STATE WATER RESOURCES CONTROL BOARD

PUBLIC HEARING

CALIFORNIA DEPARTMENT OF FISH AND GAME'S
LOWER YUBA RIVER FISHERIES MANAGEMENT PLAN
AND A COMPLAINT BY
THE UNITED GROUP AGAINST YUBA COUNTY WATER AGENCY
AND OTHER DIVERTERS OF WATER FROM THE LOWER YUBA RIVER
IN YUBA COUNTY

THURSDAY, FEBRUARY 24, 2000
PAUL R. BONDERSON BUILDING
SACRAMENTO, CALIFORNIA
9:00 A.M.

REPORTED BY: ESTHER F. WIATRE
CSR NO. 1564

APPEARANCES

HEARING OFFICER:

JOHN BROWN

COUNSEL:

DANIEL N. FRINK, ESQ.

STAFF:

ALICE LOW
ENVIRONMENTAL SPECIALIST

ERNEST MONA
ENGINEER

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REPRESENTATIVES

YUBA COUNTY WATER AGENCY:

BARTKIEWICZ, KRONICK & SHANAHAN
1011 Twenty-Second Street
Sacramento, California 95816
BY: ALAN B. LILLY, ESQ.

BROWNS VALLEY IRRIGATION DISTRICT:

BARTKIEWICZ, KRONICK & SHANAHAN
1011 Twenty-Second Street
Sacramento, California 95816
BY: RYAN BEZERRA, ESQ.

SOUTH YUBA WATER DISTRICT &
CORDUA IRRIGATION DISTRICT:

MINASIAN, SPRUANCE, BABER, MEITH, SIARES & SEXTON
1681 Bird Street
Oroville, California 95965
BY: PAUL R. MINASIAN, ESQ.

CALIFORNIA DEPARTMENT OF WATER RESOURCES:

DAVID A. SANDINO, ESQ.
1416 Ninth Street, Room 1138-2
Sacramento, California 95814

SOUTH YUBA RIVER CITIZENS LEAGUE:

LAWRENCE D. SANDERS, ESQ.
216 Main Street
Nevada City, California 95959

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE:

ROBERT J. BAIOCCHI
P.O. Box 1790
Graegle, California 96103

REPRESENTATIVES

BROPHY WATER DISTRICT:

DANIEL F. GALLERY, ESQ.
929 J Street, Suite 505
Sacramento, California 95814

WESTERN WATER COMPANY &
WESTERN AGGREGATES, INC.:

KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD
400 Capitol Mall, 27th Floor
Sacramento, California 95814
BY: SCOTT A. MORRIS, ESQ.

NATIONAL MARINE FISHERIES SERVICE:

STEVEN A. EDMONDSON
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

CALIFORNIA DEPARTMENT OF FISH & GAME:

OFFICE OF THE ATTORNEY GENERAL
1301 I Street, Suite 1101
Sacramento, California 95814
BY: WILLIAM D. CUNNINGHAM, ESQ.

UNITED STATES DEPARTMENT OF THE INTERIOR:

REGIONAL SOLICITORS OFFICE
2800 Cottage Way, E-1712
Sacramento, California 95825
BY: EDMUND GEE, ESQ.

WALTER COOK:

WALTER COOK
42 Northwood Commons
Chico, California 95973

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SACRAMENTO, CALIFORNIA

THURSDAY, FEBRUARY 24, 2000, 9:00 A.M.

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H.O. BROWN: Bring the hearing to order.

Mr. Cook, you are up on direct.

MR. COOK: Mr. Brown, I would like to present an opening statement and begin here.

H.O. BROWN: Yes, sir.

MR. COOK: I would like to point out that the Yuba County Water Agency is in continuing violation of its 1965 agreement with the California Department of Fish and Game. The agreement is identified as the Lower Yuba County Fishery Management Plan of February 19 -- or it is in that plan at Page 185, and it was DFG Exhibit Number 26 in the '92 hearing.

The agreement is violated at Daguerre Point Dam. It specifically requires the Yuba County Water Agency to make releases from Englebright Reservoir to maintain minimum flows in the Yuba River immediately below Daguerre Point Dam for the maintenance of fish life. It contains two major conditions which must be met by the Yuba County Water Agency which follow:

One, the flows shall be in addition to releases made to satisfy existing downstream water rights.

And two, it shall be measured over the crest of

Daguerre Point Dam and through the fishways at that dam.

The 1992 hearing record and the evidence to be presented in this hearing will establish the following:

There is no gauge to measure the flows across the Daguerre Point Dam, either at or near the dam.

Two, it is not possible to measure the flows over the crest of the dam and through the fishways at the dam as required by the agreement. There are times when no water passes over the crest of the dam and only a relative trickle passes through the fish ladder.

The nearest downstream gauge identified as the Marysville gauge is located about five miles downstream from Daguerre Point Dam. By the time the main channel of the Yuba River passes the Marysville gauge, substantial turbid and warm water percolates and flows out of the Goldfields and has been added to the river below the dam, but before the Marysville gauge. There is no further flow gauge in the river below the Marysville gauge.

Yet there are a number of miles between the Marysville gauge and the mouth of the river as it enters the Feather. And yet there are numerous private diversions downstream of Marysville gauge without a river gauge to measure those.

