STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

HEARING ON WATER RIGHT APPLICATION OF THE El SUR RANCH

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PROCEEDINGS

HEARING OFFICER DODUC: Good morning, everyone. Thank you for being back on time. Please take your seats.

Before we get to Ms. Goldsmith and her redirect, Mr. Lindsay, I believe you have a final question for these witnesses.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Yes, I do.

HEARING OFFICER DODUC: Final for now, I should say.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Yes, thank you.

I need to set this question up a little bit and talk about permits and going to licensing. In water rights, when a permit is issued, it includes a complete use date. In this case, the applicant -- I'm not aware and I double checked the application this morning -- hasn't asked for anything other than the standard ten years. It's not based on regulations or anything, but that's what normally is granted for an irrigation permit.

And during that ten years, the applicant has time to use water and show how much beneficial use is made. And then after that, the permit could go to license based on how much water is actually beneficially used in that ten years after the permit is issued. History doesn't affect this. The clock starts when the permit is issued.

It occurred to me thinking about a request for a 20-year rolling average in a permit with a ten-year complete use date, that's impossible. We wouldn't issue a permit for that, because you get to the end of a ten-year period and you wouldn't have any record to show a 20-year rolling average.

So how do we get out of that? Well, you extend the complete use date perhaps. Could change the rolling average time period. In thinking about that, let's say the rolling average went out to the state of 20 years and complete use date went out to 20. You'd still when you got to licensing at the end of that only have one rolling average period to look at because that was the whole 20 years. That's it. If you left it at, say, a 20-year complete use date with ten-year rolling averages, you'd have ten periods to look at.

So any questions about that concept, Mr. Hill?

MR. HILL: I think I'm following you, but the mathematics of it I'm not clear on.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: I understand.

So that's my question right now to make sure you understand that. I could ask you right off do you want to alter your application in any way, that might be more appropriate after you've consulted. And maybe on redirect we could hear about that.

MS. GOLDSMITH: I'd like to make a comment to that. It's not testimony.

But we do have a long history of use at the ranch, but we don't know what the terms of the -- what terms and conditions may be imposed in a permit. And so I'm a little reluctant at this point to say we should have less than 20 years, but it seems to me it's something that we may need to evaluate after we've seen what the terms are and then have a discussion with the Board and possibly request a modification with reasoning if a longer period seems more representative of operations under the permit.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Let me comment then on process.

My understanding is we will write an order based on the evidence in this hearing. We can, of course, take that and write an order where we think is right. I'm just looking for, if possible, that the applicant's preference is into the record. That's my question.

Any follow-up from the rest of the staff?

MR. HILL: Preference -- the preference would be for 20-year period if at all possible to match the rolling average. That would be the easiest I think, the most applicable.

And also reflect on circumstances that the ranch is so reactive and dependent on seasonal events and any one year, as you well know, in weather makes averaging ridiculous. So the longer the time period, the more reflective and responsive it is to the real-world situation.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: I was consulting with my attorney. I missed the first part of that. The ten-year you're not in favor of that, pretty much?

MR. HILL: A 20-year period would be favorable, preferred.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Okay. Thank you.

HEARING OFFICER DODUC: Great. Ms. Goldsmith, we'll now turn to you for redirect of your witnesses.

Let me ask that everyone take a moment right now and put your cell phones, Blackberry, iPhone, whatever noise-making devices you have back on silent and vibrate.

All of the other announcements yesterday we advised estimate with respect to evacuation.

And for those of you presenting new witnesses today, please confirm at the start of the testimony that your witness was here yesterday and they've taken the oath.

And with that, Ms. Goldsmith, you may begin your redirect.

MS. GOLDSMITH: Thank you.

REDIRECT EXAMINATION

BY MS. GOLDSMITH:

Q Dr. Hanson, yesterday there was discussion of a 0.5 foot criteria in the river. And it was represented by the questioner that this was a passage criteria. Have you had a chance to look at that? I think was in the Big Sur River Waterway protection plan.

A Yes. The discussion came up in cross-examination yesterday as to whether or not we use the 0.3 foot depth criteria for evaluating juvenile movement opportunities between habitat units during the summer and fall months. There has also been discussion in the literature with regard to a 0.5 foot depth criteria.

I went back and took a look at that, and the 0.5 foot criteria was a criteria that was proposed for juvenile rearing habitat as opposed to passage among habitat units. It is ascribed to Department of Fish and Game biologist Allen Baracco. And we did have an opportunity, not as part of my reports, but subsequent to that, to look at what the 0.5 foot criterion for rearing would be in the lower river.

And to do that, I just did a really quick analysis. I selected data from October 10th of 2007. And the reason I selected that data is that the flow at the USGA gauging station located upstream was ten cfs on that date. We then looked at the data from our passage transects and the VT velocity transects to determine what rough proportion of the lower river would meet that 0.5 foot criteria at a ten cfs flow at the gauge. What we found through those preliminary and admittedly rough analysis was about 8 percent of the linear distance between the lagoon and the State Park did not meet the .5 foot criteria, but that about 92 percent of that area did exceed the 0.5 foot criteria for juvenile rearing.

Q When you say State Park, are you talking about the Andrew Molera parking lot or the Pfeiffer State Park?

A I'm talking about the Andrew Molera State Park parking lot, which was the upper bound of the reach within which we did our studies.

Q Thank you.

Now, yesterday, there was a fair amount of discussion of the importance of the lagoon as habitat for the fish. And the policy statement by the National Marine Fisheries Service was fairly critical in terms of concern about the lagoon. Can you tell us generally the studies that you have done concerning the lagoon habitat?

A Yes. In fact, we started in our 2004 studies by identifying a series of transect locations that we would take water quality and habitat measurement at that actually began right at the sand bar so that we were able to then collect data throughout the whole lagoon and the river upstream of the lagoon. It was based on the results of our 2004 studies that showed that water temperature, electrical conductivity, water depth, other habitat parameters such as that were consistently good in the lagoon reach in the 2004 dry year.

And so subsequently, we moved our transects upstream to focus more intensively on the area of the river within which the well operation may have a bigger affect.

I've had discussions with the National Marine Fisheries Service biologist from Santa Rosa regarding the importance of the lagoon.

Q   Was that after the date of the comment letter that was submitted?

A   The discussions I had were actually prior to the date that the letter was submitted, my understanding.

And in our discussions, we had an hour or more where we talked about studies. We talked about our findings. We talked about changes in the surveys.

But I had prepared a synthesis document for the National Marine Fisheries Service that discussed our results of the lagoon studies. And in that document, I focused on the data collected in 2007 rather than all of the data that we had collected. And I think the National Marine Fisheries Service used that document and that subsequent discussion in 2007 and drew a conclusion that we had not looked at the lagoon itself rather than going back to our 2004 studies, which weren't referenced in the lagoon synthesis piece that I provided for them.

Q Now, just to refresh your recollection, if this does -- and if it doesn't, then better say so -- but you talked with them on May 26th; isn't that right?

A That's right, yes.

Q The date of their comment letter was May 18.

A Then my discussions would have been after the date of their letter.

Q Did you get -- did they say they had a lot of lingering questions after your discussions?

A We talked more about what kind of data we had collected. We talked about a joint interest and concern about the habitat quality in the lagoon. We talked about the importance of the lagoon as habitat for juvenile rearing. We talked about some of our snorkel surveys and the observations that we made of juvenile steelhead rearing within the lagoon. So it was really a scientific and technical discussion among colleagues.

And through that discussion, we talked both about the data we had collected, as well as some of the concerns that the National Marine Fisheries Service biologist was interested in. I think not so much that he had identified a specific problem, but rather he was exploring what data are available, what have you learned, where are there data gaps, and what more might be of interest specifically to the National Marine Fisheries Service with regard to the lagoon dynamics.

Q In all of your measurements, did you find any indication at all that there was a persistent stratification of the lagoon in terms of salinity?

A We did not see any evidence of any persistent stratification in terms of salinity. Or typically dissolved oxygen is depressed in some lagoons and creates anoxic conditions.

Q You found no evidence of that?

A We did not.

Q And temperature was stratified or not stratified?

A Temperature was not stratified. The only parameter that we saw that was stratified was salinity. And it wasn't associated with stratification. It was really associated with the wave overtopping of the sand bar. So if you had high waves, we would have overtopping of the sand bar that would bring kelp and saltwater into the lower-most portion of the lagoon. That saltwater, having a higher density, would settle towards the bottom and would take a period of time, typically hours or days, before that saltwater was then flushed back out of the lagoon to the coastal waters.

Q Okay. Mr. Lindsay, could you put up on the screen Table 16 and 17 from ESR-24. I don't know what page number. But the tables follow all the text.

In the mean time, so as not to waste my time while you're doing that, I'd like to ask Mr. Hill what is your opinion about whether or not your pastures are cultivated crop?

A Well, thank you for the opportunity to comment on that further. It's our opinion -- it's my opinion it is cultivated. We do practice -- besides the remediation practices that were referred to yesterday, mowing, fertilization. And, in fact, there's actually a project slated for next fall where we're going to reshape one of the fields and take about eight to ten acres of the current grass, lay it to one side, lay the top soil to one side, re-grade the field, and do some leveling. And then we're going to come back and re-seed that area. And we're going to check -- look for -- now that we have such wonderful experts accessible to us, we're going to take advantage of that and see what grass species we need to consider.

There is some competition as we have some non-native kikuyu grass in the area we're going to eliminate. We're going to take advantage of the intellectual property here today to see what we can do to improve the quality of what's there. And things that are both water conservation crops as well as maximum nutrition for the herd.

Q One recollection from the visit to the ranch was having kikuyu grass pointed out to me -- or actually I saw it. It was beautiful and green. And I said, wow, look at that. And it's not even in the irrigated pasture. And is kikuyu grass suitable cattle forage?

A In my opinion, no, it's not. It's something that's green in the dry summer months, but nutritionally -- I haven't ever done an analysis on it, so I can't speak. But it's something that cattle migrate to. They'll eat it. But then I've seen them eat thistles and dry grass. If the cow is any indication of nutritional value or palatability, I would say it's not very good or certainly doesn't compete with the permanent pasture.

Q Thank you.

Now yesterday, Mr. Hanson, you were shown Table 16 and table 17. I guess we can only show one at a time. You were asked about passage of Transect 11. And it was

pointed out that on I think the fifth -- could you recount what you recall of that?
A Yes.
Q What I do recall is you said there was more to the answer and you were not permitted to go on.
A Yes. We were discussing the results of our studies during 2007, and the table that's shown on the screen is Table 16 from our 2007 studies.
As part of that, we went out once a week and made measurements of water depths at various transect locations. And the results of a series of those measurements are shown on Table 16.
We also manipulated or requested that the well operation be manipulated during that time period so that we could tell what was the reaction of the river and the habitat for steelhead in response to whether the wells were on or off. And the discussion that occurred yesterday focused on the data that was collected during our September 5th survey.
Q The mean depth?
A The mean depth is 0.06 feet.
Q With the new well on?
A That was a period when the new well was operating.
If you go to our next survey date, September 12th, the mean depth had increased to 0.15 and both wells

were off. And the inference of that portion of the discussion was that "and, therefore, it's the wells that are causing the difference."

What I wanted to also explain is that when we did our analysis, we needed to consider not just whether the wells were operating or not, but we also needed to consider the hydrologic conditions, the flows that were coming into the study reach at the time and other factors. Mr. Horton has described evapotranspiration and a variety of other factors.

The thing I wanted to point out is when you're interpreting these kinds of data and trying to draw causal relationships between well operations, you have to also recognize that the flow at VT-1 which, is the flow upstream of the area where the wells would have an effect and reflect the flow of water coming from the upper watershed into the study reach.

On September 6th, the flow was 1.97 cfs. So very, very low flow.

If you go to September 12th, the flow at VT-1 is now 5.28. Three or four times higher.

And so the hydrologic conditions that were occurring when these studies were made is also a major factor to take into consideration if you're looking at what is the incremental effect of the well operation on this average depth that occurred at passage Transect 11.

Our analysis considered those various factors, not just whether the well was on or off, but the context within which the environmental conditions are occurring in the river that have an influence on habitat suitability for steelhead.

The second thing I wanted to mention is that it was implied, and appropriately so, that the conditions we saw on September 5th are very adverse for steelhead. We wouldn't expect the water depth to be sufficient at Transect 11 to allow steelhead much of an opportunity to move upstream or downstream in response to conditions. And that's a condition that occurs because of the natural hydrology in the system in combination on September 5th, the Labor Day weekend. And those factors combined had a significant stressing effect on the instream flows in the river.

As we started to work through this, we recognized that. And even though statistically we weren't able to identify a detectable effect of whether the wells were on or off with respect to this parameter, we recognized that this is an important habitat for steelhead that needs to be protected. And that needs to be protected not just from the effects of the wells, but the combined effects of the wells, the upstream diversions, the natural hydrology, a variety of factors.

It was in our recommendation the best way to do that was to identify instream flows that were sufficiently high that well operation could then be curtailed or changed to help alleviated any incremental effect of the wells on these kind of habitat conditions.

When we did that, we analyzed our water quality data. We looked at our passages data, the whole host of things that we collected, and determined that a flow of 8.2 cfs at the USGS gauging station met our downstream passage criteria and provided flow that would help with the dissolved oxygen issue that we discussed yesterday, flows that would help with the temperature issues that we talked about yesterday.

But we were concerned that the 8.2 had some assumptions about upstream demands and factors that affected that. So rather than just cut it right at that level, we added a buffer. And we decided that for purposes of developing a trigger for well operations, we would recommend a flow at the USGS stage of ten. And at ten cfs, then there would be a monitoring. There would be a change in well operation. There would be other actions that would proactively occur that would provide the protection to avoid any incremental effect of well operations on habitat conditions.

Q Thank you.
Mr. Horton, VT-11, is that within or outside the zone of influence of the wells?
A It's within the calculated zone of influence for groundwater.
Q For groundwater. And for surface water?
A We could not detect any impact to surface water in P-4-UL just below VT-11 P-5-L above VT-11.
Q One final question, since I still have some time. And this is for Dr. Allen.
You were asked yesterday about economic reasons that constrain the ranch. And in your testimony apparently you did reference your reports that talked about earlier reports. But is housing one of those constraints?
A I was told that it's not a possibility for additional housing for ranch personnel on the property during one of my meetings with Mr. Hill on a visit to the ranch. So that could be an impact to someone traveling a great distance just to check on the water. It's pretty difficult.
Q Mr. Hill, do you believe that the housing is a constraint for your labor pool?
A Absolutely, it is. In fact, I recently undertook a search for a new ranch manager. And using a very noted

firm out of the Rocky Mountain states that sells large ranches in places by such people, the customary home that the ranch managers that this firm was sourcing were accustomed to homes between 4- and 6,000 square feet. Current manager house at the ranch is about 2100 square feet.

I'm limited to ten percent maximum increase in square footage according to the Monterey County land use plan. Even if I were to want to exceed that, I then have to pursue a coastal development permit through the California Coastal Commission. And if that isn't enough for a person to want to give up, I don't know what is.

So, yes, I'm severely constrained when it comes to anything. Ten percent is the maximum enlargement of any structure at any time, and the conservation easement has even further restrictions.

MS. GOLDSMITH: That's all the redirect that I have.

HEARING OFFICER DODUC: Thank you, Ms. Goldsmith.

Ms. Ferrari or Mr. Takei, does the Department have re-cross?

MS. FERRARI: Just briefly. Thanks.

RECROSS-EXAMINATION

BY MS. FERRARI:

Q Chandra Ferrari, Department of Fish and Game.

One quick question for Mr. Horton. Can we please pull up ESR-4, PDF page 154?

Mr. Horton, on this graph, it says that ESR-10b in river stilling well show a similar response curves to changes in pumping. Can you explain to me where this well is?

A ESR-10b is east of the new well towards -- between the new well and the river.

Q And is that -- where is the river stilling well?

A I'll have to look. I think it's in the area below Transect 11.

Q Right below Transect 11?

A Let me check. Correct.

Q It is right below Transect 11?

A Yes.

Q That area did show a similar response curve to the change in pumping?

A It does appear it does in this graph, yes.

Q So that would be around Transect 11 that would probably be influenced by pumping?

A Correct. However, in later review of this data, after 2006-2007, going back, the curves there are also demonstrated I believe in the upgradient surface water elevations.

Q Could this be in an anomaly?

A I think it's predominantly related to the surface water changes coming into the system about the same time as well.
Q Thanks.
BY MR. TAKEI:
Q Kevin Takei, Fish and Game.
Dr. Sage, we've been hearing a lot of questions and factors about what goes into a cultivated field. I was just hoping that we get some clarity to this question. If you could tell me the difference in your opinion between an irrigated pasture that is cultivated and an irrigated pasture that would be considered uncultivated.
HEARING OFFICER DODUC: Before I answer, I was paying attention, and I don't think Dr. Sage was part of redirect. You are limited on your recross to the redirect that Ms. Goldsmith presented.
MR. TAKEI: I'll direct this question to Mr. Allen -- Mr. Hill.
MS. GOLDSMITH: Objection. I did not ask Mr. Hill anything about --
MR. TAKEI: You asked him about the characteristics of his operations, and which lends towards the ability of cultivation. And he gave his opinion that was a cultivated field.
HEARING OFFICER DODUC: I'm sorry. What was your

question, Mr. Takei?

MR. TAKEI: We're talking about the characteristics of a cultivated field. I'm trying to understand the difference. His opinion that it was cultivated, I'm trying to understand what the difference is between an irrigated pasture that is cultivated and an irrigated pasture that is uncultivated.

HEARING OFFICER DODUC: I will allow the question.

MR. HILL: My characterization of that, my opinion of that, would be the difference between range land that is normally not irrigated if it were to be irrigated it's a cold weather crop versus the permanent pasture that's a warm weather or summertime crops. The production differences between the two are huge.

BY MR. TAKEI:

Q So is it just the production difference?

A No. It's the make-up of the species and mix of plants, the diversity, the protein content for the animals, it's growth rate. It's response to weather. All of those lead into -- you know, contribute to a crop that is grown on irrigated pasture in the summer months that yields an optimum crop for cattle during that time of year.

Q And just -- I think we're clear though when you

referred to the range land that's unirrigated, that's uncultivated?
A Correct.
Q And is there anything else that you did to your irrigated pasture, aside from the mowing, the fertilizing, and you mentioned that your plans to re-shape the field. Is there anything else?
A I'll have to think on that for a minute. We do noxious or weed removal and abatement. There are times around certain -- as I mentioned, we do some remediation. And any time there is any bare ground that's due to certain cattle activities like around water troughs and so forth. I mentioned weeds.
Well, re-shaping some of the border dikes. We do that to control water. Fencing; those are all activities that we take, and repairs. Those are the general activities that occur to me right now. I may have left something out.
Q Okay. Thank you.
And Dr. Hanson -- this action maybe should be directed towards Mr. Horton.
But Dr. Hanson was talking about we had a Table 16 up here. And your explanation of the criteria being mentioned there's the losing and the gaining reaches.
Are you able to tell me if any of those losing

and gaining reaches are attributed to the well operation? And that may actually should be directed towards Mr. Horton.

BY MS. FERRARI:

Q Maybe I can jump in real quick.

What I'm curious, Mr. Hanson, is clearly in your analysis you said there are multiple factors that you were using to determine the habitat conditions and so forth. And one of those was that you showed us VT-1 section there and how it started out lower, and then it got higher. And you seem like you were attributing that to a gaining reach.

I'm just wondering what information you were relying on when you were inferring or assuming that certain reaches were naturally gaining or losing?

A Okay. I didn't make any assumptions about whether a reach was losing or gaining.

VT-1, the data that I showed between September 5th and September 12th, reflects the in-flow from the upstream areas coming into our study reach. And so it's whatever the hydrology, the upstream demand, all of those factors are.

What we used was the data that was collected at VT-1, VT-2, and VT-3. We put all of that data in our statistical analysis. And so whether it was gaining or losing, from my perspective, is simply reflected in the data we used, not in the processes that might be occurring within those reaches of the river.

MS. FERRARI: Thanks.

HEARING OFFICER DODUC: Thank you. Mr. Lazar.

MR. LAZAR: Good morning. Adam Lazar, Center for Biological Diversity.

Chairman Hoppin, Member Doduc, before I begin, I'm curious, we haven't had an opportunity to review the fourth amended application with the applicant and the applicant's experts. Are we going to have an opportunity to do that?

HEARING OFFICER DODUC: I'm curious. There was opportunity during cross yesterday for you to ask those questions.

MR. LAZAR: Member Doduc, my cross-examination was focused on their direct testimony, and their direct testimony did not encompass the fourth amendment. It did not encompass the new permit conditions that were provided on June 14th. You'll see that --

BOARD MEMBER MAHANEY: It's a little unclear what you're asking for. You're asking for time now to ask questions --

MR. LAZAR: I don't need time now, necessarily. But I think it would be helpful to at least have an opportunity to ask questions about the fourth amendment and the new permit conditions.

HEARING OFFICER DODUC: I'm not planning to bring the witnesses back later on in the hearing for those questions.

MR. LAZAR: Will you provide some additional time now so that we can explore at least a couple of conditions here?

HEARING OFFICER DODUC: And why did you not ask those questions yesterday?

MR. LAZAR: Again, I was crossing them on their direct testimony. And their direct testimony didn't concern the new permit conditions.

HEARING OFFICER DODUC: Ms. Mahaney, is the attorney, but in Water Board procedures, I guess the cross is not limited to the direct testimony as long as it's relevant to the issue at hand. So you did have that opportunity yesterday to ask questions about the amended application.

I appreciate that you may not have known that. And since it was a late filing and since the Board staff did ask questions on that matter, I'll grant you some latitude to ask some questions on the amended application today, but there will not be another opportunity today.

MR. LAZAR: Thank you.

I would like to ask some questions about the --

MS. GOLDSMITH: Excuse me.

HEARING OFFICER DODUC: Ms. Goldsmith.

MS. GOLDSMITH: I don't know whether our experts have seen copies of the letter that was submitted. The letter was submitted by the applicant -- by myself on behalf of the applicant. It was informed by the testimony that was put in yesterday, but I'm not sure that it's, I guess, very fair to be asking our experts questions about that specific document. I think that if there are questions about subjects that are in there that were covered by the studies, I don't have a problem with that. But in terms of --

MR. LAZAR: That's fine.

HEARING OFFICER DODUC: That's fine. I think your witnesses know if they do not know, they can say they do not know.

MR. LAZAR: Thank you.

RECROSS-EXAMINATION

BY MR. LAZAR:

Q So I'm going to ask a few minutes of redirect first.

Mr. Hanson, you discussed the lagoon just a minute ago. Did you develop a study of the relationship between the inflow into the lagoon and the percentage of the time the lagoon stays open?

A We made observations during our studies as to whether the lagoon mouth was open or closed during each of our surveys, but we did not develop a specific relationship between inflow to the lagoon and whether the lagoon was breached or not.
Q And what about the lagoon open versus closed and pumping? Did you alternate pumping? And did you ever perform the maximum cfs pumping, or in the studies was ever the maximum requested pumping performed and then the lagoon examined to look at the effect in terms of whether it was open or closed?
A During all of our studies, whatever the conditions were when the pumping occurred, they would be in a place, for example, for a week. We would schedule our crew to come down usually on the fifth, sixth or seventh day of that week so that the conditions had stabilized. And during each of those site visits, they would then determine visually whether the lagoon was open or closed.
Q Do you have a study or an analysis that shows that?
A It's simply imbedded in our data. We didn't do a specific analysis of that relationship.
Q Okay. When we were looking at Table 17 yesterday, we were discussing these critical low flow periods. And then when Ms. Goldsmith did redirect, you explained it was due to the natural hydrology of the system and that there were

a number of other sources or other variables there. Did you take specific measurements of what those other variables are?

A What we used in our analysis was the flow at the VT-1, the flow at VT-2, the flow at VT-3, and the flow at the USGS gauge as the driver for looking at hydrologic conditions.

There were other factors that Mr. Horton described, such as evapotranspiration, that would affect those flow measurements at different locations. Those were not part of our analysis. They are simply imbedded in the data that we used.

Q Maybe my question should be to Mr. Horton then. When we had these critical dropoffs, the .06 and then it goes back up to .15, you said that this could be attributed to other factors besides pumping alone. That's accurate; correct?

MR. HORTON: Here's what I can tell you about those flows.

On September 1st, 2nd, 3rd, and 4th, the USGS gauge hit its lowest daily averages for the season at 6.3 cfs.

And VT-1, we also hit maximum loses between the gauge and VT-1, 4.5 cfs on a daily average.

Imbedded with those averages though are what we see as an additional -- there's a swing of about 1 cfs. We see it gauge VT-1 with the daily ET demands.

So at any given point in time, depending on when these transects were taken, we could have another one cfs above that sort of average for at least a half.

So what we see coming around the corner on the fifth of September before we even get to the study area as a result of the Labor Day weekend withdrawals upgradient is a 2.2 cfs. And from that time on, the surface water flows recover from the extraction that occurred over the Labor Day weekend. And we get a continual rise in the USGS gauge area as well as in VT-1. This explains the difference between the 5th of September that you see there and the 12th of September.

Q Dr. Horton, my question was really that you're blaming the changes in the flow here on what you call the Labor Day Weekend. And I'm wondering if you were able to take measurements of what kind of loss you're having due to this weekend?

A I can tell you. We have an average loss in our study period between the gauge and VT-1 in 2007 was 2.9 cfs. That increased over the days of this holiday to 4.5 cfs.

Q Thank you.

I'd like to go over some of the new terms in this fourth amended application. And I won't just repeat the letter, because I understand you may not have seen it.

The applicant has requested from May 1st through October 31st a bypass flow of ten cfs is my understanding between May 1st and October 31st. This is Condition A.

This question will be for Mr. Horton.

And then for Part B, between July 3rd and July 5th and the Sunday before Labor Day, or Tuesday following Labor Day, there is a 16 cfs or greater.

Now, why would there be a six cfs difference there at the gauge between what you're normally recommending and then what's recommended for Labor Day and July 4th?

MS. GOLDSMITH: If you know.

MR. HORTON: I don't know.

MS. GOLDSMITH: If you know why those numbers were chosen.

MR. LAZAR: You don't know why the numbers were chosen? Do any of the experts know why these numbers were chosen?

MS. GOLDSMITH: I don't believe so.

MR. LAZAR: I see.

MS. GOLDSMITH: I think that Dr. Hanson has spoken to the ten cfs though.

MR. LAZAR: The ten cfs, I see.

MS. GOLDSMITH: He could also speak to the 30 cfs.

MR. LAZAR: I see. But not the 16. Okay.

BY MR. LAZAR:

Q And then Conditions D and E are interesting. It looks like Condition D looks like if they could do flow measurements at a USGS gauge and the 010 is the lower gauge that are necessary to provide equivalent fish passage to that provided in A and C, these flows shall be substituted.

As I read that, that means that whatever flows will provide fish passage in A and C would -- so Condition D then would result in a lower total cfs flow? I'm confused about that. If flow is necessary to provide equivalent fish passage are determined or using flow measurements at O and O -- that's the new lower gauge -- such flows shall be substituted.

Can I read between the lines and assume that you're referring to the forthcoming Department of Fish and Game flow study? I know you're not an expert, Ms. Goldsmith, but I'm asking why is that condition in there?

MS. GOLDSMITH: Ms. Doduc, I don't know whether you want to allow this attorney/attorney colloquy in the record. I'd be happy to speak with Mr. Lazar afterwards

HEARING OFFICER DODUC: I would suggest you do that.

BY MR. LAZAR:
Q Okay. It would appear that we have a set of new terms and conditions here that can't be adequately explained.
Let's take a look at Condition E here. In lieu of compliance with the first four conditions -- in other words, in lieu of compliance with A, B, C, and D, you propose to oxygenate three cfs of groundwater at Transect 11.
Dr. Hanson, can you tell me, is Condition E here with the pumping of three cfs and the oxygenation going to be the equivalent to these bypass flows in A through D? Is it going to provide the same kind of fish protection?
A This provision is intended to provide the same level of protection or greater than would be provided by the bypass flow.
Q So the ten cfs bypass flow proposed in paragraph A here, the three cfs of aerated alluvial groundwater would provide an equivalent protection to Condition A, which is the ten cfs?
A That's its intent. Although there would be a need to go out and actually document that this does achieve the criteria providing fish passage.
Q Before Condition E could be met or --
A As part of Condition E. And Condition E is not a minimum of three cfs, as I understand it. It would be an

augmentation of whatever the existing flow in the river is by three cfs. So it's hypothetically assumed that the flow in the river is six.
Q During the summer, we've seen it far lower than that.
A I'm just using a hypothetical here.
But the flow is six. Passage is not met. The supplementation occurs. Flow in this example goes to nine. The passage is met. Then that condition would be satisfied.
Q I see. Thank you.
You said yesterday in response to questions of the Board that ten cfs was a flow threshold below which you could be concerned about the condition of the steelhead. Do you mean ten cfs at the point of diversion or ten cfs at the upper gauge?
A All of the flow measurements that we have used by points of reference refer to the USGS gauge upstream of the point of diversion, not the new gauge.
Q If you meant ten cfs at the upstream gauge, how would you know what flow would be near the point of diversion?
A Presumably, we would have this new gauge 010 that you mentioned and Provision D of the letter that's on the board --
Q Right.
A -- that would provide information on the flow in the

immediate area of the point of interest.
Q In the future, we'll have that information?
A My understanding is that gauge has been installed and is currently being calibrated and implemented.
Q But the ten cfs condition has been put into the fourth amendment before we have data -- or actually, we do have data now, but it's just preliminary data, before we have a full set of data.
MS. GOLDSMITH: May I suggest that Mr. Horton respond to that question?
MR. LAZAR: Absolutely.
HEARING OFFICER DODUC: Dr. Horton.
DR. HORTON: So which is the specific question we need to answer here?
BY MR. LAZAR:
Q The specific question: Since we don't yet have a full set of data at the lower gauge and we've set a minimum bypass of ten cfs at the upper gauge, how would you know what the flow would be at the point of diversion?
A The thinking on this is through the study so far we have good correlation between our gauges and the USGS gauge. We presented that in my 2008 report on the 2007 study year.
So we infer from that that this new gauge will also have good correlation -- in fact, better, because

we're going to have a continuously recording gauge over time. Therefore, we can adjust -- these standards were all set based on the flows at the USGS gauge. And once we have the new correlation to this gauge because it's at a location between our gauges of VT-1 and VT-3, it's not been gauged before, that those flows would be adjusted.
Q Just one more question for Mr. Horton.
During low-flow periods, can there be variability in the quantity of natural depletions of water between the two gauges?
A Are we talking USGS gauge and the new gauge?
Q Yes.
A Yeah. Exactly, there is variability. And that's why we've proposed -- we proposed that the permit terms should transfer to the new gauge, which eliminates all that variability.
Q All right. And a minute ago you were talking about these tests again, Table 17. Just to confirm, those tests were a week long?
A You have to be more specific.
Q The tests we were looking at in Table 17, ESR-24?
A What do you mean by "tests" specifically?
Q The pumping tests in Table 17 and 16 of ESR-24. Can we take another look at those really quick?
A Yeah. Let me look at the table.

Q Thank you. I think we can continue. So as I was talking about before, based on these dates here, 8-31, 9-5, 9-12, it looks like you were alternating weeks of which the pumps were on and off.
A That's correct.
Q Did you ever test for longer than a week?
A In 2007, we did not.
Q And looking at these dates here, would you expect that if we were looking at individual days here 9-04, 9-06, 9-07, because these are only once weekly measurements, would you expect to see ranges between the two extremes of those weekly measurements then?
A Again, you're referring to the mean depths?
Q Yeah.
A Yeah. Certainly these I believe are spot measurements.
MR. HANSON: They are.
DR. HORTON: So over the course of the day, we have the diurnal fluctuating in the flow. They're occurring. And the withdrawals focus during the day upstream from users.
BY MR. LAZAR:
Q So these are spot measurements; they're not a weekly average?
A It's a mean depth on that day at whichever time that

was collected, correct.
Q Okay. Thank you. No further questions.
HEARING OFFICER DODUC: Thank you, Mr. Lazar.
Mr. Johnson, do you have any cross?
MR. JOHNSON: No, I do not.
HEARING OFFICER DODUC: Mr. LeNeve?
MR. LE NEVE: Just a couple questions.

RECROSS-EXAMINATION

BY MR. LE NEVE:
Q I make no apologies for not being an attorney, but I will apologize for not knowing all the rules. So if I ask a question that's not allowed, I'm sure someone will tell me it's not allowed.
Yesterday, Chair Hoppin asked Mr. Hill when the easement for the west side of the field was granted. And I'm sorry I missed that date. When was that easement granted?
MR. HILL:
A I believe in the early to mid 1990s.
Q Early to mid '90s.
A I don't have the precise date. The easement document was up there. It's on the -- it's in the documents. But I'm going to estimate around 1994, thereabouts.
Q Okay. Was that before or after you were told you didn't have a legal water right?

A It was after.
Q After. So then I'm assuming you were gambling that you would get the legal water right?
I didn't get an answer.
A You haven't received one yet, sir. Events unfold --
MS. GOLDSMITH: May I ask that you clarify the question? Perhaps you're asking why he did it?
MR. LE NEVE:
Q Yeah. He knew he didn't have a legal water right and he knew he had to irrigate his pasture. But then he went ahead and made a conservation easement that required him to irrigate his pasture. From the documentation we've heard from the experts, the ranch would not be feasible without irrigating that pasture.
So if I'm looking at a time frame, you knew you did not have legal water to irrigate that pasture when you made that easement?
Q I think I'm clear on your question now.
There is no nexus, nor has there ever been a nexus, between the application for water and the furtherance of the conservation easement. What triggered the interest in the conservation easement was that I participated with legislators in creating the Act at the time to fund Monterey County to be able to purchase conservation easement back in the 1980s, because they had

the Coastal Act passed and everybody thought there was going to be a race to the courthouse for building permits. That had a 10 or 15-year-life span while that money was available to Monterey County.

Within about a month or so while that money sat for 15 years, a few people used it, that was going to get returned to the State General Fund. So the ranch decided, independent of any water application permit, that conservation easement was an appropriate thing to do. So we applied it both to the ocean side of the highway as well as the inland side of the highway. It's not just the permanent pasture. It covers 3,000 acres. And again, this application is only 246.

Q Thank you.

I want to go back to the juvenile fish that Dr. Horton and I had been discussing. And I apologize for not having the draft EIR. In my comment letter, I stated that the management plan has basis for measuring -- and the county plan lists depth required for juvenile fish passage of .5 feet. And I don't believe I was mistaking juvenile fish passage for juvenile habitat. So it says juvenile fish passage. How did we get from juvenile fish passage to juvenile habitat?

MR. HANSON: The criteria that I looked at that we used for fish passage as we discussed yesterday was the

0.3. When I discussed and looked at the criteria, the 0.5 foot depth, it appeared to me that that was originated with Allen Burracco and was for juvenile rearing, not for passage.

BY MR. LE NEVE:

Q Where would that be measured?

A Juvenile rearing would not be measured explicitly by the critical riparian elsewhere passage is the primary interest. Juvenile rearing would be measured at the variety of habitats located upstream and downstream in the river, including the pools, the runs, as well as the ripples.

Q Okay. So that was an unfortunate choice of words saying juvenile fish passage then, when it should have said juvenile fish rearing?

A That was at least my understanding and my interpretation of the 0.5 foot depth criteria was for rearing and not specifically for passage.

Q Okay. One more question. Is it logical for juveniles to migrate from one rearing facility to another?

A The juveniles have a certain level of site fidelity. But as conditions change, density dependent mechanisms like competition or environmental conditions change the habitat conditions within the river. You would expect those juveniles to migrate from one habitat type to another.

And that's one of the reasons we wanted to retain the opportunity for a fish who might be downstream in a pool to move upstream through a ripple to a run. And we want that opportunity to move among those habitat units in response to the environmental factors and the biological factors that dictate where juveniles are rearing. So yes, they do move.

Q Okay. Thank you. That's all.

HEARING OFFICER DODUC: Thank you. At this time, Ms. Goldsmith, do you wish to move your exhibits into evidence?

MS. GOLDSMITH: Yes. If you'll give me a moment, it's back there.

BOARD MEMBER MAHANEY: Ms. Goldsmith, and everyone else, if you have exhibits that come in, we would appreciate it if you make sure to serve them all on all the parties electronically as well as provide an electronic copy to the Board just to keep our records nice and tidy.

MS. GOLDSMITH: We brought 15 paper copies and distributed them to the parties here. We did not know in advance and we certainly will provide electronic copies as soon as we get back to the office for your records.

BOARD MEMBER MAHANEY: Thank you.

MS. GOLDSMITH: At this time, I'd like to move into evidence ESR-1 through ESR -- was there an ESR-40? I think it's through ESR-39.

HEARING OFFICER DODUC: It's believe it's 39, too.

STAFF GEOLOGIST MURPHEY: We ended at 39.

MS. GOLDSMITH: Thank you. Through ESR-39.

HEARING OFFICER DODUC: Any objections? Not hearing any --

BOARD MEMBER MAHANEY: Would you like to add the new application letter as an Exhibit Number 40 to keep our records clear?

MS. GOLDSMITH: We certainly can do that. It's my understanding they are part of the exhibits that you offered.

BOARD MEMBER MAHANEY: They are. But just in terms of this coming in after all the other exhibits, it would be helpful to identify it separately.

MS. GOLDSMITH: Sure. I'll identify that as ESR-40.

HEARING OFFICER DODUC: Any objections? Not seeing any, those exhibits have been moved. Thank you.

(Whereupon the Exhibits ESR-1 through ESR-40 were admitted into evidence.)

HEARING OFFICER DODUC: Is the Department of Fish and Game prepared to present your case-in-chief? Please begin with your opening statement.

MS. FERRARI: Good morning, Board members and staff. My name is Chandra Ferrari. I'm staff counsel with the Department of Fish and Game.

The Department appears before you today as a trustee agency for the fish and wildlife resources and the state of California. As such, it is our agency's mission to protect such public trust resources on behalf of the people of this state. Our mission encompasses all of the public trust resources that reside within the Big Sur River watershed, including the steelhead trout and other terrestrial and biological resources.

