifer.
THE HEARING OFFICER: Okay. Mr. Fereday?
MR. FEREDAY: Well, we would object to it on the grounds that it was not relied upon by Mr. Utting, and we still don't see the foundation for it.
If Mr. -- if the protestants, any of them, wish to introduce this document, they should probably validate it and verify it through their own witness. This witness is aware of it. That's all he's testified to. So we would object on that ground.
THE HEARING OFFICER: Okay. Well, again, I think this is probably a document that falls within the discretion of the hearing officer and administrator of the hearing to receive into evidence. Perhaps under the formal rules of evidence, it wouldn't come in.
But I personally know Mr. Berenbrock. He is an employee of the USGS, or at least was at the time, and I know that he's prepared reports for them. And this appears to be in that standard format. So I'll receive it into evidence.

(Exhibit 285 admitted.)
THE HEARING OFFICER: Thank you, Mr. Thornton. You may ask questions about it.
MR. THORNTON: Thank you.
Q. Mr. Utting, on page 1 of Exhibit 285, in the third paragraph, second sentence identifies "The two upstream reaches of the river at net gains, whereas the most downstream reaches near the confluence with the Snake River had a net loss."
And how does this net gain to the river, how is that reconciled with your model identifying net losses?
A. Now, I always --
MR. FEREDAY: I'm going to object just on the grounds that this witness has already testified that he didn't use this. So that -- that question, I think, also lacks a foundation.
THE HEARING OFFICER: Okay. Overruled.
I want Mr. Utting to be able to read this carefully, Mr. Thornton, because as I read it, I'm not sure what it says. So I'm --
THE WITNESS: That's always dangerous between a surface water hydrologist and hydrogeologist to know what "gain" and "loss"

means. I assume he's talking about flow in the river increasing when he says "gain."
Q. (BY MR. THORNTON): Correct. And if you would refer to page 5 and perhaps read a paragraph that's titled "Approach and methods" that would help you understand the gain versus loss.
THE HEARING OFFICER: Okay. What page are you on?
MR. THORNTON: It's page 5. And it's their approach and method for defining what a gain and loss is.
THE WITNESS: Okay. Surface water perspective. That's reasonable.
Q. (BY MR. THORNTON): Okay.
A. Okay. Well, I don't know how his reaches compared with the one in Urban. And Urban indicated a small loss in '96, and maybe that's the same one that's in here. I don't know. He then indicated a larger one in 2000, so -- which, of course, would not be in this report.
So it may be that that 21 cfs is reported in here. I don't know. I would have to look at it in detail. It is the same year, I think he refers to it as '96.

Q. Correct. And if you would refer to page 13 of that document, of your Exhibit 285.
A. Okay.
Q. And for the Boise River it identifies "Reach one gained throughout its length, except from Lucky Peak Dam to Barber Dam, where no gain or loss was measured." It does identify that "The largest gain of 16 cubic feet per second, per mile was in downtown Boise between site 10 and 12, and overall net gain was 51 cubic feet per second." Figure 8, table 2. You can refer to that, perhaps.
THE HEARING OFFICER: Mr. Thornton, I'm lost.
MR. THORNTON: Okay.
THE HEARING OFFICER: It seems to me we don't know what reaches are what, where it began, where it did not --
MR. THORNTON: Okay.
THE HEARING OFFICER: -- whether it's consistent with -- these reaches have any match points with previous testimony that was lost from the Boise River down to Capitol Bridge.
MR. THORNTON: Okay. If you would refer, Mr. Hearing Officer, to page 14, figure 6.

THE HEARING OFFICER: Okay.
MR. THORNTON: There is a depiction of a location of the reaches. From reach one, base of Lucky Peak Dam, to the lower end of Garden City, Glenwood Bridge.
THE HEARING OFFICER: Okay. I see it.
MR. THORNTON: And in the studies that the USGS did, as identified in their findings on page 13 that identify that this reach gained, and the overall net gain in that reach was about 52 cubic feet per second.
THE HEARING OFFICER: The reach was --
MR. FEREDAY: Objection. We still don't have a question -- or at least a question for which this witness has a foundation for answering.
MR. THORNTON: And I believe I was trying to address the Hearing Officer's question to help focus on where the location of these reaches were.
THE HEARING OFFICER: Boy.
MR. THORNTON: So I can ask it -- I don't know if I need to ask a question now or not, Mr. Hearing Officer.
THE HEARING OFFICER: You need to ask questions of Mr. Utting.
MR. THORNTON: Right.

THE HEARING OFFICER: My concern and my voiced concern was that it seemed to me we were skipping through this document from one place to another without establishing certain things, certain foundational information --
MR. THORNTON: Okay.
THE HEARING OFFICER: -- that was important both for Mr. Utting and for me. And it probably should be done through a question and answer.
Q. (BY MR. THORNTON): Okay. And so, Mr. Utting, if you could turn to page 14, figure 6, of Exhibit 285.
And do you see the depiction of location of reach one?
A. I do.
Q. Does the location of reach one also include that area upstream of the Capitol Bridge?
A. Well, this figure doesn't show Capitol Bridge. But -- I couldn't say for sure. It's upstream. It's the furthest upstream reach on the Boise River.
Q. It would be in that reach?
A. Yes, it would be that.
Q. Okay.
A. The big reach one and then there's

small numbers in it. Okay.
Q. Right.
A. Those are river runs. Okay. These are --
THE COURT REPORTER: I need you to speak up. I can't hear you.
THE WITNESS: Yeah, I'm sorry. I'm just trying to figure out what the figure shows. It's the first I've seen it.
Okay. I see reach one, and that includes Capitol Bridge in there somewhere.
Q. (BY MR. THORNTON): Okay. And do you see on page 13, again, a description for that reach one having a net gain of approximately 52 cubic feet per second?
THE HEARING OFFICER: You're referring to where?
MR. THORNTON: So page 13, underneath the Boise River heading, the third -- second paragraph down, last sentence.
THE WITNESS: I see that number, but, you know, reach one includes areas beyond just upstream from Capitol Bridge. So it may include areas that are both losing and gaining, with a net gain over a longer reach than Mr. Urban apparently

considered in his report. But I can only speculate on that.