The Yuba County Water Agency's operation of the South Canal -- when I say South Canal, there was a little confusion apparently. The South Canal is identified on one

of the Board's exhibits in '92. I don't have the number handy here. But there is a North Canal and a South Canal coming out of the Daguerre Point Dam diversion, out of its reservoir, one headed north and one headed south. For convenience I think it has been referred to that many times. I don't think there is any real confusion there by calling it South Canal. It is easy for me and he can identify it as the evidence comes in.

The Yuba County Water Agency's operation of the South Canal out of Daguerre Point Dam Reservoir permits spawning salmon to enter the Yuba Goldfields and directs their offspring to follow the current in the South Canal to their death in the irrigated fields.

A flashboard dam and a bypass channel is used to direct water out of the South Canal and back into the river for the purpose of controlling the elevation of water in the South Canal. And it diverts the water into the river below Daguerre Point Dam. The bypass channel has allowed spawning salmon to enter the Goldfields and the South Canal. Some of the salmon has spawned in the channel. Their offspring -- that is the diversion channel itself. Their offspring are subject to mortality from heat and predation. Others have entered the South Canal and have traveled upstream in the Goldfields to spawn.

When the young start the downstream migration, they

reenter the South Canal and are attracted to the deadly current. The Daguerre Point Reservoir inlet into the South Canal is not the correct point of diversion for any water diverted by the Yuba County Water Agency under its permit from the Water Board.

The underflow from the Yuba River percolates through the cobbles in the Goldfields above the South Canal, resulting in substantial river flows. These flows empty into the South Canal during its course through the Goldfields and below the entry point from the Daguerre Point Dam. The flows are over and above the flows entering the canal at Daguerre Point Reservoir. The five cubic feet per second flows below Bullards Bar Dam measured at the existing Colgate Dam, which is located a few yards below the Bullards Bar Dam, complies with the DFG 1965 agreement. However, the flows do not meet the basic provisions of Section 401 of the federal Clean Water Act. Sufficient flows are necessary to maintain water quality and aquatic species.

The evidence will show that the riverbed below the dam is dry for the most part. There are unconnected pools of water, but no continuous flow below the dam. The minimum flows are not sufficient to provide a stream of surface water connecting the ponds. The river remains starved for water for about seven miles downstream when Bullards Bar water finally leaves its tunnel and pin stop and is returned

to the river through the Colgate Powerhouse, a short distance above the Englebright Reservoir.

The provisions of Public Resources Code Section 5937 and the public trust require an order that increases the flows across Daguerre Point Dam, or at least measures the flow. Due to the turbidity and increased water temperatures entering the river from the Goldfields, the water quality and flows should be checked at Marysville gauge, as well. Marysville gauge flows, however, should not be used as a measure of the flows across the Daguerre Point Dam. Under Section 401 of the federal Clean Water Act, the flows below Bullards Bar Dam need to be at a sufficient amount to ensure the water quality and health of the aquatic species in the Yuba River.

The Yuba County Water Agency should be ordered to operate the South Canal in a manner that will prevent spawning anadromous fish from entering the Yuba Goldfields, and it should be ordered to operate the South Canal in a manner that will prevent South Canal diversion flows from reentering the river. The South Canal point of diversion should be changed to the location where the South Canal exits the Yuba Goldfields.

For testimony I will be presenting Mr. Bill Calvert, and then I will be testifying myself. To avoid confusion, I hope, Mr. Baiocchi has kindly consented to ask questions

of me as a witness. I have, for the purpose of convenience, written them out, and I think that we can make it at least partially understandable.

And so I will first then call Mr. Calvert, if he could come to the table.

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DIRECT EXAMINATION BY WALTER COOK

BY MR. COOK

MR. COOK: Did you testify yesterday? You have been sworn?

MR. CALVERT: Yes.

MR. COOK: And you have submitted written testimony for these proceedings?

MR. CALVERT: Yes.

MR. COOK: Is that testimony correct and accurate?

MR. CALVERT: Yes.

MR. COOK: I don't think I asked you. Would you state your full name and your place of residence.

MR. CALVERT: William Obit Calvert, 6450 Hammonton Road, Marysville, California 95901.

MR. COOK: Would you state the location of your residence in relation to the Yuba River and the Yuba Goldfields?

MR. CALVERT: I would like to explain. I call it the Lower Yuba River, but from Parks Bar down to Daguerre Point

Dam I call that the upper section, and from Daguerre Point on I call that the lower section, to the extremes to the end of the Goldfields. So when I refer to the Upper Yuba, I am talking about the part between Daguerre Point Dam and Parks Bar Bridge.

So my residence is about halfway between Daguerre Point Dam and Parks Bar Bridge.

MR. COOK: And is --

MR. CALVERT: And is located in what they call the Yuba Goldfields.

MR. COOK: Now, Mr. Calvert, for convenience of your testimony, for illustrating your testimony, we prepared a overlay, an overhead, clear map, which is a schematic of the Yuba River in the area of the Goldfields and its operation and flows, which is not according to scale, but which I believe you may agree accurately shows the flows and the general schematic of the Yuba Goldfields and the Yuba River.

MR. CALVERT: Yes. We drew that up so it would be helpful to identify exactly what we are looking at, and we can all be on the same page of what we are talking about.

MR. COOK: I will put this on the overhead right now.

H.O. BROWN: Does it have an exhibit number?

MR. COOK: No, it doesn't, Mr. Brown.

Was that Mr. Frink that asked the question?

MR. FRINK: Mr. Brown.

MR. COOK: No, it does not. I would like to have an exhibit number. I could -- I had previously exhibits in '92. So to keep from confusion, perhaps this one could be called AA. Would that be satisfactory?