The department has also submitted a written opening statement, which is going to be circulated right now. So for the stake of brevity, I'm going to be touching on a couple of the main points of the written one.

The Department will be providing testimony today on three of four key issues described in the Notice of Public Hearing.

The first issue addressed is whether or not there is water available for appropriation in the Big Sur River. The Department does not believe there is sufficient water available to both accommodate all the diverters in the watershed, including the diversion of El Sur Ranch, and ensure that the public trust resources are protected.

However, the statement that Ms. Goldsmith made yesterday, that you don't have to choose between these two things, is a concept that is shared by the Department. We believe that there is a solution that will allow the El Sur Ranch to continue its operation and ensure that public trust resources at the bare minimum maintain the status they have today. And the main part of that solution is the imposition of an interim minimum bypass flow, which I will discuss in more detail shortly.

Mr. Custis will be providing testimony today that conveys the results of his water availability analysis and cumulative flow impairment index. Mr. Custis calculated his own analysis, because it his opinion that the water availability analysis conducted by the applicant is deficient. Chief among these deficiencies, as Mr. Custis will describe today, is the fact that the applicant's analysis failed to include all the upstream diverters. This skews the results, as there will certainly seem to be more water available if the analysis does not account for all the diverters removing water from the watershed.

The results of Mr. Custis' analysis showed that all operating scenarios that included El Sur Ranch's proposed pumping rates produce an impairment index above ten percent from June through November. The Department believes these results are here for the Water Board to follow its policy for maintaining instream flows in northern California coastal streams, which states that no new diversions during summer months should be approved.

However, if the impairment index greater than ten percent is determined by the Board to be in the public interest, then the Department recommends they be subject to permit conditions, require maintenance of bypass flows that are protective of the fisheries and other public trust resources.

This brings me to the second key hearing issue noticed by the Board, which is whether or not approval of the application will result in significant adverse impacts to public trust resources. The Department's answer is yes. The Department considers this watershed to be extremely valuable to public trust fish and wildlife resources, most notably the steelhead trout.

As you have heard and will continue to hear in testimony today, the steelhead is an exceptional resource from a public trust perspective. However, its status is precarious. Dr. Titus will present testimony today that steelhead numbers have declined in recent decades in most, if not all, coastal watersheds in California, including the Big Sur River. The south central California coast distinct population segment, a grouping which does include the Big Sur River river population steelhead, has gone from the estimated 20,000 adult spawners during the mid-1960s to being characterized as at-risk of extinction by the mid-1990s and subsequently listed as threatened under the Federal Endangered Species Act.

In addition, the Big Sur River steelhead population is no longer productive enough on a continuous basis to maintain a population and support at least a modest level of harvest in a sport fishery. Steelhead harvest has not been allowed on the Big Sur River since 2000, the culmination of gradual restriction of sport fishery over several decades. The current catch and release fishery reflects the relatively healthy status of the Big Sur River steelhead population, but a status that still falls well short of a system's capacity for supporting the fishery.

The Department urges the Board to remember this is a threatened species. Aggressive regulatory action is warranted to ensure that species at the bare minimum maintains the status it has today. The Department recommends that the Board be as proactive as possible to ensure this population does not further decline on its watch.

With that in mind, the Department will present testimony today that the significance of the Big Sur River steelhead population extends beyond the Big Sur River. Other, more degraded watersheds depend in part on strays from the Big Sur River steelhead population to maintain their own steelhead populations.

In other words, the Big Sur River steelhead population acts as a source population for these other watersheds. So maintaining or improving the conditions of the Big Sur River steelhead population is important, not only for the Big Sur River but also for the whole distinct population segment.

As I stated before, the Department believes that the steelhead are in relatively good shape, but their habitat conditions are not ideal for growth. Stunted growth has been linked to a lower rate of survival in the ocean, which in turn can result in lower rates of adults returning to the Big Sur River to spawn. The Department believes the applicant's diversion exacerbates these conditions when pumping occurs during low flow periods.

Both Dr. Titus and Mr. Custis will provide testimony on the calculations used to develop the Department's proposed interim minimum bypass numbers. Essentially, the numbers are made up of three different components. Dr. Titus will provide testimony on the first component, which are the flows needed to protect biological resources. Mr. Custis will provide testimony on the second and third components, which are necessary given the unique nature of El Sur Ranch's diversion.

The second component of the bypass flow is the calculations of the losses in river flow from the existing USGS stream flow monitoring gauge to the point of diversion. This is required because, given the location of the diversion close to the lagoon, it is not feasible to have a monitoring gauge downstream of the point of diversion. Therefore, an upstream gauge must be used, and the loss of flow expected to occur from the gauge to the point of diversion must be included in the bypass calculation.

I know there's been some talk of the new gauge that's currently installed. And I'd just like to point out here that the Department is aware there is only funding for three years for that gauge right now. So if that was to be reflected in the permit, we hope there be two different sets of conditions: One for relying on that gauge and one also for relying on the USGS gauge if that ended up being -- if the funding can continue for the second gauge.

The third component of the bypass calculation is maximum rate of diversion also required due to lack of downstream monitoring gauge. There are no real-time monitoring devices on the wells, so there's no way to ascertain the actual amount of water being diverted at any given time. Therefore, the Department has included the maximum diversion rate sought by the applicant in the bypass calculation to ensure the resources are adequately protected at all times.

I would like to point out that the Department and the applicant have approached this I think key hearing issue regarding significant adverse impacts to public trust resources very differently. That difference stems from the fact that the application before the Board involves the diversion from a subterranean stream as opposed to a surface stream. This, of course, has introduced several different complexities into this process.

The key to the Department's approach to this issue was recognizing that the subterranean stream and the surface stream are part of one water course. In other words, the Department treated this as if it was analyzing the diversion occurring from a surface stream. So we determined the condition of the public trust resources of the watershed, determined what conditions would be necessary to protect those resource. In this case, what bypass flows are required to protect a minimum maintenance condition. And then assume that any diversion from the applicant that occurred when the flows were less than the bypass would be detrimental.

The Department's bypass flow recommendation specifies that the applicant will cease diverting completely when the bypass flow number is reached. The Department recommends that the Board follow this approach. We think it is consistent with case law that states that subterranean streams should be treated as surface streams. And also consistent with past subterranean stream water right decisions, for instance, the North Gualala decision that included in the permit that the well diversion would cease completely when the bypass flow number in the river was reached. The Department believes that this approach is the most proactively protective of public trust resources.

The applicant, of course, approached this issue in a different way. Essentially, they attempted to ascertain the impacts of their pumping on the surface flow. The Department believes there are multiple issues to the Board utilizing this approach to determine the proper measures for public resource protection. First, there is broad-based issues with the "impacts" test. And second, there are deficiencies with the specific impacts analysis conducted by the applicant. The Department's testimony will describe these issues.

To summarize, on a broad-based level, not taking into consideration what the particular deficiencies are the applicant's analysis, the impacts test assumes an impact will remain static. In other words, it does not account at all for the dynamic river system and therefore cannot accurately capture how the diversion from the wells will impact the river every season of every year.

Utilizing the impacts test is also extremely unworkable from an enforcement standpoint and would require unnecessarily complicated and burdensome monitoring protocols. If the impacts test is used to set protective conditions and there's no provision for constantly re-assessing river conditions to adjust terms and conditions, the risk of using it falls squarely on the resources.

As for the specific deficiencies with the applicant's analysis, the major point is that they understated their impacts by not addressing the effects of residual loss on the river, among other things. In other words, there is a lag time that exists between when pumping stops and when the surface level in the river stops lowering. The applicant's well test initiated pumping before the residual losses to the river ceased. In other words, the river's level failed to return to its base line before the next pumping test started.

The Department asks how can the impacts to the river be accurately assessed when there never was an accurate base line rating. In addition, there has been no attempt in this process, either by the applicant or the Board in the CEQA process, to ascertain the cumulative impacts to the watershed that resulted from 60-plus years of pumping.

In light of the inherent difficulty that exists with trying to accurately assess the impacts of pumping from a subterranean stream on the river and the fact that the applicant failed to accurately measure the impacts of their diversion, the Department recommends that the Board include the whole diversion amount in the bypass calculation to ensure sufficient protection of the biological resources.

If the applicant's contention that their impact is so small that their permit does not require protective conditions, it is the Department's contention that the evidence show the El Sur diversion is more likely to draw down the surface flow during low flow periods when the resources most need flow than at any other time.

In addition, when conditions are not ideal, any amount of water coming out of the river can be detrimental in that it can exacerbate the less-than-optimal conditions already in place.

Therefore, even if the Board decides to utilize the impacts test to determine the protective measures and even if you assume that the applicant's impacts analysis is accurate, the Department still believes a minimum bypass flow condition is warranted, particularly during the low-flow season.

Finally, the Department will be providing testimony for key hearing issue three regarding whether the water will be put to reasonable and beneficial use. The Department does not believe the requested amount of water will be put to reasonable and beneficial use. The total volume and requested rates of diversion exceed that which is considered reasonable and beneficial under Water Code Section 1004 in California Code of Regulation Title 23, Section 697, Subsection A(1).

Water Code Section 1004 states that "annual diversion for uncultivated land shall not exceed two-and-a-half acre feet per year." It does not appear that the Board has a specific definition for uncultivated. However, the Department did find a definition for uncultivated cropland used by the Federal government's Department of Agriculture. The Department believes the definition is helpful in this context and that the Board should utilize a similar definition.

Utilizing the definition, it is clear that the irrigated pastures of El Sur Ranch qualify as uncultivated, because they are the functional equivalent of permanent hay land. At two-and-a-half acre feet per year, per acre per year, the total annual diversion should be approximately 620 acre feet per year. This number is less than 40 percent of the 1615 acre feet a year requested by El Sur Ranch in their application. Also less than half of the modified amount of 1320 acre feet a year.

As for CCR Section 697, Subsection A(1), Mr. Custis's testimony states that the physical setting of El Sur Ranch diversion does not match the one cfs per 80 acres criteria -- the one cfs per 50 acres criterion, and therefore the Department recommends the water right require the diversion rate to comply with the one cfs per 80 acre criteria, which would result in a diversion rate of approximately 3.1 cfs, not 5.84 cfs.

In addition to the fact that the total volume and requested rates of diversion exceed that which is considered reasonable and beneficial under Water Code and regulation, the Department supports its contention that the water will not be put to reasonable and beneficial use with two calculations that show the amount being requested exceeds the irrigation requirements.

Mr. Custis will provide testimony today about the two methods that he utilized to ascertain the net irrigation requirements and what results were produced.

I conclude by respectfully requesting that you include as conditions of this permit the Department's proposed numbers to ensure the viability of the public trust resources in this watershed and in the larger central coast area which is functionally linked to the Big Sur River.

Thank you.

BOARD MEMBER HOPPIN: Ms. Ferrari, when you were talking, you mentioned that there has been no fishery on the body of water since 2000. But then after that, I thought I heard you say -- and I want to clarify -- that there is fishery, but it's catch and release.

MS. FERRARI: Catch and release. I'm sorry. I meant no -- I guess catch and keep fishery.

BOARD MEMBER HOPPIN: No catch and eat.

MS. FERRARI: Yeah, it's gradually gone down from a two-bag limit. I think about four years after that, it was a one bag limit. And then by 2000, it was catch and release.

BOARD MEMBER HOPPIN: Thank you.

DIRECT EXAMINATION

BY MS. FERRARI:

Q Dr. Titus, you're on first.

A Good morning.

Q Can you please state your name and position for the record, please?
A My name is Rob Titus, T-i-t-u-s. I'm currently employed as a Senior Environmental Scientist in the Fisheries Branch of California Department of Fish and Game.
Q Is Exhibit DFG-T-A a true and correct representation of your testimony in this proceeding?
A Yes, it is.
Q Is Exhibit DFG-T-B a true and correct statement of your qualifications?
A Yes, it is.
Q Have you been involved either as a participant or lead scientist in studies or data collection efforts on the Big Sur River?
A Yes, I have.
Q Can you please, as concisely as possible, give a summary of those studies and data collection efforts?
A Sure. I conducted an investigation of juvenile steelhead habitat use and life history on the Big Sur River from 1992 through 1995.

I also led an effort during 1997 to collect scales from adult steelhead spawners for a growth study. My last direct involvement in data collection efforts on the Big Sur itself was during August 1997 when I conducted a brief electrofishing surveys on Juan Higuera Creek, which is one of the main tributaries to the lower Big Sur to follow up on a tagging study that was initiated in 1994.

Q Can you please briefly identify the public trust fish and wildlife resources that the Big Sur River watershed supports?

A Sure. The Big Sur River watershed provides habitat for a diversity of high profile aquatic resources, the most prominent of which is the steelhead rainbow trout. In addition to this keystone species, the Big Sur River watershed is has a host to an important native amphibian and aquatic reptile species, including the ESA-listed California red-legged frog and the western pond turtle.

Q So while the Big Sur River watershed supports numerous public trust resources of interest, your specific studies and data collection efforts have focused predominantly on steelhead?

A Yes.

Q What is the current conservation status of steelhead on the Big Sur River?

A The steelhead is listed as threatened under the Federal Endangered Species Act as part of the south central California coast steelhead distinct population segment, or DPS.

Q Generally speaking, are there observable trends for steelhead populations that inhabit California's coastal streams?
A Yes. Most of the steelhead populations in California's southern-most coastal counties have been extirpated or greatly reduced in abundance within the last 60 years. And the trend in decline of steelhead appears to be creeping northward along the coast.
Q Is there any indication that the steelhead population in the Big Sur River has also declined over the last 60 years?
A Yes. The Department estimated the population at about 300 adults for the state's 1965 Fish and Wildlife Plan. And the population has possibly declined to 100 or fewer adults in recent decades as indicated in the status review for the listing of steelhead.
Q From Exhibit DFG-T-3, which is your draft manuscript of the history and status of steelhead in coastal drainages, what is the common factor found to be affecting steelhead distribution and abundance?
A Diversion of water from streams supporting steelhead.
Q In your opinion, if the Big Sur Ranch's application to divert water is approved, does it have the potential to affect steelhead distribution, growth, and abundance in the Big Sur River?

A Yes, it does.
Q In what way?
A In my opinion, the magnitude and timing of the pumping operation could impact steelhead production by exacerbating the effects of less-than-optimal juvenile rearing conditions that occur during low-flow periods.

Department experience with steelhead streams on the central and South Coast tells us that an entire stream segment can be rendered largely unusable as steelhead habitat as a result of long-term diversion effects. And I provide in my testimony an example from San Luis Obispo County that's relatively well documented in this respect, Santa Rosa Creek. And this alters instream distribution and abundance of fish and ultimately the population productivity. The reduction in flow can restrict fish passage and mobility, including movement of steelhead between lower-most river and habitats. Several life stages can be affected, including adults migrating upstream to spawn, smolts migrating downstream on their way to the sea, and half-pounders making later summer/early fall forays into the river.

Growth of the juvenile steelhead stops during low-flow periods because of reduced food delivery. Diversion of flow from the river exacerbates these conditions with consequences for marine survival of smolts

due to the reduced size at ocean entry.
Q Can you briefly explain why the Big Sur River steelhead population is such an important public trust resource?
A The Big Sur River steelhead population is really exceptional. It provides one of the last remaining decent steelhead sportfishing experiences on the south central California coast. It is particularly important ecologically as well, because given its distinction as a so-called source population, it is key to the survival of the many small steelhead populations that occur along the Big Sur coast.
Q You just noted that the Big Sur River steelhead population is an important source population. Can you briefly describe what a source population is?
A Certainly. I mentioned earlier that the Big Sur River steelhead population is in the south central coast DPS. Well, steelhead populations within a DFS must be largely reproductively isolated from steelhead population in other DPSs, but at the same time, must interact among themselves to result in the relatedness that defines the DPS.
The group of populations within the DPS river presents then a meta-population or a population of populations, basically, where functionally there are source populations inhabiting relatively large stable

habitat patches that provide surplus individuals that colonize sink populations in smaller relatively unstable habitat patches. Extinction risk is relatively low in the source populations because of this stability of the habitat. And extinction risk is relatively high in the sink populations, placing high importance on colonizing individuals from the source populations to help maintain those sink populations.

And I identified several streams in my testimony among the Big Sur coast that are likely sink populations relative to the Big Sur as a source population.

Colonizing individuals in population of anadromous salmonids like steelhead are typically referred to as "strays," because of the otherwise very strong homing instinct in these fishes. The Big Sur River steelhead population is considered to be the source population in the south central coast DPS.

Q Given that the Big Sur River steelhead population acts as a source population, is it your opinion that protection of the population is necessary for the continued viability of the entire south central coast DPS?

A Yes, I do. Protecting, maintaining, and even improving conditions on the Big Sur River for steelhead production is of very high importance for the DPS as a whole. The significance of this function gains even more weight, considering stream declines in steelhead abundance and what were other likely source populations in the DPS: The Pajaro, the Salinas, the Carmel rivers.

As recently as the 1960s, these three rivers, along with the Big and Little Sur River, supported an estimated total of nearly 5,000 adult steelhead spawners. Thirty years later, this total was estimated at about 500 spawners, representing a ten-fold reduction.

Q Given that the importance of the Big Sur steelhead population extends beyond the Big Sur watershed, do you believe that the El Sur Ranch diversion has the ability to influence steelhead productivity outside of the stated zone of influence of the pumps?

A Yes, absolutely. The question of how the El Sur Ranch diversion affects steelhead is not restricted to just individual steelhead within the zone of influence of the pumps on an annual basis or even to the Big Sur River population as a whole, but also as to incremental losses in steelhead productivity in the Big Sur River affect the entire at DPS on a time scale of at least decades.

Q In your opinion, is the steelhead population in the Big Sur River healthy?

A Yes, it's relatively healthy.

Q What do you mean by relatively healthy?

A Well, given the condition of steelhead populations and others similarly situated coastal streams south of San Francisco, the population in the Big Sur River is doing quite well. That is, relative to the San Gabriel, Los Angeles, Santa Clara, Ventura, Santa Ynez, Carmel, Salinas, Pajaro, San Lorenzo River -- I could go into a third day of hearing -- and the scores of small coastal streams and creeks south of San Francisco that once provided habitat for healthy self-sustaining steelhead populations and support a vibrant and even famous sport fisheries and where steelhead are now either extirpated, greatly reduced in abundance, or dependent upon human intervention for their persistence, and where Man's participation in the ecology of these systems as anglers is no longer even an option. Yes, indeed, the Big Sur River is a real standout stream.

That being said, also have to point out that habitat conditions for steelhead on the Big Sur River are not completely pristine or unimpaired by any means. In addition, despite relatively good habitat conditions, the Big Sur steelhead pollution has still decreased over the last few decades as I noted earlier.

Q Isn't it true that the natural hydrograph of the Big Sur River indicates that it produces less than optimal flows on occasion, even assuming no diversions were occurring at all?

A Yes.
Q So you mentioned at the beginning of your testimony that you are concerned with the pumping exacerbating the effects of low-flow conditions in the river. If the Big Sur River is naturally producing poor flow conditions for steelhead, do you really believe that the pumping operation makes the river conditions worse than they already are?
A Yes. By their own admission, the El Sur Ranch's diversions have a measurable effect on surface flows of the Big Sur River. Given small amount of water typically available from the watershed during the summer to fall low-flow period, diversion of the magnitude and application will disrupt the ecological function of the river, inducing cascading effects on steelhead production and life histories that in the long-term would be expected to reduce abundance of an already modestly-sized steelhead population.
Q Can you explain the aspects of steelhead production and life history that may be effected by the El Sur Ranch diversion, especially during the summer to fall low-flow period?
A Yeah. In my opinion, the diversion will negatively effect juvenile steelhead growth during the low-flow period by further reducing the availability of drifting

through organisms to the fish. The diversion may have this effect on juvenile steelhead during virtually any water year type, all though the effect of maximum diversion would be greatest under the lowest flow conditions.

In addition, the diversion has the potential to impact the depth of the Big Sur River at critical riffles, and thus impede upstream passage of both immature half-pounders and adult steelhead.

Finally, in a broader sense, diversion effects on steelhead growth, migration, and survival may reduce life history diversity within the Big Sur River steelhead population, which is necessary to maintain adaptability to variable environmental conditions.

Q You noted that El Sur Ranch diversion has the ability to influence food availability for juvenile steelhead. What is the relationship between food availability and growth?

A Well, as one might expect, if there is a lack of available food, growth rates stall or are reduced.

Q How would El Sur Ranch diversion contribute to a lack of food availability in the Big Sur River?

A The production and delivery rate of food to juvenile steelhead is at least in part a function of stream flow. And we've been involved in research that demonstrates this. Low-flow conditions reduce food availability. El Sur Ranch diversion will reduce flow even more than what would otherwise occur and thus exacerbate the effect of low-flow on the delivery rate of food.

Q Why is maintaining growth in steelhead populations so important on an individual and population scale?

A Well, first-year growth performance of juvenile steelhead in the Big Sur River is of cascading importance to the fitness of individual fish. The instream growth of steelhead determines their size at ocean entry. Ocean survival of steelhead smolts is strongly size dependent where relatively large smolts have a higher survival than small smolts. Therefore, achieving as much growth prior to smolting as the natal stream can support under natural conditions has far-reaching implications for the individual.

This growth imperative during the early life history of steelhead also has implications for the population. For steelhead population to grow, its productivity must increase to where the spawning adults are being produced exceeds simple replacement. Evidence in this testimony from other sources clearly indicates that the arrested growth of juvenile steelhead that occurs under low-flow conditions in the Big Sur may represent the greatest bottleneck to population productivity.

While juvenile steelhead rearing in habitats where water is diverted during low-flow periods may survive and even appear to be healthy and in good condition, the nuances of how diversion or flow affects delivery of food to steelhead, their growth rates, their size at ocean entry, their ocean survival, and ultimately survival to spawn may go completely undetected.

Q You identified a range of flows within which food availability results in appreciable growth of juvenile steelhead over a sustained period of months?

A Yes, I have. It appears to be somewhere between 20 and 60 cfs.

Q And how did you arrive at that range of flows?

A In my direct testimony, I assessed seasonal growth rates of juvenile steelhead relative to flow conditions in 1993, which was a wet water year type.

Steelhead grew relatively well and attained a relatively large size during the summer of 1993 when the daily mean stream flow decreased from about 60 to 20 cfs.

Throughout fall 1993, when flow remained near 20 cfs, steelhead grew very little in length, and their average nutritional status decreased as reflected in their length wave relationships. Thus, it was apparent that somewhere between 60 and 20 cfs the river reached a threshold below which it no longer delivered enough food for steelhead to maintain their weight, much less continue growing appreciably in length.

Q You also noted that the diversion has the potential to impact adult steelhead upstream passage. How is that?

A In some years, low-flow conditions may persist throughout fall and as late as mid-January or so, extending well into the period that adult steelhead returning from the ocean on their spawning migration.

Under such conditions, adult steelhead may become concentrated at a location in the river where upstream passage is impeded due to insufficient water depth, usually on a riffle. By reducing stream flow, especially at a relatively high proportionate rate under low flow conditions, the El Sur Ranch diversion has the potential to increase the frequency of occurrence of passage problems for adult steelhead.

Q You stated earlier that you believe the El Sur Ranch diversion has the ability to negatively effect the Big Sur River steelhead population and consequently other steelhead populations in the south central coast DPS. In light of that statement, what terms and conditions would you recommend that the Water Board adopt to avoid such impacts?

A I recommend that the Water Board include as a condition of El Sur Ranch's water right permit interim minimum bypass flow requirements.

Q What are your proposed interim minimum flow recommendations?

A I recommend 132 cfs for the period December 1 through May 31st. This flow is recommended to accommodate upstream and downstream passage of adult steelhead and is expected to accommodate downstream passage of steelhead smolts as well.

I recommend 29 cfs for the period June 1 through November 30th to accommodate juvenile rearing.

Q And why are your proposed flow recommendations interim?

A These are interim recommendations based on the information that we have available currently. Given that the Department is currently conducting a PHABSIM that will yield possibly new flow recommendations or revisions to what we're proposing today.

Q How did you arrive at 132 cfs for the minimum flow requirement for adult passage?

A We used the method presented in the Water Board's North Coast Instream Flow Policy to develop a minimum bypass flow for adult steelhead passage. This flow was designed to protect steelhead by "minimizing unnatural adult exposure, stress, vulnerability, and delay during adult spawning migration." The method uses the mean annual unimpaired flow in watershed area to arrive at passage flow. Using the equation in Table 2.1 of the policy, input values of 101 cfs for mean annual flow and 58 square miles for watershed area yields a minimum bypass flow of about 132 cfs.

Q How did you arrive at the 29 cfs for minimum flow requirement for juvenile rearing?

A As Kit Custis will note in his testimony, the calculation to establish bypass flows for juvenile rearing at the El Sur Ranch point of diversion requires three separate components. The first being minimum flows to protect biological resources. The second being flows to account for the maximum flow lost downstream from the USGS monitoring gauge. And the third component being flows to account for maximum instantaneous rate of El Sur Ranch's diversion.

My testimony directly addresses the first component: The flows needed to protect biological resources. I did this with the wetted perimeters analysis. And from that analysis, I concluded that 17 cfs would provide a minimal level of production to biological resources on an interim basis.

Q Can you briefly describe what the wetted perimeter method is designed to do and how you applied it in this case?

A Yes. The method is designed to determine bypass flow that provides a minute level of protection for aquatic life in food-producing riffles. On graphs of wetted perimeter as a function of stream flow, we selected the point at which the wetted perimeter reached an asymptotic as an appropriate level of protection for juvenile steelhead rearing. We call this point the "incipient asymptotic flow."
Q Which data did you use to conduct this analysis?
A I used habitat transect data that we collected during a juvenile steelhead study from 1992 to 1995.
Q Were the data used in the wetted perimeter analysis collected in the zone of influence of pumps?
A No. They weren't directly within the zone of influence.
Q Approximately what distance were your study sites from the zone of influence?
A The downstream-most site was about 2,000 feet from the top of the zone of the influence of the new well.
Q Given that the data collected were not specific to the zone of influence, do you believe that the recommended flows produced by this methods should be applied in the zone of influence?
A Yes, I think they're applicable. First, the data collected were in relatively close proximity to the zone

of influence.

Secondly, we collected data at six sites that spanned most of the Molera Park reach of the river. And we obtained remarkably similar results at five of those six sites.

Finally, the river morphology does not appear to change significantly in the Molera reach until the river transitions into the lagoon. So, therefore, I think it is reasonable to assume that similar incipient asymptotic flows would be found downstream from our study sites in the zone of influence.

Q In your opinion, are your recommended interim bypass flows sufficient to maintain connectivity between the Big Sur River and Pacific Ocean?

A Yes, as long as the watershed delivers that much water throughout the low-flow period.

Q Okay. Thank you, Mr. Titus.

Mr. Custis, can you please state your name and position for the record?

A My name is Kit Custis. I'm currently employed at the Department of Department of Fish and Game as a Senior engineering geologist.

Q Is Exhibit DFF-C-A a true and correct representation of your testimony in this proceeding?

A Yes, but I have four technical changes to my testimony. These changes are needed to ensure that the direct testimony matches the corresponding exhibits.

On page nine in the discussion of the conclusions of the water availability analysis cumulative flow impairment index of Exhibit DFG-C-13, the first sentence Proposal 1b should be changed to proposal 1a.

In the conclusions on the Proposal 3 should be changed to reflect that it reaches from 12 percent to 27 percent for June to November and two percent to seven percent for December from May.

A third change on page 46, it should be changed to state that my calculations show that the arc angle between VT-2 and P4L is approximately 37 to 45 percent as shown on Exhibit DFG-C-49.

And a fourth change to remove on page 48 the reference to DFGT Exhibits 60. That's in the third line.

Q Is Exhibit DFG-C-B a true and correct statement of your qualifications?

A Yes.

Q Are you familiar with the project setting? In other words, the stretch of the Big Sur River that is included in the zone as influence as described by the applicant?

A Yes.

Q In your opinion, is there water available for appropriation under El Sur Ranch's water right application?

A Yes, but only if the bypass flows that are protective of public trust resources are included in conditions of the permit.

Q Based on the results of your water availability analysis and cumulative flow impairment index calculations, when is water available for diversion?

A Assuming that the impairment index of less than ten percent is what's desired, water is generally available for diversion from January through April under the pumping rate sought by El Sur Ranch and from December to May the pumping rate sought by the Department. If water diversion is authorized during summer months, a minimum bypass condition should be included.

Q What informed your opinion?

A I developed my own water availability analysis and cumulative flow impairment index for the El Sur Ranch diversion.

Q You also note in your --

A What this is is the first -- just a listing of the water -- priority water rights in the watershed. What I want to note is the parts that are blue are El Sur Ranch's. But essentially the first group here are what are in the water availability analysis as submitted by the applicant by the EIR. The rest of these water rights were

left out of that analysis. So that caused me to redo --
Q Okay. Thank you.
You also noted in your written testimony that your water availability analysis and cumulative flow impairment index calculations were done on a monthly basis. The applicant did their calculations on an annual basis. What are the advantages to your approach?
A My water availability analysis and impairment index were calculated on a monthly basis to better determine season availability of water and allow for more accurate depiction of the impairment to the river from the diversion.
Q So overall, what conclusions did you draw from your cumulative flow impairment index analysis as it relates to El Sur Ranch's proposed diversion?
A The conclusion I reached is that El Sur Ranch's proposed diversions have a potential to have a significant impact on flows in the river and thus impact fisheries, particularly if the diversion rates that El Sur Ranch are requesting are approved. In all operating scenarios analyzed, El Sur Ranch is the largest diverter in the watershed.
Q Would adoption of the DFG recommended diversion rates reduce the potential of the diversions to have a significant impact on the flows of the river?

A Yes. If the diversion rates that Fish and Game recommend are used for the appropriate permit, then the monthly impairment values for December to May are significantly reduced to a value at or below seven percent. And this is DFG Exhibit C 13.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Which page of C 13?

MR. CUSTIS: It would be the fourth page.

The impairment index is -- I've highlighted cumulatively in red. Where it exceeds ten percent, it's solid red. And where it's between five and ten percent, it's a dash.

To go on --

BY MS. FERRARI:

Q In your opinion --

A I have more.

Q Continue. I'm sorry.

A Adoption of the DFG recommend diversion rates -- adoption of the Fish and Game recommended diversion rates for June to November still result in a monthly impairment index value greater than ten percent, suggesting potential impairments to the fishery's resources. Therefore, protection of fishery and other public trust resources require that permit conditions include the requirement for maintaining bypass flows throughout the years as a

condition of the requested diversion.
Q In your opinion, will approval of the application result in any significant adverse impacts to public trust resources?
A Yes. As just discussed, I believe there is sufficient water in the system to accommodate the diversion and ensure public trust resources are protected.
But the diversion by El Sur Ranch from the Big Sur River, especially during the low-flow periods of June to November increase the vulnerability of the river to adverse impacts because the maximum instantaneous rate of diversion requested is 5.84 cfs and the ranges -- which ranges from approximately 18-and-a-half percent of the June median flow to 42.3 percent of the September median flow. And this would be DFG Exhibit C-4.
You've seen this chart before. It's a little hard to read when it's colored. Essentially it's a probability graph. And the dark lines spanning it are the two cfs the nine CFS, so bypass flows that are recommended.
In addition, monthly average diversion from upstream diverters during the low-flow period appears to constitute less than five percent of the median flow. And you can see this if you go back to the Exhibit 13. But we don't need to do that. It's the same in each one of those

exhibits.

The claimed riparian rights of El Sur Ranch range from approximately 26 to 59 percent of the median flow. Combining the diversions of El Sur Ranch, including its claimed riparian diversions, with those of the upstream diverters during the low-flow period, it is highly likely that significant impacts will occur to the public trust resources of the Big Sur River.

Q Given that the El Sur Ranch is diverting from a subterranean stream and not the surface flow of the Big Sur River, how is it possible that the diversion could impact the resources in the river?

A El Sur Ranch diverts from the subterranean stream that is hydrologically connected to Big Sur River.

Q If the El Sur diversion has the potential to impact public resources, what permit terms do you believe are necessary to protect the public trust resources?

A I propose that the requirement that all pumping and diversion must stop whenever flows fall below the minimum bypass flow values be included in the El Sur Ranch permit terms and conditions.

Q Specifically what minimum bypass flows do you recommend?

A I recommend the 132 cfs from December to May and 29 cfs from June to November.

Q You note in your written testimony that the bypass calculations include three components. The first component is the minimum flows needed to mitigate biological impacts; correct?
A Yes.
Q And Rob Titus discusses the calculation of this number in his testimony; correct?
A Yes.
Q Can you please describe the second component of the bypass flow calculation and what methodology you used to determine the number?
A The second component of the bypass flow calculations is necessary to account for maximum losses downstream from the monitoring gauge. I included the highest reported upstream loss of 8.9 cfs in the bypass calculation.
This is required due to the unique location of El Sur Ranch's point of diversion at the mouth of the river. Given this location, a long-term gauge can't be established downstream of point of diversion. Therefore, the monitoring point of the bypass must be located somewhere upstream from the point of diversion.
Q Why did you determine, given the variability in flow that occurs between the gauge and the point of the diversion, that the maximum recorded losses should be included in the bypass calculation as opposed to, say, the

average loss?
A Given the high variability of flows between USGS gauge and the El Sur Ranch as a point of diversion, certainly associated with the timing of the maximum downstream loss events, I believe it's necessary to include the maximum downstream loss numbers in the bypass flow calculation. To do otherwise would leave the public trust vulnerable when large losses downstream of the USGS gauge -- we call it the Big Sur gauge as opposed to the Andrew Molera gauge -- occur.
Q Did you factor in any other information to determine the second component of the recommended bypass flow?
A I think we had a question that's different. We took out some of the questions.
Q Did you factor into your bypass flow Dr. Titus' recommended bypass flow to end up to the 29 cfs?
A Yes. It's the first biological component.
Q Can you please describe the third component of the bypass calculation and what methodology you used to determine that number?
A The third component of the bypass flow calculation is the maximum rate of diversion requested by El Sur Ranch. I utilized that number, 5.84 cfs, instantaneous diversion rate.
Q Given that there's evidence of the whole amount of El

Sur Ranch's diversion from the subterranean stream does not immediately effect the surface flow of the Big Sur River, why should the whole amount be included in the bypass calculation?

A The fact that the monitoring bypass flow can't occur downstream from the El Sur Ranch point of diversion require that the bypass flow value include all potential losses upstream -- from all losses downstream from the monitoring gauge in order to predict the flow downstream point of diversion. To account for the losses from El Sur Ranch diversion, the maximum permitted rate should be used in the bypass flow calculation. If a value less than the maximum diversion is used, then this resource protection would be compromised.

Q In your professional opinion, will the requested amount of water be put to reasonable and beneficial use?

A No.

Q What is the basis for your opinion?

A The total volume and instantaneous rate of diversion south of El Sur Ranch exceeds the amount of water that is normally considered beneficial by the Water Code 1004, which is the two-and-a-half acre feet per acre year in California Code of Regulations Title 23, Section 697(a)(1), which is the one cfs per 80 acre feet irrigated acre feet; also, in comparison to the application rates for pastures in the general area and calculation of crop water requirement using the standard measures.

Also, the irrigation requirement calculated by NRCE in 2007 exceeds the irrigation requirement by calculating using the two standard methods of estimating evapotranspiration and crop water requirement, which the California Department of Water Resources' California Irrigation Management System, the CIMIS method, and one method by Pruitt and Snyder published in 1985.

Q Assuming that El Sur Ranch's pasture is deemed by the Water Board to be uncultivated, would the requested annual diversion amount be greater than two-and-a-half acre feet a year?

A Yes. El Sur Ranch is requesting appropriation of water to divert from January 1st to December 31st of each year and annual maximum now as amended to 1320 acre feet of subterranean stream flow of the Big Sur River for use on 246 acres of pasture. That comes out to about 5.4 feet per acre, per year. Two-and-a-half acre feet per year per acre, the total annual diversion should be -- it should be 615 feet for 246 acres.

Q Okay.

BOARD MEMBER HOPPIN: Could you repeat that? I didn't hear that last set of numbers.

MR. CUSTIS: Okay. It's two-and-a-half acre feet per year per acre with 246 acres. Then the total diversion should be 615 acre feet.

BOARD MEMBER HOPPIN: Did you give a number if it was considered cultivated? You had some of those numbers ran together. Are you siting on your opinion on uncultivated?

MR. CUSTIS: Okay. I can go through all three of them if you want.

The 1320 acre feet is for 246 acres, which is what -- comes out to about 5.4 per acre per year. And then what you see is the two-and-a-half acre feet.

BOARD MEMBER HOPPIN: The part I didn't get, it seemed like you were referring to some DWR number on cultivated pasture, and that was what I didn't --

MR. CUSTIS: Oh, no. The DWR -- we'll get to that. But the DWR has a methodology for trying to estimate how much irrigation is needed on the pasture.

BOARD MEMBER HOPPIN: Okay. I thought you covered that and I didn't catch the number. I'm sorry.

HEARING OFFICER DODUC: Ms. Ferrari, before you continue, we did stop the clock. So Mr. Hoppin's question was not on your time. But I need to let you know the clock was set at 60 minutes at the beginning of your, direct and you only 30 minutes and 41 seconds left.

MS. FERRARI: Thank you.

