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BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF THE NORTH SNAKE AND MAGIC VALLEY GROUND WATER DISTRICTS' 2009 JOINT MITIGATION PLAN FOR 2009 (Blue Lakes)	**Docket Nos. CM-MP-2009-001** **CM-MP-2009-002** **CM-MP-2009-003**
IN THE MATTER OF A&B IRRIGATION DISTRICT'S RULE 43 MITIGATION PLAN (Water Right Nos. 36-02356a, 36-07210, and 36-07427)	**AFFIDAVIT OF DANIEL V. STEENSON**

STATE OF IDAHO)
) ss
COUNTY OF ADA)

DANIEL V. STEENSON, being first duly sworn upon his oath, deposes and says that:

1. Attached hereto as **Exhibit A** are true and correct copies of portions of the transcript of the Deposition of Alan Haines Wylie, PH.D., taken on October 24, 2008.

2. Attached hereto as **Exhibit B** are true and correct copies of portions of the transcript of the Deposition of Cindy Yenter, taken on October 21, 2008.

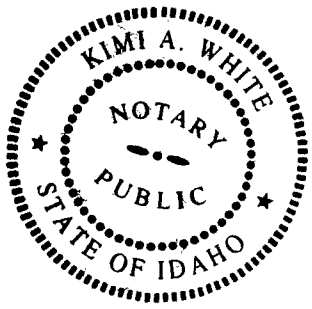
3. Attached hereto as **Exhibit C** are true and correct copies of portions of the transcript of the Deposition of Alan Haines Wylie, PH.D., taken on November 13, 2009, and Deposition Exhibits 40 and 43.

Further your affiant sayeth naught.

Dated this 16th day of December, 2009.

Daniel V. Steenson

SUBSCRIBED AND SWORN to before me this 16th day of December, 2009.



Notary Public for Idaho
Residing in Boise, Idaho
My Commission Expires: 4/20/10

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 16th day of December, 2009, I served a true and correct copy of the foregoing **AFFIDAVIT OF DANIEL V. STEENSON** by delivering it to the following individuals by the method indicated below, addressed as stated.

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Daniel V. Steenson

Exhibit A

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF)
DISTRIBUTION OF WATER TO)
WATER RIGHTS NOS. 36-04013A,)
36-04013B, AND 36-07148)
(SNAKE RIVER FARM))
_____)

DEPOSITION OF ALLAN HAINES WYLIE, PH.D.

OCTOBER 24, 2008

REPORTED BY:

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

Notary Public

A. No.
Q. Okay. Allan, with respect to your work on the model, have you done additional work on the model since you were last deposed?
A. Yes.
Q. Can you describe the work that you've completed on the model or started on the model since you were last deposed?
A. The modeling committee is working towards the release of version two of the Eastern Snake Plain Aquifer model. And as part of my duties on the modeling committee, they assign me calibration runs to conduct between our every-other-month meetings that we have.
Q. And what's the reasons for this additional work that the modeling committee and you specifically have undertaken?
A. Just to keep the model up-to-date with our current understanding and add -- you know, we're continuing to gather more data and update the model with the new data and our improved understanding.
(Mr. Bromley joins the proceedings.)
Q. (BY MR. SIMPSON): And so would that be consistent with basically your understanding of

what the Department or others have identified as adaptive management?
A. I don't know.
Q. You're not quite certain what "adaptive management" would mean?
A. No.
Q. But with respect to the model itself, as new data becomes available, new information becomes available, it's the modeling committee's perspective and yours that that information should be incorporated into the model?
A. Yes.
Q. And from your belief, would that also apply to any other analysis or computations done by the Department; for example, with respect to observations of well data or spring-flow data and computations associated with the administrative orders?
A. Yeah. My -- I think that the Department should try to use the most current up-to-date data and techniques always.
Q. Okay. So then, have you done any additional work, for example, on identifying the percentage of springs to the subreach gains, if you will?

A. I know Tim Luke was looking at that.
Q. Okay. You provided some testimony at the spring delivery call?
A. Yes.
Q. And part of your testimony related to that issue of the percentage of essentially the source of water for Snake River Farms to the reach gains; correct?
A. Correct.
Q. And have you done any additional work or been involved with Tim Luke or others regarding the assessment of that percentage?
A. Tim contacted me. And if memory serves, what he asked me to do was review what he had done. And I just don't remember much more than that.
It's a serious -- a serious limitation that the model works to reaches and the spring users, you know, can't take the water from the whole reach. They get the water from their spring. We all recognize that that's a limitation.
Q. Right. And that limitation is attempting to correlate a spring and the amount of flow that would come out of a spring or a source

of water to the whole reach itself; correct?
A. Correct, yes.
Q. Okay. And from your perspective, then, would continued efforts be desirable to better describe that relationship between a spring or a source and the reach?
A. Yeah, they're -- yes. It would be desirable to improve that.
Q. Right. And so if we were able to improve that through your efforts or the efforts of others, that would be relevant information in terms of accurately describing the amount of water that would appear in a spring or spring source as a result of actions taken on the plain?
A. That would be desirable, yes.
Q. And by "plain," you understand that I mean the Eastern Snake Plain?
A. Yes.
Q. Okay.
A. It would, of course, have to be something that the committee also approved of.
Q. Allan, would decreasing the size of the nodes and the cells in areas adjacent to the canyon walls help in defining specific spring discharges?

A. I don't think cell size is our most serious limitation. It's the ability to get -- to monitor discharges from all the springs that's the -- that's holding us back. And one of the things that's -- makes that the most difficult is the way the springs are all plumbed.

Q. You mean the varying elevation of the springs and where they discharge and not being able to measure those accurately?

A. Well, if you go to a spring, you see that maybe in many cases three or four hatcheries are getting water out of one spring or one spring complex.

And then you start to talk to all the hatchery owners and, you know, "Could we monitor the water coming from this spring?"

And "Well, sort of, because I also get water from this spring complex over here (indicating)." And they're joined before they come into the hatchery.

So, you know, just a tangled web of plumbing to get all the water together, and there are very few places that it's really doable to monitor the flow from one spring or one spring complex.

So, you know, what we're doing is we're gearing up to monitor all those that are doable and then start trying to figure out how to tackle those that are much, much more complex.

Q. When you say you're gearing up, it implies that you think it's a worthwhile exercise?

A. Oh, it's definitely worthwhile, yes. It's not easy. But if it were easy, it would already have been done by now.

Q. Have you looked any further at the concept of preferential pathways for which you provided some testimony on in the spring-user case?

A. There are definitely preferential pathways.

Q. And would those preferential pathways that you acknowledge exist, would those exhibit a characteristic that might not be linear in terms of as the aquifer either increases or decreases you may see a different rate of flow as opposed to those areas or those springs that aren't preferential?

A. Yes. The -- the springs connected through -- to the aquifer through preferential pathways will respond differently than the springs

that are -- have a less robust connection to the aquifer.

Q. So in other words, then, those preferential pathway springs might at higher flows exhibit more or less flow coming out of the spring source as opposed to one that wasn't preferential?

A. That's correct.

Q. So as the aquifer declined, the relationship between flows and the decline in the aquifer might not be linear?

A. The stage -- theoretically, the stage and discharge if the elevation of the spring was fixed, a point -- if it was a point, then there would be a linear relationship between stage in the aquifer and discharge from the spring.

If the spring was a complex, so there were different elevations for different parts of the spring, then there would be a nonlinear relationship between aquifer stage and discharge from the complex.

Q. Okay. And so if I recall correctly, in your testimony at the hearing you looked at the Covington and Weaver flows at near-peak periods, we'll say, and looked at the flows of the springs associated with Snake River Farm's source of water

compared to the springs throughout that reach; correct?

A. Yes.

Q. And did a comparison, a proportional comparison --

A. Yes.

Q. -- to come up with the percentage figure; correct?

A. Correct.

Q. And so depending upon whether that spring complex was one spring or a spring complex would define whether or not that percentage and that linear assumption would be correct or not; correct?

A. The percentage breakout of assigning a percentage of the reach -- spring reach gains to Clear Lakes is -- to the Snake River Farm is a linear apportionment. It's not a linear breakout based on aquifer stage and spring discharge, though. It is a linear relationship.

Q. Well, it was just one snapshot in time --

A. Yes.

Q. -- the relationship between that spring and flows throughout the reach; correct?

would depict that water levels have continued to decline in the western half of the aquifer; correct?

A. Correct.

Q. And that decline would also then manifest itself in spring discharges in the Thousand Springs reach?

A. Yes.

Q. Allan, do you recognize those documents? I'll represent that those were part of a production made Tuesday in connection with either Mr. Luke's deposition or Ms. Yenter's, and at the end of the deposition we had them in front of us and we weren't sure what they were.

Do they appear to be part of an exhibit that we've already marked?

A. They do. They appear -- this appears to be the 2007 CREP, part of Exhibit 31. This also appears to be part of 31, the first page of 31. This is the second page of 31. And this would be the third page of Exhibit 31.

Q. Okay.

A. So those are all part of Exhibit 31.

MR. SIMPSON: Okay. So just a duplicate. We've already marked them.

Thanks, Allan. That's all the questions I have.

EXAMINATION

BY MR. STEENSON:

Q. Allan, as you know, my name is Dan Steenson. And I represent Clear Lakes Trout Company as well as others who use spring water in the Thousand Springs area.

Now, about your dream.

MR. SIMPSON: Easy questions.

Q. (BY MR. STEENSON): I want to follow up on a few of the questions that Mr. Simpson asked you. You mentioned early on you were surprised by the amount of sediment that you found by reviewing certain monitoring well data.

Did that data indicate at what depth the sediment was encountered?

A. It's all below the ESPA.

Q. So what does that mean, "below the ESPA"?

A. The Eastern Snake Plain Aquifer is believed -- well, defined as quaternary.

Q. Could you spell that for me?

A. I can try. I'm dyslexic.

Q-u-a-t-e-r-n-a-r-y. When I review this, I can get it right.

And that's fairly -- geologically speaking, fairly young basalt flows.

Then there are older basalt flows in some places below -- or tertiary-age basalt flows below the quaternary basalt flows in some places. Some places, the bottom of the basalt of the ESPA is rhyolite; in other places, it's sediment.

Geologically, I was expecting near Buhl that it would be rhyolite. I was surprised that it was sediment.

Q. In any case, it's below the level of springs, the elevations of the springs, along the Thousand Springs reach?

A. That's correct.

Q. You said that you hadn't looked at 2008 data.

But other than Exhibit No. 33 that you looked at in answering Mr. Simpson's questions, were you aware that ground water levels have been dropping since 2005 and indeed since 2007 and 2008?

A. Yes.

Q. And were you aware that spring flows

as well have been declining from 2007 to 2008 as well?

A. Well, what I've looked at are in Exhibit 18. And that shows water levels on figure 4 on page 9 from a transducive that we have operating along the North Side Canal system near Wilson Lake.

And it appears from this that the declines since 2004 have been have been fairly modest in both most of the springs and the wells. A notable exception would be Briggs Spring. The declines during 2007 appear quite abnormal in Briggs Springs.

Q. So when you were answering Mr. Simpson's questions and you said that there were USGS data indicating that spring flows were stabilizing, what do you mean when you use the term "stabilizing"?

