STATE OF CALIFORNIA

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE WATER RESOURCES CONTROL BOARD

In the Matter of:	)
Public Hearing to Consider Water Right Applications 31487 and 31488 filed by the United States Bureau of Reclamation and Petitions to Change License 3723 (Application 5169) of Washoe County Water Conservation District, License 4196 (Application 9247) of Truckee Meadows Water Authority, and Permit 11605 (Application 15673) and License 10180 (Application 18006) of the United States Bureau of Reclamation Truckee River Watershed	)
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VOLUME III

FRIDAY, JULY 23, 2010

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DIXIE L. COOKSEY, CSR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 4375

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ALI SHAHROODY
DONALD A. MAHIN
JOHN E. SARNA

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P R O C E E D I N G S

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CO-HEARING OFFICER DODUC: Good morning. The microphones are working. Please take a moment right now to put your cell phone on silent or vibrate.

And if we could please have Mr. Shahroody, Mr. Mahin and Mr. Sarna back up with their attorneys, and Mr. Van Zandt and Mr. Mackedon over here preparing to do cross-examination.

With that, Mr. Van Zandt, begin when you're ready. Thank you.

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CROSS-EXAMINATION BY MR. VAN ZANDT

FOR TRUCKEE CARSON IRRIGATION DISTRICT

and CHURCHILL COUNTY

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MR. VAN ZANDT: Thank you. Good morning. Questions for you first, Mr. Shahroody, if I could.

You testified about Winnemucca Lake during your direct there. Winnemucca Lake is a terminal desert lake, correct?

MR. SHAHROODY: Yes.

MR. VAN ZANDT: And Pyramid Lake is also a terminal lake?

MR. SHAHROODY: Right.

MR. VAN ZANDT: Now, is it the Tribe's intention to attempt to restore Winnemucca Lake with part of the water that's being appropriated in these proceedings?

MR. SHAHROODY: The Tribe likes to at least get part of the wetlands put back, but I don't believe -- that's more of a conceptual than anything related to the unappropriated water permits issued by the State Engineer.

MR. VAN ZANDT: So right now Winnemucca Lake is not a place of beneficial use for any of the water that's being appropriated here?

MR. SHAHROODY: That is correct, and even if it is, physically you cannot get it because, as I said, Mud Slough elevation is about 60 feet above the present elevation of the Pyramid Lake which is the connecting channel for the Winnemucca Lake.

MR. VAN ZANDT: Mr. Shahroody, how much water does it I take to raise Pyramid Lake by one foot?

MR. SHAHROODY: That has been an old test. Pyramid Lake surface area is pretty much the same as Lake Tahoe. It's about 120,000 acres, or one foot will take 120,000 acre feet.

MR. VAN ZANDT: So I think you stated yesterday that the Tribe's target was 3812, was that the number

you used, or 3810?

MR. SHAHROODY: I did not say a target. From what I hear the biologist tell me, since I'm an engineer and operating the river for the purpose of the fish flows, they have indicated 3812 elevation is an elevation where the delta may not be -- with the larger flows of course -- the delta may not be as prohibiting as what it is right now which is 3801.

MR. VAN ZANDT: So based on that, Mr. Shahroody, wouldn't the use of the entire amount of the 477,000 acre feet of water that the Tribe received under permit that was sent down to the lake, that would help to raise the lake, wouldn't it?

MR. SHAHROODY: Well, that would offset the evaporation that we talked about, and based on the calculation of 1 foot in 120,000 acre feet, evaporation is about 3 1/2 to 4 feet. That takes about 450 to 480,000 acre feet just to offset the evaporation and keep the lake pretty much steady, although there are fluctuations depending on hydrologic conditions.

So it really would not help to raise the lake based on what you referred to as the amount of water being appropriated for the Tribe.

MR. VAN ZANDT: I want to make sure the record is clear on this.

So it's your opinion that Pyramid Lake evaporates between 450 and 480,000 acre feet annually?

MR. SHAHROODY: Correct, depending on elevation. If it is a higher elevation, you have a larger surface area, you're going to evaporate more. If it's lower elevation, you have a smaller surface area, you're going to evaporate relatively less.

So on average, yes, it is about 450,000 to 480.

MR. VAN ZANDT: And that evaporation rate is pretty common for a desert terminal lake, isn't it?

MR. SHAHROODY: As far as depth or as far as the amount?

MR. VAN ZANDT: As far as the amount, given the surface area that we're talking about.

MR. SHAHROODY: Well, as I said, depending what elevation you have. If the lake, of course goes up, evaporation demand is going to be a little bit more.

So generally for that area it's desert, and it takes about, as I said, 3 1/2 feet to 4 feet of evaporation. And unfortunately you don't have that much rainfall in that part of the world to offset the evaporation.

MR. VAN ZANDT: I think we had some prior testimony from you about the testimony at the unappropriated water hearing for the Tribe's

applications, and I think the number that was given there was it would take at least 410,000 acre feet to sustain the lake.

MR. SHAHROODY: Again, as I said. That's a function of the elevation. I think we probably were talking about lower elevation at that time.

MR. VAN ZANDT: Well, let's look at your Pyramid Lake Historical Elevation Chart, that's at USBR 7, Figure 6 on page 37, Mr. Lindsay.

As I read the chart, the record begins in 1905, but then there's a gap so that it is closer to 1909, I guess, is when we have more of a continuous record or even actually to 1912, right?

MR. SHAHROODY: Yeah, there is a gap because as far as data collection at the turn of the 20th century wasn't that intensive, so there is a gap in the data.

MR. VAN ZANDT: So initially it had a little bit of a rise from 1905 up to about 1911 or 1912 at which point we begin to see a decline, right?

MR. SHAHROODY: That is correct.

MR. VAN ZANDT: Now, in 1912, who was -- who was operating and managing the Newlands Project?

MR. SHAHROODY: United States through the Reclamation Service.

MR. VAN ZANDT: And TCID, the Truckee Carson

Irrigation District, they took over operation and management at the end of 1926; is that correct?

MR. SHAHROODY: Correct. The operation and maintenance contract was signed between the United States and the TCID in 1926.

MR. VAN ZANDT: Now, between 1912 and 1926, by my reading of your chart the lake dropped about 25 feet. Do you see that, from 3870 down to 3855?

MR. SHAHROODY: That's correct.

MR. VAN ZANDT: Then we have a continuation of a drop or decline in the lake levels throughout the late '20s and into the '30s.

Now, Mr. Shahroody, doesn't that coincide with one of the worst droughts that this country has ever experienced?

MR. SHAHROODY: That's what I said yesterday. The '30s, if you look at it, it really got steep, and that's because of the combination of the diversions out of the basin and, of course, the drought that we had in early '30s.

MR. VAN ZANDT: Then in the 1940s the lake seemed to stabilize a little bit; do you see that there? But then drops again in the mid '40s, right?

MR. SHAHROODY: '40s and '50s are big years. You had big events, the floods in the '40s, and one of

the biggest floods occurred in 1950 -- I believe it was 1953. And both those flood events sort of cushioned the decline temporarily.

MR. VAN ZANDT: And in fact in your written statement there is a Table 6 that begins on page 20 that kind of tracks the hydrologic conditions of the various years? It's on page 20 and 21.

MR. SHAHROODY: Table 6 from the Water Availability Analysis for Stampede Reservoir, it tracks the flows for Little Truckee River, runoff at the Stampede dam site for the hydrologic period 1901 through 2006. That's 160 years of hydrologic data.

MR. VAN ZANDT: And just looking at that data, for example, in the late '40s, actually starting about '46, we had another decline in snowmelt and rainfall; isn't that right?

MR. SHAHROODY: 1946 I show to be an average year, hydrologic condition.

MR. VAN ZANDT: Starting that year, and going forward it's dry, below average, below average and then it's average again, right?

MR. SHAHROODY: That's correct. And in 1952, as you see, a pretty big year, and then we have another big wet year in 1956. So the '50s, if you see also another big year in 1958, as I said, '50s were quite

wet, and so were the '60s.

MR. VAN ZANDT: Until you get to the end of the '50s, there's two dry years and one below average year, right at the end of the '50s.

MR. SHAHROODY: '59, '60 and '61 were dry.

MR. VAN ZANDT: Right. So if you go back to Figure 6, page 37, it would seem that the trends that we're seeing on the historical lake elevations are tracking the hydrologic conditions, right?

MR. SHAHROODY: Not necessarily. There are more than -- the average flow, of course, at the Floriston, which is the state line, it's slightly above 500,000 acre feet. So what you have to take a look at is what's happening to that water, how much is being diverted out, and as we talked about, evaporation.

Therefore, true substantial diversion out of the basin, the system on average is going to decline. So when you look at a certain hydrologic year being dry, but those are also being offset by big years in this situation.

And I'll give you a good example, in fact, since you brought that up. 1912, 1912 being at the height. In the early part of the century of 20th was one of the wettest periods for California and for the mountain. And in fact the teens and going into the '20s

were pretty wet. In spite of those wet periods you could see there is still decline.

And the same thing continues in the '50s and '60s, as I said. They were quite wet. '69 was quite wet. Still be bottomed out by '67 in spite of these wet years.

So there are dry years but they're offset by a number of big years which could be as much as or more than a million acre feet of water passing the state line. So I would not pin it exactly because there are several years of dry years, as a result of this decline.

MR. VAN ZANDT: Well, I think the comparison that I can see between Table 6 and your Figure 6, pretty much the dry, average and below average years track your depiction of the historical lake elevations. But I wanted to point out to you, if we look at what happened when the OCAP came in, there is a slight rise, right?

MR. SHAHROODY: That's because of the wet situation, as I said, in the teens.

MR. VAN ZANDT: And then the lake seems to have gone through the same drought that California did in the late '70s. There was a drought, correct?

MR. SHAHROODY: In '76, '77, we had drought and that's, of course, past the OCAP situation.

MR. VAN ZANDT: Right. And then we had an

extremely wet year in '83, and that's depicted. It shows the rise of the lake. It went actually up above 38 -- looks like -- 13 or so, right?

MR. SHAHROODY: That is correct, also. After the OCAP being put in place, then the lake began to stabilize, and then of course did rise with hydrologic conditions and stabilized as the graph shows.

MR. SHAHROODY: And then you had in the peak, looks like it gets up to about 3817 or 18, and then as Mr. Erwin and Mrs. Phillips testified yesterday, there was what they considered to be the worst drought in the history of the Truckee Meadows from '88 to 1993, 1994, right? So that's depicted here, that sharp decline on your chart, right?

MR. SHAHROODY: There is no doubt the lake responds to the hydrologic conditions. It's a fluctuating level. We look at the average over a long term what the trend is. So when you have dry periods, the lake level will go down; and when you have wet periods, the lake level comes up. It's a question of the trend and the continuity of the decline which is the matter of importance here.

MR. VAN ZANDT: Well, I was just wondering, when was the Tribe's permit for unappropriated water approved by the State Engineer?

MR. SHAHROODY: I think it was in 1998.

MR. VAN ZANDT: 1998? So we have an increase from the lake during that time period. Would you attribute that partially to the unappropriated water flowing into the lake?

MR. SHAHROODY: No, I don't. That was just a paper exercise.

MR. VAN ZANDT: But the lake has declined over the last ten years or so with the OCAP in place, right?

MR. SHAHROODY: Which OCAP?

MR. VAN ZANDT: The '97 OCAP. The current OCAP.

MR. SHAHROODY: Well, the 1997 OCAP, the lake has declined again because we have been through -- the 2000 period has been dry. Of course we have the 2005 and 2006 were wet, and you see that's reflected on the graph. And the late 1990s were quite wet, and that's reflected.

And the lake reflects in fact hydrologic conditions. As Ms. Phillips indicated yesterday, we started the drought period of '90s. From 1988 on, the lake shows that it goes down. Then once the drought is finished in 1994, then the wet period is started, it goes up.

But the question is that if you notice that,

the lake is not trending downward, it's basically stable. And after the OCAP was put in place, and basically as any other lake, including -- especially the terminal lakes, they respond to the hydrologic conditions.

MR. VAN ZANDT: So I'm getting curious about the 477,000 acre feet because it's the Tribe's intention, is it not, to ultimately store that water in Stampede Reservoir?

MR. SHAHROODY: That's what I said.

MR. VAN ZANDT: So the goal of providing 450,000 acre feet per year to the lake to help sustain it and stabilize it, that's inconsistent with the plan to store water in Stampede and not release it to the lake, isn't it?

MR. SHAHROODY: It is quite consistent, because as I explained yesterday, there is the element of timing of the flows, that basically because of the construction of the dams and reservoir it has affected the natural hydrograph for fish to basically move up and spawn. When I talk about fish, it's not only cui-ui but also the Lahontan cutthroat trout, which historically they tell me did spawning not only in the spring but also have fall spawning.

So the purpose here is to have the water stored

to be able to mimic the natural hydrograph based on releases from the Stampede Reservoir. But as also I said yesterday, the same water, instead of going down to Pyramid Lake, let's say this season, part of it would go back to Pyramid Lake next season when it is released, so therefore it's all committed for the fish to go to Pyramid Lake.

MR. VAN ZANDT: And in fact if you look at your Figure 3, in USBR 7, it appears that at least through the '90s and into the early 2000s the amount of water that was being held back in Stampede was pretty significant.

MR. SHAHROODY: Through '90s, I pointed that out. In fact, coming out of 1994, because the Stampede Reservoir -- we were coming out of a drought period. Stampede Reservoir, like for any other demands like M&I and agriculture, was used for the purpose of fish, so therefore Stampede Reservoir actually stayed fairly low, closer to 70,000.

When the opportunity came up, based on 1995 being a wet year, therefore it did store as much as 150,000 acre feet. But the fact of the matter is that after that we went through the wet years, and as I said, late '90s, and Stampede was relatively full. Then we began to go into dry period in 2000, early 2000, then

the Stampede water was used.

So all of these waters being stored in Stampede then gets released then goes to Pyramid Lake. So on average, Pyramid Lake would get the same amount of water whether it goes in one time or it goes over a period of time, at least a portion of it from Stampede and Prosser Creek Reservoir.

MR. VAN ZANDT: Now, Mr. Shahroody, you testified extensively about the cui-ui and the Lahontan cutthroat trout. You are not a biologist, are you?

MR. SHAHROODY: No, I'm not a biologist. I just basically know what they tell me as far as the timing, the flow regimes, what kind of flows they need and how the cui-ui would actually act or react in terms of temperatures and other things.

To answer your question, I'm not at all a biologist; I don't claim to be one.

MR. VAN ZANDT: So somebody else told you what you testified about yesterday with regard to the cui-ui and the Lahontan cutthroat trout, right?

MR. SHAHROODY: Well, I've been exposed enough, but at the same time there is an interdisciplinary team between Pyramid Lake Tribe, United States Fish and Water Service, Bureau of Reclamation, Bureau of Indian Affairs. And we meet once a month to plan, and there

are biologists there from all sides, and of course the Bureau is there because the Bureau is reservoirs. And basically I get directions how to manage the flow for the purpose of fish. So that's my role.

MR. VAN ZANDT: You were testifying yesterday about Marble Bluff Dam. That dam actually provides a barrier to fish migration from the lake, doesn't it?

MR. SHAHROODY: It does provide a hard barrier as opposed to -- without it, it would be a soft barrier.

MR. VAN ZANDT: And you testified that a new lock system was built in actually to actually move the fish past the dam, right?

MR. SHAHROODY: It's a trap. As I said, trap and truck without a truck. And then of course there is a lock system -- similar approach, yes -- to lift, to trap the fish as they come in to the Marble Bluff Dam because you can't go anymore before they go into a set of locks. And then of course once they're there, they're lifted, and then they're moved over to upstream of the Marble Bluff Dam.

MR. VAN ZANDT: Also upstream from there is the Indian Ditch Diversion structure; isn't that right?

MR. SHAHROODY: It's quite a bit upstream. There is Nixon, or Indian Ditch if you want to call it. That's about, I would say, about 4 miles upstream.

MR. VAN ZANDT: 4 miles upstream?

MR. SHAHROODY: Yes.

MR. VAN ZANDT: And that structure also provides a barrier to fish passage, doesn't it?

MR. SHAHROODY: That structure also provides barrier, and there is a fish ladder there. And in fact, the Tribe has been working on that barrier to -- in fact, extensively studying it to modify or possibly remove, to remove that so there would be 100 percent passage instead of using the United States Fish and Wildlife service ladder.

MR. VAN ZANDT: So the Indian Ditch or the ditch near Nixon, that is the main diversion structure for the Pyramid Lake reservation lands that are irrigated; isn't that right?

MR. SHAHROODY: Well, it's one of them. There are two other ones upstream. If you refer that this is bigger than those, yes.

MR. VAN ZANDT: Thank you.

You also testified yesterday about the case of the Tribe v. Morton and the establishment of the OCAP in 1973 by court order.

Mr. Shahroody, isn't it true that the Bureau of Reclamation, United States Bureau of Reclamation, issued a report in 1976 stating that only 47,000 acres could be

irrigated with the 288,129 acre feet of water that was allowed to be diverted under the 1973 OCAP?

MR. SHAHROODY: I don't recall as I'm sitting here right now.

MR. VAN ZANDT: You attended the recoupment trial?

MR. SHAHROODY: I did. Are you referring to a document so-called referred to as a draft environmental document which wasn't officially released? Is that what you're referring to?

MR. VAN ZANDT: No, I'm not. I'm talking about a technical memorandum prepared by the Bureau of Reclamation in support of an Environmental Impact Statement.

MR. SHAHROODY: Recoupment was in 2002, and I'd have to check my notes.

MR. VAN ZANDT: Isn't it true, Mr. Shahroody, there were 70,000 acres of contracted water rights in the Newlands Project?

MR. SHAHROODY: That's correct.

MR. VAN ZANDT: And about 59,000 or so were actually irrigated, right?

MR. SHAHROODY: Yes.

MR. VAN ZANDT: Now, since you mentioned Tribe v. Morton, I was kind of surprised that you didn't

mention the case of Nevada vs. U.S. You're familiar with that case?

MR. SHAHROODY: I am.

MR. VAN ZANDT: So isn't it true that that case was an attempt by the United States to reallocate Claim 3 water away from the Newlands Project to Pyramid Lake?

MR. SHAHROODY: Well, I don't know reallocate; of course, I'm not a lawyer. From my understanding, the United States and Pyramid Tribe were attempting to re-adjudicate and have claims of water for fish instead of just a limited amount for agriculture for the Tribe.

MR. VAN ZANDT: And the point of that was that the United States was trying to get a modification to the Orr Ditch Decree to change the amount of water that could be delivered to Pyramid Lake under Claims 1 and 2, right?

MR. SHAHROODY: In terms of fish, that's -- again I'm not a lawyer. That's what I understand.

MR. VAN ZANDT: But that case ultimately was decided by the United States Supreme Court in favor of the water right owners of the Newlands Project, wasn't it?

MR. SHAHROODY: It was decided by United States Supreme Court in terms of protecting the water rights of

the farms and the farmers within the Newlands Project, but did not affect the Claim 3 conditions which basically states that the United States has the right to control, to dispose and manage the water diversion so long as those water rights are satisfied. And that's one of the reasons you have OCAP, to manage the efficiency, the timing, but to make sure that water rights are delivered.

MR. VAN ZANDT: Mr. Shahroody, you keep expanding the answers far beyond my question. I would like the board members to instruct you not to do that, because you should be answering the questions I ask you.

MR. PALMER: I think he should be allowed to expand in order to properly explain his answer. The questions are aimed at getting the full picture.

CO-HEARING OFFICER DODUC: Well, I'll ask Mr. Van Zandt to keep his questions very focused, and I'll ask the witness to keep his answers very focused.

MR. VAN ZANDT: Mr. Shahroody, how much water was adjudicated in favor of Pyramid Lake Tribe in the Orr Ditch Decree?

MR. SHAHROODY: The total amount of the Claim 1 and 2 adds up to be about 30,000 acre feet.

MR. VAN ZANDT: Now, you mentioned also in your written testimony, I don't think we talked about it

yesterday, but it's at page 39 of your written statement, the Carson-Truckee Water Conservancy case.

Do you recall that.

MR. SHAHROODY: I have to take a look at it. I have it here.

MR. VAN ZANDT: That case allowed the Secretary of Interior to use Stampede Reservoir for the protection of the fish in Pyramid Lake, right?

MR. SHAHROODY: Correct.

MR. VAN ZANDT: Now, the application that's now before the Board, under that application other parties will be able to store water in Stampede Reservoir including Truckee Meadows Water Authority, City of Fernley, the Washoe Conservancy District. And I think Mrs. Phillips told us that it was about 7500 acre feet of emergency water that TMWA will have in the bottom of Stampede.

Doesn't that storage by these other entities take up space in Stampede that should be dedicated for fish?

MR. SHAHROODY: To the extent there is empty space, for one, they would be storing in that empty space, and also to the extent there was an agreement between the Sierra Pacific Power Company and TMWA and the Pyramid Lake to provide that 75,500 acre feet.

But most all of them they would be occupying empty space. And to the extent that the project water under this permit would be available to store, those waters would be junior.

MR. VAN ZANDT: So are you saying that these other entities will only be able to credit store water if the United States is not able to store the 126,000 under the current permit and on top of that the 100,000 acre feet -- 100,500 acre feet of new appropriation?

MR. SHAHROODY: I don't know if the TROA has been structured in that fashion. Basically, the Pyramid Lake water -- well, let me say basically the water that will be stored under the permit, that would be the first water to be there. And also, based on the applications made to this Board, additional water is to be stored, of course.

This is, again, diversion to storage. 126,000 acre feet of diversion to storage annually under the present permit. To the extent that there's space available and the 126,000 acre feet per year has been exercised and there is additional water coming in that would otherwise -- I'm not expanding my answer to you, but I'm trying to explain -- that additional water coming in which otherwise would be going to Pyramid Lake, that would be the subject of a decision by this

Board to store that water for the purpose of fish, which you referred to as fish credit water.

Now the other rights, as I said, with the exceptions, would be junior, and those rights then have to vacate.

MR. VAN ZANDT: And that's despite whatever priority they have under the Orr Ditch Decree, right?

MR. SHAHROODY: Well, it's not a matter of priority because the priority is you store the water in their own reservoirs. And after that, like for instance Independence or other reservoir, they would be bringing their water to store there because the space is available.

But now if hydrologically water is available to meet the project requirements and also, as I said, 126,000 every year, plus fish credit water under the TROA to be stored there, those waters have to go out.

MR. VAN ZANDT: So the effect of this --

MR. SHAHROODY: Which is, I'm sorry, consistent with the decision on the Stampede.

MR. VAN ZANDT: Appreciate that. The effect of that, as you described it, means that the fish water and fish credit water that's being stored in Stampede now has the highest priority on the river, right?

MR. SHAHROODY: It does with few exceptions.

You have to read the TROA in that respect.

MR. VAN ZANDT: Thank you.

So I was curious. If you look at application 31487.

MR. SHAHROODY: I don't have it.

MR. VAN ZANDT: We'll get the exhibit number for you. It's one of those State Water Resources Board exhibits.

So this is the application to appropriate water for Stampede Reservoir 31487, right?

MR. SHAHROODY: That is correct.

MR. VAN ZANDT: Does anybody know what the exhibit number is for this?

MR. SHAHROODY: I don't have the exhibit number.

MR. PALMER: By the chart I have from the state board, 31487 is State Board Exhibit 5.

MR. VAN ZANDT: That's right. Thank you.

So page 1 of this exhibit, applicant is the U.S. Department of the Interior.

MR. SHAHROODY: Correct.

MR. VAN ZANDT: And then when you go over to the next page, the indication is that this is going to be a companion to a previous right under application 15673. That's the one for the 126,000, right?

MR. SHAHROODY: That's correct.

MR. VAN ZANDT: And then it says that there's a maximum area to be irrigated in any one year, 96,800 acres?

MR. SHAHROODY: That's correct.

MR. VAN ZANDT: Now, what I want to turn your attention to is the justification for the amount. This was for the 100,500 acre feet of additional water that's being applied for here, and that's under paragraph 5.

The pages are not numbered, unfortunately. It's on the fourth page. Do you see that paragraph.

MR. SHAHROODY: And you're talking about the application which was filed for the Stampede?

MR. VAN ZANDT: Yes.

MR. SHAHROODY: I see the justification, paragraph number 5.

MR. VAN ZANDT: So here the justification is increase in the municipal and industrial drought water supply for Reno and Sparks, City of Fernley and the Truckee River Basin in California, right?

MR. SHAHROODY: Right.

MR. VAN ZANDT: And enhance conditions for cui-ui and Lahontan cutthroat trout, correct?

MR. SHAHROODY: That's right.

MR. VAN ZANDT: And reduce stream flow

variability, enhance seasonal stream flows and water quality, and maintain reservoir storage levels to better serve recreational uses. Do you see that?

MR. SHAHROODY: I see that.

MR. VAN ZANDT: So the water that's being appropriated here is not exclusively for the benefit of Pyramid Lake fisheries, right?

MR. SHAHROODY: Well, again, as it was explained before, this is to provide for the uses in terms of water would be stored and diverted in other locations, so therefore it would cover all of the possibilities.

MR. VAN ZANDT: To your knowledge, Mr. Shahroody, has the Secretary of Interior changed his position with regard to the use of Stampede Reservoir in support of Pyramid Lake and its fisheries?

MR. SHAHROODY: Not that I know of.

MR. VAN ZANDT: Now, part of the justification that's on the second page of the application under the printed justification was that 96,800 acres that I mentioned before -- do you have an understanding where that 96,800 acres is?

MR. SHAHROODY: My understanding is that it includes -- that basically comes from, I believe, the original application also. That includes the Truckee

Meadows lands and also lands in Lower Truckee and also lands in Newlands Project.

And also bear in mind under OCAP, of course -- again, I'm not trying to expand my testimony -- there is a provision for storage of Newlands Project water in Stampede, and the same thing under TROA. So in order to do that, therefore, if the Newlands Project got stored in available space in the Stampede and then got shipped to Newlands, therefore that would be covered.

MR. VAN ZANDT: The narrative that's included doesn't mention irrigation. It's just the mere putting of the number in, right?

MR. SHAHROODY: Somebody dropped the ball there.

MR. VAN ZANDT: Do you have an understanding of what the breakdown of the 96,800 acres is between Newlands Project and the Truckee Meadows?

MR. SHAHROODY: Well, as we talked yesterday, the Newlands Project maximum irrigated, Mr. Rieker testified, would be 2,200 acres in Truckee Division which directly gets its water from Truckee, and about 56,000 or 57,000 in Carson Division. So that's about 60,000 acres there.

And I assume there are some few thousand acres left still in Truckee Meadows before they are converted

for M&I uses. And there is also some acreage in Pyramid Lake area.

But if you add them up, of course, it's not going to come to 96,800. I assume this is more of taking the old number and putting it here.

MR. VAN ZANDT: This is in the records of the Board, but isn't it true that the breakdown is 26,800 acres in the Truckee Meadows and 70,000 acres in the Newlands Project?

MR. SHAHROODY: I think you have 26,000 acres of irrigated lands in Truckee Meadows.

MR. VAN ZANDT: Well, that wasn't the question. That's what I'm saying is on the permit.

MR. SHAHROODY: Well, I agree with you.

MR. VAN ZANDT: Thank you.

MR. VAN ZANDT: Mr. Mahin, good morning. How are you.

MR. MAHIN: Good morning.

MR. VAN ZANDT: The petitions for change that are before the Board today, there is an added new purpose for water quality; isn't that correct?