Q. (BY MR. THORNTON): And if you would refer to page 15 on table 2 where it identifies flow gains and losses along three reaches of the Boise River.

A. Uh-huh.

Q. And do you see where they have a site number and site name on the left-hand side?

A. Yes, I do.

Q. And then going across to the right, you will see a column which identifies either measured gain or loss along the subreaches?

A. I see that.

Q. And do you see how the different site numbers are broken up between site one and two as the Boise River near Boise, and then it goes to the Boise River below -- I mean Barber Dam near Boise? Do you see how they're broken up in segments?

A. I do.

Q. And do you see where it gives information at Boise River at Ann Morrison Park?

A. Yes, I do.

Q. And having a gain of approximately

4 cubic feet per second?

A. I do.

Q. And do you see where it shows Boise River at Fairview Avenue having a gain of approximately 16 to 17 cubic feet per second?

A. Yes, I do.

Q. Okay. Do you see that all those sites number for the first -- I don't know -- maybe seven, eight sites are all in a gaining reach except for the first one, where it is at zero?

A. I see that.

Q. Okay.

MR. FEREDAY: Objection. I don't think that's a fair characterization of it --

THE WITNESS: Is there a question?

MR. THORNTON: Yeah.

MR. FEREDAY: -- of the data.

Go ahead and ask your question.

Q. (BY MR. THORNTON): Do you see on the table 2, page 15, right-hand side underneath the column "Measured gained or losses," where we just went through different segments of reach one where they were all in -- do you see that they're all an increase, except for the first one which is no -- which is zero? Do you see that?

A. I see that.

Q. And do you see an overall net gain or loss of approximately 52 cubic feet per second?

A. Well, I see he's indicated that, yes.

Q. Okay. And these figures here in this document were not used in your model; is that correct?

A. That is correct.

Q. Okay. Thanks for that.

A. Can I comment on this?

Q. You bet. Sure.

A. One thing I notice is that the flow in the river was approximately 230 to 250 cfs. And I know from surface water measurements I've done if you get 10 percent accuracy, you're doing pretty darn good. And I notice that a lot of these reaches the estimated gain is quite -- you know, it's less than 10 percent. So I don't know how accurate this is. That would be my first comment.

So the number 51.98 reported to two significant figures to me is highly suspect, when I consider the error brackets on this.

The other thing is there must be some reason that TVHP updated these numbers somehow under Urban. So I used Urban as the later figure.

I was not aware of this. I did not go back to this source. But none of this really affects the measured gradients or the transmissivities that we used to calculate the flow in the model. This shows the flow coming in. But those are my comments.

Q. Do you know the accuracy, based on the confidence limits, for Treasure Valley report?

A. No, I just know surface water measurements, in general, are difficult.

Q. So would you say that the surface water measurements identified in the Treasure Valley report are any more or any less accurate than in this report?

A. I have no idea.

MR. THORNTON: Okay. So I'm done with the questioning on this document. If we want to go to Mr. Glanzman.

THE HEARING OFFICER: Okay.

MR. FEREDAY: Mr. Hearing Officer, at this point we would like to take a break, and based on stipulation from a request from Mr. Glanzman to clarify his testimony this morning, we'd like to recall him to the stand so that he can finish up and catch a plane early in the morning.

THE HEARING OFFICER: Okay. We'll excuse you temporarily, Mr. Utting.

Mr. Glanzman.

RICHARD K. GLANZMAN,
having been called as a witness by M3 Eagle LLC and previously sworn, testified as follows:

FURTHER REDIRECT EXAMINATION
BY MR. FEREDAY:

Q. Mr. Glanzman, you realize you're still under oath?

A. Yes, sir.

Q. This morning do you recall your interchange with the Hearing Officer with regard to Exhibit 71, page 5?

A. Yes, I do.

Q. And those questions you'll recall involved his inquiries as to the identification aquifer to aquifer of various water-quality samples.

Do you recall that?

A. I do.

Q. I would like to clarify or invite you to clarify the sequence of who did what when with

regard to your evaluation of water-quality samples for the M3 project, sir?

A. Thank you.

Q. First of all, what was the sequence? What happened first? What was your first involvement in terms of evaluating those samples?

A. Ed Squires sent pages 1 and 2 of the database in the back of Exhibit 43 for me to evaluate and to -- he asked me to take a look at that water chemistry and see what it might say, how would I deal with it. So I plotted it on a trilinear diagram.