MR. MONA: If you wish, that is fine.

MR. FRINK: I believe Mr. Mona prepared an exhibit list and did assign exhibit numbers for what you have in for this hearing.

Is that correct, Mr. Mona?

And those numbers and exhibit names are so far?

MR. MONA: We have Cook-A, Cook-Q, Cook-N, Cook-O and Cook-1. So we can probably number this next one Cook-2.

MR. COOK: Whatever is fine as far as I am concerned. Those other numbers or those other letters related to the 1992 exhibits. This one, of course, is something we just prepared.

MR. FRINK: Excuse me, one more clarification. All these exhibit numbers are for this hearing. We are putting an S and a dash in front of the label of the party and the numbers. So all the numbers Mr. Mona just read would have an S and a dash before them.

MR. COOK: That is fine, and thank you very much.

Mr. Calvert, do you see what might be a channel called, I think, the Yuba River main stem, I believe it says?

MR. CALVERT: Yes.

MR. COOK: Do you see that?

MR. CALVERT: Yes.

MR. COOK: That represents the Yuba River on this plat. And can you tell the direction of flow on --

MR. CALVERT: It would be to the bottom of the --

MR. COOK: From the top to the bottom?

MR. CALVERT: From the top to the bottom, yes.

MR. COOK: Perhaps, Mr. Mona, do you by any chance have a pointer? I am sorry I didn't bring one from Chico. If anyone has a pointer, it might be helpful. I would sure appreciate it.

Can you point out, Mr. Calvert, the location of where the Daguerre Point Dam is shown on that schematic?

MR. CALVERT: Can I approach the map?

H.O. BROWN: You may.

MR. CALVERT: This would represent Daguerre Point Dam. It is a double draw line on the main stem of the Yuba River.

MR. COOK: I believe it has an identification.

MR. CALVERT: It has identification of DPR Dam.

MR. COOK: Now, below the dam can you show where the Yuba River flows?

MR. CALVERT: The Yuba continues to flow to the bottom of the drawing.

MR. COOK: Now, above Daguerre Point Dam, upstream from

Daguerre Point Dam --

H.O. BROWN: Is there a pointer upstairs somewhere? You can ask them to send one down here.

MR. COOK: I forgot mine.

Can we proceed, Mr. Brown?

H.O. BROWN: Yes, proceed.

Let's go off the record for a moment until we get the pointer.

(Break taken.)

H.O. BROWN: Back on the record again.

MR. COOK: Mr. Calvert, upstream from Daguerre Point Dam, immediately upstream, it shows a widening of the river on that little plat?

MR. CALVERT: Yes, it does.

MR. COOK: What does that represent?

MR. CALVERT: That represents, I believe, the bypass area. This would be more like an island, and this would be a bypass area, and the water would flow through the gabion screen into the South Canal and the bypass back into the -- near Daguerre Point Dam at this area.

MR. COOK: Would that be the reservoir, basically?

MR. CALVERT: Yes, it would.

MR. COOK: You pointed out the gabion screen. It is marked as gabion?

MR. CALVERT: It is marked as gabion.

MR. COOK: Would you make a point to that?

That is a large cobblestone screen for the purpose of preventing small fish from entering the South Canal; is that correct?

MR. CALVERT: That is my understanding of it, and it has a screen in the center of it with large cobbles and rocks to protect it.

MR. COOK: Have you ever observed water passing over the top of that gabion screen?

MR. CALVERT: Yes, I have, during high water. Especially in '97 it went over. And other times with high water I have gone down and observed it going over the top of the gabion screen.

MR. GALLERY: Mr. Chairman.

H.O. BROWN: Mr. Gallery.

MR. GALLERY: I didn't understand from Mr. Calvert's testimony that he had anything about the flood flows going over the gabion; is that correct?

MR. COOK: In the written testimony?

MR. GALLERY: Written testimony.

MR. COOK: I think that is correct, and he is responding to the previous testimony that has been presented here the last several days.

MR. GALLERY: I would like to make the objection he stays within his written testimony consistent with said

direct examination.

H.O. BROWN: Thank you, Mr. Gallery.

That is correct, Mr. Cook. We try to stay within the written testimony and summation thereof. We allow for latitude in cross than we normally do in direct. I will give you some latitude on this, but try to stay within the text of the direct so it is a fair approach for the other attorneys to be prepared to address the direct.

MR. COOK: Very well. I hope I don't stray from that. I will do my best.

H.O. BROWN: Thank you.

MR. COOK: Well, I believe that your written testimony discusses the South Canal. Would you describe or show the South Canal on that plat?

MR. CALVERT: The South Canal gets its water, some of its water, through the gabion screen after summer has pretty well started and the irrigation of the rice fields have started. They open this and fill the South Canal. And it flows through the Goldfields through the cobbled area along the canal. It picks up water from east of the canal. The seepage comes through and you will see it picking up water and gaining water as it is going out the south part of the Goldfields.

MR. COOK: About how far does the South Canal travel through the Yuba Goldfields?

MR. CALVERT: My best estimate would be about two miles.

MR. COOK: Now, on that little plat there is a marking, South Yuba, Brophy, and below that is South Canal. Is that part describing the South Canal?

MR. CALVERT: Yes.

MR. COOK: Looking upstream from the South Canal, there is a waterway described on the plat as the Little Yuba. Would you describe what that is?