MR. MAHIN: I'm not certain whether it was water quality or wildlife.

MR. VAN ZANDT: Well, we can take a look at one of the permits, but I'll just represent to you that

actually the term water quality is used in the application as a new use, beneficial use for water in these change applications.

So based on that and your understanding of what's going to happen with the water quality settlement agreement water, the water can be exchanged, that water can be exchanged in the four upstream reservoirs that are before the Board today, correct?

MR. MAHIN: That is my understanding.

MR. VAN ZANDT: So that includes Boca, Stampede, Independence and Prosser, right?

MR. MAHIN: Yes.

MR. VAN ZANDT: Now, I was a little confused by your testimony yesterday. You gave a number for the total acreage, if I can find that here, total acre feet that's been purchased for water quality, 5,390 acre feet; is that right?

MR. MAHIN: Yes, that was my testimony yesterday.

MR. VAN ZANDT: I didn't see that number in your written testimony. I was trying to figure out where that number came from. Is that an updated number?

MR. MAHIN: I believe it was on page 7. Let me take a look here. It's in paragraph 15 on page 7. I simply added the numbers that were on lines 10 and 11.

MR. VAN ZANDT: So that's what the source of the 5,390 is?

MR. MAHIN: Correct.

MR. VAN ZANDT: And then when we go over to paragraph 18, the 4,535 acre feet of water, is that based on the consumptive use portion that's been transferred?

MR. MAHIN: There is a consumptive use portion adjustment that the State Engineers made on those water rights that were derived from the Truckee Meadows area and the Truckee River Basin itself but not from those on Claim 3. So it's a combination of consumptive use within the Truckee River Basin and the face value for those under Claim 3.

MR. VAN ZANDT: And do you know what the approximate percentage of reduction is for the waters that are limited to consumptive use?

MR. MAHIN: It's my understanding that it was 2-1/2 acre feet per acre was the consumptive use factor used by the State Engineer.

MR. VAN ZANDT: Okay. The 4,535 acre feet, you converted that to a flow rate of 25 cfs. So how many months will it take to consume 4,535 acre feet at 25 cfs?

MR. MAHIN: That was a four-month calculation

pursuant to the Orr Ditch Decree.

MR. VAN ZANDT: So that's based on what we call the 25 percent rule in the Orr Ditch Decree?

MR. MAHIN: Correct.

MR. VAN ZANDT: Isn't it true, Mr. Mahin, that the 25 percent rule is limited to irrigation water?

MR. MAHIN: That is not my understanding.

MR. VAN ZANDT: If we pull up Exhibit 7, please. Page 87, Mr. Lindsay, please.

Let's go back to where the narrative begins.

The second paragraph on the left there, Mr. Mahin, if you want to blow that up. It's magical.

CO-HEARING OFFICER DODUC: It's magical when the microphones work.

MR. VAN ZANDT: See that, Mr. Mahin:

> No owner, person or party entitled to the use of water under this decree shall be allowed to use for irrigation during any calendar month more than 25 percent of the quantity of direct water in acre feet hereby allowed for the land for the season.

So isn't it true that that 25 percent rule applies to irrigation water?

MR. MAHIN: It's my understanding there are two

different 25 percent rules in this narrative. This is one applying to irrigation. There is another -- and I don't recall which paragraph it's located in.

MR. VAN ZANDT: Well, let's look at page 88, second paragraph on the left, a little bit longer paragraph. It states:

> All users of water allowed by this decree a flow of less than one inch per acre for his, her or their respective lands may, with the consent of the Water Master or by his direction to the owners or person in charge of the ditch through which the water is conveyed, use when needed for the irrigation of his, her or their land, a larger flow than specifically allowed by this decree, up to and not exceeding one inch per acre, provided the amount of water used during any calendar year shall not exceed the seasonal acre feet allowance for the land, and that the flow allowed would not, if continuous, deliver in any one month in excess of 25 percent of the seasonal allowance in acre feet heretofore in this decree specifically allowed for said lands.

So, Mr. Mahin, isn't it true that under both of these paragraphs this 25 percent rule applies to irrigation?

MR. MAHIN: Not being a lawyer, I really couldn't say that with certainty. My experience is that the State Engineer has allowed a diversion rate that is related to the 25 percent when the water rights have been converted to wildlife purposes from irrigation. So not rendering a legal opinion about what the decree says, I know what the State Engineer has allowed.

MR. VAN ZANDT: Thank you.

Mr. Sarna.

MR. SARNA: Yes.

MR. VAN ZANDT: Good morning.

MR. SARNA: Good morning.

MR. VAN ZANDT: So I started to ask you this question and your counsel was very kindly enough to point out to me you would come back, so here you are. I appreciate that.

And we were asking you a question about the Truckee River Operating Model and its use in the analysis of benefits under the Environmental Impact Statement/Environmental Impact Report in support of these applications. And you indicated in your testimony that you didn't know of any new information that should

be brought to the attention of the Board regarding the Environmental Impact Statement or Report.

You are familiar with the Truckee River Operating Model, are you not?

MR. SARNA: Yes, I am.

MR. VAN ZANDT: And were you on one of the working teams or technical advisers that were working on the model?

MR. SARNA: I worked on the model during the negotiations and during the first EIS/EIR. I did not work on the model for the draft and final EIS/EIR that occurred in 2007 or 2008.

MR. VAN ZANDT: Let me show you TCID Exhibit 168, please.

This is a memo to the Cal-TROA team, TCID-168, and the subject is TROA derailment issue, Summary of initial operation studies from Rod Hall. And if we go to the last page, to the next to the last page of that document, it's -- all the way to the bottom if we could, Mr. Lindsay. Thank you.

It has your name and telephone number. Do you see that?

MR. SARNA: Yes, I do.

MR. VAN ZANDT: You are familiar with this document, are you?

MR. SARNA: I believe I wrote this document, yes.

MR. VAN ZANDT: So here in the middle of the first page there is the paragraph that begins: First Rod generated these model runs. Do you see that?

MR. SARNA: Yes, I do.

MR. VAN ZANDT: And it was your conclusion from -- excuse me, who is Rod?

MR. SARNA: It's Rod Hall was the person. He was a modeler who worked with the -- I believe he was a private consultant who worked for the U.S. Bureau of Reclamation.

MR. VAN ZANDT: Was he the primary architect of the Truckee River Operating Model?

MR. SARNA: No, I think Al Olson was the primary architect of it back in the 1980s or '90s and Rod Hall took the model that Al Olson put together and he helped, assisted people and ran studies during negotiations for them so that the negotiators could look at the model and figure out what was appropriate for each team to negotiate.

MR. VAN ZANDT: How long did your involvement last with the modeling effort?

MR. SARNA: Probably from about -- I started studying the model probably when it first came on board

in 1993, and I continued until probably around the year 2000, and then I had staff -- I directed staff who looked at the model after that.

MR. VAN ZANDT: To your knowledge, did the Truckee River Operating Model change at all between the draft Environmental Impact Statement and the final?

MR. SARNA: The 2003 Environmental Impact Draft trial and the final?

MR. VAN ZANDT: Yes.

MR. SARNA: I don't know if it changed or not during that time. I had staff working on it. I don't recall any changes. I guess I wouldn't be surprised if there were changes. It may have been necessary to change the model, but I don't recall any changes specifically.

MR. VAN ZANDT: How about between the prior draft Environmental Impact Statement back in '98?

MR. SARNA: I'm certain it changed much since the prior Environmental Impact Statement because TROA changed, so they had to represent TROA.

MR. VAN ZANDT: I was intrigued by your statement in TCID Exhibit 168 commenting on an effort by Mr. Hall, and you say a few results are counter-intuitive and others seem erratic, and, in fact the group did come up with some explanations for these

trends that didn't seem too far-fetched.

So what did you mean by the results were counter-intuitive and others seemed erratic?

MR. SARNA: To put it in context we had just finished getting involved in a difficult negotiation session and we came out of that and realized that there were some changes we had to make to TROA. All the parties realized it.

And I and several other parties asked Rod -- or our team and several other parties asked Rod to give us some -- do a study, I guess you would call it a study. Which he ran a number of model runs. I don't even know if those model runs get in the EIS/EIR, if that code gets in the EIS/EIR, but he did a number of model runs that showed us different trends or different results. All the parties looked at those results.

And I looked at them. And we had asked him to do it fairly quickly because we needed to move on with the negotiations and figure out what direction to set within the negotiations. And to me that particular set of results didn't -- there was -- as I said, some results were counter-intuitive, I believe. The results seamed counter-intuitive at the time.

CO-HEARING OFFICER HOPPIN: Mr. Sarna, would you get a little bit closer to the microphone.

MR. SARNA: Sure. I'm sorry.

What we do -- if we found results that were counter-intuitive we would tell -- I would inform Rod about it and the other parties, and we would -- and Rod would in conjunction with the Bureau would look at the model results and he'd either see if there was a problem with the model runs in how the model runs were set up, and if so he would correct them. Or he would get back to us and say, well, it's really not counter-intuitive, this is what you're missing.

So those are usually the two outcomes. I don't know what happened after this set of model results. I made the statement, and probably I would assume one of those two options happened afterwards.

MR. VAN ZANDT: Do you know a gentleman named Bill Sikonia?

MR. SARNA: Yes, I do. I met him during the negotiations, yes.

MR. VAN ZANDT: And he is a USGS person?

MR. SARNA: Yes.

MR. VAN ZANDT: Do you know that he was severely critical of the Truckee River Operating Model?

MR. SARNA: Yes, I was told he was. Well, he told me he was critical of it.

MR. VAN ZANDT: Another gentleman, a Mr. -- I

think it was Bill Greer, worked for the Bureau of Reclamation. Do you know him?

MR. SARNA: No, I don't recall Bill Greer. I may have met him during the negotiations, but I don't recall him specifically.

MR. VAN ZANDT: How about Mr. Cartier?

MR. SARNA: Yes, Ken Cartier. I knew him during the negotiations.

MR. VAN ZANDT: He's USGS?

MR. SARNA: Yes, he was, as a matter of fact.

MR. VAN ZANDT: He was also critical to the model, wasn't he?

MR. SARNA: I don't know if -- I don't know if he was critical to the model or not. I think he wrote -- in the beginning he seemed fairly comfortable with it, but I really don't recall him being -- well, I saw a memo that he and Bill Sikonia put together, and jointly they seemed critical of the model. I don't remember Ken Cartier when I talked to him in person being particularly critical of it.

MR. VAN ZANDT: And how about Mr. Dale Robertson, do you know him?

MR. SARNA: I don't recall Dale Robertson.

CO-HEARING OFFICER DODUC: Mr. Van Zandt, you've run out of time for cross. Please close up your

examination.

MR. VAN ZANDT: I'm wrapping up. This is it.

CO-HEARING OFFICER DODUC: Thank you.

MR. VAN ZANDT: So, Mr. Sarna, when you said that you had no information to present to the Board, do you know if any of the information about the issues with the model were revealed to the decision-makers in either the Department of Water Resources when they made their decisions on the EIR?

MR. SARNA: No, I don't recall any -- I don't recall discussing the model in particular when we had meetings to talk about the model, talk about TROA with the various decision-makers. I believe they looked upon us staff as having to evaluate TROA and making a determination as to what the benefits were and whether or not those benefits would be realized, and they trusted us to look at things in such detail as what was in the model.

MR. VAN ZANDT: And that benefits analysis was based at least in part on model runs, right?

MR. SARNA: In part, because mainly we used our professional judgment and our understanding of the Truckee River system.

MR. VAN ZANDT: Thank you. That's all I have.

CO-HEARING OFFICER DODUC: Thank you.

Mr. Mackedon?

MR. MACKEDON: Thank you. I'll try to be very quick.

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CROSS-EXAMINATION BY MR. MACKEDON

FOR THE CITY OF FALLON

--o0o--

MR. MACKEDON: Mr. Shahroody, it's true and we all know the fact that it's true that the trend for Pyramid Lake has been that of decline for centuries; isn't that true?

MR. SHAHROODY: I don't know any more information than I presented.

MR. MACKEDON: Well, we don't have dates prior to 1905, but we do know that there was a lake called the Great Lake Lahontan.

MR. SHAHROODY: Oh, you're talking about geologic times? Yes.

MR. MACKEDON: So when I say that it's likely that Pyramid Lake was declining for centuries without any manmade impoundments and diversions, that's true, is it not?

MR. SHAHROODY: That's true about the Lake Lahontan. I mean, the Great Lake Lahontan has declined and these are the remnants. These lakes are remnants of

the Lake Lahontan in the Great Basin.

MR. MACKEDON: Quickly here, your data shows that OCAP came into effect in 1967 and that there is a stabilizing trend from that point forward; is that correct?

MR. SHAHROODY: That's what the data shows.

MR. MACKEDON: You know and you understand that when the Newlands Project was created by the Federal Government, one of the components of the project and one of the considerations as a part of the invitation to the settlement within the project was that there would be electric power. You know that, don't you?

MR. SHAHROODY: I think that's part of the features of the Newlands Project.

MR. MACKEDON: As it was created by the Federal Government.

MR. SHAHROODY: Well, as I said, this is part of the features of the Newlands Project, and there are hydroelectric power plants at Lahontan Reservoir.

MR. MACKEDON: And prior to 1967 water was diverted into the Truckee Canal onto Lake Lahontan for the production of power during the winter months, isn't that true, when water was available?

MR. SHAHROODY: That is true.

MR. MACKEDON: And the United States government

discontinued that practice in 1967?

MR. SHAHROODY: Did as a part of the 1967 OCAP and on.

MR. MACKEDON: And to your knowledge was there any compensation paid to any of the owners of water within the project for that loss of winter power revenues?

MR. SHAHROODY: I'm not aware of it.

MR. MACKEDON: Then in addition to that fact we have the fact that the Boca was constructed in the 1930s; is that right?

MR. SHAHROODY: Correct.

MR. MACKEDON: And that's an impoundment of water that would impact flows to Pyramid Lake at the time, correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: And following that there is the Washoe Project in the '60s?

MR. SHAHROODY: The Washoe Project of Prosser Creek Reservoir was constructed -- that was constructed first, then the Stampede Reservoir, but those are not supposed to or they do not impact Pyramid Lake.

MR. MACKEDON: Well, the Tribe has argued that they have been operated in a way that impacts Pyramid Lake after their creation, right?

MR. SHAHROODY: Well, if they were contracted since under the Washoe Project, if they were contracted for the purpose of municipal and agricultural, would have. That was the purpose of the litigation that was made on the Stampede case, which then the judge basically exclusively allocated the water from the Stampede to flow to Pyramid Lake for the purpose of fish.

MR. MACKEDON: The Marble Bluff Dam was constructed for the purpose, initial purpose of benefitting Lahontan cutthroat trout, correct?

MR. SHAHROODY: The purpose was to stabilize the degradation in the river, because degradation was so severe and making the slope of the river so steep it was difficult for even cutthroat, which is stronger than cui-ui, to go upstream. To that extent, yes.

MR. MACKEDON: And the dam proved to be detrimental to the cui-ui?

MR. SHAHROODY: Well, as I said before, it's a barrier, and before that we have a soft barrier.

MR. MACKEDON: And it was after that that the cui-ui was classified as a danger, is that right?

MR. SHAHROODY: Dates are in my testimony, and I assume, yes.

MR. MACKEDON: Is it your position today that

the Pyramid Lake Tribe has a right to store water in Stampede Reservoir under the present permit conditions for the unappropriatd water or the remaining water at Truckee River that the Tribe appropriated without approval or further approval by the Nevada State Engineer?

MR. SHAHROODY: You're referring to the existing permit in the Stampede Reservoir?

MR. MACKEDON: You have made reference to the existing permit. You say this unappropriated water is stored pursuant to the present permit conditions, if I understand you.

MR. SHAHROODY: That is correct. That emanates from the Judge Solomon's decision on the Stampede Reservoir which instructs the Secretary of Interior that dedicate the Stampede Reservoir water under its permit in California, and to be used for the purpose of fish, and it's not necessary to get permission from the State of Nevada for that.

MR. MACKEDON: What is the date of Judge Solomon's decision?

MR. SHAHROODY: I believe it was 1982.

MR. MACKEDON: Are you aware of the fact that the attorneys for the Pyramid Lake Tribe have argued to Nevada courts that no water would be stored under those

permits because no approval had been given by the State Engineer until approval was obtained? Are you aware of that?

MR. SHAHROODY: I'm not aware of that.

MR. MACKEDON: You're not aware of the fact that the Tribe's attorneys argued successfully that the court should not consider storage as a part of the court's consideration, the impact of the unappropriated waters, because storage would be considered by the State Engineer at a later time?

MR. SHAHROODY: See, you are getting into the legal situation, and I'm not set up to be able to answer that.

MR. MACKEDON: Thank you.

Quickly, Mr. Mahin, you testified yesterday, if I'm correct, that according to your information and recollection that the Truckee River was dry in 1992 and 1994 at a point, let's say, just below Reno near Sparks. Is that correct?

MR. MAHIN: Yes, I did. I actually observed that physically myself.

MR. MACKEDON: I did too. And the only water that was flowing that might be flowing in the river below that point issued from the wastewater treatment plant at Vista, which is a point below Reno and Sparks,

and that plant serves as a sewer discharge for those communities, correct?

MR. MAHIN: That was the major source of water downstream of the point where it was dry.

MR. MACKEDON: So the Newlands Project at that point could not have been diverting or causing impacts negative to any party upstream during that period of time?

MR. MAHIN: That is my understanding, that the dry river at the point just east of Reno could not have been caused in any way by the Newlands Project, nor -- but a dry condition below Derby Dam if it existed at the time, and I have not reviewed the record, might have been caused by the Newlands Project.

MR. MACKEDON: The Newlands Project could not have been responsible for the water quality or the degradation of water quality in terms of temperature and the other aspects that you testified to at that point of discharge; that is, at the Vista treatment plant, correct?

MR. MAHIN: Not upstream of Derby Dam.

MR. MACKEDON: Now, the solution to the problem was what you've referred to as the water quality agreement, correct?

MR. MAHIN: Correct.

MR. MACKEDON: Today is the first time I heard that, I think, characterized correctly as an augmentation of water. And what do you mean by augmentation?

MR. MAHIN: By securing water rights that would have been otherwise used for other beneficial purposes to leave them in the river so they may flow to Pyramid Lake.

MR. MACKEDON: Now the problems caused were the results of the degradation of those waters by users above the Vista power plant, correct, or water sewage plant?

MR. MAHIN: The water quality problem that was the issue of litigation was temperature and dissolved oxygen both of which -- well, temperature is directly related to the lack of water in the river. That lack of water in the river in years other than '92 and '94 is largely caused by the diversion of large quantities of water at Derby Dam. The dissolved oxygen is an outcome of having high temperatures. So the dissolved oxygen declines with higher temperature.

MR. MACKEDON: The diversions of Derby Dam are no different from the diversions to the Steamboat Ditch which serves Reno except that the return flows from the Steamboat Ditch would go back to the Truckee River; the

return flows in the Newlands Project would go to the Stillwater Wetlands and other wetlands. That's the only difference.

MR. MAHIN: There is a significant difference. Steamboat Ditch only diverts a few percent of the Truckee River whereas the Derby Dam can divert at times 90 to 100 percent.

MR. MACKEDON: I can see the Steamboat ditch is much smaller than the Truckee Canal. Steamboat ditch is one of many diversions that serves the Reno/Sparks. How much does Reno/Sparks or TMWA divert from the Truckee River to serve its users?

MR. MAHIN: I believe you heard testimony yesterday that the demand was on the order of 80,000 acre feet.

MR. MACKEDON: So that would almost be comparable to the diversions at Derby, correct?

MR. MAHIN: The timing is what is not comparable, because that 80,000 acre feet is spread out over the entire year, and it's not all diverted from the river. There's 10 to 15,000 that's diverted from groundwater.

MR. MACKEDON: That's because of recent suburbanization of the Truckee Meadows, correct?

MR. MAHIN: For TMWA it is urban water uses.

If you're referring to the remaining agriculture within the basin, I don't have a really good handle on what those numbers are at the moment. They have significantly declined over recent years due to urbanization.

MR. MACKEDON: Now, we looked at and you saw the charts that were shown that Mr. Shahroody had prepared which showed a decline in the level of Pyramid Lake. You saw that?

MR. MAHIN: Yes, I have.

MR. MACKEDON: And you go back to, say, the 1950s, during that period of time Truckee Meadows was using its water to irrigate predominantly, right?

MR. MAHIN: The agricultural rights in the Truckee Meadows at that point in time were largely in irrigation.

MR. MACKEDON: And had a season of use that wasn't incompatible with the Newlands Project, correct?

MR. MAHIN: I don't know whether you could say it's not incompatible, because its season of use or its use pattern would coincide with the Truckee Division. So if you're dismissing the Truckee Division as not existing or not being at the same time, I guess you might be able to say that.

But they're concurrent irrigation demands,

because there were similar crops, and the Newlands Project has a significantly more recent priority date than the Truckee Meadows rights. So at times in the '50s when irrigation was taking place in the Truckee Meadows, it could potentially be interfering with the Truckee Division of the Newlands Project.

MR. MACKEDON: Thank you. You misunderstand the point I'm attempting to make through your questions. I don't mean to dismiss the Truckee Division nor the Truckee Meadows; I'm trying to include them as a matter of perspective and associate them with the diversions that the United States Government created for the benefit of the Newlands Project. But thank you for the answer.

The solution to the problem that you faced or the solution provided by the Water Quality Agreement is to augment the water supply for the benefit of Reno/Sparks, TMWA really, so that Reno/Sparks could and has the possibility now of the full build-out to 119,000 acre feet as potential drought protection. Isn't that true?

MR. MAHIN: I'm not sure I understood your question. Are you asking the purpose of the water quality water or the purpose of the overall TMWA? TMWA involvement with TROA -- I mean, we've got two things

here. And I'm not sure what you're asking.

MR. MACKEDON: I'm trying to be brief, perhaps too brief.

The consequences here of the Water Quality Agreement is that you sacrifice or take water from a portion of the Newlands Project and put that water in the river, correct?

MR. MAHIN: It takes water from wherever we could find willing sellers. So we were purchasing water in the Truckee Meadows, along the Truckee River. We purchased water from the vicinity of the Tracy Power Plant, from McCarran Ranch which is a significant purchase on the mainstem of the Truckee River. We purchased water down between Derby Dam and Wadsworth and the Indian reservation.

So there were purchases throughout the area of where the Truckee River water was utilized. So it was exclusive to the Newlands Project.

MR. MACKEDON: The authorization was to make those purchases from the Truckee Division of the Newlands Project to the extent possible, correct?

MR. MAHIN: There was no direction on that within the agreement. It was to buy water where available from willing sellers.

MR. MACKEDON: When you talk about willing

sellers, the owners of water within the Newlands Project were all at that time facing various -- subject to various lawsuits, some which were brought by the Federal Government itself; isn't that true?

MR. MAHIN: I'm not certain of the litigation history in that particular area. There were individuals who refused to sell, didn't want to sell in the Newlands Project. There were people in the Truckee Meadows and on the main stem of the Truckee River that were very willing to sell.

So I don't know that that was particularly a greater motivation than others. Money seemed to be the best motivator.

MR. MACKEDON: So you don't know whether the threat of litigation or the fact of litigation would impact the definition of what a willing seller would or would not be?

MR. MAHIN: It didn't seem to affect the willingness of individuals to sell. The greatest impact was receiving market value for their water when agriculture of their type was not particularly economically beneficial.

MR. MACKEDON: Thank you.

Mr. Sarna, I have a very brief question for you and then I can end my questions.

MR. SARNA: Yes, sir.

MR. MACKEDON: Good morning.

MR. SARNA: Good morning.

MR. MACKEDON: And I believe you are the correct witness to discuss this. I believe it was part of your direct testimony. If it's not, forgive me and we'll move on.

But you, among others, have testified that part of TROA's configuration is the movement of water between reservoir and for multiple purposes and for multiple parties which creates a more flexible operation of the river.

Is that part of your testimony and understanding?

MR. SARNA: Yes, it is.

MR. MACKEDON: Now, is it also true that this movement of water between reservoirs or among reservoirs is to occur without any formal transfer proceeding as movements occur in front of the State Engineer?

MR. SARNA: You mean outside of this proceeding? Because this proceeding --

MR. MACKEDON: Outside of this or any other proceeding.

MR. SARNA: For some waters, yes; for other waters, no. For Cal M&I credit water, every application

to create, establish Cal M&I credit water would have to go before this Board.

MR. MACKEDON: Go before this Board.

MR. SARNA: Yes.

MR. MACKEDON: And my concern relates to the Nevada State Engineer.

And I believe legislatively -- and Mr. DePaoli will know this better than me -- but that California has conceded some jurisdictions in Nevada regarding the law of the river in relation to TROA. But my concern is -- I'll give you an example that may be helpful. I hope that it is.

My example would be that if I'm a water right owner and I want to transfer for any length of time water that I own to another party or for another purpose, I need to go to the Nevada State Engineer and the Nevada law and make an application for that.

Is that what you understand to be the case?

MR. SARNA: I've been told that, but I'm familiar with California. I'm not familiar with what's required in Nevada.

MR. MACKEDON: Is it your understanding that these waterflows move between reservoirs for multiple purposes for multiple parties without the formalities that are normally associated with transfers or

associated with this type of activity, if we can call it that, required by the Nevada statutes?

MR. SARNA: Like I said, I'm not familiar with Nevada statues.

MR. MACKEDON: Let me look at my notes for one second.

CO-HEARING OFFICER DODUC: While he's doing that, a quick survey of the attorneys. Do you intend to redirect?

MR. DePAOLI: I do not.

CO-HEARING OFFICER DODUC: Mr. Palmer? Mr. Soderlund?

MR. PALMER: Yes, a few questions.

MR. MACKEDON: I have no more questions.

For absolute clarification, or what I think is clarification of the Tribe v. Morton decision, I would ask the Board to look at page 262, paragraph 4 of Joint Exhibit No. 8 regarding the effect of that decision upon Orr Ditch. So that Mr. Shahroody's interpretation is, I think, correct that this will make it clear.

I have no further questions. Thank you for the opportunity.

CO-HEARING OFFICER DODUC: Thank you, Mr. Mackedon.

With that, let's take a short ten-minute break

so everyone can stand up a little bit, and then we'll come back with redirect.

(Recess)

CO-HEARING OFFICER DODUC: Mr. Palmer, redirect?

MR. PALMER: Yes, thank you.

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REDIRECT EXAMINATION BY PALMER

FOR THE U.S. BUREAU OF RECLAMATION

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MR. PALMER: Mr. Shahroody, you were asked a question regarding Winnemucca Lake and whether that was in the proposed place of use for these petitions and applications. Do you know if it is or not?

MR. SHAHROODY: I don't know.

MR. PALMER: Well, we can refer to --

CO-HEARING OFFICER DODUC: Your microphone is not on.

MR. SHAHROODY: It's on. As I said, I don't know.

MR. PALMER: I believe you were asked questions regarding the purposes for what we've been calling the unappropriated water permit that the Tribe has with the Nevada State Engineer, and I believe that you described those in your direct testimony.

I just wanted to be sure that that was clear. What are the purposes for which the Tribe applied for the permit?

MR. SHAHROODY: The purposes of that are for Pyramid Lake, fishes for the lower Truckee River and for Pyramid Lake.

MR. PALMER: So it's for use in the Truckee River as well as for flows to Pyramid Lake?

MR. SHAHROODY: Correct.