Q. Okay. And when he -- when you got those -- that sample data, had you heard of the Willow Creek Aquifer, for example?

A. No, I had not.

Q. Had you heard of the Pierce Gulch Sand Aquifer?

A. No, I had not.

Q. Had you heard of any of these aquifers, the Spring Valley Ranch wells?

A. I had heard of the Spring Valley Ranch wells.

Q. Okay. How about the Emmett Aquifer?

A. No.

Q. And how had you heard about the Spring Valley Ranch wells?

A. I had taken a look at the Spring Valley Ranch wells earlier for United Water.

Q. Oh, for a completely separate project?

A. Oh, absolutely.

Q. Okay. So when you received these water-quality samples, did you have a map of any of these aquifers?

A. No. I had no idea where they were, other than the Spring Valley Ranch wells.

Q. Then what did you do once you received these?

A. Plotted up the trilinear diagram and did the basic statistics and found that there were -- that cluster and seeming trends of some of the water samples, groundwater samples, and then their distribution kind of scattered about.

Q. And that is the first trilinear diagram that shows up on page 6?

A. It is.

Q. Has that changed since you did that?

A. Only in now it has aquifer designations on it, through questioning and an iterative process with Ed Squires as to what -- is

there any significance to this trend, for example, looking at the Terteling Springs trend there. And we were looking at the identification of the wells that were involved there. And he says, "Well, that's the Terteling Springs formation."

Q. So you didn't get instructions from him in any way to plot these in some way, did you?

A. Oh, no. It was after the trilinear was plotted, the only thing that changed on that trilinear was symbols in which, through an iterative process with Ed Squires, he identified that, "Well, those are all Terteling Springs formation, and that tassell of cluster that you've got up there, those were all the Pierce Gulch Sand Aquifer."

Those are the first time I really heard of those two aquifers. And certainly later the Willow Creek. I hadn't heard of that until -- because I said, "Well, about these ones that are scattered about here." I knew where Spring Valley Ranch. That, I had. I knew what those were.

But the Willow Creek, I had no idea what those were or they were not something different than Pierce Gulch or...

Q. Were you seeing something different in

your samples, though? You could tell that there was something different from what turned out to be a Willow Creek sample as compared to what turned out to be a Pierce Gulch sample?

A. There was some differences. Clearly, as we were talking about it, I says, "The Willow Creek formation has some similarities to the Terteling Springs?"

And then Ed came back and said, "The Willow Creek formation in the upper part of the Willow Springs, sandy part." So then --

Q. Of the Terteling Springs?

A. Of the Terteling Springs, yes. Willow Creek is the sandy part.

Q. Mr. Glanzman, could you make water from the Willow Creek Aquifer fit geochemically into, say, the Pierce Gulch Sand Aquifer?

A. No, sir, that's not possible. And it isn't necessarily -- these are reach tools. The trilinear diagram is one tool. We have the total dissolved solids as another tool. The other trace elements as an added adjunct to that. All of those have to say the same thing. And when they don't, then it is something else.

Q. So is it accurate, then, to say that

there's no way to plot a Willow Creek Aquifer water sample so that it's going to cluster the same way as an -- overall as a Pierce Gulch Aquifer sample?

A. As the Hearing Officer pointed out, it's close, but it isn't within the cluster. It's in the Terteling Springs trend to the Boise Aquifer. So it's Terteling Springs formation mineralogy is usually what it is.

MR. FEREDAY: Okay. No further questions. Thank you.

THE WITNESS: Thank you.

And I thank you, sir.

THE HEARING OFFICER: Mr. Thornton?

MR. THORNTON: No questions.

THE HEARING OFFICER: Mr. Smith?

MR. ALAN SMITH: No questions.

THE HEARING OFFICER: Mr. Edwards?

MR. EDWARDS: No.

THE HEARING OFFICER: Okay. Thank you, Mr. Glanzman.

THE WITNESS: Thank you, sir.

MR. FEREDAY: We'll recall Mr. Utting.

THE HEARING OFFICER: Thank you.

MR. FEREDAY: Thank you, gentlemen.

THE WITNESS: Yes. Thank you, sir.

THE HEARING OFFICER: You may continue your cross-examination, Mr. Thornton.

MR. THORNTON: Thank you.

MARK UTTING,

having been called as a witness by M3 Eagle LLC and previously sworn, testified as follows:

CONTINUED CROSS-EXAMINATION

BY MR. THORNTON:

Q. If you could you go to Exhibit 2, which is your one-year progress report, regional hydrogeologic characterization.

MR. FEREDAY: And for the record, Mr. Hearing Officer, Exhibit 2, I believe, is identical to the laboriously named Exhibit 42A4. This was a report that was part of 42, which was the application.

MR. THORNTON: And if you wish, we can change that so it's --

MR. FEREDAY: It actually might be simpler, now that the record is replete with references to 42A4.

THE HEARING OFFICER: Yeah.

MR. THORNTON: So just to make sure I fully understand, 42A4 is the one-year progress report; is that correct?

MR. FEREDAY: That's right.

MR. THORNTON: And the date on that is May 2007; correct?

MR. FEREDAY: That's right.

THE WITNESS: If I may comment, the quality of reproduction in my copy is much better in figure 2 than the 4A.

Q. (BY MR. THORNTON): I'll let you use what you --

A. Okay.

THE HEARING OFFICER: You want to refer to Exhibit 2, then, Mr. Thornton? It's up to you.

MR. THORNTON: I'm fine with whatever is more efficient and understandable. I think -- how about we'll just use 2 now? Okay.

THE HEARING OFFICER: Okay.

MR. THORNTON: Exhibit 2. All right.