MR. CALVERT: The Little Yuba, as I've called it and heard it referred to, is seepage from the river that percs through the rocks and goes into the ponds of the Goldfields above the canal. And to get the water that they were after back in the '80s, they joined these ponds together to increase this flow into the South Canal.

The water mainly travels through the historic bed of the Yuba River. That is this area at one time was a stream of the Yuba River, and it seems that the water tries to get back to that and percs right into the South Canal and then goes out past Hammonton-Smartville Road just before Hammonton-Smartville Road and on down to the south county.

MR. COOK: At the upper end of that Little Yuba is there any connection to the main stem of the Yuba River?

MR. CALVERT: No, not that I am aware of.

MR. COOK: Have you observed water flowing into the

Little Yuba?

MR. CALVERT: Yes. There is a pond that has a, what I would call a, huge amount of water that percs through the rocks. I've tried to measure the amount, and it's hard. I don't understand really how to measure the water. But somehow you take the width of it. If it is 15 feet or ten feet -- let's take a ten feet wide, a foot deep. And the best I can do is throw a straw into it and see how long it takes it to go ten feet or five feet or whatever. Sort of use what little math I can use to figure it out. And I come up with somewhere around 20 to 40 cfs.

MR. COOK: Now, have you -- I'll go to one further foundation question.

How long have you lived at your present residence?

MR. CALVERT: Since November 1974.

MR. COOK: During that time have you had an opportunity to investigate the area of the Yuba Goldfields and Yuba River?

MR. CALVERT: Yes. At one time in this area there was a gentleman that raised trout. My wife actually worked for him and fed the trout. So I had knowledge of all this area because I would help them feed the fish once in a while.

And I've observed the high and low of all of it and pretty much temperatures that would affect trout. So I'm pretty knowledgeable of the ponds, it's cold and warm and so

forth and the area and the amount of flows that goes through.

MR. COOK: Would you show the approximate location of what that trout farm was?

MR. CALVERT: It would be roughly where "seepage" is written. Right in here. This is just a stem. It wasn't designed to show the ponds, but it would have been in the far, upper reaches of this. Right in here.

MR. COOK: And you're pointing generally in the direction or location of the word "seepage" on that plat?

MR. CALVERT: Yes, yes.

MR. COOK: Have you, during the years that you have observed this area, observed salmon in any place on that Little Yuba River?

MR. CALVERT: Yes, I have. It would have been up -- they placed berms across all the early entryways with roads going across this, entry roads into the Goldfields. And they blew out during some years, some of these below, and it let the salmon that came up through this outflow channel that got into the South Canal, would go up and actually reach about two miles east of the actual canal. And they would go right up to where the water percs through the cobbles and leap up on the cobbles and slide back in.

This happened for two or three years in one particular time. I would have to say it was around '93, '94; somewhere

in that area.

MR. COOK: Mr. Calvert, have you observed the fish spawning in that area that you just described?

MR. CALVERT: Yes.

MR. COOK: Have you observed any juveniles, any juvenile salmon or steelhead in that area?

MR. CALVERT: Yes. I have seen the small fish. And I know they were salmon. And I have seen steelhead in some of the real shallow pools in this area up through here.

At one time I saw a fish when the blow-out dam was out. It was in the, like February or March, and I reported it as a spring-run salmon. And Mr. Bill Mitchell came out and checked, and he also confirmed that there was a steelhead and small salmon in this area. And he also saw some of the trout that we had raised previously, and he had identified those as Idaho trout. He was surprised that he saw this funny looking trout there.

MR. COOK: Are you talking about the South Canal at the present time?

MR. CALVERT: Yes. It was right in the South Canal.

MR. COOK: Had you observed juveniles in the Little Yuba?

MR. CALVERT: Yes.

MR. COOK: Now you mentioned the blow-out dam. Would you show the location of the blow-out dam on that plat?

MR. CALVERT: Would be this right here.

MR. COOK: You are pointing at the area which appears to be in a Y-shape with several lines connected to and adjacent to the South Canal; is that right?

MR. CALVERT: Yes. They have a set of flashboards that regulate the level of the South Canal. And I guess that is a fairly expensive setup. So to protect this, they built a blow-out dam a little to the south of it and lower so when the water gets higher this will blow out and protect their structure of the flashboards.

But what happens when this blows out, it dewaters this area in here and the salmon that have come through the outflow channel that spawn here, it just kills them instantly or it exposes any redds to air and the fry that can't get out of the rocks.

MR. COOK: Now the flashboard that you mentioned a minute ago, is the other branch of that Y. Actually would be the one -- the branch closest to Daguerre Point Dam; is that correct?

MR. CALVERT: This is closest to Daguerre Point Dam, which is the flashboard?

MR. COOK: Yes.

MR. CALVERT: Yes.

MR. COOK: Have you personally observed salmon in the area just below the flashboard dam?

MR. CALVERT: Yes. Every year since 1992 I have observed salmon. '92 was the largest amount of salmon that I ever saw in this area.

MR. COOK: Have you observed salmon spawning in that particular area?

MR. CALVERT: Oh, yes. I have observed them spawning all along here and some right in this area, right at the Y.

MR. COOK: Have you observed the -- Strike that.

From your observation would you say there was a gravel area there sufficient for the salmon that were there to spawn?

MR. CALVERT: I believe there is. I see them spawning there, and they are very active, flipping over and beating them up. Their nest in here, yes. I would think that is sufficient. It's probably not really as good as the river, but, yes, I have seen them spawn.