MR. PALMER: I'd like to refer you back to the figure that Mr. Van Zandt spent a fair amount of time on. I believe that's Figure 6. It has the elevations of Pyramid Lake.

MR. SHAHROODY: Yes.

MR. PALMER: Can you tell me in your view, and tell us what it's based on, the primary cause of the decline of Pyramid Lake beginning in 1905?

MR. SHAHROODY: The primary cause of the decline is the diversions which were substantial, of course, over the period of time in the 20th Century by Newlands Project from the Truckee River through the Truckee Canal.

MR. PALMER: So Mr. Van Zandt asked you a question regarding the hydrograph, so it's my understanding you're saying that the natural hydrograph

condition doesn't account for all the drop in Pyramid Lake that we've seen since 1905?

MR. SHAHROODY: No, it does not, because the hydrology changes from one year to another year, but they continue to be compensating. The average are to stabilize, and that's pretty much shown for the period of, looking at '70s or '80s to present, and that's the kind of thing you would experience if you did not have diversions to Newlands Project as it was done historically.

MR. PALMER: And are you the only one that holds that opinion? Have you spoken to anybody else regarding this subject?

MR. VAN ZANDT: Objection; calls for hearsay.

CO-HEARING OFFICER DODUC: One at a time, please. Objection, Mr. Van Zandt?

MR. VAN ZANDT: He's calling for a hearsay answer.

CO-HEARING OFFICER DODUC: Our procedures allow for hearsay if it's relevant to the issues at hand, so the witness may answer.

MR. VAN ZANDT: If it's credible, I believe.

MR. SHAHROODY: There are publications in place, and in fact this chart comes from the Pyramid Lake Task Force of 1970, at least up to that date at

which they have data. The Task Force was formulated to basically look into how they can stabilize Pyramid Lake and the causes of it. And there are other publications by other consulting engineers, so it's consistent.

MR. PALMER: Have you yourself studied the stream flow records for the Truckee River as it relates to the diversions at Derby Dam and the water elevations at Pyramid Lake?

MR. SHAHROODY: Quite a bit.

MR. PALMER: And over what period of time have you been studying those records?

MR. GOETSCH: I have been studying, of course, the period of the record available since 1901, and for Truckee River and Pyramid Lake to the extent available. I've done quite a bit of analysis.

In fact, I wish I had brought that chart which I made the analysis by superimposing the present operations that we have, which is 1997 OCAP operations of the OCAP. If we superimposed -- and assume that you had 1997 OCAP in place in, let's say, 1910, and then run the hydrology, you would see, basically, 1910 fluctuating pretty much horizontally and going all the way to 2010. So you wouldn't have this drop.

MR. PALMER: I believe you were asked a question regarding diversion from the Truckee River for

the Newlands Project, and there were references made to the United States as originating that in 1905.

Who benefits from the diversions from the Truckee River at Derby Dam?

MR. SHAHROODY: Newlands Project and the farmers.

MR. PALMER: Has that been the case since 1905?

MR. SHAHROODY: Say that again.

MR. PALMER: Has that been the case since 1905?

MR. SHAHROODY: Yes, it has.

MR. PALMER: And just to make -- you were getting at it in your last answer, but some discussion was had regarding the effect of the OCAP on the elevation of Pyramid Lake, and I just want to be sure that I understood what you were saying there.

So did OCAP have an effect on the elevation of Pyramid Lake?

MR. SHAHROODY: Definitely.

MR. PALMER: And how did that affect flow in Pyramid Lake?

MR. SHAHROODY: As I said before, the average flow at the state line of the Truckee River is about 550,000 acre feet. So historically, the diversions to Truckee Canal prior to 1967, if you look at the records of the diversion to Truckee Canal, they averaged about

240,000 acre feet. So that by itself, of course, takes practically half of the water away. There are no return flows as such. The water goes to another basin completely.

So as a result of that, just to take simple math and water balance, therefore the flows into the Pyramid Lake -- granted, of course, there are some additional diversion upstream -- so the flow to the Pyramid Lake reduced significantly. That is from the period of the diversion of Truckee Canal to 1967.

MR. PALMER: And so once OCAP was put in place, did that end the decline of lake elevation in Pyramid Lake?

MR. SHAHROODY: Well, let's put it this way. The chart shows it did, but of course did not necessarily help to get the recovery. And that's one of the reason you have the situation in '70s and going to '80s until we have the final OCAP put in place in 1988 and we begin to see some effect. And then of course you have the 1997 OCAP put in place which then of course started helping.

MR. PALMER: And do you know whether diversions at Derby Dam since 1967 have always been in compliance with OCAP?

MR. VAN ZANDT: Objection. This is outside the

scope of the direct.

CO-HEARING OFFICER DODUC: Mr. Van Zandt, your objection is what?

MR. VAN ZANDT: This is outside the scope of my cross.

CO-HEARING OFFICER DODUC: Mr. Palmer, your response?

MR. PALMER: He was talking about the effects of what caused decline in Pyramid Lake and indicating it had nothing to do with the diversions by the Newlands Project at Derby Dam. So I'm exploring whether those diversions have had an impact on the lake level at Pyramid Lake.

CO-HEARING OFFICER DODUC: I will allow the question.

MR. SHAHROODY: No. After the 1973 court decision, Tribe v. Morton, the court instructed to promulgate the 1973 OCAP as directed by court, and TCID decided that they are not going to abide by it. And then, of course, the Secretary with a letter stated that to the extent that this is going to be litigated, and if you are taking any water above, more than the allowable diversion under the 1973 OCAP, that you have to pay it back.

And as a result of that, of course, this went

on without following the OCAP from 1973 all the way to 1984. And that is the result of what's referred to as recoupment. There is another litigation going on to pay that water back because of excessive diversion over and above the 1973 or any other OCAP in place.

MR. PALMER: There were some questions regarding the use of storage in Stampede, and I understand that the water stored in Stampede that's used for fish water, it has uses instream; is that right? Beneficial use for fish instream, is that part of the use of that stored water?

MR. SHAHROODY: It is.

MR. PALMER: And where does that water ultimately end up when it's used for those fish purposes instream?

MR. SHAHROODY: Used in California for the instream all the way in Truckee River and flows through the lower Truckee River, again instream flows, and then ends up in Pyramid Lake.

MR. PALMER: And for yourself, I think you said at the beginning, how many years have you been studying the Truckee River?

MR. SHAHROODY: I've been working on it, as I said, since 1979.

MR. PALMER: And how many of those years have

been involved in issues regarding the water needs, flow needs for the river for the cui-ui and the Lahontan cutthroat trout?

MR. SHAHROODY: I think that's occupied quite a bit of my time every year, and I would say continuously until present.

MR. PALMER: And during the course of those number of years, have you had occasion to speak with biologists and other experts regarding the fish needs on the river?

MR. SHAHROODY: Yes. And that's an integral part of working the lower river for the purpose of the list of the species, especially working with the Fish and Wildlife Service and the Tribe's fishery department, and to the extent it applies to the operation of the reservoir with the Bureau of Reclamation. And, of course, BIA has trust responsibility as well as, of course, the other governmental agencies working with BIA closely, too.

MR. PALMER: And that's where you gained your understanding of what the fish needs are in the Truckee River that you've applied your engineering skills to?

MR. SHAHROODY: Well, whether I like it or not, that's happened by osmosis.

MR. PALMER: There was a question from

Mr. Van Zandt regarding the purpose of Stampede Reservoir and whether that purpose has changed, and I just wanted to first refer you to joint exhibit -- Applicant's Joint Exhibit 16. That's public law 101-618, and if you could just take a moment to read -- I've highlighted the section in yellow just for ease. It's section 205 B on page 13 of that exhibit.

If you could read that for the Board and the record. Go ahead and read it out loud, please.

MR. SHAHROODY: The Secretary is authorized to use Washoe Project facilities, Truckee River Storage Project facilities and Lake Tahoe Dam and Reservoir for the storage of non-project water to fulfill the purposes of this title, including the Preliminary Settlement Agreement as modified by the Ratification Agreement and the Operating Agreement. The Secretary shall collect appropriate charges for such uses.

MR. PALMER: So the reference in that section you just read to operating agreement, what is that?

MR. SHAHROODY: That's referred to as TROA.

MR. PALMER: So your understanding is that the Secretary is now authorized, it is your understanding,

to operate these reservoirs, including Stampede, for the purposes of TROA?

MR. SHAHROODY: That's my understanding.

MR. PALMER: Are you aware that the Secretary of the Interior has signed the TROA?

MR. SHAHROODY: Yes.

MR. PALMER: And next I'd like to refer you to the Stampede permit. I have my own copy here that I would refer the witness to. It is State Board Exhibit -- let me get the number here -- for application 15673 for Stampede filed on January 7, 1954, and that's State Board Exhibit 3. And this is just a copy of the permit.

Will you just identify that what I'm handing you is, in fact, a copy of the permit for application 15673?

MR. SHAHROODY: Yes, it is application number 15673 filed January 7, 1954.

MR. PALMER: I just wanted to clarify something that Mr. Van Zandt asked that the witness wasn't from his memory able to, and if you would turn to page 2 of that under the section titled Description of Proposed Use, and the first item there, I believe it's paragraph 11, place of use, and could you just tell us where the irrigated acres are to be located under this

permit?

MR. SHAHROODY: On the place of use it says Truckee Meadows gross acreage 36,340, and net acreage 26,800, and then it says within the township, and it cites the township and ranges. And then Newlands Project gross acreage 107,140. I assume that's acres. Net acres, 70,000. And then it gives township and ranges.

MR. PALMER: Then further down in paragraph 13 it says irrigation use, and it says the area to be irrigated is 96,800 acres. And I think that's the acreage number you were discussing with Mr. Van Zandt?

MR. SHAHROODY: That is correct.

MR. PALMER: And that's the same acreage number that's in the current change petitions before the Board?

MR. SHAHROODY: That is correct.

MR. PALMER: Thank you.

Mr. Van Zandt asked you a couple of questions regarding the U.S. Supreme Court case Nevada v. United States, and I just wanted to clarify. What is the priority date, if you know, of Claims 1 and 2 in the Orr Ditch Decree?

MR. SHAHROODY: I believe it's 1857 or '56.

MR. PALMER: What's the priority date of Claim 3?

MR. SHAHROODY: 1903.

MR. PALMER: In your view is Claim 3 a junior claim under the Orr Ditch Decree?

MR. SHAHROODY: Yes, it is.

MR. PALMER: That's all I have for Mr. Shahroody. Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Palmer.

Before we move on, though, Mr. Van Zandt did have an objection to one of your questions as hearsay and I did rule on it, but I also asked Ms. Mahaney to provide some clarification and perhaps a follow-up question.

SENIOR STAFF COUNSEL MAHANEY: As Ms. Doduc correctly noted, hearsay is admissible in State Water Board proceedings but by itself shall not sustain a finding unless otherwise admissible in a civil proceeding. So we wanted to give you, Mr. Palmer, an opportunity to address Mr. Van Zandt's hearsay objection.

MR. PALMER: I don't even know if I remember what it was he was objecting to. I think it was because I asked Mr. Shahroody if he was aware that other experts held a similar opinion as his regarding Pyramid Lake.

And I was asking him from his knowledge. He

has 30 years of experience meeting with a variety of experts, and he would know whether some of those experts had expressed a similar opinion to him, and that was the basis of the statement.

CO-HEARING OFFICER DODUC: Thank you very much, Mr. Palmer.

Mr. Van Zandt, we have noted your objection and we'll consider your objection in determining the weight of the evidence.

And with that, Mr. DePaoli, I believe you said you did not have redirect?

MR. DePAOLI: I do not have redirect.

CO-HEARING OFFICER DODUC: So then Mr. Soderlund.

MR. SODERLUND: Thank you.

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REDIRECT BY MR. SODERLUND

FOR CALIFORNIA DEPARTMENT OF WATER RESOURCES

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MR. SODERLUND: Mr. Sarna, in the cross-examination you referred to, I believe, TCID Exhibit 168 which was a memo that you stated was written by you, and in that memo you used the word counter-intuitive.

And my question is: In general, when assessing

model outputs or runs and whether they were intuitive or counter-intuitive, what was your intuition based on?

MR. SARNA: My intuition was based on a review of the model results and comparing them to my knowledge, my professional knowledge of the operations and what to expect.

MR. SODERLUND: Mr. Sarna, was a final EIR, an actual copy of a final EIR/EIS for the TROA provided to the California Secretary for Resources?

MR. SARNA: Yes, it was.

MR. SODERLUND: And did that final EIR/EIS include comments from the public?

MR. SARNA: Yes, it did.

MR. SODERLUND: And in those comments was the model, the TROA operations model discussed?

MR. SARNA: Yes, there were comments on the TROA operations model.

MR. SODERLUND: And did the final EIR/EIS include responses to those comments?

MR. SARNA: Yes, it did.

MR. SODERLUND: And after the Secretary for Resources was provided a copy of the final EIR/EIS, did he certify that document?

MR. SARNA: Yes, he certified it in September 2008.

MR. SODERLUND: Thank you. No further questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. Soderlund.

Mr. Van Zandt, recross?

MR. VAN ZANDT: Thank you, just a few questions here.

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RECROSS-EXAMINATION BY MR. VAN ZANDT
FOR TRUCKEE CARSON IRRIGATION DISTRICT
and CHURCHILL COUNTY

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MR. VAN ZANDT: I want to understand your testimony, Mr. Shahroody. On redirect here you are saying that if there were no diversions from the Truckee River at Derby Dam to the Newlands Project, that Pyramid Lake would essentially have sustained itself at the 3870 level, or thereabouts, for the entire time period we're talking about?

MR. SHAHROODY: I'm sorry. I didn't say that.

MR. VAN ZANDT: Well, I think you referred to a squiggly line would go across the top of the chart, right?

MR. SHAHROODY: I did not say in terms of no diversion. I said if you superimposed the 1997 OCAP as

if you had it in place in 1910 with some magic, and the 1997 operating criteria would have been in place, then the Pyramid Lake level would have stayed about 3870 going horizontally, except reacting pretty much to hydrologic changes. That's what I said.

MR. VAN ZANDT: And you say you have done that analysis?

MR. SHAHROODY: I have.

MR. VAN ZANDT: But you did not produce that in this hearing, did you?

MR. SHAHROODY: I just didn't want to add more material, but I'd be more than glad to submit it to this Board.

MR. VAN ZANDT: Now, isn't it true, Mr. Shahroody, that water that is diverted at Derby Dam includes some of what we call headwaters or waters to provide pressure to move the water down the canal that's spilled back into the river at Gilpin Spill?

MR. SHAHROODY: They -- when I say they, TCID takes more than OCAP allowed at Derby Dam itself, but then it is returned, a certain amount of it, at the Gilpin Spillway, because then OCAP requirements are measured just a few feet downstream by USGS gauge.

So, therefore, it would have the extra water taken -- and I'm not sure about the head -- and then the

requirement is that to look at the USGS gauge, and if the OCAP says, let's say, take 300 cfs, even if they're taking 400 at the Derby Dam, they would have to return 100 cfs back to the river.

And it is the matter of that gauge, that USGS gauge, and Bureau of Reclamation actually regulates the diversion by that USGS gauge past the Gilpin Spillway.

So to answer your question, there are some extra water taken. I'm not sure if it's because of the head or it's just because of the operator. Maybe it's comfortable for him to take a little bit more water so to make sure that uniform flow as allowed by OCAP would pass the USGS gauge on the canal downstream.

MR. VAN ZANDT: I was interested in the language that you read from public law 101-618, and this is joint Exhibit 18 under 205 B, and it indicates that the Secretary is authorized to use the Washoe Project facilities.

So when you told me previously on cross that you didn't believe the Secretary had changed his authorization, that was incorrect, is that what you're saying?

MR. SHAHROODY: Would you say that again.

MR. VAN ZANDT: Well, I asked you whether the Secretary had changed the authorization for Stampede

Reservoir for use for Pyramid Lake fisheries, and your answer was no, to your knowledge he had not, right?

MR. SHAHROODY: That is correct, that's what I said.

MR. VAN ZANDT: Right. But now that you've read to 205 B section, you're changing that testimony?

MR. SHAHROODY: No, I'm not changing. This is for the purpose of -- my earlier statement was for the purpose of fish, and this is for the purpose of using those facilities for operating agreement.

MR. VAN ZANDT: So the question was whether or not -- if there was a need to have the entire amount, 226,500 acre feet of storage in Stampede Reservoir dedicated for either fish water or fish credit water, that there would be no opportunity for the other TROA parties to store credit water in Stampede; isn't that correct?

MR. SHAHROODY: Well, with the exceptions I indicated, that is correct.

MR. VAN ZANDT: So under that case then the entire amount of Stampede Reservoir would be dedicated for fisheries?

MR. SHAHROODY: That is correct, and that's the way it is written in TROA.

MR. VAN ZANDT: And I wanted to make sure that

the record was clear. The State Board Exhibit 3, which is the permit for Stampede, 15673, it lists 26,800 acres in the Truckee Meadows, right?

MR. SHAHROODY: You mean the original application?

MR. VAN ZANDT: This is the permit.

MR. SHAHROODY: The permit application based on original filing, is that what you're referring to?

MR. VAN ZANDT: Yes.

MR. SHAHROODY: Yes.

MR. VAN ZANDT: And then 75,000 acres for the Newlands Project.

MR. SHAHROODY: Correct.

MR. VAN ZANDT: And that continues in the application to appropriate additional water that is before the Board here, right?

MR. SHAHROODY: That is correct.

MR. VAN ZANDT: You were asked by Mr. Palmer about the recoupment lawsuit. You testified at the recoupment lawsuit, correct?

MR. SHAHROODY: I did.

MR. VAN ZANDT: I was there, too.

MR. SHAHROODY: Yes, you were.

MR. VAN ZANDT: Isn't it true, Mr. Shahroody, that of the time period that you mentioned, I think from

'73 to '84, actually the government was looking at a time period of 1973 to 1987, correct?

MR. SHAHROODY: That is correct. I was tying it to 1973 OCAP, but then after that there were interim OCAPs, as counsel mentioned, for '85, '86 and '87 before the final OCAP was put in place. And then the calculations were any excess diversion compared to those interim OCAP.

MR. VAN ZANDT: And the government was seeking in that lawsuit recovery of 1,058,000 acre feet; isn't that right?

MR. SHAHROODY: Yes.

MR. VAN ZANDT: And that was over that time period from '73 to 1987, right?

MR. SHAHROODY: That is correct.

MR. VAN ZANDT: And isn't it true that the trial judge found that there was only over diversions in five of those years, not the entire time?

MR. SHAHROODY: There were, but then of course that was overturned by the 9th Circuit.

MR. VAN ZANDT: Excuse me?

MR. SHAHROODY: I think the judge decided that in those five years, as you mentioned, but then actually that was appealed to the 9th Circuit. Again, I'm not going to get into legal matters, because that's

basically not my area.

MR. VAN ZANDT: Well, I think you're in error about that, but let me just ask the final question on recoupment.

The amount of the water that was awarded out of the million acre feet was 197,000, right?

MR. SHAHROODY: That is correct, but that was appealed, as I said.

MR. VAN ZANDT: That's all I have for Mr. Shahroody.

Mr. Sarna, just a couple questions.

On the final EIR Mr. Soderlund asked you if comments from the public had been revealed to the decision-makers in the Department of Water Resources, and the response to the comments; is that correct?

MR. SARNA: The response was yes.

MR. VAN ZANDT: And that included some comments from the public about problems with the model, did it not?

MR. SARNA: Yes.

MR. VAN ZANDT: Now, these criticisms that I had asked you about on cross from Mr. Sikonia, Mr. Greer, Mr. Cartier and Mr. Robertson, those were internal memos, were they not?

MR. SARNA: Yes.

MR. VAN ZANDT: Those memos -- I'll ask the question straight out.

Were those memos presented to the decision-maker on issues and problems with the model before the Environmental Impact Report was certified?

MR. SARNA: No, they were not. What was presented to the decision-makers were the comments on the draft EIS/EIR and the responses that we provided those comments.

MR. VAN ZANDT: That's all I have.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

Mr. Mackedon?

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CROSS-EXAMINATION BY MR. MACKEDON

FOR THE CITY OF FALLON

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MR. MACKEDON: Mr. Shahroody, the Newlands Project was authorized by the United States government; is that correct?

MR. SHAHROODY: Right.

MR. MACKEDON: And some of the components of the project we've learned is a dam at Lake Tahoe or an enlarged dam at Lake Tahoe; is that correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: A dam about 6 feet in height; is that correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: And do you know how much water that dam impounds?

MR. SHAHROODY: I think Mr. Blanchard testified about 744,000 acre feet.

MR. MACKEDON: And that was a part of the project authorized by the United States government as part of the project?

MR. SHAHROODY: That's part of the Claim 4.

MR. MACKEDON: And Derby is part of the project?

MR. SHAHROODY: Yes.

MR. MACKEDON: And Derby Dam diverts water from the Truckee River?

MR. SHAHROODY: Yes, it does.

MR. MACKEDON: And by diverting water from the Truckee River, it reduces flows in the river from that point down; isn't that correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: And that would be true of any diversion --

MR. SHAHROODY: That's correct.

MR. MACKEDON: -- that transferred water to

another place?

MR. SHAHROODY: That's correct.

MR. MACKEDON: So it doesn't take an expert to know if you divert water from a stream to another place that it's going to reduce the flows by the amount diverted from that point on, correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: And that would be true of any diversion. And it seems to me that probably the United States government, don't you think, when it created the project knew that?

MR. PALMER: Well, I object to that question. I don't think the witness knows what the United States thought when it decided to --

CO-HEARING OFFICER DODUC: The objection is sustained.

MR. MACKEDON: The Newlands Project receives a portion of its water through the Truckee Canal which reduces flows in the river below that point and necessarily reduces the amount of water that Pyramid Lake receives?

MR. SHAHROODY: That is correct.

MR. MACKEDON: That was the inherent nature of the project, and we're living with those consequences. Now, that's an impact or a consequence of the creation

of the project.

Now, your charts and graphs you've shown us this morning have dealt primarily with quantity. There has been much discussion and you've been involved in some of it involving quality of water.

Now, suburbanization in the Truckee Meadows and other activities in the Truckee Meadows upstream of Derby have had an impact on the quality of the water; is that true?

CO-HEARING OFFICER DODUC: Mr. Mackedon, please ask your question of the witness and not present testimony at this time.

MR. MACKEDON: I'm not trying to testify; I'm trying to lay a foundation. But let me ask you this.

CO-HEARING OFFICER DODUC: Just ask the question.

MR. MACKEDON: Does suburbanization above Derby have the potential for impacting water quality in the river?

MR. SHAHROODY: Yes.

MR. MACKEDON: Is that a consequence or a responsibility or a fault on the part of the owners of water within the Newlands Project?

MR. PALMER: I think he's asking for some kind of legal determination here when he's talking about

fault and responsibility. I don't think that's in the realm of --

CO-HEARING OFFICER DODUC: Please rephrase the question, Mr. Mackedon.

MR. MACKEDON: I'm asking for -- it's a fact. You've testified as a matter of fact that urbanization within the Truckee Meadows above Derby Dam affects water quality within the river, correct?

MR. SHAHROODY: Correct.

MR. MACKEDON: And that is not caused as a matter of fact by any activity on the part of owners of water or water rights within the Newlands Project, is that true?

MR. SHAHROODY: That is true.

MR. MACKEDON: Okay. TROA is not yet in effect; is that true?

MR. SHAHROODY: That's true.

MR. MACKEDON: So it's been signed, but it's not in effect. Can the Pyramid Tribe or any party take action pursuant to TROA before going before the Orr Ditch court?

MR. PALMER: This is beyond the redirect, I believe, getting into how TROA is administered. I think that's where he's going.

MR. MACKEDON: I think that you asked these

questions on redirect about whether TROA was in effect, whether it had been signed, and I'm following up on that.

CO-HEARING OFFICER DODUC: I'll allow the question.

MR. MACKEDON: Do you understand the question?

MR. SHAHROODY: Would you repeat it, please.

MR. MACKEDON: Would you read it back, Ms. Reporter.

(Record read)

MR. SHAHROODY: I'm having a hard time hearing. I'm sorry.

MR. MACKEDON: I'll do better. Thank you for the effort there.

Simply this. No party to TROA can implement any aspect of TROA until TROA has been approved by the Orr Ditch court; is that right?

MR. SHAHROODY: That's correct. It's in front of the court right now.

MR. MACKEDON: Right. You would agree, would you not, that the 119,000 acre feet that ultimately or that is diverted or may be diverted in the Truckee Meadows impacts the flows in the river in Pyramid Lake?

MR. PALMER: I guess I'll object. I don't believe the redirect had anything to do with diversions

in Truckee Meadows. I was asking him about diversions in Derby Dam on my redirect.

CO-HEARING OFFICER DODUC: Mr. Mackedon?

MR. MACKEDON: I won't pursue this, but the tendency in my estimation is to suggest that there is some difference in quality or kind of a diversion made to the project from other diversions, and I'm trying to understand why that would be true.

CO-HEARING OFFICER DODUC: The objection is sustained.

MR. MACKEDON: Do you understand the question?

MR. SHAHROODY: Again, you have to repeat it.

CO-HEARING OFFICER DODUC: You don't have to answer the question. I sustained your attorney's objection.

MR. MACKEDON: I'm sorry.

CO-HEARING OFFICER DODUC: I've totally let you out of control, Mr. Mackedon.

MR. MACKEDON: I heard you wrong.

The last question I have, and this relates to the recoupment decision. Is it your understanding that the recoupment court, whatever it decided, and whatever the 9th court decided, that no individual water right owner in the Newlands Project received more water than that it was entitled to?

MR. SHAHROODY: I prefer not to go further on the recoupment, because I see that I'm going to be a witness in that proceeding.

Unless you direct me to answer.

CO-HEARING OFFICER DODUC: No.

MR. MACKEDON: You testified in -- you were at the recoupment hearing. You testified there.

CO-HEARING OFFICER DODUC: The witness says that he prefers not to answer that question based on some upcoming --

MR. SHAHROODY: It is.

MR. MACKEDON: And based upon that you're going to sustain that?

That's all the questions I have. Thank you for the opportunity to ask those questions.

CO-HEARING OFFICER DODUC: Thank you. And I believe that concludes the topic, anyway, this topic.

MR. PALMER: Can we do a housekeeping and maybe move our exhibits into evidence?

CO-HEARING OFFICER DODUC: I would prefer that you hold off on moving your evidence today since there is a possibility that two of your witnesses will be returning next week.

Are there any other housekeeping items, Mr. Soderlund?

MR. SODERLUND: No thank you.

CO-HEARING OFFICER DODUC: Okay.

Ms. Mahaney, were there any other legal matters that we need to clear up? I'm sorry. I forgot to ask staff if they had questions for you.

MR. MURPHEY: Yes. A little bit of housekeeping. We sent an e-mail out to the parties on the 20th asking the applicant and petitioners to provide a list of all the points of rediversion and coordinates, and we just wanted to know if that exhibit will be introduced when you enter your exhibits?

MR. PALMER: I don't know the absolute answer to that. I didn't check on the progress of that, but I understand that is being worked on and that is what we were trying to attempt.

MR. MURPHEY: We'd just like to get that entered before the hearing closes.

MR. PALMER: That's our goal. I can find out from those who are working on it whether we can still meet that.

MR. MURPHEY: Okay, thanks.

MR. PALMER: I was just informed that we still anticipate having that available before the end of the hearing.

CO-HEARING OFFICER DODUC: You don't or you do?