Q. All right. On page 10 there is a paragraph starting "Domestic wells."

A. Yes.

Q. And it identifies 1600 domestic single-family households domestic wells in the

greater project area from Eagle to Emmett, show that the preponderance of these domestic wells are located upgradient.

Could you describe to me what upgradient is.

A. "Upgradient" means that the potentiometric surface or water levels within the aquifer are elevationally higher such that water flows from the upgradient area toward and to the downgradient area.

Q. Okay. And then on figure 11, I believe that identifies, say, "See figure 11." And I'm on a figure I believe it's 11. And this identifies "Number of wells by section and quarter section in the M3 project area."

Are you on that one?

A. Yes.

Q. Is there anything on this figure that depicts gradient?

A. No, there's not.

MR. THORNTON: Okay. Mr. Hearing Officer, I'm just going through some of the questions we've already covered. I'm just making sure they're covered so...

THE HEARING OFFICER: Let's go off the

record for a minute.

(Recess.)

THE HEARING OFFICER: We are recording.

Mr. Thornton.

MR. THORNTON: Okay.

Q. On Exhibit 16, the M3 model, on page 34, and in the second portion of that page -- I'll wait until you get to it.

A. What page, please?

Q. Page 34.

A. Okay.

Q. In the large paragraph that's titled "The role of models."

A. I am there.

Q. And it identifies that "We wish to emphasize M3 model, or any model, cannot be relied upon to give exact answers or to future what-if questions." And then it says that "They cannot be 100 percent accurate."

And I believe you stated -- the question I have is, I believe -- did you not state that one of the best ways to test a model is future monitoring?

A. Yes.

Q. Do you believe that monitoring of

the -- a certain array or certain system of wells adjacent to the M3 property would be the best way to determine what is happening to drawdowns and to help correlate with your -- calibrate your model?

A. I would like to see a good network of high-quality, properly designed and constructed wells all over the area that we would keep track of to see what's going on as a result of all the various hydraulic inputs and impacts that might occur.

Q. Would that monitoring, in terms of helping to better understand your model of recalibrate, be to look at your predicted levels of groundwater decline versus what's actually happening?

A. That would help very much, yes.

Q. And potentially, that could be used to help either recalibrate the model; is that correct?

A. Uh-huh, yes.

Q. Okay. I believe you earlier stated that -- today when asked a question by Mr. Fereday regarding the geochemistry work, was it very helpful for you in determining water flow, water volume in the aquifer?

A. The geochemical analysis came after all the modeling report was done, the pumping test report was done, all these things afterwards. So it was a confirmation for me to see that it was another tool that was totally consistent with all the other tools that we've produced.

So it was one more thing to say, yeah, this is on the right track. It shows the flow rates are rapid through the PGSA, and it shows that we have a little precipitation input in just the areas where we think that would be possible.

Q. Okay. And then did you hear the testimony provided yesterday by Mr. Glanzman?

A. Yes, I did.

Q. Did you hear him testify that the geochemistry data that he analyzed did not support nor did it refute flow to the Payette River?

A. I heard that, yes.

Q. Or Payette River Basin, I should say.

A. I agree with that.

Q. If we could go to Exhibit 45 and to figure 5 of 45.

A. I am there.

Q. Okay. And did you earlier testify based on the -- I believe it was the orange or the

red line, the M3 Eagle test well No. 1, did you testify that you are seeing where it has -- appears to have an increase in the water table?

A. There are several places where I see that, yes.

Q. Okay. And if one was to look at the November to November points from year to year, are you seeing an increase or a decrease?

A. Well, from those -- well, we don't actually have but two data points for November. And if I look at the very beginning of November, then I would say it's slightly lower in the second data point.

Q. Okay. And do you have a November 2006 point?

A. I see that the very end of November there is a data point there, yes.

Q. Okay. So there's three points, perhaps?

A. In that case there would be three points.

Q. Okay.

A. Which would show that -- let's see. We don't have the end of November of 2008. So again, we're restricted to two points.

Q. Okay. Is it -- is it appropriate to look at just two data points or two years to be able to identify if water table's increasing or decreasing?

A. No, it's not appropriate.

Q. And if we could go back to 42, the second -- 42A, the second amended application, and it's A, tab 4.

A. Yes.

Q. And there's a figure 4, if you see that.

A. I have figure 4, yes.

Q. Okay. That's titled "A conceptual block diagram of the Pierce Gulch Sand Aquifer."

A. Yes.

Q. And I believe I heard you testify earlier today -- and correct me if I'm wrong -- that the Pierce Gulch Sand Aquifer dips to -- why don't you describe which way it's dipping in this. It may be easier than me trying to recount. Could you please --

A. In this conceptual block diagram, we see the Pierce Gulch Sand Aquifer dipping toward the southwest.

Q. And then is there also -- I believe

you said that it -- I may be wrong, that it also dips somewhat to the -- maybe it was the northeast on this other axis. Which way is it dipping on this --

A. Well, it rises to northeast and dips toward the southwest of this conceptual block diagram.

Q. Okay. And the rise to the northeast, where does that -- where would that come out at, if it's going to the northeast?

A. Well, we have the green line shown on this block diagram, sometimes almost yellow in this reproduction. And that green line is where this -- the Pierce Gulch Sand Aquifer reaches the surface, and therefore that would be a high point in this figure.

Q. Okay. And what hard evidence or hard science is there to show the end point of that green line?

A. We don't have any evidence, hard evidence of the end point of that green line. We have a conceptual understanding of how this Pierce Gulch Sand Aquifer was produced by the smearing out of the Willow Creek Aquifer, and we believe off to the west that they probably become

hydraulically connected, but we don't know for sure.