A. They're -- the rate of decline is much less since 2004 than from 2000 up to 2004.

Q. How would you quantify the rate of decline and the decreasing rate of decline that you're referring to?

A. Since 2000, the -- for instance, the Wilson Lake well has declined -- between 2000 and

2004, the Wilson Lake well declined about 17 feet. And since 2004, it has declined less than an additional foot.

Q. And are there other areas where you can make similar references?

A. We have three wells along the North Side system with transducers in them. The Wilson Lake well is the well with the most complete record. Things periodically go wrong with transducers.

Q. Your statement referenced spring flows, as I recall.

A. Yes.

Q. You're referring now to wells?

A. Yes.

Q. Do you have data that relates to spring flows, not simply well levels?

A. Yes. If we look at page 15, figure 11 is a graph of Briggs Springs.

Q. And is that of Exhibit 18?

A. Yes. You can see that sudden drop in 2007 on Briggs. That's unusual. But again, you can see that the decline up through about 2004 was more steep than the decline since 2004, with the exception of that drop in 2007.

Q. And I take it you don't have --

A. Figure 10 is --

Q. Allan, if I could.

A. Sure.

Q. I take it you don't have data yet through the remainder of 2008 to further this line, to show where it would be this year, how low it would be this year at Briggs Springs?

A. I haven't updated that.

Q. And what would be the most recent month of data reflected in this table you're talking about at page 15? That's the top figure.

A. I believe I -- yes, I -- I published this in June. So for Briggs, that would be within a few months of June. The data for Box Canyon, Briggs Springs, and Blue Lakes aren't updated all that often by the USGS. It would be within a few months of June.

Q. So thinking about current events, this looks like a graph of a bear market to me --

A. Yes.

Q. -- where the highs are lower and the lows are lower; would you agree with that?

A. Yes.

Q. Okay.

A. Something unusual happened in Briggs. If you look at figure 10, you can see Blue Lakes. And that's -- should be of interest to you. It doesn't look like 2007 was a particularly good year for Blue Lake Spring either, although it didn't drop as low. The high didn't go up as high as it has in the past.

Q. Now, in your modeling work, does your modeling work unable you to formulate expectations for what a spring like Blue Lakes Springs would be producing? In other words, does this data reflected in the figure on Blue Lakes Spring at page 14 of Exhibit 18, how does it compare to what the model would lead you to expect for Blue Lakes Spring?

A. This is neither -- what happened in 2007 for Blue Lake or Briggs -- of what I would have expected. Something unusual happened.

Q. For both?

A. For both.

Box Canyon is different. That's on page 16. It would appear that the bad year for Box Canyon was 2005.

Q. In the current economic vernacular, Box Canyon capitulated 2005; is that what you're

saying?

A. Yes.

Q. But neither the model nor any other information the Department has available to it gives the Department a basis for explaining these differences among the springs; is that correct?

A. No, I cannot explain.

Q. Now, in looking at your post audit for 2007 -- that is, Exhibit 31 -- the post audit related to the late-season recharge specifically.

Do I have the right exhibit?

A. Yes.

Q. And I'm now looking at page 21 of Exhibit 31. And looking at those graphs in figure 18 and reading the conclusion, it appears that what you observe is that -- or whoever prepared this document --

A. It was me.

Q. Was it you?

You conclude that the benefits from late-season recharge events such as this one is short lived. It doesn't last very long.

Is that --

A. That's correct.

Q. Okay. So that by the time we get to

the following irrigation season, the benefits from late-season recharge would be gone?

A. Very modest. For the Buhl to Thousand Springs, it would be around 1 cfs at its peak, the benefit.

Q. Okay. And what are the -- I forget the term you used -- key or monitoring springs that you are looking at for data? It sounds like Box and Briggs.

What are the others?

A. The USGS monitors Box Canyon, Briggs Springs, and Blue Lakes. The Department is taking over Blue Lakes Spring, and we're monitoring -- we're also picking up Blind Canyon. I believe we're picking up Lower White. We're going to try to pick up Rangen and the main spring at the National Fish Hatchery. And there are two springs in the Malad to Bancroft reach that we're adding.

Q. Did you have any basis for formulating for yourself or for the Department any expectations as to spring flows for any of these major springs this year, what the spring flows would be looking like for this particular year, 2008?

A. No.

Q. Why is that not done? Why has that not occurred in the process of analysis of the hydrologic condition of the ESPA and springs below Milner?

A. I suppose it's not done because no one's ever asked for it to be done.

Q. And you gave a similar answer in response to a question John asked about a letter going out; right?

A. Yes.

Q. Is it possible to do forecasts for spring flows as you do for, what, river flows above Milner?

A. In fact, some effort. We've asked the University of Idaho to help us try to forecast spring flows in the Fort Hall bottoms.

Q. And intuitively and anecdotally, given the kind of winter we had and the diversions that perhaps you know about through the main canals and the level of depletions, would you have expected flows of the springs to exhibit further declines, the lows going lower this year in 2008, or would you have expected, as you explained before, stabilization this year in 2008?

A. Well, I was surprised at what happened

for -- in 2007 for Briggs and Blue Lake. So when I get a chance to look at what -- at 2008, I think I'm not likely to be surprised because I've scaled my expectations.

Q. But prior to seeing the 2007 data, I take it you would have expected Blue Lakes Springs, for example, to be stabilizing at this point in time; correct?

A. That's correct.

Q. Based on your work with the model and all the other information you have available to you?

A. That's correct.

Q. Does this suggest that some aspect of the modeling work and the other work that's been done is not giving an accurate basis for setting expectations for spring flows going forward?

A. It certainly suggests that we need to incorporate the new data into the model and see how that changes things.

Q. You thought we would have reached capitulation at more of these springs at this point, I take it?

A. Yes.

Q. Just like the modelers working for

Greenspan and on Wall Street, there seems to be something amiss; correct?

A. It always -- let's see. Nature is always more complex than our models.

Q. And don't worry, I'm not going to ask you about your investment portfolio. I may get back to your dreams, though.

Is the source for Snake River Farms a spring complex or a point? in the terminology that you used when you were answering Mr. Simpson's questions earlier.

A. I asked Dr. MacMillan to give me a tour of the Snake River Farm. And when he did, it appears that there's a complex of springs that discharge and -- at various points. And they attempt to collect the data from the discharge from these various points and run it through their facility.

Q. So it would be a spring complex?

A. It would be a complex.

Q. And since we've been talking about Blue Lakes, would the source for Alpheus Creek be a spring complex or a point?

A. The Blue Lakes is a -- discharges at a canyon -- out of a canyon wall. And there's a

Exhibit B

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF)
DISTRIBUTION OF WATER TO)
WATER RIGHTS NOS. 36-04013A,)
36-04013B, AND 36-07148)
(SNAKE RIVER FARM))
_____)

DEPOSITION OF CINDY YENTER

OCTOBER 21, 2008

REPORTED BY:

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

Notary Public

THE DEPOSITION OF CINDY YENTER, was taken on behalf of Clear Springs Foods, Inc., at the offices of Idaho Department of Water Resources, 322 East Front Street, 6th Floor, Boise, Idaho, commencing at 9:08 a.m. on October 21, 2008, before Jeff LaMar, Certified Shorthand Reporter and Notary Public within and for the State of Idaho, in the above-entitled matter.

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EXHIBITS

INDEX (Continued):

EXHIBITS

we do because we like to update hydrographs in the middle of the year. And always when we do, of course, they give it to us. I seem to recall that we asked for data through March of '07. But I can't really remember for sure.

Q. Okay. I'm going to show you some tables. And these tables may not be in the form you get them from Blue Lakes, but these tables I'll represent to you indicate measurements by Blue Lakes of Alpheus Creek and their diversion.

You're aware, of course, that this year Blue Lakes is receiving an additional 10 cfs?

A. Yes. I'm delivering that, yes.

Q. And you began delivering that in April, did you not?

A. Approximately. Yeah, it was sometime in the middle of April --

Q. Okay.

A. -- that was turned in.

Q. And would your expectation have been with that delivery of 10 cfs from Pristine Springs over to Blue Lakes that Blue Lakes would receive 10 cfs more this year throughout the season than it did last year?

A. No. My expectation would have been

they would have received 10 cfs more than they otherwise would have received.

Q. Right.

A. It's really kind of difficult for me to compare it.

MR. STEENSON: Off the record for a moment.

(Discussion.)

MR. STEENSON: Let's go back on.

Q. So, Cindy, are you aware or have you evaluated the data yet to determine flows on a monthly basis in '07 and flows on a monthly basis in '08 at Blue Lakes Springs and compared them?

A. I don't know that we have created those hydrographs yet.

And I guess I should probably take the opportunity to correct what I had said earlier regarding data from Blue Lakes Trout.

We do have the 2007 full year record. I believe we may have asked for some data in March of 2008 for those first three months of 2008. There may have been a hydrograph then prepared at or around that time which would have shown, you know, the historical diversions up through March of 2008. That, of course, would not have included any of the additionally delivered flow under the

mitigation agreement.

So no, I haven't really seen anything which would allow comparison between 2008 and 2007 after the extra 10 cfs were delivered.

Q. Are you aware that flows in July of 2008 on an average monthly basis, average daily basis per month, as compared to July of 2007 are lower by approximately 6 cfs?

A. I was aware of that, yes.

Q. Are you aware that flows in August of 2008 on an average daily basis for that month are approximately 6 cfs lower at the Blue Lakes Springs and Alpheus Creek as compared to August of 2007?

A. I was not actually -- hadn't actually made that connection yet. The reason I was aware of July was because the hatchery manager and I had talked about it.

Q. Now, when you learn of these unexpected declines in flows at a spring like Alpheus, the spring source for Alpheus Creek, what further actions or what further inquiry do you undertake on behalf of the Department with respect to that unexpected decline?

A. Really, my response to changes in

availability of supply on a surface water source like that is really more directly related to just instant administration of the rights on that drainage. I mean, I don't -- I don't really take any global action. You know, my focus is more immediate. And when the availability changes, then are the rights being administered properly? That's really the scope of my response to a change like that.

Q. And in this context in Water District 130, how is it different for you than in the typical surface water context?

A. It's not, really.

Q. Okay. So when you learned of the unexpected decline in flows at Blue Lakes in July, what actions did you take?

A. Really nothing out of the ordinary. I mean, I may have mentioned it to someone. I was, you know, concerned just from a water delivery standpoint. But I didn't -- I didn't run and sound alarms and ring fire bells if that's what you mean.

I mean, I didn't -- administratively there was really no action that I -- that I felt obligated to take, other than just make sure that

the diversions were recorded properly and administered properly.

Q. And of course, as compared to last year, the springs being down by 6 cfs would result in a benefit from the Pristine Spring water coming over to Blue Lakes as compared to last year only 4 cfs? If you're getting 10 cfs more from Pristine yet your spring flow is down by 6 as compared to last year, your benefit is only 4; correct?

A. Well, yes, mathematically, that's correct.

Q. So you discussed what you saw in July with whom within the Department in terms of the decreased spring flow at Blue Lakes?

A. Officially, Dan, I don't believe I discussed it with anyone. I may have mentioned that I had observed that the flows fell off. I never made an official statement of any type.

Q. Okay. Was any action taken by anyone else within the Department with respect to that unexpected decline that you saw in July?