MR. PALMER: We do.

CO-HEARING OFFICER DODUC: Thank you all very much.

And right now I'll ask how is the court reporter doing? Do we need a break.

Mr. Van Zandt to present Truckee-Carson Irrigation District's case in chief limited to the item Ms. Mahaney specified yesterday.

MR. VAN ZANDT: Is it all right if we just take a short break while we reposition?

CO-HEARING OFFICER DODUC: That's fine. Let's take a short break.

(Recess)

CO-HEARING OFFICER DODUC: Whenever you're ready, Mr. Van Zandt, you can begin your opening statement.

MR. VAN ZANDT: Thank you very much.

Mr. Chairman, Board Member Doduc, staff members. On behalf of the Truckee Carson Irrigation District, Churchill County and the City of Fallon I'm giving the opening statement today.

We will be calling six witnesses to deal with the issues that are before the Board today. The Board has heard significant testimony about what those issues are, so we don't need to outline those.

Our first witness is going to be Mr. Brad Goetsch who is the County Manager for Churchill County, and he will be testifying concerning some policy issues but also the background on demographics and the economy in Churchill County, their sources of water, and protections that are needed for the community water supply as well as some of his observations on the potential impacts from shortages.

And he will also address some public interest issues, and is basically going to be describing some of the key features of Churchill County, including its 27,000 citizens, the existence there of the Stillwater National Wildlife Refuge, the Carson Lake and Pasture, the U.S. Navy facility at Fallon, and also the Fallon Paiute Indian Tribe which has extensive trust lands, reservation lands, within the boundaries of Churchill County.

Next you'll hear from Mr. Ernie Schank, Ernest Schank, who is the president of the Truckee Carson Irrigation District Board, and he'll testify regarding some of the history of the Newlands Project and TCID, some of the governing decrees and agreements and management of the Newlands Project by the TCID Board. He'll also be addressing the water supply situation and his observations with regard to potential shortages as

well as addressing some public interest issues as well.

And he will be describing the over 600 miles of canals, laterals and drains that are part of the Irrigation District that was established under Chapter 539 of the Nevada Revised Statues and has been in existence since 1926 -- excuse me, since 1918, but entered into a contract with the Bureau of Reclamation in 1926 to run, operate and maintain the Newlands Project.

Right now we're looking at about 3,000 or just a little bit more than 3,000 water right owners who have water right contracts for about 74,000 acres within the Newlands Project. And usually we'll see somewhere between 59 and 60,000 acres of that being irrigated on an annual basis.

We will also hear from Mr. Lyman McConnell. Before I talk about him, he's part of the motion to exclude, so I just want to advise the Board we have filed our response to the motion to exclude. So I will not address him in my opening statements, issues associated with that, but will reserve that.

CO-HEARING OFFICER DODUC: No, I will allow you to go ahead and address it since this is an opening statement.

MR. VAN ZANDT: Oh, thank you. Okay.

Well, Mr. Lyman McConnell, he was the former project manager for the Truckee Carson Irrigation District from 1984 to 2006 and has extensive knowledge about the project and the history.

And he will testify concerning the implementation of water management under the decrees, the Orr Ditch and the Alpine Decree, and also the Truckee River Agreement and the intent and the history behind the Truckee River Agreement and compromises that the Truckee Carson Irrigation District reached that allowed the Truckee River Agreement to be finalized which resulted in a stipulation between the parties and allowed just a few years later for the Orr Ditch Decree to be entered.

Similarly, he will testify regarding justifications for the Washoe Project which includes Prosser and Stampede Reservoirs and the inclusion of the Newlands Project as points of diversion in the Stampede permit and the Prosser license.

He will also testify that there has been no use of Stampede water in the Newlands Project since 1973 and how water at Stampede is being used in Pyramid Lake even though the lake is not listed as a place of use in the permit.

He will also testify how the OCAP, the

Operating Criteria and Procedures that began in 1967 and the current version, the 1997, must be implemented consistent with both the Alpine and the Orr Ditch Decrees and how the Secretary of Interior is required to implement the Truckee River Operating Agreement without interfering with vested and decreed water rights. And that's actually a provision of Public Law 101-618 which is the Settlement Act, what's been referred to as the Settlement Act.

Now with regard to the Truckee River Agreement, Mr. McConnell will list the components and the compromises in the Truckee River Agreement and will testify from his perspective as the former project manager how the parties agreed to this under the Truckee River Agreement and also that there is no provision in the Truckee River Agreement that allows for a party to withdraw.

Mr. McConnell will also testify how the Prosser Tahoe Exchange Agreement came about and how the exchange mainly benefits the Newlands Project and how it has been interfered with and how the Prosser-Tahoe Exchange is final and binding on all parties, meaning that there is, again, no provision for withdrawal.

And he will also be testifying about how the approval of the applications that are before the Board

are inconsistent with these various agreements and also the decrees.

Mr. McConnell will also touch upon the fundamental differences between the Truckee River Agreement and the Truckee River Operating Agreement which basically is the Truckee River Agreement operates the river for the benefit of all the parties while it appears the Truckee River Operating Agreement operates with each entity acting in its own best interest.

Next we will hear from Dr. Willem Schreuder who is of Principia Mathematica, and Dr. Schreuder is an expert in computer modeling with a special expertise in hydrology. He will be testifying primarily about the Truckee River Operating Model you heard testified to by the applicants' and petitioners' witnesses already.

He'll give us a little bit of background on why a model is created and how it's used in the context of an Environmental Impact report. And he will also talk about what the model should accomplish and its connection to the Environmental Impact Report, and in particular on the evidence of injury or shortages that are discussed in that document.

Next he'll be addressing some flaws that he has detected in the Truckee River Operating Model. He has extensively reviewed and actually run the model on a

number of occasions and he will be giving you his observations about the model and also discussing admissions by some of the modeling people who participated in the process of the Environmental Impact Report, including people from the United States Geological Survey and the BOR that in fact the Truckee River Operating Model is scientifically indefensible.

And he will also address whether or not the applicants had an alternative to the Truckee River Operating Model, and he'll be talking a little bit about the program called Riverware.

Mr. Chris Mahannah of Mahannah & Associates will also be testifying. He's a recognized water resources and hydrologist expert. Testified many times in front of the Nevada State Engineer and in federal and state courts in the state of Nevada.

And he will be testifying about the consumptive use portion of the water rights that are stored that will be stored in Stampede, Boca and in Independence with regard to the petitions for change that are before the Board in these proceedings. And he'll be looking at that both in relationship to M&I and also from an agricultural standpoint.

He will also testify about the availability of water to appropriate under the Stampede and Prosser

applications to appropriate new water rights.

Mr. Mahannah was involved in both the Truckee Carson Irrigation District and the Pyramid Lake Tribe unappropriated water hearings in Nevada and has done extensive analysis on the availability of unappropriated water in the Truckee River Basin and its tributaries. And you will hear his conclusion that in fact there is no unappropriated water to appropriate on the river or the tributaries that would satisfy these applications you have before you.

Finally, Mr. Mahannah will provide related testimony regarding some of the observations he has about some of the witnesses that the applicants and petitioners have put forth -- Mr. Van Camp and Mr. Shahroody, Mr. Mahin in particular -- by way of rebuttal.

And he will be addressing the water availability analysis as well that Mr. Shahroody did. He will also provide his opinion on the question of the new points of diversion as creating a new water right from these applications or in fact the question of whether or not the water right, the existing water is being expanded.

Finally, you will hear from Dr. Kenneth Knox. Dr. Knox is now employed by URS Company but he was the

former Chief Deputy State Engineer for the State of Colorado for many years, and he is expert in water resources, and he has technical expertise and interpretation of decrees and regulations as well.

Dr. Knox will testify regarding methods and approaches used by the applicants and the petitioners in these proceedings, and he'll provide some opinions on the following subjects: First, the expansion of the water rights caused by these applications; whether or not water rights junior to the Newlands Project water rights must be curtailed to prevent injury; whether the applications are premature because the Tribes unappropriated water has not sought upstream storage that would supplant these applications; whether the Truckee River Operating Agreement does not protect Newlands Project rights from harm as required by Public Law 101-618; whether or not the operating criteria and procedures cannot circumvent or get around the decreed rights of the Orr Ditch for the Alpine Decree.

He will also be talking or addressing whether the granting of the applications here would forever circumvent the requirements under California law for the change application -- excuse me -- the petitions to change of these water rights in the future.

He also will be offering an opinion that the

change is not properly analyzed as to amount, timing or flow rate or location, and from that in some ways you can't tell whether it expands the right. He will also be giving his opinion on the appropriation of the Truckee River and whether it's fully appropriated.

He will also be giving a short discussion on the Environmental Impact Report and its acknowledgement of shortages with no mitigations in place. And he will talk a little bit about some public trust issues with regard to the exclusion of the Newlands Project water right owners from the TROA and how that may violate public trust and how the DIS failed to adequately evaluate alternatives and impacts.

So at the end of the day after you hear our witnesses, the Truckee Carson Water Irrigation District, Churchill County and the City of Fallon would be requesting that the Board in fact deny all the pending applications and the petitions before it.

Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

Ms. Mahaney?

SENIOR STAFF COUNSEL MAHANEY: Mr. Van Zandt, I understand you filed opposition papers. In the interest of time, if you have a spare copy, if you could just

provide that to me directly, I'd appreciate that.

MR. VAN ZANDT: Yes, we have a copy for you.

SENIOR STAFF COUNSEL MAHANEY: Thank you.

CO-HEARING OFFICER DODUC: Please call your witness. I'm sorry, is Mr. Mackedon calling the first witness?

MR. VAN ZANDT: No. It would be Mr. Goetsch.

MR. GOETSCH: Mr. Chairman, Board Member Doduc, My name is Brad Goetsch. I'm the Churchill County Manager, and I'll try to talk fairly fast and get through all that I have to say.

For my background, my family is Kansas and Colorado farmers --

MR. VAN ZANDT: Mr. Goetsch, I'm going to have to interrupt you, I'm sorry. You were not here when the witnesses were sworn.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

(Witness sworn)

CO-HEARING OFFICER DODUC: Thank you.

MR. VAN ZANDT: And just some preliminary questions.

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BRAD T. GOETSCH

Called by TRUCKEE CARSON IRRIGATION DISTRICT and CHURCHILL COUNTY

DIRECT EXAMINATION BY MR. VAN ZANDT

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MR. VAN ZANDT: Mr. Goetsch, you prepared a written direct testimony for today's proceedings, did you not?

MR. GOETSCH: I did.

MR. VAN ZANDT: And it is -- Churchill County 1 is the exhibit number.

And you've had a chance to review that document, have you not?

MR. GOETSCH: I have.

MR. VAN ZANDT: Are there any corrections to the document?

MR. GOETSCH: No.

MR. VAN ZANDT: Is it a true and correct copy of your testimony?

MR. GOETSCH: It is.

MR. VAN ZANDT: At this time would you please give your direct testimony.

MR. GOETSCH: Thank you. I'll carry on then.

I'm the Churchill County Manager, and my

background is from Kansas and Colorado farm families. I have a degree in environmental biology from Colorado University. My recent career experience was 27 years in the U.S. Navy including multiple combat cruises, the Pentagon the White House, Top Gun, and most recently the Commanding Officer of NAS, Fallon, Nevada.

I've had a little over six years as the County Manager in Churchill, and about 50 percent of my time is spent on water-related issues in that capacity.

Other water-related activities that I'm involved in. I'm the Vice Chairman of the Nevada State Board for Financing Water Projects. I'm a board member of the Central Nevada Regional Water Authority which is eight Nevada counties, two Utah counties and three California counties. I'm on the Board for the Nevada Water Resource Association. I'm on the Board for the Northern Nevada Development Association. And I am the primary overseer of the Churchill Water and Sewer Utilities. I also am involved with Carson Water Subconservancy District and a number of geothermal projects.

Churchill County Community. Well, the community and the whole state of Nevada and many other organizations and communities, the environment, a large Native American tribe and others benefit from the

Newlands Project. We are an agricultural community that was created and given life by the Newlands Project, and we wouldn't exist without that project.

97 to 99 percent of the groundwater that we pump and use for all the uses in our valley comes from the Carson and Truckee Rivers and recharge from the Newlands Project. A little over 27,000 people are our permanent population, over half a million visitors per year as well.

We have a little over 3,000 water right owners, and those are made up of multi-generational farm families, Native American families, and we have 23 dairies, a large beef industry, a wine industry, teff and other grains and melons and other things that we raise there.

We have a large percentage of military, active duty and retirees and contractors associated with NAS Fallon and the Naval Strike and Air Warfare Center and the Top Gun school that you may be familiar with.

The ranges in Churchill County associated with that base are the Navy's most important training facility in the world, and over 85 percent of all ordnance dropped in training in the Marine Corps and the Navy are dropped at this facility and come out of NAS Fallon.

Western Nevada College is a big part of our community, and it's the fastest-growing campus associated with Western Nevada colleges.

The Fallon Paiute and Shoshone Tribe is a large part of our community and it's much larger than the Pyramid Lake Tribe, populations that are recorded.

We have hospital and healthcare facilities, recreation and renewable energy. We are one of the nation's premier renewable energy areas, and between hydroelectric power and geothermal power we make over 320 megawatts, which is more than ten times what we use. Most of that is exported to California.

We have over 4,500 to 5,000 permitted wells and probably 8,000 plus domestic wells and other wells within the County.

Churchill County and the project, the Newlands Project, are models of efficiency, and we see ourselves as reuse experts. We have a chart that we use with the public when we train them that say we use one snowflake or one drop of rain at least 18 times as it comes down the Carson River and goes through Churchill County before it is finally --

MR. PALMER: Can I interject at this point?

CO-HEARING OFFICER DODUC: Mr. Palmer?

MR. PALMER: I just must be looking at the

wrong testimony, because I'm just not finding most of these statements in his written direct testimony. But maybe I'm just not quite with it this morning. I just don't see most of these statements in his written direct testimony.

CO-HEARING OFFICER DODUC: Mr. Van Zandt?

MR. VAN ZANDT: Well, I think maybe Mr. Goetsch is providing a little more detail than in his written statement, but he's basically following the outline of what the statement has. Not to read the statement verbatim into the record, but he's trying to inform the Board of the parameters of the statement of his testimony, so...

CO-HEARING OFFICER DODUC: Help me pronounce your last name.

MR. GOETSCH: Getch.

CO-HEARING OFFICER DODUC: Mr. Goetsch, please keep your oral testimony limited to what's in your written testimony which is Exhibit Churchill County 1.

MR. GOETSCH: Okay. I'm trying to refer to the same numbers and things, so I'll try to keep it right on that track.

CO-HEARING OFFICER DODUC: Great. Thank you. I do appreciate the background information on Churchill County.

MR. GOETSCH: There you go. Okay.

I talked to the impact of potential dry years and drought years and that we've been told by BOR that the model said that the driest years was when the greatest impact would be, and that could be up to about 30,000 acre feet lost, or that's equivalent to about an entire irrigation cycle in Churchill County. And in a dry year where we may be able to irrigate 25 to 50 percent of the normal crop, losing an entire cycle is a significant impact.

About a third of our economy, and I mention that fact in my written statement, comes from agriculture. That's between 175 and 270 million per year from agriculture and its multiplied effects. Any impact on agriculture reduces not only all the family incomes and impacts the people directly, but it also impacts the tax base of the county.

Our community, including members of the Fallon Paiute-Shoshone Tribe, the City, the County, the Navy, other governmental agencies that depend on this water, are concerned about TROA. They're concerned about upstream uses and about the fact that --

MR. PALMER: I have another objection.

CO-HEARING OFFICER DODUC: Mr. Palmer?

MR. PALMER: Hearsay. He's trying to tell us

what other parties are concerned about here, and that's hearsay because there is no foundation in his testimony for what these other parties might be saying about any of these issues.

CO-HEARING OFFICER DODUC: Thank you, Mr. Palmer. We'll apply your objection in determining the weight of this testimony.

CO-HEARING OFFICER DODUC: Mr. DePaoli?

MR. DePAOLI: I would like to join in that objection for the record as well.

CO-HEARING OFFICER DODUC: Thank you, Mr. DePaoli.

Mr. Van Zandt.

MR. VAN ZANDT: I'll respond for the record. Thank you.

We're talking about the County Manager here of Churchill County whose responsibility is to represent a large number of constituents. I could bring in every citizen from Churchill County, but I don't think you'd appreciate that.

CO-HEARING OFFICER DODUC: I am allowing the testimony, but we will apply Mr. Palmer and Mr. DePaoli's objection in determining the weight of this testimony.

So please continue.

MR. GOETSCH: Okay. And I'm getting near the end. I'll be very brief.

So our valley is a beautiful, productive and delicate environment. We have Lahontan Reservoir which is part of ancient Lake Lahontan, the Carson River, Carson Lake and Pasture, Carson Sink, Stillwater Wildlife Refuge, other reservoirs and geothermal reserves, and the Pacific Flyway and Bird Habitat where over 250,000 birds visit us, and we have international visitors every year that come and see those, including some species that are classified or could be potentially classified -- ibis, eagles, things like that.

We raise vegetables, fruit, milk, beef and wine are kind of the bread basket for our area. And we don't have a lot of population. We don't have a big political power, but we do matter.

Now, we believe in the law of physics and mass, and if more water is stored upstream it came from somewhere. Where did it come from? It came from somewhere else.

And we would just ask that you please consider us in this hearing and in other action you take and that you base any decision on science and law and not on politics. And that's the end of my message.

CO-HEARING OFFICER DODUC: Thank you. Any

other questions on direct, Mr. Van Zandt?

MR. VAN ZANDT: No, that concludes our direct.

CO-HEARING OFFICER DODUC: All right.

Mr. Palmer, do you have any cross?

CO-HEARING OFFICER DODUC: Mr. Palmer?

MR. PALMER: Thank you.

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CROSS-EXAMINATION BY MR. PALMER
FOR U.S. BUREAU OF RECLAMATION

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MR. PALMER: Good morning, Mr. Goetsch. I'm Steve Palmer representing the Bureau of Reclamation in this proceeding, and I just have a few questions of you based on your written testimony.

MR. GOETSCH: Sure.

MR. PALMER: First I'll refer you to page 3 of Churchill County Exhibit 1, and it's the paragraph at the top of the page that continued over from page 2 just before Roman Numeral II at roughly line 5.

You have the statement, "Flows in the Truckee Canal will be reduced," and I want to know what you're basing that statement on.

MR. GOETSCH: Well, okay. I've been doing this -- I was involved in the base since 1998 which was involved in water issues, and I've been the County

Manager for six years. In that time you and I have seen each other in a number of hearings and other things before, as most of the people in this room.

So I guess I'm basing that statement on my discussions and prior hearings and discussions on BOR and the staff on their model and on other things dealing with TROA, that in dry years water delivered to the Newlands Project would be impacted. That's the delivery method to the Newlands Project.

MR. PALMER: So in dry years there may be impacts, and do you know what would cause those impacts? Is it just the fact that it's a dry year?

MR. GOETSCH: I've been told that the deliveries would be reduced in those years, yes, that in dry years, because of upstream storage, there would be less water delivered to the project. And my statement was then that would impact the project.

Did I answer your question?

MR. PALMER: So you're saying today currently there is storage somewhere upstream that is causing in dry years the Newlands Project --

MR. GOETSCH: No, that's not what I'm saying.

MR. PALMER: Maybe I'm not understanding your answer.

MR. GOETSCH: I'm saying I've been told by the

proponents of TROA and by the folks from the federal agencies that have come and briefed us on how TROA would work and have tried to explain TROA to us that the model showed and that there was some evidence in the EIS/EIR timeframe and those studies that were referred to earlier and the model runs that there would be impacts at times to the Newlands Project.

MR. PALMER: And do you know if that's -- were you here for the hearing yesterday?

MR. GOETSCH: I wasn't. I arrived late last night and came in this morning.

MR. PALMER: Have you reviewed the Environmental Impact Statement/Environmental Impact Report for TROA, State Board Exhibit 7.

MR. GOETSCH: I have.

MR. PALMER: And are you aware how that displays what are called -- what we've referred to here as shortages to the Newlands Project.

MR. GOETSCH: I'm not an expert at it, but yes, I think I'm aware, yes.

MR. PALMER: So is that what you're basing your statement on?

MR. GOETSCH: That and other meetings and conversations with the folks that prepared that study, yes.

MR. PALMER: So you have no personal knowledge of your own or you've made no analysis of your own?

MR. GOETSCH: No, I'm not an absolute water expert or a hyrologist.

MR. PALMER: On paragraph 4 of your direct testimony on page 4 there is a statement: Reduced irrigation from the Truckee Canal would detrimentally impact the water table.

And could you explain what you mean by that?

MR. GOETSCH: Yeah. What I mean by that is -- boy, this may be a long explanation, but my knowledge and the history of the project is that the water table in our valley was substantially lower before this project was built and took place, and irrigation waters were brought into our valley. I think the water came up, I'm going to say, as much as maybe 70 feet. I don't know what the number is. But the water table was changed once the water rights were brought into the valley and were delivered into the valley.

When we have a low water year, we see a direct impact on the water table in the Lahontan Valley. And as I run the water systems, we get well reports consistently and we have USGS studies monitor a number of wells in our valley consistently. And when we have lowered water deliveries in drought years or dry years,

we see a decline in the water table.

Again, did I answer your question?

MR. PALMER: Yes, thank you. And do you know whether the County -- I'm just using generally the County because you weren't specific -- has a water right in Nevada to this return flow from the canal?

MR. GOETSCH: Can you restate that.

MR. VAN ZANDT: The question is vague.

MR. PALMER: I'm asking whether he knows -- let me back up.

You're saying that the County relies on the seepage from the canal for the groundwater, because your statement is that reduced irrigation impacts the water table. So you're saying the County relies on that water table that is supported by seepage from the Truckee Canal. Is that what I understand?

MR. GOETSCH: I'd say the County and all the wells in the valley. Not just County, but every individual.

MR. PALMER: So do you know whether any of those individuals or the County has a water right to that seepage from the canal?

MR. GOETSCH: Well, the County owns a number of water rights, and we have a lot of folks that own water rights. I don't think there is any water right directly

related to canal seepage anywhere in Nevada or anywhere else on the river or the canal. I don't know.

MR. PALMER: Okay. Thank you.

In paragraph 6 you end that paragraph with the statement that this action would serve to frustrate the delicate balance relating to perpetuation of these important areas, and you're asking for the application to be denied. Is that what I understand in your statement?

MR. GOETSCH: That's what the statement says.

MR. PALMER: And again, what's that based on that this would happen because of these petitions and applications?

MR. GOETSCH: If the water was reduced as has been talked about earlier, then all of those things, both the groundwater and these wetlands and the many lakes that are supported there that support these shore birds and these waterfowl would potentially -- as I talked about, as the water table drops, those water levels drop accordingly. So all of those waterways and wetlands also logically would be affected.

That's what that statement referred to.

MR. PALMER: And that then relates back to your statement about reduced flows in the Truckee Canal?

MR. GOETSCH: Well, yes, if there were reduced

flows in the Truckee Canal.

MR. PALMER: That's all I have. Thank you.

MR. GOETSCH: Sure.

CO-HEARING OFFICER DODUC: Thank you, Mr. Palmer.

Mr. DePaoli.

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CROSS-EXAMINATION BY MR. DePAOLI

TRUCKEE MEADOWS WATER AUTHORITY

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MR. DePAOLI: Good morning, Mr. Goetsch.

MR. GOETSCH: Good morning.

MR. DePAOLI: I just want to follow up to make sure I understand. If you could look at page 3 of your written testimony, beginning at about line 4 going through line 8 of that testimony, is all that testimony based on what someone has told you?

MR. GOETSCH: No. I've done my best -- I'll say again, I'm not an expert, but in 10 to 12 years I've tried to work my way through the Truckee River Agreement which was fairly simple and fairly short, and the Truckee River Operating Agreement which I still can't understand and can't get all the way through, the size of it. But I feel that I have a fairly good understanding of those agreements and of some

differences in those agreements.

So this is my opinion based on what I think I know.

MR. DePAOLI: So can you tell me what the differences are between the Truckee River Agreement and the Truckee River Operating Agreement?

MR. GOETSCH: How many days have you got or how long? I would have to look at those two documents together. Like I said, the Truckee River Agreement seems fairly simple. The people well before my time were a part of that agreement, and I can read that document and look at things and say this is fairly clear what somebody is supposed to do or how something works. It's a document that I can squeeze between my fingers in about 1/4 inch.

The Truckee River Operating Agreement I have bookshelves and shelves full of papers and things that support it, and EISs and interpretations and things that I still don't understand.

MR. DePAOLI: Do you know how much of the Truckee River Agreement is actually in the Truckee River Operating Agreement?

MR. GOETSCH: Well, the Truckee River Operating Agreement says that it has to abide by and obey the Truckee River Agreement.

MR. DePAOLI: No, my question was do you know how many -- how much of the actual provisions from the Truckee River Agreement are actually in the Truckee River Operating Agreement?

MR. GOETSCH: I can't answer that.

MR. DePAOLI: On that same page you indicate that you believe the new rules for accounting and management of water at Independence, Stampede, Boca and Prosser Creek Reservoir will be imposed to the detriment of the protestants and water right holders in the Truckee Division of the Newlands Project.

On what do you base that statement?

MR. GOETSCH: Again, that goes back to what I said earlier. In my simple mind there is a finite amount of water as it currently stands, and under rules of the past that water flowed in the rivers and was stored basically at the bottom end of the river in Lahontan, which is part of the project.

If there is going to be new storage created that increases storage on the system, somewhere, in this case upstream in those reservoirs, there is no new water that I know of. We haven't got another river connected into the system. We're using the same system but we're moving storage.

So my interpretation is that that storage and

that balance then that used to be at the bottom end has been moved to the top end. It's that simple.

MR. DePAOLI: Do you understand the prior appropriation doctrine?

MR. GOETSCH: I do. I think I do.

MR. DePAOLI: Do you understand that any new storage would be stored junior to any downstream senior water rights?

MR. GOETSCH: I think that's correct.

MR. DePAOLI: On that same page at line 17 and 18 you say that these applications will exacerbate the magnitude of negative impacts.

Are you using the word "applications" there in a technical sense, meaning the applications to appropriate that are before the Board?

MR. GOETSCH: Yes. If this is approved, as I understand it, and these waters are moved and the controls are changed, and from what we were told by the experts from BOR that said it was really not going to be lots of effects but there would be effects especially in the dry years, then the dry years are what we really worry about and what the project was made for.

If we have a wet year, we don't even need the project or the Truckee River. We can get all our water off the Carson side. But the dry years is why that

project was created, in the dry years where we are already suffering economically and water shortages, and those are the years that this agreement appears to be, and I've been told by the expert is going to have its major impact or the impact that it does have on us, then that makes the worst times worse. The times when we built the project to protect us get made worse. That's what I was trying to state there.

MR. DePAOLI: And that's based on what someone told you?

MR. GOETSCH: Including some of the people in this room as they've briefed me.

MR. DePAOLI: I have no other questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. DePaoli. Mr. Taggart?

MR. TAGGART: Thank you.

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CROSS-EXAMINATION BY TAGGART

FOR THE CITY OF FERNLEY

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MR. TAGGART: Good morning, Mr. Goetsch.

I have a couple clarifying questions about the testimony that you have about water levels, groundwater levels.

Is it fair to say that your concern with

groundwater levels is in both the Carson and the Truckee Division?

MR. GOETSCH: Yes.