BY MS. FERRARI:
Q What did you calculate for a reasonable diversion rate and what standard did you use to determine this number?
A I recommended a diversion rate of 3.1 cfs using the California Code of Regulation Title 23, Section 697 (a)(1) using the duty of one cfs per 80 acres as irrigated along with the amended acreage of 246 acres.
Q Did you conduct an analysis to determine the irrigation requirement of El Sur Ranch?
A Yes, I conducted two of them using the CIMIS method and Snyder method. My calculations found the pastures can be irrigated at two-and-a-half feet per year per acre.
Q Okay. In order to ensure that the reasonable and beneficial use standards will be met, what terms and condition do you recommend be included in the water right permit?
A I recommend a maximum combined diversion rate of both wells instead of 3.1 cfs and that the maximum annual total diversion volume be limited to 615 acre feet for the 246 acres.
Q Thank you. The hydrogeologic studies conducted for El Sur's water right application concentrate on determining how much of the water pumped by the El Sur Ranch wells comes from the Big Sur River. In your opinion, did the applicant accurately determine the impact to the Big Sur

River from their wells pumping?
A No. I believe there are many issues with methodology used by the applicant to access their impact. These include:
The use of the geometric mean for hydraulic conductivity for different stream bed units;
Taking direct measurements of change in the river flow only at a portion of the river within a zone of influence;
Having insufficient points of measurement on the river to differentiate natural gains and losses from pumping use changes;
Failure to recognize the importance of residual losses following pumping;
Failure to allow pumping impact to return to pre-pumping conditions prior to the beginning of the pump test;
Failure to run the pump test long enough to determine the impacts for long-term pumping;
And a failure to evaluate the consequences of changes in the channel location, river bed material, and channel geomorphology on gains and losses from the river and the water quality during pumping.
Q Did you calculate losses in river flow when both the old and new well were pumping during late-September to

early October in 2007?
A Yes.
Q What methodology did you use to make your calculation?
A I used two standard analytical models, one by Jenkins in 1977 and one by Hunt in 1999. The Jenkins model was developed by the USGS and commonly used to calculate well impacts from streams. The second stream depletion model by Hunt which tries to address some of the major issues where the Jenkins model is criticized, specifically the lack of low permeability of the stream bed layer and the streambed penetrates the entire underlying aquifer.
Q What were the results of your calculation?
A In ESR-6, Table 3-1 shows the pumping of both wells at 5.02 cfs results in the river loss in Zones 2 to 4 ranging from 1.0 to 1.2 cfs. This loss is in close agreement with the results of Jenkins and Hunt models which would account for the fact that the area of loss is only a portion of the streambed within a zone of influence is approximately 40 percent.
The results of both Jenkins and Hunts model show that at the end of five days of pumping the stream depletion from the old well is approximately one-and-a-half cfs, from the new well approximately 1.9 cfs, with the sum of approximately 3.4 cfs. This sum is approximately 2.85 times the 1.2 loss in Zones 2 and as

stated in Table 3-1.

A suggestion of the short-term five-day pump test -- model results calculated result in approximately 14 percent greater. During this pump test -- the duration of this pump test didn't allow for the cone of depression to fully develop. Extending pump time would increase the impact.

The model suggests that at five days of pumping the stream depletion is approximately 50 to 75 percent of the total pumping. And after 30 days, depletion would be approximately 80 percent of the total pumping.

So Zones 2 to 4 loss of 1.0 to 1.2 multiplied by two-and-a-half, which deals with the 40 percent area to adjust for the partial river length suggests that the five-day pump test actually range from approximately 50 to 60 percent.

MS. FERRARI: I wonder if I could have permission to ask one last question?

HEARING OFFICER DODUC: Go ahead.

MS. FERRARI: Thank you.

BY MS. FERRARI:

Q Did the impacts test conducted by the applicant take into consideration the fact the stream continues to lose flow after pumping stops?

A No. The impact test that the applicant did -- and was going to point to two exhibits, but we don't have time. They show the residual depletion after five days of pumping, after the pump test that they did from the old and new well respectively.

For example, one day after shutting off the old well, after five days of pumping, the river is still losing about 40 percent of the total pumping rate. After five days, approximately twelve percent. The results of this analysis I conducted show that residual losses in the river after pumping can be significant.

MS. FERRARI: Thank you.

HEARING OFFICER DODUC: Thank you. With that, let's go ahead and take a ten-minute break before we begin with cross-examination by El Sur Ranch.

(Whereupon a recess was taken.)

HEARING OFFICER DODUC: Please take your seats. We'll get started with cross examination by El Sur Ranch.

CROSS-EXAMINATION

BY MS. TEETERS:

Q Mr. Custis, my name is Danielle Teeters. I represent the applicant, Mr. James Hill, in this matter. I'd like to ask you some questions regarding your testimony.

Now, you're still under oath. So you still promise to tell the truth? You understand that; right?

A Yes.

Q Now based on your direct testimony, it appears that you're somewhat familiar with the hydrogeologic conditions of the --

HEARING OFFICER DODUC: Could you get closer to the mike? Thank you.

BY MS. TEETERS:

Q Let me start over.

Based on your direct testimony, it appears you're somewhat familiar with the hydrogeologic conditions of the Big Sur River near the El Sur Ranch; is that right?

A Yes.

Q And part of your knowledge includes the fact that the El Sur Ranch wells are located in the underground aquifer and not the surface flow of the river; is that correct?

A Yes.

Q Now, under the current hydrogeologic conditions of the Big Sur River within the zone of influence, the rate of impact on the surface wells -- on the surface flow is not equal to the rate of pumping by the El Sur Ranch wells; is that correct?

A I think I would disagree with that.

Q What is that based on? Is that based on specific data that you gathered?

A El Sur Ranch collected -- is it 2006 -- that information that showed that during the short-term pumping between Zones 1 to 4 that you lost approximately 56 percent of the flow in the river for the diverted pumped.

Now, the issue that comes up when you're pumping a well next to a river and getting stream depletion is that you have a residual effect that the river continues to lose water after you stop pumping. And that similar to the -- that decays over time. But the time it takes for that recovery to occur to come back to base line is dependent on how long you've pumped.

Q I'm having trouble hearing you.

A It's on dependent on how long you've pumped; how long it takes to come back to pre-pump conditions. And when El Sur Ranch conducted a pump test in September, they ended up pumping for a number of months prior to beginning pump test. And that duration of pumping, even though you turned the well off for five days, is still residual loss in that river system. So when you started pumping and started measuring losses, you had already losses in the river from the previous pumping period that were still decaying on.

Q Were you finished? Is your answer based on your SDF model?

A It's based on the modeling of stream depletion and the fact that you're going to have to have -- in order for the well to recover, you're going to have to draw water out of it, out of the stream, and out of the aquifer in order to make that happen.

And there is another component to this answer, which is your wells are located in a basin that has a limited storage capacity. Jones and Stokes estimated around 765 acre feet.

When you pump, particularly in the summer when you're not getting flood flows and flow precipitation adding to the aquifer, you have the potential of the amount requested in your permit to de-water that aquifer. But you don't, essentially. The aquifer would draw down -- it goes down a little bit, but doesn't drain the aquifer.

So that means that water has to be coming from somewhere to keep that aquifer full. In my opinion, the place for that water is coming from is from the river. And that would be coming from the river both inside the zone of influence and outside the zone of influence.

Q So was that a yes, that it is based on the models that you did your SDF analysis under?

A It's based on the two parts. It's based on the model, which said you have residual loss. But it's also based on water balance, which says if I have only 765 acre feet of water and I pump -- I think it's from June to November, you're asking to pump 1300 acre feet of water. I've got to drain that aquifer or I've got to replenish it, if it's not in our -- which is a condition that you have here is that it does drain the aquifer. So water has to come from somewhere.

And it's my opinion that these losses that you're seeing from VT-1 down to the zone of influence are related to that water that has to be made up from the pumping.

So it's two pieces. One is the basic stream depletion hydraulics and the other is your particular setting, which is you don't have an abundance of water in storage. And so when the aquifer is stressed, you either drain it or you replace it. And in this case, you replaced it. The sources of replacement would be fresh water from the river. It could be the ocean. But we don't see the ocean filling up the aquifer.

Q I'm going to get to what I think are problems with your SDF model in a minute.

But my ultimate question was whether the rate of impact on surface flow was equal to the rate of pumping by the El Sur Ranch wells -- whether the rate of impact on surface flow was equal to the rate within the zone of influence. It sounds to like your answer is no, even though you said it was what you thought was a 56 percent depletion, that does not equal one-to-one; is that correct?

A You're going to have to restate that. I got lost on the second half.

Q Sorry. My question is -- original question was the rate of impact on surface flow within the zone of influence is not equal to the rate of pumping by the El Sur Ranch wells; is that correct?

A You now have to ask what time frame that you're asking. In other words, in the tests that El Sur Ranch did, which were short term, that number did not equal the total pumping of the well. So in other words, like I said before, in one of the tests in 2007 -- because you didn't look at Zone 1, you came up with a number around 30 percent for Zones 2 to 4.

In 2006, when you included Zone 1, you came up with a maximum number of 56 percent. But those were short-term tests. And in the pumping of a well with stream depletion, that grows with time. So if you ran a 30-day test, you would find that it would start approaching 80 percent. Time is very important.

The other part of the -- if you're looking at the question of the instant I'm pumping, you know, there's two things: There's instantaneous loss and there's total loss volume. The interesting thing with residual depletion is depending on the hydraulics and depending on the distance of the well to the river, you can actually lose more flow after the well is turned off than during the pumping. And Jenkins points this out in his paper. He reminds people that this is possible. And that based on the model that I did, the old well seems to kind of fall into that. It's real marginal, but it seems to peak just -- you will peak just after you turn the well off.

So time of the duration of pumping is very important, just as it is when you're trying to stabilize your cone of depression. With stream depletion, that's not synonymous with the cone of depression forming. In other words, the stabilization of your cone of depression doesn't mean that your stream depletion is also stabilized. It could continue depending on how long you pump.

Q Well, let's go ahead and now talk about your stream depletion models and your analysis of that. Part of your analysis showed that the surface flow impact when the pumps were pumping did not occur at a discrete point of diversion; is that correct?

A Yeah. I mean, when you pump a well, you are influencing an area of the river. It's not like the surface water diversion where everything is taken out at one point, one weir or one pipe.

Q So in other words, the flow through the colmation layer was distributed over a reach of the river; correct?

A Well, I don't know if you have a colmation layer. But the flow through the bottom of the layer is distributed across the river reach, yeah. With or without a colmation reach -- or I call it clogging layer.
Q Would you agree that the purpose of the SDF model is to ultimately is to show how much of an impact on surface flow is seen by a well drawing water from an underground aquifer?
A The purpose is to -- say that again.
BOARD MEMBER HOPPIN: Sir, would you speak right into that microphone? Between your piece of candy and where you are --
MR. CUSTIS: I've got strep throat so --
BOARD MEMBER HOPPIN: I appreciate that, but I need to understand you.
BY MS. TEETERS:
Q My question was: Do you agree that the purpose of an SDF model is to show how much of an impact on surface flow is seen on a well drawing water from an underground aquifer?
A The purpose of the model is to try to estimate how much water is depleted out of the stream during pumping.
Q From an underground aquifer?
A Yeah, from a well.
Q Thank you. Now, did you perform your SDF analysis

with that in mind?
A   Yes.
Q   And you utilized, from what I understand from your testimony, two different models to make your analysis?
A   Yes.
Q   The Jenkins model?
A   Yes.
Q   And the Hunt model?
A   Yes.
Q   Now, the isn't it true that the Jenkins model does not consider the hydraulic conductivity of the streambed?
A   That's correct.
Q   And, in fact, it assumes that the stream is fully penetrating; correct?
A   Mathematically in setting up the model, that's what I assumed, is the boundary for the mapping.
Q   That's not the actual condition that we have in the Big Sur River; is that correct?
A   That's not the condition on the Big Sur River. But you also have to understand when you set up a model like that, you set boundary conditions that may seem unreasonable naturally, but they don't impact the calculation significantly.
Q   So is that a yes, it's true?
A   It doesn't -- he assumed that it penetrates the entire

aquifer, yes.
Q In the zone of influence?
A He assumed that the stream that's being impacted cuts all the way through the aquifer, yeah.
Q So it's fully penetrating?
A Fully --
Q That's not the case that we have or the conditions that we have currently?
A No.
Q Thank you.
Now, isn't it true that you didn't calibrate either of these models using the actual groundwater level data obtained by SGI in numerous studies, hundreds of data collected during 2004, 2006, and 2007?
A Well, my analysis was to compare against the 2007. You don't -- the Jenkins model won't give you the vertical loss in a stream at a particular point. It gives you cumulative loss. The best way to calibrate it is what I did was to look at the area where you calculated losses of 1.0 to 1.2 cfs and ask -- I looked at it from the perspective of the well.
In other words, only this part of the river is coming into my well, and the rest of the river is still coming into my well or could be coming into my well. And so that's the reason for coming up with the angle of

intersection between the zones that you've come up with values for.

And then based on that percentage is divided into the numbers that you've got to come up with the total number. So it's -- I mean, I did calibrate it to your 2007 data.

Q So you did use actual groundwater level data?

A Jenkins model doesn't give you the groundwater level.

Q Does --

A It just gives you a flow volume of extracting. If you look at the print-out, you're getting cfs -- I've calculated cfs you're getting acre feet. It's a volume. It's not a gradient.

Q Now, does the Jenkins model require you to look at the conclusion of your analysis and compare it to actual data collected?

A Well, you wouldn't want -- that's what I did. I made a comparison to what was to Zone 2 to 4 in 2007 and pointed out that the Jenkins model over-estimates how much pumping by 14 percent. So that's the comparison.

Q Now, wouldn't you use scientific data collected over a series of years to make this analysis instead of a model?

A The purpose of the model was two-fold. One is to point out that there is other parts of the river that have a potential to lose water. The second component to it was to point out there is a residual loss in the river that wasn't accounted for.

And the importance of that residual loss -- this whole question of how much water is being taken out of the river when you pump, if you don't account -- if you read Jenkins' paper, he calls it a pre-stress condition; stress being the well pumping. If you don't let the system recover to background, to non-pumping conditions, then you're continuing to pump on top of the residual that you pumped from the last time.

I kind of call it the stair step. You pump, and then begin to residual. And depending on when you kick in the pump again, it climbs back up. But you never -- if you don't give enough time, you never go back to zero. So each time -- I've got an exhibit to show you if you want to understand how that looks.

Each time you pump and then drop back and then you have to start back up, but you're not starting at the bottom. You're stepping up. So following back a little bit, stepping up. Falling back a little bit, stepping up. Through the seasonal cycle of pumping, you're always climbing in your losses.

To turn the pump on and let it decay for -- essentially, Jenkins reported you have to let it decay for the time you pump.

Q   Now going back to the groundwater levels measured by SGI, I understand what you're saying about the stream depletion stabilization. Didn't, in fact, the SGI 2007 data show that water levels stabilized after four days?
A   Well, I'm not sure that's true. But there is a difference between stream depletion and stabilization of water levels. There was a figure that we showed -- I think it was Exhibit 8, 3-11. Could we put that up? I'll show you. It's ESR-8. Figure 3-11. It's El Sur Ranch exhibit.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Figure 11?

MR. CUSTIS: 3-11.

When you're pumping both wells, you've -- in my opinion, if you're going to reach -- this is a graph showing the flow between VT-1 and VT-3. It's a depletion graph, basically.

If you're reaching stable depletion -- in other words, it's reached its maximum from the pumping impact and it's just continuing at that level, this would not be sloping. This should be flattening out. This is VT-2, right, the blue. So the losses that are occurring at VT-2 are still on down the projection.

I expect if you were hitting a standard of stable condition that this would start to flatten out, just like you have in a pumping curve. It draws down rapidly and then flattens out as your pumping stabilizes. You haven't come to a stable depletion yet on this.

MR. TAKEI: I want to ask that the record reflect Mr. Custis was pointing at the -- be about the vertical line of October 5th there is the four blue dots trending down to represent what he was describing.

MR. CUSTIS: And then when you turn the pump well off, these things come back together. But you never get the separation that you've seen VT-2 and VT-3 pretty much throughout the rest of the graph. It's being impacted by the lagoon and there's changes.

For the most part, VT-2 there is -- below VT-3 to VT-2 is a gaining reach. When you start pumping, they cross over. The VT-2 starts losing water. And VT-3 is impacted later.

In other words, it's further away from the well. It's getting impacted later by that expanding cone of depression. When you turn it off, they never quite come back. You don't get that separation again until unfortunately the water runoff event comes in and sort of wipes out the test.

I would expect at recovery you would get a separation. You then have a gaining reach downstream of VT-3, which would show up in VT-2. But you're still losing water. You're still intercepting groundwater from the residual pumping. That's why these two are not separated here.

MR. TAKEI: I just ask the record reflect when Mr. Custis stated these two do not separate, it would be towards the right of the graph -- to the right of the vertical line of 10-5. He was pointing to the blue dots. And there are the round red dots with the white interior. There is a lack of space between those as compared to previously in the graph.

MS. TEETERS: Mr. Lindsay, if we could go to -- I believe it's ESR-5, Table 10-B.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Table 10-B.

MS. TEETERS: Yes. If you could just scroll down for a couple pages here. Could you scroll -- could you go to Table 10, Figure 10-B? I don't have a page number. It's figure ESR-10-B groundwater elevation.

Madam Chairman, could you tell me how much time I have left?

HEARING OFFICER DODUC: We've stopped the clock during this. So that's what we have left.

MS. TEETERS: Thank you very much.

BOARD MEMBER MAHANEY: For everyone else as this prepare, if you can point to the PDF pages we can keep this moving along.

MS. TEETERS: I apologize.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: What page?

MS. TEETERS: ESR-10-B of the 2006 report.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Where's Appendix E?

MR. TAKEI: Try PDF 194.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Thank you.

Q Thank you.

BY MS. TEETERS:

Q Have you had a chance to review that, Mr. Custis?

A I've reviewed this in the past, yes.

Q Now the Jenkins model -- just to go back and reiterate, the Jenkins model assumes a fully penetrating stream; is that correct?

A That's correct.

Q Now these groundwater levels -- elevation levels show that when both pumps are on and the old well is on and the new well is on, over the course of roughly -- well, more than 30 days, after a period of time, these groundwater levels stabilize; correct?

A You're saying that the time period that -- your three time periods are pumping are cumulatively 30 days?

Q Could you repeat that?
A You said the pumping period is 30 days?
Q Correct. As is noted by the dates on the bottom of the graph.
A But you pumped between this period and then you stopped, and then you pumped between this period and you stopped. So cumulatively in each pumping period with the sum of all the pumping period is 30 days. I mean, from my looking at the graph, it's not a continuous 30 days of pumping. That's what I'm trying to say.
Q That's correct. But the periods that you're looking at, it's longer than four days on some of them. For example, old well is on from 9-21 to 9-30. That's approximately nine days, thereabouts. The new well is on from 10-6 to 10-13 or so. That's seven days.
The point is the levels do stabilize even after four days. And isn't it true then that if the groundwater levels stabilize, stream depletion also stabilizes?
A The answer to the last question is no. Is there a first question asked whether it stabilized? Whether the drawdown stabilized?
Q The first part wasn't really a question.
A Okay.
Q The first part was looking at this graph, even when pumping is more than four days, groundwater levels

stabilize according to this graph; correct?
A Again, we go back to if you look at the -- if we assume when you started pumping -- this is in 2006. I have a calendar of the pumping period before 2006. But I think it was longer than five days before -- around 2007, you only had five days of break between your pumping. And then you started your test. I think in 2006 you have a little bit longer time. I can look that up. I mean, that's a point that's important to me because of the residual effect.
If you've waited long enough for the water to come back to base line to zero and you look across here, when you stopped taking data, you haven't quite recovered back to that level. In here with both wells pumping, you're coming back up to that and dropping down. Coming back up close to it and dropping -- but the final analysis with the new well only, you haven't quite reached that. And, in fact, you're kind of decaying and flattening out, which shows to me you're not going to reach this level.
And I'm told I have to describe all this. So I'm pointing to the left-hand side in the horizontal line that comes in before the first period of pumping in 9-9 and then matching it to semi-horizontal lines between the next period -- two periods of pumping, which is around 9-21.
And then there is another period which is around

10-3, which is a nearly horizontal line. The final one, which I don't think quite comes back to the pre-pumping level, which is in 10-15. And then the data stops.

Q But isn't it true if you look at the end of the graph, that it doesn't come back up to the level that it was before pumping? If you look at that, you'll see that the dates -- there is only three days in that analysis. And we are saying that it stabilizes after four days. That analysis looks like it's from 10-12 to maybe 10-16. That's only three days. I just want to point that out. There is no question there.

Now at this time, Madam Chairperson, I've only got two minutes.

If we could stop the clock for this discussion, that would be great.

I've only got two minutes and we need to get to Mr. Titus' testimony as well. And I'd like to at this time to make an offer of proof as to why I need more time.

HEARING OFFICER DODUC: All right.

MS. TEETERS: Now an offer of proof has to say what the purpose is of the testimony and who I'm going to need more time for, and that's Mr. Titus. I'm sorry -- Mr. Custis.

And the issues in the hearing notice involve several things. Is the water available? What are the terms and conditions of the permit? Will the impacts cause adverse impacts on public trust? Water quality? And whether or not the water is put to reasonable and beneficial use?

There are several things covered in Mr. Custis' testimony that involve these things. And in order for me to test those theories, I'm going to need more time to do that, because these are very scientific issues and technical issues. And it's not easy to get to them in a 30-minute time period, or even an hour and then leaving no time for Mr. Titus.

I would request that we get at least another half an hour and then perhaps take a look at the time after that, if any.

HEARING OFFICER DODUC: Half an hour would be for just Mr. Custis?

MS. TEETERS: That's correct. Another half an hour for Mr. Custis and then at least another half an hour for Mr. Titus. And as I said, these are very technical issues, and we need this time to really get into these analyses and prove why their analyses are incorrect.

HEARING OFFICER DODUC: Ms. Ferrari?

MS. FERRARI: If I could just respond briefly.

We don't object to some additional time, understanding these are complicated issues.

But understanding these are complicated issues, we had to cross six of their witnesses -- or five I guess yesterday -- in the allotted amount of time. And I believe we were granted a couple extra minutes for that. So I would request that there be some short of time limit on the additional time in that I don't think 30 minutes of additional time is reasonable.

MS. TEETERS: Had you requested more time yesterday, it could have been before this Board to have more time to go into these matters. But you didn't request that. You requested two minutes.

HEARING OFFICER DODUC: All right.

Mr. Lazar.

MR. LAZAR: Thank you, Member Doduc.

Our clients agree that these issues are technically complex. We feel it would be unfair to grant one particular party more time to address and cross than the other parties. So that any time allocated in addition to the applicant, we would ask that the other parties be allowed that time as well.

HEARING OFFICER DODUC: Yesterday, no one requested additional time for cross-examination, except for Ms. Ferrari. And even then, I think she only used seven additional minutes.

It's always been the Board's practice that should the cross-examination be relevant, the questions pertaining to the issues at hand, that we would allow it, to the extent that it remains pertinent and relevant. And obviously that same offer extends to all the parties when conducting cross-examination.

MR. LAZAR: We're looking for a fair share. Thank you.

HEARING OFFICER DODUC: So with that, we will go ahead and add another half an hour to your cross-examination. And if necessary, we'll re-visit it. But I also encourage you to stay focused on your line of questioning and be as efficient as possible.

MS. TEETERS: Of course. Thank you.

BY MS. TEETERS:

Q Mr. Custis, getting back to your SDF model, your spreadsheet print-out, Exhibits 58 A through D, show that stream depletion continues and does not stabilize after four days of pumping; correct?

A Yes. That's correct.

Q Now, based on our recent discussions, isn't this in direct contradiction with the data SGI collected?

A I don't think so.

Q Now, the calculations that the Jenkins and Hunt models use, they did not provide some portion of the well discharge is satisfied by underflow; correct?

A The models are assuming that you're pumping an aquifer. So if you're using underflow as a legal definition, the models don't care what the legal definition of the water is. It's groundwater or it's aquifer or subsurface water that's being pumped by the well based on it's a well.
Q I understand that. But the model itself doesn't account for underflow. It accounts for what's in the groundwater aquifer. It doesn't mean that there's underflow flowing past the wells; is that correct?
A Okay. During the pumping of a well, if you are -- I guess the question I would have is where is the water flowing past the well? In other words, a well pumps. It creates essentially -- captures all water that comes within that capture zone and ends up in the well. Outside of that capture zone, the water can go past the well.
Now, the Jenkins model and both the Hunt model are essentially based on well hydraulics. And so fundamental to their model is whatever water is being pumped by the well is not flowing past the well. It's coming into the well.
So I'm a little -- you have to put a boundary on where you want to talk about where it's going past the well.
Q I want to put a boundary on exactly where it's going

past the well, which is in the underground aquifer. The figure that you showed actually showed that there was approximately or at least, actually, 3.5 cfs of underflow in the aquifer. And my point is that neither the Jenkins or the Hunt models consider that underflow.
A I think that's incorrect. I think that the answer -- we're going back to -- I don't know what the question was, but it was where I separated out that you have a hydraulic question, which is a stream depletion, a Hunt or a Jenkins model question. And then you have a question of your basin that -- your aquifer that you're pumping out which has a certain fixed volume. And if you pump your underflows at 3.45 -- is that what you quoted?
Q That was taken at VT-1. But yes, that was the measurement in VT-1 of 3.45 or possibly 3.5.
A That's surface flow.
Q It's also flow in the underground aquifer according to the 2007 test by SGI.
A Say that again. Where was the point of measurement?
Q VT-1.
A VT-1 is a surface water measurement.
Q No. That's incorrect. VT-1 --
A Yes. It's a surface water measurement. There's a transect there.
Q I am sorry.

A There's a transect that goes through VT-1 that's 8A, and that's an underflow. And my understanding that's where number of 3.45 comes from.
Q I apologize. I'm getting my transects confused.
A That's okay.
Q Let me just go through some quick questions with you. I think they're pretty much yes or no questions.
Now, does the Hunt model or the Jenkins model assume that the width of the stream is much less than the thickness of the aquifer?
A The Jenkins model doesn't get into that. The Hunt model in a sense does, because it uses a leakage co-efficient in there. But it doesn't ask -- it doesn't ask you for a direct -- I have to look here. It don't think it asks you for a direct width of the stream versus depth of the aquifer. It asks you for the thickness of the aquifer, and then you're not asked the width of the stream.
Q Is that a yes?
A Say the question again since I confused myself.
Q Neither models that you used -- actually, I'm sorry. Let me re-start that. Both models that you use assume that the width of the stream is much less than the thickness of the aquifer?
A I think that's correct.

Q And that's not the case here. That's not the reality of the conditions of the Big Sur River?
A Depends on the time of year. What's the -- Hanson had some cross-section widths which are about -- what's the -- he some tables 16. Table 16, we've been looking at one that had a width on it. I'd have to go back to those to see. In the low flow, it may -- the width may be very close to the depth. In high flows, the water width is going to be more than the depth.
Q But it's not the same year in year out; is that correct?
A The width of the stream will vary with flow, yes.
Q Now, does the Hunt model assume a linear river?
A A linear river?
Q Yes.
A Yes. Both models do.
Q And the Big Sur River is not linear; is that correct?
A That's correct.
Q Now, does the Hunt model -- I'm sorry. Were you through with your answer?
A Well, yeah. Go ahead and ask. I have a point to make, but go ahead.
Q Does the Hunt model assume an aquifer of infinite extent?
A That's correct.

Q And the aquifer in the Big Sur River is not of infinite extent?
A The aquifer that you're pumping out of is bounded by the subterranean banks. So it's not -- there's a low flow or what we call a low flow boundary.
Q Isn't it also true that the Hunt model does not consider the proximity of the ocean to the wells?
A Yes. It's not interacting with the ocean.
Q And isn't it true that the study area that we're looking at is very close to the proximity of the ocean?
A Yes.
Q And, therefore, the Big Sur River constantly changes its stage in flow and proximity to the ocean as a part of that consideration; correct?
A Parts of the Big Sur River is very dynamic. So change flow, channel, morphology, all of those things change.
Q And now isn't it true that the Hunt model does not take into consideration a change in location of the channel?
A No, I wouldn't agree with that.
Q How does it do that?
A You put in a distance between the well and the shortest -- basically the distance to the stream or a river you're trying to analyze. So you change the location. You change that distance in the model and the

answer changes.

Q And did you do that?

A Yes.

Q And on what basis did you analyze and make the analysis?

A On what basis? What reasoning?

Q I'm sorry. I'll clean it up.

Did you look at it to a specific change in location?

A Well, I've run that model on the Big Sur River maybe a few hundred times to I've looked at the change.

What I did for this -- actually have an exhibit if you want to look at it -- for this hearing, which is to ask with the fixed distances that you have right now with the new well and the old well -- new well it comes 500 feet; the old well, 1,050 feet. Then ask the question because it's illustrated when you try to see how these models predict a river. Even though the river isn't ideal to the model, it still looks at the hydraulics and how the river and pumping interact.

But if you move half the distance for the new well, so 250 feet, and then ask what happens if I move 2,000 feet away? What's the shape of the pumping drawdown versus the residual drawdown? I've done that and have an exhibit I can show you, if you want.

Q Actually, I have other questions so I'd like to move on.
Now, as a scientist -- and I'm not one. But as a scientist, if you have site-specific data available, isn't it necessarily true that you wouldn't use a model to come up with stream flow depletions?
A No. I think that the purpose of a model, rather than trying to come up with true decimal point precision on what happens when you pump the well, is to try to understand the hydraulics and the characteristics of the setting and help you look for places where you might want to further investigate.
And the problem I have with the studies that were done is that they, first of all, assumed that the zone of influence is the only place where you can lose water. And that's not correct. And the reason for that is because your aquifer is limited in size, when you pump long enough, that water -- when you pump a well, the cone of depression, when it forms, the water initially comes out of the well, is the water in an unconfined aquifer is the water that drains out of the soil and alluvium and makes that cone of depression. That's what first comes out of the well.
When that stabilizes, you now have to start drawing water out of the saturated portion that's

underneath that. But unless you're drawing down the aquifer, that water has to be replaced. So you have the zone of influence, which is residual drawdown line. But you have to replace that water. If you're not drawing down the aquifer, you have to replace it with water from the outside.

And this is -- I don't know if I should do this. To convince my lawyers what I was talking about, I put out there what I call a bathtub model. Okay. You've got a bathtub that's full. And you've got a good drain. It's got to have a good drain. You pop the plug and you'll create a whirlpool. Water goes out through the drain through the whirlpool. That whirlpool expands to a certain diameter, but you will still drain that entire bathtub without that whirlpool having to go all the way across the bathtub.

So the whirlpool is my zone of influence, my cone of depression from the well. But it's being fed laterally from the water outside of it as the water -- so if you don't replace it, the whole bathtub drains. So what I'm saying is you've got to replace it to keep that aquifer up.

HEARING OFFICER DODUC: Mr. Murphy, if you could stop the clock. This is the second time I think you've attempted to get that question answered, and it's a question I want to know the answer to as well. So let me jump in and see.

Let's start with what specific measurement and data you're referring to.

MS. TEETERS: We would be referring to the figure that was just up, figure ESR-10-B, which shows that groundwater levels stabilize, even after the four days.

HEARING OFFICER DODUC: And how did you obtain those measurements?

MS. TEETERS: I would have to ask that question of my expert, and I don't have that information readily available because again I'm not a scientist. But my expert witness Mr. Paul Horton could answer that question.

HEARING OFFICER DODUC: Could you come up and do that very quickly?

MR. HORTON: What is the specific question? Where is the data from the graph with the stabilized drawdown?

HEARING OFFICER DODUC: Yes.

MR. HORTON: That's data from water level transducers placed in monitoring wells from the pumping wells near the river that demonstrate the drawdown effects directly responding to the pumping test we did.

HEARING OFFICER DODUC: So that was data collected --

MR. HORTON: Minute by minute.
HEARING OFFICER DODUC: And not manipulated through any sort of modeling?
MR. HORTON: That's just a dump of the actual drawdowns that occur, how they stabilize, and then how they recover back to the pre-pumping levels.
HEARING OFFICER DODUC: Okay. That part I understand.
So the question for you is: Why is data -- why was that data collected not adequate to demonstrate the impact or lack of impact of the diversion? Why would you have to use a model when the data was collected and not manipulated and presented in the figure?
MR. CUSTIS: Okay. The location when that data was collected is next to 4UL, the upper 4. It's right where the --
HEARING OFFICER DODUC: So you are concerned with the location that those data was collected?
MR. CUSTIS: That's important, yes.
HEARING OFFICER DODUC: Are there any other concerns besides the location?
MR. CUSTIS: The other concern I have is that -- and it goes to the fact that the river is not your ideal linear river.
HEARING OFFICER DODUC: Sorry. The river is not

going to what?

MR. CUSTIS: The models assume that the river is a linear river and extending out to infinite.

HEARING OFFICER DODUC: Your model?

MR. CUSTIS: Our model. My model. Typical analytical model.

And what you have at this setting is actually kind of have two rivers that intersect each other. Okay. And the distance from the new well to both of those rivers is approximately the same. The distance from the old well to the river is different. The lagoon is much closer. So even -- and you have sort of tails that come off of these sections of the river, okay. So you don't have this ideal condition.

You also have a boundary condition, which is a no-flow boundary, which is your bank and your bedrock, and that's going to push -- when you pump, that's going to push all the losses towards the streams, towards the river.

HEARING OFFICER DODUC: Would not that be reflected in the measurements themselves because the pumps were pumping during parts of --

MR. CUSTIS: Yes. The pumps were pumping. What I'm trying to point to is that outside -- these are measurements within the zone of influence. Okay. And going back to -- we are in a residual time period, so the drawdown from the previous periods of pumping has occurred.

HEARING OFFICER DODUC: Yes.

MR. CUSTIS: And now we're inducing more drawdown. So when you're recovering, you're recovering back to when you started pumping as far as the water level. But water level and stream depletion don't go simultaneously. Your stream depletion can actually lag the water level recovery. So you can't -- this is the importance of a model, is that it tells you that you can't just look at the water level and say, oh, my depletion has stopped.

HEARING OFFICER DODUC: So can we put up that figure that you had such a difficult time finding, Larry?

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Which exhibit was that?

MS. TEETERS: ESR 10-B.

MR. TAKEI: ESR-5.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Thank you.

HEARING OFFICER DODUC: So when you looked at this graphic, it is your professional interpretation that the groundwater elevation has never reverted or does not get back to its original level? But there is residual withdrawal --

MR. CUSTIS: Yes. Okay. Essentially, what -- somewhere up here -- I'm pointing to the left side of the graph -- is where if we didn't have tidal and all of those problems is where we started at pre-pumping somewhere 30 days, 60 days. When you have a pumping cycle and you come back to that, you, first of all, didn't recover here. There isn't enough data. But --

HEARING OFFICER DODUC: Close enough.

MR. CUSTIS: Maybe, with time, it will recover. I still think you've got some residual in here. This is within the cone of zone of influence. Okay. That's a hydraulic drawdown due to the well. And so it's -- you kind of have to go back to my bathtub. You have a drawdown that occurs, and you let the pumping stop and the drawdown comes up. But depending on how long you pump --

HEARING OFFICER DODUC: And how long you stop.

MR. CUSTIS: And how long you stop, that water level, we don't have water levels in Creamery Meadow. That water level in Creamery Meadow will drop and drop. But my zone of influence doesn't change that. The water in the aquifer is not going to change. If I'm recovering drawdown from my pre-pumping time, I don't know where my aquifer is relative to before I started pumping at all. And downstream of VT-1, down to -- unfortunately there is no monitoring in the zone of influence, but down in the VT-3, you have a losing reach.

And in one of my exhibits, I think it's 16, it shows that that loss increases during pumping. It's C-16. And when I'm saying is that a lot of the loss that is -- a lot of the water that's pumped out is replaced by that water lost from VT-1 downstream in order to maintain the aquifer. So it -- your losses don't have to a occur only in the zone of influence. That's unique to your El Sur Ranch basin, because you don't have inflow stream. You have a very constrained subterranean stream that has a limited volume. When you start pumping too much, if you don't draw down the water level, you've got to replace it. And what are the sources of replacing it? The stream, which I think is the preference. You could have increased underflow, which is up the Transect 1 and AA, cross section 1-AA.

But in order to have increased underflow in the summer, you're not increasing it. You're going back to Darcy's law. You're not going to increase cross section area. You're not going to increase hydraulic conductivity. The only thing you increase is gradient. The zone of influence doesn't extend all the way up to increase the gradient. I don't think you're going to get a lot of additional inflow to meet the additional water that's coming out of the well that's not coming directly in the zone of influence out of the river from up in AA.

The ocean could fill that gap. But because they have a limit on their pumping of the old well, they start pulling in, you know, thousand micro size per centimeter of water, they turn the well off. They stop that infiltration of the groundwater from coming in so it's not a source.

HEARING OFFICER DODUC: Thank you.

MR. CUSTIS: That's why I've come back to it's the river.

BOARD MEMBER HOPPIN: Mr. Custis, just to add on, when Ms. Ferrari started her presentation, she said for your assumptions that all diversion from this well was coming from surface water. And I would assume that meant that there was no underflow that would naturally accrete to the ocean or the lower end of the lagoon.

Are you assuming in the analysis in the answer you just gave Ms. Doduc that there's no underflow that goes anywhere other than into the river?

MR. CUSTIS: No. What -- and this was something that was brought -- Chandra tried to bring out with Mr. Horton.

If you assume before you start pumping that your basin is an equally to the groundwater is in equilibrium.

So you have water coming into the transect. You have water going out to the ocean. You have evapotranspiration losses from the riparian, okay. But you're more or less in balance.

Once you start pumping, you start and you can even have discharge to the river. But it's just talking about the aquifer.

Once you start pumping, you upset that balance. You have out-flows now that exceed your inflows. So you still can have water going to the ocean. It's just that you have more out than in. So you need increasing somewhere. We're only talking about the groundwater. So the source is -- where do you get extra water? Well, the simplest is the river. Somewhere I think Paul said all the water is connected to the river. So somewhere in the river, it's losing more water.

And what we don't have from VT-1 down to VT-3 is a pre-pumping condition. Was that a gaining reach or a losing reach prior to turning on the pumps? We don't know that.

We do if you look at my Exhibit 216, you see as pumping goes on, you begin to lose more water. But we don't know what the condition of that reach is beforehand.

So what I'm saying is that in the middle of the pumping season, which is September, you may have dropped the bottom of the groundwater low enough that that becomes a much -- water could go from gaining to losing reach or it becomes a larger losing reach where it's losing more water. That's refilling the aquifer outside of the zone of influence.

So a lot of this has to do with the size of that basin. If I was out doing this in the Sacramento Valley, I can draw a lot of water out of that aquifer with just a minor amount of drop in head. But if I get into a confined system like this is where the mass balance, I'm pumping more than is in the system, I'm going to draw that down, unless I replace it.