Q. Okay. If you could go to Exhibit 47. And that's the hydrogeologic analysis of the M3 Eagle site by Dr. Ralston.

And are you familiar with this report?

A. I'm there. Do you want to direct me to a page?

Q. And are you familiar, have you read through this report?

A. I have, yes.

Q. Okay. On page -- on page 3 at the top -- and actually, you may need to start reading at page 2 -- excuse me -- the very last paragraph. And it's quoting your July 2008 hydrologic report.

Could you identify, why does the green line not extend farther to the northwest as a no-flow boundary?

A. Well, we have hydraulic evidence there is a well that's located in that area that is to the northwest that has water levels intermediate between the Willow Creek Aquifer and the Pierce Gulch Aquifer, suggesting that as we get toward the west that the no-flow boundary, which is a function of the low-permeability deposits of the

mudstone of the Terteling Springs must somehow be thinning out, be less present, and we must be getting the sand of the Terteling Springs formation, which is the Willow Creek Aquifer of that area, coming together with the Pierce Gulch sands. In other words, they were smeared out, but in that area we don't have the fine-grain deposits.

Q. And that well, is that -- does that have a name for the well? Is that the JDH, or I'm confused?

A. No, no. We have a well. And I would be hard-pressed to come up with it immediately.

Q. Well, perhaps in Dr. Ralston's --

A. No. No, he does not have that in there. But we could look it up if you need that data.

Q. Could you look at figure 9 on Dr. Ralston's report of Exhibit 47.

A. Yes. Oh, sorry. Figure 9?

Q. Figure 9. It's the last page I have in mine here.

A. Yes.

Q. And is that well depicted as 2412?

A. No.

MR. THORNTON: Okay. In the interest of time, I'll -- I'll change the line of questioning a little bit. We'll be covering a lot of this later in our case.

THE HEARING OFFICER: Okay.

Q. (BY MR. THORNTON): What I would like to ask you on that same figure, though, Mr. Utting, on figure 9, could you describe the blue arrows and what they represent, the darker blue arrows.

A. The blue arrows are our interpretation of flow direction based on the potentiometric surface or the water-level surface which typically are at right angles to the contours in an isotropic aquifer, which we believe those to be. So those arrows indicate the direction of groundwater flow in the Pierce Gulch Sand Aquifer.

Q. Okay. And could you describe on those blue areas there going west and then somewhat to the northwest and then fairly abrupt change to the north, can you describe what hard information that you have to direct the flow that direction?

A. Well, we found the intermediate well that had levels showing the mixing of these two zones. We see that the Pierce Gulch Sand Aquifer

is present off to the north in the -- near Payette, so that's our assumption, that there's a mixing of the waters flowing in that direction. We do dash the flow in this direction here (indicating). So it is our best estimate, and we do not have hard evidence in that area.

Q. Okay. And which -- what data -- maybe you can describe on figure 9 the well represented by an elevation of 2412.

Was there any more information than that one well to help you develop your contours?

A. Was there more information?

Q. Yeah. Was there other wells used?

A. We used a number of wells that recorded our earlier contour map. You can see the locations and the water levels that we measured and recorded for those wells.

Q. Okay. And then are those to the north and west of the M3 property? How many -- let me withdraw that question. How many wells -- information did you have to the north and west of the M3 property?

A. I would have to refer to our contour map to get the exact number. But there were a number of wells.

Q. And maybe we can get to that. And I'll try to find it here too.

MR. LAWRENCE: Exhibit 18.

Q. (BY MR. THORNTON): And if I could ask -- I could be incorrect on that.

MR. FEREDAY: Excuse me, Mr. Thornton. Okay. Okay. We've -- I think we're looking at not Exhibit 18, Mr. Thornton. I think it's figure 6 of Exhibit 42A4.

MR. THORNTON: Yeah, of the 2007 report. 42A4, which is the second amended application.

THE HEARING OFFICER: Let's go off.

MR. THORNTON: Okay.

THE HEARING OFFICER: Let's go off for a minute.

(Recess.)

THE HEARING OFFICER: We are recording again.

Mr. Thornton.

MR. THORNTON: Okay.

Q. Mr. Utting, are you on figure 6 of Exhibit 42A, tab 4?

A. Yes, I am.

Q. Figure 6 is identified as preliminary regional groundwater level contours and flow

directions; correct?
A. That's correct.
Q. And could you describe the information on wells to the north and west of the M3 property that you used, which ones you used?
A. Well, we used a series of wells that we determined had the depth to probably, but not necessarily, tap the very top of the Pierce Gulch Aquifer, because it's deeper in that direction. Many of the wells don't penetrate deep enough.
So we collected water levels from those wells, but these were not survey wells. They're wells we had elevation from a handheld GPS and topo maps.
Q. And those wells you got handheld information from GPS and topo maps, is that the top of the well or the water table?
A. Well, we would get the top of the well, and then we would measure the depth of the well.
Q. And did you measure the depth of the wells?
A. I wasn't part of that. We would have well logs on most of these wells that would indicate depth of the well. But I don't know if

the well depth was measured.
Q. Do you know which of those wells actually were used to assist in directing -- or in placing the arrows for the groundwater flow?
A. Well, in this figure all of those wells were used to place those arrows, because they were used to calculate the groundwater flow contours.
Q. Did you just say that you didn't necessarily have all -- you didn't know if the -- what those wells were representative of the Pierce Gulch Sand Aquifer?
A. No. We had to use drillers' reports, which are not always reliable, so we didn't have so much confidence in what was going on in that western area.
Q. And did you have firsthand knowledge of the well construction of those wells?
A. Me? I don't have firsthand knowledge of that.
Q. Do you know if those wells were sealed from top to bottom?
A. I do not know.
Q. Is it possible that there could be intermixing of aquifers between those wells?