MR. TAGGART: And the Truckee Canal runs through Lyon County and then enters Churchill County which is the area that you're concerned with, correct?

MR. GOETSCH: I'm concerned with Churchill County, yes.

MR. TAGGART: And so the seepage from the canal, that affects the water levels in the Truckee Division but not in the Carson Division, right?

MR. GOETSCH: Well, the deliveries from the canal that go into the lake affect the entire county or valley.

MR. TAGGART: I understand that. I'm just trying to clarify for the Board that the Truckee Division groundwater levels are associated with seepage from the canal directly. Would you agree with that statement?

MR. GOETSCH: Well, not solely dependent on that. There are still irrigated lands on the Truckee Division that also that surface application of that irrigation affects the water table as well.

MR. TAGGART: And in the Carson Division where the vast majority or population of your county is

located, that is not being directly affected. The groundwater levels are not being directly affected by seepage from the canal, right?

MR. GOETSCH: By seepage from the canal, I don't believe so.

MR. TAGGART: So in the Carson Division it's more a function of irrigation on farms that creates the groundwater level that people rely on for their wells?

MR. GOETSCH: Yeah, the amount of water delivered to the Newlands Project, correct.

MR. TAGGART: Isn't it the amount of ground that's irrigated and the amount of water from that irrigation that percolates into the groundwater system, isn't that what is affecting the groundwater levels?

MR. GOETSCH: No, that's a small component of it. But as you mentioned earlier, the same leakage that takes place from the Truckee Canal takes place from all of the canals on the project and the water delivered to the wetlands for fish and wildlife that sits in the valley that also has the opportunity to percolate.

So there's a number of components. And the lake itself probably has some level of leakage as well that influences us.

MR. TAGGART: Well, do you think decreasing amounts of irrigated lands have an impact on groundwater

levels in Lahontan Valley?

MR. GOETSCH: If it delivers the overall -- if it decreases the overall delivery of water to that terminal valley, yes. If the water arrives otherwise, not so much.

MR. TAGGART: I guess my question is really simple. As you see irrigated lands decrease in the Lahontan Valley, do you also have concerns about decreasing water levels in groundwater as a result of decreasing irrigation?

MR. GOETSCH: And I'm trying not to dodge that question, but not directly.

If those lands -- as you are probably aware, fish and wildlife, not only are there government projects that move this water out of our valley and take it to Pyramid Lake; there are government projects that restrict farmlands of water and move it to the wetlands in our own valley.

And if that water stays in our valley, if it comes out of a farm but it goes to a wetland in our own valley, it's still coming into our terminal valley and having an effect on the recharge in our valley, so I don't think there is a direct loss there.

So it's coming out of irrigation, but it's staying in the valley, so it's continuing to do

basically the same thing.

Did I answer your question?

MR. TAGGART: And so as we sit here today, the County is not concerned with decreasing water levels in wells in Lahontan Valley because of the things you just described. Is that a fair statement?

MR. GOETSCH: No, we are highly concerned about decreasing water levels if water is removed out of the project.

MR. TAGGART: Well, are water levels decreasing now?

MR. GOETSCH: Are water levels currently decreasing is your question?

We don't have -- right now there are no or I am not aware of any current successful purchases moving water upstream going on in the last couple of years, especially as the economy has been bad. So I don't think there are current decreases that are directly related to water being moved out of the valley.

MR. TAGGART: That wasn't my question. I'm just trying to understand.

Are groundwater levels in your County decreasing now?

MR. GOETSCH: I would say it's very much like what you heard about the lake. We're dependent on the

weather, on the amount of water that comes in. It varies from year to year.

MR. TAGGART: I have no further questions. Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Taggart. Mr. Pagni?

MR. PAGNI: Thank you.

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CROSS-EXAMINATION BY PAGNI

WASHOE COUNTY WATER IRRIGATION DISTRICT

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MR. PAGNI: I only had a couple clarifying questions for you, Mr. Goetsch.

I thought I heard you testify that the number of domestic wells in Churchill County is 8,000; is that what you said?

MR. GOETSCH: That's my estimate.

MR. PAGNI: On page 4 of your testimony you indicate that the number of domestic wells is 4,130.

MR. GOETSCH: I think I said permitted wells in that testimony, and then I said in my statement that we have about 4,500 to 5,000 known permitted and maybe as many as 8,000 other just domestic wells.

MR. PAGNI: I'm just trying to clarify which number was accurate.

One other question.

You said in response to Mr. DePaoli's questions that you acknowledge that you still really don't understand the Truckee River Operating Agreement that well.

So my question is: Wouldn't you agree that when you're testifying about potential results of the Truckee River Operating Agreement if implemented that your knowledge is less than perfect?

MR. GOETSCH: I would agree with that completely. But as I said, I'm paraphrasing what I've learned from the experts that we've asked to come and present information to us -- again, many of them right in this room -- and I'm paraphrasing what I believe they've told me.

MR. PAGNI: And would you agree then that those same experts in this room that represent the petitioners in this case, those are the people with the best knowledge to testify about what the effects of the Truckee River Operating Agreement will be?

MR. GOETSCH: I guess I won't say who has the best knowledge. We have a lot of other folks that have studied the Truckee River Operating Agreement that have different opinions as well.

MR. PAGNI: You'd agree their knowledge is

better than yours?

MR. GOETSCH: Expert's knowledge, yes. Hydrologists' and experts' knowledge is better than mine.

MR. PAGNI: Thank you. I have no further questions.

CO-HEARING OFFICER DODUC: Mr. Soderlund, no cross? No cross.

Mr. Springmeyer or Mixson representing Pyramid Lake Tribe? No cross.

And Mr. Mackedon, any cross? No cross. All right.

Any redirect, Mr. Van Zandt?

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REDIRECT EXAMINATION BY MR. VAN ZANDT
FOR TRUCKEE CARSON IRRIGATION DISTRICT
and CHURCHILL COUNTY

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MR. VAN ZANDT: Just one clarifying question, Mr. Goetsch.

When you're referring to the people in the room who told you these things about shortages, who specifically are you referring to?

MR. GOETSCH: I'm not real good with names, but I can turn around, and most of them work for Mr. Parr

back here. So the folks from BOR have been very helpful in coming to the County and holding meetings with us and trying to explain TROA to us and trying to help me to understand TROA and how it works.

MR. VAN ZANDT: So it's the BOR people?

MR. GOETSCH: Mostly, yes, sir.

MR. VAN ZANDT: Thank you. That's all I have.

CO-HEARING OFFICER DODUC: Any recross, Mr. Palmer?

MR. PALMER: No, thank you.

CO-HEARING OFFICER DODUC: Recross, Mr. DePaoli?

MR. DePAOLI: No, thank you.

CO-HEARING OFFICER DODUC: Recross, Mr. Taggart?

MR. TAGGART: No, thank you.

CO-HEARING OFFICER DODUC: Recross, Mr. Pagni?

MR. PAGNI: No, thank you.

CO-HEARING OFFICER DODUC: I think that concludes.

Mr. Hoppin has questions. I almost forgot my Chair. His phone didn't ring today, that's why.

CO-HEARING OFFICER HOPPIN: I get that all the time.

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QUESTIONS BY the Board AND STAFF

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CO-HEARING OFFICER HOPPIN: Mr. Goetsch, I need to follow up for my own information on Mr. Taggart's question.

Is there anything that precludes a water right owner in Newlands from selling his water right other than just supply and demand and economics?

MR. GOETSCH: I would say no. I mean, there are a lot of -- it's a willing seller/willing buyer.

CO-HEARING OFFICER HOPPIN: Okay. You mentioned in the beginning of your comments about the contributions agriculture makes directly and indirectly to your economy including the tax base, and you also mentioned that when Newlands was formed, I believe in 1904 or the early part of the last century -- the specific date isn't important -- that it's your understanding that the water table went up significantly and allowed for more groundwater pumping.

Is that correct?

MR. GOETSCH: Yes.

CO-HEARING OFFICER HOPPIN: So as the County Manager, as you're responsible for that county, is there any difference to the County whether water is removed from the system by virtue of sale or by virtue of

drought or some other deficiency in delivery? I mean, it's the same net effect, isn't it?

MR. GOETSCH: Anything that impacts the water impacts our economy and all of our families, and we're based on those -- I think I said those three main things -- agriculture, renewable energies and the military base there.

CO-HEARING OFFICER HOPPIN: But your county has no instrument -- we have in California a very fragile instrument that tries to protect agricultural land. But in your county, in your state, certainly in your area you have nothing that is designed to protect that agricultural production and tax base; is that correct?

MR. GOETSCH: Actually, we do. We've instituted a very aggressive and probably the nation's premier Agricultural Land Conservation Easement Purchasing Agreement with the Federal Government and the Navy to help both buffer the base and protect the base from encroachment that could close the base down in the future.

Because it's important to the Navy and to preserve our agriculture, we've entered into a partnership where we buy conservation easements on farmland, take the development rights off of them and tie the water rights to that farmland. It's extremely

successful.

Our target is 15,000 acres in this first phase and another 15 to follow that to maintain farmland around the base in those activities and to keep agriculture and water tied to the recharge in the community.

CO-HEARING OFFICER HOPPIN: But supply and demand is really what dictates whether water will be sold out of your immediate area or not; is that correct?

MR. GOETSCH: As well as the decrees and how the river works and what can be moved to other sections, but yes, sir.

CO-HEARING OFFICER HOPPIN: Thank you, Mr. Goetsch.

CO-HEARING OFFICER DODUC: Questions from staff?

At this time, Mr. Van Zandt, do you wish to move Churchill County Exhibit 1 into evidence?

MR. VAN ZANDT: Yes, please.

CO-HEARING OFFICER DODUC: Is there any objections to that? Mr. DePaoli.

MR. DePAOLI: Yes. I just wanted to register the hearsay objection for the record.

CO-HEARING OFFICER DODUC: It is so noted.

MR. PALMER: Same.

CO-HEARING OFFICER DODUC: Noted, Mr. Palmer.

With that we'll accept Churchill County Exhibit 1 into evidence.

(Whereupon the above-named exhibits were accepted in evidence.)

CO-HEARING OFFICER DODUC: Some questions for you, Mr. Van Zandt.

With respect to TCID's remaining, I guess, five witnesses, do you plan to call them as a panel or grouping of panels? Do you have a preference?

MR. VAN ZANDT: That was not my intention, because they do have discrete topics to deal with.

I did want to advise the Board what I think the appropriate way to proceed is, given the motion to exclude. I have one more policy witness who is Mr. Schank, and then I would like to put on our modeler who is not the subject of the motion to exclude, and then stop until we get a resolution because all the other witnesses may have some impact on the way they phrase their testimony and the way we present it to the Board.

And so it probably will get us right to the 2:00 time period, by my estimate, that we're working off of here.

CO-HEARING OFFICER DODUC: So that would be

Mr. Schank and then Mr. McConnell?

MR. GOETSCH: No, Mr. Schreuder. Willem Schreuder. Dr. Schreuder.

CO-HEARING OFFICER DODUC: Okay.

It's so nice when my attorney agrees with me.

I'm going to ask you to go ahead and proceed with Mr. Schank who I believe is your other policy witness.

MR. VAN ZANDT: Yes.

CO-HEARING OFFICER DODUC: And we'll stop there for today, and that way you'll have your remaining three witnesses in their entirety for next week. It will also give us a chance to take a look at your opposition paper and work on a ruling on the motion as well.

Does that work?

MR. VAN ZANDT: Okay. I was going to call Mr. Schank and then Dr. Schreuder and then we'll stop.

CO-HEARING OFFICER DODUC: Doesn't Dr. Schreuder have other testimony that is relevant for next week?

MR. VAN ZANDT: No, I don't believe so.

CO-HEARING OFFICER DODUC: Then I'm fine with that. Please go ahead.

MR. VAN ZANDT: Thank you very much. I'd like to call Mr. Ernest Schank to the stand, please.

CO-HEARING OFFICER DODUC: Please identify yourself. Are you Mr. Schank?

MR. GOETSCH: I am.

CO-HEARING OFFICER DODUC: You are?

MR. GOETSCH: Mr. Schank.

(Witness sworn)

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ERNEST C. SCHANK

CALLED BY TRUCKEE CARSON IRRIGATION DISTRICT and CHURCHILL COUNTY

DIRECT EXAMINATION BY MR. VAN ZANDT

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MR. VAN ZANDT: Good afternoon, Mr. Schank.

Could you identify yourself for the record, please.

MR. SCHANK: Yes. I am Ernest C. Schank, and I am the president of the Truckee Carson Irrigation District.

MR. VAN ZANDT: And would you spell your last name for the record as well.

MR. SCHANK: S-c-h-a-n-k.

MR. VAN ZANDT: And Mr. Schank, did you prepare written direct testimony for today?

MR. SCHANK: I did.

MR. VAN ZANDT: And are there any corrections

to your testimony?

MR. SCHANK: Yes, there are a couple.

MR. VAN ZANDT: Would you inform the Board as to what those corrections are, please.

MR. SCHANK: On page 4.

CO-HEARING OFFICER DODUC: Actually, I'm sorry, let me interrupt since I was busy making a note.

Could you please identify your exhibit again? This is TCID --

MR. VAN ZANDT: Exhibit 281.

CO-HEARING OFFICER DODUC: 281. Thank you.

MR. SCHANK: On Exhibit 281, page 4, line 24, the exhibits should read: TCID-183, TCID-187 and TCID-185.

And on page 5, line 20, the first full sentence in that line should say, "this will result in." The word "result" and "in" needs to be added between "will" and "reduction." And with that I think it's correct.

MR. VAN ZANDT: So with those corrections, Mr. Schank, is this a true and correct copy of your written direct testimony?

MR. SCHANK: It is.

MR. VAN ZANDT: And you've prepared a summary of it for the Board, have you?

MR. SCHANK: Yes.

MR. VAN ZANDT: Would you proceed to give that summary, please.

MR. SCHANK: I will. I'm pleased to present this, Madam Presiding Member and Chairman of the Board and staff.

As I said, my name is Ernest C. Schank. I am the president of the Truckee Carson Irrigation District. In that capacity, which I will note is an elected, nonpaid public service position, I represent approximately 3,000 water owners in the TCID service area.

I am also on the Board of Directors of the National Water Resources Association, the Carson-Truckee Water Conservancy District and the Carson Water Subconservancy District boards.

I have held the position of president of TCID for the past 12 years and have been a member of the Board for 16 years.

I hold a Bachelor of Science degree in animal science from Brigham Young University in Provo, Utah.

I am 59. In about two weeks I'll be 60 years old. And I've lived in Fallon, Nevada my entire life. My occupation is that of farmer and rancher. My grandfather came to the valley in 1929. He purchased the ranch on which I live and has been the residence and

has been the farm for five generations since 1939.

Until 1976 we also operated a dairy farm. My principal crop is alfalfa which I rotate with small grains.

I'm able to be here today, thankfully, because I have a son who is home cutting the second crop alfalfa, and I appreciate the fact that he does this so that I can be of some service to my community.

My testimony will center on the history of the Newlands Reclamation Project and TCID and the necessity of a reliable water supply in the Lahontan Valley.

I will state upfront that a reduced water supply to the Newlands Project will have detrimental impacts to the water-dependent economy of the Lahontan Valley.

My testimony implicates the public interest and the public trust related to impacts to project water rights from the operation of TROA, including how the subject petitions for change and applications affect the public interest and the public trust.

In 1902 the United States Congress passed the Federal Reclamation Act. In 1903 the Secretary of Interior authorized the Truckee Carson Reclamation Project now known as the Newlands Reclamation Project near Fallon, Nevada, as one of the first five projects

under the Reclamation Act.

The Newlands project has the distinction of being the first project to begin construction in July of 1903, and if my math serves me correctly, that means we are 107 years old.

And it also has the distinction of having the first dam in Reclamation's inventory, that being Derby Dam which has USBR specification 00001.

The communities of Fallon and Fernley grew up as a result of the building of the project. In the early years of the project the United States initiated suit on both the Carson River and Truckee Rivers to secure through a quiet title action a sure supply of water to the project.

These suits resulted in the adjudication of the two rivers. In 1944 the Orr Ditch Decree adjudicated the Truckee River, and in 1983 the Alpine Decree adjudicated the waters of the Carlson River.

In 1926 the Secretary of Interior contracted with the Truckee Carson Irrigation District to make repayment of the construction costs and to operate and to maintain the Newlands project. The project is now paid out. In other words, construction charges have been paid back in full to the United States.

Title, however, to the project still is in the

name of the United States.

The water rights have been determined by the Supreme Court to be owned by the individual property owners. The Newlands Project contains approximately 73,700 acres of water-righted lands which approximately 59,000 acres are currently being irrigated, with a diversion requirement of approximately 300,000 acre feet annually.

The Truckee Carson Irrigation District also operates three hydro generation plants. Water users currently pay to provide for the maintenance and operation of the project facilities.

Water supplies for the Newlands Project are derived from the Carson River and direct diversions on the Truckee River as well as releases of previously stored water in Donner Lake, Lake Tahoe, Prosser Creek Reservoir, Boca Reservoir and the Lahontan Reservoir.

There are two divisions in the Newlands Project. The Truckee Division begins at Derby Dam on the Truckee River and continues to Lahontan Reservoir. The Truckee Division can only be served directly from water from the Truckee River via the Truckee Canal.

The Carson division is downstream of Lahontan Reservoir and utilizes water stored from both the Truckee and Carson Rivers.

The date of priority rights for the Newlands Project water rights are 1902 -- or is 1902.

I think it important for the Water Control Board to understand that the Orr Ditch Decree was finalized only after the parties on the river had entered into the Truckee River Agreement of 1935.

The main participants in the negotiations of the Truckee River Agreement were the United States, the Truckee Carson Irrigation District, the Washoe County Water Conservation District and Sierra Pacific Power Company. Sierra's water resources responsibilities have since been taken over by the Truckee Meadows Water Authority.

The TROA or the Truckee River Agreement provides for the agreed-upon management of the Truckee River for releases from the reservoirs and Lake Tahoe in order to maintain Floriston Rates for all downstream beneficial uses including uses in the Newlands Project.

I will also note that TCID and TMWA are the sole co-tenant owners of privately stored water in Donner Lake, and an operating agreement is between those two parties.

It is my understanding and belief, based upon experts acting for TCID, that TROA will cause shortages to the Newlands Project. Water shortages in the

Newlands Project directly affects the public in that area; that is, the farmers who individually hold water rights and all other individuals living and owning businesses in the surrounding communities.

Specifically, TCID and the Newlands Project users as a whole will experience a drop in hydropower generation revenues, reduction in water delivery fees, reduced agricultural revenues to individual farmers related to reduction in crop yields, reduced business to local businesses, reduced revenues generated and associated with the recreation and local reservoirs and marshlands in the community.

I might note for the Board's edification that the ground that I own is designated as bottom ground. I have 3.5 acre feet of water per acre for the crops that I grow which is primarily, as I mentioned, alfalfa.

We raise four crops a year. I put seven irrigations on my crops to get those four crops a year: Two on first, two on second, two on third and one on the fourth crop. The fourth crop is the most valuable. It is also the lightest crop, but it provides about 78 percent of my net income from that fourth crop. Each irrigation is worth about 14 percent of my water supply.

The Truckee Division receives 100 percent of its water from the Truckee River with diversions from

the Truckee Canal. Shortages in the Truckee River directly impact the availability of water to divert to water rights owners in the Truckee Division.

For example, last year flows were reduced in the Truckee River at the end of the irrigation season to a point where flows in the Truckee Canal were insufficient to satisfy the demands of the Truckee Division water rights owners.

In summary, TCID believes TROA will cause artificial shortages resulting in decreased farming revenues, less carryover storage in Lahontan, reduced hydro generation revenues, reduced recreational activity. It will cripple businesses whose revenues are generated by ag dollars, and it will cause a reduction in the tax base for the counties.

I further state for the record that the new credit storage schemes and water exchanges are a process that will neuter TCID's ability granted by the Truckee River Agreement of 1935 to assure a reliable water supply to the water rights owners within the boundaries of the Newlands Project.

I thank you for this opportunity to provide this testimony to the Board.

CO-HEARING OFFICER DODUC: Thank you. Any further direct?

MR. VAN ZANDT: I just wanted to have Mr. Schank identify some of the exhibits that he mentions in his written testimony, if I could.

First one is TCID-5.

MR. SCHANK: Want me to explain what it is?

MR. VAN ZANDT: Yeah, just describe it for the record.

DR. SCHREUDER: That is the 1926 contract repayment and operation maintenance contract with the United States.

MR. VAN ZANDT: And the second one is TCID-19.

MR. SCHANK: That is the Truckee River Agreement of 1935.

MR. VAN ZANDT: And TCID-44.

MR. SCHANK: That is the agreement between Sierra Pacific Power Company and the Truckee Carson Irrigation District for the operation of Donner Lake.

MR. VAN ZANDT: I'm talking about 44. You may be on 45 there.

MR. SCHANK: Okay. 44 is the indenture.

MR. VAN ZANDT: For Donner Lake?

MR. SCHANK: For Donner Lake, yes.

MR. VAN ZANDT: And 45?

MR. SCHANK: That is the agreement between Sierra Pacific and Truckee Carson Irrigation District

for operation of Donner Lake.

MR. VAN ZANDT: And TCID-134.

MR. SCHANK: That is the Alpine Decree.

MR. VAN ZANDT: And TCID-161.

MR. SCHANK: That is the current contract which we work under which is known as the 1996 contract with the United States.

MR. VAN ZANDT: And TCID-183.

MR. SCHANK: That is a letter that our experts sent which details some problems with the modeling, and it's addressed to Mr. Parr.

MR. VAN ZANDT: And TCID-185.

MR. SCHANK: TCID-185 is a letter from Mr. Chuck Binder, another of our experts, concerning some problems that he saw as he looked through the EIS.

MR. VAN ZANDT: And TCID-187.

MR. SCHANK: I believe that is a letter from you, Mr. Van Zandt, also to Mr. Parr concerning some comments on the draft Truckee River Operating and Environmental Statement Impact Report.

MR. VAN ZANDT: Thank you. And at this time I'd like to move those into evidence, if that's convenient.

CO-HEARING OFFICER DODUC: I would prefer that we wait until the end of TCID's case-in-chief to move

those exhibits into evidence.

MR. VAN ZANDT: Even the statement?

CO-HEARING OFFICER DODUC: Yes.

MR. VAN ZANDT: Okay, thank you.

CO-HEARING OFFICER DODUC: Chair Hoppin?

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QUESTIONS FROM the Board AND STAFF

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CO-HEARING OFFICER HOPPIN: Mr. Schank, I suppose we're both fortunate to have sons that are home taking care of our business while we're here trying to be important.

Would you clarify for me, you're able to grow four cuttings of alfalfa with 3 1/2 acre feet of water, or do you have the ability to take water from a small grain crop that may not use quite that much water and pool that water? How does that work?

MR. SCHANK: I guess the answer to your question is partly yes, but we -- I guess you would characterize it double-cropping, some people would call it.

When I rotate with small grains I put the grain in, generally it is a spring crop. And as soon as it comes off -- in fact, one week ago today we planted our new seeding alfalfa. And so it requires the entire

3 1/2 acre feet of water, and I generally use every bit of water.

CO-HEARING OFFICER HOPPIN: When you have a mature crop of alfalfa are you able to grow it with 3 1/2 acre feet of water?

MR. SCHANK: Yes. I mean, it's tight, but we can do it.

CO-HEARING OFFICER HOPPIN: Thank you.

CO-HEARING OFFICER DODUC: Okay. Thank you. And if you could join your witness, I'll ask the attorneys doing cross to come up.

CO-HEARING OFFICER DODUC: Mr. Palmer, we'll start with you when you're ready.

MR. PALMER: Thank you.

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CROSS-EXAMINATION BY MR. PALMER
FOR U.S. BUREAU OF RECLAMATION

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MR. PALMER: Mr. Schank, good afternoon, it is now.

MR. SCHANK: Good afternoon.

MR. PALMER: Good to see you again. Glad you were able to make the trip.

I just had a few questions regarding your direct testimony for you this morning.

Just to clarify, you talked about the water rights for the Newlands Project, and I believe you said that the water rights are held by -- you referred to them as the water right owners of the project.

Is that right?

MR. SCHANK: They're owned by the water right owners, by the land owners, yes.

MR. PALMER: The farmers in the project.

MR. SCHANK: Yes.

MR. PALMER: Does TCID hold any water rights to the Newlands Project?

MR. SCHANK: Very few.

MR. PALMER: And what do you use those for?

MR. SCHANK: Any that we own are generally water rights that we've collected because people have not paid tax assessments, and it's probably less than ten acres.

MR. PALMER: Thank you. And isn't it true that in the Orr Ditch Decree, Claim 3, that water right is held in the name of the United States?

MR. SCHANK: That's not what the Supreme Court said.

MR. PALMER: I asked about the Orr Ditch Decree. You have the Orr Ditch Decree as one of your exhibits.

MR. SCHANK: I do.

MR. PALMER: And isn't it true in that exhibit that the water rights for Claim 3 are held by the United States?

MR. SCHANK: That's what it says in the decree.

MR. PALMER: I'll now refer you to page 3 of your written statement and about line 11 and 12. You refer to the number of acres, 59,000 acres.

Do you see that?

MR. SCHANK: Yes.

MR. PALMER: And you say that's being irrigated with a diversion requirement of approximately 300,000 acre feet. And what do you mean by "diversion requirement"?

MR. SCHANK: Well, I guess that's historically, at least in the last few years, what it takes to water that many acres. That's what the diversion amounts to.

MR. PALMER: And isn't that actual requirement controlled by OCAP?

MR. SCHANK: Well, OCAP sets the amount that we can take.

MR. PALMER: And how does that relate to the 300,000 you refer to here?

MR. SCHANK: Well, I think you'll find that maximum allowable diversion is about 300,000. I mean, I

don't have the data in front of me, but I think that's what you'll find.

MR. PALMER: So you're referencing, as we heard it the other day, the MAD as the 300,000?

MR. SCHANK: Yes.

MR. PALMER: In your next paragraph starting on line 14 you refer to several reservoirs, and you also say that water supplies from the Newlands Project are derived from the Carson River and direct diversions, et cetera. Do you see that?

MR. SCHANK: Yes, I do.

MR. PALMER: Can TCID or the water right owners in the Newlands Project call on storage in any of these reservoirs and have that water diverted into the Newlands Project through the Truckee Canal?

MR. SCHANK: That is a process of the Federal Watermaster who, if the water is available, makes sure that Floriston Rates are being met, and Floriston Rates may be made up from any of these sources.

MR. PALMER: So that's how that works is it's through the Floriston Rates structure that's in the Orr Ditch Decree?

MR. SCHANK: That's exactly right.

MR. PALMER: Now I'd like to turn you over to page 4 of your direct testimony, please. And this is

just a clarification to make sure I was understanding your testimony.

The very top of that page, line 1 and 2, you say there are several thousand individuals and entities that own water rights from water supplied by the Truckee River and its tributaries.

Do you see that statement.

MR. SCHANK: Yes, I do.

MR. PALMER: Are you only referring to the Newlands Project or more?

MR. SCHANK: No, I'm referring to all those that are parties to the Orr Ditch Decree.

MR. PALMER: Thank you. I just wanted to clarify that.

Now I'd like to refer you to further down on that page in your Roman Numeral III, roughly lines 22 to 24, and there you say that TROA will cause shortages to the Newlands Project.

Do you see that?

MR. SCHANK: I do.