A. I don't believe so.

Q. Now, in your duties as watermaster, did you observe this year generally when the

irrigation season began up on the plain, when ground water users began irrigating up on the plain?

A. Yes, that's generally fairly obvious to me.

Q. And when was that this year, if you recall?

A. Well, it was fairly late this year because we had a cool -- cool spring. There's no specific -- you know, I can't put my finger on a date, only that it was typically later this year because we had such a cold --

Q. Perhaps sometime into May or even June for a lot of the irrigators up on the plain because it was cold and wet?

A. It was cold and wet. There may have been some pumps that came on early because the spring was rather -- you know, was warm at times, but then it cooled down. You know, I -- by July 1, everything was on. It just seemed that June was -- there wasn't as much stuff on in June because it was cool.

Q. As I recall, it was the first half of June, the first couple of weeks of June, and then about mid-June the weather turned.

Is that your recollection?

A. That's my recollection.

Q. So to the extent there are immediate impacts to the springs from pumping, or were this year, they would not have been seen until after the irrigation season began in earnest, if you will, in mid-June?

A. To the extent those can be documented, that would have been the time frame, yes.

Q. Now, with your involvement in the implementation of mitigation plans, I wonder if you'd agree with me that there are some matters of ongoing concern as we evaluate the efficacy of mitigation.

One would be, would it not, is the extent to which the estimate of injury caused by junior ground water pumping to senior spring rights is accurate?

A. You're saying that's a valid concern?

Q. Yes.

A. Yes, it's a valid concern.

Q. So if information were discovered or developed to show that the estimate of injury caused by junior ground water pumping on spring rights was inaccurate, high or low or wrong in

some other way, you would expect, wouldn't you, that that would be a cause for some reevaluation by the Department, perhaps some change in mitigation plan requirements?

A. Yes, that would be cause for that.

Q. And then a second important factor would be, assuming that the estimate of the injury is correct, whether the mitigation that is offered or required, the extent of the mitigation that is required is sufficient to address that injury?

A. Yes, that's a determination that the director would have to make.

Q. And is subject to ongoing evaluation as these mitigation plans are evaluated and as the hydrologic circumstances of the aquifer are better understood?

A. I'm not intimately involved in the final decisions, but that's what I see happening.

Q. And what you would expect to happen?

A. What I would expect to happen, yeah.

Q. And then a third level of concern with regard to mitigation plan implementation would be whether the mitigation offered will produce -- the mitigation activities that are described in the plan would produce the required mitigation;

correct?
A. That's also an issue or a concern, yes.
Q. And you are more directly involved in this part of the process in terms of gathering data --
A. Correct.
Q. -- as the watermaster; correct?
A. Correct.
Q. And then you work with Tim Luke and Allan Wylie and others on an annual basis to evaluate the extent to which the mitigation activities have met their required goals; correct?
A. Correct, inasmuch as I'm providing the data and some of the insight into, you know -- well, not really insight. But I'm providing the hard data for Dr. Wylie to run the model scenarios.
Q. And the fourth area -- and I think if I understand your testimony correctly, this is where you're most directly involved -- is to ensure that the ground water users are actually performing the mitigation activities that are described in their plans; correct?
A. Correct.

Q. And have you in 2008 had occasion to find that ground water users -- any ground water users are not performing required mitigation activities?
A. Well, of course, that's kind of a loaded question because on the one hand we have an approved mitigation plan for Blue Lakes Trout, which I'm administering. So, you know, I have to say that one has been, you know, fulfilled as approved.
With regard to Snake River Farms, there just has never been an approved mitigation plan, so there's been nothing for me to verify up to this point.
Q. Sure. And as part of your administrative process, what would be your response if you discovered that mitigation activities that were required were not being performed?
A. Well, you know, this is all done in post audit. So basically, if a part of the mitigation plan, for instance, was idled acres -- and, of course, there were no idled acres. That component was not a part of any mitigation plan for past two years. But the earlier plans had

idled acres.
We would go out during the year and simply make sure those idled acres were idled. And if they weren't idled, then in the post audit they didn't get credit for them. I basically didn't go out and make them idled. That was not -- because they weren't illegally diverting. They were just not in compliance with their proposed mitigation plan. So they didn't get credit. But it all happened post audit.
Q. But it seems like your view would be that the fact that we're seeing spring flows that are lower than would have been expected for 2008 is a cause for the Department to investigate what might be the causes of those lower-than-expected spring flows and restructure mitigation requirements as necessary if the information you gather suggests that restructuring of mitigation requirements is required?
A. That could be one approach the Department takes.
Q. At a minimum it would seem that seeing lower-than-expected spring flows is a cause for concern within the Department, is it not?
A. I can't speak for the whole agency, of

course.
Q. I mean, speaking for yourself.
A. Speaking for myself, of course, it's a concern.
Q. Have you formulated any conclusions or opinion about how the ground water users' proposed application may affect water flows to Clear Lakes Trout Farm, Clear Lakes Trout Company?
A. You're speaking of the Snake River Farms mitigation plan?
Q. Yeah, the ground water users' mitigation plan for the Snake River Farms.
Have you made any conclusions or formulated any opinions about how any aspect of the proposed mitigation may affect flows to Clear Lakes Trout Company?
A. No, I have not.
Q. Okay. And is someone in the process of doing that?
A. Not really. The applications were all protested, and so therefore we have not made any determinations of sufficiency of any kind.
Q. And since there is an exhibit that's been marked related to the mitigation plan for Blue Lakes Trout Farm -- Exhibit No. 10, I think

Exhibit C

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF	)	
WATER TO WATER RIGHTS	)	
NOS. 36-04013A, 36-04013B, AND	)	
36-07148	)	Docket No.
(SNAKE RIVER FARM)	)	CM-MP-2009-004
(Water District Nos. 130 and 140))		
Third Mitigation Plan	)	
_____	)	

DEPOSITION OF ALLAN HAINES WYLIE, PH.D.

NOVEMBER 13, 2009

REPORTED BY:

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

Notary Public

THE DEPOSITION OF ALLAN HAINES WYLIE, PH.D., was taken on behalf of Clear Springs Foods, Inc., at the offices of Barker, Rosholt & Simpson, 1010 West Jefferson Street, Suite 102, Boise, Idaho, commencing at 10:35 a.m. on November 13, 2009, before Jeff LaMar, Certified Shorthand Reporter and Notary Public within and for the State of Idaho, in the above-entitled matter.

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Also Present:
John Koreny
Charles E. Brockway

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came up above land surface, then the committee would have felt that that was water that was coming directly from the ESPA through these older basalts, and then discharging. And that occasionally happens. One example would be Blue Heart Springs.

There's another example that I'm aware of where there's a flowing well below the rim. But for the most part, wells below the rim have much lower heads. And the committee did -- looked at a study by Dr. Dale Ralston where he collected elevations of wells in the Hagerman Valley and water levels from wells in the Hagerman Valley. And they don't rise up to the level of the Eastern Snake Plain Aquifer. They are more reflective of the level of water in the river.

So the committee concluded that wells below the rim aren't reflective and don't deplete the Eastern Snake Plain Aquifer.

Q. Okay. When you say "the committee," that's the ESPAM technical committee?

A. Yes.

Q. Okay. Okay. And they reached that conclusion when? In 2009 or in prior years?

A. Oh, certainly 2008.

Q. Okay.

A. The summer of 2008.

Q. Okay. So the reflection of the ground water elevations in the basalts below the canyon rim is, in your view, more reflective of the river elevation than it is necessarily the elevation back in the aquifer?

A. Yes.

Q. Okay. Does that address whether or not there's an interface between the upper basalts and the lower basalts in the aquifer?

A. No.

Q. Okay. So then is there still an interface in terms of water flow from the upper basalts down into the lower basalts to some degree?

A. Yeah, the -- the lower basalts tend to have -- be -- have a much lower hydraulic conductivity, permeability, if you will, so there's a strong preference for water to stay in the quaternary basalts, the younger basalts.

And the interaction with the lower basalts is --

Q. Not as free as it is in the younger basalts, the upper basalts?

A. That's correct.

Q. Okay. But would you not conclude that there is still some interaction between the upper and the lower basalts, younger basalts and the lower basalts in terms of water flow?

A. It's -- it's probably also dampened because there's a significant age difference there. There's likely a sediment deposit between the younger basalts and the older basalts, also insulating.

There's some instances that I know of coming down the grade, to the Buhl grade, you can see that interface between the younger basalts and the older basalts. And there isn't much of a sediment layer there.

So we can't say conclusively that there's always a sediment layer. But in many instances there is.

Q. Uh-huh.

A. It's in most things -- like most things hydrogeologic, it's not a clean cut. But there's a great deal of evidence suggesting it's not a strong communication.

Q. Okay. And that work you identified references Dr. Ralston's investigation?

A. Yes.

Q. Okay. Is that a document that you have?

A. It's on the modeling committee -- the ESHMC web page.

Q. Okay. Fair enough. Dr. Wylie, I want to return now to some testimony that you gave in the spring case.

And with respect to a calculation that's been described as a spring percentage, do you recognize that?

A. Yes.

Q. Okay. I thought maybe you would.

Do you recall that you testified in the delivery call case regarding the spring percentage of the calculated percent of the Snake River Farms spring complex to the Buhl to Thousand Springs reach?

A. Yes.

Q. And do you recall your testimony wherein you testified that you participated in that analysis?

A. Well, that I supplied the director the analysis I thought he wanted.

Q. Okay. And Mr. Luke also participated

in that calculation or analysis?
A. Yes.
Q. Okay.
MS. McHUGH: I'm just going to object to this line of questioning as being not relevant for the December 7th hearing, understanding that maybe it's relevant for some future hearing.
Q. (BY MR. SIMPSON): Do you recall that your statement in that case was that that analysis was not rigorous?
A. Yes.
Q. Okay. And in fact, didn't you admit in that testimony that you could not defend it?
A. Yes.
Q. And based upon those statements, would it be fair to say that a more rigorous analysis might be one easier to defend?
A. Oh, I view that as a post-modeling administrative adjustment. And I don't think I'm required to defend it.
Q. Fair enough. I'm not here today asking you to defend it.
But what I am asking is that because of your acknowledgment that it wasn't a rigorous analysis, would you agree it was perhaps at that

point in time an analysis that had to be completed in terms of the administrative hearing process?
A. Director Dreher felt the need to supply that analysis.
Q. Okay. And if there was a different or a more rigorous analysis of the relationship between actions on the aquifer and the results showing up in individual springs, is that something that you would entertain and perhaps defend?
MR. BROMLEY: Calls for a legal conclusion.
THE WITNESS: Much of -- much of what I do is at the request of the director. And, you know, I might be able to dream up something, but it might not be acceptable to whoever the next director might be. So I'm reluctant to say something that might come up would be acceptable.
Q. (BY MR. SIMPSON): Okay.
A. But it's possible that something more technically defensible could be presented. But I can't say that the Department would adopt it.
Q. Would you not recognize that if there is something more scientifically defensible it should be considered, in your view?
MR. BROMLEY: Calls for a legal conclusion.