And so it's a question of balance. The river -- how fast can the river lose water.

HEARING OFFICER DODUC: Please continue with your cross. But I would suggest you move on to your next line of questioning for this witness.

MS. TEETERS: I was just going to say that. Thank you.

BY MS. TEETERS:

Q Now, Mr. Custis, I'd like to talk about your minimum bypass flow analysis. You calculated a minimum bypass flow for the period December 1 through May 31 season; correct?

A December 1 through May 31 -- yes.

Q And you concluded that the minimum bypass flow of 132 cfs was required?
A Yes.
Q And that conclusion was based on a bypass flow requirement -- I'm sorry -- was based on a formula provided in the North Coast In-Stream Flow Policy; correct?
A That's correct.
Q And you calculated that -- the reason that you calculated that was to be protective of the Big Sur River fishery?
A That's correct.
Q Now, you stated earlier that you submitted a CV with your testimony; correct? You submitted a CV as an exhibit to your testimony?
MS. FERRARI: Resume.
THE WITNESS: This is merely a summary.
MS. TEETERS: I'm sorry.
THE WITNESS: Oh, yes. Okay.
BY MS. TEETERS:
Q And your CV is a summary of your education and experience important to this matter?
A Yes.
Q Just to be sure, your CV lists your education and experience that qualifies you to render an expert opinion?

A Yes.
Q And you just stated that you rendered an opinion on bypass flow recommendations as they pertain to the fishery in the Big Sur River; correct?
A What I used was the regional curve that in the policy is essentially a substitute if you don't do site-specific studies. So, yeah, I used what the Board determined was an acceptable bypass flow calculation in lieu of site-specific studies.
Q And the purpose -- I'll get back to the site-specific studies in a moment.
And the purpose of your calculation though was to be protective of the fisheries; correct?
A Yes. The Public Trust resources, yes.
Q Do you have a specialty in fisheries?
A No.
Q Have you ever provided testimony to this Board regarding fisheries?
A No.
MS. TEETERS: Then I would recommend to the Board at this time that Mr. Custis's minimum flow recommendation of 132 cfs based on protection for the fisheries be excluded.
HEARING OFFICER DODUC: Ms. Ferrari.
MS. FERRARI: That calculation was also done by

Mr. Titus and is in his testimony. So I would say the portion of Mr. Custis they want to strike, that's fine. We think Mr. Titus is providing the same information.

HEARING OFFICER DODUC: Any other party wish to weigh in?

Since Ms. Ferrari concurs, then we'll go ahead and strike that.

MS. TEETERS: Thank you.

BY MS. TEETERS:

Q I'd like to get back to the North Coast Policy which you site in your testimony throughout.

Now, wasn't that policy developed based on a specific climate and hydrology of northern California streams?

MS. FERRARI: Can I object here? If we are going to strike a portion of his testimony that's relying on that policy for the 132 as being Mr. Titus, now it's Mr. Titus's information that I would feel you would need to cross on. I don't think you can cross him on information that's now going to be stricken from the record.

HEARING OFFICER DODUC: Your response to the objection?

MS. TEETERS: He uses the North Coast Policy as an example throughout his testimony. So if you're willing to strike his testimony as a whole, I'm willing to do that as well.

HEARING OFFICER DODUC: Mr. Lazar.

MR. LAZAR: I request clarification of what's being stricken from Mr. Custis's testimony, because I'm -- in terms of the scope of the flow recommendation, are we saying that just the numbers are being stricken from his testimony? What's being stricken?

MS. FERRARI: I thought it was just the numbers.

HEARING OFFICER DODUC: That's what I thought as well.

MR. LAZAR: Okay. So the methodology that he used to calculate the numbers or that he used in conjunction with Mr. Titus is not being stricken.

HEARING OFFICER DODUC: That's correct.

MR. LAZAR: Thank you.

HEARING OFFICER DODUC: Mr. Johnson.

MR. JOHNSON: I would like to ask a little bit about the basis for striking this. And I didn't object because DFG didn't based on what they thought it was going on. But the policy was developed by engineers and hydrologists and fisheries people to develop a regional estimate based on hydrologic information of certain fisheries' thresholds that existed in the literature.

HEARING OFFICER DODUC: Mr. Johnson, you're not the witness, you're not testifying. So please state your objection.

MR. JOHNSON: If the point is that only one or the other of those specialties is qualified to use the formulas in the policy -- is that the import of the question?

HEARING OFFICER DODUC: Actually, let me get back to Ms. Ferrari.

Any other comments you wish to make before I rule on your objection?

MS. FERRARI: Well, I guess first if the methodology that we're talking about is still -- we're not striking that from the testimony --

HEARING OFFICER DODUC: It's not.

MS. FERRARI: Okay. Then she can proceed.

HEARING OFFICER DODUC: Well, thank you. I was about to overrule your objection.

Please proceed.

MS. TEETERS: Thank you.

BY MS. TEETERS:

Q I'd like to actually turn to your recommendation of 29 cfs, that you determined from -- along with Mr. Titus, you determined from June 1 to November 31 as measured by the USGS gauge; is that correct?

A Yes.

Q Did you calculate the 29 cfs bypass flow as the sum of

three components?
A Yes.
Q And I believe those were the minimum flows to protect fisheries, the maximum historic losses, and the maximum permitted instantaneous diversion rate?
A Yes.
Q Now, Mr. Titus wetted perimeter study recommended a 17 cfs as minimum bypass flow at the USGS gauge which you considered and added into your analysis; correct?
A His measurement for his wetted perimeter were tied to the USGS -- the Big Sur River of the USGS.
Q Does his 17 cfs measurement include an average condition of 3 cfs loss between the USGS gauge and the Molera Campground?
A I think that's what you'd have to ask Mr. Titus. But I think that's -- when we looked at it, we knew we had to adjust for this downstream loss, yes.
Q So it already includes some portion of the downstream loss; correct?
A It assumes that his measurements, yeah, that there was a loss.
Q So in other words, it's your understanding that the minimum bypass flow required downstream at the point of diversion is 14 cfs?
A I think you'd have to ask Mr. Titus on that because

there was -- in his coming up -- my recollection of his method for coming up with this is a range of numbers, and he picked sort of a middle range of those numbers which --

MS. FERRARI: Mr. Custis, I'm going to stop you there.

I don't think -- we object to the line of questioning as it relates to the methodology for the biological component of the bypass flows.

MS. TEETERS: Well, what I'm trying -- the point I'm trying to make is that Mr. Custis may have double counted for the maximum losses when Mr. Titus's number already includes 3 cfs for loss.

HEARING OFFICER DODUC: I'll allow the question.

MR. CUSTIS. Then I'd have to go back to the way that Mr. Titus calculated it. He's got a range of values and he picked sort of a middle value. So if I recall, the highest was somewhere around 19 cfs. So if we had used that, then we'd have come up even higher.

She was telling me the range was 15 to 19. And that was the range of the numbers.

By MS. TEETERS:

Q Would 19 be the high end of that?

MS. FERRARI: I think you should have directed these particular questions to Mr. Titus, and he can tell you if he accounted for the 30 cfs.

HEARING OFFICER DODUC: Well, that was an objection, I gather.

MS. FERRARI: I'm sorry. Objection.

BY MS. TEETERS:

Q So Mr. Titus --

HEARING OFFICER DODUC: Actually she made an objection. Would you clarify for me why this line of questioning is important as pertaining to this witness and not Mr. Titus?

MS. TEETERS: Yes, ma'am.

Mr. Custis in his second point of what he was calculating, he accepted or allegedly accepted the maximum historic flow losses downstream from the gauge. Maximum historic losses. He wants to add a number on to the number that Mr. Titus came up with that already includes a loss component in it. And my question -- ultimate question has to do with the numbers and the math that they've come up with for this 29 cfs bypass flow and whether or not those numbers have been double counted.

HEARING OFFICER DODUC: Okay. Please focus your question to Mr. Custis on the calculations that he did complete and not Mr. Titus.

Proceed.

MS. TEETERS: Thank you.

BY MS. TEETERS:

Q Now, Mr. Custis, did you calculate a maximum loss of 9 cfs between the USGS gauge and the ESR point of diversion?
A The number I used was 8.9 cfs from the Jones & Stokes report.
Q Now, if we could go to Exhibit DFG-C-15, which I believe is page 22 of the PDF.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: The PDF of his testimony?

MS. TEETERS: Yes.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: I'm looking for DFG-C-15.

MS. TEETERS: Correct.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: In Mr. Custis's testimony, which is C --

MS. TEETERS: 15. Oh, I'm sorry DFG-C-2 I believe.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: DFG-C-2.

BY MS. TEETERS:
Q Is that correct? Mr. Custis, is your testimony DFG-C-2 -- no, I'm sorry.

It's DFG-C-A. I believe we want page 22.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Okay. There's page 22. Where do you want me.

MS. TEETERS: I apologize. It's Exhibit C-15 to his testimony. You'll have to scroll down quite a bit.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Okay. So you don't want me in DFG-C-A; you want me in DFG-C-15, is that correct?

And you'll have to go back out.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Okay. Here we go.

MS. TEETERS: Thank you very much.

BY MS. TEETERS:

Q Now, as you just confirmed, Mr. Custis, you assigned the 8.9 cfs loss or the 9 cfs loss based on an August 22nd, 1997, instantaneous measurement taken by Jones & Stokes; is that correct?

A Yes.

Q And a copy of that report was produced by El Sur and Mr. Lindsay, El Sur Ranch Exhibit 27?

A Yes.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Okay.

MS. TEETERS: Page 22.

BY MS. TEETERS:

Q Does this look like the report that you took that number from, Mr. Custis?

A Yes.

MS. TEETERS: And, Mr. Lindsay, if you could put up the cross examination PowerPoint. First the slide.

Thank you.

Q Now, Mr. Custis, based on the highlighted text there, the August 22nd reading was the very first measurement taken by Jones & Stokes, period; isn't that correct? Is that what the text says?

A It's the first reading of the reporting in that table, yes.

HEARING OFFICER DODUC: While he's reading that, could you identify where the came from.

MS. TEETERS: Yes, ma'am. It's El Sur Ranch Exhibit 27, table 3. And that's page 2-5. And in the PDF, it's page 22.

HEARING OFFICER DODUC: Thank you.

BY MS. TEETERS:

Q Now Mr. Custis, if you'll look at that first line that's highlighted. And it says, "On the first measurement date", is that correct?

A Yes.

Q And then if you read further down a little bit it says that "The cause of the large flow loss on that day has not been determined," correct.

A That's correct.

Q Now, if you look at the other measurements taken, the loss between them, the maximum one is 2.5; correct?

A I'll take your word for it. I think there's -- in my table I made that calculation. So 2.7.
Q And because they could not determine the cause of the loss, wouldn't you agree -- and since this number is so far above the other numbers, wouldn't you agree that this may be an outlier?
A No.
Q Do you have other data that was collected to prove otherwise?
A Yes. I've got, you know, USGS gauge at El Sur and Andrew Molera has come on line. So they're now putting outflow values at that gauge. And we put it in October, and they've created a rate increase, provisional. But they now get on the web and see what the flows are at Andrew Molera. And that's what I've got is a table that has the flows starting in October, November, December, and then the flows for -- well, up to yesterday. So April, May, and up to yesterday -- in June up to yesterday. And when you look at the flow losses between those two gages, you get values that range -- well, there's gains also. But you get values that range from 2 -- there's some in here that are -- in non-storm water typically it's 5, some 12, some 11. One here is a minus 14 loss, but it may be from a storm event.

So we're getting more data to back up these point values. And this is up above your zone of influence. And it's USGS gauge data. I can give you copies of that.

Q Now, isn't it true that as provisional data that this gauge hasn't been calibrated?

A No. I think the USGS fields of data are calibrated, both -- the data that you download from the web are always provisional until the GS finalize them. So even the data that I'm getting from the Big Sur gauge are marked as provisional. Some of them -- I would have to look back in October of last year they maybe approved them. But the last three months they're provisional. And that's the way the GS operates is -- in fact we have an e-mail from a person that's installing this gauge warning us that this is provisional data. All gauge data is provisional. If you're monitoring on a daily basis with a provisional gauge and you gain provisional data, you have the potential after the fact to violate your permit. Because they're going to want to change the gauge value when they approve it. It's pretty much a given. So it is provisional, but it is the normal process of data that you would use to monitor on a day-to-day basis. It's always going to be provisional.

Q And has that gauge been calibrated?

A Yes. The USGS I don't think would put out the data set unless they have the rate implementing curve that they felt comfortable with. Now, is it going to improve with more points? Yeah, it's going to improve with more points. But the reason they went from October -- or they put it in October 22nd until the -- the first time I saw it was June 1st. They never put outflow. They put out stage, which is -- the reason is they didn't feel they had a rating curve. But once they have a rating curve, they're going to put out -- they put out that data even though it's provisional.

Q Now, Mr. Custis, just to narrow your response a little bit. You have no other data that would -- let me finish my question. You have no other data from August 22nd, 1997, that would show that in fact this is not an outlier?

A If you go to Exhibit C-16.

You have to go down to the bottom. This is the base data and these are differences.

On 10-10-2007, you have a loss between USGS and VT-2 of 8.84, between USGS and VT-3 of 8.65. And that's after the wells have stopped the pumping for about five days. So my interpretation is is that that's very close to what Jones & Stokes measured. And you've taken that measurement. So I think it's within -- it's not an outlier. Both from what we're seeing in the USGS gauge and the 2. -- your own data and Jones & Stokes that you can't get those kind of loses.

Q I'm actually really glad you brought up the 8.84 because that's where I was going next.

Now, the 8.84 loss as reported in the Hanson report, you compared that -- do you know -- actually the 8.84 loss was based on an instantaneous measurement that was taken at VT-2; is that correct?

A It was combined in the USGS daily measurement and the instantaneous one at VT-2, yes.

Q Now, if you compare -- well, let me take a step back.

The USGS daily average, that looks at what was occurring over the entire day; is that correct?

A Yes.

Q And the instantaneous measurement quite obviously is done at a moment in time; correct?

A Yes.

Q Now, to your knowledge, do average daily flows incorporate events of evapotranpiration and precipitation occurring during the day?

A Do average daily flow events -- you have to say that again. I missed it.

Q An average daily flow measurement --

A Right.

Q -- does that take into account precipitation and evapotranspiration that has occurred over that day?

A It should.

Q Thank you.

But an instantaneous measurement taken before a precipitation event occurs would necessarily not take that into account; correct?

A That's correct.

Q Now, did you do any research regarding precipitation events that occurred on October 10th, 2007?

A No.

Q There was a precipitation event that day of a half an inch according to the Big Sur River State Park --

A Okay.

Q -- weather station.

Now, based on your comparison of the daily average flow that would include the precipitation event perhaps and the instantaneous measurement that was taken that perhaps would not include a precipitation event, can you make the same kind of loss relationship?

A I'm not sure -- you have to ask the question of what happened at your upper gauge. Did you see that precipitation event at the upper gauge or was it just down at the lower gauge? But in any case, the issue is if you're using the upper gauge as you're measuring point. It is your measuring point. Regardless of whether you have rainfall occurring or not during the day or ET during the day, that all has to be part of the variance. And part of the reason for having a high loss rate is to take care of that potential problem for variance that's happening on an instantaneous basis. In other words, you know, fish are living on an instantaneous basis but you're using an upstream gauge that is an average. So you've got to deal with your variance.

Q I understand that, Mr. Custis. But my point is you assign a maximum loss here, and it's based on these two data points collected over the course of two years that you say represent the highest loss. And my point is that when you're looking at these highest loss numbers, I believe the Jones & Stokes number is an outlier for the reasons we discussed. I believe this number cannot be -- the relationship for this number of loss cannot be made the way you make it, because necessarily the USGS gauge reading - let's say it's 10 - and if a precipitation event happens and necessarily causes flow to be read at that meter, that doesn't --

HEARING OFFICER DODUC: This is not the time for you to make your argument. Please address the witness with a question.

MS. TEETERS: Thank you. I was trying to explain my point.

BY MS. TEETERS:

Q Perhaps, and we don't know, the USGS gauge daily

average measurement did not take into consideration, or it did, the precipitation; more importantly the instantaneous rate may not, is that correct? In other words --
A It depends on the instantaneous rate. If the instantaneous rate was made before there was precipitation, then it wouldn't. If it was made afterwards, then it would have.
Q And your point is you just don't know?
A Well, I don't know what the time of the VT-1 or any of the VT-2 or 3 were made relative to a precipitation event.
Q So wouldn't this necessarily mean that your loss calculation there is in question?
A I wouldn't disagree with that. I think what's coming on-line is what's happening in the USGS gauge, and it's showing that it's not an outlier. There are days when you get values above that. And those are -- well, like I say, you have the same issue, is you have to worry when you get variations that are -- whether those are due to flooding events that are coming down and you're just picking up a floodway or a small tributary that's getting more water than the other part of the watershed. So there is -- when you get big offsets, you need to worry about that. From the data I'm looking at, you're getting offsets that are five, six, seven -- well, eight's not that big of a -- eight or nine is not that far out. It's not an outlier.

MS. TEETERS: Madam Chairperson, at this time I'd like to request at least 15 more minutes of time.

HEARING OFFICER DODUC: We just added your 30 minutes extra. So we advise that you need to work within 30 minutes extra time.

MS. TEETERS: All right. Well, except that we have to get to Mr. Titus. And I only have --

HEARING OFFICER DODUC: You may make your request at that time, but for now, you have 30 minutes.

MS. TEETERS: Thank you.

BY MS. TEETERS:

Q Mr. Custis, I'd like to discuss your theory of dynamic channel.

A Okay.

MS. TEETERS: And, Mr. Lindsay, if you could put up the PowerPoint again. And then the third slide.

Thank you.

BY MS. TEETERS:

Q Now, Mr. Custis, can you predict that the Big Sur River channel will change location?

A Could you predict where it's going to change from year to year?

Q No, I asked you if you could predict it at all whether it was going to change.

A I actually think it's changing right now.

Q But can you predict it -- can you say that next year it will change?
A I think it's changed now. I went down on June 2nd and looked at the river. And I think it's beginning to make a cutoff chute back to the original where it was pre-'95. So, yes.
Q Now, can you predict when that will occur? Can you predict when a channel change of location will occur?
A I don't think anybody can predict what the river is going to do on a specific day. What I've seen looking at the air photos is that when you get flood flows that are above around 4,000 cfs, you get changes down in the lower reach. And on March 24th we had a flood flow that peaked at 4700 cfs.
Q Now, you can't predict where it would change, is that right?
A Well, what it's looking like it's doing right now is -- I can't really see that image very well. But what it looks like it's doing right now is cutting off the meander that it created in '95, '98. And that's a typical thing that a river will do when it -- it wants to isolate and meander. It cuts a chute right across was the bend in the meander. And that's actually where the old channel -- I mean prior to '95 it's where the channel went.
Q And do you have any current aerial photographs that

would show what you're saying is correct?
A Yes.
Q Did you bring those with you?
A Yes. What I've got is -- what I did on June 2nd -- I went down on June 1st and walked around a little bit. And then spent most of the time on June second. And I've been watching the river down there since 2007. It was the first time I went down there.
And I went down last year. It looked like the lagoon was filling in. It's not what it was in 2007. And you began to have -- what I tried to find in 2007 was the old channel. I just wanted to know where it was and what it looked like. And it was filled in full of oilers and plants and poison oak.
In 2010, you began right near where the -- I should give you these images because they --
Q Mr. Custis, if I could just stop you. I believe my question was just if you brought them with you.
A Yes.
Q I really -- I'm running out of time, and I'd really, really like to move on.
A They're here if you want them.
Q I'd just like to move on if that's okay.
But my point is, you can't predict where it's changing -- going to change to?

A I think at this point the channel has decided it's going to go back to its original -- relative original location. So if you call that a prediction, I might say, well, I think it's going to do it. What year? Depends on the flows.
Q And could you predict what characteristics of the new channel would be when it changes location?
A If I had to predict, I would look to what happened in the past. That's basic geology. The past is the key to the future.
Q So are you saying it would be the same kind of conditions as is now currently in the river channel?
A I would say that it -- as it is now?
Q Because if you said it's going to go back to what it was, if it changes a location from what it is now, going back would be the current conditions, correct?
A If it changes back to what it was prior to where it is today, the conditions then would probably be similar to what actually Mr. Titus saw when he was doing his studies.
Q Thank you.
Now, isn't it true that the Big Sur River flows through an alluvium-filled valley?
A Yes.
Q Your best estimate, how many rivers in California flow through alluvium filled valleys? Is it ten?

A First you have to define what a river is. But --
Q A river is --
A A lot of rivers flow alluvial valleys. I mean --
Q Is it more than a hundred in California?
A I'm certain there's more than a hundred, yes.
Q So it's very common?
A Yes.
Q Now, it's also common for rivers that flow through alluvium filled valleys to shift their location from time -- their channel location from time to time?
A Yes.
Q Now, to your knowledge, does this Board speculate about possible channel relocation when looking at every permit that they grant for streams that go through an alluvial valley?
A I think the issue here is because you're trying to introduce an impact test, which is dependent on a location between the well and the river, that that's unique. Most of the permits -- I'm not an expert in water rights permits and haven't seen them all. But most of the subterranean streams, ones that I've dealt with, you consider it a surface water diversion and you regulate it as such. And at that point you don't need to know where the channel is. And you don't need to know the condition of the channel. It's simply as if you had taken it out of

surface water. So I'm not sure the Board has previously entertained the idea of the impact test for permit conditions on a subterranean stream.

Q Now, I'd like to move on to your water availability analysis.

A Okay.

Q Part of the water rights application process is for an applicant to determine whether there's water available for appropriation; correct?

A That's language in your flow impairment, yes.

Q And the water availability analysis that you did, that you completed, goes towards that; correct?

A It does what?

Q The water availability analysis -- now, you did a water availability analysis?

A Yes.

Q Now, on page 7 of your written testimony, you cite the 2002 National Marine Fishery Services' and your department's guidelines for maintaining instream flow to protect fisheries resources downstream of water diversions in mid-California coastal streams; correct?

A Yes.

Q Now, Isn't it true that those guidelines state that the cumulative diverted volume to define the CFII should be calculated using average water years?

And we can look at page 15 of those guidelines. And I believe it's my next slide.

MS. TEETERS: And, Mr. Guthrie, could you distribute that to the parties, please.

MR. CUSTIS: I'll agree with you on that. It says an average.

BY MS. TEETERS:

Q Thank you. Now, are you -- you are familiar with the North Coast Policy, correct? We just discussed it.

A Reasonably familiar with it, yes.

Q And in the methodology set forth in that policy, isn't it true that it states that the annual unimpaired flow is the total volume of water on average that would flow past a particulate point of interest?

A I think that's probably what it says, yes. I don't have it in front of me, but --

Q Thank you.

And are you familiar with the underlying guidelines that support the State Board's guidelines for preparation of water supply report and cumulative diversion analysis?

A I'm not sure which report you're -- this is the Board's report on how to prepare a water availability analysis and impairment?

Q It's entitled, "Guidelines for the Preparation of

Water Supply Report and Cumulative Diversion Analysis to the Policy for Maintaining Instream Flows in the Northern California Coastal Streams."

A Oh, this is northern California's policy.

Q Yes.

A Yes. I mean I'm reasonably familiar with it.

Q And that calls for the use of average flows; correct?

A I would think so, yes.

Q Thank you.

Now your calculation used median values?

A Median, yes.

Q Thank you.

Your Exhibit DFG-C-5 shows that -- Mr. Lindsay, could you put that up, please -- shows that the median water available for the Big Sur River is 55,856 feet, correct?

A That's correct. Annually, yes.

Q Thank you.

And the actual average annual water available is 72,126 acre-feet; correct?

A That's correct.

Q Now just to be sure, both DFG and this Board require you to use an average instead of a median; correct?

A I don't know it's required. I think the methodologies allow you to use other methods of calculation. You just have to justify them. I don't think that the Board's prescribes you can only use an average. I think the Board allows you the flexibility of calculating as you see fit. But you just have to justify.

Q But the Board and DFG both state that you should use average flows, the average at --

A The policy and the guidelines that are out state that you can use an average. That you must use the average, I don't think that's what it says.

Q Now, your analysis of 55,000 acre-feet that's available is about 77 percent of the average; is that correct?

A I'll take your word for it.

Q And your exhibits C-4 and C-5 show that the average monthly flow at the USGS gauge is higher than the median monthly flows for all months; correct?

A Average is higher than all months? Looks like it, yes.

Q So wouldn't it necessarily follow that the use of average flows would show that ESR is diverting a smaller percentage of the actual available flow than what your analysis shows?

A The percentage, if you based it on average, it would -- the cumulative impact is what you're talking about?

Q Uh-huh.
A Would go down.
Q Thank you.
Now, as I understand your testimony, you calculated the water availability analysis by including 30 upstream users; correct?
A Well, using the upstream diverters that -- yeah.
Q And in one part of your analysis, that included seven additional diversions as ones recorded by Mr. Hill?
A Because they were riparian diversions, I included them like in all other riparian diversions. Now, in doing my analysis, I did a couple of -- call them proposals. I did a couple of proposals. One was including all of those riparian diversions, and the 1B excluded them and assumed they were not going to continue after the permit was granted.
Q But I just want to make sure the record is clear.
MS. TEETERS: So if we could go to DFG-C-4.
I'm apologize. It's C-12.
Could you scroll down, please?
BY MS. TEETERS:
Q Now, did you add the diversions reported by Mr. Hill, the riparian diversions, as a separate filing? I think that's what you just said.
A Yeah, because it is -- because it's riparian, yes,

it's a separate.

Q And did you look at his statements of diversion at the Water Board?

A I looked at the statements of diversion. Yeah, I have those on file, yes.

Q Now, looking at his statements of diversion that are Record No. S14132 and 14133, which I believe is on my PowerPoint, Mr. Lindsay?

A They're the older ones, okay.

Q And could you read the highlighted portion at the bottom of the page?

A I'm afraid I can't focus on it. I've got --

Q You have a copy?

And actually I can have Mr. Guthrie give you a copy right now.

A Thank you.

"The total annual water used to irrigate the total irrigated acres is diverted from Well B and Well D together, and each of which is covered by a separate statement of water diversion use."

MS. TEETERS: And could you go to the next slide, Mr. Lindsay.

BY MS. TEETERS:

Q And could you read or at least stipulate that that's the same language.

A It's the same language, yes.
Q Thank you.
Now, part of your table on C-5 includes calculations that separate the current application.
BOARD MEMBER MAHANEY: Excuse me. Just on one, just for record keeping. The statement of diversion in use is already an exhibit that's being handed around or --
MS. TEETERS: It needs to be another exhibit. Sorry.
BOARD MEMBER MAHANEY: And this would be ESR-41.
MS. TEETERS: Yes. Thank you.
We could include both of those as ESR 41.
BOARD MEMBER MAHANEY: Just a reminder again. If these exhibits could be served electronically so we can have electronic copies.
MS. TEETERS: We will do that. Thank you.
BY MS. TEETERS:
Q Going back to your Exhibit C-12.
You calculate the total diversion amount of 1800 acre-feet annually for each well; correct?
A Yes, that's correct.
Q And then you also separately include -- well, actually in the ESR diversions you also include the other riparian rights; is that correct?
A For El Sur Ranch?

Q Yes.
A Yes. All seven riparian, yes.
Q Now, your water availability analysis also takes a look at all of these numbers as you calculate what is available; correct?
A I said that I did two analyses. One where I used all these numbers and one where I didn't use them at all.
Q And the current application request, 5.84 cfs, to your knowledge includes all of the riparian diversions you have listed on C-12?
A No, I don't -- this is the quandary I had with those riparian diversions is it was unclear whether -- and some of them were filed last year -- whether they're going to be waived once the permit is granted or whether they're going to still be considered riparian. Because according to the draft EIR and these documents and -- this data of course came out of the State Board's -- it's not my interpretation of what's in this document. It's what the State Board's -- you know, their database has listed for these permits.

But 5.84 may not be the maximum that the well can pump. According to the EIR, it can pump 7.9. These documents say 8 combined, I think. I'm not quite sure by combining these two statements together with one -- the two statements with one statement of a combining on how to separate them out. But the water -- what was in the State Board's website is that each one of them has instantaneous diversion of 4 cfs. That's what's in the database. And that somewhat reasonable EIR says it's 7.9.

So when I had to do the water availability analysis, I ran into a problem that if you combine all of this riparian and the appropriate, you have more than 8 cfs to be pumped. And so what I ended up doing was just saying that's it, that's the maximum. If you're putting both of these in together, that's the maximum that can be pumped.

When I did it without the riparian, I used the 5.84 as the maximum. Actually it's 5.34 -- because of the overlapping permit conditions, you have an instantaneous rate and you have a 30-day running rate. Because I did it as a month, I used that 30-day running average, which is at 5.34. And that produces 300 -- and outside of the July to October window, that produces 318 acre-feet maximum.

So I kind of had to interpret what's the possible maximum can happen both from a well standpoint and from the permit standpoint. And that's what I did the analysis on. It wasn't -- this is the only -- you know, all other people upstream it was very clear. They get to pump so much water and that's it. When you accumulate their daily amount times the periods - and some of them are annually

and some of them are seasonally - that total volume adds up. So it's real easy to just sort of daily distribute that water use out. With El Sur and it's overlapping permit conditions you kind of had to ask which one of them is limited.
Q Mr. Custis, did you look -- as you were looking at the statements of diversion and use and you were analyzing this matter, did you look at the application filed by the applicant?
A Yes, I read the applications.
Q And the 2006 version or amendment -- or amendments of the application states that all diversions are from the two wells including the riparian?
A I'll take your word for that. I know that the two wells in the application are the old and the new well. I'm not sure about the riparian.
Q It does state that and you can take my word for it.
A I'll take your word for it.
Q And it states that wouldn't it make your riparian diversion analysis unnecessary?
A No. Again, going back -- El Sur Ranch has riparian lands. And at this point in the permit, it's said to be 25 acres. But originally I think there's -- in that application there's sort of a reservation clause that says, "We reserve the right to add on a riparian

differently." Prove it obviously. But we're not agreeing to and they're not agreeing to the 25 acres. El Sur Ranch has other lands. It's not the only riparian land. The pasture's not the only riparian land in the watershed. They can pump riparian water -- if they still have the right to pump riparian water, even with the appropriative permit, they can put that water use on the 25 acres or they can put it to some use on another part of the ranch that is riparian --

Q Are you done with your --

A -- because there's no restriction on riparian.

Q Are you done with your answer?

A Yes.

Q Thank you.

Now, we already discussed your CV. I'd like to know if you have any experience or education surrounding irrigation, agricultural irrigation.

A I went to UC Davis in the hydrological sciences. I didn't take the class in agricultural irrigation, but have taken classes in hydraulics, pipe hydraulics and those sort of things.

Q And do you have any specific academic training or background regarding irrigation requirements necessary to provide forage for a cattle ranch?

A No.

Q And your CV lists no specific project regarding that?
A I missed that. Say it again.
Q Your CV lists no specific project where you were tasked with determining the irrigation requirements necessary to provide forage for a cattle ranch?
A That's correct.
Q Thank you.
And yet you rendered an opinion on the irrigation requirements in your written testimony?
A I rendered an opinion using two standard methods what -- while doing welding in the Snyder (phonetic), they based upon a well maintained pasture.
Q And do you have any specific experience with surface irrigation?
A Surface irrigation? Not as a professional.
Q Surface irrigation design?
A I'll say no. I mean --
Q Surface irrigation management?
A I'd say no.
Q Is one of your expert specialties determining crop water requirements?
A I've done it. It's not something I do all the time, but I've looked at watering requirements, yeah. But it's not something I --
Q Have you ever provided testimony before this Board

wherein you were declared an expert in irrigation requirements?

A No.

MS. TEETERS: At this time I'd like to move this Board to exclude Mr. Custis's testimony regarding crop watering requirements and irrigation requirements and specifically as they pertain to a cattle ranch that provides forage for its cattle.

HEARING OFFICER DODUC: Ms. Ferrari.

MS. FERRARI: I'm going to say that Mr. Custis is a certified geologist and hydrogeologist. And he said specifically in his testimony that the equations that he used are specifically precipitation minus -- I'm sorry -- evapotranspiration. They're relatively in a geologist's terms simplistic calculations. And I think that they would be helpful to the Board clearly knowing exactly -- maybe I think exactly what you would label the pasture, as he doesn't have some exact experience with that, but he does have experience with these types of calculations and he clearly do it. He can do it better than a layperson. But I think it would be helpful information for the Board.

MS. TEETERS: Could I make a further comment, please?

HEARING OFFICER DODUC: Quickly.

MS. TEETERS: His testimony is being offered as expert testimony in this matter. And he is clearly not an expert in determining crop irrigation requirements. And I think that it should be excluded on that basis alone. Just because he can run calculations on a model does not mean he can take into account site-specific data and how to input that into a specific calculation that have been sort of input with specific information related to the specific crop type. And he doesn't have the requisite amount of experience to make that kind of calculation taking in the site-specific data.

HEARING OFFICER DODUC: I'm allowing the testimony, but the objection is noted. And we can use -- it will be considered in weighing the evidence.

MS. TEETERS: Thank you very much.

BY MS. TEETERS:

Q Now, getting into your analysis of the crop water requirements, you used a weather simulation model, didn't you, for your calculation?

A Precipitation simulation you mean?

Q Correct.

A Yes.

Q Now, as a scientific, wouldn't you use site-specific data versus a model simulation model that would predict weather -- simulate weather?

A With hydrologic data, precipitation being one of them,

you run into the problem if you have a short-term record, a few years, that that record is not representative of what's going on in the long term, because you're now trying to predict a long-term average. The recent data set, which is available for the -- you can get it anywhere in California, I think Oregon too -- tries to run a long-term -- it does run a long-term simulation. And what I was looking for was an average as opposed to a day-to-day precipitation event.
Q Now, do certain models take into account solar radiation?
A I'm not quite -- I think the prism model is based purely on a rain gauge information. I don't think there's a --
Q Temperature?
A It may take in the temperature because of elevation effects and things like that.
Q And wind?
A Probably not wind.
Q Now, based on your testimony, you only looked at possibly two, but definitely one, parameter -- weather parameter and that was precipitation; correct?
A Only weather parameter was precipitation, yes.
Q Thank you.
In calculating a crop water requirement and

specifically evapotranspiration, isn't it necessary to look at soil radiation and wind at least in the calculation?

A When you're trying to operate on a day-to-day basis and you're trying to figure out today how much water and tomorrow how much water, then you would want to look at the site-specific conditions. When you're asking a question that is more broad than that on, you know, what is the average condition going to be, then these methodologies will work fine. It's an issue of what your purpose is. If your purpose is to operate a ranch, then you're going to want more specific information. But if your purpose is to ask how much water on average can I apply to this, you could -- that's why the methodology is there.

Q Those methodologies could take into account a crop water requirement; correct?

A The methodologies require you to multiply your base evapotranspiration by whatever your crop is. So a crop is important.

HEARING OFFICER DODUC: Hold on a second.

Mr. Lazar.

MR. LAZAR: Would the record please note that Mr. Custis is now being tested on the very issues that he supposedly wasn't capable of answering because he's not an expert in that. He's using the calculations based on a model that was created by an expert. And now he's being asked to provide an opinion on the importance of those different factors which he's not an expert.

HEARING OFFICER DODUC: Counselor.

MS. TEETERS: Yes. This Board stated earlier in part of your ruling, if you will, on that objection, was that you would add weight to it but you would determine what weight to add. And this testimony is just going towards exactly what weight this Board should lend to that testimony.

HEARING OFFICER DODUC: I'll allow it. But I will ask you to look again at your time constraints.

MS. TEETERS: And I'm moving on right now.

BY MS. TEETERS:

Q Mr. Custis, I'd like to talk to you now about your cultivated land analysis, or determination actually.

A Okay.

Q And It's your that -- and it's opinion that the pasture is not cultivated; correct?

A It's my opinion based on the federal description of cultivated and uncultivated land, yes.

Q And that is from the National Resource Inventory Program?

A That's from a -- yeah, it's from the National Mapping

Program.
Q Thank you.
MS. TEETERS: And, Mr. Lindsay, could you put up the PowerPoint again, please.
And the next slide.
And, Mr. Guthrie, could you hand this out, please.
And this is also going to be an additional exhibit. And I guess that would be 42.
HEARING OFFICER DODUC: Stop the clock or something.
MS. TEETERS: And, Mr. Lindsay, could you scroll down one, go to the next slide.
Thank you.
BY MS. TEETERS:
Q Mr. Custis, if you could read the definition of a crop -- actually let me just guide you through it.
The cropland definition states that crop -- cultivated cropland comprises land in row crops or close-grown crops and also other cultivated cropland, for example, hayland or pastureland that is in a rotation with row or close-grown crops. Is that what it says?
A Under "cropland?"
Q Yes.
A Yes.

Q And then --

STAFF GEOLOGIST MURPHEY: Excuse me. We just got handed three documents. I'm not sure which exhibits you want to enter and which is which. Can you clarify that, please?

MS. TEETERS: Yes. I apologize.

This document I'm referring to, which will be Exhibit ESR 42, is a glossary of terms from the Natural Resources Conservation Service which Mr. Custis cites to in his testimony as to where he got the definition of cultivated land.

STAFF GEOLOGIST MURPHEY: Okay. We also received guidelines for maintaining Instream Flows for -- to protect fishery resources. Is that another exhibit?

MR. TEETERS: No, I'm just entering this one at the moment.

STAFF GEOLOGIST MURPHEY: Okay. Thanks.

MS. TEETERS: Thank you.

Q I'm going back, Mr. Custis, to the exhibit.

Mr. Lindsay could you go to the PowerPoint slide before this.

BY MS. TEETERS:

Q Now, looking at the definition, Mr. Custis, for pastureland, that definition states - and correct me if I'm wrong - that it is a "category of land managed

primarily for the production of introduced forage plants for livestock grazing." Do you see that?
A Yes.
Q Is that correct?
A Yes.
Q And it also considers -- pastureland is considered a single species in a pure stand, a grass mixture, or grass-legume mixture. Do you see that?
A Yes.
Q And did you take note of Mr. Allen's written testimony wherein he says the types of crop that was listed or that was present in the El Sur Ranch pasture?
A Yes. I mean I don't know what species, but there's a mixture.
Q He stated that there was a legume?
A Yes.
Q Okay. Thank you.