A. It's -- based on what I have seen of wells in the Treasure Valley area, it's probable that many of them have mixing.
Q. Okay. And if you could go to -- back to Exhibit 47, Dr. Ralston's report. And on figure 9.
A. I am there.
Q. Okay. And as an example, you see the elevation 2477 --
A. Yes.
Q. -- on the well?
And that -- I'm trying to read with my poor eyesight. That contour is somewhere around 2477; is that --
A. Well, it would be 2475 would be the contour.
Q. Okay. Thank you.
And then immediately to the north in what's called the Willow Creek Aquifer you see an elevation of 2355, right, or a contour line of elevation 2355 on that black dotted line?
A. Yes.
Q. And there are no flow arrows between -- or do you see any flow arrows between 2477 to perpendicular and towards that contour

line 2355 coming out of the Pierce Gulch Sand Aquifer?
A. I do not see any flow arrows.
Q. Is that due to the -- what is depicted as a green line, that fault then?
A. It's not a fault, but it's a no-flow boundary.
Q. No-flow boundary. And then I see over to the north and west a well elevation of 2412.
A. Yes.
Q. What information do you have in terms of the well construction for that one?
A. Give me one moment, please.
Q. You bet.
THE HEARING OFFICER: Let's go off the record again.
(Recess.)
THE HEARING OFFICER: We're recording. Now, I think the question had to do with information about a particular well, Mr. Thornton, of Mr. Utting.
MR. THORNTON: Yes.
Q. The well that is depicted on figure 9 of Exhibit 47 as 2412.
A. Yes.

Q. And that 2412 represents the water level --
A. Water level.
Q. -- groundwater level? I'm sorry.
A. It's the elevation of the groundwater.
Q. The elevation of the groundwater level.
And were you there during the construction of that well?
A. No, I was not.
Q. Do you have information on how that well was constructed?
A. We have a well driller's report, we have some of the information summarized on a table sent to IDWR, but not everything that's on the well driller's report is included on the table.
Q. And do you have the year that well was constructed?
A. July of 2004.
Q. And do you know what method was used to construct that well?
A. I do not.
Q. Do you know who the well driller was, the company that drilled that well?
A. I personally do not.

Q. Do you know if that well was sealed from top to bottom?
A. I do not, but I suspect it was not.
Q. Do you know the depth of that well?
A. Yes.
Q. And the depth of that well is?
A. It's 421 feet.
Q. Okay. And that's below ground level; correct?
A. That's correct.
Q. How many miles, approximately, to the west of that is it from the M3 property from your panhandle area where you had some of your very good wells you put in?
A. I would say it looks about 8 miles, if I'm measuring correctly with my fingers.
Q. Maybe we should --
A. It could be 10. 8 to 10 miles.
Q. And over -- the aquifer -- as identified, the dip of the aquifer, as I have heard testimony, could be 200, 300 feet per mile?
A. It's approximately 100 feet per mile beneath the M3 site.
Q. Okay. And if it was a hundred feet per mile from the M3 site and if you went 8 or

10 miles, would that not potentially put the -- if you're following that dip that we heard about, put it between 800 or a thousand feet?
A. It would if we were going directly down-dip. But in fact, we're going slightly down-dip, but mostly across on the strike, in which case the actual projection, if you were to draw a 45-degree line at the end of the panhandle, we would then see that maybe it was a mile or two down-dip from the projection of that plain.
Q. What information do you have to show the strike of that Pierce Gulch Sand Aquifer?
A. The strike of the aquifer in the M3 area is based on the contour map of the base of the PGSA that we produced from the geophysical analyses of the wells in that area.
Q. And what are the depths -- at the M3 property, what is the bottom and approximate top in the M3 area of the Pierce Gulch? Excuse me. Let me try to rephrase that.
What would be the top of the Pierce Gulch Aquifer and, say, the bottom of it at the M3 site?
A. Well, it depends on where on the site you are. Certainly out by the green line, it's at

ground surface for the top of the aquifer. The depth of it can be zero at the green line from the bottom of the aquifer because it's reaching ground surface.
If we want to look at the depth at test well 1, for example, we can look at one of the cross-sections, and we can see -- well, let's just look at test well 4. Of course, there's a higher elevation around there.
As I recall, it's going to be around 300 feet at the top. If we want exact numbers, let's refer to a figure with the cross-section.
Q. And if -- it may be okay, just a range. If you want to get exact, that's fine. And if you think you need to, we sure can.
A. Well, depends on how much accuracy you want in that estimate.
Q. I guess the question I'll ask, and then maybe we can decide on the accuracy needed, how certain are you that the well represented at 2412 is indeed in the Pierce Gulch Sand Aquifer?
A. I'm not entirely certain.
Q. So without being entirely certain of -- if that is in there, if the well represented by 2412 is in the Pierce Gulch Sand Aquifer, does