Q. (BY MR. SIMPSON): Well, let me just finish that.
In your view, since you identified that the existing spring percentage analysis was not rigorous, would you support a more rigorous analysis?
A. I'm quite content leaving it as an administrative decision, that as long as the committee feels the best thing to do is to predict to the reach, then the next director or the current director, or whatever, is -- has their discretion on how to predict to the spring, what kind of an adjustment necessary to go to the spring.
Q. Okay. Is it still your position that you wouldn't defend the spring percentage method?
A. I would not, no.
Q. Okay. Have you had an opportunity to review the regression analysis offered for review by Dr. Brockway?
A. Yes.
Q. Okay. Initially is that analysis more rigorous from your perspective than the spring percentage method?
A. It's -- we talked, I believe the last

hearing, about Laura Janczak's thesis. And Eric Harmon, yes, did a similar regression analysis. And that was presented to the hearing officer.
Q. Right. And the Laura Janczak analysis you referenced in your prior deposition taken a year ago?
A. Correct.
Q. Okay. And upon request by counsel for ground water districts, you provided them a copy of that analysis, if you recall?
A. I don't recall that, but...
Q. Okay. And is the point of your response that that analysis by Ms. Janczak was similar to what Dr. Brockway's regression analysis was?
A. The head in the aquifer versus discharge in the spring.
Q. Okay. And generally speaking, do you agree conceptually with that relationship?
A. Conceptually, yes.
Q. Okay. And with respect to Ms. Janczak's work, did you agree with the work that she completed?
A. Agree with? I --
Q. Well, you reviewed it?

recall specifically where those wells were in proximity to the Snake River Farm spring?

A. That's correct.

Q. Okay. So in terms of proximity, if they were in the cells immediately upgradient from Snake River Farms, would that, in your view, be a close enough proximity?

A. Yes.

Q. Okay. If they were in the next cell adjacent or next cells adjacent to those cells closest to the canyon rim, would that be in close proximity?

A. That's -- that would depend on where the junior users that might be curtailed would be and where mitigation would take place. So the closer you get to where these administrative actions take place and the farther you get from the spring, the more that analysis is going to -- it will give you inaccurate results.

Q. Allan, would you agree that the springs that discharge that constitute the source of water for Snake River Farms are a spring complex?

A. Yes.

Q. And given that they're a spring

complex, that affects the reliability of the linear relationship of the spring percentage calculation?

A. I don't know that the fact that it's a complex makes it any less reliable than other complicating factors.

Q. Well, if you had one spring, you had one outlet, as compared to a complex -- where there were multiple outlets; correct?

A. Uh-huh.

Q. And Snake River Farms is a complex, so it has multiple outlets that provide the source of water; correct?

A. Correct.

Q. Then the fact that it's got multiple outlets, would you agree, affects the linearity relationship between the spring flows in that complex and the reach gains in the river, that percentage?

A. I'm not seeing that.

Q. Would whether a source of water is a spring complex or a single spring affect the reliability or voracity of their linear relationship in that calculation regarding spring complex or spring percentage?

A. The -- their -- the existence of complex -- the existence of spring complexes is not one of my concerns for not -- not one of the reasons why I think the percentage analysis is not rigorous.

Q. Okay. But would you agree with me that that could be a factor?

A. I don't see how.

Q. Okay.

A. But maybe I'm just dense.

Q. So what were the factors that you considered in coming up to the conclusion that the spring percentage was not rigorous?

A. The conductants, the robustness with which the spring is connected to the aquifer controls the slope of that stage in the aquifer, and spring discharge responds.

And not all springs in a reach have the same conductants, so they respond differently. And there are various factors which are involved in the aquifer decline. And not all of these actions, be they actions by people or nature, are the same everywhere above the rim.

So the spring reaches and the individual springs in the reaches are all going to

respond differently to these activities.

Q. Okay. So that connection between a spring and the aquifer was a concern for you?

A. That's correct.

Q. And so would the characteristic of a spring being a spring complex as opposed to an individual spring be something then you'd consider?

A. There are very large individual springs, and there are very large complexes. And as best I can imagine right now, the connection potentially could be the same.

Q. And so with respect to springs responding differently, would that, in your view, give more reason to consider that regression analysis which looks at individual spring responses to aquifer changes?

A. That is part of why it has some appeal.

Q. And so then would it be fair to say that from your perspective that as an alternative to the spring percentage, the regression analysis should be considered?

MR. BROMLEY: Calls for a legal conclusion.

THE WITNESS: I'm -- I'm not inclined -- I

like my job. I'm not inclined to put a director, future director, in a box. Post-modeling analysis -- post-modeling administrative adjustments, in my view, are the job of the director.

Q. (BY MR. SIMPSON): Well, if asked to review the merits of a regression analysis by a post-administrative-order director, would you think that analysis has merit?

A. It -- as I said, it has an appeal, yes.

Q. Okay. With respect to Dr. Brockway's regression analysis at Snake River Farms and at that complex, does it, in your view, represent a relationship between spring flows at the Snake River complex and ground water level changes in the ESPA?

A. Yes.

Q. Okay. Is it one that's scientifically based?

A. I didn't see a problem with that.

Q. Okay. Is it based upon sound science?

A. I thought it was okay, yes.

Q. You didn't find any problem, from your perspective, with that analysis?

A. No.

Q. Okay.

MR. BROCKWAY: Do you want me to leave?

MR. SIMPSON: No. I'm hoping he'll tell the truth about it.

MS. McHUGH: I think you were trying to get him to adopt it.

Q. (BY MR. SIMPSON): In reviewing that analysis, do you think that analysis adequately represents a relationship in spring flows and changes in the ESPA ground water levels?

A. Adequately represents changes in spring flow and changes in the aquifer?

Q. Yes. And the relationship between those.

A. Over a -- the range of -- for the data that he had, yes.

Q. And did you identify any shortcomings or problems with the data that he had?

A. Just limitations, you know, the -- it would be nice if 40 years ago we were taking monthly water levels and in an unpumped well there, yeah. But the Department hasn't. Nobody has been. But that -- that's not a fault of Dr. Brockway's. It's...

Q. So would it be fair to say the only limitation in that analysis that you observed, in your review of it, was that it had a limited time frame in terms of the data collected?

A. And -- yes.

Q. Okay.

A. Yes. And that's just the way the data is.

Q. That's fairly consistent with all the data on the ESPA, where you'd always like to have more data to put into the model; correct?

A. Yes, generally modelers would like more data.

Q. Okay. If you know, Dr. Wylie, are there any other procedures that have been identified to compute individual flow impacts?

A. There are analyses -- analytical solutions.

Q. Okay. Have you attempted to use any of those other procedures?

A. Not -- not for Snake River Farms. I've done them in other instances.

Q. Okay. Have you used a similar regression analysis that Dr. Brockway identified at any other complex or in any other reach of the

Snake River?

A. I've -- I've used the staging aquifer spring discharge. With wells when I was at the University of Idaho, I had a series of transducers in wells along the rim. And we had -- we gauged some springs and used USGS gauge data. And that was either shortly before or shortly after Laura Janczak did her thesis.

Q. Okay.

A. And collected very careful elevations on the wells and the springs and developed these linear regressions.

Q. Okay.

A. Figured out which wells worked best with which springs.

Q. And was that in the Thousand Springs reach?

A. Yes.

Q. Okay. And did you find that analysis acceptable?

A. Yes.

Q. And did that result in a paper that you wrote at that time?

A. No.

Q. Okay.

in a reach? Certainly if the reach is small enough and the stage in the river is fairly constant.

Q. (BY MR. SIMPSON): And so those are the very same reasons why it's applicable as between a spring and aquifer level changes?

A. Yes.

Q. Okay. Do you believe that the accuracy in the simulation of water levels in the ESPA is greater or less than the accuracy in the simulations of the Snake River reach gains?

A. I used to know this. They -- the output from the calibration run gives you the statistics. And I'm not -- I'm not recalling -- I believe that the statistics for the head matches were better. It makes sense. There's a lot less noise in the head data than in the reach gains.

Q. Well, what is the accuracy of the measurements of water levels in the ESPA which were used to calibrate the model?

A. The water-level measurements by convention are widely believed to be within a hundredth of a foot. The elevation of the wells is less certain. The wells that weren't surveyed, we picked elevations off of digital elevation

models.

And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe.

And then there's the issue of well trueness, which is -- I've seen where a well -- wells are rarely perfectly straight down. They typically wander around in kind of like a corkscrew. And if the driller isn't very careful, those vertical corrections, I've seen them around 8 feet.

So throwing all of that together, the estimate on water levels would depend on how deep the well is. The deeper the well is, the more problem you have with the trueness, and whether or not the well was surveyed or elevation was picked off the digital elevation model.

Q. In terms of the accuracy of the water levels in the ESPA to calibrate the model, was that accuracy identified as a tenth of a foot, plus or minus a tenth of a foot?

A. I don't think that the committee discussed that.

Q. Well --

A. That would be -- to have it be plus or minus a tenth of a foot, you would have to have pretty shallow wells, and they would have to all be surveyed.

Q. Was that accuracy better than plus or minus 10 percent?

A. Probably.

Q. Better than plus or minus 5 percent?

A. I would guess more like plus or minus 2 percent.

Q. Okay. Fair enough. You identified some work that you did after Ms. Janczak completed her work, and regarding the relationship or correlating between individual spring flows and water levels.

Are there other examples in which you've completed that work, other than what you've just described for us?

A. I don't believe so.

Q. Okay. Other than reviewing Dr. Brockway's regression analysis and Ms. Janczak's analysis, do you know of other regression analyses that were undertaken?

A. Eric Harmon's.

Q. Okay. And other than Mr. Harmon's,

any others?

A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow -- I'm sorry, Modflow, the -- it's been -- and Modflow and written in the '80s.

1989?

MR. BROCKWAY: Around there.

THE WITNESS: You know, that must have come from somebody's observations, so the technique --

Q. (BY MR. SIMPSON): It's pretty widely accepted?

A. Correct.

Q. Okay. If you were told that a correlation between a historical target spring flow and a USGS observation well had a linear R2 of .91, would that be a good correlation?