MS. TEETERS: Madam Chair, this is going to take at most two or three more minutes.

HEARING OFFICER DODUC: All right.

BY MS. TEETERS:
Q Now, if you look further at that pastureland definition, it also includes culture treatments, fertilization, weed control, and control of grazing; correct?

A Yes.
Q Now, isn't it true that Mr. Allen's analysis of whether this was a pastureland and cultivated included the fact that it was controlled grazing, weed control, fertilization?
A I believe so, yes.
Q And, in fact, Mr. Hill testified to that as well.
And does this -- let me strike that, start the question over.
Under these guidelines, the El Sur Ranch pasture falls into the cultivated definition; correct?
A No. I think under these guidelines it specifically said noncultivated cropland include permanent hayland and horticultural cropland. I would equate the El Sur Ranch with a permanent hayland.
Q Well, let's take a look at the definition of hayland that is in this glossary. I don't have it highlighted, but I believe it's on page 3.
Do you see that?
A Yes.
Q Now, hayland is defined in this as cropland managed for the production of forage crops that are machine harvested.
Do you see that?
A Yes.

Q And do you have any evidence that the El Sur Ranch pasture has been machine harvested versus providing forage for the cattle?
A Well, I'd have to go back to testimony, but I seem to recall someone was saying that if they cut the fields. So whether it's -- whether they're harvesting it or not, I mean that's -- I don't know. But I don't think that -- it's my recollection that it's the testimony that it does get cut.
Q Thank you.
I'd like to talk with you about effective precipitation now.
HEARING OFFICER DODUC: Wrap it up soon, counselor.
MS. TEETERS: Thank you.
BY MS. TEETERS:
Q Can you tell me what effective precipitation is?
A It would be the precipitation that was available to the plant.
Q Thank you.
And if all the rain for -- comes in two consecutive days, can all that rain be utilized by the crop?
A No, it wouldn't.
Q And if the precipitation runs off the field, is it

available for crops on that field?
A No.
Q Now, if the ranch in one day got ten inches of rain, not all that precipitation could be used by the crop; correct?
A Well, we would assume -- except the part that might go in the tail-water pond, yeah. No.
Q And you just stated previously that part of your -- actually the only parameter that you considered in determining crop water requirements was an average precipitation; correct?
A Well, we have evapotranspiration. But the only input component was precipitation.
Q And that didn't take into account the amount of precipitation a crop could actually use?
A That's what the evapotranspiration calculation does.
Q And your evapotranspiration calculation did not include solar radiation or winds, correct?
A The two methodologies don't. They're based on an average. They do not use those coefficients.
Q Thank you.
That's all I have.
MS. FERRARI: Madam Chair, can I speak up?
HEARING OFFICER DODUC: Yes, Ms. Ferrari.
MS. FERRARI: And I was wondering if we could

introduce into the record the photographs that Mr. Custis had showed of the channel location changing in response to, I believe -- if we could mark it --

HEARING OFFICER DODUC: Sure.

MS. FERRARI: -- DFG-C-60.

HEARING OFFICER DODUC: Okay.

(Whereupon Exhibit C-60 was marked for identification)

HEARING OFFICER DODUC: Does El Sur Ranch wish to introduce ESR -- or to submit ESR 42 into the record at this time? In fact, 41 and 42.

MS. GOLDSMITH: Yes.

Yes. And actually I apologize. We do have another exhibit that was shown. And --

HEARING OFFICER DODUC: Could you come up into the microphone.

I'm not sure if we got an exhibit number for it. But it is the guidelines for maintaining instream flows. And it was referred to regarding Mr. Custis's use of the median flows versus average in calculating his water availability analysis.

STAFF GEOLOGIST MURPHEY: We'll mark that as ESR 43.

(Whereupon Exhibit ESR-43 was marked for identification.)

MS. GOLDSMITH: Thank you very much.

BOARD MEMBER MAHANEY: And I know I've already asked. We'd like to get a revised exhibit list again to make sure we have everything lined up. Electronically too.

MS. GOLDSMITH: Yes. Thank you.

HEARING OFFICER DODUC: Any objections to those three exhibits from El Sur Ranch?

Mr. Lazar.

MR. LAZAR: The statements proposed of diversion -- the statements of diversion provided contain different amounts of water of diversion compared to a third provision of the application. And we're not sure which, if the application is accurate or if the statement of diversion is accurate. Hopefully we can get some clarification on which set of numbers is accurate, so that we can put a handle on them.

HEARING OFFICER DODUC: You are referring to ESR 41?

MR. LAZAR: The statement of diversions, yes. The numbers are different than in the third application and so we're just trying to get clarification which numbers we should be looking at, then go with actual diversions.

BOARD MEMBER MAHANEY: Just to clarify. Your objection is not to offer any evidence --

MR. LAZAR: My objection is to the authenticity of the document, because the numbers provided in the third revision appear to be at odds with the application -- excuse me -- with the statement of diversion. And so we're just trying to get clarification of which numbers we should be using then or if the -- I guess the document that was provided as ESR 41 is purported to be an accurate reflection of diversions.

HEARING OFFICER DODUC: Ms. Goldsmith.

MS. GOLDSMITH: We would ask the Board to take judicial notice of its own files for the statements of diversion - and they're listed - in Mr. Custis's testimony concerning the WAA. I think that can give you -- after lunch I'll write down all the numbers, but they were in his calculation. We would simply ask you to take judicial notice of it.

HEARING OFFICER DODUC: Thank you.

Mr. Lazar's concerns are noted. And with that, we'll accept these two exhibits into the record.

(Whereupon Exhibits ESR-41 and 42 were received into evidence)

HEARING OFFICER DODUC: All right. We're going to take a very, very late lunch break. Let's resume at 1:30.

And, Mr. Lazar, I assume you will have cross examination.

(Whereupon a lunch recess was taken.)

AFTERNOON SESSION

HEARING OFFICER DODUC: If you'll take your seats, we'll resume.

And actually, Mr. Lazar, we're not resuming with you after all. We're resuming with Mr. Berliner. And you'll have 30 minutes to cross-examine Mr. Titus.

CROSS-EXAMINATION

BY MR. BERLINER:

Q Good afternoon, Dr. Titus. My name is Tom Berliner and I'm an attorney for the El Sur Ranch.

A Good afternoon.

Q I think first a couple of cleanup items, if you could.

An issue came up in Mr. Custis's testimony regarding the 3 cfs of average loss in the river, and the question of your number. Correct me if I'm wrong, but your number, whether it's 15, 17, 19, already includes the 3 cfs of loss; correct?

A Yeah, that was the assumption, was that because we were averaging the incipient asymptote flows from ten habitat units and that our measurements were taken on different days when the flow of the gauge varied and where the realized flow in habitat unit were making our steelhead measurements -- were varied. And what we didn't do, we didn't actually measure or estimate flow in that unit on those days. Because we were averaging our

measurements and assumed some average in conditions, we assumed that overall our 17 cfs flow recommendation included an average loss between a gauge and Molera park. So the 3 cfs, yes.
Q Thank you.
And you indicated that the fishing on the Big Sur River had been changed from -- you could keep them until you'd just catch and release; right?
A Yes.
Q Now, that wasn't done because of steelhead numbers, right? Wasn't that done because they were a listed species?
A Well, the regulations allowed a harvest of two fish up to at least 1996. In 1998, the harvest was reduced to one-fish bag. And during that interim the fish had been less than -- and by 2000 it was reduced to a zero-bag limit, reflecting, yeah, the overall apparent reduction of fish and conditions with the fact that we were not dealing with a listed species.
Q August of '97 sounds about right for the listing date?
A 1997, yes.
Q Do you have any evidence of "take," as that term is used under the Endangered Species Act, by the operations of the El Sur Ranch on the Big Sur River?
A You mean whether or not I have any direct observation

of there being take?

Q Yes.

A No. And -- although I'd like to add to that that I've never conducted any sort of an investigation to try and trust that as well.

Q I appreciate that.

Because I understand the last field work you did on the river was 1997, correct?

A That's right, um-hmm.

Q And that field work was actually the one where the creek was some scaling samples?

A That's correct.

Q But the actual work on the main stem finished in 1995 when you were doing your studies from '92 to '95; Is that correct?

A Yes.

Q Now, those studies that you did -- now my understanding was you were doing those to acquire a basic assessment of the fishery, their use of the river, steelhead, rainbow trout; is that generally a fair description?

A Yes. We wanted to look at habitat use. And the other element to the study that we initiated but weren't able to complete because of funding restrictions in 1995 was a PHABSIM. We wanted to -- the program I worked on at the time was the department's PRC-10000 mandated program. And we wanted to relate the actual dynamics including fish abundance and the various aspects of steelhead population to weighted usable area generated by PHABSIM. And we got through one data set collection during the summer of 1994 under the low flow conditions, and that was the last work we were able to do on that.

So there was that additional element. But otherwise, yes, it was basically -- as far as the steelhead study went itself, it was looking at habitat use and life history.

Q So it wasn't done for any reason directly pertaining to the El Sur Ranch, was it?

A No, it wasn't.

Q Now, at that time you found that the steelhead population on the Big Sur River was healthy; is that correct?

A Yes, relative to what I had been working with regarding assessing conditions for steelhead south of San Francisco in a broader sense; that is, I didn't find a concrete-lined channel or a dam or discarded bicycles and shopping carts in the stream channel. There was water and fish and the opportunity to function like that.

Q Well, maybe I can refresh your memory. In your DFG-T-1, does the phrase, "Overall the Big Sur River

continues to display a healthy steelhead population," sound familiar?
A Yes.
Q Thank you.
Now, with respect to the manuscript that you've been working on the history of steelhead in California -- you're familiar with that document; correct?
A Yes, I am.
Q And you're the primary author of that document?
A Yes.
Q And did you start that document in the early '90s?
A I started it in 1992.
Q And is it still in draft?
A It is.
Q Do you have plans to final it?
A As a retired annuitant.
MR. BERLINER: Let the record show we all laughed.
BY MR. BERLINER:
Q Have you been working on that draft steadily over the years?
A Not steadily. Episodically.
Q But you've updated it from time to time?
A A little bit. It's been several years since I've done any more substantial revision to it.

Q In your testimony earlier today, you characterized the steelhead population on the Big Sur River as being stable; correct?
A As being stable?
Q Yeah.
A I don't believe so.
Q You don't think that you characterized it as, "a stable population"?
A I characterized it as a source population.
Q That's a different question.
A Okay.
Q You don't recall that you used the expression "stable"?
A No, I don't.
Q If you don't, just say so. That's fine. It's not meant to be a test.
A I don't.
Q Okay. But then let me ask you, do you think that the steelhead population on the Big Sur is stable?
A You'd have to define "stable" for me.
Q Well, why don't you define it. You're the biologist.
A That could take some thought.
Q While you're thinking about it, let me move on. I'm going to try to keep to my 30 minutes if we can. But we'll come back.

A Okay.
Q And as of today, you described the Big Sur as continuing to support a healthy steelhead population, right? Referring again to your Exhibit T-3.
A I would qualify the term "healthy." It's not without issues. But we recognize that there's been an overall reduction in abundance throughout that DPS and including the Big Sur. And we've certainly recognized, including through testimony provided as part of this proceeding, that there are issues with habitat quality on the Big Sur. So --
Q What was that word just before Big Sur? Issues of --
A -- habitat quality. For example, you know, dissolved oxygen concentrations down in the two, three, four, five milligram range, issues like that, I wasn't aware of previously.
Q You weren't aware of previously to what?
A To the work that was conducted by Dr. Hanson.
Q You're referring now to the localized DO near Creamery Meadow?
A Yes, I am.
Q Are you aware of any other water quality parameters, referring to things like DO, when the temperature -- somebody mentioned carbon dioxide yesterday, pH -- that are in any way affected by the operations of El Sur Ranch?

A   You're meaning in terms of where they're actually affected by the pumps?
Q   Yes.
A   I can't say that I have made any specific assessment that way.
Q   Now, since you first conducted your studies, to the best of your knowledge the El Sur Ranch has been operating the pump and irrigating that entire time; correct?
A   Yes.
Q   Now, you've prepared a wetted perimeter analysis for the river; correct?
A   I did, yes.
Q   And in preparing that analysis, did you follow the application of the wetted perimeter method as described in their 2004 book?
A   Generally.
Q   Generally.
     Did you deviate from what they prescribed in that book?
A   Yes, I adapted the method to our question.
Q   And your question was what?
A   Trying to identify a minimum flow that we thought would provide a minimal level of protection to -- that would be appropriate for a listed species like steelhead.
Q   So would you say you used a nonstandard method for the

wetted perimeter analysis?
A To the extent that the wetted perimeter really has a set protocol, yes. I mean, it's really -- I think the literature related to application of the method reflects that as generally adapted and for use in different circumstances by different users. It's really kind of more of a general concept. It has, you know, a certain -- it's trying to yield a certain type of information related to, you know, the wetted perimeter of a stream as a function of stream flow.
Q And is a normal wetted perimeter analysis done where you're looking for a first break point in order to do a flow assessment?
A Yes.
Q And you would look -- and to do an analysis you'd locate various transects on the river; correct?
A That's correct.
Q And generally speaking you could return to those exact same transects time after time to do your analysis; correct?
A Yes.
Q But you didn't do that, did you?
A We returned to the same habitat units and made multiple transect measurements in each unit and then averaged those.

Q And were the habitat units that you returned to each time exactly the same each time?
A Yes, they were.
Q So you measured multiple transects; correct?
A That's correct.
Q And you measured multiple points within each habitat unit; correct?
A That's correct.
Q And then to come up with your curve you took averages; correct?
A Within a habitat unit, yes.
Q Okay. So as I understood what you wrote in your written testimony, the first break point generally defines about 50 to 80 percent of the habitats sufficient for aquatic life, generally speaking?
A Fifty to 80 percent of the wetted perimeter, yes.
Q As I understand it, you wanted to get something above 80 percent; correct?
A Correct.

MR. BERLINER: I'm going to ask, Mr. Lindsay, if you could put up on the screen the first slide of our PowerPoint.

BY MR. BERLINER:
Q Dr. Titus, is this an example of the wetted perimeter curves that you drew?

A Yes, they are.
Q And just for orientation, there is a -- I'm referring to T-22 of Fish and Game's exhibits.
On the lines that are on the five graphs, generally speaking, you'll see an arrow pointing down -- which is your first break point; correct?
A That's correct.
Q -- and then theres an arrow generally pointing up that's your second break point; correct?
A That's the incipient asymptote, yes.
Q And is the incipient asymptote sort of the same as a second break point?
A You can call it that, yeah.
Q I mean if there's some technical difference, we should get it right. I'm not a math guy either.
A I think there's -- there's a distinction that goes beyond that, but that's fine, yes.
Q Okay. If I get confused on our stuff, set me right, because I don't want to create a bad record.
Now, under a typical standard wetted perimeter analysis the first break point would be giving you the 50 to 80 percent protection; right?
A That's right.
Q So in order to find a higher level you went to a second break point; correct?

A   That's right.
Q   Now, when I look at those, I understand that you sort of eyeball where the line goes; right?
A   These lines were fitted by eye, that's correct.
Q   Okay. Now, I see that at some points you connected those from dot to dot and at some points you kind of shot between the dots; right?
A   Yes. If there was a situation where there were multiple points along the line, I would try to fit it to the average of those.
Q   And so just to be clear, while you averaged these, in fact these are averages of averages; correct? In other words, these are not the only data points you had?
A   Yeah. Those are our averages.
Q   So each data point on there is an average?
A   There's only one degree of averaging within a habitat unit for each one of those points.
Q   Okay. Just to be clear, because we're using the word "average" a lot, each dot represents an average of some data points; right?
A   That's true, yes.
Q   And then when you drew the line, you may have either connected the dots directly or averaged between the lines; correct?
A   Yeah. I mean, typically any kind of curve fitting

like that is representing an average relationship between two parameters in a plot like that. So, yes, there could be a -- you know, there's another degree of averaging if you want to look at it that way.

Q And in your testimony at your wetted perimeter study at T-22, if I understand you correctly, your first break point corresponded to a flow of about 8 cfs or so with a range of about 6 to 11 cfs?

A That sounds familiar. I'm going to look for my copy here.

Q Page 8.

I'd be happy to provide it to you, Dr. Titus, if that would help.

A Thank you.

Q We needed that back.

A Thank you.

Yes. The range was 6 to 11.

Q Okay. And the break point on your -- so on your second break point the flow is about 17 cfs; is that right?

A The average, yes. This is for low gradient levels, yes.

Q All right. Can you cite to any river in California where the State Water Board has used a second break point to set a flow standard?

A No. I'm not familiar with that application.
Q Can you cite any instance where the Board has used a wetted perimeter method to set a flow standard?
A I can't say that I'm familiar with it. Although I know the wetted perimeter analysis is used in flow assessments in California, and having had recent discussions with one of our engineers that works with instream flow issues.
Q But to the best of your knowledge, the Board has not set a flow standard on that basis; correct?
A That's true. Although I can't say I've investigated that either.
Q I understand.
Now, as I understand it, you're contending that the wetted perimeter analysis you did should be applied to the portion of the river within the zone of influence; correct?
A Yes.
Q And is the assumption there that the river within the zone of influence is generally the same as the area where you did your wetted perimeter studies?
A In terms of basic morphology, yes.
Q And so just to give sort of a simplistic example, you did a wetted perimeter analysis on a stream that was, for our purposes, 30-feet wide and had a flow a foot deep, and

you moved to a portion of the river that was ten-feet wide, so that the flow was now three-feet deep, that would be a dissimilar reach of the river; correct?
A Yes. Could be, yes.
Q And as I understand it, the lowest points of measurement that you took in doing your study was at M25, which I think you said earlier was 2 or 3,000 feet upstream, is that right?
A About 2,000 feet, yes.
Q Two thousand feet up from the point of diversion?
A Upstream from the --
Q -- from the zone of influence?
A From the zone of influence from the well, uh-huh.
Q Okay. Wouldn't you characterize the stretch of the river where the El Sur pumps are drawing their water as a transitional zone between the river and the lagoon?
A That area - I'm trying to think now - it's getting down toward a transitional zone definitely, although they're still a little ways up from the lagoon there.
Q Do you --
A It's still a well defined channel. I think it's still a well defined rectangular channel at that point.
Q Do you agree that it's tidally influenced?
A You know, to tell you the truth, I'm having a hard time thinking back as to whether or not it's within an

area that I recall seeing, you know, an apparent backing up of water. But, yes, I would assume so based on discussions I've heard at other times during this proceeding.
Q Now, did you have a chance to look at Dr. Hanson's studies for three recent years and the data that was in those studies?
A Yes, I have.
Q You've reviewed those studies?
A Uh-huh.
Q Did you review any of the data directed by Dr. Hanson to do a wetted perimeter analysis?
A No, I didn't.
Q Is there any reason you didn't?
A Yeah, I looked at it from that standpoint to see whether or not there would be an opportunity to. But I don't think -- that there wasn't a broad enough range of flows covered in those studies to be able to do it.
Q You didn't think that having a critical dry year and a dry year and a wet year was enough?
A Well, water-year type doesn't really play into it. What's important is the actual realized flow. If it's 100 cfs during a critically dry year, 100 cfs during a wet year, it doesn't make any difference.
Q No, I understand.

A   It's the range of flows. I mean to be able to identify or depict a relationship like that, you've got to have a broader range of flows. And we had flows up to approaching 60 cfs. And then we could read those measurements.
Q   And how many different flow types would you need? Would you need five different type or ten different type or --
A   There's no prescribed minimum. I've seen studies when there have been only three measurements -- the measurements made of three different flows, which seems minimal to me. The more, the better basically.
Q   So would six be better than three?
A   I would say so.
Q   Well, just so you know, Dr. Hanson had six.
A   Pardon me?
Q   Dr. Hanson, you had six -- you used six?
     DR. HANSON: I had six I think, yeah.
BY MR. BERLINER:
Q   Okay. Now, you looked at growth of steelhead on the river; correct?
MR. TITUS:
A   Yes.
Q   And you looked at growth on the main stem of the river primarily, not in the lagoon; right?

A That's true.
Q And did you also not look at growth in deep pools?
A In deep pools?
Q Yes.
A We looked in one deeper pool. We were able to work in a deeper pool above the mouth of Juan Higuera Creek.
Q Didn't you indicate in your recapping of your work that you skipped most of the deep pools because it was too difficult to survey those pools?
A We couldn't sample them effectively with the backpack electrofishers. But we did do the one and a couple of other shallower pools.
Q And do you agree that studies by Sogard and others show that slow growth of steelhead is typical for rivers on the Central Coast during the summer?
A Yes.
Q Is there anything unusual about the growth of steelhead on the Big Sur River as compared to those other coastal streams?
A Seems to follow the same pattern with regard to a slowdown in growth during the summer at -- growth trends.
Q And is that some sort of adaptation by the steelhead because of it's hot, flows are low, they're a pretty adaptable fish?
A They are an adaptable fish. And you're asking whether

or not something represents an adaptation?
Q Wouldn't that be a natural adaptation for this particular population along the coast since these streams all seem to dwindle during the summer and it's pretty warm?
A I don't know if I would characterize it as an adaptation. I wouldn't call it adaptation.
Q What would you call it?
A Making the best of a bad situation for a two-to-three-month period.
Q I would call that an adaptation. Okay. But I got my Doctorate in Biology at Hastings Law School. So --
(Laughter.)
By MR. BERLINER:
Q And as I understand the studies from Bond and others, they've established that the lagoons along the coast, little streams, are high priority areas for growth of steelhead; is that correct?
A Yes, that's true.
Q And is there evidence that the fish on the Big Sur River enter the ocean primarily as one-year old's?
A One and two-year old smolts.
Q But generally it's one-year old's, isn't it?
A The demographic data suggests that, yes.
Q And doesn't that then suggest that they're of a size

sufficient to support their survival in the ocean and contribute to adult returns?
A Yes.
Q In fact, were you here for Dr. Hanson's testimony?
A I'm sorry?
Q Were you here for Dr. Hanson's testimony?
A Yes.
Q And did you see that Dr. Hanson established that growth on the Big Sur is at least as good as, if not better, than most of the other Central Coast streams?
A I wouldn't agree that it was most of the other Central Coast streams. But other select streams, yes.
Q To the extent that he had data?
A Yes. And, you know, I'd have to qualify that as well as whether or not riverine growth was being compared with lagoon growth and, you know, whether it's all apples and apples or not. But I'm familiar with the data that were presented, yes.
Q Did you also review the studies by the Source Group?
A By who?
Q Source Group, SGI, the hydrologists that are working on behalf of El Sur Ranch.
A Oh, you mean the -- which report --
Q There are about three hydrologic reports.
A Yes.

Q You looked at those?
A Yes, I did.
Q And did you review the draft and final Environmental Impact Report?
A No, I didn't.
Q You didn't cite any of those documents in your testimony, did you?
A No, I didn't.
Q Doesn't your testimony rely essentially on the data that you collected from 1992 to 1995?
A And other information from the literature, yes.
Q Well, wouldn't best available science require that you at least consider and evaluate that other evidence and indicate why you did or did not use it?
A You could argue that, I suppose.
Q Now, you've recommended a winter bypass flow that's based on a depth criteria, you said, of 0.7 or 0.8 feet. Does that sound right?
A The winter flow bypass requirement?
Q Yes.
A The flow that we're recommending isn't based on Thompson's criteria.
Q Let me refer you to your Exhibit T-A.
A Okay.
Q And I'm just going to quote from it.

"Given the large size of adult steelhead on the Big Sur River, there may be some question as to what an appropriate depth criteria may be for adult passage at critical points on the lower Big Sur River. The so-called Thompson methods for developing upstream passage flow recommendations for adult salmonids apply to 0.6 foot depth criteria for standard steelhead as a" -- "for steelhead as a" -- I'm sorry -- "applies to 0.6 foot depth criteria for steelhead as a standard."

Now, I'm going to skip a little bit and say, "Thus, development of passage criteria for steelhead on the Big Sur River may require a greater depth criteria of a 0.7 or a 0.8 foot should this approach be used."

Does that sound familiar?

A Yes, it does.

Q And do you agree that a 0.7 or a 0.8 depth criteria could be an appropriate approach?

A Based on the information we have now, yes.

Q Now, are you aware that Dr. Hanson did a study regarding depth criteria at 0.6 and then because new criteria came out, he had to change that to 0.7?

A I'm aware that he changed it to 0.7.

Q And do you know what flow Dr. Hanson recommended in order to meet the 0.7 criteria?

A I believe it was 30 cfs.

Q That's correct?
A Okay.
Q And are you aware that this was later reconfirmed and found that a 28 cfs would be sufficient?
A I saw that in the presentation of testimony, yes.
Q And despite that, you're asking for 132; correct?
A That's right.

HEARING OFFICER DODUC: Mr. Berliner, how much more time do you need?

MR. BERLINER: Oh, ten minutes, if that would be okay. Maybe faster.

HEARING OFFICER DODUC: And what is the remaining line of questioning that you have for this witness?

MR. BERLINER: Limiting factors on the river and a little bit about the lagoon, which will be pretty brief because we've already touched part of that. And then just a couple of general questions and I'll be done.

HEARING OFFICER DODUC: Okay. But please do it in ten minutes.

MR. BERLINER: Should be plenty of time. Thank you.

HEARING OFFICER DODUC: I should have said five minutes.

MR. BERLINER: I will shoot for that.

BY MR. BERLINER:

Q As I understand it, you're contending that flow is the most important limiting factor on the Big Sur River, is that correct?
A Yes.
MR. BERLINER: If I could have the next slide in our PowerPoint, please.
One after that, I guess.
BY MR. BERLINER:
Q Does this chart look familiar?
A I saw it yesterday.
Q This is the chart from the NMFS Steelhead recovery plan; is that right?
A Uh-huh, yes.
Q And I note that for the Big Sur River NMFS is charged -- National Marine Fishery Service, NMFS -- is charged with coming up with plans and guidelines for recovery of steelhead; is that correct?
A Yes, they are.
Q And this chart shows a ranking of concerns by NMFS regarding the Big Sur River and other coastal streams; correct?
A Yes.
Q And I note that on the Big Sur River, where it comes to groundwater extraction, they did not identify it as a threat at all. And I notice where it talks about dams and

surface water diversions, they did not identify that as a threat as well. Do you see that?
A Yes, I do.
Q And do you see where they indicate that dark green is a low threat and light green is a medium threat? There is a key down there on the bottom.
A I see that, yes.
Q And You'll see that on the Big Sur River there are no yellow or red threats, and for medium threats they identify roads and recreational facilities; right?
A Yes.
Q And for low threats they identify passage barriers, roads, and wild fires; correct?
A Yes.
Q Are you also familiar with a report done by the Department of Parks and Recreation in 2003 regarding the Big Sur River?
A I've seen reference to it. I've never seen it myself.
Q You're not familiar with that report?
BOARD MEMBER MAHANEY: Excuse me. Just for the record, I want to make it very clear we were looking at ESR-34 in that previous line of questions.
MR. BERLINER: Yes. Thank you.
BY MR. BERLINER:
Q So you're not familiar with that Parks and Rec report?

A No, I'm not.
Q Would it surprise you that they identified recreational impacts to spawning areas and reds as being problematic on the river?
A I'd have to look at how they arrived at that conclusion.
Q So you have no opinion?
A Pardon me?
Q You have no opinion on that report at this point?
A No.
Q Now, you've expressed some concern about the lagoon on the Big Sur; correct?
A Fill me in.
Q Pardon me?
A I'm sorry. Concern about the lagoon in what respect?
Q Just in general in terms of whether it's got temp -- whether temperatures are appropriate or DO or stratification --
A I'm sure it could be a concern, water quality, yes, in general.
Q And are those the concerns that are similar to the ones that NMFS has expressed?
A Yes.
Q And are you aware that Dr. Hanson studied the lagoon?
A Yes.

Q And are you aware that Dr. Hanson found no problems for steelhead for stratification or DO or temperature or salinity?
A I think there were some issues with DO presented.
Q In the lagoon?
A In the lagoon -- in the head of the lagoon.
Q All right. Well, the record will speak for itself on that.
Now, are you aware that some lagoons on the Central Coast closed for long periods of time?
A Yes, I am.
Q Are you familiar with a lagoon closing on the Big Sur River?
A Occasionally.
Q You're occasionally -- no --
A It does close occasionally.
Q It closes occasionally?
A Yes.
Q And are you aware, does it close for long periods of time or short periods of time?
A I would say relatively short periods of time.
Q There were several pages out of your testimony starting at about page 2 where you talked about likely or potential or this might be a concern or that might be a concern regarding the operations of the pumps on

steelhead; correct?
A Could you be more specific, please?
Q On page 2, the sort of second full paragraph down, you indicate that ranch diversions likely will result in significant impacts -- let's see -- will likely result -- you use that phrase several times. You say could result in significant impacts to fisheries in the zone of influence and the lagoon because reduction in flow can restrict fish passage, can degrade habitat, possibly dry up the river, may result in an increase in water temperature. Do you see that?
A Yes, I do.
Q Now, all of those are possibilities, right?
A Yes, they are.
Q But they're not actual, are they?
A In terms of demonstrative connection between -- I don't -- what do you mean?
Q You have not established causation, have you?
A No.
Q Thank you.
And over the last 20 years since your manuscript has been in draft and the El Sur Ranch has been pumping, unconstrained other than by its reasonable and beneficial use of water, you haven't changed your description of the Big Sur River and steelhead; correct?

A That's true.
Q And isn't it true that in your 1994 memo to Ken Gray you described the Big Sur River as being relatively pristine? I'd refer you to T-1 at page 3.
A I'll take your word for it. I'd have to look at it.
Q It's a quote?
A I think it's in the introduction to the document.
Q Well, actually its's on page 3. And I'll just read it to you to refresh your memory.
It says, "The Big Sur River was selected as a study site because of its relatively pristine, unregulated condition, and good accessibility."
Does that sound familiar?
A Yes, it does.
Q And isn't it true that from 1994 to 2010 you've continued to describe the Big Sur River as being pristine?
A I don't think I've described it since then.
Q Since 1994?
A I don't think so, no.
Q Well, is Exhibit DFG-T-3, dated August of 2010, your exhibit of your manuscript?
A And that was -- again, that was -- that part of it was written in 1992, 3 or 4 or 5, somewhere in there.
Q Okay. But you haven't updated --
A I haven't updated that, and along with a number of

other things in the manuscript.
Q So that probably -- the same thing would apply to your description of the lagoon. Has the river from the lagoon to the gorge remained highly functional for steelhead population?
A I'm sorry. What's the question?
Q Is the same true for your description in the same document that the lower Big Sur from the lagoon to the gorge remains highly functional?
A That was written back in -- when I you was doing that work down there --
Q Are there any --
A -- 16 years ago.
Q Okay. Are there any significant changes on the Big Sur that you're aware of that have occurred between then and now that relate to --
A I haven't conducted any assessments that would allow me to make a direct -- draw a conclusion to that effect.
Q Are you aware of any studies that have concluded that the Big Sur River is a source river for steelhead?
A No, I'm not.
Q A similar question regarding the steelhead as being a meta-population.
A Yes. That's documented in the steelhead genetics literature. I've also had conversations with Carl Escarza

at the NMFS lab in Santa Cruz, who's recognized as probably the expert on the subject in California -- at least California. And his indication is that the Big Sur is the source population on that part of the coast in that DPS, especially given the fact the Carmel River populations had much reduced levels than what they've been previously.

Q But you haven't submitted that as evidence, have you?

A No, I haven't.

Q Okay. And then one last question.

A With one exception. The systematics that were presented in the status review for the lab.

Q The last question for you, Dr. Titus, concerns the North Coast Stream Policy.

Are you aware that the policy in Section 2.2.2 indicates that if you have site-specific information, you're to use site-specific information rather than the general regional formulas there in the policy?

A I recall seeing reference to that, yes.

Q But you didn't use that, did you?

A No.

MR. BERLINER: Doctor, thank you very much for your time. I appreciate it.

HEARING OFFICER DODUC: Thank you, Mr. Berliner.

And that concludes the El Sur Ranch

cross-examination.

Mr. Lazar.

MS. GOLDSMITH: It's very, very clear these witnesses are being cross-examined as a panel.

Before we broke for lunch, I mentioned that I would get the numbers of the statements of diversion and use that I would like this Board to take official notice of. And they are SO -- or S014132, also 14133. And two of those were introduced as ESR-40, I think.

The other ones that were -- that should be taken official notice of are S016291, 16292, 16353, 16354, and 16355.

And just for clarification for the other parties, I would note that since the enactment of the 2009 water legislation, it's been required -- it may have been required before that but maybe not clear -- that water diversions even for those who have unpermitted applications need to filed under Statements of Diversion of Use. And we were instructed -- El Sur Ranch was instructed by your staff to file separate statements for diversion under riparian rights and total diversions for each of the two sources of each of the two wells and one for the cumulative. So one should not add all of the numbers up together to get like five times as much water as was actually diverted.

HEARING OFFICER DODUC: Thank you, Ms. Goldsmith.

Mr. Lazar.

MR. LAZAR: Thank you.

Questions for Dr. Titus.

CROSS-EXAMINATION

BY MR. LAZAR:

Q I have in my hands here the guidelines for maintaining instream flows to protect fisheries. And then Mr. Berliner recently quoted the maintenance of minimum bypass flows. I want to read you back page 6 of those guidelines.

It says, "The determination of a bypass flow's adequacy can be based on site-specific biological investigations conducted in consultation with NMFS and DFG. Or in the absence of site-specific data, it would be not less than the estimated unimpaired to have a medium flow at the point of diversion."

These bypass flows that were just proposed by the applicant, did they consult with Department of Fish and Game in establishing those?

A Not to my knowledge.

Q And to your knowledge, did they consult with National Marine Fishery Service?

A Not to my knowledge.

Q And did you base your minimum bypass flow in part at on least the unimpaired February median flow?
A It's based on the median annual flow.
Q The median annual flow?
A Yes.
Q But the winter -- there's two sets of minimum flows, right? There's a winter flow and a summer flow. So at least the winter flow then would have been based on the unimpaired February median flow?
A It's -- well --
Q I'm just reading the justification here. It says, "The unimpaired February median flow guidelines is based on the observation of available information is positively correlated with discharge." And I'm just not going to waste the rest of my time reading. But that was part of your consideration?
A Yes.
Q When you're considering publishing for scientific publication, is the newness of the data a concern whether or not a journal will publish your data?
A It can be, yes.
Q So it might not be as easy to publish a study now in which you provided the data or you calculated the data a number of years ago?
A The data I collected during the early '90s?

Q Correct?
A That's possible, yes.
Q And are you aware that there are other studies going on right now involving the lagoon?
A Yes, I am.
Q Thank you.
We just heard that Dr. Hanson had concluded that the proposed diversions would not affect the habitat of the steelhead in a number of different manners, including dissolved oxygen, temperature. And I was curious, when you looked at those, did you notice, was Dr. Hanson evaluating proposed diversions or was he using the existing conditions of the river?
A He was using the existing scenario on the lower Big Sur River.
Q But the proposed diversions though are considerably higher than what the existing levels are?
A Well, that's true, yes.
Q In other words, Dr. Hanson's studies then would not have considered or did not consider what the proposed diversions were?
A Yes, I think that's true, yes.
Q Now, Dr. Hanson suggested the winter bypass flow of 30 cfs. That's over 110 cfs less -- or excuse me -- almost a hundred cfs - it was 132, right - than what you proposed?

A Yes.
Q How do you explain that discrepancy?
A I think right now the passage conditions for adult steelhead on the lower Big Sur are in a state of flux. Several years ago the Department of Fish and Game made measurements to determine a low flow closure for the Big Sur and arrived at a flow of 40 cfs, which stands in the regulations today.

In communicating with Robert Holmes, who's conducting the PHABSIM study on the river now, there are passage conditions that I think we'll hear more about in other testimony at the head of the lagoon that may even require more -- a higher flow per passage of adult steelhead using Thompson criteria. And the location I think in Dr. Hanson's studies, the critical ripple was farther upstream than the critical ripple that's being identified now at the head of the lagoon as being the first bottleneck to upstream passage.

So I think especially since the basin complex fire in 2008, a lot of the sediment's been moving through the system and the issue of upstream passage of adults has worsened since Dr. Hanson conducted his studies.
Q And in other words, the flows that he was recommending would not have reflected the latest conditions?
A That's correct, yes.

Q I see.

And have there been late fall and early winter populations of steelhead in other steams lost?

A I'm sorry, I didn't understand the question.

Q The late fall and early winter steelhead populations in other streams, have these been lost? Have they been reduced?

A Oh, yes, absolutely.

Q Could the Big Sur River serve as a source for these different types of life histories?

A Yeah, there's a pretty broad spectrum of things that the fish can do there.

Q Including inform the genetic composition of the other streams potentially?

A That's true, yes.

Q Isn't it an important attribute for the lagoon to be open year-round?

A Well, it seems to be the norm for the Big Sur River, in contrast to a lot of other Central Coast streams where the sandbar closure is normal now. So along the Big Sur current I think because of the relatively high gradient of those streams that one of their characteristics is for them to remain open year-round if not nearly year-round.

Q Okay. Thank you.

Were you able to determine any correlation between the opening and closing of the stream and differences in the flows? Did you observe in the testimony any relationships drawn between those?

A I presented in my testimony observations provided to me from a former collaborator regarding opening and closure of the lagoon, yes.

Q Okay. Thank you.

MR. LAZAR: I have some questions for Mr. Custis.

BY MR. LAZAR:

Q Mr. Custis, I have a number of questions here. I was hoping that we could go over the testimony in which you reviewed the SGI hydrogeology studies. I'm going to begin with the problem that you identified with the geometric mean on page 44 of your testimony.

You say something along the lines of the average hydraulic conductivity for the zone of influence is based on a geometric mean. And then you say the problem with that is it assumes that there's a single type of geological unit but that multiple types are present. Is that an accurate characterization of your testimony?

A Yes.

Q And when you say there are multiple types of geologic units present, what does that mean in layman's terms?