that lend some uncertainty to your contour flow lines?
A. Yes. In fact, you'll see that we're getting dashed lines out of that area that shows that we're not entirely confident with that.
Q. And then all the other wells that were depicted in figure 6 of -- that we've been discussing northwest of the property and into the Pierce Gulch Sand -- or going up into the Emmett Valley -- the Payette Valley, I should say, do we know if those are in the Pierce Gulch Sand Aquifer?
A. Which wells specifically?
Q. Ones -- ones that are northwest of the M3 property, any of them, how many of those do we know for certain are in the Pierce Gulch Sand Aquifer?
THE HEARING OFFICER: Can we refer to a document?
MR. THORNTON: Yeah. Figure 6, I'm losing track, 42A, tab 4.
MR. ALAN SMITH: Tab 4, yeah.
Q. (BY MR. THORNTON): The one we were earlier on when I asked you a question which wells -- what well information did you have

northwest of the M3 property. And I'll wait until you get to that.
Are you on that?
A. Yes.
Q. I believe I heard you testify a little while ago that the wells west and north are probably but not necessarily in the Pierce Gulch Sand Aquifer?
A. That's correct.
Q. And then again, you don't have intimate knowledge on the well construction of those; is that correct?
A. That is correct.
Q. Okay. And how much confidence do you have in those wells overall for using those in your modeling?
A. Well, I wouldn't say -- we use them in the modeling to help us understand the geology in that area and some of the water levels. But as you can see from the dashed lines, that's the area that we have less confidence in.
And in a way, it doesn't really matter, because what we're really looking at would be the impacts that pumping within 5, 8 miles of the M3 site would have, basically, with the area

of the protestants, the area between Eagle, Star, and the M3 site. And in that area we have a very high degree of confidence.
In areas further away, we have less confidence, and we're not trying to predict the impacts in those areas. If in fact it was important to predict the impacts in that area, then I believe M3 would have us go out and drill these hundred thousand dollar wells and do these expensive studies.
But we looked at the area where the impacts were going to be the greatest, where people were the most concerned, and that's where we concentrated spending the money to collect the data and do the analysis.
Q. And then you identified just now that you were looking at emphasizing areas where the people have the greatest concern?
A. Sure.
Q. Did you not testify earlier in -- that your model does not -- and was not developed to evaluate the shallow aquifers, the effects of the shallow aquifers?
A. It only gives an approximation, because it's not calibrated to those shallow

aquifers. That's correct.
Q. Would you say that the number of domestic wells constitute a number of people that may be concerned about their water in their wells?
A. Yes.
MR. THORNTON: I think that's my last question. Thanks.
THE HEARING OFFICER: Okay. Mr. Smith, do you want to launch with Mr. Utting, or do you want to --
THE WITNESS: Mr. Utting would love to be launched. I'd love to finish this up.
MR. ALAN SMITH: Do you want to finish?
MR. FEREDAY: Mr. Hearing Officer --
THE HEARING OFFICER: I don't have an objection to --
MR. FEREDAY: We would like to finish, if possible tonight, even if we had to go a little late with Mr. Utting.
THE WITNESS: May I interject?
THE HEARING OFFICER: Let's go off the record.
MR. FEREDAY: Let's go off the record.
THE HEARING OFFICER: Let's go off the record.

(Recess.)
THE HEARING OFFICER: We are recording again.
Mr. Smith.
MR. ALAN SMITH: All right. Thank you.

CROSS-EXAMINATION
BY MR. ALAN SMITH:
Q. Mr. Utting, I'm going to try to recall some of your testimony here. And if I don't state it accurately, you correct me, please. I think you said, if I recall correctly, that the flow from the -- or the Pierce Gulch Aquifer was able to sustain a number of wells at 2,000 gallons per minute?
A. That is correct.
Q. What number do you have there?
A. Well, I was only looking at the amount that M3 has requested in their water rights application, which would be a total average withdrawal of 9.03 cfs. So I rounded that up to 10 cfs, which would be three wells at 1500, or two-and-a-half wells or less producing at 2,000. The site can produce more, but that is not what M3 needs or wants. So I did not address that.

Q. Well, we've heard testimony, I believe, from four wells to five or six, verbal testimony. And I believe Exhibit 42 states maybe as many as 15 wells.
A. Well, if we had 15 wells, we would have to have a smaller average pumping out of each well so that the total amount was the equivalent of pumping three wells at the slightly under 1500 gpm.
So the number of wells is not the important thing here. What's important is how much water is coming out of the ground. If you have more wells, you have to pump less to stay within your water right allocation.
Q. But your water right application isn't only the 9.03, is it?
A. That is the average withdrawal over the year. That's really what determines the impacts to people in the area. You have a short-term pumping at a higher rate. As we saw in the pumping test, it takes awhile for those drawdowns to move outward.
So a day or two of peak pumping at your summer hot period, then you drop back down, you won't see that huge amount. M3 will be

limited to the 9.03 if this water right is approved for their average long-term pumping at full build-out.
Q. I believe you said the long-term impacts will result in some measurable effects on other wells.
What do you mean by "some"?
A. Well, we have used the computer model to predict the impacts in the Pierce Gulch Sand Aquifer. And in the area of the protestants' wells, we believe that those wells completed in the Pierce Gulch Aquifer could have measurable drawdowns of 10 to 15 feet.
What Mr. Dittus has testified, though, is that we may be overpredicting just because of what he has seen in his production wells that have been producing for 10, 15 years and longer.
Q. And I believe you said you calculated the flow rate of the PGSA, that that was only a calculation?
A. I made a calculation of the flow that is occurring now beneath the M3 site with M3 not pumping any supply wells.
Q. And I believe you said that multiple pumping wells were put into your model.