MR. PALMER: And then you have several references to TCID Exhibits 183, 185 and 187 as you corrected; is that right?

MR. SCHANK: Yes, that's correct.

MR. PALMER: And I think Mr. Van Zandt

identified those as comment letters from various consultants hired by TCID to review the Environmental Impact Statement/Environmental Impact Report for TROA.

Is that correct?

MR. SCHANK: That's correct.

MR. PALMER: Do you know whether those comment letters were made part of the final EIS/EIR?

MR. SCHANK: I do not.

MR. PALMER: We can take a moment and verify, but I would submit that if we looked in the state board Exhibit 7 --

MR. VAN ZANDT: We'll stipulate that those comment letters were included in the EIS/EIR.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

MR. PALMER: And those comment letters are the only basis for your statement that TROA will cause shortages to the Newlands Project; isn't that correct?

MR. SCHANK: Well, I believe -- like Mr. Goetsch, I've been involved in this long enough that I believe personally, besides what the experts say, that there will be shortages caused.

MR. PALMER: And what's that personal belief based on?

MR. SCHANK: It's based on what I've been told

as I've discussed this with Bureau people, with my own experts, and with personal knowledge of how the system operates and works.

MR. PALMER: So it's how you perceive what you've been told by various folks; is that correct?

MR. SCHANK: Well, it's how I perceive what I've watched and observed for about 40 years.

MR. PALMER: You're saying that TROA will cause these shortages. TROA is not in effect yet, is it?

MR. SCHANK: No, but proposals are in effect, and I've been involved in water issues for over 40 years.

MR. PALMER: I'm trying to understand what exactly you've looked at for you to say that TROA itself will cause these shortages.

MR. SCHANK: If the water does not come down the river in the Floriston Rates and it is impounded in upstream reservoirs, and water that was once project water shared by all as it comes down the river now has a name and a title on it, it is going to cause shortages because we cannot divert it if it makes it to Derby Dam.

MR. PALMER: But you understand that TROA maintains the Floriston Rates structure, don't you?

MR. SCHANK: It does not maintain it as it currently is.

MR. PALMER: And what do you base that on?

MR. SCHANK: On my understanding of TROA.

MR. PALMER: Have you read TROA?

MR. SCHANK: I have. Not recently. And if you give me a test, I'll fail it.

MR. PALMER: I assume perhaps it's the same answer. If you look over to the top of page 5, starting at line 2 you have the statement: Water shortages in downstream portions of the Truckee River means adverse impacts on operation of the Newlands Project, et cetera, and it goes on.

The basis for that statement is what you just told us in answer to my last several questions; is that right?

MR. SCHANK: Yes.

MR. PALMER: In that same page 5 of your Exhibit 281, line 15, you have the statement, "artificial shortages caused by TROA." What do you mean by "artificial shortages"?

MR. SCHANK: Well, as I said previously, if water is -- if we are precluded from taking water because it is stored upstream and becomes basically the property of someone else, then it does cause an artificial shortage. If you understand that the water should have been ours under the current regime, we

should have had the opportunity to use it, and if it caused a shortage it's going to cause crop reduction because we're not going to have the water to put on the crops. The crops are not going to get the 3 1/2 or 4 1/2 acre feet that they have a duty to receive and is needed to grow an adequate crop.

MR. PALMER: And when you say water is ours, I assume you mean the water rights you described earlier?

MR. SCHANK: Project water.

MR. PALMER: The water right owners on the Newlands Project?

MR. SCHANK: That's right.

MR. PALMER: Through Claim 3 in the Orr Ditch Decree?

MR. SCHANK: That's right.

MR. PALMER: You have a statement also on page 5 about line 25, and you say, "For example, last year's flows were reduced."

Isn't it true that last year the Newlands Project had a 100 percent allocation?

MR. SCHANK: That is true but with qualifications. Would you like me to give the qualifications?

MR. PALMER: No.

On the top of page 6 you have the statement, it

says, "Last year's reduced flows provided less carryover storage." Do you see that?

MR. SCHANK: Yes, I do.

MR. PALMER: And did that impact this year's allocation?

MR. SCHANK: It did not, but it could have.

MR. PALMER: But it did not?

MR. SCHANK: But it did not this year.

MR. PALMER: I'd like to know if -- you mentioned about -- you referenced the comment letters on the EIS/EIR in your testimony. We just went over those exhibit numbers and Mr. Van Zandt agreed that those are part of the record in State Board Exhibit 7.

Do you know whether those comments were responded to in any way?

MR. SCHANK: I do not.

MR. PALMER: Mr. Van Zandt, would you also stipulate that those comments are responded to and is part of Exhibit 7?

MR. VAN ZANDT: I will stipulate that there was a response.

MR. PALMER: That's fair enough. I understand the distinction.

And then I'll look at your last page, and you say at the top of that page: I understand that this

process is accomplished without filing a change petition.

And by "this process" you mean TROA?

MR. SCHANK: Yes, I do.

MR. PALMER: And are you aware that TROA contains provisions in it that allow parties or even nonparties to seek a remedy if they in fact believe they are going to be injured by an operation under TROA?

Do you understand that?

MR. SCHANK: I do understand that there is a mechanism.

MR. PALMER: Next on line 7 you have a statement that says, "Further, it is my understanding that TROA supersedes the Truckee River Agreement or TRA and reduces Floriston Rates."

And Mr. DePaoli had asked Mr. Goetsch a similar question about do you understand what parts of the Truckee River Agreement are actually included in TROA?

MR. SCHANK: Is that a question?

MR. PALMER: Yes. Do you understand or do you know what parts of the Truckee River Agreement --

MR. SCHANK: Not specifically.

MR. PALMER: That's all the questions I have.

Thank you, Mr. Schank.

CO-HEARING OFFICER DODUC: Thank you,

Mr. Palmer.

Mr. DePaoli?

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CROSS-EXAMINATION BY MR. DePAOLI

FOR TRUCKEE MEADOWS WATER AUTHORITY

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MR. DePAOLI: Good afternoon, Mr. Schank.

MR. SCHANK: Good afternoon.

MR. DePAOLI: Mr. Schank, in your written direct testimony you talk about 900 miles of canals, laterals and drains.

Do you have a breakdown between how many miles there are of each?

MR. SCHANK: There are approximately 350 miles of primary laterals, that would be your larger canals. There's 350 miles of primary drain. And the other miles would be made up of what I would call lesser than primary or smaller laterals and drains.

MR. DePAOLI: Are most of the drains in the Carson Division of the project?

MR. SCHANK: No, not necessarily. There are drains in the Truckee Division also.

MR. DePAOLI: In terms of the mileage.

MR. SCHANK: I can't give you a firm answer, but certainly the Carson Division is larger, and it not

only has more laterals, but it would have more drains. But for the area I can't say one is greater than the other if you were to -- you know, comparable area.

MR. DePAOLI: And in terms of -- in comparison to the size of the irrigated area, is that what you're talking about?

MR. SCHANK: Well, if you took the same area that the Truckee Division encompasses and overlaid that in the Carson Division, I don't know whether you would see any difference in the same area. But certainly the Carson Division is a larger area and has more drains and more laterals than does the Truckee.

MR. DePAOLI: And what are the drains for?

MR. SCHANK: Well, the drains have two purposes. In the arid west, in order to reclaim the soil you have to get rid of the salts. And that was one of the things that was learned in the early days.

In fact, the United States did not budget enough money to build an adequate drain system, and that's how TCID became an entity was so that we could bond under state law to build a drainage system.

But the drains remove excess surface flows, but more importantly, they leach the salts and carry them away so that the soil can sustain crops.

MR. DePAOLI: On page 4 of your testimony at

lines 13 and 14 you talk about TCID and TMWA being cotenant owners of the waters in Donner Lake.

Are you aware of the partition judgment that was entered in the Superior Court in Nevada County partitioning that water right as of June 9, 2010?

MR. SCHANK: I will only say this, and I'll ask the chairman, because I don't want to say any more than I should.

This is the subject of litigation. There was a decision rendered but it has been appealed.

MR. DePAOLI: So you are aware of the decision. That's all I was asking. I wasn't asking any more than whether you're aware of it.

MR. SCHANK: I gave an answer.

MR. VAN ZANDT: That's okay. You can answer.

MR. SCHANK: I'm aware of it. I said that.

MR. DePAOLI: Thank you.

Mr. Schank, what is your definition of a shortage?

MR. SCHANK: Anything less than a full duty.

MR. DePAOLI: And what are some of the causes of shortages?

MR. SCHANK: Well, certainly a drought. You could also have shortages because of other causes, washouts. I guess any number of things could cause

shortages.

MR. DePAOLI: Buildup of moss in a canal?

MR. SCHANK: I guess it could, but we live in a time and an era when generally those kinds of things we can take care of.

MR. DePAOLI: Have you ever had any problems that way?

MR. SCHANK: With moss?

MR. DePAOLI: Yes.

MR. SCHANK: Certainly we have.

MR. DePAOLI: Do you have any going on at the present time?

MR. SCHANK: We do.

MR. DePAOLI: Where?

MR. SCHANK: Throughout the project.

MR. DePAOLI: How about in the Truckee Canal?

MR. SCHANK: We do in the Truckee Canal.

MR. DePAOLI: And is that preventing you from taking what OCAP would allow to you take at the present time?

MR. SCHANK: It certainly does not help us take everything that we can.

MR. DePAOLI: Can shortages also be caused by the fact that your water rights are simply junior to other water rights on the system?

MR. SCHANK: They could, yes.

MR. DePAOLI: In your judgment, does a prior senior right taking water ahead of yours cause an artificial shortage?

MR. SCHANK: If it's taken in accordance with Nevada law, beneficial use, it could, yes. Certainly.

MR. DePAOLI: That's an artificial shortage, in your opinion?

MR. SCHANK: No, that's not an artificial shortage.

MR. DePAOLI: Okay. And if it's allowed under California law, it wouldn't also not be an artificial shortage?

MR. SCHANK: As long as it's not changing what I believe the current laws and rights are.

MR. DePAOLI: You were asked -- wasn't the situation in 2009 that is referenced at the bottom of page 5 of your testimony, "the last year's flows were reduced in the Truckee River at the end of the irrigation season," wasn't that caused by the fact that there were senior or equal priority water rights that were being required to be satisfied below Derby Dam causing less water to be available in the Truckee Canal?

MR. DePAOLI: It was caused by Claim 3 water rights, yes, that I believe were given a superior right

over their equal Claim 3 rights that remained in the project.

MR. DePAOLI: Well, in 2009 were there not, first of all, changes to Claims 1 and 2, Orr Ditch Decree water rights that had to be satisfied below Derby Dam during this period of time?

MR. SCHANK: There were Claims 1 and 2 rights that were satisfied.

MR. DePAOLI: They were having to be satisfied ahead of the Claim 3, right?

MR. SCHANK: That's correct.

MR. DePAOLI: And were there not also some water quality water rights that have priorities under the Orr Ditch Decree higher than the Claim 3 rights that were having to be satisfied below Derby Dam?

MR. SCHANK: I believe so.

MR. DePAOLI: And then in addition there were the City of Fernley's equal priority Claim 3 water rights that had to be satisfied?

MR. SCHANK: They're supposed to be equal.

MR. DePAOLI: Well, in your judgment -- and we've had testimony here from the Federal Water Chief, Deputy Federal Watermaster, indicating exactly how that division is made at Derby Dam.

Are you saying that the Federal Watermaster is

referring the water rights that the City of Fernley is sending below Derby Dam to those that go in the canal?

MR. SCHANK: I believe so.

MR. DePAOLI: How so?

MR. SCHANK: Well, first of all -- and again, I guess I ought to -- should I answer?

First of all, they're not being used in the historical manner for which they've been used in the past. And when you take Claim 3 water rights that have historically been used for agriculture and spread over a 7 1/2 month diversion cycle, everybody's needs in the Truckee Division can be met.

But when you take a portion of those rights and consolidate them into four months of the hottest and most -- the time that crops need the most water, then you cause harm to the remaining Claim 3 rights in the Truckee Division that spread their water over a 7 1/2 month period.

That's what happened last year is we had a hundred percent year, but those people in the Truckee Division that were dependent upon this water for their agriculture had a six-week period when they could not get water and yet other claim water was being passed by.

MR. DePAOLI: Well, let's break that into two parts.

First of all, those changes that the City of Fernley had were approved by the Nevada State Engineer as not causing injury, were they not?

MR. SCHANK: That was his opinion.

MR. DePAOLI: And it's his job to have that opinion; is it not?

MR. SCHANK: That's correct.

MR. DePAOLI: And was there an appeal of that decision?

MR. SCHANK: There was.

MR. DePAOLI: And was that appeal dismissed?

MR. SCHANK: It was.

MR. DePAOLI: And the question of 4 months versus 7 1/2 months, that's a question under the Orr Ditch Decree; is it not?

MR. SCHANK: That's correct.

MR. DePAOLI: And it's for the Federal Watermaster to make that determination, is it not?

MR. SCHANK: That's correct.

MR. DePAOLI: I have no further questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. DePaoli.

Mr. Taggart, your cross.

MR. TAGGART: Thank you.

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CROSS-EXAMINATION BY MR. TAGGART

FOR CITY OF FERNLEY

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MR. TAGGART: Good afternoon, Mr. Schank.

MR. SCHANK: I like your new look, Mr. Taggart, preppy glasses and a haircut.

CO-HEARING OFFICER DODUC: What was his old look?

MR. TAGGART: I looked a lot like I do right now.

CO-HEARING OFFICER DODUC: We'll talk later.

MR. TAGGART: I want to ask you, just to clarify a few things. You testified a lot about shortages, and I want to clarify that.

The shortages that you're discussing are the ones that have been described in the EIS/EIR; is that correct?

MR. SCHANK: It says that there will be increased shortages.

MR. TAGGART: And that chart that's been used so far in the hearing -- I don't think you were here yesterday, but there is a chart that Mr. Van Zandt has used with a couple witnesses from the EIS.

Are you familiar with that chart?

MR. SCHANK: I can't say I am.

MR. TAGGART: I just want to clarify, that's the genesis of your concern for shortages is that discussion in the EIS itself?

MR. SCHANK: Part of it, yes.

MR. TAGGART: And are these the shortages that you say were described to you by BOR staff?

MR. SCHANK: Well, they were going from the modeling. So where they got their information from, we have been told, I've been told by individuals who were part of that process -- namely, Roland Westergard -- that we will incur shortages.

MR. TAGGART: So these statements made to you were not made during confidential settlement discussions?

MR. SCHANK: I can't say that they weren't not made in settlement discussions, but they've been made outside of settlement discussions.

MR. TAGGART: Currently there is a limit on the amount of water that can be diverted at Derby Dam at 350 cfs, correct?

MR. SCHANK: Correct.

MR. TAGGART: And that's based upon the safety concerns for the canal, correct?

MR. SCHANK: Correct.

MR. TAGGART: And as a result of the limitation

of 350, isn't it true that there are times when TCID cannot take water that it would otherwise be entitled to?

MR. SCHANK: That's correct.

MR. TAGGART: Do you know how much water TCID has not been able to receive based on the 350 cfs limitation?

MR. SCHANK: I do not.

MR. TAGGART: Isn't it true that any impact that TROA may cause, that you perceive TROA may cause, would pale in comparison to the impact of not being able to receive the full entitlement based on the 350 cfs limitation?

MR. SCHANK: I can't say that for sure.

MR. TAGGART: But the 350 cfs limitation is a real one that exists right now, right?

MR. SCHANK: That's correct.

MR. TAGGART: And unless a very significant and expensive improvement is done to the canal, that limitation will remain on the canal, correct?

MR. SCHANK: Could. I don't know what the Bureau is going to find in their studies, et cetera.

MR. TAGGART: And that limitation is in part to protect the City of Fernley from another flood event, correct?

MR. SCHANK: I believe in part.

MR. TAGGART: Now, in the past isn't it true that TCID has received water simply because upstream water users did not use their full entitlement?

MR. SCHANK: I can't say for sure. Floriston Rates apply on the river, and the water that is available to be diverted is at Derby Dam and we're able to divert it.

MR. TAGGART: But if an upstream water user does not use their full entitlement and it's in the river, you're able to divert it, correct?

MR. SCHANK: I believe that's according to Nevada beneficial law, yes.

MR. TAGGART: Thank you.

CO-HEARING OFFICER DODUC: Does that complete your cross, Mr. Taggart?

MR. TAGGART: Yes, it does.

CO-HEARING OFFICER DODUC: Mr. Pagni?

MR. PAGNI: My questions were actually answered already. I have no cross. Thank you.

CO-HEARING OFFICER DODUC: Mr. Soderlund? No cross.

Mr. Springmeyer? No cross.

Mr. Mackedon has left the room. Does the City of Fallon wish to cross? Hearing none, all right.

Mr. Van Zandt, any redirect?

MR. VAN ZANDT: Just a couple of questions, if I could.

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REDIRECT EXAMINATION BY MR. VAN ZANDT
FOR TRUCKEE CARSON IRRIGATION DISTRICT
and CHURCHILL COUNTY

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MR. VAN ZANDT: Mr. Palmer asked you, Mr. Schank, about the allowable diversions which we were referring to as the MAD and the number that you have in your statement is 300,000 acre feet.

Can you just give the Board kind of an idea of how that 300,000 acre foot number is arrived at?

MR. SCHANK: Well, according to the OCAP, and I will not -- I can't recall the specific dates, but we have a date certain. When I say we, the Irrigation District on behalf of the water users has a date certain that we have to in advance supply information to the United States Bureau of Reclamation as to how much land will be irrigated.

And we do that. We have a process for doing that, and we turn that in and then they determine what our right to divert is and it's called a Maximum Allowable Diversion or MAD.

MR. VAN ZANDT: And is that calculated off the 3 1/2 and 4 1/2 duties and the irrigated acreage?

MR. SCHANK: I believe so, yes.

MR. VAN ZANDT: And the transportation loss is applied as well?

MR. SCHANK: There is transportation losses and evaporation losses, et cetera, that I think are a part of the formula. I can't say for sure.

MR. VAN ZANDT: Mr. Palmer was asking you on page 5 of your statement about the shortage from last year, and you answered his question with qualifications.

Did you want to tell us what those qualifications are?

MR. SCHANK: Well, I think I mentioned to one of the other crosses when they asked concerning the historical diversions on the Truckee Canal and in the Truckee Division in particular.

And when you take a large block of water that has historically been used in the 7 1/2 months time period for agricultural purposes and then you consolidate that or a large portion of that into a 4 month diversion during the hottest, driest part of the season, it results in what we had last year in the Truckee Division.

The irrigators had a 6 week period when they

could not get water and their crops burnt up. Now, granted they got 100 percent supplied because they were able to take some of it at the end of the season and try to restore some of those crops that they lost, at least for the next season. But that can't be profitable to not be able to water your crops for 6 weeks in the middle of the hottest part of the summer, and that's what happened.

MR. VAN ZANDT: Thank you. Mr. Taggart was asking you about some of the people that may have told you about shortages and mentioned Roland Westergard.

Who is Roland Westergard?

MR. SCHANK: Roland Westergard is the former Director of Conservation and Natural Resources for the State of Nevada. Also he served as the State Engineer. And I believe for a long period of time he was the chief negotiator for the State of Nevada in the TROA process.

MR. VAN ZANDT: Okay. And the final question, the 350 cubic feet per second limitation that's on the canal right now, do you consider that to be a permanent restriction or temporary restriction?

MR. SCHANK: I hope it's temporary. I'm trying to get the canal back so that it can carry its capacity.

MR. VAN ZANDT: Thank you. That's all I have.

CO-HEARING OFFICER DODUC: Thank you, Mr.

Van Zandt.

Recross, Mr. Palmer?

MR. PALMER: None, thank you.

CO-HEARING OFFICER DODUC: Mr. DePaoli?

MR. DePAOLI: None, thank you.

CO-HEARING OFFICER DODUC: Mr. Taggart?

MR. TAGGART: None, thank you.

CO-HEARING OFFICER DODUC: Mr. Pagni?

MR. PAGNI: None, thank you.

Questions? Questions? Thank you very much.

MR. SCHANK: Thank you for your time.

CO-HEARING OFFICER DODUC: A couple housekeeping items, so we can go off record.

(Recess)

CO-HEARING OFFICER DODUC: I'll ask Mr. Van Zandt to begin when he's ready.

MR. VAN ZANDT: Thank you very much.

Truckee Carson Irrigation District, Churchill County and the City of Fallon call Dr. Willem Schreuder.

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WILLEM A. SCHREUDER

CALLED BY TRUCKEE CARSON IRRIGATION DISTRICT, and CHURCHILL COUNTY

DIRECT EXAMINATION BY MR. VAN ZANDT

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MR. VAN ZANDT: Dr. Schreuder, will you state your name for the record, please.

And you were here to be sworn the other day; is that correct.

DR. SCHREUDER: I was. My name the Willem A. Schreuder, S-c-h-r-e-u-d-e-r.

MR. VAN ZANDT: And for the education of the Board, could you describe some of your qualifications, please.

DR. SCHREUDER: Yes. I hold a Bachelor's, Honors, Masters and Ph.D. from the University of Stellenbosch in South Africa. That's why I still talk funny. My Ph.D. was in computational fluid dynamics which is basically the study of fluids using numerical models.

I also hold a Master's degree and a Ph.D. from the University of Colorado in Boulder, the topic of which is parallel systems; in other words, using large numbers of computers to solve problems in conjunction.

I have about 25 years worth of experience in mathematical modeling, and in particular more than 20 years of experience in specifically hydrologic modeling, groundwater and surface water models.

MR. VAN ZANDT: And a copy of your resume is included as TCID Exhibit 275A; is that correct?

DR. SCHREUDER: That's correct.

MR. VAN ZANDT: And that is a true and correct copy of your resume?

DR. SCHREUDER: It is.

MR. VAN ZANDT: And you have testified as an expert in court proceedings before, Dr. Schreuder?

DR. SCHREUDER: Yes. I have represented private, local, state and the federal government in a number of settings ranging from district court to the United States Supreme Court.

MR. VAN ZANDT: And you're referring there to Kansas vs. Colorado?

DR. SCHREUDER: Actually, it's Kansas vs. Colorado and Nebraska in the Republican river.

MR. VAN ZANDT: Okay. And you also have some experience in the Truckee River area?

DR. SCHREUDER: Yes. I've worked on the Truckee River Basin since the early '90s, specifically in the area below Lahontan Reservoir initially.

And then as part of that project later on around 1986, '87 or so I did work with Mr. David Robertson who was the author of the Below Lahontan Reservoir model. And as part of that work I actually got an early copy of the negotiated settlement model, as it was called at the time, and then analyzed it for the

purposes of our work in that case.

As things proceeded, I subsequently also analyzed what became the Truckee River Operations Model for both the draft EIS in 1998, I believe it was, and the one for the final EIS which I believe was in 2004.

MR. VAN ZANDT: And Dr. Schreuder, did you prepare an expert report for these proceedings today?

DR. SCHREUDER: I did.

MR. VAN ZANDT: By way of direct testimony?

DR. SCHREUDER: Yes.

MR. VAN ZANDT: And that is identified as TCID Exhibit 275B?

DR. SCHREUDER: That's correct.

MR. VAN ZANDT: Now, are there any corrections to 275B?

DR. SCHREUDER: Unfortunately, yes. There's two references to specific TCID exhibits that are incorrect.

The first is that TCID-152 doesn't exist. The references should be to TCID-151. These occur under opinion 1, approximately in the middle of the paragraph, under opinion 12 in the last section, and in the summary findings about the fifth line from the bottom.

In addition, there are two references that are referred to as TCID-159. If you look at the references,

the first reference which is a letter from Kenn Cartier to Mr. William Bettenberg, that should actually be TCID-158. And that is referred to under opinion 1, which in the last sentence of opinion 1 there is a reference to TCID-158, and that should be -- correction 159, which should be 158.

MR. VAN ZANDT: Thank you. With those corrections, is this a true and correct copy of your direct testimony?

DR. SCHREUDER: Yes.

MR. VAN ZANDT: Now just to kind of set the stage for your testimony, what is the purpose for creating a mathematical model such as the Truckee River Operating Model?

DR. SCHREUDER: Well, generally speaking we build models because we would like to isolate cause and effect. When you do experiments it's hard to understand what some of the other things are that change in the system, and you don't always know whether this observation is as a result of something else or the change that you're imposing to the system.

In a mathematical model you can control all of the inputs to the model, and you can change one thing at a time and then see what is the effect that is caused by that change. You can also, of course, consider

alternate universes. So you could model systems that aren't in operation at this time and see what changes that would have on the behavior of the system, the Truckee River Agreement as an example.

CO-HEARING OFFICER DODUC: Mr. Palmer?

MR. PALMER: Same objection as before. I don't see any of this information in his direct testimony.

CO-HEARING OFFICER DODUC: Mr. Van Zandt?

MR. VAN ZANDT: Well, I believe the thrust of the testimony includes this, because the whole purpose of his testimony, of course, is to provide information to the Board on the Truckee River Operating Model.

So he's merely defining for the Board what the model was trying to accomplish from his point of view and how it was used.

MR. PALMER: But this is not in his direct testimony. I don't see any of that in his direct testimony. He begins starting and talking directly about the TROA model. And in fact, which I'll get into on cross, what his direct testimony is, is with a few additions verbatim the comment letter that he submitted in 2004 on the draft EIS/EIR, nothing more.

DR. SCHREUDER: Mr. DePaoli.

MR. DePAOLI: I would like to join in that, and I think we're going to probably be running into this as

we go along here. But my understanding was that we were to file written direct testimony and that the witness was to summarize that testimony, and instead it seems like what we have was a summary of testimony and now the witness is giving the direct testimony, and it was to be the other way around. At least that was my understanding.

CO-HEARING OFFICER DODUC: Thank you, Mr. DePaoli.

Any further comments, Mr. Van Zandt?

MR. VAN ZANDT: Well, I think if you read Dr. Schreuder's direct testimony, he has to give a frame of reference, and that's what he's doing here is giving a frame of reference for what he's about to tell the Board with regard to the Truckee River Operating Model. I think that's appropriate under these circumstances.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

I'm going to allow the questioning or the testimony, but we will note your two objections, Mr. Palmer and Mr. DePaoli, and we will apply the objections in determining the weight of the evidence.

But you may proceed, Mr. Van Zandt.

MR. VAN ZANDT: Thank you. So I'll ask you specifically: How was the Truckee River Operating Model

intended to be used?

DR. SCHREUDER: The particular use of the model was to evaluate various alternatives. And so the model was run with changed conditions representing different scenarios including the Truckee River Operating Agreement. And differences to the outputs was observed, and these were interpreted to how the system would change as a result of the operation of the Truckee River Operating Agreement.

The key behind all of my testimony is basically that in order for those results to be reliable, we need two things.

Number one, we need to be sure that that model is in fact a true analog of how the system behaves. So we need to have confidence that if we change a certain input that that is really how the system will behave as a result.

The second thing that we need is that we need the model to not behave erratically. So what we need is that if small changes occur to the system, we should be able to see small changes to the results.

Unfortunately, neither of those two preconditions were met.

MR. VAN ZANDT: So would you please summarize for the Board the opinions that you have in your written

testimony.

DR. SCHREUDER: Yes. In the interest of time, I won't go through all of those, but you can summarize my opinions in two major points.

The first is that I don't believe that anybody truly understands what the Truckee River Operations Model does. It's very convoluted; it's very complex. And there may be some individuals who think they know what it does, but in practice I don't believe they do.