A. Yes.

Q. And that would be consistent with your previous statement that an R2 above .8 would be a good correlation; correct?

A. Correct.

Q. Do you believe it would be possible to estimate individual spring-flow impacts using the ESPAM-simulated ground water levels at specific USGS well locations and then using regression

equations between water levels in spring discharge to estimate discharge impacts?
A. We've discussed my unease with certain aspects of that.
Q. The two items that you identified?
A. Correct.
Q. Right. Okay. Other than those two items, you believe it would be possible?
A. Certainly, other than those two things, it has an appeal, yes.
Q. And if those two items are reconciled, then would your appeal be even stronger?
A. Perhaps. It may never override my appeal for this job, though.
MR. SIMPSON: With that, let's take a lunch break.
(Lunch recess.)
MR. SIMPSON: Back on the record.
Q. Allan, I'm glad you had a good sandwich at lunch.
I'll have you look at what is Appendix 2 to Dr. Brockway's report that he filed in this matter. And it's the regression analysis.
And just, is that the regression analysis that you've seen with respect to

Dr. Brockway's work? Does that look familiar?
A. Yes.
Q. Okay. So that appears to be the document that we've been referring to this morning?
A. That's correct.
Q. Okay. And then with respect to that same appendix, Appendix 2 to Dr. Brockway's report, and this is figure 2.
And can you see on there where it's identified the well that Dr. Brockway reviewed in terms of his regression analysis and its relationship to the Snake River Farms springs? Do you recall that figure?
A. I don't recall this figure, but it looks as if the well is very close to the spring.
Q. Okay. So in terms of proximity and the discussion we had this morning, the R2 -- the "R2"? -- R-squared value --
MR. BROMLEY: D2.
MR. BROCKWAY: R2D2.
Q. (BY MR. SIMPSON): We'll stick with R-squared for a while.
But the R-squared value would definitely be an indicator of how close the well

was to the spring as well? Isn't it true the time R-squared value is the primary indicator of the relationship between the well and the spring flow?
A. The R-squared tells you how well the, in this case, aquifer had explained the discharge of the spring.
Q. Okay. And this morning we discussed one of the reservations or concerns you would have with respect to the regression analysis was how long of a dataset did we have available to us; isn't that right?
A. That's correct.
Q. And if you had, say, a 24-year dataset available on a USGS observation well, would you consider that a pretty good dataset? Was that an adequate length of period of time for it?
A. Is it an unused well, unpumped well, I guess?
Q. Irrespective of whether it's a pumped well or a nonpumped well, given that it's an observation well, USGS observation well, would that be a good dataset?
A. The time span is good.
Q. Okay.
A. If it was an unpumped well, I'd be

very comfortable with that. And if it has a good R-squared, then it's likely an unpumped well.
Q. Now, this morning you explained that on at least one occasion you had an opportunity to use the regression analysis on the evaluation you did on certain wells to spring flows.
Do you recall that?
A. That's correct.
Q. Okay. And do you recall generally the time frame that would have been? Would that have been 2004? 2005? 2006?
A. I went to work for the Department in 2004. So it would be somewhere between the late '90s and 2004.
Q. Okay. Okay. And, Allan, if you personally felt there was a scientifically justifiable procedure which might better estimate the spring flows resulting from actions on the aquifer, would you take that procedure or that analysis to the Department for consideration?
A. I would -- I don't know.
Q. Well, that -- excuse me. Go ahead.
A. In -- I try to not get involved in what I consider administrative decisions. And there are administrative decisions that are made

that I think could be made better, I guess. But they're administrative decisions, and if they want my input, they know where to find me.

And I think my job is to do -- answer the technical questions that they ask me, and they ask me plenty of technical questions. I have --

Q. You have plenty to do?

A. I have plenty to do.

Q. Okay.

A. I don't --

Q. Well, with respect to the spring percentage, is that one of those decisions that you feel could be made better?

A. I don't know. You've obviously thought about it a lot more than I have. I know it's a concern for the spring users.

Q. Well, would you agree that in any work done by the Department, the Department endeavors to use the best science available?

A. As with a lot of legal and policy things, I think a lot of decisions get made because that's the way they've been made before.

Q. So your answer to that is sometimes yes, sometimes no, with respect to using the best science; is that correct?

A. I try to use the best science I know how to do to answer the questions that I'm asked.

Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today?

A. The -- if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes, I would use a regression analysis.

Q. Well, if I were to come to you and say, "Allan, I want you to estimate the spring flows or the change in spring flows to Snake River Farms as a result of actions taken on the aquifer," would you utilize the regression analysis?

A. I might. I would have to look at how well the model did at predicting heads at one of the wells, probably one of the wells Dr. Brockway used.

One thing I could do is recalibrate the model with the added weight on water levels in that specific area. And that might increase my

confidence. Probably look at more than one well.

Q. But that --

A. As with intercontinental ballistic missiles, space flight, firearms, darts, the smaller the target, the greater the uncertainty. So I would -- if it were really important, I would probably look at more than one thing.

Q. Do the R-squared values, does that raise the level of confidence?

A. Assuming the model were able to -- I was convinced the model were able to predict the head change in that area, then I would be very comfortable given the R-squareds that I've seen.

Q. Okay. And have you looked at all to determine with respect to the model, the model's ability to determine changes in head in that area?

A. No.

Q. Okay. So as you sit here today, you haven't addressed that question?

A. No.

Q. Okay. And do you have any reason to believe that the model doesn't reflect accurately the head changes in that area of the aquifer?

A. It's certainly possible that it doesn't. I -- I can't tell you whether it does or

not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing.

Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short?

A. No.

Q. The discharge amounts that are short?

A. No. I am aware that they're short and they're still going down.

Q. That the aquifer levels are still going down?

A. Yes.

Q. And the corresponding spring flows are still going down?

A. (No audible response.)

Q. So we still haven't reached equilibrium; would that be a true reflection?

A. I wouldn't -- in one sense we have to be in equilibrium all the time.

Q. Daily at the particular moment we're in equilibrium; correct?

the effect would be in other areas of the aquifer in other counties; correct?

A. Correct.

Q. And just looking at that analysis, the uncertainty of those results that were described through the modeling of those actions, would it be reasonable to conclude that those were at a level of certainty plus or minus 2 percent because that's the uncertainty of the ground water level measurements?

A. If I were going to declare an uncertainty for water levels, the model's ability to predict water levels, I would do some model runs, I would try to ask the model to change things, and see how well it could still match water levels in river gains. And how it had to change water -- how it had to -- what adjustments it had to make in order to do that.

And there's -- in the analysis, it gives a standard deviation and a mean for how well it matches all the water levels. And you can look at that. And you can ask it to recalibrate and see how well it continues to match those statistics.

And from that I could come up with --

that's one possible way, just one possible way I could do that. I haven't done any of that yet.

Q. Okay. Dr. Wylie, is all of Water District 130 included within the trim line area for Clear Springs?

A. I don't believe so.

Q. Okay. Why not?

A. Because some of it falls out of the -- some of it is less than 10 percent response on the Devil's Washbowl to Buhl reach.

Q. Would the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values?

A. Can you try that one again?

Q. Would the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values? Let's try this one more time.

Would the uncertainty in the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values?

A. Can I look at that?

Q. You want to look at that for the

answer? Sure. You can look at it, because it's got the answer at the bottom.

MR. BROCKWAY: Does that become an exhibit?

Q. (BY MR. SIMPSON): The last one.

A. Yeah.

MS. McHUGH: And just for the record, Dr. Wylie is looking at a handwritten note from Dr. Brockway to Mr. Simpson.

THE WITNESS: Okay. So as best I can figure, the question is, if you run a simulation, say a baseline dataset, and then you run a simulation with some kind of a treatment that would result in a change in, in this case, pumping stress on the aquifer, and you difference those two simulations, then the question is is there less uncertainty in that difference than there is in the prediction? Is that the question, Mr. Simpson?

Q. (BY MR. SIMPSON): Well, that may have been the question, but I have moved on from that for obvious reasons, some of which being the author of it.

A. Models are generally better at predicting differences than --

MR. SIMPSON: Okay. I'm going to mark what

will be the next exhibit, 40.

We can go off the record for a few minutes.

(Recess.)

(Exhibit 40 marked.)

MR. SIMPSON: Back on the record.

Q. Allan, you've been handed Exhibit No. 40.

Do you recognize that document?

A. Yes.

Q. Okay. And have you seen that document in committee meetings for ESPAM?

A. Yes.

Q. Okay. And prior to today and prior to this week, have you reviewed that document?

A. Yes.

Q. And is it true that at least a part of that document is what you've discussed earlier today, the basis for some of the answers and some of the questions that were posed to you earlier today?

A. This document hasn't changed my mind on anything.

Q. Okay. Well, let's just go through it. On the second page of this document, it has a

A. Correct.
Q. But given the fact that the spring flows --
A. They haven't stabilized.
Q. Right. Then the general trend in the aquifer is still in decline; correct?
A. Correct.
Q. And is that what the version 1.0 version of the model would have predicted?
A. Yes.
Q. That we would still concede declines?
A. Yes, we did a drought scenario.
Q. Uh-huh.
A. And in that drought scenario, it said that if we continued to be in a drought that water levels would continue to decline.
Q. Okay. Are we still in a drought?
A. We had a good year.
Q. Last year?
A. Yes.
Q. How about the year before?
A. It was average.
Q. Okay. And the year before that?
A. Drought.
Q. So we've had one dry year in the last

three; correct?
A. Yes.
Q. Okay.
A. Seven dry years in the last ten or something like that.
Q. Was that reflection of the last three years, was that in the drought scenario --
A. No.
Q. -- as the model described it?
So in the drought scenario, as you've described, did this drought scenario identify year after year of drought?
A. Yes.
Q. Okay. So the drought scenario isn't reflective of what we've observed with respect to weather patterns over the last period of time; correct? At least over the last three years.
A. The drought scenario, I believe, was three additional years of drought. The model finished in -- our calibration data set went to 2002.
So that scenario said that with three additional years of drought, water levels would decline. And we did one with if we had a wet year, how would that impact it. And I don't --

I'm a little less clear recollecting what that showed.
But I don't think it showed that one wet year was going to turn it around. There's a lot of water lost in storage when you get these kinds of declines. So replenishing the aquifer is not a trivial thing. There's a lot of water lost in storage.
Q. Same could be said for pumping, isn't that true, that through pumping there's a lot of water lost to storage?
A. That's -- that's how -- one of the primary ways it gets lost, yes.
Q. Okay.
A. There's less recharge and more pumping.
Q. You've, have you not, reviewed the IDWR hydrographs that show continuing ground water level declines in the ESPA; correct?
A. I have, yeah.
Q. Okay. And what's your opinion for the reasons for the these continued declines?
A. Primarily drought, and there's changes in irrigation practices. The farmers have to get by with less water, so they have to change their

irrigation practices.
Q. And would that also mean increased pumping as well in changing irrigation practices?
A. It's a combination of increases in pumping and less incidental recharge. You got to fix the leaky canals if you're going to get water to the last guy on the ditch. And if you're flood irrigating and there's less water, you got to learn how to get by with less water, convert to sprinklers. All these things conspire to result in declines in the aquifer.
Q. And you identified changes in surface water practices.
And you would agree, wouldn't you not, that increasing in ground water pumping would also be a factor?
A. Oh, yes.
Q. Okay. Do you believe that aquifer levels are going to continue to decline?
A. Well, there has to be an end to it. I mean --
Q. When there's no more water? Is that what you mean?
A. Well, let's say for the foreseeable future, yes.