MR. COOK: Now, below that Y, below the flashboard dam, below the blow-out dam, there appears to be a channel that goes back to the Yuba River; is that correct?

MR. CALVERT: Yes.

MR. COOK: Would you show that on the plat?

MR. CALVERT: Well, there is two channels that go back to the river. This one that is dotted was used for several years, and it was allowing salmon in, so they put a culvert and fish screen at the culvert. I call it a fish screen.

It is just big metal bars on it that they drop down over the culvert that kept the salmon out, the large salmon. But smaller ones and steelhead came on through.

But they dug this a little different, and that became the outflow channel for that Y area. And here they put a rock barrier. They have had -- through the years they have had a fish screen, a rock barrier, different types of a fish screen. One's pointed in and debris would stack up on it to cause a washout around the edges. One time it rusted so bad that the salmon could come through. Another time they built it so it would open toward the river. But as the debris came down, it would just open it and let the salmon in.

MR. COOK: Are you presently discussing the area as described on that plat as diversion channel?

MR. CALVERT: Yes.

MR. COOK: Is the flow marker accurately showing the direction of flow in that diversion channel?

MR. CALVERT: Yes.

MR. COOK: Have you observed water flowing into the Yuba River, the main stem of the Yuba River, from that diversion channel?

MR. CALVERT: Yes, I have.

MR. COOK: Would you describe any appearance, unusual appearance, of the water as it enters the channel?

MR. CALVERT: I have seen it in the summer when it's

fairly clear and at times in the summer when it would discolor and become almost muddy to a degree. I have seen it in high water. Washed it out. I have observed it in all kinds of seasons. So, yes, I am familiar with the water that goes out that way.

MR. COOK: Now in relation to the main stem of the Yuba coming from below Daguerre Point Dam, with respect to the clarity of the water and the water coming from that diversion channel, what is the difference, if any?

MR. CALVERT: Quite a bit. Sometimes it has a, lack of words, is a milky color. Other times it has a combination of milky to a discolored -- I wouldn't call it muddy, but you could see that mud had mixed with the milky color. And it goes into, just pours right into the Yuba River. When this dam is out, when the berm is it, it tends to clear up some of the discoloration.

MR. COOK: Now, based on your experience in observing the Goldfields and the Yuba River, do you know of any other entrance through which adult salmon could enter the Goldfields besides the diversion channel?

MR. CALVERT: Yes. There is a lower diversion channel right at the west end --

MR. COOK: Can you push that up just a little bit?

MR. CALVERT: Right at the west end of the Goldfields. This channel also is -- it acts the same as this one, except

it has no flashboard or blow-out dams, just wide open to the river. I have seen salmon in this area, right in here right next to the river.

MR. COOK: Do you know if there is a connection between that lower diversion channel and the South Canal?

MR. CALVERT: I really don't know. I suspect there is because the amount of water you see coming out here sometimes is low. And I suspect they're using this water to run some of the mining operations and --

MR. GALLERY: Mr. Chairman, I would like to renew my objection about Mr. Calvert sticking with what his written direct testimony is about. He is now taking about something that wasn't in his direct testimony at all. And we have had no chance to look at that. It is kind of getting something new that was not --

H.O. BROWN: Mr. Cook.

MR. COOK: I apologize, Mr. Brown. I will withdraw the question.

H.O. BROWN: Thank you, Mr. Cook.

How much more time, Ernie?

MR. MONA: Three minutes.

MR. COOK: Now, Mr. Calvert, have you observed the bed of the north fork of the Yuba River below Bullards Bar Dam?

MR. CALVERT: Yes, I have.

MR. COOK: And would you describe the water flows below

Bullards Bar Dam?

MR. CALVERT: I went on a tour that the Water Agency invited us on. And at the bottom of Bullards Bar there was a seepage pipe that had water coming out of it. I don't know how much. I believe someone asked, and they said at the time it was some -- between three and five cfs comes to mind. I don't know whether that is exact or not. And another small pipe that had some water coming out of it.

And it formed a pool at the base of the dam. Then you would go a little ways downstream. There was nothing but just cobbles and dry rocky bottom and then another pool was there. They were not joined by any stream that I could see.

And basically that is what I noticed at the base of the dam.

MR. COOK: Thank you very much, Mr. Calvert.

Would you like cross-examination, Mr. Brown, of this individual or would you like to wait until my case is completed?

H.O. BROWN: Let's complete your testimony. Then if you would like, we'll do you as a panel.

MR. COOK: Very well. Thank you.

I will ask Mr. Baiocchi if he can ask the written questions.

H.O. BROWN: All right, Mr. Baiocchi.

MR. BAIOCCHI: Have one question.

H.O. BROWN: Yes, sir.

MR. BAIOCCHI: After Mr. Cook puts on his testimony, would it be fair and reasonable that Walter, in case there is objections or whatever, that he can act as his own counsel; is that fair?

H.O. BROWN: That is fair.

MR. BAIOCCHI: Thank you.

Walter, have you taken the oath yet?

MR. COOK: No, I have not, Mr. Baiocchi.

(Oath administered by H.O. Brown.)

MR. BAIOCCHI: Mr. Cook, have you reviewed a copy, a true copy, of your testimony?

MR. COOK: Yes, I have.

MR. BAIOCCHI: Is that a true copy?

MR. COOK: Yes.

MR. BAIOCCHI: Please state your name and address.