A It should have been the 2006 study. It's ESR-5. And I think it's dated.

Q Well, you're referring to C-47, the comparison of the two values?
A That's where I'm heading to. If you look at the descriptions of the -- when you go out and -- the geologist goes out and --
Q Could you speak a little closer to the microphone.
A When the geologist goes out and maps something, they'll describe it - this is cobble, this is silt, this is sand. And when you look at the table, there's -- somewhere on a PDF number for -- I think it's 2-2. It presents all of the permeability studies and a description --
Q I'm sorry. 2-2 of?
A ESR, should be, 5. It's 2006 study when they did the test.
So, anyway, you have a variety of descriptions of geologic units.
Q You've got a variety of descriptions of geologic units within the stream?
A Within the stream, yeah. And they -- you know, when you look at them, they have sort of generally similar hydraulic conductivity within the same description.
Q Did the applicant use just one type of geologic unit to determine the hydraulic conductivity?
A Essentially that's what's going to end up happening,

by taking all of the different units from, you know -- and taking the geometric mean of all them, you do in essence create one unit.

Q If we could look at DFG-C-47, please.

A Okay.

Q Now, as I understand it, what you've done here is you've taken two different types of calculations, one involving a single geologic unit and one involving multiple geologic units. And yet when we get the geometric mean of both of them, they come out equal.

Could we slow down just a little bit more?

Is that accurate? Am I characterizing that accurately?

A Essentially what I was trying to do was point out and put forth two cases. The upper one is where you have a coarser grain material with a little bit of fine. And the bottom one is we have a lot of fine. And so the question is, how much water flows through each one of them? If you break them out into separate units and perform Darcy's law. And I'm assuming the same gradient also. So the upper one, which of course will come up with roughly around two feet per day, and the lower one would come out with 20 cubic feet per day. Okay?

Taking those same two values and taking the geometric mean, which to describe the geometric mean is it's a -- it's the nth root or the nth power of -- the nth root of N numbers -- the product of N numbers -- for two numbers, which is why I kept it to two. It's the square root of two numbers multiplied times each other. Okay?

So you come up with the same geometric mean even though the number of -- within the area of coarse grain material in the top is far more than it is in the bottom and the fine is less than the bottom.

Q So if they had taken an evaluation of different types of geological units, they could have come to a different conclusion regarding hydroconductivity?

A Yeah, I would think so. When you look at the table, and I'm trying to -- it's somewhere. I think it may be in here.

I calculated the difference between the high -- I have Table 3-2 on ESR-5, PDF 124.

When you take the highest and lowest values that are in that table and divide the lowest into the highest, you end up with a ratio of about 8.6 to 1. So that's the spread of the hydraulic conductivity in the data set. And yet it's not one number they use.

Q Can you repeat that classifying -- you have a spread of 8.6 to 1.

A Right. If you take -- the highest number I saw on that table -- it's actually the highest and lowest of --

is 311 feet per day and the lowest is 36 feet per day. And you divide that out and you find that the highest is 8.6 times what the lowest is. So you have a pretty good spread in hydraulic conductivity.

Q Can I clarify. You're saying that one type of geologic sample there is eight times -- is over eight times -- it has eight times the hydrologic conductivity?

A That's correct yes.

Q Okay. Would you describe that as significant?

A I think in these calculations it is. Now, the problem with hydraulic conductivity is it can be variable. But because you're doing this precise calculation of down to a couple of decimal points in QFS, you need to break out the area, all that is represented by each type, and calculate that separately, because I think -- obviously if you took the highest, which is 300, versus your geometric mean, you've missed the -- you've lost by three times.

Q Thank you.

The second point that you bring up is the consistency of the conductivity. This is on page 45, where you describe where the top foot of material controls the infiltration. I believe that we've all heard this called the colmation layer.

A That's right.

Q So if I understand this correctly, if the colmation

layer moves or if it's lessened or it's removed, then that unblocks the conductivity of the stream. You removed the clogging layer. Is that what you called it before, the clogging layer?
A Yeah. It's easier to pronounce, yeah.
Vertical hydraulic conductivity is -- think of it as a layer cake. Okay? And you've got a layer cake.
Q Layer cake?
A You've got sand, you've got silt. If you're looking how fast water will flow vertically through that, it's the silt that's going to control it. Finer grain material is going to control how fast it flows through. If you're looking at how fast it will flow horizontally, it's the sand now that's going to control it.
So when you have that clogging layer, the material falls on -- you know, on the bottom of the riverbed, it's real critical how it layers. And in their permeability test they showed that.
Q Now, you said in your testimony that they did another permeability test where they removed the top foot. And when they did that, wasn't there much greater conductivity?
A That's correct. When they took the top foot off, the conductivity emitted was very -- it was essentially what is emitted with a well test for the -- you know, on line,

somewhere around 3,000 or 600, somewhere in there.
Q I thought it was interesting, yesterday we heard from Mr. Hill that there was a recent storm event in which he described the colmation layer being removed and losing a lot of water. Do you remember that?
MS. TEETERS: Objection. Mr. Hill's testimony --
HEARING OFFICER DODUC: Come up to the microphone.
MS. TEETERS: I believe that Mr. Hill's testimony - and it can speak for itself, that is the best evidence in the record of it - and Mr. --
MR. LAZAR: Let me rephrase, please.
BY MR. LAZAR:
Q Do you recall yesterday Mr. Hill's testimony regarding a storm event?
A I'm sorry, I don't.
Q I don't know how to refresh your memory if I'm not allowed to.
HEARING OFFICER DODUC: What specifically are you --
MR. LAZAR: I would like to refresh his memory regarding Mr. Hill discussing a storm event in which a severe amount of water was lost to the stream as a result of the loss of the colmation layer.
HEARING OFFICER DODUC: You just said so.

MS. TEETERS: Excuse me. I believe Mr. Lazar has mischaracterized Mr. Hill's testimony. I would object to this line of questioning on that basis.

HEARING OFFICER DODUC: Mr. Lazar.

MR. LAZAR: I'm bringing up --

HEARING OFFICER DODUC: Can you point to the specific --

MR. LAZAR: I don't have the transcript with me from yesterday.

HEARING OFFICER DODUC: The testimony is based on exhibits submitted by El Sur Ranch. Can you point to a specific --

MR. LAZAR: His testimony was not based on an exhibit. His testimony was directly to the Board yesterday.

MS. TEETERS: And I would add, Madam Chairperson, that Mr. Hill's testimony regarded the 1990 excavation by the Department of Parks and Rec --

MR. LAZAR: That's not accurate.

MS. TEETERS: -- wherein --

MR. LAZAR: That is not --

HEARING OFFICER DODUC: Mr. Lazar, please let her continue.

Continue.

MS. TEETERS :-- and wherein the Department of

Parks put an excavator in the river and pulled up the colmation layer. And that's what he's talking about. And then also the next storm event put the colmation layer back. It laid the siltation back. That was his testimony as I remember it.

MR. LAZAR: Madam, I believe that the record will speak for itself in terms of what Mr. Hill did and did not say yesterday.

But let me rephrase the question without Mr. Hill's input.

HEARING OFFICER DODUC: And you obviously cannot ask the witness to answer a question based on testimony that he does not recall.

MR. LAZAR: I think that's fair.

MS. TEETERS: Thank you.

BY MR. LAZAR:

Q Is it possible in a major storm event for the colmation layer to shift or be moved?

A I would expect so, because in a large storm event the whole bed moves.

Q And the bed -- did the bed move itself after the 1995 storm event?

A Well, the whole channel moved.

Q The whole channel moved?

A Yeah. And we --

Q The whole channel moved.
And when the whole channel moved, would you expect the colmation layer would have changed as well?
A Yeah. I think from year to year or from flow to flow the colmation layer is changing. And the reason is is that this layering effect is very important. If it doesn't -- you know, if it doesn't lay down uniformly or it doesn't have the right thickness or the right permeability in the silts, you're not going to get the same value. And that's real critical for vertical hydraulic conductivity, because the low permeability layer drives the overall permeability. Wherein as if you're looking horizontally, it's coarse stuff, but the fine stuff doesn't care -- it doesn't matter.
Q And you observed as recently as last week that the channel is shifting again?
A I went out in the field last week to look at the lagoon and see what its condition was in, because we had a pretty good storm event in March for the new gauge that USGS -- although they can't give us flows at that level, put the stage at 14 feet. And so I want to see what happened.
Q Is it possible that even now, even after this most recent storm event, that the hydroconductivity has changed because of our changing in colmation layer?

A   I think that's true, and particularly in the lagoons. The lagoon's filling in with coarse grain material.
Q   The lagoon's filled in with coarse grain material?
A   It's filling in, yeah, from what it was. The first time I looked at it was in 2007. So it's filled in a lot since 2007.
Q   Thank you.
        On pages 45 and 46, you discussed the velocity transects placed within the zone of influence, not at the edges.
        Can you look at that?
A   Yes.
Q   Are you familiar with that testimony?
A   Yes.
Q   Can you explain what you meant when you said that they're within the zone of influence and not at the edges?
A   If you're -- VT-2 and VT-3 are shown here, if you look at one of the maps of the site, but it's --
Q   If we looked at ESR 2, Figure 3-3 -- it's going to be on page 51.
A   It's sort of in a mid portion of the zone of influence, if you would look at it from upstream to downstream where the river goes past the zone line. And the problem is that if you're trying to measure what's happening within that zone, you need to know what's coming

in and what's going out in the zone, not just what's happening in a portion of it.
Q Did the applicant only measure the loss between the two transects then?
A Well, they measured for transects. In other words they were trying to calibrate their piezometer data set. And that's why they shifted the size of the zones to the transects. So they're trying to validate the data set is what they were doing with the transects and the piezometers with its geometric mean.
Q Did I see you with a red pointer before?
I'm going to ask you to use that in just a moment.
So just to reiterate or summarize then, the piezometers here in your opinion are not at the edges of the zone of influence?
A Well, the upper ones, five and six, are -- six is probably outside. You know, I looked at the data, and I think five might actually have some influence from the pumping. There's nothing downstream from one, so you're not getting tossed out into the lagoon.
HEARING OFFICER DODUC: Counselor.
Hold on just a minute, Mr. Lazar.
MS. TEETERS: Madam Chair --
HEARING OFFICER DODUC: Could you identify

yourself again. I keep calling you a counselor.

MS. TEETERS: I am actually.

Danielle Teeters. I'm a counsel --

HEARING OFFICER DODUC: Peters?

MS. TEETERS: Teeters, like teeter-totter.

I want to object to this line of questioning because it appears to me that he is not cross-examining the witness. What he's doing is asking for direct testimony. And, quite frankly, he's actually crossing the findings of our witnesses, which he had a chance to do yesterday.

MR. LAZAR: No, I'm actually -- if I may offer.

HEARING OFFICER DODUC: Mr. Lazar.

MR. LAZAR: Thank you.

I am actually addressing the specific questions that Ms. Ferrari addressed this morning in terms of limiting hydroelectrical factors. And I'm seeking clarification on the points that she offered during direct.

HEARING OFFICER DODUC: Ms. Teeters, I will allow this line of questioning because it is relevant. And I believe Mr. Lazar is asking this witness his opinion based on his expertise.

MS. TEETERS: Thank you.

BY MR. LAZAR:

Q   Could we take a look at -- you said earlier today that the zone of influence was incomplete; that, in other words, based on what we just looked at here, your conclusion about the location of the piezometers and the fact they're not at the edges is based on a related conclusion that you made that the zone of influence is not identical to the zone -- that you concluded is not identical to the zone of influence that the applicant has concluded; is that accurate?

I might be muddling this. Let's pull up a chart so we can get this clarified.

A   In this graphic there's two things there which we are talking about. One are transects, and those are VT-2 and 3.

Q   Okay.

A   And then you have piezometer.

Q   I'm confusing two issues.

A   And I think you're confusing two issues. Although the piezometers in the lower -- in the lagoon part don't go far enough, in the upper part, they're, you know, five and six probably -- if I had to draw the line for no impact, it would be between five and six.

Okay. The problem that I had is that I don't have a transect up there to measure the actual flow in the river and calculate the loss in the flow in the river from

the vertical gradient and this geometric mean. What I need to be able to do is to, first of all, know what loss occurs. We have a loss from VT-1 to VT-3. But that's half of the zone of influence. What I want to know is how much is coming into the zone of influence. So I need something up by P6 that transects of a restricted flow.
Q Okay.
A And then you're going to have one down at P3. That's fine. Now, I know what happens in the first half of the zone of influence of the river. And then I have it going down to two. But it's that lack of information coming into the zone of influence that muddles the question of how much of that loss from VT-1 to 3 actually belongs in the zone of influence and how much is outside the zone of influence.
Now, we've done piezometer readings and they made a statement that in 4 UL they're not seeing a loss. Okay. The problem with that is then is they have a problem with the piezometer. So --
Q What is that problem with the piezometer?
A Well, it leaked. In other words it got pushed down in the subsurface and not have any connection to the surface. Otherwise it's just measuring the surface flow. And I think what they said was they weren't sure that they were getting a good seal on that. So they thought maybe they

were getting leakage. Now, that's a problem.

The other problem is that at P5 they indicate that they don't see any impact from pumping. But I'm not sure that I would agree with that from the data that they have. I think I can make a comparison so it looks like there is an impact from that.

So if you're going to put a transect to measure surface flow, you need to get up by six or up farther so that you're outside of the hydraulic from the depression zone of influence, as opposed to knowing whether the loss is occurring from VT-1 down to the zone are changing with pumping or not. Is it there because that actual pumping impact is extending beyond the hydrology boundary into the whole aquifer.

Q And is it your contention that it is?

A Yes.

BOARD MEMBER MAHANEY: Mr. Lazar, perhaps I missed the reference. But could you identify for the record the chart that was being discussed.

MR. LAZAR: I'm sorry. What was your question?

BOARD MEMBER MAHANEY: My question is whether you had identified for the record for when we are later reading the transcript the chart that is being discussed by Mr. Custis.

MR. LAZAR: Oh, yeah. This is ESR 2, Figure 3-3, page 51.

BY MR. LAZAR:

Q I'd next like to look at DFG-C-49.

Now, I was a little confused about this chart here.

A Can I interrupt you for a second?

Q You've got a couple big circles and --

A We have a color one. It's on the disk.

Q I'm sorry. I missed that.

A There is a color version of that. It was on the disk I gave you this morning.

MR. LAZAR: Would it be possible to stop my time while looking for it?

THE WITNESS: You can keep asking the question if you'd like.

MR. LAZAR: That's not what we were looking at.

THE WITNESS: It's 49.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Oh, 49. I'm sorry.

THE WITNESS: That's it.

BY MR. LAZAR:

Q I found this chart quite confusing. Can you explain what's going on here?

MS. TEETERS: Objection. Calls for a narrative and not cross.

HEARING OFFICER DODUC: Mr. Lazar.

MR. LAZAR: I will be more specific.

HEARING OFFICER DODUC: Okay.

BY MR. LAZAR:

Q I found this confusing because you've drawn two large circles here that appear to be centered around the old well and a new well. And then your testimony, you discuss this chart in terms of zone of influence. And then there are these terms here that say New Well ZOI and Old Well ZOI. What are New Well ZOI and Old Well ZOI that are depicted on this chart?

A They're where the solid red lines drawn from the twelve radiate out and intersect the individual zone of influence circles and the river.

Q Are those the same zone of influence calculations made by the applicant?

A Yes. Well, the applicant's map presented are just portions of those circles. And originally they were put in both of them. Now they're just put in the outer one, which is the new well zone of influence. So --

Q In other words, the old well zone of influence isn't on the new one?

A It's generally within the new well zone of influence. And since we're dropping --

Q It appears the new well -- excuse me -- the old well

zone of influence also included the lagoon.
A It includes a bigger portion of the lagoon, yes.
Q Bigger portion of the lagoon.
So if the zone of influence as it was measured by the applicant did not include the lagoon, then at least according to this chart would you say that part of the zone of influence hasn't been measured?
A Yeah. There is a problem with -- within 2006 they did take measurements in the lagoon and documented a loss. 2007 they didn't or they said they couldn't make that calculation. And so it dropped that impact area out of the picture even though it's theoretically within that circle. So that is what -- when I did my calculation on this chart, I assumed that it was part of the zone of influence.
Q Now earlier we were discussing the location of VT-1 and where VT-1 was placed. I believe that you were discussing that earlier. Let's take a look at that.
Could we take a look at ESR-2, please. And I want to look at 4-4, please, page 57.
SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: This is a very big exhibit.
I'm sorry. Say the page again.
MR. LAZAR: I'm going to be looking at page 57.
Thank you.

BY MR. LAZAR:
Q Are you familiar with this graph here?
A Yes.
Q What is the light yellow area there?
A That's the old well unit.
Q That's the old well unit.
And what is A-A1 there?
A That's a line marking a cross-section.
Q How do you think they determined -- how did they determine where to place that transect?
A To some extent it's arbitrary as you try to understand what -- in that case, what's coming into the top of the --
MS. TEETERS: Madam Chairperson?
HEARING OFFICER DODUC: Ms. Teeters, please come to the microphone.
MS. TEETERS: Again, I must object to this. Surely it calls for speculation. Mr. Custis doesn't know why the SGI placed the line there. Proper cross of this would have been yesterday and to Mr. Horton since he made the exhibits and put the lines there.
HEARING OFFICER DODUC: Mr. Lazar.
MR. LAZAR: I retract the question how they determined where to place the transect.
HEARING OFFICER DODUC: Thank you.
BY MR. LAZAR:

Q Let's take a look to the right of the transect there.
I still see light yellow there to the right of the transect.
A That's correct.
Q Is it possible that the river could lose water to the right of that transect?
A Yes.
Q It is possible.
Could you describe the alluvium of the aquifer?
A Well, I think the general description is mostly made of the coarse grain sands and cobbles. Although because there's an exhibit that shows essentially the contour of the bed, the intersection between that alluvium and the bed, there is an ancient channel that runs through the center and then essentially follows -- bends with the river and goes out.
Q An ancient channel. I think we could better see this on page 60.
A What this is showing you is -- I think in contours is showing you the top of the bedrock. And in the center of the elongated area is a low point that comes out, goes --
Q You can use your pointer.
A -- comes down here. The deeper part goes out in this portion here. And there's a little -- one of the cross-sections, should be D. This is a knob. And then

you have another like a saddle. So this is another low point in the alluvium. And then you have the exposed bedrock on either side. And then there's a small channel that goes up where the old well is.
Q On either side of the river there we see solid lines but at the top we see a dotted line.
A That's correct.
Q What does the dotted line stand for?
A Geologic maps or contours. The dotted line is sort of interpolating or estimating without data. It's a variable, less than positive.
Q You see where the new well is located there?
A I believe it's right up in here.
Q Now, if you follow that channel there to the right, if you keep following that channel is where the new well is, between --
A -- minus 20 contour.
Q Yeah. Is that the ancient ancestral channel that you described just a moment ago?
A Yeah, that's one of the things that -- if you want to compare it to a modern channel. But this is the foul line running down through the center here. That's the edge. And if I remember right, one of the interesting things about this subsurface was is that the deeper the zone is coarser grain. And if I remember right, below minus 20,

mean sea level, you have coarser grain material than you have above it. And that's typical of ocean -- rivers on the ocean worldwide but in California. This channel was created when the sea level dropped.

MR. LAZAR: If I might clarify why I'm asking these questions.

HEARING OFFICER DODUC: In a moment, Mr. Lazar.

Ms. Teeters.

MS. TEETERS: I would again like to raise my objection that this has nothing the do with Mr. Custis's written testimony. This is beyond the scope of his written testimony and we've now crossed into redirect. And I'd like to make an objection on that basis and have the testimony stricken.

HEARING OFFICER DODUC: Ms. Teeters, we'll note your objection. But please understand that under Water Board's proceedings we are allowing cross-examination beyond the direct testimony of witnesses as long as it's relevant to the key issues.

So we'll allow Mr. Lazar to continue with this line of questioning, but we will note your objections.

MS. TEETERS: Thank you.

HEARING OFFICER DODUC: Yes.

MS. TEETERS: Can we have an agreement that it's a standing objection. Then I don't have to keep popping up and down.

HEARING OFFICER DODUC: Yes, let's do that.

MR. LAZAR: I believe that the question in his direct testimony that I was identifying were the limits of measurements based on the velocity transects and piezometers. And what I'm attempting to establish is that it is possible for underground flow to come out of the river outside of those edges based on the testimony that Mr. Custis provided in his direct testimony on pages 45 and 46.

BY MR. LAZAR:

Q So to continue along those lines, is it possible that water could then based on this map here, based on these channels enter into the alluvium above where VT-1 was placed -- or excuse me -- above where the upper transect was placed?

A I would assume that water is -- since it's moving through the transect, I would assume that water is coming through that alluvium; and because the river is there, there is a possibility of a discharge from the river to the alluvium.

Q Why would they place the new well in that ancestral channel there?

MS. GOLDSMITH: Objection.

HEARING OFFICER DODUC: Ms. Goldsmith, please come up to the microphone.

MS. GOLDSMITH: I object to that question. It calls for speculation of the witness. He has no idea why they put wells where they put them.

HEARING OFFICER DODUC: Mr. Lazar, can you rephrase?

MR. LAZAR: I would like to rephrase.

BY MR. LAZAR;

Q When wells are drilled, do they typically put the well into the ancestral channel?

A My discussions with this issue came out in another subterranean stream a number of years ago and talking to a driller on the coast. And that very issue as to why -- well, I thought the well was supposed to be put into that ancestral -- you know, the deeper. And so this is coarser grain material so you get better yields out of it. The drillers know this. And so if somebody asked me to put a well in, they're going to do the best job they can trying to find that channel. Now, obviously they have to guess where it is. But they know they're looking for it.

And so, yeah, you're going to try to drill into the deepest zone that gives you the biggest transmissivity. And you can even have the coarser material so it gives you the highest transitivity.

Q Where would an ideal reference point be for conducting

impact studies then?
A -- reference point.
Q At the upper reach?
A Oh, at the upper reach? If I were trying to look at how much underflow basically comes into the upper reach -- and we don't have that map -- but I would put it up around the bend that's by the --
Q Could we look at 57 again, please.
A I would put it up -- a cross-section up in here. And the reason being is that I have narrowest bedrock and the narrowest alluvium. And probably when you have -- when you get -- you know, if you have a ? transect for the surface water in here, you don't run the risk of having all this loss that could occur in this before you see the loss of transect.
So I'm trying -- you know, I'm trying to eventually have this discussion when we put in the gauge. I wanted it up here.
Q Mr. Custis, for the record, could you be more specific so that the record will indicate where you're pointing?
A What I'm showing is in the right-hand side of the drawing right where the blue of the stream just sort of stops and you have a green bedrock on either side of the yellow alluvium. So it's sort of right -- you know, just sort of right below the drawing.

Q Now, to your knowledge were there piezometer placed in Creamery Meadow?
A No. To my knowledge, at one point Jones & Stokes actually had now with the recent submittal of - and you can actually read the map - they had a well I think right out in here somewhere which was kind of right where the bend in this between zone 2 and the lagoon. But that was wiped out with the shifting of the channel. So there's nothing in the Creamery Meadow now.
Q So we don't actually know then if water is coming from the upper reaches through Creamery Meadow?
A Oh, I think we can infer that underflow is coming down Creamery Meadow. It goes back to the question of mass balance. If you were pumping hard and not recharging, then Creamery Meadow would dry up. But you do have inflow along the river here. So there's some groundwater in Creamery Meadow. Whether it's full all the time or not is the question.
Q So to again summarize then, it looks like the area to the right of the transect there then could be supplying groundwater -- or could be supplying water from surface flows that is not being accounted for within those transects?
A Well, yes, that's true. Where it might show up and being accounted for is in the USGS VT-1 calculation.

Q I see.
A But that runs all the way up the river, you know, six miles up the river.
Q Could water in the so called losing reach upstream of VT 3 be related physically to the operation of El Sur's pumping?
A From VT 3 up the river? Yes, I think so outside -- even going outside the zone of influence.
Q Thank you.
Dr. Titus, I had a couple more questions about the proposed -- the applicant's newest proposed conditions. They were just recently introduced, so I don't know if you had a chance to look at them.
A Very briefly.
Q Were you aware that one of the alternatives proposed was to pump aerated groundwater, 3 cfs, in order to compensate for loss of flow in the river?
A Yes.
Q Would 3 cfs of groundwater contain the same mix of nutrients -- excuse me, not nutrients -- food and oxygen and CO_2 as the groundwater -- excuse me -- as the surface water?
A I would say not, No. Aquatic invertebrates that are produced in the stream are typically occurring in aerated surfaces of the stream substrate and riffles and

particulate. Some of the food that's being delivered to them is dropping off of riparian vegetation. So all of those inputs are coming from either the top layers of the substrate in the stream or from outside the stream. So, no, especially with respect to food delivery, you wouldn't be getting that from groundwater.
Q You would not be getting food delivery from groundwater?
A I'm sorry?
Q Just to repeat what you just said, you would not be getting food delivery from groundwater?
A That's correct, yes.
Q If flow is percolating, are any nutrients being lost?
A This is not necessarily an area that I'm an expert in at all. But I know that in biofiltration systems, for example, in wet lands, that part of the idea of that is that you're going to remove nutrients from the water as it is percolating through that system, for example.
Q Are you familiar with the literature that discusses benthic production in the zone underneath the bed -- the streambed?
A What's the source again?
Q Are you familiar with literature describing production of nutrients -- I keep saying nutrients -- it's the wrong term here -- production of food or rather the benthic

production below the streambed?
A   Below the streambed. Like how far down below the streambed?
Q   Let me rephrase -- let me take a different line here.
A   Okay.
Q   If there's lower groundwater level below the streambed level, that is to say there's space between the groundwater and the stream, is there a loss of production -- a loss of benthic production?
A   I would guess so, but I don't know that as a fact. I mean, I don't know -- I'm not that familiar with those systems. But if you're talking about -- invertebrates being produced in groundwater?
Q   No.
A   Or you mean as water from the surface moves into the groundwater, whether or not we're losing food organisms?
Q   Well, actually I'm asking something different. I'm asking whether or not reducing the groundwater level will reduce the conditions for which the macroinvertebrates grow in the stream itself?
A   Oh, okay. Yeah, if it reduces stream flow in the stream, then yes.
Q   Okay. The FEIR proposals several flow limitation criteria, including Table A, the base-line critical flow criteria. I believe it's table A in the DEIR. But

it's -- it's the same table we referred to yesterday in which the proposed base-line conditions would be considered.

Are you familiar with the base-line pumping conditions that have been proposed in Table A in the DEIR?

A Not really.

MR. LAZAR: Oh, that was great. Thank you so much.

BY MR. LAZAR:

Q This is the table I was just referring to.

A Okay.

Q And then we see on the right here base-line allowable diversion rate. And then in the summertime we see these numbers, 2.89, 2.48, 2.32. As I read this table - let me ask if you're reading it the same way - these are allowable diversion rates when the USGS gauge reaches a certain level. Maybe you could help me clarify this.

MS. TEETERS: Excuse me. I would like to object to this line of questions as it's a mischaracterization of Table A.

HEARING OFFICER DODUC: Rephrase your question, Mr. Lazar, without characterizing the table.

MR. LAZAR: Okay.

BY MR. LAZAR:

Q I see Table A reading, "Extreme critical dry and

critical dry flow rate limitations on project diversions." I then see the months listed from January to December. On the one hand I see USGS limiting flow rates, and then I see base-line allowable diversion rates. Is that what you are seeing as well?
A Yes, it is.
Q These base-line allowable diversion rates for the summer, in June, July, August, would these be protective allowing these base-line conditions to continue?
A You're referring now to which flows -- which column?
Q On the right here we see the base-line allowable diversion rates approach 3 cfs. In June we have 2.89; July, 2.48.
A Meaning that would be the instream flow?
Q No, that would -- yes, that would be the allowable diversion rate, the cfs.
A I'm not sure that I'm interpreting what that represents exactly.

This might be a better question for Mr. Custis actually.
Q Thank you. I will ask Mr. Custis.

Mr. Custis, are these the base-line diversion rates, the allowable under the proposed permit, what they would be allowed to pump?
A These are the -- if you look at the footnote, it kind

of explains the connection between those columns. Okay?

When the flows in the USGS gauge drop below the values that are in the middle column - it says 10 percentile, 20 percentile - you can't exceed the base-line rate. So essentially you can always pump the base-line rate regardless of what the USGS gauge says. It's just they don't want you -- when you get down to, say, in June, 11 cfs, they don't want you pumping any more than 2.89 cfs. So maybe with that explanation, maybe Mr. Titus can answer your biological question.

The table is a little confusing. But I've looked at it for a number of times.

Q Do we have a correlation between the allowable base-line diversion rate there and what the actual cfs would be in the stream?

A I don't think so. I mean that was a question that I had when I looked at this in the draft EIR is how was -- you know, on the right-hand side they have a base-line allowable which is an historic value, it's basically set on what the historic would pump, say 2.89 cfs -- why the tenth percentile is protective? I mean why -- I don't have any -- I haven't read anything that explains why that happens, and for the whole chart.

Q And when we have these limiting flow rates - once again I'm going to ask you to clarify - if it drops below

these limiting flow rates, then they're only allowed to pump what it says under base-line allowable diversion rate?
A That's correct.
Q So if it keeps decreasing below the USGS limiting flow rate, then they're still allowed to pump the base line there?
A That's correct.
Q So it could go all the way down to zero in the summer and they would still be allowed to pump 2.89, for example, until --
A That's how I interpret that chart, yes, because it says project diversion shall not exceed the base-line diversion rate. So you can't -- when you get down to that low flow, they don't want you taking any more than what's on the right-hand side. But it doesn't have a lower limit.
Q There's no lower. I see.
And we have not to the best of your knowledge seen a correlation there between the base-line diversion rates and what kind of cfs that would produce in the stream?
A Well, I think that there's a lot of study that the SGI tried to go towards that to answer that question. And, you know, my objection is that I --

Q Right. Okay.
Has the applicant provided any analysis to your acknowledge that links these percentile requirements to the collection of biological resources?
I'll ask that of Dr. Titus.
A No.
Q Just a couple more questions for Mr. Titus.
There was a test we saw earlier -- actually this would be more for Mr. Custis.
Earlier we saw a table -- let's bring it up once again.
This is going to be Table 17 of ESR-24.
That's great. Thank you.
If we look on the right here - this is going to be for Mr. Custis - we see practices in which one well was tested, both wells were tested. Is this how you would perform a pumping test?
A Well, I think ultimately you're trying to answer that question, what's the effect of one well pumping and two --
Q I'm sorry?
A Ultimately that's what you're trying to answer is, in fact, if you're looking to measure impacts, what's the impact of one well pumping versus when you pump the next one, then pump them together? They should -- you know, they may give you a different answer simply because wells

aren't true with each other if they're too close. It's when you get a -- you know, you just can't add the two together. The problem I have with this is the time between pumping doesn't allow you to go back to the base line. So they're still kind of losing flow while you start the next pump test.
Q And when the -- if we look at September 5th, September 6th, September 9th, were both pumps turned on at that point?
A September 5th and 6th it looks like just the new well was on.
Q So based on this, do we know when the depths were that low what the effects would be in terms of effect on depth of having both wells on?
A No.
Q Also, these tests were for a week at a time. But my understanding is that the permit allows for a 30-day sustained pumping average. Is there a way to gauge what an effect would be of 30 days of pumping from seven days of pumping?
A Well, you're best to do the pump test itself. Because what happens is, as you extend that pumping period, you have a potential to run into -- you know, you're always assuming when you do these, you only use an aquifer, you have a chance of running into, you know, into any of these

that will affect the answer.

The second is that although they don't like models, you could try to fit your short-term data to a model. But you'd still want to test it. You'd still want to, you know, run a test to make sure that -- because you're projecting out a long ways in time what's going to happen. So you really want to calibrate it.

Q If the tests were kept on for longer than seven days, is it possible or even likely that the depth would have continued to decrease here?

A I would think the depth would continue to decrease. And that goes back to some of the -- well, particularly for the new well. On one of the figures we saw earlier today the loss in the river hasn't stabilized.

Q Thank you.

MR. LAZAR: That's all I have. Thank you.

HEARING OFFICER DODUC: Thank you, Mr. Lazar.

Mr. Johnson, do you have cross?

MR. JOHNSON: I do.

HEARING OFFICER DODUC: Okay. Then let us take a break. And we we'll resume at 3:30.

(Recess.)

HEARING OFFICER DODUC: Mr. Johnson, you may begin.

MR. JOHNSON: Thank you.

Good afternoon, everybody. I have maybe two or three questions for Dr. Custis and two or three questions for Dr. Titus.

And the first one goes to Dr. Custis.

CROSS-EXAMINATION

BY MR. JOHNSON:

Q Q And I want to clarify the point that you made in your testimony about the recovery time for a drop in stream flow based on -- a measurement drop in stream flow based on pumping and the time that it takes to recover. And I'm going to illustrate this the old fashioned way with hand gestures.

And am I correct that what you are saying is that a measurement of a drop in stage of this amount might not capture the entire amount of drop, because the high amount from which it's being measured may already reflect a drop in stage from previous pumping that hasn't been recovered?

HEARING OFFICER DODUC: Hang on, hang on.

Mr. Berliner.

MR. BERLINER: I have absolutely no problem with the question, but the record's going to be a mess. If you could at least indicate your hand motion what you're doing as you ask the question so that the court reporter can take something down on the record so that we know what he's responding to. That would really help.

MR. JOHNSON: That's a really good point.
BY MR. JOHNSON:
Q So for purposes of the record I'll try to do it without the hand gestures now that you've -- you've seen the hand gestures. Maybe you can understand what I'm asking.
What I'm asking is -- we'll disregard the hand gestures. The hand gestures are out of line.
So is it accurate to say that your point about measurements of drop in stage and recovery time is that the measured amount from the top level to the lower level might not reflect the full amount of drawdown caused by the pumping because the top level will already reflect a drop from previous pumping that hasn't yet recovered?
A I mean, I can -- I have an exhibit that I can show you that kind of goes through the stair-stepping concept, if that would help. But essentially you're correct. If you're not fully recovering before you start pumping again, then you're starting at a level of loss that isn't zero. It's some amount. And depending upon how long you pumped and how long you've let it recover, that number.
Q And the point is that the measured amount of drop won't reflect the full effect of the pumping?
A It will reflect what is pumped at that moment.
Q Relative to --

A It won't affect the overall long-term pumping in there.
Q Relative to a stage that may already be reduced because of previous pumping?
A Right. I mean if you're looking at the question of long term versus short term.
Q Thank you.
I hope my next one isn't worse. I'd like to make sure I understand the bathtub metaphor and possibly extend it a bit. And I think what we're talking about is not the lag time between a subsurface pumping and a surface expression by the mass balance -- or the water balance part of the analysis. And so if we have a bathtub with a drain in it, or a well, and we extend the metaphor so that the bathtub is both the surface and subsurface expression of the stream - and for purposes of the question let's call the whole thing a stream - water is coming into that reach of the stream from above, upstream, and leaving that reach of the stream below, and it's in balance if there is no accretion or diversions happening. The water's coming into the tub and going out of the tub. And what you're saying, I believe - and tell me if I'm correct, this is an accurate characterization of your testimony - is that subtracting an acre-foot from the bathtub - it's a large bathtub - whether it's from the surface expression of the

stream or the subsurface expression of the stream, will deplete one acre-foot of water from that tub and one or two things will happen: Either there will be less water available to move downstream into the lower reach or it will take time for the upper stream flow from up top to refill the tub before the full quantity moves back downstream?
A In essence, yeah. You have -- your presumption is you're at balance. And by taking something out, you have a deficit. And the question is, what does the deficit cause? And if you assume that your inflows aren't going to change, then you have -- it takes so long to fill it up, and it may not fill up if your -- if your outflows and inflows are matched without the pumping, now you've essentially just dropped the water level down is what it amounts to. So, yeah.
Q Right. And putting aside the time lag or the questions of subsurface versus surface, a removal of X amount, one acre-foot, of water from either in the tub is a depletion of that amount that's not available to move downstream or wouldn't be filling the tub if that amount -- you know, if there's a rock fall or a structure until that extra acre-foot comes from above to refill it again before it can move downstream again?
A Yeah. I mean, essentially, yes.

Q Thank you.

MR. JOHNSON: I have couple questions for Dr. Titus then.

The first one goes to temperature thresholds. And I shouldn't say thresholds because it's not a binary thing.

But you're familiar with the NOAA document that defines an 18 degree Celsius, a 64 degree Fahrenheit objective or threshold for steelhead. And the study that Dr. Hanson referred to yesterday from I believe American River Steelhead I think in a laboratory environment, but I'm not positive, it had a range of temperatures from I believe slightly less than that to higher than that, 20 degrees Celsius and 68 degrees. And I'm wondering based on your experience in the Big Sur River and keeping in mind the habitat quality there and availability of food whether you have an opinion as to which of those numbers would be more appropriate for consideration in this proceeding and why.

A Okay.

Q Two questions but --

A Sure.

Well, in terms of your first question about -- or your fundamental question in terms of which criterion would be most appropriate, definitely the 64 degree or 18 degree C criterion.

The 20 degree criterion derived Myrick and Check using Nimbus hatchery steelhead on the American River, there's an indication that the behavioral response of the fish in those lab studies was that they were, you know -- the feeding activity and intake was higher at those higher temperatures.

And I can say from my own experience on working on the American River with that same stock that they do grow very well. However, there's a couple of caveats to that. One is that the American -- the lower American River provides a ton of food to those fish to help process the increased metabolic costs associated with doing what the fish are doing in those higher thermal conditions. So lots of food.

I would say -- I often refer to the steelhead in the American River as the fastest growing rainbow trout in the world. We're talking daily growth rates of up to about a milliliter and a half per day. Very, very fast. But that's all driven by the fact that they have that energy source available to them to be able to meet those metabolic costs.

There's another aspect to that though. When temperature conditions on the American River, mean daily temperatures, are above 65 degrees - so we're talking right in the range of what the NMFS criterion is - we also see the fish develop lower bacterial infections that result in anal prolapse -- prolapsed anus basically on fish, which over a protracted period of time then leads to tissue degeneration and causes problems for the fish if it goes un resolved. And that's talking to fish pathologists in my department that's something they see in hatchery conditions, which is where they deal with most of the fish they work with, when temperatures do get up into the upper 60's.