Q. And by "foreseeable," you mean 5, 10, 15 years?
A. Five years, let's say.
Q. Okay. A minimum of five years?
A. I would expect them to continue declining for something like five years.
Q. Okay. And have you expressed that opinion to your supervisors at the Department?
A. I've said that it looks to me like we have to do something or the springs are going to go dry.
Q. Okay. And what's been the response to that?
A. I guess an agreement that it looks bleak.
Q. Uh-huh. Kind of a "So be it"?
A. No.
MR. BROMLEY: Objection. Form.
THE WITNESS: My supervisors aren't in a policy-making position.
Q. (BY MR. SIMPSON): So in response to you raising that issue or that discussion with you and your supervisors, after that it goes up to a policy decision? Is that what you're saying?
A. Perhaps one response to this would be

a concerted effort to increase the recharge that happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was -- I know there was an effort to try to get more of the -- a higher percentage of the late-season recharge in the lower part of the aquifer.
So I don't know -- certainly a "so be it" attitude is not -- not what I would expect. I expect that people are taking notice and trying to do things.
Q. Is more water leaving the aquifer than what's coming in, as reflected by the declining trends?
A. That's what the declining trends show, yes.
Q. Okay. So are we mining the aquifer? If more is going out of the aquifer than what's coming in, are we mining it?
A. If more is going out than what's coming in, I guess that's a reasonable definition of "mining."
Q. Okay. Dr. Wylie, you testified in the spring user hearing on the basis for the

implementation of a trim line.
Do you recall that testimony, generally?
A. I recall testimony on the trim line, yes.
Q. And that it was a reflection of model uncertainty?
A. That's the way the director defined it, right.
Q. And would you define it that way? Is the trim line a reflection of model uncertainty?
A. That's -- that's the way it's defined, so yes.
Q. Okay. Earlier you talked about recharge, you know, recharge efforts. And those recharge efforts, you identified the fall recharge and those efforts.
Would those be artificial recharge efforts, that is, they're not naturally-occurring recharge, are they not?
A. That's correct.
Q. Okay. So also would seepage losses through canals, that likewise would be artificial recharge, as opposed to natural recharge; correct?
A. Those are recharge due to man's

activity.
Q. Right.
A. Is that what you mean by "artificial"?
Q. Would that be fair to say, artificial would be the result of man-induced recharge as opposed to precipitation or tributary underflow or river losses or those activities which would be natural recharge?
A. Recharge -- if we're going to call recharge due to man's activities artificial, then it would be artificial recharge.
Q. Okay. Well, would you agree that artificial recharge would be recharge induced by man's activities? It's not something naturally occurring but for man's movement of water and putting water at a point where it will seep into the ground; correct?
A. The -- I could see how a person could define recharge on the shoulders of the season as artificial and recharge -- incidental recharge that happens during the irrigation season as natural.
But, you know, if you want to define it as strictly recharge due to man's activities, then irrigation during the -- incidental recharge

during the irrigation season would be due to canal losses during the irrigation season would be artificial, and I agree.

Q. Okay. Okay. With respect to the model uncertainty and the calculation of the trim line in relationship to the river gauges --

A. Yes.

Q. -- was that a rigorous analysis, in your view, similar to what you described the spring percentage as not being a rigorous analysis?

A. The -- my analysis that I provided to Director Dreher on uncertainty for version 1 of the model was not rigorous.

Q. Okay. So likewise, then, because it wasn't rigorous, are you willing to defend it?

A. I'm willing to defend it as a placeholder.

Q. Okay.

A. As soon as -- in this instance, as soon as the committee's ever able to provide a better analysis, then I will adopt that one.

Q. Okay. And by "committee," you mean the ESPAM committee?

A. Yes.

Q. Okay. And have you been at ESPAM committee meetings where Sean Vincent and other Department employees have recognized that there's no relationship between model uncertainty and the river gauges?

A. No, I have not.

Q. You haven't been to those meetings?

A. I've heard Mr. Koreny claim that, but I've not really --

Q. You haven't heard Sean say that directly?

A. No.

Q. Okay. Isn't it true that the trim line as used in the order is not scientifically based, but based upon the fact that, scientifically speaking, the model isn't 100 percent accurate?

A. Well, it's true that the model is not 100 percent accurate.

Q. Then is the calculation of the trim line scientifically based or is it just a calculated representation of uncertainty at the river gauges?

A. Director Dreher tied the trim line to uncertainty. And the model is -- without question has uncertainty.

Q. But wouldn't it be fair to say that you identify a calculated method for taking into account model uncertainty which was and still today is unknown?

A. And will be. There are ways to get a reasonable -- get a more defensible estimate for uncertainty, but it will never be --

Q. You'll never know exactly the degree of uncertainty?

A. You'll never know exactly what the uncertainty is --

Q. Right.

A. -- until you don't need the model.

Q. Would you agree that the effect of pumping from each well in the ESPA on a particular reach has the same level of uncertainty under your calculated method?

MS. McHUGH: I'm going to object again on relevance for this hearing, this line of questioning on model uncertainty and all of that.

MR. SIMPSON: Well, I guess at this point I'll just say that the hearing officer opened up discovery on IDWR employees. And that's why we're here today. So...

MS. McHUGH: I just want to make sure that my objection with regards to relevancy to the December 7th hearing is on the record.

MR. SIMPSON: Okay.

Q. Did that give you some time to think about it, or do you want to offer an opinion on that issue too?

A. Could you restate your question? I can't understand it the way you state it.

Q. Okay. Would you agree that the effect of pumping from each well in the ESPA on a particular reach has the same level of uncertainty under your calculated method?

A. So are you asking that this simplistic uncertainty analysis is not spatially or temporally varying, and that a more rigorous analysis would be spatially and temporally varying uncertainty?

Q. Well, with respect to your present analysis, the 10 percent, isn't it true that each well and the effect of each well and the pumping at that well is either plus or minus at the river gauges because of the lack of complete certainty as to the reading at the particular river gauge?

A. Well, there are two possibilities that

you're trying to drive at, and I'll try to answer both. One is that if the river reach is expanded, if the reaches are combined so they're all one reach, then the impact of a well on the river is going to be 100 percent. All depletions are eventually realized in the river. Okay? That's one possibility --

Q. Okay.

A. -- that your question might be going at.

And two, if and when we do a rigorous uncertainty analysis, it should show that uncertainty is both spatially and temporally varying.

So if we look at reach A, some portions of the aquifer will -- the impact on that reach will be more certain than others. And if we look in time, over time that uncertainty will vary how those impacts are realized at the reach.

Q. Okay. You're identifying the fact if your placeholder is replaced with a rigorous analysis of uncertainty --

A. Uh-huh.

Q. -- it will look at the spatial and temporal effects; right?

A. Right.

Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes --

A. Uh-huh.

Q. -- is that temporally and spatially accurate?

A. No, it's simplistic.

Q. Simplistic?

A. It's a simplistic, nonrigorous. I think we've identified that.

Q. We've agreed on that point. Sure.

So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct?

A. Correct.

Q. And if you're looking at a well that's 5 miles away from the river reach, it will have the same plus or minus 10 percent; correct?

A. That's correct.

Q. And if you have a well that's 20 miles away, it will likewise under the present analysis have a plus or minus 10 percent?

A. That's correct.

Q. Okay. So that plus or minus 10 percent, as you've described it, is really applicable throughout the whole Eastern Snake Plain; correct?

A. Correct.

Q. Okay.

A. It's not spatially or temporally varying.

Q. Right. Would you agree that each well pumping on the ESPA has had some or will have some depletive effect on the reaches of the Snake River, including the Buhl to Thousand Springs reach?

A. Each well pumping on the ESPA has an impact. 100 percent of its impact's realized on --

Q. One of the reaches?

A. -- one or all of the reaches.

Q. Okay.

A. They -- there are responses carried out to five decimal places. There are cells that have zero impact on some reaches. So not every

reach is impacted by every cell. Most cells do impact within five decimal places.

Q. Every reach?

A. Every reach. Not all.

Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches?

A. That's correct.

Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach?

A. They are assigned a constant uncertainty at the current time.

Q. Okay. So isn't that a reflection of the uncertainty of the river gauges?

A. That is a reflection of the uncertainty of the river gauges, correct.

Q. Right. So then with respect to the trim line, is that an additional uncertainty that's then assigned to those wells outside of

that trim line?
A. No.
Q. Do you understand my question?
A. The way I see it is that I told Director Dreher that if he was going to deploy the model, he had to acknowledge uncertainty somehow.
Q. So did you make that policy decision?
A. I told the director that it was important to acknowledge uncertainty --
Q. Okay.
A. -- if he was going to deploy the model. And Director Dreher chose to do it with the trim line.
Q. Okay. I have a follow-up to a question I asked you.
Have you been at any ESPAM technical committee meetings where Mr. Vincent identified that the trim line is not based upon model uncertainty?
A. No, I don't recall that at all.
Q. Okay. Mr. Wylie, did IWRRI or IDWR perform a sensitivity analysis of the model to determine uncertainty?
A. As a result of a calibration run with the software we use, there's a sensitivity

analysis printed out. And I don't believe that that played much of a role in my -- when I came up with the 10 percent.
I did some other analyses, and they consisted mostly of where I would ask -- try to recalibrate the model and see how much I could change what model cells were contributing mostly to the reach to try to change the response functions, ask the model to change the response functions.
And the result of that, that there was an average -- kind of an average of right around 10 percent. Of course, it was spatially variable, and I was just looking at steady-state response functions, not transient.
But the fact that I could only change them -- well, my recollection is some of them were changing around 20 percent, but they weren't in areas that there was much irrigation. But most of the cells that were -- where there was much irrigation, it was around 10 percent.
Q. Okay. If you were using the model to predict water-level changes in a certain cell or cells on the ESPA as a result of actions taken on the ESPA as opposed to looking at changes in the

reach gains, would the model uncertainty be different if the model were calibrated to those wells in those cells, that uncertainty is much less, say 2 percent, as you described previously?
A. So if instead of predicting reach gains --
Q. Right.
A. -- we were predicting water level in the aquifer, what would the uncertainty be?
Q. Wouldn't that uncertainty be the accuracy of the water levels in those observation wells or that well data?
A. I don't know. It's certain that the water levels would play a key role since that's the metric that we're trying to predict.
When we are trying to predict reach gains, the uncertainty in the gauges plays a more key role.
Q. Well, you wouldn't try to assert that the accuracy in measuring water-level changes in those wells was plus or minus 10 percent, would you?
A. I haven't.
Q. But would you agree that that would be unreasonable, that is, you wouldn't use the same

uncertainty attached to the river gauge as you would to a water-level change?
A. So if we're in a situation where water levels are the key and we need to get uncertainty for water levels, I would do -- and I believe you pressed me on this in the A & B hearing, and I -- I would do different analyses than I have, and I'm sure I would come up with different conclusions.
And I would bring these conclusions to the director, whoever that would be, and because presumably I would have implored the director "We need to address uncertainty in this matter if the model's going to be used this way." And then some kind of a decision would be made by the director.
Q. Well, if in fact --
A. But it would, in fact, no doubt reflect more of the uncertainty in water levels than the uncertainty in river gains.
Q. In fact, didn't Gary Johnson look at if you recharged in certain counties what the effect would be in other counties?
A. Yes.
Q. Yeah. And that was using the ground water model from a countywide perspective, actions taken in one county -- i.e., recharge -- and what

the effect would be in other areas of the aquifer in other counties; correct?
A. Correct.
Q. And just looking at that analysis, the uncertainty of those results that were described through the modeling of those actions, would it be reasonable to conclude that those were at a level of certainty plus or minus 2 percent because that's the uncertainty of the ground water level measurements?
A. If I were going to declare an uncertainty for water levels, the model's ability to predict water levels, I would do some model runs, I would try to ask the model to change things, and see how well it could still match water levels in river gains. And how it had to change water -- how it had to -- what adjustments it had to make in order to do that.
And there's -- in the analysis, it gives a standard deviation and a mean for how well it matches all the water levels. And you can look at that. And you can ask it to recalibrate and see how well it continues to match those statistics.
And from that I could come up with --

that's one possible way, just one possible way I could do that. I haven't done any of that yet.
Q. Okay. Dr. Wylie, is all of Water District 130 included within the trim line area for Clear Springs?
A. I don't believe so.
Q. Okay. Why not?
A. Because some of it falls out of the -- some of it is less than 10 percent response on the Devil's Washbowl to Buhl reach.
Q. Would the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values?
A. Can you try that one again?
Q. Would the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values? Let's try this one more time.
Would the uncertainty in the model simulations of differences in reach gains due to changes in pumping be less than the simulation of absolute values?
A. Can I look at that?
Q. You want to look at that for the