MR. COOK: My name is Walter Cook. I reside at 42 Northwood Commons in Chico, California. ZIP code, 95973.

MR. BAIOCCHI: What is your business or profession?

MR. COOK: I'm a retired attorney.

MR. BAIOCCHI: Please describe your background and legal experience.

MR. COOK: I was previously employed by the State Lands Commission as staff counsel, assigned to issues involving

state ownership in a sovereign capacity of the lands underlying navigable waterways, the public trust and public rights of access and easements on and to its waterways.

In addition to legal responsibility, I supervised a task force assigned to public ownership problems in the San Francisco Bay area, which included tidal officers, real estate agents, surveyors and draftsmen.

MR. BAIOCCHI: Thank you.

What is your knowledge and experience relating to the Yuba River below Bullards Bar Dam and the Yuba Goldfields?

MR. COOK: My observations of the Lower Yuba River and the Yuba Goldfields, since moving to Chico in 1994, have been somewhat reduced. However, prior to that I spent a great deal of time in the area and became intimately familiar with the river, the Goldfields and their character, fisheries, watercourses dams and Yuba County Water Agency diversions. Canoeing the river has been a favorite pastime of mine. I have paddled the river from Parks Bar to Hallwood as many as 25 times in a given year. I have paddled the river both summer and winter, including salmon spawning periods.

MR. BAIOCCHI: How familiar are you with the Bullards Bar Dam?

MR. COOK: I've been to Bullards Bar Dam on numerous occasions. On June 18, 1991, I hiked down the road to the

base of the dam. I walked past the old dam and down to the riverbed a couple hundred yards or so. In addition, I participated in the group observation of Bullards Bar Dam as part of the Water Board hearing, including to the base of the dam. So, I have been to the base of the dam twice.

MR. BAIOCCHI: Thank you.

Are you familiar with the minimum flow requirements at the base of the dam?

MR. COOK: Yes. They are five cubic feet per second.

MR. BAIOCCHI: Would you describe the flows you have observed when you were at the base of the dam?

MR. COOK: The minimum flows established for areas below Bullards Bar Dam are obviously inadequate. At the time of my visit there was no continuous above surface river flow below the dam. There were pools of water, but there was no connecting stream between them except for the pools, the small river flow is located within the rocks well below the surface.

In addition I pointed out that I took a photograph of the Yuba River streambed below the base of Bullards Bar Dam. The photo was submitted with my testimony at the 1992 hearings as Exhibit A. A copy was attached to my written testimony presented for this hearing. And I intended to bring an enlarged copy but it remains in Chico, unfortunately.

At about the time of the photo there was a substantial flow into the dam. Within a few days of my photograph below the dam I observed the water flowing into Bullards Bar Dam on the South Fork, which did not include water coming from the Middle Fork and the Oregon Creek. But there was a very substantial flow. I couldn't tell you the cubic feet per second, but it certainly was a very heavy flow. It was something that I wouldn't want to try to swim across. I don't think I could make it.

At about the time of the flow there was a substantial flow, but apparently most of it after it got into the dam was diverted through the tunnel for power generation at the Colgate Powerhouse, which is located about seven miles downstream.

MR. BAIOCCHI: Mr. Cook, you meant at or about the time of the photo?

MR. COOK: Yes, sir.

MR. BAIOCCHI: Have you observed flows below the dam on other occasions?

MR. COOK: Yes, I have.

MR. BAIOCCHI: Please describe.

MR. COOK: I visited the dam on numerous occasions. Every time I drive over the dam I stop, walk along the fence and look down to the riverbed. I have never seen the riverbed below the dam when it didn't look like it did the

time that I was at the base of the dam. In fact, on the orientation visit to the dam on the 15th of this month, the entire group drove to the base of the dam and the same conditions were observed at that time.

MR. BAIOCCHI: Have you ever visited the Daguerre Point Dam and the North and South Canals?

MR. COOK: Yes, many times.

MR. BAIOCCHI: Would you please describe Daguerre Point Dam and the South Canal and their operations?

MR. COOK: If I may use the plat on the overhead. The Daguerre Point Dam is operated as a diversion dam. River water is diverted out of the main channel of the river by the Yuba County Water Agency from the dam's reservoir, the area immediately above the Daguerre Point Dam, into canals, both to the north and to the south of the current riverbed. And that would be immediately above Daguerre Point Dam there is two lines showing a canal headed to the north and on the other side of the reservoir just above the Daguerre Point Dam is the South Canal headed in the opposite direction.

The South Canal is blocked off as it leaves the reservoir by a rock gabion fish screen which is intended to prevent fish passage out of the main channel of the river and down the South Canal. A transparency of Exhibit Q, which I used yesterday, and because I think this is more

understandable. I will not be using it today. I think this present plat is more easy to understand.

Daguerre Point Dam is shown at the left middle of Exhibit Q. From there the South Canal traverses the Goldfields to the right. It goes past the town of Hammonton, which is a mile or so downstream on the South Canal. And thence on its course to its exit from the Goldfields to the head gates of the delivery of the water into the South Yuba. I believe it is the South Yuba-Brophy Channel, called at that point, and the water users to the south. So it heads into the, for the purpose of irrigation, due south of the river.

Flowing into the South Canal is another major waterway, which parallels the current riverbed. It is shown as coming from the top of the map, of the plat. At its inception its entire flow percolates out through the rocks of the dredger tailings without a direction connection to the plain river channel. It constitutes a substantial stream until it finally reaches the South Canal.