The second is that if we throw good science out the window and simply treat this model as a black box, when we exercise that model and we look at changes that occur to the outputs as a result of running that model in different ways, we see rather erratic and very counter-intuitive results.

And so as a result, I don't believe that this model forms a sound scientific basis for any decision-making.

What I would like to do is go through a few items here and just illustrate these two main points.

The first is that the model really isn't very well-understood by anybody. I do believe that Rod Hall who is the primary author of this model in fact thought that he understood all of the instructions that he gave to the computer to actually do these calculations. But

there are 72,000 lines of code, and it's very convoluted, and I don't believe that anybody can in clear conscience say that they are certain that this model doesn't contain any very significant errors.

CO-HEARING OFFICER DODUC: Hold on a second, Mr. Schreuder.

Mr. Palmer?

MR. PALMER: I've restrained myself so far, but I can't anymore. This is hearsay. He's implying that to prove his point the other people who are not here to testify and to be cross-examined --

CO-HEARING OFFICER DODUC: Mr. Palmer, direct your objection to me, and your objection is that it's hearsay?

MR. PALMER: Yes, it is.

MR. VAN ZANDT: May I respond, please?

CO-HEARING OFFICER DODUC: Mr. Van Zandt, go ahead.

MR. VAN ZANDT: He's an expert. Under California Evidence Code, an expert may rely on hearsay in forming an opinion.

CO-HEARING OFFICER DODUC: Thank you. I will allow the testimony. We will note your objection, Mr. Palmer, and we'll consider that in weighing the evidence.

Please continue, Mr. Schreuder.

DR. SCHREUDER: You would of course ask how do I know that nobody understands the code? Well, I have written many models, and I understand that very often I go back to that code sometime later and I think to myself, what was I thinking? This is an obvious mistake that slipped by.

So in any large program like that, what you need is multiple individuals that look at that code, understand what it does, and what it is intended to do, and then say, yes, we think that this is the smallest number of errors that's possible and that this model would be reliable.

In order to illustrate some of these things I would like to refer to some of these particular exhibits that's in my notebook.

The first is that we're talking about what's called spaghetti code, so there is very convoluted control flow. It jumps through all kinds of places, and it is very hard to follow the control logic. However, we are scientists and deal with complex problems all the time. But in this case, if you look, for example, at TCID-155 on page 2, at the top of the paragraph there is an example of code that was entered into the model that gave incorrect results.

And what Mr. Sikonia addresses in this point is that there was a mistake in the calculations and it came up with negative spills, so water was flowing back over the dam into the reservoir.

Instead of understanding why this occurs and correcting that code, there was simply a statement added to the program that says, well, negative flows can't happen, let's just make that zero.

That's not how you're supposed to write this kind of code. You have to correct the fundamental problem, not just change the result in the end.

A second example is --

MR. PALMER: Excuse me.

CO-HEARING OFFICER DODUC: Mr. Palmer?

MR. PALMER: I don't see Exhibit 155 referenced in his direct testimony. Can we point that out, please?

DR. SCHREUDER: I have to go through it here and look at each example. I couldn't within a few seconds point that out directly to you, ma'am.

MR. VAN ZANDT: It's in the references which is the last page, third entry.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

MR. VAN ZANDT: You're welcome.

DR. SCHREUDER: Thank you.

As another example, in the code where the Floriston Rates are calculated there are -- there is a do loop that runs through the loop twice. And in the one example it uses beginning-of-month storage; in the second case it uses end-of-month storage.

In a program where clarity and transparency is the goal, you would call that variable storage. In this case it's called dog, and it doesn't refer to the valley, it just is called dog like cat or cow or some of the other variable names that are used in this program.

That doesn't help understand the code if you're an independent reviewer.

In addition, I at least initially was totally dismayed that the Bureau and other parties would put forward this code as a sound scientific basis.

And I thought I was the lone voice in the desert. However, I have subsequently discovered that a number of other individuals working for both the Bureau and the USGS have expressed similar opinions.

And I'd like to refer you to, for example, TCID-151 on the second paragraph of the letter where Mr. Sikonia says, "Furthermore, I could not and would not defend it in court," referring to the model.

Similarly --

CO-HEARING OFFICER DODUC: Hold on,

Mr. Schreuder. Mr. DePaoli?

MR. DePAOLI: I just want to register an objection for the record as to these references to these exhibits from witnesses who are not going to testify. And I understand that hearsay is admissible, but it seems to me when one looks at some of these documents, I'm not sure they fit the test of this sort of evidence that persons would rely on.

Many of these are not even addressed to anyone; they're addressed to interested persons.

CO-HEARING OFFICER DODUC: Mr. Van Zandt?

MR. VAN ZANDT: Well, again, the expert can rely on hearsay. But in the reality -- and we've already had Mr. Sarna identify who Bill Sikonia was. He was a USGS person.

This in fact is a document that was produced by an employee of the United States Government and could be construed as a party admission in this case.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

I will allow the testimony. Mr. DePaoli, your objection is noted and will be used in weighing the evidence.

Please continue, Mr. Schreuder.

DR. SCHREUDER: I would like to refer to just

two more examples. Both of them are letters to Mr. William Bettenberg dated November 1 which is TCID-158. In the third paragraph of the first page -- this is from Mr. Kenn Cartier.

He says: Nevertheless, I certainly would not have wanted to explain in a court or believe anybody can honestly do so without a major multi-year rewrite.

The last example is a letter from Mr. David Robertson who was a contractor to the BLM at the time.

On the last page, the last paragraph of TCID-159 he makes the comment: As a final summary, the points I would like to make are that the present model is not understandable and probably could not be defensible at any deep level.

The bottom line here is that a number of individuals that spent an awful lot of time studying this code for the TROA parties came to the conclusion that this model is not defensible.

The second example that I would just briefly like to address is that the model behavior is completely erratic and counter-intuitive.

You have alluded to the fact, Mr. Chairman, that some of the results that we see in the EIS is counter-intuitive. Well, if you delve deeper, there are even larger issues with the model in terms of its

results.

What I particularly would like to draw your attention to, for example, is in TCID-159 which I just referred to. On page 5 they describe a set of calculations that the model makes. And what is documented here is that you take in the calculation of the Floriston Rates one value and you subtract three other values from it.

Now, you know from high school arithmetic that if you took those three values that you subtract, add them together first and then make the subtraction, the answer shouldn't change. However, what this document says is that in the case of the TROA model such minute changes to the model completely changes the result.

In fact, the sentence reads: Although our lines are mathematically equivalent to Rod's command lines, the modification produces substantial difference in the output results.

This should not happen. In fact, what I showed as part of my evaluation of the EIS model is that you run this model on a different computer and the answer changes. I, for example, took the model program that they run on a Sun computer and I ran it on an HP computer and a Dell computer, and on each computer the answer comes out differently.

How can you rely on a model that is so sensitive to the exact sequence of calculations for any decision-making? I don't think you should.

MR. VAN ZANDT: Just one question, Dr. Schreuder.

The information that has been placed before the Board that was derived from the EIS/EIR that relied on the Truckee River Operating Model, what level of confidence would you have in that information that you would suggest to the Board?

DR. SCHREUDER: I have very little confidence in those results.

MR. VAN ZANDT: Thank you.

I'd just like to identify for the record what the exhibits are that were referenced here.

MR. VAN ZANDT: These won't be in order, but TCID-159, TCID-137, TCID-154, TCID-138, TCID-243, TCID -- I think this was 158. I'm sorry, one is 158, and 159. So the first one I mentioned is 158, this next one is 159.

TCID-148, TCID-149, TCID-150, TCID-151, TCID-153, TCID-155, TCID-156, TCID-157, TCID-160, TCID-163.

And the report, of course, from Dr. Schreuder, TCID-275B, and his resume 275A.

Thank you. That's all I have.

CO-HEARING OFFICER DODUC: Thank you, Mr. Van Zandt.

Any questions for Mr. Schreuder? I do.

QUESTIONS BY the Board AND STAFF

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CO-HEARING OFFICER DODUC: You may not know this, but you've just tickled one of my great interests. In fact, my first job out of college was as a modeler.

DR. SCHREUDER: Good.

CO-HEARING OFFICER DODUC: And my first job, actually one of my first jobs here at the State Board as a staff engineer was to study the calcium model that is used to simulate the modeling of our two major water projects here. So this is a near and dear topic to my heart.

I want to follow up on a couple things you said. One of your concerns with respect to this model is that you said -- you questioned the certainty of the model, how it captures the conditions that it's modeling.

Well, as you know, no model can fully capture the conditions of a system. All systems are extremely complicated. And as engineers and scientists, we always allow for some room of uncertainty.

From your opinion, what level of uncertainty would have been acceptable for this or any other model?

DR. SCHREUDER: Well, it would depend on what kind of uncertainty you are referring to. If you're referring to the uncertainty in modeling, you put parameters, let's say the transit losses or any of those kind of calculations. There is obviously a significant degree of uncertainty, because this model wasn't calibrated.

So what we would normally do is to apply the model to historical conditions, look to what extent the model can reproduce those, and to the extent that some parameters are uncertainly known, go in and tweak those so we can get a better match between the calibrated and the observed conditions.

That wasn't done here. This model is purely treated as a mass balance model. So for example in cases where you store water and when you release that water, the transit losses are different than when they are under the conditions that prevailed if you didn't store that water.

Those kinds of differences are not even considered in this model.

So to get back to your original question, what level of uncertainty is acceptable, the types of

measurements that we're dealing with obviously aren't precise. So what we would like to do is to apply the model in a different fashion and hopefully subtract out the differences between the two simulations and then say, well, there's a positive or a negative increase as a result of these differences.

The chaotic behavior or erratic behavior we see in the model makes it very difficult to quantify that particular uncertainty, because it's very difficult to tell when a change in the model is simply the difference between you've compiled it with a different compiler or you're running it on a different architecture of computer or whether these are real predictions by the model. So it's difficult to tell the signal from the noise.

And so in terms of evaluating the uncertainty of those predictions, we can't even say anything about that because of the erratic behavior of the model essentially preventing us to make any quantitative determination of what the uncertainty is.

CO-HEARING OFFICER DODUC: And how many times have you run the model under what circumstances?

DR. SCHREUDER: I've probably run the model three, four dozen times with different scenarios. I've run the model many times, but in terms of evaluating

different scenarios, I've probably done a few dozen. I don't remember exactly how many there were.

CO-HEARING OFFICER DODUC: And models tend to evolve over time. When you say the model, is there a particular version or has there been only one version of the model?

DR. SCHREUDER: I have at least five, I think five different iterations of the model going back to about 1993, and the latest one being at the time of the final EIS.

While there are obviously significant differences from one iteration to the next as they model different conditions or different versions of the TROA, there are differences between those models. But if you look at, for example, the behavior that these folks describe in 1996, I observed the exact type of behavior in the final version of the model.

So I believe that it's inherent in this particular program, and it's not a function of exactly which version we're talking about.

CO-HEARING OFFICER DODUC: To your knowledge, has the model been through any sort of official scientific peer review?

DR. SCHREUDER: I believe that these gentlemen that wrote these letters were primarily contracted to

perform that level of peer review.

CO-HEARING OFFICER DODUC: Contracted by?

DR. SCHREUDER: Either the USGS or Reclamation. I don't know whether it was the parties or these individual agencies.

The fact that they were very harsh in their criticism of this model would conclude me to say that no, it hasn't been peer reviewed, because the potential peer reviewers were very critical of the model.

CO-HEARING OFFICER DODUC: You mentioned that running the model on different computers, a Dell, a Sun, got you different results. How different? I mean, what is the significant level of difference that you observed?

DR. SCHREUDER: Thousands of acre feet in some predictions. It varies a great deal when it occurs and the magnitude of the differences. But it's not in the last decimal place.

If you actually are interested, there are some of these exhibits that actually discuss this in a fair amount of detail and document changes of 500 to 1,000 acre feet.

And in my analysis I saw -- I think the largest change was something like 3,000 acre feet difference between the different simulations of the exact same

inputs, just on a different architecture.

CO-HEARING OFFICER DODUC: Well, the same program runs differently on my HP than it does on my MacBook. I mean, there are accounting differences.

DR. SCHREUDER: Agreed. I mean, you always would expect there to be differences in the last decimal place. You don't expect the exact same results.

The observation that these gentlemen make and that I independently make is that it changes the answer by a lot. It's not just subtle changes in the results, and that is what is troubling.

The behavior of the model is almost like this is a chaotic system, and I can't believe that this is in fact a chaotic system. I think it's simply the way that it's being represented that it gives that appearance.

CO-HEARING OFFICER DODUC: It's been my experience that most water systems are chaotic.

But back to my initial comment about no model ever being perfectly -- being perfect or fully capture a complex natural system, it's a fact that we all accept. And I think in most circumstances I find in my experience that while not perfect, models do serve as a very valuable tool in decision-making, in policy development, all sorts of things. It may not be perfect, but it is a tool.

So my question to you is given your criticism of this model, what other tool would you recommend be used that would assist and provide us the same kind of assistance in making these complicated decisions that this model provides?

DR. SCHREUDER: Well, there's two answers to that question.

First of all, my recommendation as well as these other gentlemen was that they should do a complete rewrite of the Truckee River Operations Model in such a way that it is understandable and that other people can get their heads around it.

The second alternative is to use, for example, the Riverware program. And in fact, that was the recommendation I had made as part of my EIS comments.

The Riverware model was available to them in 1996 or 1997, I believe. And so that model, because it's, number one, object-oriented so you can understand the interaction between the objects much better, and also it's a nice, clean implementation of rules that doesn't have strange side effects.

That would have been a much better tool. And in fact it's my understanding that Reclamation has since actually adopted Riverware as a replacement to the Truckee River Operations Model for at least the

administration.

So I think both of these two options would have at least provided a much more reliable source of information for decision-making.

I completely agree with you that no models are perfect. I think all honest modelers will admit that. The problem is in this case I don't think we actually understand what this model does. And that's the cause of my concern, not that it should be perfect.

CO-HEARING OFFICER DODUC: And you fully understand how this other model you recommend operates?

DR. SCHREUDER: It's much easier to understand, and it would be much easier for peer reviewers to look at it and actually get to a comfort level that they can recommend that this is a reliable tool for decision-making.

I don't believe that the Truckee River Operations Model has risen to that level.

CO-HEARING OFFICER DODUC: Have you ran similar scenarios on the Truckee River Operating Model and this other model that you recommend?

DR. SCHREUDER: No. We actually requested a copy of the Riverware model from Reclamation, but we've been unable to actually get that information from them.

CO-HEARING OFFICER DODUC: Thank you.

With that then I'll ask you to join your witness and I'll ask the attorneys conducting cross to come up.

You may begin your cross when you're ready, Mr. Palmer.

MR. PALMER: Thank you.

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CROSS-EXAMINATION BY MR. PALMER
FOR U.S. BUREAU OF RECLAMATION

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MR. PALMER: Good afternoon. Is it Schreuder?

DR. SCHREUDER: I say Schreuder.

MR. PALMER: Schreuder. Thank you. I want to just ask a couple questions regarding your qualifications. I think that's Exhibit TCID-275A.

You mention that you have experience in hydrologic modeling; is that right?

DR. SCHREUDER: Yes.

MR. PALMER: Including surface water?

DR. SCHREUDER: Yes.

MR. PALMER: And what particular experience is that?

DR. SCHREUDER: Well, in Colorado surface water is the most senior water rights, so every project that I've ever worked on in Colorado involves surface water.

The most recent large case that I was involved with was the sub-district rules in the San Luis Valley where the purpose of that ruling was to approve rules for the sub-districts. And there specifically the question was what are the impacts of various conditions on surface water.

Prior to that was again in the San Luis Valley, what is called the Rio Grande rules. This was rules for the confined aquifer. And again, the primary question there was what are the impacts of various management alternatives or new wells on stream flows. And so that was the project that we were working on there.

In the Republican River the issue was depletions to stream flows. Stream flows is what it's all about in the Republican River Compact, and so that was the basis of that decision.

I can go on for hours if you want to, but basically every water rights case that I've ever -- well, not every, but the vast bulk of water rights cases that I've worked on in Colorado and in other states had to do with surface water.

MR. PALMER: I guess I just didn't see that in your statement of qualifications, because you list the Rio Grande groundwater model, you list many groundwater projects, and so I just didn't see surface water in

there.

When you talk about depletions of stream flow, what's depleting the stream flow in those examples you mentioned?

DR. SCHREUDER: Any changes in management, but particularly we're interested in the impact of groundwater pumping on stream flows.

MR. PALMER: Isn't that the same -- when you described the Rio Grande and the confined aquifer, isn't that related to impacts of the pumping of that confined aquifer on the Conejos River?

DR. SCHREUDER: On the Conejos is one of them, but there are many other streams that have impacts on them, yes.

MR. PALMER: So you're looking at groundwater pumping impacts on surface water?

DR. SCHREUDER: I'm sorry, I didn't follow the first part of your question.

MR. PALMER: You're looking at the impact of groundwater pumping from this confined aquifer and whether there is any relationship to that pumping of that confined aquifer on the streams in the area; is that correct?

DR. SCHREUDER: Yes, but a much more complicated situation. So, for example, what we're

interested in as a result of upstream pumping, sometimes there are changes in stream flow. And so we don't just do a simple analysis where we look at the impact of groundwater pumping on the stream flows, but we also look at how things change in the stream network as a result.

MR. PALMER: Thank you. Turning now to your Exhibit 275B, and I looked at that exhibit and I also wanted to ask you if you authored -- I guess it was actually coauthored -- a letter commenting on the Environmental Impact Report/Impact Statement, the draft, and that's in State Water Resources Exhibit 7. It's comments and responses.

I can show it to you if that would be helpful. And it's a letter, Principia letterhead, December 27, 2004. It's on page 141 of that appendix.

DR. SCHREUDER: Yes. The answer to your question is yes, I coauthored that letter.

MR. PALMER: And isn't it true that the Exhibit 275B is in large part verbatim from that comment letter?

DR. SCHREUDER: Depends on what you mean by "in large part verbatim," but it follows the same lines and makes many of the same points, yes.

MR. PALMER: We can go through that if you

like, but I see in large part except for the additional information regarding the 1976 era memos, that it's verbatim from your 2004 comment letter.

DR. SCHREUDER: Again, it depends on what you mean by verbatim. It isn't verbatim the same, but yes, it's in large part the same.

MR. PALMER: Would you like me to read it and compare it? I mean, there's language that's exactly the same; is that right?

DR. SCHREUDER: I don't disagree with that. There is language that's the same.

MR. PALMER: Thank you. And these memos that you've referred to in your direct testimony, and exhibit numbers were listed off, for example -- let me get the right exhibit numbers. You changed a couple of them.

TCID-151 and TCID-159 were a couple. And there's several others that were listed, and they're all from 1996; is that correct?

DR. SCHREUDER: I believe that's correct, yes.

MR. PALMER: And your comment letter in the EIS, I think I read, was in 2004; is that correct? Roughly? I can show it to you if you'd like.

DR. SCHREUDER: Yes, it's December 27, 2004.

MR. PALMER: And do you know whether there were

comments in that letter that were published in the final EIS/EIR?

DR. SCHREUDER: Yes, there were.

MR. PALMER: And when you were looking at this model did you make any attempt on your own to look at stream flow records or gauging information or anything else and make your own analysis to compare to the analysis that you saw from the model to determine whether in fact they were representing in any way the actual system in which it was modeling?

DR. SCHREUDER: Yes, I did. I can't say that it was exhaustive in the sense that I tried to actually go through and verify that the model was calibrated, but I did collect stream flow records and so forth to inform myself as far as the general type of behavior that we see on the system, yes.

MR. PALMER: And what particular data did you look at?

DR. SCHREUDER: Basically, the USGS stream flow records that is available for the various gauges.

MR. PALMER: And then what did you do with that data in order to make your determination?

DR. SCHREUDER: Basically, just looked at the daily flow records and see how they compared against the values that are in the model.

MR. PALMER: Did you develop your own model to test whether what was being shown in the TROA model related to any of that historic information?

DR. SCHREUDER: No.

Board members, there is some comments in these letters that say to do that would cost about a million dollars and take four man years. So I agree that level of effort would be required, and so I didn't attempt to do that.

MR. PALMER: In fact, that statement is in TCID Exhibit 159, the Robertson software that says that redoing the -- I think we've been calling it the TROA negotiation model -- will be costly and time-consuming; is that correct?

DR. SCHREUDER: I believe it's said that in many cases. Mr. Sikonia expresses that opinion, Mr. Greer expresses that opinion, and I don't remember if Mr. Cartier does.

MR. PALMER: And do you know whether there was another model that could have been used at the time in 2004 that at that time in 2004 could have been used to model the TROA operations?

DR. SCHREUDER: I believe that the indications in both the EIS and other documents that I've seen indicates that Reclamation and others have been working

on a Riverware model from somewhere during the late '90s, and that that would certainly have provided another alternative model that they could have used.

MR. PALMER: Do you know if that Riverware model was in fact set up at that time to model the TROA operations?

DR. SCHREUDER: I don't know from personal knowledge whether it was or not.

MR. PALMER: So you have no idea whether it could have actually been used to model the TROA operations in 2004?

DR. SCHREUDER: I don't have firsthand knowledge one way or the other.

MR. PALMER: And I believe you said that it's your understanding that the TROA negotiation model is a comparative model, at least that's how it was used in the analysis, the EIS/EIR; is that correct?

DR. SCHREUDER: Yes. I would probably phrase it a little bit different. There was a number of scenarios run. So the model wasn't run in a different fashion, but the model was used to compare flow rates under different scenarios.

MR. PALMER: And when you say scenarios, would that be the various alternatives that are depicted in the EIS/EIR?

DR. SCHREUDER: I'm sorry, I'm using the wrong terminology. Yes, they are called alternatives.

MR. PALMER: Thank you. I just wanted to make sure we were talking about the same thing.

You may not know this, but I was looking at some of the exhibits you referenced, and I'll just pick on TCID-151 as an example. And I believe that one -- I don't have it in front of me -- but I believe it says "to interested persons."

Do you know who the interested persons were?

DR. SCHREUDER: To some extent, based on who responded to it. So I believe this went to Mr. Greer. There is a reference there to a gentleman named -- his last name Israel. I don't remember his first name.

So it's my understanding that this was fairly widely distributed amongst the individuals that were working on the model at the time, but I couldn't give you an exhaustive list of who all that went to.

MR. PALMER: Do you know whether TCID in fact received any of these memos in 1996?

DR. SCHREUDER: When you say these memos --

MR. PALMER: These particular ones that we've referred to -- I can go to the list -- the ones from Bill Sikonia, the ones from Mr. Greer, the one from Cartier, the ones from Robertson -- any of those that

you referred to, the so-called 1996 memos, TCID Exhibits 150, 151, 152, 153 -- anyway, you get the idea.

DR. SCHREUDER: Well, we do need to make the distinction. Some of the earlier ones, for example, TCID-148 -- correction, that's not the one I was referring to.

149, I believe, was sent to TCID directly by Mr. Sikonia. Some of the later ones I don't have any personal knowledge whether it was sent to TCID or not, but it's my understanding that these were obtained later, and so it's my assumption that it was not sent to TCID.

MR. PALMER: I see on -- which one is up there? I'm sorry. 150?

HEARINGS UNIT CHIEF LINDSAY: 149.

MR. PALMER: I'm sorry, which number?

HEARINGS UNIT CHIEF LINDSAY: 149.

MR. PALMER: The one we have up as an example, there is a date stamp on there that says Received TCID, March 27, 1996. So you would assume TCID received this one?

DR. SCHREUDER: I believe so, yes.

MR. PALMER: Do you happen to know who Russ Armstrong is or was?

DR. SCHREUDER: The name doesn't ring a bell.

MR. PALMER: Some of the memos were addressed to him. I just didn't know if you knew who that was.

DR. SCHREUDER: The name is not familiar to me.

MR. PALMER: That's all I have. Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Palmer.

Mr. DePaoli?

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CROSS-EXAMINATION BY MR. DePAOLI
FOR TRUCKEE MEADOWS WATER AUTHORITY

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MR. DePAOLI: Good afternoon, Dr. Schreuder.

DR. SCHREUDER: Good afternoon.

MR. DePAOLI: I think when you started your direct testimony you said you worked on the Below Lahontan model. When was that?

DR. SCHREUDER: I don't think I said I worked on the Below Lahontan Reservoir model. I worked with Mr. David Robertson, and he was the author of the Below Lahontan Reservoir and in fact gave me a copy of the model somewhere around 1996 or 1997.

MR. DePAOLI: So you weren't working on it when he was working on it?

DR. SCHREUDER: No. I wasn't actually contributing to the model, no.

MR. DePAOLI: So what was your experience then on the Truckee River that you testified to at the beginning of your testimony?

DR. SCHREUDER: Do you just want me to restate what it was?

MR. DePAOLI: Yes.

DR. SCHREUDER: Basically, in the early '90s we were contacted by Mr. Mackedon, and he was interested in just the hydrology in general in the area around Fallon and so forth.

And so at that time we initiated a study where we were looking at what happens to the water, to what extent does it flow in the groundwater system, how does it evaporate. And basically we're looking at it from a mass balance point of view, but not just the surface portion of it, but looking at the entire aquifer system.

And towards the end of that study, I think it was somewhere around 1967 -- correction -- 1996 or so, came into contact with Mr. David Robinson who actually was developing the Below Lahontan Reservoir model which deals with largely this similar area.

MR. DePAOLI: So that experience was in the Lahontan Valley?

DR. SCHREUDER: Yes.

MR. DePAOLI: In your opinion number 1 on the

very first -- not the first page, I guess. In opinion 1 you say it's virtually impossible for any independent and unbiassed reviewer to follow the steps the model takes.

Are you saying it's impossible or very difficult?

DR. SCHREUDER: Impossible is a terrible word. All I can say is that there were some very talented individuals that worked on this for an awfully long time, two years or more, and at the end of that period they still concluded that they didn't understand exactly what this thing does.

MR. DePAOLI: How about you? Could you do it?

DR. SCHREUDER: Modelers are like fighter pilots; we don't ever back down to a challenge.

Given enough time and understanding, I could, I believe, do what was suggested which is to replace the Truckee River Operations Model with an alternative that would be understandable. However, I believe that many of these gentlemen, and I concur, that it would be easier to rewrite the whole thing from scratch than to salvage the Truckee River Operations Model as it currently exists.

MR. DePAOLI: Leaving the other folks aside, my question is: Could you do what you say here is

virtually impossible?

DR. SCHREUDER: Given enough time and money, I could develop a substantial understanding of what the model does. Given even more time and money, I could perhaps make the model understandable to others, which is really what the bottom line is, but it would be a daunting task.

MR. DePAOLI: On that same page, opinion 2, you say that the program claims to track water flow quantities throughout the TROA system but can produce computed output only for a few selected flows at selected locations.

What selected flows does it produce?

DR. SCHREUDER: Do you want me to enumerate the entire list?

MR. DePAOLI: Yes.

DR. SCHREUDER: I don't believe that in the exhibit set that I have in front of me I do. If I were to go look at my computer files I could enumerate the list for you, but I can't based on the materials that I have in front of me right now.

MR. DePAOLI: What flows doesn't it produce that you think it ought to produce?

DR. SCHREUDER: Well, again, I'll use the Riverware analogy. In that model, basically what the

model allows you to do is for every object -- and an object is a reservoir, a stream reach, a diversion dam, all of those things. It has all of the things that contribute to the behavior of that system.

So you can look at every input, you can look at every output, you can look at change in storage, you can look at where all the diversions go, and you can track step by step exactly where does this water go, how does it get exchanged, how does it move from one account to the other and so forth.