So even though that particular stock of fish does seem to be potentially well suited to growing at higher temperature conditions than what we would typically associate for steelhead, there's some issues related to that. And, again, the laboratory studies, we're talking about a controlled environment where things like, you know, microbes that could lead to bacterial infection would presumably be controlled for.

Now, in the Big Sur River, the other aspect to the lower temperature criterion being more appropriate is that they don't have the food there. The analysis that I conducted as part of my direct testimony demonstrates that during the low flow period, regardless of whether it's a wet-water-year type or a dry-water-year type, the flows get down below some range where those fish are simply not getting enough food delivered to them in the current of the river for them to grow appreciably in lengthAnd, in fact, they're starving, because the relationship between their length and their weight is below a level -- that is, there's a slope to that line of three. When it drops below three, what it means is that those fish as they continue to grow in length, they're losing weight relative to that length. Okay. That's not a good thing, especially if you're thinking in terms of these fish need to reach as large a size as they can before they enter the ocean to maximize their chance of survival to adulthood.

And that's really, you know, what I see as a serious problem in general, I mean, on the Big Sur River, and a potential bottleneck especially if they have effects or things like a water diversion that are just simply exacerbating that condition.

Q Thank you. And that may begin to get into my next question. So feel free not to repeat yourself if that's part of the answer.

You said that the flow is a limiting factor for steelhead on the Big Sur River and there was -- you were questioned on that. And I want to go back to it and ask what your basis for that opinion is.

A Well, a couple things. One is the impacts on growth, that I think we've documented well. It's documented in other coastal drainage. And this is, you know, the product of fairly new research. So even though my data may be somewhat vintage, it demonstrates these issues that through other more recent research seems to be applicable to the Big Sur as well.

The other issue is survival. Dr. Hanson has indicated in his work that appear that survival is pretty good within a group of fish that he was monitoring in 2004 in the lower river and lagoon. It's a little difficult to assess because there weren't any confidence intervals around those estimates. So we couldn't really see how different one was from the other.

But within our own work, for example, from 1994 what we found was from the gorge down to our lowermost site, which again was about 2,000 feet above the upstream limit of the zone of influence of the new well, at the El Sur Ranch, we found between September and late November, beginning of December in 1994 under low flow conditions that we saw mortality -- or reductions in densities of juvenile steelhead that were between 50 and 60 percent. So there's a large mortality that also occurs during that period.

So we're talking about poor survival -- relatively poor survival and the poor growth associated with low flow conditions. I would definitely consider

that to be a bottleneck to population productivity.
Q Thank you.
I have one more question. And I apologize if it's a doozy.
We've heard quite a bit of discussion about the habitat condition of the Big Sur River relative to other south Central Coast streams. And I would like to get a little bit more clarification on your testimony as to the condition of the Big Sur River in and of itself. And I would ask for, you know, a definitive, you know, conclusion on good condition using, you know, the Moyle criteria. But I assume you're -- to put a context and to set up the question, I assume -- well, I should ask you, are you familiar with the criteria that were established for good condition of fish, evaluating individual fish and populations and fish communities and -- are you familiar with those?
A You mean in the sense of Fish & Game in the -- of '69 through '87 or --
Q Right, the criterion that Dr. Moyle developed originally. And I'm not going to ask for a conclusion on each of those or test you on the thing. I'm asking for a context as to whether you're familiar with that and you think that that's a useful way to evaluate condition of fish in a river like the Big Sur?

A Well, it could be --

HEARING OFFICER DODUC: Before you answer -- Mr. Berliner.

MR. BERLINER: I'm going to object that this is a compound question. I don't know if we're talking about one fish, populations of fish. You specified three different -- you know, you asked about a single fish, multiple fish and Moyle's studies, and there's no context. If you could break that down so it's clear as to what Dr. Titus is responding to, it would be very helpful for the record.

HEARING OFFICER DODUC: Mr. Johnson, please do that.

MR. JOHNSON: Yes.

HEARING OFFICER DODUC: Lay a foundation and simplify your questions.

MR. JOHNSON: Right.

BY MR. JOHNSON:

Q You know, I think I will leave aside that entirely and just ask you as an expert in fisheries for your evaluation of the condition of fish in the Big Sur River, in and of itself, not relative to other places.

A Well, now I'm a little confused as to with respect to what aspect of the population.

Q Well --

A Well, I guess I can talk about that.
Q What I'm getting at is not the question of how the Big Sur River compares to other places that may or may not be good comparisons, but the condition of the Big Sur River fisheries. And so you've said many times, and many people have established, that it's in relatively good shape compared to other places. I want to know how good of shape it is. And if there are things that are great or thing that are not, what those are.

HEARING OFFICER DODUC: Mr. Berliner.

MR. BERLINER: I'm going to object. It calls for a narrative and it's a compound question.

HEARING OFFICER DODUC: I will overrule the objection. I think the question is clear enough.

Please answer, Mr. Titus.

MR. TITUS: Okay. I guess if I were going to think in terms of some sort of relatively specific criteria, that one might be if you're in a menagerie in the population. The thing with steelhead / rainbow trout is that these fish can respond to their approximate environmental conditions by, if conditions are really lousy, you know, trying to get in and out of the ocean, they can stay in stream and become resident. We do see a certain degree of that on the Big Sur. The anadromous function overall seems to still be there obviously.

That's a good thing. That's a positive.

We've identified -- you know, the adults are coming back from the ocean. They're spawning. Fish can experience some pretty good growth rates when the flow is there. But when flow conditions become low -- and they get low -- you know, relatively low every year, and then in some years really bad, they experience problems. Then it really becomes a question of, you know, in terms of what we as managers of these resources do from that point. You know, this kind of ties into some other things, including state mandates like the 1988 Magnuson Ferguson Act that tells the state that it needs to double natural production of management's resources throughout the state.

And then we also have recovery mandate from NMFS that says that we're going to recover these DPS's.

The Big Sur presents itself as a case that, yes, this population is in relatively good shape. It's got some issues that we've identified, and we have opportunities like this one through this proceeding to move things back in the right direction in terms of both recovery, in terms of meeting state mandates, maintaining a resource that can provide a sport fishery on the south Central Coast.

Everything so far, if we look at our history, it's documented well enough. We have gone drastically in the other direction. And it's time now to move things in the other direction. And we have the opportunity to do that on the Big Sur. And I'm not saying anything that necessarily has to put the El Sur Ranch out of business by any means. But we're talking about trying to maintain the integrity of the system so that it can produce steelhead optimally, get its population productivity on the plus side so that it can serve as the source population. The Big Sur is the population down there now. I mean this isn't -- we're not making this stuff up. But this is a serious issue. We've lost the Carmel. The Carmel used to be, you know, a big one. San Leandro was famous for the sports fishery that it supported.

I don't know if anybody -- you know, if people have seen the film "Rivers of the Lost Coast." Very good documentation of what has happened with some of those fisheries. We've barely even touched on the subject of sport fisheries and being in the business of where we want to -- you know, we're fish and game, right? We want people to go out, catch fish, be happy, buy license and promote -- you know, promulgate that system. But we've gotten down to such a low level with respect to our anadromous resources, that that almost seems like just sort of an aside. That's a big part of what this is all about.

So one of the other metrics that I would indicate here is that -- with respect to the Big Sur River itself is that the status of the sport fishery is really a very good barometer of what the status of the population is. What I currently worked for the department is on anadromous sport fish management in the Central Valley. So chinook salmon, steelhead, striped bass, sturgeon, so on. And especially with chinook salmon we have decent numbers on numbers of spawners. And we've developed some very good models that relate fishing effort and catch and harvest to the number of fish that are available to be fished upon. It really determines the. If the fish aren't there, the anglers are not going to go out and go fishing. And if the anglers don't go out and go fishing, they don't catch any fish or harvest anything. It's very logical. There's nothing unusual about that.

And typically our regulation follow that pattern. That is, when abundance is low and, if anything, the department is conservative in following through with developing more restrictive regulations, because, after all, the last thing we really want to be doing is taking angling opportunity away from the public. But we've seen them -- if you look at the history of sport fisheries on the Big Sur River, once upon a time there were summer trout fisheries there, you could fish on the juveniles in the river, and the population seemed to be able to handle that.

And in addition to harvesting adults -- and within the last 15 years we've seen a status where the allowable daily bag limit was two fish per day, down to one fish per day, and now we're down to catch and release. The trend is there.

The next step is what? Closing the fishery altogether. So that's, you know, in terms of the status, I think that's one of the best barometers that we have.

From our perspective what we'd like to see is the population productivity that would not only secure the ecological integrity of the population, but also allow for this type of human interaction with the population where anglers do have the opportunity, and if they so choose, to actually harvest a fish.

MR. JOHNSON: Thank you very much. And that concludes my questions. I appreciate the opportunity to be here.

HEARING OFFICER DODUC: Thank you, Mr. Johnson.

Mr. Le Neve, do you have cross?

MR. LE NEVE: Just a couple.

I just have a couple questions for Dr. Titus. And Brian Johnson just answered -- kind of answered some of them.

CROSS-EXAMINATION

BY MR. LE NEVE:

Q And I want to go back to the health of the fish in terms of historic times. And for historic, let's talk about my time frame on the Big Sur River, which goes back to the '40s. How do you rate the run of the fish on the Big Sur now compared to the 40s or 50s - good, poor, fair?

A Well, I'd have to go -- like now, one of the things with the Big Sur is that, well, we don't have a dam there where we can put a fish ladder and count fish, which is a good thing. So I'd like to say the Carmel or any other river or other locations where we had the opportunity to figure that into the structure and string and count fish. And it's a little tricky business.

Q I hear --

A Now, again, you know, I can only refer to our general barometers with respect to run cycle. If I were to make an educated guess relative to what we have seen occur with abundance in general at DPS, I would say the runs were much stronger during the '40s than they are now.

Q Okay. Without going through the whole thing, can you characterize as saying that the runs continue to go down by each decade?

A By what?

Q By each decade.

A Oh, yeah. You know, the declines have been precipitous since World War II basically. I mean, you know, we've got plenty of examples. But imagine a man standing next to the Los Angeles River in 1945 holding a steelhead that was caught there. If you've seen pictures of the Los Angeles River any time recently, it's a concrete-lined flood control channel. And basically all of these declines that we're talking about had occurred within the last 50, 60 years.
Q Okay. And you also -- there's a discussion about your statement that the Big Sur was a pristine river. And is that pristine in relationship to other rivers, is that pristine in relationship to again the Big Sur historically?
A Well, I think that I actually said mostly pristine in what I've written previously. And, again, this was within the context of putting together this history that included the entire coast south of San Francisco where --
Q I'm just referring to the Big Sur. Pristine according to Big Sur 30 years ago?
A Oh. I can't say that I had a -- you know, I didn't set criteria for making that evaluation. But I mean the trend overall is that it was probably more pristine 30 years ago than it is now.
Q In Dr. Hanson's report, the 2008 report, reports adult

steelhead in the river in October. And I assumed that it was in the newly entered fish. And I was clarified in the final EIR that it was actually a holdover fish. And this was in October.

If there are kelts in the river in October, what does that do to the full requirements you guys could guess? Could we actually still have an adult in the river at that point in time, or do we have to assume that's not an isolated incident? So how does that affect the flow requirements?

A Well, that's a good point. I've also observed post-spawners events in the river through the summer and into the fall at various locations. So there are some fish that hang on. And we've also observed these half pounders. This was a surprise. We saw one in August of 1995. This was clearly a sea-run fish. It's in my testimony, photograph. And we've looked at scales. And, in fact, an image of a scale from that fish is presented that shows that it has encroaching growth on it. And this fish come back into the river. We don't know -- necessarily understand what that behavior's all about. And I refer to half pounders. This is something that's characteristic to the Rogue River in southern Oregon, where there's a very, you know, sizable and noticeable run that serves as a fishery resource on those streams.

And then because of the -- and those rivers up north have very good connectivity to the ocean. That's again one of the distinguishing characteristics of the Big Sur River is the fact that it's connected to the ocean most of the time, which allows for that kind of behavior. We don't necessarily at this point in time understand the overall significance of that particular behavior. But, you know, again one of our objectives with management is to maintain biodiversity including in terms of within a species in terms of all the life histories that are present.

Jennifer Nelson, a department biologist out of the Monterey office, also documented the presence of half pounders in the lower Big Sur River last fall, when there were flow conditions that were similar to what we saw in 1995. So what we saw in '95 wasn't an isolated incidence.

So in terms of getting back to your original question, I think that it all comes together here. We've got these fish that are larger. And I think getting that has been -- there may be flow requirements associated with having -- maintaining these larger fish, post-spawners, and these half pounders that are coming in from the ocean that we haven't necessarily addressed completely in our assessment so far.

Q You see, I am from the Carmel Steelhead Association.

They're very dear to my heart. And is it widely stated that each fish needs to be protected?

A I would say so.

Q Okay. Another question is minimal flows. Everyone keeps talking about the minimal flow requirements. We have a threatened species, and the idea is to recover our threatened species. Do minimal flows lead to recovering the species?

A No, no, I think -- I've indicated that sort of highlight this in the discussion section of my wetted perimeter report. What we're talking about there was shooting for maintaining a realized flow of 17 cfs on an average up and down the river is a minimum condition. That's keeping the rocks wet across the riffle, you know, from bank to bank to allow for food production, keep the fish wet. I mean we can't say a whole lot more about that. But, you know, minimally what we were shooting for with that analysis was maintaining water from bank to bank.

That should not be confused with being an optimal flow, by any means. We know that an optimal flow is -- in terms of keeping fish growing, for example, there's going to be identified a range somewhere above 60 and -- or above 20 and below 60 there appears to be some threshold where there's enough current and enough of, you know, production area in the stream to keep these fish growing. Which again has those cascading effects in terms of those given individuals survival likelihood to reaching adult hood. So minimum flow is to just try and get through those really rough periods until it starts raining again and those come back up and create a more favorable condition. Not to be confused with saying a more optimal condition.

So as far as recovery goes, we don't want to manage -- the upshot here is that we don't want to manage for a minimum flow.

Q If everyone's talking about minimum flows as a requirement, shouldn't we be talking about optimal flows?

A Yeah, again -- you know, it depends on what the question is. But if you want to provide a condition that is generally more favorable and -- you, again, the bottom line is increasing population productivity, not only in the Big Sur but in the other populations that it serves as a source population to. And you've got to -- yes, it's going to require, you know, providing as good habitat conditions as possible.

Q Do you believe that the flows requested by the El Sur Ranch would have any possibility of recovering species rather than just maintaining it?

A No, I don't. I don't think they would recover the

species.
Q I have one more question.
In your report you talked about -- I think you listed the strain of fish from one river to another. And what is the percentage of the strain of steelhead?
A Best numbers we have for that part of the coast from Scott ? in Santa Cruz County, I think on the one stream it was 2 percent and about 4 percent on the other. It's around three percent. It's not a very high number. So if you're talking -- my direct testimony I gave a couple of examples. If you have a population of 300 fish -- or 300 adults, there's an equivalent of seven to eight strains per year. If it drops down to a hundred, you're talking two, three strains per year.
Q Okay. This may seem like an odd question. But what's the rate of strain of salmon?
A I'm sorry?
Q What is the rate of strain of Salmon? Is it greater or less than steelhead?
A Oh, no, no. Well, that's a more complicated question because then -- when we previously got strains from the Central Valley, for example, where they do all kinds of things with the fish, including producing them in hatcheries and trucking them to various locations, that greatly increases the likelihood of strain. But if --

we'll say up in the -- it tends to be also a very high rate of homing, low rate of strain, as far as that's concerned, under natural conditions.
Q Under natural -- is it similar? Or you said it's greater than homing. Is it greater or less than steelhead?
A You know, I don't know right off the top of my head.

MR. LE NEVE: Thank you.

HEARING OFFICER DODUC: Thank you.

Questions from Mr. Hoppin.

BOARD MEMBER HOPPIN: Dr. Titus, I've got three questions or actually three confirmations of things that I believe I heard.

You had mentioned that at one point there was a summer trout fishery on the Big Sur River. I assume that means there is no longer one.

DR. TITUS: Yes, that's correct.

BOARD MEMBER HOPPIN: When did that end?

DR. TITUS: It would have -- it ended during the 1970s. I don't remember the exact date.

BOARD MEMBER HOPPIN: It's been a long time.

And, Ms. Ferrari, correct me if I'm wrong in my question, if you would. But I believe in your opening statement you asked Dr. Titus if he had noticed a significant adult decline in abundance in the last six year; is that correct?

MS. FERRARI: I didn't specify a number of years. I just asked if he had observed trends in general.

BOARD MEMBER HOPPIN: Okay. I'm curious. I thought you gave a specific number of years. But certainly you're more correct than what I scribbled down here.

If you haven't studied this river yourself in the last 16 years, how are you sure there's this decline? I mean you mentioned there isn't a fish ladder for reasons that are good but they're also bad. Given the time of year the fish come in, given the fact that they go in and go back out, how do you correlate the suspicion of the decline? I don't know that.

DR. TITUS: Well, again, from a number of indices. One, what management has done with the sport fishery regulations. And then we don't typically clamp down on harvest unless the best information we have available to us at abundance is lower or has been reduced to a level where we no longer fear that allowing harvest is a proved measure.

Another barometer is the information put together for that DPS in general that shows a very drastic decline in abundance over the last four or five, six decades. In terms of, you know, anything more recent, we don't have any, you know, information directly from the river itself. But, again, using these general trends as an indication of what's as happening. You know, and the abundance of decline that we're talking about is one that has occurred over a period of decades and not just within the last 16 years.

BOARD MEMBER HOPPIN: And I'm not trying to grill you. But how do you know -- how will you know when the trend reverses itself? I mean any kind of underwater tracking topography? I understand why you don't want to stick wires in all these fish, as vulnerable as they are. I mean really it's someone's best guess, I guess it would be accurate to say.

DR. TITUS: It won't be within the foreseeable future. The Department of Fish and Game in concert with the National Marine Fisheries Service has developed a coastal salmonid monitoring plan. That plan is in the process of being implemented. I believe some of the biologists that will head up the monitoring -- this will occur from basically the Oregon to the Mexican border; not every stream obviously, but at least select streams. And the idea there will be to monitor population trends in key streams up and down the coast as an index of especially to aid in the recovery process, not only with steelhead but coho salmon, coastal chinook, so on.

BOARD MEMBER HOPPIN: But in reality, since your scale studies in the mid-90s until this new procedure kicks in, we're just going by really best estimates; is that correct?

DR. TITUS: Our best assessments, yes.

BOARD MEMBER HOPPIN: I'm not saying there's anything wrong with your best assessment. Just there's nothing to -- you can't put your credentials on a number and say we're comfortable within a range of 5 percent that this is right; it's just the best knowledge you have given the fact that it's a very difficult system to count adult fish?

DR. TITUS: Yes.

BOARD MEMBER HOPPIN: My last question. Would you say that given the pumping practices that have been rather static on this ranch for as long as you've been observing and been involved in it, which is a significant portion of your career, that the pumping practices as they have been have impeded adult passage for in-migration and for out-migration of the adults?

DR. TITUS: You know --

BOARD MEMBER HOPPIN: I know there's always an exception. I was kind of that way when I was in high school. I usually got there after everybody else had figured something out. But I mean for the most part in generalization. And we heard yesterday that the in-migration on a normal year the cues usually started in November or early October, the out-migration is generally over in April. You and Mr. Le Neve discussed that you had observed kelts at different times and what have you. But generally speaking, when we look at cultural practices that have been practiced by this ranch, have they over your period of observance impeded both in-migration and out-migration of adults?

DR. TITUS: It's difficult for me to answer directly because the work that we did down there was focused primarily on areas above the El Sur Ranch wells. And, again, that work wasn't directed toward assessing that particular influence on the river.

One thing I can mention though, I mean that would -- I did provide some observations of where connectivity with the ocean -- let me repeat my testimony, connectivity to the ocean did appear to be linked to operation of the pumps in the lower river in 1994 during a critically dry year.

I'd like to add too that the information on smolt migration, we saw smolts migrating downstream as late as late June, for example, in a good water year like 1993, it stopped earlier in 1994 when flows --

BOARD MEMBER HOPPIN: Were they migrating downstream to the lagoon or were they out-migrating?

DR. TITUS: They were migrating down to the lagoon, yes. So what happened to them once they got that far between there and the ocean, I can't say directly.

BOARD MEMBER HOPPIN: Is there a consistent pattern of in-migration with half pounders or do they show up some years and not in others? I'm certainly fortunately, very thankfully familiar with pattern on the river. But I'm not at all familiar with the pattern on this.

DR. TITUS: Well, we saw the one in 1995. And Mr. Nelson saw several this past fall. There is a commonality between those two years that they're relatively good water years. But beyond that, I really can't say much more about it.

BOARD MEMBER HOPPIN: There's nothing like the Klamath or the Rogue for the check or the -- it's minimal.

DR. TITUS: I can't say that there's a huge run of those fish that comes in. But, again, it almost became, you know, something --

BOARD MEMBER HOPPIN: So if you remember, it can't be a receiver for one fish. It had to have been a big deal.

DR. TITUS: Yeah, yeah.

BOARD MEMBER HOPPIN: Thank you, sir.

HEARING OFFICER DODUC: Staff have questions?

STAFF GEOLOGIST MURPHEY: Yes, I have a question for Mr. Custis.

Concerning your comparison when you looked at the Jenkins and Hunt methods, you ran those models. And you said in your testimony that you found out that the pumping impact would be -- would withdraw 3.4 cfs instead of 1.2 by the time you looked at the Jenkins Hunt method compared to the study data. You know, with those models are you able to predict how much more drawdown there would be in the river? Because with a 1.2 cfs I believe there is roughly half an inch of drawdown. Do you compare those models and predict the amount of drawdown in the river?

MS. CUSTIS: You're asking for water surface drawdown as opposed to flow cfs?

STAFF GEOLOGIST MURPHEY: Right. And you said there'd be an increase in volume as part of a kelt, volume taken out from 1.2 up to 3.4. So could you make a relation between that removal of volume and the decrease in --

MR. CUSTIS: -- the water surface profiles.

You can get -- to do a water surface profile this is what you're talking about, what's the water surface elevation. It's a far more complicated math exercise than measuring something at one cross-section. And the way you have to do that is to have -- you have to run something like a HEC-2 model or something along the river and change the flow of the actual cfs coming into the river and ask the question, how is it going to respond? And I believe in my conversations with Robert Holmes and the staff, they're doing that type of analysis.

So you can get to that question, but it's a simple -- you know, it's not a simple -- you know, some of these cfs means the river will drop this much. You have to worry about all the hydraulics around the river, the roughness of the river, its energy gradient. It's too technical. You have fluid numbers and you get into all kinds of things when you actually try to do a water surface profile. It's not a simple thing to do.

So, yeah. But you can do it if you need to. And that's, like I said, they're doing that analysis.

STAFF GEOLOGIST MURPHEY: So that current IFIM study will be looking at that.

MR. CUSTIS: Well, you'd have to ask them specifically how they're studying. But I know that they are doing the flow models and surface water flow models to try to understand how the water flows through those riffles and what -- you know, in other words trying to take measurements at different stages. And then they use the model to predict what you're asking for, is how things would change when the flows change. So, you know, it's not just one. It's kind of a rating curve. I mean You have to have multiple analysis in the area in order to calibrate your model. But my understanding is you have to ask someone exactly what he's doing. But that meeting looks kind of like, my understanding, what they say they're doing.

STAFF GEOLOGIST MURPHEY: Okay. Thanks. That's all I have.

HEARING OFFICER DODUC: Other questions from staff?

Yes, Ms. Farwell.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: I have some questions. I'll generally direct them to you, Mr. Titus.

The first question is, do you know when the IFIM study will be completed?

DR. TITUS: The IFIM?

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Yes.

DR. TITUS: That's being conducted now or --

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Yes.

DR. TITUS: -- am I aware of it?

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Yes. Do you know when it will be completed?

DR. TITUS: Yes. It will be completed next year.

I'm sorry.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: That's all right. I wasn't clear.

DR. TITUS: Yeah, I understand it will be completed by I think August 2012.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Okay.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: Excuse me. I thought I heard something the other day about the study would be completed but the results wouldn't be available until 2013. Is that correct?

MS. FERRARI: We could bring up Robert Holmes, who is doing the study, - he's in the audience - if there's specific questions about that.

HEARING OFFICER DODUC: Please.

STAFF GEOLOGIST MURPHEY: Just for the record.

MS. FERRARI: What?

STAFF GEOLOGIST MURPHEY: Did he take the oath yesterday?

MS. FERRARI: No, he did not.

HEARING OFFICER DODUC: Will you raise your right hand.

(Whereupon Mr. Holmes was sworn.)

HEARING OFFICER DODUC: Please identify yourself.

MR. HOLMES: My name is Robert Holmes. Last name spelled H-o-l-m-e-s. I'm a staff environmental scientist with Department of Fish and Game and the instream flow coordinator.

The current IFIM study will be complete in August of 2012. And then we plan to go through the Public Resource Code process. And we're estimating that that will take approximately six months. And we would be transmitting the flow recommendations to the Water Board through that process. And they should be arriving in early 2013.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Okay. Thank you.

The other questions I've found were related more to biological resources -- other biological resources on the Big Sur River and lagoon. So I know you haven't studied those.

HEARING OFFICER DODUC: Hold on a second.

Ms. Goldsmith.

MS. GOLDSMITH: Since we have a new DFG direct testimony, I'd like to ask some questions on cross.

HEARING OFFICER DODUC: This wasn't direct, but what questions from Board staff.

MS. GOLDSMITH: He's under oath.

MS. FERRARI: I was just wondering if it could be limited to the testimony that he gave, which was simply on the timeline of the IFIM.

HEARING OFFICER DODUC: Fair enough. I'll grant that.

MS. FERRARI: I'm sorry.

MS. GOLDSMITH: I wanted to ask whether or not the IFIM was planning to study transects within the zone of influence.

MS. FERRARI: That would be I think a question that's fine to ask him.

HEARING OFFICER DODUC: Why don't we ask him to come up and answer that question right now before Ms. Farwell continues.

MR. HOLMES: Yes, Robert Holmes here again.

It's my understanding that there will be transects within the zone of influence.

HEARING OFFICER DODUC: Thank you.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Okay. My other questions, like I said, are going more towards the other biological aspects of the river and lagoon. And I know that most of your testimony hasn't been directed towards that. So answer them as you can.

DR. TITUS: Okay.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: The first question is -- and these are all about the interim flow. Okay?

DR. TITUS: Okay.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Would the interim flow result in flow alterations such that the red-legged frog or the western pond turtle feeding habitat in Swiss Canyon or Big Sur River becomes unsuitable?

DR. TITUS: I don't know.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Fair enough. That's what I need to know.

Can you speak to how the interim flows would result in changes to habitat for aquatic reptiles?

DR. TITUS: I don't know that either.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Okay. Thank you. That's fair enough.

Also same question to the other vegetative communities in and along the river.

DR. TITUS: Vegetative communities?

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Along the river, changes to it.

DR. TITUS: I haven't done any kind of work on that either.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Thank you.

And my final question is, how would the interim flows affect the lagoon ecology, such as opening and closing of the lagoon? Any effects on the lagoon due to the interim flows?

DR. TITUS: Okay. So you're asking in terms of how flows in general or relative to --

STAFF ENVIRONMENTAL SCIENTIST FARWELL: The interim, yes, the interim, if the interim flows were imposed?

DR. TITUS: Oh, I see. You know, we hadn't really assessed that entirely or even specifically at all in terms of what 17 cfs would do for maintaining a connection with the ocean. I'm trying to think now. We looked primarily at conditions upstream.

I have to think about that one a little bit. I know there's some -- there's information available where they make that assessment. And there could be other testimony being presented that might address that.

STAFF ENVIRONMENTAL SCIENTIST FARWELL: Okay. Very good.

Those are all my questions. Thank you.

HEARING OFFICER DODUC: Thank you.

Ms. Mahaney.

BOARD MEMBER MAHANEY: Dr. Titus, if I heard you correctly, the 132 cfs was based using the North Coast history of inflow policy approach; is that correct?

DR. TITUS: Yes, it is.

BOARD MEMBER MAHANEY: And of course the North Coast history of inflow policy applies to the North Coast, correct?

DR. TITUS: Right.

BOARD MEMBER MAHANEY: What factors did you use in forming an opinion that lead you to believe it was appropriate to apply it to this region?

DR. TITUS: I think just the terms of the general hydrological conditions that are present in the Big Sur River relative to the coastal streams, especially immediately north of San Francisco. But there's a lot of similarity in terms of precipitation patterns and the overall hydrological cycle that made the application of that method appropriate at least for minimally ballparking an upstream passage flow.

BOARD MEMBER MAHANEY: Thank you.

HEARING OFFICER DODUC: If there are no other questions.

Ms. Ferrari, do you have any redirect?

MS. FERRARI: Yes, I do.

HEARING OFFICER DODUC: You may have 20 minutes for redirect.

MS. FERRARI: Okay. May I do it from here?

HEARING OFFICER DODUC: Sure.

MS. FERRARI: I'll start with Mr. Titus.

REDIRECT EXAMINATION

BY MS. FERRARI:

Q   Q So you have been questioned earlier today about the wetted perimeter method and whether or not it had been utilized by the Water Board in setting instream flows; correct?
A   Yes.
Q   Okay. To your knowledge is the PHABSIM the methodology that is used to set instream flows that might be used by the Water Board?
A   Yes, absolutely.
Q   And isn't it true that the wetted perimeter method does incorporate elements of the PHABSIM --
A   There's some similarities, yes.
Q   -- of the similar information from the wetted perimeter that you would get from the PHABSIM?
A   In a more generalized sense it's -- what PHABSIM does that the wetted perimeter method doesn't do is develop, you know, integrated information on specifically how fish are utilizing a habitat in terms of depths and velocities and substrate and cover and relating that degree of availability of habitat and use and ultimately relating the output as a weighted usable area to flow.
        Now, if you look at wetted perimeter curves relative to PHABSIM weighed used for area curves for juvenile steelhead rearing, the overall shape at least of the two is very similar at least in a case like the Big

Sur where you have -- you're reaching an ascenteric-type (phonetic) of relationship with PHABSIM curve attendant come up very sharply through a low flow range and hit a broad dome or maybe even an ascentropic-like relationship.

So there is that similarity in terms of, you know, characterizing the relatively rapid increase in habitat that's available as you progress through a relatively low flow range and then identifying some, in case of PHABSIM ultimately an optimum flow.

Q Thank you.

So the applicant or Dr. Hanson has used a .3 foot criteria, it appears, for his juvenile passage; correct?

A Uh-huh.

Q Or it might be three-tenth of a --

Are you aware, has that ever been used, that criteria ever been used to set a bypass flow ever in any literature or --

A Not to my knowledge at all, no.

Q Did the applicant's analysis use any other methodology to come up with instream flows related to juvenile rearing that you were ever aware of?

A No. In my assessment the issue of juvenile rearing habitat other than how they say the lagoon was characterized really wasn't addressed.

Q You had stated earlier that to come up with the adult

passage criteria you had utilized the Central California Coast Policy?
A I don't know.
Q You didn't know?
A No.
Q Why did you not utilize the Thompson method to come up with adult --
A Well, we didn't have data available to apply the Thompson criteria. Those are being -- those data are being collected currently in the PHABSIM study. So that information would be available once that study is completed.
Q And then we talked a little bit about your incipient asymptote number using --
A -- the second break point.
Q -- the second break point -- the second break point as opposed to using the first break point.
Can you explain why you used the second break point and not the first break point?
A Yeah. Again, we were concerned about the degree of protection that would be provided by a standard wetted perimeter break point flow. Given that it would reportedly provide only 50 to 80 percent of the wetted perimeter, we just thought that was way under what we thought it should be, represent a minimum condition for a

listed species that we're trying to recover. So we wanted to develop an index of flow that would minimally again keep the channel wet from one side to the other and provide some minimum conditions for juvenile steelhead.
Q How does the number, your incipient -- or second break point number, relate to the flows that you had identified as being ideal for food delivery to the juveniles?
A Well, yeah, that was kind of a -- when I got through with the assessing growth of juvenile steelhead and realized that there was some flow above 20 cfs and, say, less than 60 where there seemed to be this threshold below which the fish simply aren't getting enough food any more, it kind of made me realize that, well, 17 cfs, that's pretty darn low relative to -- I mean if we were going to incorporate into a flow recommendation a criterion that we wanted to maintain to the extent possible feeding conditions for juvenile steelhead, that we were undershooting that mark.
Q So actually even the second break point is a little lower than --
A Conservative in that respect, yes.
Q Why didn't you use Dr. Hanson's information on steelhead in your direct testimony?
A Well, I thought there were limitations to it. I mean, overall, it didn't really tell us anything more than what

we already knew about steelhead use of the lowermost river. We knew from our previous work that indeed steelhead did utilize the lagoon. What was added was information on water quality and that sort of thing. But we also felt there was some limitations to it in terms of, for example, the abundance estimates between July and October of 2004; there is an indication that maybe survival was pretty high, but there was -- the way the direct observation counts or the snorkeling counts were made, there was no major -- there was no way to assess the precision of those estimates.

There are techniques that can be utilized with snorkeling surveys, for example, having replicate counts and taking the average of those and being able to develop a confidence interval that can then allow you to judge, you know, just how distinct those two estimates are from one another. Or, you know, using comparative methods like comparing direct conservation counts with either electro-fishing or seeing or some other method that would give you an index of abundance. And it wasn't done, so we -- you know, there was an indication there were a few hunted fish in the lower river. But beyond that, it didn't really help us. We had more quantitative information from our previous studies that we could use.

And the other thing that we were a bit curious about were the metrics used for assessing the condition and the health of a fish. And one of Dr. Hanson's bottom-line conclusions is that the fish appear to be healthy and in good condition. But in going through the studies, I didn't find any specific metrics for being able to -- this measure quantitatively arrived at that conclusion. For example, relating weight of the fish to length and coming up with a condition factor or something that would give us some, you know, actual information as related to those two parameters.

Q Okay. Thank you.

Mr. Custis, just a couple questions for you.

You had stated that you believe that stream depletion continues after pumping had stopped; correct?

A Yes.

Q Okay. And there was some discussion about this data that the applicant had provided and maybe why you didn't completely utilize that. Can you describe why you think the data is not sufficient to provide a complete impacts assessment?

A That's a broad question.

Q Why did you not use the data provided?

A Well, I didn't use the information that was between VT-3 and VT-2. That's measured information. Outside of those areas, if you -- because upstream of VT-3 I had loses but I don't know whether those are occurring in the zone of influence or whether they're occurring just outside of the zone of influence or all the way up to VT-1. And those that are on 1 and 5 it's a losing reach. But I don't know where I started from. And when summer happens down in the lagoon, I know in 2006 it was a losing reach. You can look at the piezometer data in 2007 and see that there's a response to pumping, but it's not quantified or -- you know, in 2006 it was, but it wasn't in 2007. So it's become a little difficult to sort of patch the other -- an actual amount.

Q So would it be fair to say now that you did use that data when you thought it was sufficient for your analysis?

A Yeah. I mean I used the information that was there and tried to compare it to.

Q Okay. There had been some discussions about these criticisms of the Jenkins model related to the low permeability or the lack of it accounts for the permeability layer and the concept that the river is infinite. Were you aware of these criticisms when you used the --

A Oh, yeah. Yes.

Q How did you address these criticisms in doing your analysis?

A One, I used the new Hunt model, which does allow low permeability layer. And the other way of looking at it was to run simulations with Jenkins and Hunt using the same parameter.

Q Well, if I may. You've used another model that was developed to address some of the shortcomings of Jenkins --

A Yes, the Hunt model --

Q -- in conjunction with the Jenkins model?

A Yes, the Hunt model was done for that --

Q -- for that purpose?

A -- for that particular reason.

And when you look at 58 -- when you look at that -- C-58, you can see there's a difference between what the low permeability really makes for these particular set of parameters. It occurs mostly in the first two hours of pumping.

Okay. And the next question I ask from the example in the exhibit, how thick would that layer -- that low permeability layer have for me to see a measurable impact? And I ran sort of just kept increasing the thickness of it and ran it up to around 15 feet, and then I started seeing a measurable impact.

So what happens with the Hunt versus the Jenkins model is, depending upon all your characteristics, well, the Hunt model is the Jenkins model with a component dealing with the low permeability on top of it. Okay? And what happens in that low permeability component is, if it's not important, the terms cancel each other out and it essentially becomes zero. So that's why I ask -- initially it's important. But as time goes on, that component becomes minuscule or it drops out.

Q Okay. So you're saying ultimately it really doesn't affect the results?

A For that particular set of characteristics, yes.

Q There's also some talk about your second component of the bypass calculation, which was the maximum lost from the gauge. Were you aware that you were using a maximum number, not the average? I'm Sorry. I should rephrase that.

Were you trying to find the number that constituted the maximum observed losses from the gauge to the point of diversion?

A Yes.

Q Okay. So, I mean, you specifically put that maximum number in your calculation, correct, as opposed to an average?

A Yes.

Q And why do you think it's important to have that?

A Well, because, it -- you know, this goes back into median and average. What's this? A median.

It's a median value -- 50 percent of the time you will have insufficient flow. In other words any flow above the median has a potential to -- downstream tend to have flows that are insufficient. And that's assuming that you had -- and we will get the two gauges in place for a couple -- two, three year. We'll get a pretty good feeling for what that distribution of change is. Right now we just have spot information. And then this idea that, well, this 8.9 is an outlier, well, an outlier occurring because you only have a little bit of data.

Now, in looking what's coming out right now as provisional data, I don't see this as a true outlier. It's at the high end obviously. But I don't think it's going to be considered -- you know, the real number is down here at three and this is just a fluke.

Q Okay. You had shown some pictures of the river channel where you said that you believe it might be starting to meander back to its old location. And if that's the case, how would this change the wells' impact on the river, in your opinion?