I can't tell you the cubic feet per second, but it perhaps -- my guess would be about a quarter of the size of the main channel itself. I personally observed on a number of occasions the headwaters of this particular stream, that is called the Little Yuba and that particular stream begins when you observe water flowing out of the rock

cobbles. There is no connection to the river, to the mainstream of the river, merely water flowing out of cobbles forming this substantial stream.

I believe the Yuba County Water Agency's permits to appropriate water, designated the entry point of the South Canal as the point of diversion. However, from Exhibit Q, it is clear that large amounts of river water pass into the South Canal from the internal stream I have mentioned, that is the Little Yuba, and from seepage flows into the canal along its course to the Goldfields.

The true point of diversion of all the water that empties out of the Goldfields in the South Canal is where the South Canal exits the Goldfields, because it is a continuing amount of water flowing into the canal from there. About a quarter of a mile down the South Canal from the Daguerre Point Dam Reservoir there is a seasonal check structure with flashboards which control the water level in the South Canal. By adding cross -- flashboards the water level can be raised or by removing flashboards it can be lowered.

This leads into a bypass channel which is described on the plat here as the diversion channel, which flows at about an average, my guess, is, based on conversations with Mr. Wilson, I believe my estimate at this time is 75, perhaps, to a hundred cfs. And it flows to its outfall back into the

Lower Yuba River channel. There has been in the past an ineffective screen which is located just above the outfall, and I am referring to that item or structure just before the diversion canal enters the Yuba River main stem.

When the outlet screen is inoperative, many salmon enter the bypass channel from the river, and thence to the South Canal and further into the Goldfields. The spawning salmon must past the seasonal check structure flashboards or blow-out dam shown on the plat. I have observed numerous adult salmon in a holding pattern just below the structure. That is just below the flashboard structure, which would be the structure just above that Y-shaped portion of the diversion channel and closest to the Daguerre Point Dam reservoir. I've observed very many spawning salmon in that location.

I have also reviewed the Smith report, which was referred to briefly yesterday and which was submitted in evidence in the 1992 hearings, pointing out that, based on U.S. Fish and Wildlife Service review, that there is inadequate area for salmon spawning, for all the salmon to come in there; that, in addition, when they do spawn, that the young are subject to predation and to warm water temperatures. And it is a very unhealthy place to spawn below that. However, I have seen fish jumping at the flashboards, but I have not personally seen fish getting

from that area into the South Canal. But according to the photographs, other evidence that fish obviously go above there.

Once adult salmon do reach the South Canal itself, then they can travel upstream in the Little Yuba until there is a crossing, perhaps a mile upstream. Their offspring follow down the current of the Little Yuba and they enter the South Canal. Due to the current in the South Canal, many, if not all, of the juveniles will go down the South Canal rather than across at the flashboards or blow-out dam and will end up into the agricultural fields below the area.

Juvenile salmon above the South Canal have a very perilous route to follow to get back to the ocean and most of them apparently do not make it.

MR. BAIOCCHI: Would you please describe the flows in the main channel of the Yuba River downstream from the Daguerre Point Dam?

MR. COOK: The minimum flow at Daguerre Point Dam is obviously deficient. Both the DFG and FERC call for a minimum summer flow in addition to releases made to satisfy existing downstream rights of 70 cubic feet per second to be measured over the crest of the dam and through the fishway. Yet there are times during the summer when there is no measurable flow over the crest of the dam and only several cubic feet per second through the fish ladder.

In fact, as there is no gauge either at our near the dam, as required by the Yuba County Water Agency license, it is not possible to determine whether the minimum flow requirements are being met. Instead the Marysville gauge is being used for measuring the minimum flows, but the gauge is located about five miles below the dam. By the time the river reaches the gauge, the river includes additional water that has returned to the river from the Goldfields, in general, as well as from the South Canal by a bypass watercourse or what is described as diversion channel on the plat.

Canoeing past the area, the Goldfields area, well below Daguerre Point Dam, I personally observed water seeping through the rocks into the river, as well as the water coming out of the diversion channel.

The water returning to the river from the South Canal via the bypass or diversion channel, as shown on the plat, adds substantial turbidity to the otherwise clear river water. I believe I have a photograph that was introduced in 1992 showing discoloration. Just about every time I have gone by that area I have found that the water entering the Yuba River is substantially discolored, appearing to be mud or whatever. I took a jar one time and found that water coming out of there had sediment in it.

The Yuba River main stem water, on the other hand,

coming down from Daguerre Point Dam in the summertime and most of the time passing through there is very clear. And I took a jar of water from that one time and found no sediment. So there is a major change in the coloration of the water from above this location to the diversion channel outflow itself.

MR. BAIOCCHI: Have you reviewed historic maps of the Lower Yuba River?

MR. COOK: Yes.

MR. BAIOCCHI: What were these maps and what did you observe?

MR. COOK: Meanders of the historic Yuba River, as shown by the official surveyor of the U.S. Surveyor General, which is township map 16 north, range 5 east, of August 6th, 1887, shows the historic and current river beds shown on the plat attached to the amended settlement agreement between the State Lands Commission and the Yuba Goldfields, Inc., filed in the U.S. District Court for the Eastern District of California. Civil Number S-79-73-RAR. These show that the historic bed of the Yuba River originally passed about a mile to the south of the current riverbed. The township map and the settlement plat were introduced by me during the 1992 hearings as Exhibits N and O to my proposed testimony, and are part of the record of this matter. Copies are attached.