answer? Sure. You can look at it, because it's got the answer at the bottom.
MR. BROCKWAY: Does that become an exhibit?
Q. (BY MR. SIMPSON): The last one.
A. Yeah.
MS. McHUGH: And just for the record, Dr. Wylie is looking at a handwritten note from Dr. Brockway to Mr. Simpson.
THE WITNESS: Okay. So as best I can figure, the question is, if you run a simulation, say a baseline dataset, and then you run a simulation with some kind of a treatment that would result in a change in, in this case, pumping stress on the aquifer, and you difference those two simulations, then the question is is there less uncertainty in that difference than there is in the prediction? Is that the question, Mr. Simpson?
Q. (BY MR. SIMPSON): Well, that may have been the question, but I have moved on from that for obvious reasons, some of which being the author of it.
A. Models are generally better at predicting differences than --
MR. SIMPSON: Okay. I'm going to mark what

will be the next exhibit, 40.
We can go off the record for a few minutes.
(Recess.)
(Exhibit 40 marked.)
MR. SIMPSON: Back on the record.
Q. Allan, you've been handed Exhibit No. 40.
Do you recognize that document?
A. Yes.
Q. Okay. And have you seen that document in committee meetings for ESPAM?
A. Yes.
Q. Okay. And prior to today and prior to this week, have you reviewed that document?
A. Yes.
Q. And is it true that at least a part of that document is what you've discussed earlier today, the basis for some of the answers and some of the questions that were posed to you earlier today?
A. This document hasn't changed my mind on anything.
Q. Okay. Well, let's just go through it. On the second page of this document, it has a

reference to the director's letter. And I think that that's included in the packet back there. If you thumb through it, you would have found it.

A. Yeah, I found it.

Q. And does that letter identify that the purpose of the trim line or the clip was to avoid curtailing ground water users who may have no effect on enhancing reach gains?

A. Would that be in the quotes from the hearing officer?

Q. Well, if you look on page 2 of the document. All right. And if you look up towards the top there, do you see the first full paragraph -- or excuse me, it looks like it is the second paragraph that starts with "The Director's letter explains that"?

A. Yes.

Q. And do you see the sentence in italics there in quotes?

A. Yes.

Q. And do you recall that that was the purpose of the trim line or the clip, as it's called there? And if you want to look on the letter, it's on the second page of the letter on the top of the page.

A. The second page?

Q. Right.

A. Okay.

Q. And you see the reference now to that sentence, do you not?

A. Yes.

Q. Okay. And it's on the second page of the letter --

A. From Director Tuthill?

Q. -- from Director Tuthill at that time to members of the committee; correct?

A. Correct.

Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct?

A. Well, to six significant digits, no effect, yes.

Q. Right. And no means no, right, in terms of this statement in Mr. Tuthill's letter identifies that the purpose of the trim line or the clip was to avoid curtailing ground water users who might have no effect? Is that what it says?

A. That's what it says, yeah.

Q. So would it be fair to say that where the "no effect" standard was used, that would be identified by the ground water model and the running of the ground water model?

A. Well, to five or six significant digits, sure.

Q. Right. But that's what the model would show is if that were the standard to five or six significant digits, those cells would have no effect on certain reaches of the river; correct?

A. Correct.

Q. And otherwise, every cell would have an effect on reaches of the Snake River; correct?

A. If the reaches are big enough, every cell has an impact, correct.

Q. Okay. And in the Buhl to Thousand Springs reach, is that a big enough cell, as you described -- or big enough reach? Excuse me.

A. It's one of the smaller reaches.

Q. Okay. And so what you're saying is that there would be cells in the ESPA model for which going out five or six digits would not show an effect?

A. It's -- I would expect, yes, that

there would be cells in the model that would have no effect but six significant digits.

Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach?

A. They would show an effect.

Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis?

A. We would have to define "de minimis."

Q. Well, why don't you give me your definition, and I'll ask the question again.

A. Okay. I could define it as, for instance, if it has less -- if a cell has less than 10 percent of an impact on a reach, then it's de minimis. And then we would --

Q. Okay. Let's add up all the cells outside of the trim line --

A. Uh-huh.

Q. -- and their depletive effect from pumping within those cells on the Buhl to Thousand Springs reach, would that total effect be

Q. "10 percent trim line not clipped to Water District 130" and then "10 percent trim line clipped to 130."

So you're testifying that the Department doesn't clip to the boundary of Water District 130?

A. That's correct.

Q. Okay. That with respect to either the trim line identified for Snake River Farms or the trim line identified for Blue Lakes, it wasn't clipped to the boundary of 130?

A. No.

Q. Specifically or factually?

A. Factually.

Q. Okay.

A. For a while Water District 140 didn't exist. With no mailbox, there's no point in sending a bill.

But after 2007, and in the 2007 orders, the orders specifically say that Water District 140 is being organized. And since then, Water District 140 has been involved in both calls.

Q. Okay. And with respect to the boundary between Water District 130 and Water

District 120, is that the eastern boundary of the trim line?

A. No. The trim line crosses that. It so happens that there's no irrigated acres.

Q. East of the Water District 130 boundary?

A. Right. So there's nobody to curtail.

Q. No mailbox?

A. Yeah.

Q. Okay. Any other comments that you would have on this document?

A. The -- if we take that out, then the new information in here is the 1 percent trim line.

Q. Uh-huh.

A. Everything else has already been covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules.

Q. Well, back then to my other questions on the ground water districts' mitigation plan.

Have you reviewed that mitigation plan?

A. Yes.

Q. Okay. Are you familiar with how the figure of 2.6 cfs of replacement water was identified?

A. That was from a scenario that I ran.

Q. Well --

A. Okay. The 2.6, that's from the 6.9 percent.

Q. Okay. And so you have an understanding of how the 2.6 cfs of replacement water requirement was calculated?

A. Yes.

Q. Okay. Are you comfortable with the manner in which that number was calculated; that is, does it reflect the best scientific understanding of the relationship between the pumping that's occurring and the effect on the spring flow?

A. That's -- the way I see it, that's two questions. It's a -- in my opinion, that's an administrative, post-modeling adjustment. And I'm comfortable with that. It's arguably not the best available science. But we let teenagers drive, and it's clearly not the best available science.

Q. So you think it would be better to keep the teenagers off the road?

A. I do.

Q. Okay. Likewise --

A. I have one.

Q. Yeah. Likewise, would we be better off to use a different method to determine the calculation?

A. It's possible that a better method could be come up with. The hearing officer and two directors are comfortable with the percentage.

Q. Is it true that they're comfortable with the percentage, or did both the hearing officer and Director Dreher in his approval of the hearing officer's determination acknowledge that additional work needed to be done?

A. My recollection is that the additional work needed to be done on uncertainty.

Q. Not on spring-flow calculations?

A. Not on spring-flow calculations. I could be wrong.

Q. Okay. But if that were the recommendation by the hearing officer, would you support that, based upon what you know?

A. If a director came to me and asked me to come up with something better, I would.

Q. And do you think you could?

A. I'd certainly try.
Q. Do you think it's possible, based upon the tools that you have available to you?
A. I have some ideas.
Q. Okay. Are those ideas consistent with the work that you've done in the past on regression analysis?
A. That would be one.
MR. SIMPSON: Let's go ahead and mark this as the next exhibit.
(Exhibit 41 marked.)
Q. (BY MR. SIMPSON): Do you recognize Exhibit 41, Mr. Wylie?
A. I suspect I was asked to review part of this.
Q. Well, did you have any part in the drafting or review of this transfer memo?
A. I -- like I said, I suspect I was asked to review part of it. There was a part on using the transfer tool.
Q. If you'd look at page 12.
A. Yes, some part of this.
Q. Paragraph 12 or subsection 12 on page 12, is that part of the area that you were asked to review?

A. I think so.
MS. McHUGH: Sorry. Was that page 12?
MR. SIMPSON: Page 12.
THE WITNESS: Page 12, paragraph 12, yeah.
MS. McHUGH: Okay.
Q. (BY MR. SIMPSON): So that's part of the transfer memo that you reviewed?
A. Yes, that part.
Q. And you reviewed that not in preparation for this deposition, but at the time this memorandum was created?
A. Yes.
Q. Okay. And what were you asked to comment on with respect to page 12?
A. I tried to clean up the language. And then I suggested that they stick with 5 percent instead of 10 percent, but it doesn't look like that.
Q. Why did you suggest sticking with 5 percent instead of going with 10 percent?
A. Because that puts the risk of losing water on the person doing the transfer.
Q. Right. Rather than the other water right holders?
A. Yeah, all the other water right holders on the ESPA.

Q. Right. So then do you have an understanding that the purpose of not only section 12 that you reviewed but also the water-right transfer memo was to provide guidelines for ensuring that other water rights weren't injured as a result of a proposed transfer?
A. I suspect that that's why they have the transfer process.
Q. And from your perspective, when you advocated for keeping the 5 percent threshold instead of 10 percent, it was to ensure that the other water rights would not be injured as a result of that transfer?
A. To decrease the risk of having the other water rights injured, yes.
Q. Do you believe that if the threshold were kept at 5 percent, it would further decrease that risk that you identified?
A. So if they couldn't increase depletions in a reach by more than 5 percent, that would decrease the risk of causing injury to others? 10 percent increases the risk of causing injury to others.

Q. So would the answer to my question be yes, then?
A. I got -- kind of got lost in your question, so I tried to restate it.
Q. I got lost in your answer, so I thought I'd try to help you out.
But so is it true that you're advocating for the keeping of the 5 percent threshold was to further minimize the risk that other water right holders would be injured as a result of a proposed transfer?
A. That's correct.
Q. Apparently you didn't prevail on that thought?
A. Apparently not.
MR. SIMPSON: Well, let's take a break for a minute. I think I'm done.
(Recess.)
(Mr. Simpson and Ms. McHugh not present.)
MR. STEENSON: Let's go on the record.

EXAMINATION
BY MR. STEENSON:
Q. Good afternoon, Dr. Wylie. As you

know, I'm Dan Steenson representing Blue Lakes Trout Farm in this matter. We have had conversation before.

So do you mind if I at times call you Allan?

A. Go ahead.

MR. STEENSON: Okay. I think I'd first like to mark the next exhibit, 42. It's a one-page document. And there are extra copies.

(Exhibit 42 marked.)

Q. (BY MR. STEENSON): Allan, do you recognize what's been marked as Exhibit 42?

A. Yes.

Q. Okay. Do you recognize that to be your written explanation of the basis for the 10 percent error factor that you have been describing during your testimony today?

A. That's correct.

MR. STEENSON: Okay. Mark an Exhibit No. 43.

(Exhibit 43 marked.)

Q. (BY MR. STEENSON): Allan, would you read that. This is not something that you've seen before. Take a moment to read that, and then I'll ask you a question or two about it.

A. (Reviews.)

Okay.

Q. Allan, I'll represent to you that this is a description of the scientific method that I downloaded from a source on the Internet.

And my question to you is whether you agree generally with this description of the scientific method, as you understand that method?