A Well, originally -- and this was in the '92 staff report on the complaint. The original distance between the new well and the river was about 160 feet, something like that. If it goes back into that area of the channel, then you're going to get more drawdown and more -- half

the channel, which will result in more loses or higher level loses in the channel. And it has some interesting effects with the residual. But essentially because you're closer to the river, you will get more loss.
Q Okay. So the general conclusion is if the channel moves closer to the wells, then we're probably going to see a greater impact on the river from the wells -- from the pumping of the wells?
A Yeah -- well, okay. We have two --
Q That might be an oversimplification. But is that the general concept?
A Yes. The closer your well is, the more you have an impact on instantaneous rate of diversion. The impact on the volume diverted is probably pretty close to the same. And then it gets into these -- and your have diversion residual --
Q Right. You're talking about a question of timing?
A -- and your instantaneous diversion rate will go up.
Q Right.
For your water availability analysis there's been discussion about the fact that the North Coast and Central Coast in the stream policies recommended that average diversion number -- or average numbers be used when you use a median number. Can you explain why you used a median number?

A Well, if you -- yes. But maybe it would be easier if we look at -- I think it's C-5 -- Exhibit C 5.

What this table shows is essentially the information in Table C-4, multiplied by the number of seconds in the month to come in, then calculating acre-feet. So we're seeing acre-feet instead of cfs. But essentially it's the same table.

What I did here was -- in the black lines that cross there, those are the averages. The dark sort of gray line that runs across the center, that's the median.

And the problem I had was is that when you look at an average and you're doing it month by the month, the percentile of what is average changes from month to month. And the question I felt on a water availability analysis is what's the average, what's the common water level that's going to be seen in the river. And that's going to be the 50 percentile. It's going to be the median. Not, you know, one year it's -- I'm trying to look and talk about it here -- you know, one year it's the 35th and then it's up to the 50th and next month it's back to 35th. So it's jumping around from month to month.

Since I'm trying to do a month-to-month analysis, I felt that if my base line is jumping around, my percentages are going to be -- I couldn't relate them one month to the next. So the 50th percentile is your average flow basically which is what you'll see 50 percent of the time.

Q Okay. Thank you.

Also with your water availability analysis there was some talk that you had included some numbers regarding the riparian diversion based upon the numbers that you saw in the statement of diversion in use; correct?

A Yes.

Q But you had done a number of scenarios looking at different cumulative low impairment indices, some of which included riparian -- the riparian diversions as stated in the statements of diversion and use and some which did not, right?

A Well, the ones that -- it's the El Sur Ranch and riparian diversions that were varied. Everyone else was included on each scenario.

Q Right. And you didn't change what you did with the El Sur Ranch riparian diversions so you could have a comparative analysis for all those different circumstances?

A Yeah. The question was, is the -- first of all, it was the question, are all these riparian diversions listed valid? And I had to assume based on Water Code that they are and how to add them together.

The second was -- the second of the -- for the 1B was to say that we're not going to divert our riparian rights. So it's a zero. We're just going to divert on the appropriative announcement. That's probably a more realistic scenario as long as we don't take anyone's riparian rights or they're not.

Q Under either scenario, with the riparians included or they're not included, did it change the percentages of the indices?

A It would change -- yeah, it would change the percentage. I'd have to look at the --

Q Let me just ask this real quick. Were they both -- with both scenarios, did they both produce over a 10 percent cumulative index?

A Certainly during the --

Q -- During the irrigation season?

A June -- yeah, the irrigation season, yeah, and solved their problems.

HEARING OFFICER DODUC: Thank you, Ms. Ferrari.

Recross by El Sur Ranch.

MR. BERLINER: Yes, please.

HEARING OFFICER DODUC: Have a seat right there. You have ten minutes for both.

MR. BERLINER: Mind if I consult with co-counsel of both the parties?

Let's take a short three-minute break.

(Recess.)

HEARING OFFICER DODUC: If we could regather please.

Now, I'm going to call you, Ms. Tetters.

You may begin when ready.

MS. TEETERS: Thank you. I just have a couple quick questions for Mr. Custis.

RECROSS-EXAMINATION

BY MS. TEETERS:

Q You mentioned that you believe there are impacts above the zone of influence; correct?

A Yes.

Q And what data - I'm not talk about models - what data do you have that proves that?

A The way you look at that, it goes to the water balance. And the issue is if you -- before pumping you have basic imbalance. If you pump more out of that basin, take more outflows, you need to have more inflows if the basin stays -- if the water level in that basin stays balanced. Otherwise, the water goes down.

Your setting there is that you don't really -- you're pumping -- in the irrigation season you're pumping enough to drain that basin, the volume storage in that basin. But you don't do that. We don't dry up the basin. And so there has to be a source of water to keep that basin full. The only source of water that's viable is the river. So if you want to look at data versus -- you do have a losing reach from VT-1 down to VT-3, and that reach loses flow -- you know, in the data that you provided, that flow loss increases as pumping periods increase. It goes from -- I think it's like C-16 -- it goes from 1 1/2, 2 cfs loss up to a around 3, 3 1/2 cfs loss as your pumping test goes on.

So there is some evidence that there's an increased loss in the flow of that section of the river. The problem is because you're measured point is VT-3, it's a little unclear exactly where in the river that's occurring. But it is somewhere up above VT-3.

Q Now, in assessing loses above -- well, between USGS gauge and the point of diversion, you're saying that the support -- the max loss, you're looking at the provisional data from the new gauge; is that correct?

A Yes.

Q Now, in your terms and conditions, Term 6 on page 24 of your testimony, you state that you will not accept use of the new gauge to assess bypass flows until it's calibrated and operating for at least two years; correct?

A That's correct.

Q But you think it's okay to use it provisionally for the max loss?

A What you're using it provisionally for is to look at the difference between the two gauges. And it's not your gauge that you're using for the bypass flow number. You're using it to evaluate what the loss downstream is. And it's a better measure because it's measured every 15 minutes. But ultimately it's measured in -- reported every day. So in the end of a couple years we're going to have pretty good ideas on water years what the difference is.

Q But isn't it correct that you are using it to set the bypass flow in that you're looking at the max loss?

A That -- the testimony was done before that data was ever available. So I'm just telling you that the USGA gauge data is confirming that it's not an outlier.

MS. TEETERS: Thank you.

MR. BERLINER: Dr. Titus.

Mr. Lindsay, if I could please get that slide C-4 again that we keep showing.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: That was from your PowerPoint?

MR. BERLINER: That was the one from Fish and Game that you just showed for Mr. Custis. I thought you might have it handy.

If you have our PowerPoint, you can use that one as well. They're the same.

Thank you.

BY MR. BERLINER:

Q Dr. Titus, you indicated that on the North Coast policy you didn't use the Thompson criteria because you didn't have the data; is that correct?

A Yes.

Q But isn't it true you didn't use Dr. Hanson's data, and if you had used his data, you would have had the data?

A We would have had some data. But the issue is that the river has changed since those data were collected.

Q You're using your data from 1992, as I understand it. And you're contending that Dr. Hanson's data, which is 15 years later, is not as good of data as what you're using from 1992?

A Theres a distinction. Where we collected -- if you're referring to the data used for the wetted perimeter analysis, those data were collected in an area of the stream and during a period of time when the river appeared to be -- have an equilibrium with regard to transport. There hasn't been any channel-forming-type flows for probably several years coming out of the 1987-1992 drought. And habitat conditions in the river and any portion of the river where we working was quite stable.

Now, we were there -- the last data collection that we did in the river itself in August 1995 did produce some outlier points on our wetted perimeter curves. And those are indicated that we'd refer to the channel-forming flows that occurred during early 1995 that did induce some changes.

The point being that in terms of those assessments being applicable today, I would argue that they are, assuming that the river reaches a state of being in -- in about equilibrium again. Which since the basin complex fires, it appears to be moving toward that. Sediment's being transported through the system. It's quite different now than what it looked like in 2009, for example.

And have you taken into account Dr. -- or Mr. Custis's - you need a promotion - Mr. Custis's suggestion that the river is moving again?

A Well, yeah -- no, I understand the river appears to be moving again. It's quite dynamic in that part of the river. But, again, that's downstream from where we conducted our work.

Q Let me ask you about the 0.3 feet. Are you aware that the study design and the results of the 2004 studies in each of the subsequent years by Dr. Hanson were presented and discussed with Fish and Game?

A Yes.

Q Okay. And Fish and Game did not express my concern,

did they, with use of a 0.3 standard?
A Okay. I'm not aware of that. I didn't conduct any of the initial review on these reports.
Q Well, you've conducted subsequent review on those reports and you didn't submit anything indicating 0.3 was inappropriate, did you?
A No, I didn't.
Q Regarding the North Coast stream policy, you indicated that Fish and Game used the median February flow as part of the basis for setting the instream flows in the winter; correct?
Mr. Custis.
A What policy is this?
Q On the North Coast stream policy.
A On the North Coast. My understanding of that is that you take the -- look at the formula to average annual flow and cfs. So in that policy it's an average.
Now, if you go to the 2002 mid-california policy, that uses a median February flow. So the two -- they're two separate policies, but the reason for -- to me, the reason for using the North Coast one is, one, it's a better written policy. It's a known policy and had much more reviews. And I think the hydrology is reasonable.
The other is that if you use the median February - and you can read it up here - it's blacked out,

but it's like 185 cfs. So 132 is a better bypass flow
Q A "yes" or "no" question for you.
Did you do any site-specific studies or measurements to confirm or validate the estimated flow?
A Site specific to validate. You mean as far as cross-sectional depth and --
Q Yes?
A Then no.
Q Dr. Titus, there is about 150,000 feet of river above the area where we divert. So there's about 150,000 feet of river providing nutrients coming downstream. And we are the last thousand feet before it hits the lagoon. How are we possibly impacting growth of the entire river by what we're doing in the lagoon when we've got 150,000 feet above us in order to produce nutrients?
It's my last question.
A That's a good one. Maybe I can stall long enough.
Let me see if I understand the question. So you're saying there's nutrients being produced. You mean food?
Q Well, there's 150,000 feet of stream flow above us.
A Okay.
Q We're the last 1,000 feet of that. So we're 1/100,000 -- we're one whatever it is. We're not much. So you've got 149,000 feet of river until you hit us,

ballpark, producing nutrients for the fish. You've got most of that coming down into the lower river and there's about eight and a half miles above us in the anadromous portion of the river. So that's about 40, 45,000 feet of river above us producing food. We're the last thousand feet. And you said food is flow dependent.

And if you look at the chart - you indicated that 20 cfs was your number - you won't find a lot of years until -- during the summer until you get up into pretty normal years for food production.

How can 1,000 feet deprive the river and the fish of food for growth when you've got eight and a half miles above that 1,000 feet?

A Plus the possibility of -- and ignore possible impact in creating a potential bottleneck to production in the lowermost part of the river that may have ramifications for production in the lagoon as well. I guess I don't really understand the argument in that sense. But I mean we could look at it from a variety of standpoints.

Take a listed species, for example. I mean if we want to put it into that perspective, okay, we can go in that direction.

In terms of ecological function, I think it's completely unacceptable to, you know, in terms of - what do you want to call it - simply just conceptually saying that, well, that's okay.

You know, maybe I'm just not appreciating the question to begin with. But I don't know that I can really respond much more specifically than that.

MR. BERLINER: Okay. Thank you.

We could pursue this but --

HEARING OFFICER DODUC: Actually I'm intrigued with this.

MR. BERLINER: Okay.

HEARING OFFICER DODUC: Because if it were less than a thousand, would you be more comfortable?

DR. TITUS: If it was what?

HEARING OFFICER DODUC: If the reach we're talking about is, say, half of what we're talking about, would it make you more comfortable?

DR. TITUS: Well, I think before we even embark on that, I think we need to know much more specifically what it is that we're talking about here. I mean this is a -- I'm having a hard time getting ahold of the question.

HEARING OFFICER DODUC: Try again.

DR. TITUS: We're talking about nutrients.

By MR. BERLINER:

Q We're talking about food production for the fish.

A Okay.

Q So when you've indicated that some recent work you're

doing is showing flows in the 20 to 60 cfs range -- and as you can see on the chart, during the summertime you don't hit 20 until you're well into -- you're in above-normal use. That's the natural hydrologic condition.
A I understand.
Q We're the bottom thousand feet of this 150,000 feet of river that's above us that's producing food for these fish.
A So the fish there don't need to eat? I mean --
Q No, no, no. The food is coming down. All the food that's being produced above as it's moving downstream --
A No, no, no. Food isn't -- especially under those kinds of conditions, it's not coming down. You're not going to find -- the fish that are upstream of that are going to be eating the food before it gets down to that part of the stream. So it's not like food is being produced and fish are nibbling away at it, but yet there's some net accumulation of food at the bottom of the river? I don't think so, especially not under very low flow conditions like that.
Q So are you contending that the only food available for the fish in that thousand feet is the food that's produced in that thousand feet?
A Probably. Almost entirely, yes. I would say that's not far from the case, especially under very low flow

conditions.

MR. BERLINER: All right. That's fine. Thank you.

HEARING OFFICER DODUC: Thank you.

Mr. Lazar, it's your recross.

MR. LAZAR: Can we put ESR-2-4.4 up again? It would be on page 57.

Thank you.

RECROSS-EXAMINATION

BY MR. LAZAR:

Q Mr. Custis, you were asked a minute ago if you have any data above the transect there that would provide flow loss. Earlier when I asked you where an ideal point would be -- or where you would put a transect in order to evaluate flow loss, you provided a different point.

Could you show me again where you would have put the transect to evaluate flow loss.

A Yeah. For the river?

I would have put it up in here. And that's again in the lower right corner of the graph where the river and the -- the river.

Q So if they had put the transect there, then they would have data and we would have data if there was flow loss in that reach?

A We would have a better understanding if you put two

parts -- you need to dig a transect up here -- or down here where the -- just above the zone of influence and up in this area where you've got minimal loss to the alluvium. Where you get down into Creamery Meadow and this whole reach, you have a high potential to lose flow to the alluvium then.
Q You're saying that -- what I just understood you saying, that there's a high potential to lose flow to the alluvium there in that reach?
A In from where I would suggest putting a transect all the way down to the third row or down to the zone -- the upper zone of influence area.
Q So that would include the area that was not evaluated for whether there was loss of flow?
A The area that's above VT-1, yes. That would include that area.
Q And again that flow then was not measured in Creamery Meadow because there were no piezometer to be placed in Creamery Meadow?
A There's no water level measurement in what is called Creamery Meadow, which would be the land that's south of the river.
Q Would you have put the piezometer in Creamery Meadow?
A I would have tried to put the piezometer in Creamery Meadow because all the parks has a permitting issue with

that. You might be able to put one in there without a major drilling rig coming in there. But because you're asking this question what's happening to the water level outside this -- you know, within the basin, outside the zone of influence, you can't get an answer to that without actually having a data point.

Q Thank you.

Dr. Titus, the body mass index, the body mass that's produced upstream in this other reach of the fish, would that body mass be then represented in the area in the point of diversion or would there be a different body mass represented if there was more food available upstream?

A Are you talking about food production now?

Q Yeah, I am.

A Yeah, especially under low flow conditions. I mean, food being produced in -- most of the food is produced in riffle habitats. And so the fish are going to hang out where food is going to be most available to them, and especially under low flow conditions where the delivery of food is low.

I mean, trout are efficient visual predators. They're not going to just -- if they're starving, they're not going to be watching this food that's going by them. So it is more or less a natural phenomena where the fact

that they're starving, it tells you that there isn't a production of surplus that's just floating down the river and washing out to the sea eventually. It's being consumed locally, such that if you impact that production at a given point, it's going to influence the opportunity for feeding in that area.
Q And just to confirm, earlier you said that the groundwater that would be pumped would not contain food?
A I wouldn't think so, no, unless there's some sort of anaerobic invertebrate that we don't know about that would be present there. But, no.
Q And so to reaffirm, under extreme low flow conditions, as you just said, it would be very difficult for food to come from upstream down to this particular area; and then just a second ago you said that the groundwater which the applicant's proposing to pump also would not contain food?
A Yes.
Q If there's very low flow and there's no food coming from upstream and there's no food coming from the groundwater, where would the food be coming from?
A I don't think there would be much food.
MR. LAZAR: Thank you.
No further questions.
HEARING OFFICER DODUC: Thank you, Mr. Lazar.
Mr. Johnson.

MR. JOHNSON: Thank you.

RECROSS-EXAMINATION

BY MR. JOHNSON:

Q Dr. Titus, you'll recall being asked about the use of the Thompson methods and your answer that the data wasn't available. If the data had been available, would the Thompson methods have been appropriate for setting a flow threshold for adult migration?

A It's the standard, so yes.

Q Would it have been appropriate or commonly used for setting a flow threshold for spawning habitat?

A For spawning habitat? Using Thompson criteria? No.

Q Would Thompson be used for setting a flow threshold for rearing habitat?

A No, it wouldn't.

Q Benthic habitat?

A No.

Q In your experience, is it appropriate for flow thresholds to consider habitat values other than migration?

A No, it's strictly for migration.

Q How often is it used for migration by setting the flow thresholds? Would it be appropriate to consider spawning habitat, rearing habitat, other things besides migration for flow thresholds? I'm not using Thompson. But would

you want to consider those things?
A Would we want to consider those factors? Yes, absolutely.
MR. JOHNSON: Thank you. No further questions.
HEARING OFFICER DODUC: Thank you, Mr. Johnson.
Mr. Le Neve.

RECROSS-EXAMINATION

BY MR. LE NEVE:
Q Dr. Titus, not to beat the .03 versus .05 to death. But are riffles rearing habitat?
A Is what now?
Q Are riffles rearing habitat?
A Oh, yes, they are, yes.
Q Then shouldn't a riffle be .05 to meet the criteria?
A .05 --
Q The Big Sur River water protection plan says a riffle should be .05. And Dr. Horton said that is the rearing habitat. So if a riffle's a rearing habitat, then should not the riffle be .05 rather than .03 cfs?
A Oh, I guess you could make that conclusion, yes.
MR. LE NEVE: Okay. Thank you.
HEARING OFFICER DODUC: Thank you.
Any other questions from staff?
At this point, Ms. Ferrari, do you wish to move your exhibits into evidence?

MS. FERRARI: Can we please move DFG-C-A, DFG-C-B, and DFG-C-1 through DFG-C-15 as well as DFG-T-A, DFG-T-B, and DFG-T-1 through DFG-T-24.

Thank you.

HEARING OFFICER DODUC: Any objections? Not seeing any, those exhibits are moved.

(Above exhibits entered into evidence.)

MS. FERRARI: Thank you.

HEARING OFFICER DODUC: Well, we have about 40 minutes. I don't want to start a case in chief and break it for cross.

So let me -- I won't hold you totally to this. But does anybody anticipate having cross for CSPA/Center for Biological Diversity/Ventana Wilderness Group?

Does anyone anticipate having cross for Trout Unlimited?

That's fine. If you anticipate having questions or cross --

MS. GOLDSMITH: I anticipate making objections. I anticipate being overruled. I've spoken with Brian Johnson about the substance of his testimony and the fact that it's legal argument. And he agrees to keep it very short. And I reminded him that he'll have the opportunity to submit in writing and also to present it to the Board when the Board considers the FEIR. And so he agreed to keep it very short.

So other than the objection which I could make just now for the record, I won't have any cross-examination.

I presume we'll be able to brief the opposite side.

HEARING OFFICER DODUC: Let me ask about the Carmel River Steelhead Association.

MS. GOLDSMITH: Again, I will not have -- maybe I might have one or two questions. I will make some objections to their exhibits.

HEARING OFFICER DODUC: Okay. And, Mr. Johnson and Mr. Le Neve, how long do you each anticipate your direct taking?

MR. JOHNSON: I would expect the opening statement and testimony to take 10 minutes, maybe 15.

HEARING OFFICER DODUC: Okay. Mr. Le Neve.

MR. LE NEVE: I would expect the same amount of time. But I'm not sure I'm prepared to do it in the format you want with the opening and the testimony --

HEARING OFFICER DODUC: Sorry. Can you hear all right.

Let me just recap here. I'm not sure you're prepared today.

MR. LE NEVE: I don't think I fully understood the opening versus the testimony. So I don't think I'm really prepared to do it in a format you would like.

HEARING OFFICER DODUC: No, you are welcome to --

MR. LE NEVE: So I would just as soon --

HEARING OFFICER DODUC: How much time do you need?

MR. LE NEVE: Fifteen, twenty minutes.

HEARING OFFICER DODUC: Okay. It's a tossup between the two of you.

MR. LE NEVE: I don't believe I'm prepared today. So I would request to postpone until the 8th.

HEARING OFFICER DODUC: All right. Mr. Johnson, if you are prepared to continue today.

Then we'll go ahead and thank the Department of Fish and Game and their witnesses for completing your case in chief.

And we'll hear Ms. Goldsmith objections which she expects me to overrule. I may surprise you.

MS. GOLDSMITH: My objection is to the Trout Unlimited's testimony if it consists entirely of legal argument.

HEARING OFFICER DODUC: Get closer to the microphone.

MS. GOLDSMITH: My objection to Trout Unlimited's testimony is that it's legal argument and notice of documents that are either already admitted in the record or are documents that the Board can take official notice of. And I believe that it's inappropriate testimony and that they can submit their brief as it is to the Board for consideration and can orally argue it before the Board when the FEIR is considered for adoption.

HEARING OFFICER DODUC: Mr. Johnson.

MR. JOHNSON: I do not believe that my presentation is entirely argument. I considered the possibility of submitting and making a policy statement. I had information that I wanted to be able to discuss and experience from my participation in other proceedings that I wanted to be able to discuss. And I was concerned that I would be vulnerable to a fairly well-founded objection from Mr. Berliner like we had from David Lyons yesterday saying that I couldn't do that. And those documents were not in the record at the time that I submitted them. And so I plan to keep it short and make an opening statement that includes what she considered argument and follow up with a very short testimonial statement where I talk about the things that were not in the record.

HEARING OFFICER DODUC: Do you wish to add something, Mr. Lazar?

MR. LAZAR: I do, yes.

I've had an opportunity to review Mr. Johnson's proposed testimony. And I believe that it contains evidence that goes outside of mere legal argument. And I believe that I at least am concerned that if he's not allowed to present his testimony, there will be evidence that should be properly included before this Board that would otherwise be excluded.

HEARING OFFICER DODUC: Thank you.

Well, Ms. Goldsmith, I might surprise you one of these days but not today. But I promise I will surprise you one of these days.

MS. GOLDSMITH: You already did surprise me, Ms. Doduc. You did sustain one of my objections early on. It was the highlight of the first day of testimony.

HEARING OFFICER DODUC: I'm mean to please.

In that case, let's go ahead and ask Mr. Johnson to present his case in chief.

Will you be questioning yourself, Mr. Johnson?

Never mind.

MR. JOHNSON: I'm at a bit of a disadvantage today because I have a fool for a client.

(Laughter.)

MR. JOHNSON: Sort of what I originally intended to have my outside counsel that I work with -- have worked with along the way. And they were not able to be here. So I think I will not question myself, but I will only make my opening statement, and then the testimony will be short and just be intended to allow me to make sure that I cover the things that weren't already in evidence.

(Thereupon an overhead presentation was presented as follows.)

HEARING OFFICER DODUC: Sorry. Before you begin, let's clarify. Have you taken the oath?

MR. JOHNSON: I have.

HEARING OFFICER DODUC: And when you say it will only take ten minutes, does that include your opening statement or in addition to your opening statement?

MR. JOHNSON: I think the opening statement will probably be longer than the evidentiary part, the testimony. And I would expect that I'm -- I'm not good at estimating my time. I tend to go longer than I think. But I'd guess that the two of them together will take 10 to 15 minutes.

HEARING OFFICER DODUC: Let's go ahead and put 20 minutes on the clock and we'll start with that.

MR. JOHNSON: By way of background, we're a river conservation group that began in 1959. And it was started by anglers and became a conservation group with a motto of "Take care of the fish and the fishing will take care of itself."

The Big Sur River is important to us and to our members in a way that many of the other coastal streams that I work on are not important, because it still has that overlap between the conservation mission of saving the last few remaining fish and having at least the potential of a sport fishery. And so I'm here largely because it is incredibly important to our members.

I have -- do I have the clicker so that I can move the slides? Or do I need to -- I'm not going to use most of them, because --

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: This is a PowerPoint, not a --

MR. JOHNSON: I'm sorry.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: -- which will work, but I'm not sure that this clicker would work with something other than a PowerPoint.

This is a PDF; right?

MR. JOHNSON: It is.

I'm not going to use very many of them. So we can try it. If it takes more than a few seconds, keep the clock running. That's fine.

SENIOR WATER RESOURCES CONTROL ENGINEER LINDSAY: It's not working. I'll have to do it for you.

MR. JOHNSON: So on the next page, I can introduce the subject of my testimony, which is in response to the questions posed by the hearing notice about the impacts of the projects on Big Sur River and on the water availability for diversion.

And one of my concerns in answering those questions is that it is very difficult to answer those questions given the state of the record. The way these questions are typically answered at the Board is to conduct a Water Code Analysis and a Public Trust Analysis that evaluates the full effect of the diversion and considers the impact of that analysis.

We heard yesterday from the authors of the CEQA document that that document couldn't be used for those purposes.

We also have -- and the reason that the CEQA document cannot be used for those purposes is because it considers as its base line all ongoing operations. And so any changes to operations could possibly have an impact. And the disjunction between those two things has made it difficult to answer the questions.

My next page, please.

--o0o--

MR. JOHNSON: In my testimony, short as it is, I will seek to make sure that a few things are in evidence that weren't when I started, that it will support my contention that the normal practice for evaluating impacts to rivers and under the Water Code and the Public Trust

Analysis is for the division staff to prepare a Public Trust Resource Assessment as part of developing the project. And this is typically done before we get to a hearing over the project. And the things that I will talk about are primarily contained in Exhibit 4 and in Exhibit 5, which is a request for official notice.

And I want to make sure I could talk about those other than the applications.

Next page, please.

--o0o--

MR. JOHNSON: It's notable to me when I became involved in this that the Public Trust Analysis, the PTRA, has apparently not been prepared for this project. Although in my experience it normally would be by the time that it's coming to the Board for discussion of anything. And it's also notable because it's the existence of the Public Trust Analysis that has made it possible for the Board to go on processing applications for all of these years with CEQA documents that don't answer those questions.

My group and many other groups have a long running dispute with the State Water Board that you may never have heard of because -- over the base line. And my experience, it hasn't been elevated to the Board as part of a decision and it certainly hasn't been litigated.

Because when the Public Trust Resources Assessment is done, that typically gets staff and DFG and other protesters and myself comfortable enough with the state of the record to be able to settle the protest or have a decision issued. That hasn't happened here.

I will point out that in this case CEQA could conceivably have some other value that it might not have in smaller projects. And chief among those is the consideration of alternatives. The Public Trust Resource Assessment doesn't consider alternatives to a project. It's just an evaluation of the project as proposed and possible bypass flow and rate of diversion limitations.

CEQA is not correctly for the big projects, that are hard enough to go to an EIR. It does include an alternatives analysis. And so if that analysis had been done for this project, we might have had a CEQA document that would have gone some distance toward answering the questions we were discussing yesterday about the relative cost of various water efficiency measures and the harm to fishing operations of different types of projects. And I believe that it's unfortunate that we do not have that.

We can skip the next page, provided everybody in the audience promises to read it tonight.

--o0o--

MR. JOHNSON: And we'll skip most of these pages.

And I'm not going to do the case law and I'm not going to do a CEQA tutorial. But just to distill so that everybody understands what we're talking about.

The CEQA base-line cases are notoriously complex. But I initially titled this slide "CEQA is easy" because it's actually possible to answer every CEQA question there is by asking, "Does the analysis help us understand the effects of the agency's decision?" And the base line is just a tool to inform the agency's ability to make that decision. And, again, it's unfortunate that the authors of the document said yesterday that it can't be used for that purpose.

Skip two more pages.

--o0o--

MR. JOHNSON: So just quickly, what is appropriate for a CEQA base line? We have in the base line existing petitions, that's the basic approval; and under the base line we have the proposed project and all components.

Next page.

--o0o--

MR. JOHNSON: The CEQA base line is also typically a trend. We have activities that will continue into the future regardless of project approval are part of the base line. Things that will only continue into the future if the project is approved are not part of the base line.

Next page please.

--o0o--

MR. JOHNSON: And we have a couple of exceptions to this rule for our ongoing activities that are covered by previous permits, which is kind of another way of saying that it would continue anyway; and also things that have previous CEQA review.

Now, I'll start skipping pages rapidly, because this part of the opening statement just includes citations for what I just said.

So next page.

--o0o--

MR. JOHNSON: Move forward to the one that starts with "cases with base lines that incorporate prior illegal activity."

--o0o--

MR. JOHNSON: This one's worth noting for future reading. But there are no cases like the one that we have that incorporate the activity into the base line. And I'll apologize to Mr. Hill for calling it illegal activity. That's a bit of a value judgment I wouldn't normally use. I know that you didn't believe it was illegal when it was starting. That's the way the cases describe it and then that's what the slide says.

The next slide --

--o0o--

MR. JOHNSON: -- is more of the same. It has a list of factors that distinguish all of the other CEQA base line cases.

The next few slides are --

--o0o--

MR. JOHNSON: -- about a superior court case the Department of Fish and Game just lost. And I attached this case as an exhibit. And I don't do it for precedent. This is not controlling precedence. It's the spirit of our case. It's another agency. I will in my testimony describe the project with the program memo and certain analogous things in DFG permitting to the State Water Board permitting that I think are useful.

If we go back one -- sorry -- go forward one now.

Right there.

--o0o--

MR. JOHNSON: That first bullet right there is the punch line for anybody who's looking for it.

Forward to three more slides I believe to -- right there.

--o0o--

MR. JOHNSON: -- Correct base line for the El Sur

Ranch. So how should this work for both the Public Trust Analysis and essentially the CEQA analysis?

The physical structures that were put in place prior to construction are in fact part of the base line. They will be there regardless of whether the agency approves the new appropriative water right, they don't disappear.

The permanent act of past diversions are also part of the base line. And future riparian diversions are part of the base line because they'll continue without regard to approval of the project.

Future appropriative diversions of a face value are not part of the base line because they will not continue absent approval of the project. And they are not past effects. They haven't happened yet. The analogy that people typically use in discussing past activity is somebody who starts quarrying for cutting trees before they have a permit. And they get stopped halfway and they're told, "Hey, you have to have a permit for this." The CEQA base line doesn't -- assumes that the first half of those trees or the first half of that quarry is gone. It doesn't come back if the permit is denied. So that is part of the base line.

But the future cutting of the trees and quarrying isn't part of the base line just because it already started. Those have not been cut yet. And water diversions are more like that. It rains every year. And the future diversions haven't happened yet.

And that concludes my opening statement.

HEARING OFFICER DODUC: Actually before you continue, Mr. Johnson, help me understand again. What do you mean by past diversions?

MR. JOHNSON: The past effects of diversions that had already happened are part of the base line. So if the fish die because of the diversions before -- or a bug died because there was a diversion before, that's part of a condition that is part of the base line. We don't assume that those bugs die again next year as part of the base line because that diversion won't happen if the project isn't approved.

Mr. Lindsay, we can turn that off.

And taking my attorney hat and calling myself as a witness.

DIRECT TESTIMONY

MR. JOHNSON: So I understand that I'll be putting all the exhibits into evidence at the end. But I'll say what they are and the significance of it.

Exhibit 4 is a list of all the pending applications. And rather than put all of those case files into the record or characterize them all individually, I had intended to characterize some of them. But given the time, I think I will just note that this is confirmation of my point, that at the Board currently the Public Trust Analysis is regularly different from the CEQA analysis because of the base line question. There are a number of pending applications that are noted in that list of pending applications where the status is that the Board has determined the project is CEQA exempt. And yet the next step is the PTRA.

I think it's also evidence in case anybody wanted to question that the Public Trust Resources Assessment is a standard thing and not something that I just made up. It has its own acronym at the beginning of the list of pending cases.

Exhibit 5 is the record for the scientific basis for the instream flow policy as well as the rest of the record. I wanted that in evidence, not just because of the policy, which I assume you can talk about anyway because it's adopted, but because of my experience with the development of the scientific record which at every point assumed that the analysis that was happening for the State Board was a Water Code analysis and Public Trust Resources analysis and not the CEQA analysis. And there's essentially no mention of CEQA impacts in it.

And, for example, the scientific basis and the policy assumes if somebody has an existing dam, that the effects of that dam should be considered, and mitigation that would be appropriate might include fish passage or gravel limitation or large woody debris augmentation and that, you know, that would be not consistent with your interpretation of the CEQA base line because it doesn't -- those impacts wouldn't exist. And that's all that was there for.

I can also say in my experience and the development of the actual policy, CEQA was not mentioned at all. There's one mention in the policy, that I requested, which is only a statement that, kind of buried in the policy, that if the project is subject to CEQA, that the analysis the applicant might have to prepare to get a permit could be different. And it makes me wonder again as a participant where I've gotten CEQA analysis if it's done are irrelevant to the permitting process.

Exhibit 8. I'm running out of time.

Exhibit 8 was the superior court decision, which I didn't put there for the precedential value. But it has a statement of facts that describe the Department of Fish and Game program, that it ran into similar issues. And I can say that it's based on my experience working on that program that it's a relatively accurate statement of the facts.

What happens here is that the Department - and I think this is relevant because they're a responsible agency for your permits and they frequently have their own permits that cover the same project in the form of Section 1602 - that they do their Public Trust Analysis for the individual permits, essentially the same way that you do, and take the full face value of the project and evaluate the impacts.

When it came time to do a watershed-wide program, which I thought was a good idea, they had a very difficult time thinking how that they would translate that into CEQA terms, because they tend to get CEQA wrong in the same way that the State Water Board does. And what's unfortunate about this is that this program that we all spent many years developing and, you know, could have been the thing that maybe prevented extirpation of coho salmon in the Shasta River this year - we don't know if they're going to be gone, but this is the last year - was went down in flames mostly because nobody could figure out how to do the CEQA analysis. But at the end they may have gone down in flames anyway. It's hard to work up in those basins.

And by the end my group, the California Trout, and a few DFG staff were the only ones standing, who still thought it was a good idea.

But in any event, the straw that broke the camel's back was the inability to reconcile the public trust responsibilities when there are CEQA responsibilities.

And the other exhibits are qualifications and such.

And that concludes my testimony.

HEARING OFFICER DODUC: Okay. Thank you.

You technically have another 20 minutes though. But if you're done, you're done.

Ms. goldsmith, any cross?

MS. GOLDSMITH: I do not.

HEARING OFFICER DODUC: Any cross from the other parties?

You wish -- oh, Mr. Lazar has cross.

CROSS-EXAMINATION

BY MR. LAZAR:

Q You refer in your testimony to annual Water Code Section 1259.2 report. Can you describe that report?

A Yes. That's the list of all pending water right applications and their status and process and their next steps.

Q And just to confirm, you say that it does include a PTRA, as you just identified it, for many of the pending applications?

A Its does.

Q And is that after that PTRA, Public Trust Resources Analysis, then conducted before the permit is issued?
A It is.
Q And then are the results or conclusions of that analysis included as conditions in the permit?
A That's typically the way it happens, yes.
Q Typically so.

No further questions. Thank you.

HEARING OFFICER DODUC: Thank you, Mr. Lazar.

Any other cross by the other parties?

I'm not seeing any.

Do you wish to redirect yourself, Mr. Johnson?

MR. JOHNSON: I have jokes running through my mind, but I'm not going to even go there. So, no, I do not.

HEARING OFFICER DODUC: At this time I assume you wanted to move your exhibits into evidence.

MR. JOHNSON: I do. I'd like to move Exhibits 1 through 8 into evidence.

HEARING OFFICER DODUC: Objections from any of the parties?

I'm not seeing any.

All the exhibits have been moved.

(Whereupon Exhibits 1-8 were admitted into evidence.)

HEARING OFFICER DODUC: Thank you, Mr. Johnson.

MR. JOHNSON: I would like at some point to make a couple of motions or requests. And I don't know whether that's in order here.

HEARING OFFICER DODUC: Procedural?

MR. JOHNSON: It probably could be saved until the end of the hearing.

HEARING OFFICER DODUC: Procedural?

MR. JOHNSON: Having to do with next steps for dealing with this application.

HEARING OFFICER DODUC: If it's next steps, let's wait until the end of the hearing.

MR. JOHNSON: Thank you.

HEARING OFFICER DODUC: Thank you.

I think we're concluding for the day. And I'm so generous, I'll let you leave 42 minutes early.

Thank you, all.

STAFF GEOLOGIST MURPHEY: Excuse me. I had a question on housekeeping.

Ms. Goldsmith, do you want to enter Exhibits ESR-41 and 43 into the record?

MS. GOLDSMITH: I thought he did.

STAFF GEOLOGIST MURPHEY: I didn't mark it down that you did.

MS. GOLDSMITH: Yes, I do.

STAFF GEOLOGIST MURPHEY: Okay, thanks. I just wanted to make sure it was on the record.

(Whereupon Exhibits ESR 41-43 were admitted into evidence.)

HEARING OFFICER DODUC: Any other housekeeping items?

BOARD MEMBER MAHANEY: Yeah, just reminders to Ms. Goldsmith and Ms. Ferrari to submit electronic copies of your revised exhibit lists and any other exhibits.

Also, for next time the parties who wish to discuss a figure contained in the testimony, just to expedite matters if you could be sure to find the PDF page. Larry can get it really quick using the on-line PDF pages rather than you bringing up your own exhibits to give him.

HEARING OFFICER DODUC: You have a whole month to do it.

And speaking of -- oh, three weeks? I stand corrected, Ms. Goldsmith.

Speaking of July 8th, does anyone object to starting at 8:30? We do have a bit to cover because we have two cases in chief and your rebuttals. So let's plan on starting at 8:30. Thank you.

(Whereupon the hearing recessed at 5:48 PM)

CERTIFICATE OF REPORTER

I, TIFFANY C. KRAFT, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing hearing was reported in shorthand by me, Tiffany C. Kraft, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 1st day of July, 2011.

____

TIFFANY C. KRAFT, CSR
Certified Shorthand Reporter
License No. 12277