How many is "multiple"?
A. Well, we went through the water rights listed within the model area. And believe me, there were hundreds and hundreds and hundreds. So all those listed water right wells were put in.
We then looked at the number of domestic wells in there, and assuming that they were not in the water right database and assumed a pumping rate. So I guess the answer is thousands. I would say probably somewhere close to 3,000 wells.
Q. And I believe you said you felt that monitoring was very essential.
My question to you is, who's going to do all that monitoring when M3 is gone and HLI is no longer being compensated to do it?
A. Well, right now the Department is monitoring wells. There's a program to monitor wells. The USGS has been monitoring wells. I personally don't know the answer to that question. M3 has got 30 years to build out this project. There will be a gradation as more and more water is needed.
So I'm guessing for the next 30 years it's going to be M3, at least monitoring some of

those wells, because they need both to protect their water supply and other people making claims that their wells have caused problems, when in fact it may be related to something else.

Q. And again, I'm quoting from what I recall your earlier testimony. I believe you stated that overlying shallow aquifers in the northeast near the Lexington Hills and west toward M3 may be connected to the PGSA.

A. I believe there's a degree of hydraulic connection. Our model demonstrated that. The pumping test demonstrated that, yes.

Q. All right, then. Could this cause some more of these senior water right holders to have to lower their wells, lower their pumps, drill their wells deeper?

A. Well, if there's a well that is just tapping the top of that aquifer and it has flaws in its construction or pump setting or a clogged well screen, then that may occur.

Q. Suppose it doesn't have any construction flaws?

A. Then a properly-constructed well that's completed at -- within the aquifer at a reasonable depth that has a proper well screen

that's developed and the pump is deep enough, I believe they will not experience any noticeable impacts.

Q. All right. I believe you stated in your earlier testimony that it's your opinion that the PGSA flows to the Payette.

A. I believe a portion of the water within the PGSA does flow to -- beneath the Payette Valley, yes.

Q. And I think Mr. Thornton asked you this, but let me ask it again, my last question, I believe: You heard Mr. Glanzman say either this morning or yesterday or maybe both that he can't find any evidence of PGSA water in the Payette area?

A. I heard that.

Would you like me to comment?

Q. If you'd like.

A. Our analysis shows that the wells that Mr. Glanzman analyzed in the Emmett area should not be receiving water from the PGSA. That's an area where if there's any upland aquifers discharging water, it would be the Willow Creek. But in fact, water flowing through the Payette Valley has other sources of recharge, a lot of

that being seepage from the Payette River.

So his geochemistry showed a different chemical signature than the PGSA. And that's good, because none of our analyses show that the PGSA should discharge water to the area in those wells that Mr. Glanzman had data from.

Q. Where is that water going, then?

A. Where is which water going?

Q. This PGSA water that --

A. I believe it's discharging further to the west. Some of it into the groundwater system beneath the Payette Valley, some of it beneath the Snake valley, and some of it beneath the Boise.

Q. No hard evidence of that?

A. I suppose all the tools work together to show that that's the situation. The presence of the aquifer, the water levels that we've measured, the previous maps by the USGS, all of those show that we would have flow in these various directions. So I believe it flows there.

And our analyses with the model shows that even if the water can't make it to the Payette from the M3 site, it really doesn't matter in terms of the impacts, the area that we're looking at from the predicted pumping that they

anticipate will do.

MR. ALAN SMITH: That's all the questions we have. Thank you.

THE HEARING OFFICER: Okay. Mr. Edwards?

MR. EDWARDS: No.

THE HEARING OFFICER: Okay. Mr. Fereday, redirect?

MR. FEREDAY: We have no redirect.

THE HEARING OFFICER: Okay.

MR. FEREDAY: And that concludes our direct case.

THE HEARING OFFICER: Let's go off the record for a minute.

(Recess.)

THE HEARING OFFICER: Okay. I'm not sure whether it was on the record, I think it was, Mr. Fereday, but you indicated that you rested your presentation of evidence.

MR. FEREDAY: That's correct, Mr. Hearing Officer. We do have additional witnesses whom we may call on rebuttal or call back some of the previous witnesses for rebuttal. But at this time we do rest our direct case.

THE HEARING OFFICER: Okay. And I would just add that I had some questions that I could

have asked Mr. Utting, but I think in the interest of efficiency and the time, I don't think I'll go into it at this point. And I assume Mr. Utting will be offering some rebuttal testimony, and we can cover some of that during that rebuttal testimony.

Okay. Anything else at this point?

MR. THORNTON: No.

THE HEARING OFFICER: Thanks for your help.

MR. THORNTON: Thank you.

THE HEARING OFFICER: And we'll stop the recording and come back on the 11th.

(Proceedings concluded at 5:08 p.m.)

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REPORTER'S CERTIFICATE

I, JEFF LaMAR, CSR No. 640, Certified Shorthand Reporter, certify:

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath by me.

That the testimony and all objections made were recorded stenographically by me and transcribed by me or under my direction.

That the foregoing is a true and correct record of all testimony given, to the best of my ability.

I further certify that I am not a relative or employee of any attorney or party, nor am I financially interested in the action.

IN WITNESS WHEREOF, I set my hand and seal this 13Th day of May, 2009.

JEFF LaMAR, CSR NO. 640
Notary Public
Eagle, Idaho 83616

My commission expires December 30, 2011

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