A. I do.

Q. Okay. Would you add anything to it that is not contained in the document, from your own perspective?

A. I don't think of anything right now.

Q. Okay. And is it fair from my layman's perspective to describe the ESPA model and models of its kind as an effort to apply the scientific method to a problem?

A. Yes.

Q. Okay. And if I understand the model in, again, very basic layman's terms, it's a mathematic representation of what is happening for the ESPA in terms of ground water interactions with surface water, and depletions and additions to those sources; is that generally very vaguely correct?

A. Yes.

Q. Okay. And so as I understand it, you go through a process called calibration to tune the model to reality, that is, to align the model's predictions with measured phenomenon; is that correct?

A. To adjust the model so that model outputs, as best they can, match observed field measurements.

Q. And this is why, as you said before, modelers like data, because it's an opportunity to find out how well you did with the model and, in addition to adjust the model, to better reflect what you find through observable data; is that correct?

A. That's correct.

Q. Okay. Now, the two issues that Mr. Simpson's been asking you about that I'm here interested in today have to do with the 10 percent uncertainty and trim line on the one hand and the use of the spring percentage on the other, as you probably imagined.

Now, the question of model uncertainty is directly related to, if not synonymous with, the question of obtaining model accuracy; is that

correct?

A. They're related.

Q. Okay. In other words --

A. It's not true that all inaccuracy is uncertainty.

Q. Okay. Explain that for me, would you.

A. If you know that the model's going to be inaccurate, you can compensate for that. But uncertainty is inability to quantify that inaccuracy.

Q. Okay. And in any case, uncertainty is an issue for scientific or technical inquiry and resolution; isn't that correct?

A. Yes.

Q. It is not an issue in terms of use of the model that is subject to legal or policy considerations; correct?

A. I don't know that for a fact.

Q. Okay.

A. I am not keenly tuned into policy and legal. All I know about legal I learned by watching Perry Mason.

Q. And perhaps some of your interactions with some of us in this room? Perhaps we've disappointed you. I don't know.

But in any case, in terms of evaluating model outputs and the confidence we can have in them, uncertainty is a technical or scientific question subject to the scientific method; correct?

A. It -- there certainly are a lot of different ways people have used to try to evaluate uncertainty in computer models. And they've generated a great deal of papers in the scientific press.

Q. In other words, defining uncertainty is not really affected by the question of who one thinks ought to be curtailed or who ought to bear the burden of curtailment or a policy question such as the economic effects of curtailment, uncertainty really has nothing to do with those considerations that I mentioned, does it?

A. Well, in my naive opinion, I think that the policymakers should take into account model uncertainty when they're making their policy decisions. And I am not in any position to tell them how it should be done.

Q. But the reverse is not true, that is, when you're asked to define uncertainty, your inquiry shouldn't be affected by who you or

someone else might think ought to be curtailed or the economics of curtailment or the burdens of curtailment? Your inquiry, then, should be a purely scientific one based on the scientific method; isn't that correct?

A. Yes. And I think that's one of -- going to be one of my challenges working with the committee on getting a rigorous uncertainty analysis.

Q. Right.

A. Because most of the other people -- well, I represent the Department, John represents you, Dr. Brockway represents Snake River Farm, and getting all these competing interests to come up with an unbiased, thorough, rigorous uncertainty analysis is going to be an exciting and challenging endeavor.

Q. For the moment, I have the luxury of speaking just to you.

And so when either myself or someone like the director asks Allan Wylie the question, Allan Wylie's analysis is purely supposed to be for the Department of Water Resources' objective and unaffected by policy considerations, that is, when examining this question of model uncertainty?

It's purely a mathematical phenomenon-based analysis subject to the scientific method; correct?

A. Hopefully repeatable.

Q. Then I want to look back at the white paper with you. That's Exhibit No. 40, I think, or is it 41?

A. 40.

Q. 40. My understanding is that at least in your view the model is the best scientific tool available to us to evaluate the impacts of ground water pumping on spring flows and spring rights; is that correct?

A. On reaches, yes.

Q. Okay. And it is the tool that the Department uses to evaluate the impacts of ground water withdrawals and additions on springs as well; correct?

A. The -- the output then undergoes a post-modeling administrative adjustment, yes.

Q. And the post-modeling administrative adjustment, is that process a scientific method process, or is that a policy process, or do you know?

A. That's a -- in my opinion, it's a

policy.

Q. Driven process; correct?

A. Correct.

Q. It's not a technical process; correct?

A. Not a technical process.

Q. Okay. Now, the Department has relied upon you as stating that the purpose of the trim line was to avoid curtailing ground water users who might have zero effect on reach gains. Now, you've talked about this with John Simpson. I just want to confirm.

Is that your opinion of the purpose of the trim line?

A. It does have that effect, but I'm not sure that that's the purpose of the trim line.

Q. Okay. Then let's look at page 2 of Exhibit 40, the first numbered paragraph there. My understanding of the analysis from the experts signed on to this white paper is that it is not correct to assert using the best tool available -- that is, the model -- to assert that a well that is located on the other side of the trim line could have zero impact on reach gains. And in fact, your testimony today, from my understanding, confirmed that that's correct, that this critique,

that this observation is correct.
So my question is, do you agree with the observations and analysis in the first paragraph at page 2?
A. (Reviews.)
Well, the first sentence there, it says, "The inference that ground water withdrawals outside the 10 percent trim line might have no effect on reach gains based on an assumed model uncertainty of plus or minus 10 percent is incorrect."
Well, as I've testified, there are some cells that, based on limitations of the number of significant digits, have no observable impact. And they're all outside the trim line. The trim line, the curtailment scenario demonstrates quite conclusively that the cells outside the model, outside the trim line, do have a measurable impact. So --
Q. So it's true with respect to those wells --
A. There are --
Q. Let me just finish.
A. Okay.
Q. It may not be true with respect to

those six-digit wells, if you will, that you mentioned previously, this statement?
A. Very clearly there is a measurable impact from pumping that happens outside the trim line.
Q. Okay. Then with the caveats you mentioned, the rest of this paragraph, I assume you would agree is also correct, that is, paragraph 1 at page 2?
MR. BROMLEY: Dan, if I could just note, could you please let Allan finish his responses. Thanks.
THE WITNESS: Well, I understand the second sentence.
Q. (BY MR. STEENSON): And do you agree with it?
A. Yes.
Q. Okay.
A. I do have unnaturally long pauses. I apologize.
Q. That's okay.
A. The third sentence there, I'm not exactly sure what it's driving at, but clearly all wells, as I've said, on the ESPA, 100 percent of their impact is realized in the river somehow

somewhere. And I'm not sure what else they might be driving at with that third paragraph.
Q. Let me try to paraphrase it and see what you think. In other words, if you want to apply a 10 percent error factor for some other reason, if you just like 10 percent as a number, but you accept the model as the best science available, then the way to apply that 10 percent error factor would be that the model's results might be 10 percent, might have 10 percent uncertainty, plus or minus, with respect to any well for which the model makes predictions anywhere, that would be consistent rather than to draw a line in the sand and say wells beyond that line may have no impact, which, as you've testified, is incorrect and can't be true, whereas wells on this side of the line closer to the rim are treated as if there's no uncertainty associated with them?
A. Ah.
Q. As I paraphrased it, would you agree with that statement?
A. Okay.
Q. Is that a "yes"?
A. That's a "yes."

Q. Okay. Thank you. See, we get there.
Now, the second paragraph addresses really a separate issue, the question of whether an impact is de minimis.
Wouldn't you agree that whether an impact of de minimis really is a different independent consideration of whether uncertainty applies to a withdrawal from the aquifer?
A. Whether -- de minimis could be defined in a number of different ways. And I understand after reading Dr. Scheüder's paper, expert report, how it's not been entered in, how de minimis is defined in Colorado. But I don't know that it's been defined in terms of water rights in the state of Idaho.
Q. Sure. And you're referring to Dr. Willem Scheüder, is that how you --
A. He says Scheüder.
Q. Okay. Scheüder. But in any case, if I asked you, Allan, if I say "What's a de minimis impact?" that's really an entirely different question than "Allan, what's the uncertainty associated with this model?"
A. That's correct.
Q. And if I then went further to say

"Allan, how should we apply uncertainty in using the model?" that's really a different question than what's "Allan, what's a de minimis impact?"; correct?

A. That's correct.

Q. Now, quickly, and maybe you're familiar with it, but take a glance through paragraph 2 and then I want to ask you whether or not you dispute any of the factual assertions or the conclusions in paragraph 2?

A. (Reviews.)

Well, I would agree that the spring users -- the junior ground water wells outside the 10 percent trim line reduce spring flow by one-half to one-third. But de minimis could be defined in many different ways.

Q. Okay. Do you think half of the impact on a spring reach is de minimis, a de minimis -- let me make sure I get the question out -- is a de minimis portion of the impact?

A. It -- I -- I think it could be defined that way, but I don't know. The best I know, it hasn't been defined in Idaho.

Q. As a scientist or a human being having a conversation with me here, I'm asking you what

is your opinion? Do you think 50 percent of an impact is a de minimis portion of that impact?

A. I could see how a director could decide that if 90 percent of the impact -- 90 percent or more of the impact of a pumping is going elsewhere, that that is de minimis on the reach in question.

Q. I'm asking for Allan Wylie's opinion.

And my question is, does Allan Wylie think 50 percent of the impact on a reach is a de minimis portion of that impact?

A. Well, clearly 50 percent to one-third of the impact is undeniably significant, and so not likely to be de minimis.

Q. Clearly it's not de minimis; right, Allan? That magnitude of impact is clearly not de minimis; isn't that correct?

A. Well, it's clearly significant. And I -- I hesitate to use "de minimis" because I've read Dr. Scheüder's paper and realize that there's legal implications. So I don't know whether there is or is not, so I'm not going to...

Q. Okay. Without asking you to offer a legal opinion, in your work as a scientist in evaluating quantities of whatever you might be

evaluating, do you ever encounter the term "de minimis" as a scientific term? Is it one you are familiar with and use as a scientist?

A. No.

Q. None at all. Okay. Is there one similar to that that you would use?

A. "Significant," "not significant."

Q. Okay. All right. I want to ask you a little bit more about calibration and go into some detail with respect to Blue Lake spring flow, and this will relate to the use of the concept of spring percentage.

I'd like to hear from you your description of model calibration, what it is, what that process is.

MR. BROMLEY: Objection. Asked and answered. All of this ground was plowed at the 2007 hearing.

THE WITNESS: In brief, it's a process of adjusting certain model parameters to maximize the match between model outputs and field observations.

Q. (BY MR. STEENSON): And why does one calibrate a model?

A. Your hope is to convince yourself and

others that the resulting model predictions are meaningful.

Q. And that they match observed measurements of reality?

A. By matching observed measurements of reality, you convince people and yourself.

Q. Okay. And what is steady-state calibration?

A. That's often used in modeling. It's rarely seen in the real world. But it's taking average conditions and average measurements and trying to match those. That's a condition that, if it existed, there could be continuous stresses and inputs and outputs from the model.

Q. Okay. And what is transient calibration?

A. That matches more real-world situations where there are seasonal changes in aquifer use and spring flows and river flows.

Q. As you've described it, is there a preference in your mind for transient calibration over steady-state calibration, or do they serve different purposes?

A. They serve different purposes. Steady state is often used in ground water modeling.