In this model there are lots of those calculations that are made that it is extremely difficult to track exactly what happens to that water because of two reasons.

Number 1, the output that the model produces is very selective; and number 2, there isn't any adequate documentation that would tell you that if I want to track how water gets exchanged from there to there, what variable do I need to go print out so that I can see exactly what it does.

MR. DePAOLI: In terms of the locations, you also in that same sentence indicate that the locations were selected by the program author but do not reflect the quantities and locations that remain of deep interest to the affected public.

I wanted to know what are those locations of interest that the interested public isn't getting?

DR. SCHREUDER: Well, I don't pretend to speak for all the interested public, but I certainly would think that a lot of the reservoir quantities, and specifically the individual accounts in each of those reservoirs would be an important set of locations that I don't think is completely enumerated in the output.

MR. DePAOLI: Not completely or not at all?

DR. SCHREUDER: There are certainly some outputs in there that are of interest to the parties, but there are also a large number of quantities that are not in there.

MR. DePAOLI: Like, for example?

DR. SCHREUDER: You're taxing my memory here. I was asked for specific quantities at the time and I couldn't find them, so I just don't recall exactly which those were.

MR. DePAOLI: Moving right along to opinion 13, you indicate in opinion 13 in the language below the opinion that TROA as implemented in the model is aimed at finding unappropriated water, storing that water and then releasing the water when it is deemed beneficial.

What is your understanding of the meaning of the phrase "unappropriated water"?

DR. SCHREUDER: Did I use the term unappropriated water here?

MR. DePAOLI: It's in the second sentence.

DR. SCHREUDER: Okay. I don't know that I can give you a definitive definition as it specifically relates to the Truckee River, but my general understanding is that it is trying to take water that would not have been otherwise diverted and would have flowed into Pyramid Lake and instead store that in various reservoirs.

MR. DePAOLI: And is that your understanding of what the Truckee River Operating Agreement does?

DR. SCHREUDER: I'm sure there's many more aspects to it, but sort of in the broad brush, that's one of the aspects, I believe.

MR. DePAOLI: Is there any others?

DR. SCHREUDER: I am not an expert in the Truckee River Operating Agreement. I couldn't tell you.

MR. DePAOLI: I take it that in your review of the model you looked at or reviewed these references that are at the end of your report?

DR. SCHREUDER: No. I reviewed some of them in the sense that they reflect to some of the things like the EIS and so forth; however, many of these memoranda didn't come to my attention until after the EIS.

MR. DePAOLI: So you didn't rely on some of these references in coming to your opinion?

DR. SCHREUDER: No. As I started out my testimony, I thought for a long time that I was this lone voice in the desert saying that the emperor has no clothes. In this testimony I specifically reflected the fact that a number of other individuals have come to the same conclusion.

MR. DePAOLI: Do you have your references in front of you there?

DR. SCHREUDER: I can find them.

MR. DePAOLI: First of all, while you're finding them, who called these to your attention?

DR. SCHREUDER: Excuse me?

MR. DePAOLI: Who called these references to your attention that let you know you weren't the voice in the desert?

DR. SCHREUDER: I received some of these documents -- I don't recall exactly when it was, but it was subsequent to the EIS perhaps two years or so after the fact from, I believe it was, Mr. Van Zandt's office.

MR. DePAOLI: Now going down the list there, we'll take them one at a time.

TCID-158, did you rely on that in reaching your opinion?

DR. SCHREUDER: It depends on what opinion you are referring to. If you're talking about specifically the EIS, the answer would be no because I received that subsequent to it.

However, for my testimony here today I took comfort in the fact that I wasn't the only one that was saying these things.

MR. DePAOLI: So you didn't rely on them to get your opinion, but it made you feel better that there was someone out there who agreed?

DR. SCHREUDER: Well, that's not the whole story. The point to me is that when the Reclamation and other parties saw my comments in the EIS, it shouldn't have been a surprise to them. Their engineers have been telling them this for years and years, and that was simply what I was trying to elucidate here.

MR. DePAOLI: I'll just be more direct and to the point. I'm just trying to figure out whether these documents were things you relied on or whether this is just a ruse to get all of these documents into this record which otherwise couldn't get into this record.

MR. VAN ZANDT: I'm going to object to the language selected by counsel. I think it is totally inappropriate.

CO-HEARING OFFICER DODUC: Your objection is

sustained. Let me ask the witness this question.

What is important to me is this list of references is did you personally review all of them, and were they part of your consideration in developing the testimony to which you submitted to this Board for these proceedings?

DR. SCHREUDER: Yes, ma'am.

CO-HEARING OFFICER DODUC: Thank you.

MR. DePAOLI: What other documents did you review in your evaluation of the model and for this testimony?

DR. SCHREUDER: I'm not sure I can give you a comprehensive list, but as a result of a number of requests of information from Reclamation, I was provided by documents different pieces of program information, for example, from Mr. Tom Scott's files and so forth.

So there's voluminous other information that I reviewed in preparation of my comments to the 2004 EIS and my testimony here today.

MR. DePAOLI: Did you review the Truckee River General Electric Decree?

DR. SCHREUDER: That doesn't sound familiar to me, so I think the answer is no.

MR. DePAOLI: Did you review the Truckee River Agreement?

DR. SCHREUDER: I don't recall if I did or not. I may have. I don't know.

MR. DePAOLI: Did you review the Orr Ditch Decree?

DR. SCHREUDER: I don't recall.

MR. DePAOLI: Did you review the Tahoe-Prosser Exchange Agreement?

DR. SCHREUDER: Again, I don't specifically recall.

MR. DePAOLI: Did you review the Alpine Decree?

DR. SCHREUDER: I don't think so.

MR. DePAOLI: Did you review the Newlands Project Operating Criteria and Procedures?

DR. SCHREUDER: I think the answer to all of these are I don't recall whether I've actually reviewed the original documents, but I've certainly had extensive discussions with individuals that are knowledgeable about these documents to familiarize myself with the general operation of the system.

MR. DePAOLI: Do you feel like you have a working knowledge of all of these documents?

DR. SCHREUDER: To the extent that I needed to in order to accomplish my assignment, I believe I had sufficient working knowledge of those systems.

MR. DePAOLI: If I were to ask you how a

pondage is filled under the Truckee River Agreement, could you answer that?

DR. SCHREUDER: Probably not.

MR. DePAOLI: I have no further questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. DePaoli.

Mr. Taggart, your cross?

MR. TAGGART: Thank you.

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CROSS-EXAMINATION BY MR. TAGGART

FOR THE CITY OF FERNLEY

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MR. TAGGART: Good afternoon.

DR. SCHREUDER: Good afternoon.

MR. TAGGART: You're familiar with the concept of peer review, correct?

DR. SCHREUDER: Yes.

MR. TAGGART: And isn't it typical in peer review for the letters that are written as part of peer review to be critical of a model?

DR. SCHREUDER: The peer reviewer's task is to point out what they think needs to happen in order to make whatever they're reviewing a sound scientific model. So in some cases the comments that they provide may be critical, but they are harmless in terms of the

overall scientific endeavor. In other cases they can be devastating.

MR. TAGGART: How many models have you reviewed in your professional career?

DR. SCHREUDER: I have long since lost count.

MR. TAGGART: Have you ever reviewed a model that you did not have at least one criticism of?

DR. SCHREUDER: Again, it depends on what you call criticism. I would usually suggest some improvement to whatever was being studied. Sometimes I would be rather harsh in my comments and suggest that they may want to start over.

MR. TAGGART: Wouldn't you agree that some criticism that one modeler may have for another modeler's work would fall under the category of a difference of opinion between two professionals?

DR. SCHREUDER: Yes.

MR. TAGGART: And for instance, one of your criticisms is the use of -- and this is opinion number 6 -- that the flows did not consider changes that may occur in the future, that historical recorded values were used.

And I think I understand that to mean that averages were used. Isn't that just simply a difference of opinion about what the best data set would be to use

in a model like this?

DR. SCHREUDER: As far as that particular opinion is concerned, yes, I think that's something that is readily rectified. You could simply consider a different set of scenarios -- or correction -- alternatives under different conditions and you could come up with a different result.

But in terms of the overall suggestion, I think that would be a marginal improvement and not the kind of fatal flaws that are identified in some of the other opinions.

MR. TAGGART: And isn't it true that when you've received -- well, you've received criticism in the evaluation of your own modeling work, have you not?

DR. SCHREUDER: Many times.

MR. TAGGART: And isn't it true that often you may not make the change that has been indicated by someone in peer review because in your judgment the change was not appropriate?

DR. SCHREUDER: In general, I would say yes; however, what I would always do is to the extent that it is something like what you pointed out which is actually readily achieved, I would simply run the model with these different conditions and say, you know, well, no, that didn't make a difference, or holy smokes, yes, it

made a difference, I'd better pay attention to this.

MR. TAGGART: But sometimes you would just look at the comment and then continue on, evaluate what the comment level of importance is and either address it or disregard it; isn't that a fair statement?

DR. SCHREUDER: I don't think I would ever disregard a comment from a peer reviewer. I would evaluate it, preferably do a quantitative analysis of what the peer reviewer suggested, and then make a demonstration that it may not make a difference or it does make a difference in which case I would have to attempt.

MR. TAGGART: Now, with this particular model was it your testimony that it did or did not receive peer review?

DR. SCHREUDER: I kind of weaseled on that one. There were gentlemen that, I believe, could have served as peer reviewers, but based on the fact that their criticism was very harsh, I don't think the review they did rises to the level of a peer review.

So I think the answer is no.

MR. TAGGART: Even though these were peers who reviewed the document and provided comments? I'll strike that question.

Now, in terms of this particular model, are you

aware that there is a USGS publication that explains this model?

DR. SCHREUDER: Which particular one are you referring to?

MR. TAGGART: I'll ask the question this way.

Are you aware of a USGS publication that describes this model?

DR. SCHREUDER: I'm aware of some USGS publications that describe some models of the Truckee River. I don't know which particular one you're referring to.

MR. TAGGART: I'm talking about the one that you provided your expert opinions about.

DR. SCHREUDER: Could you refresh my memory specifically which one you're referring to?

MR. TAGGART: The Truckee River Operations Model, the one that your opinions have been provided regarding.

DR. SCHREUDER: Yes.

MR. TAGGART: Are you aware of any USGS publications that describe this model?

DR. SCHREUDER: Yes. I believe there is a 1990 document by the USGS that discusses this. It wouldn't have been a final Truckee River Operations Model, but they discussed models of the Truckee River.

MR. TAGGART: Is that document in your references?

DR. SCHREUDER: Let me check.

Yes, it is.

MR. TAGGART: And for the Board, could you tell them what page, what document you're referring to and what page?

DR. SCHREUDER: It is TCID-137 which is the USGS Open-File Report 90-393: Review of Selected Water Management Models and Results of Simulation for the Truckee Carson River Systems, California and Nevada.

MR. TAGGART: And are you familiar with the policies of the United States Geological Survey?

DR. SCHREUDER: In a general sense.

MR. TAGGART: And are you aware of the fact that open-file reports are often generated as a result of peer review?

DR. SCHREUDER: Yes.

MR. TAGGART: When was this model first generated; do you know?

DR. SCHREUDER: There is a document here that describes it. It was first written somewhere in the late '60s or early '70s on a CDC 6600 Cyber System in Denver done on punch cards.

I think that answers your question.

MR. TAGGART: And there's been a lot of evolution in the science of groundwater modeling since this model was generated and hence since it's been updated, correct?

MR. VAN ZANDT: You mean surface water modeling?

MR. TAGGART: I'm sorry, surface water modeling.

DR. SCHREUDER: When you say since it's been updated, I'm not sure what timeframe you're referring to. But I would certainly agree that there has been progress in science.

MR. TAGGART: Aren't you applying present day modeling review techniques to a model that was built 20 years ago, and isn't that just simply unfair to apply that standard to something that was built under a different set of rules that modelers had 20 years ago?

DR. SCHREUDER: No.

MR. TAGGART: So is it your testimony that any time any decision-maker has a model that's 20 years old that it needs to be thrown out because we need to apply modern modeling techniques?

DR. SCHREUDER: No, that wasn't my testimony. I don't think the standards have changed. The standard has always been that this needs to be open, it needs to

be transparent. We need to be able to verify that we understand exactly what the model does.

Over time we've got faster computers and we've built more and more complex models, but I think the general standard is still the same.

MR. TAGGART: So your standard for your work has not changed in 20 years?

DR. SCHREUDER: As far as openness and transparency is concerned, I believe that that scientific method hasn't changed in hundreds of years.

MR. TAGGART: So you've documented every model you've ever built; is that true?

DR. SCHREUDER: When you say ever built, I built some in college that I didn't document. But when I rely -- I ask a decision-maker to rely on it, there needs to be sufficient documentation of the process so that an independent reviewer can look at it and come to an independent conclusion that this is in fact a sound scientific basis for decision-making.

MR. TAGGART: So you've done that in every model that you've built in your professional career, correct?

DR. SCHREUDER: I think the answer is yes.

MR. TAGGART: And you've calibrated every model that you've built in your professional career; is that

true?

DR. SCHREUDER: That I've built from scratch? There are some models, like change models for example, that may not require calibration. But as a general rule I would say yes, with the specific kinds of caveats.

MR. TAGGART: Are you familiar with PEST, Parameter Estimation Sensitivity? Are you familiar with that software?

DR. SCHREUDER: Yes. Actually, I am a contributor to PEST. I work with John Doherty on a regular basis.

MR. TAGGART: And was that method available 20 years ago?

DR. SCHREUDER: Well, the Gauss Levenberg-Marquardt method for doing that kind of optimization has been around for a very long time -- I don't know exactly, but decades if not -- I mean, Gauss has been dead for 400 years. But as far as the specific program is concerned, no, that program has not been available.

MR. TAGGART: Did you run PEST on this model?

DR. SCHREUDER: No, I did not.

MR. TAGGART: Why?

DR. SCHREUDER: One of the critical things in running PEST is that it calculates derivatives. So you

need to have a well-behaved model in order to have meaningful derivatives.

Due to the things that I've described as far as the erratic behavior of the model is concerned, it would get absolute garbage for those derivatives. So the method would fail miserably.

The reason I didn't apply it in this method, though, is not that it simply wouldn't work, it's that we never got to the point where we were actually trying to replace the existing model with something better.

MR. TAGGART: So you're willing, though, to make an opinion that if you ran PEST, even though you haven't run it, you're willing to make an opinion about what the results would be, right?

DR. SCHREUDER: Well, I would be able to tell you that the derivatives that you would calculate using PEST would be garbage because of the chaotic behavior in the model.

MR. TAGGART: So what is the most sensitive parameter in this particular model that you reviewed?

DR. SCHREUDER: I can't give you a quantitative answer to that.

MR. TAGGART: Do you have any idea what parameters the model is sensitive to?

DR. SCHREUDER: The answer is to all of them,

because it's sensitive to the very program itself.

MR. TAGGART: Well, what I'm asking, and I think you understand what I'm asking, is there are specific parameters that a modeler would have in their model, and they would try to find out what parameters the model is sensitive to so they could focus on those particular parameters. Isn't that a fair statement?

DR. SCHREUDER: Well, it wasn't done by the people who built the Truckee River Operations Model. They didn't conduct any type of sensitivity analysis.

MR. TAGGART: I'm asking you if you did.

DR. SCHREUDER: No.

MR. TAGGART: Are you critical of the use of Fortran? Is that one of the problems you have with this model?

DR. SCHREUDER: I was very disappointed in the Reclamation's response to my comment. It isn't about Fortran; it's that Fortran gives you enough rope to shoot yourself in the foot. You can write horrible, spaghetti code in Fortran; you can also write beautiful, elegant code in Fortran. So the problem isn't Fortran; it's the way that Fortran was used in this instance.

MR. TAGGART: You had a couple criticisms in your direct testimony. One was coming out of Exhibit TCID-155, and you commented about how it made water go

backwards or go over the dam the wrong way.

Do you recall that testimony?

DR. SCHREUDER: That's my paraphrasing of what a negative spill means, yes.

MR. TAGGART: I'll use that term then, a negative spill.

But what you stated was that the modelers went in and applied zero as a model code if there was ever a negative spill. Correct?

DR. SCHREUDER: That specifically is what that Fortran instruction does.

MR. TAGGART: So therefore that problem would not have led to any erroneous results in an output because by placing zero in place of negative spill, the model would never generate negative spill, correct?

DR. SCHREUDER: That's exactly my criticism. You're violating conservation of mass.

MR. TAGGART: But the model would never show a negative spill, right?

DR. SCHREUDER: That's a true statement, but you're violating conservation of mass.

MR. TAGGART: How much water was being evaluated in the model? What was the total amount of water that the model was tracking?

DR. SCHREUDER: I don't think I can give you a

quantitative answer.

MR. TAGGART: Well, you stated that when you ran the model on different computers you got different results and there might have been a variance of 3,000 acre feet, so that's 3,000 acre feet against how much acre feet in the total result? Would you agree it's in the millions of acre feet?

DR. SCHREUDER: Well, the specific thousands of acre feet numbers I was referring to are sometimes compared to very small numbers and sometimes to very large numbers. So as far as the significance is concerned, it varies greatly depending on what time and what location.

MR. TAGGART: Did you document the two dozen or so runs that you made of the model and the findings that you developed from those runs?

DR. SCHREUDER: Are you asking me whether I submitted that in the letter? I'm struggling with what you mean by "document."

MR. TAGGART: Well, as a modeler isn't it customary to document your activities as you're running a model? Writing down the results, isn't that a customary practice?

DR. SCHREUDER: Yes.

MR. TAGGART: And I'm asking if you did that

when you ran the dozen or so model runs in preparation of your opinions for this proceeding.

DR. SCHREUDER: Yes. I should clarify. I didn't do that in preparation for this proceeding, it was at the time of the EIS I was making those runs.

But the answer is yes, I did document it at the time.

MR. TAGGART: Has that document been made available in this proceeding?

DR. SCHREUDER: No. And it was dozens, it wasn't just a dozen or so it.

MR. TAGGART: It was just a dozen or so?

DR. SCHREUDER: I don't remember exactly the number.

MR. TAGGART: Do you still have that document?

DR. SCHREUDER: It's not just a document, it's gigabytes of computer files.

MR. TAGGART: And do you still have that?

DR. SCHREUDER: Yes.

MR. VAN ZANDT: I want to clarify. Mr. Taggart repeated an answer but repeated it erroneously. You said dozens of times.

MR. TAGGART: I think the witness clarified it was probably a dozen.

DR. SCHREUDER: No, I think I clarified that it

was dozens of times. I've lost track of how many runs I've made.

MR. TAGGART: When you did the documentation did you write down -- each time you made a run did you write down what your findings were after you made that run, and then when you made the next run did you write those findings down? And do you have a document somewhere that has all those findings written down, or are you now trying to recall something that happened 15 years ago when you made those runs from memory?

DR. SCHREUDER: Well, if you're asking me for a road map, did I have something that goes from the end to the start, the answer is no. But in preparing for this hearing, I reviewed my computer files and looked at the individual simulations that I performed.

I noticed that there were many of them, but I didn't try and count them up or try to look at the information that was contained in those computer files to see exactly what the runs were.

MR. TAGGART: But another person could not pick up that information and review it and independently understand what you documented, correct?

DR. SCHREUDER: I wouldn't go that far. I mean, if you looked at the files you would probably be able to figure it out if you know what you're doing.

MR. TAGGART: When you found these letters that were passed about on cross-examination by Mr. DePaoli, did you make any effort to contact the people whose names were in those letters?

DR. SCHREUDER: I didn't specifically try to contact them, no.

MR. TAGGART: You did not? So you didn't determine whether their concerns had been addressed in the model by calling them up and asking them that question?

DR. SCHREUDER: Well, I know it hasn't been addressed because the model still shows that exact same behavior, so clearly it hasn't been addressed.

MR. TAGGART: Sitting here today, you have no idea whether those individuals still have the criticism of the model or share -- let me restate that question.

Sitting here today, you cannot testify, can you, that each one of those individuals shares your opinion that this model should not be relied upon?

DR. SCHREUDER: That would be a true statement.

MR. TAGGART: Now, my understanding of your answer before is that you cannot quantify what the error is in these model predictions as a result of your criticisms, correct?

DR. SCHREUDER: I don't think that would be a

correct statement. It depends on what kind of errors you're talking about. If we're talking about just the errors that occur as a result of numerical round-off errors and so forth, we've got a fairly good idea of what those are. They're thousands of acre feet based on the simulations that I made.

As far as the accuracy or reliability of the model is concerned, what you were referring to as the general uncertainty to the model, I don't think we have a clear understanding of what that is.

So I think the answer to your question is yes.

MR. TAGGART: Isn't it true most of your criticisms don't really go to the results of the model, it goes to documentation? It goes to choice of data?

DR. SCHREUDER: I don't think I can agree with that, no.

MR. TAGGART: Well, as we look through the opinions in your written testimony it appears that quite a few of them are criticizing the documentation issue, correct?

DR. SCHREUDER: Yes, clearly in order to have a reliable model you need a peer reviewer that actually understands what it does. That's extremely hard to do without documentation.

MR. TAGGART: But you can't sit here today and

tell us what percentage result that lack of documentation has on the predictions of the model, right?

DR. SCHREUDER: I cannot give you a quantitative answer to that question.

MR. TAGGART: Now, it's your testimony, is it not, that this model should not be relied upon for anything, correct?

DR. SCHREUDER: It shouldn't be relied upon for any decision-making that makes any difference to people.

MR. TAGGART: So that would include the model results that predicted a shortage of water to TCID in the Truckee Division of the Newlands Project, correct?

DR. SCHREUDER: The way I would answer that is that I don't think that this model is reliable in the quantifications that it makes. The fact that those shortages still occur is certainly a significant cause of concern in the sense that it does show potential harm to vested water rights that appears to be minimized.

MR. TAGGART: So at least for that purpose then the decision-maker can rely on this model; is that your testimony?

DR. SCHREUDER: To the extent that a party has a burden of proof, I think that there is certainly significant concerns raised that I would encourage the

decision-makers to take into consideration.

MR. TAGGART: But that's the only reason the model should be relied upon?

DR. SCHREUDER: Well, I don't think you can say that the model shows that there will be 40 acre feet difference between one run and the next or that there would be a 4,000 acre foot shortage in one year.

The fact that the model shows there may be shortages in some years is certainly a significant cause of concern, but I don't think you can believe those numbers as they come out of the model.

MR. TAGGART: So can we rely on the model for trends that it indicates? Isn't that what you're saying right now?

DR. SCHREUDER: I'm not sure I'm talking about trends. I'm simply saying that sometimes it does predict shortages. I don't think that quantitatively you can rely on those predictions.

MR. TAGGART: No other questions. Thank you.

CO-HEARING OFFICER DODUC: Thank you, Mr. Taggart.

Mr. Pagni?

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CROSS-EXAMINATION BY MR. PAGNI

FOR WASHOE COUNTY WATER CONSERVATION DISTRICT

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MR. PAGNI: Thank you.

Doctor, I've been sitting here and listening to your testimony, and I'm struggling to understand a connection. Maybe you can help me out.

Have you read the change petitions that are the subject of these hearings?

DR. SCHREUDER: I've glanced at them, but I haven't studied them.

MR. PAGNI: That helps me out. Thank you.

CO-HEARING OFFICER DODUC: Does that conclude your cross?

MR. PAGNI: Yes.

CO-HEARING OFFICER DODUC: Mr. Soderlund? No cross.

And Mr. Mixson? No cross.

Any redirect, Mr. Van Zandt?

MR. VAN ZANDT: Just a couple here.

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REDIRECT EXAMINATION BY MR. VAN ZANDT
FOR TRUCKEE CARSON IRRIGATION DISTRICT
and CHURCHILL COUNTY

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MR. VAN ZANDT: Dr. Schreuder, do you have an understanding of when the Bureau of Reclamation first

started considering using Riverware as an alternative to the Truckee River Operating Model?

DR. SCHREUDER: I don't know exactly when that was. Based on the fact that they had an initial test of the model operating in around 1996, I believe, that it would have been available to them or at least they were starting to consider using Riverware probably in the late '80s or early '90s time frame, but I don't have an exact date.

MR. VAN ZANDT: Can you take a look at TCID Exhibit 173, please.

DR. SCHREUDER: Yes.

MR. VAN ZANDT: TCID Exhibit 173 is a memo from Jeff Boyer Entitled TROA Implementation Planning Committee, Meeting #16, 2/12/2002, Final Synopsis by Jeff Boyer, Implementation Planning Coordinator.

Do you see the reference there to Riverware in that first paragraph?

DR. SCHREUDER: I do.

MR. VAN ZANDT: And the date?

DR. SCHREUDER: It says that work is moving forward from the 1997 test. The document is dated 2002.

MR. VAN ZANDT: Okay.

Dr. Schreuder, the Truckee River Operating Model that you reviewed, did it have any documentation

at all that was provided?

DR. SCHREUDER: Yes, there are a few source code comments that is internal to the document, and I was also provided with a 1993 document by the U.S. Bureau of Reclamation that contains a section on running the program. And the total extent of the documentation is about two-thirds of a page which says this is how you run the program, you run NegOpr.exe, then you run ntrop3.exe and then you run hab14.exe. That's the extent of the documentation.

It then goes on to describe what the various components in the input file is concerned, but as far as documentation of the model itself is concerned, this is it.

MR. VAN ZANDT: And Dr. Schreuder, are you aware of efforts that have been expended in the last several years to try to obtain either documentation or input files for the -- well, let's do it with the documentation -- efforts by you and others to obtain any documentation of the Truckee River Operating Model?

DR. SCHREUDER: Yes. I had mentioned this in my comments to the EIS, and the response to the EIS was that an official and formal user manual for the TROA Negotiation Model is being prepared and will be released when it's done.

I have to date not yet seen it.

MR. VAN ZANDT: And that's in the USBR 7, the response comments to the final EIS?

DR. SCHREUDER: That's correct.

MR. VAN ZANDT: At page 424?

DR. SCHREUDER: Correct.

MR. VAN ZANDT: That's all I have.

CO-HEARING OFFICER DODUC: Thank you.

Redirect, Mr. Palmer? I'm sorry, recross?

MR. PALMER: No questions.

CO-HEARING OFFICER DODUC: Recross, Mr. DePaoli?

MR. DePAOLI: No questions.

CO-HEARING OFFICER DODUC: Mr. Taggart?

MR. TAGGART: Nothing further. Thank you.

CO-HEARING OFFICER DODUC: Mr. Pagni?

MR. PAGNI: No questions. Thank you.

CO-HEARING OFFICER DODUC: Questions? Thank you.

DR. SCHREUDER: Thank you for finishing me today, ma'am.

CO-HEARING OFFICER DODUC: Have a safe flight back to Colorado.

And with that we will conclude for today. We will resume on Wednesday, next Wednesday. I don't know

what the date is, the 28th at 9:00, and Mr. Van Zandt may then call TCID's next witness.

Thank you, have a good weekend everyone.

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(Thereupon the STATE WATER RESOURCES CONTROL BOARD hearing was continued at 3:09 p.m.)

CERTIFICATE OF REPORTER

I, DIXIE L. COOKSEY, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing STATE WATER RESOURCES CONTROL BOARD hearing was reported in shorthand by me, Dixie L. Cooksey, 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 meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this August 13, 2010.

DIXIE L. COOKSEY, CSR
Certified Shorthand Reporter
License No. 4375