These maps along with the deep dredging of the entire area and the current condition of Goldfields, consisting mainly of large cobbles, tends to explain to me why the water so freely pass through all the Goldfields area.

MR. BAIOCCHI: Have you observed salmon spawning in the main channel of the Yuba River?

MR. COOK: Yes, I have seen many spawning salmon in the river below the Parks Bar Bridge.

MR. BAIOCCHI: Have you observed unusual flows in the main channel during salmon spawning?

MR. COOK: During the spawning season of 1991, I traversed the river by canoe. A sale of water of Yuba County Water Agency had just ended. With the end of the water transfer the flows were drastically reduced, thereby uncovering many salmon redds or salmon nests, with the likely loss of a large number of salmon eggs.

MR. BAIOCCHI: That concludes the testimony of Walter Cook.

MR. COOK: We are prepared for cross-examination, Mr. Brown.

MR. BAIOCCHI: Mr. Brown, Walter may want to make this statement, but following cross-examination of Walter will it be okay to request that your testimony and Bill's is admitted into the record? Remind you of that.

MR. COOK: The written testimony, I will ask that after

the cross-examination.

MR. BAIOCCHI: Thank you very much for allowing me.

MR. COOK: Thank you very much.

H.O. BROWN: We are now ready for cross-examination.

Is Mr. Edmondson here?

Mr. Gee.

MR. GEE: I don't have any cross-examination.

H.O. BROWN: Mr. Baiocchi.

MR. BAIOCCHI: No cross.

H.O. BROWN: Mr. Sanders. Not here.

MR. SANDERS: Excuse me, Mr. Brown.

H.O. BROWN: I am sorry, Mr. Sanders.

MR. SANDERS: I have two questions, actually.

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CROSS-EXAMINATION OF WALTER COOK

BY SOUTH YUBA RIVER CITIZENS LEAGUE

BY MR. SANDERS

MR. SANDERS: Mr. Calvert, can you just point out on the map where your house is?

MR. CALVERT: It would be off the map, just --

MR. SANDERS: Just above the top of the map?

MR. CALVERT: About a foot above that.

MR. SANDERS: Can you also point out where the public lands is in the Goldfields? That may be not super accurate, if you can give us a general idea of what is public and

where is your property that would be helpful to me.

MR. CALVERT: My property is in Section 25 and 26. The public lands start with Section 27 and then go along the river all the way down to -- I don't recall the section number right now.

MR. SANDERS: Thank you.

MR. MORRIS: I will object to that question. There has been no foundation for establishing the location of public lands. He is not an expert.

H.O. BROWN: You have a response, Mr. Sanders?

MR. SANDERS: No. I withdraw the question.

H.O. BROWN: Mr. Lilly.

MR. LILLY: Thank you, Mr. Brown. I have no questions of these witnesses.

H.O. BROWN: Mr. Gallery.

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CROSS-EXAMINATION OF WALTER COOK

BY BROPHY WATER DISTRICT

BY MR. GALLERY

MR. GALLERY: Mr. Calvert, what is the size of your parcel?

MR. CALVERT: I have two parcels. One is roughly 60 acres; the other one is roughly 35 acres.

MR. GALLERY: Are they farming parcels or what kind of activity?

MR. CALVERT: It is dry land, yes. It is foothills. I have raised cows since I have lived there.

MR. GALLERY: How long have you been up there?

MR. CALVERT: Since November 1st, 1974.

MR. GALLERY: So you're really east of the Goldfields property. Are you up in the foothills?

MR. CALVERT: No. I'm what is considered the Goldfields.

MR. GALLERY: The property was then formerly -- your property was formerly mined, was it, for gold mining, dredged for gold mining purposes?

MR. CALVERT: No.

MR. GALLERY: So, when you say you are part of Goldfields, you say that because?

MR. CALVERT: I live on the Hammonton Road. Hammonton Road traverses the Yuba Goldfields, from Hammonton-Smartville Road through old town of Hammonton, Sand Flat and all the towns along the river up through Parks Bar Bridge and up to Smartville.

MR. GALLERY: I would like to ask, Mr. Cook, you have presented an Exhibit Q map which appears to depict part of the Goldfields and then you have some overlay print information on it.

MR. COOK: Yes.

MR. GALLERY: Can you tell me what is the base map from

which this was taken?

MR. COOK: The base is the U.S. Geologic Survey quadrangle. I believe that is the Browns Valley one. Anyway, it is the quadrangle for that particular area. Overlaid on top of it I personally traced the plat that was a part of the Smith Report which was entered in evidence in 1992 in that portion of the hearing, showing areas which were observed as part of that Smith report.

MR. GALLERY: Then did you just copy it on a Xerox machine, or how did you reproduce it? Frankly, I can't really read your overlay information on my copy. Perhaps I got a poor copy. Is there someone -- is this typical of the copies that --

MR. COOK: Mr. Gallery, if you would like I can show you the -- if you would like to look at the clear overhead, it might be easier to understand. I admit that that copy -- I copied from the overhead. It didn't come out very well and I apologize for that. But I would be happy to show you the overlay if you'd like.

MR. GALLERY: Could you put the overlay up, then, Mr. Cook? And the overlay is your Exhibit Q among your exhibits?

MR. COOK: It was used the other day in cross-examination. I found it a little too busy is why I went to this new plat.

MR. GALLERY: So, on this overlay, Exhibit Q, could you point out to us what you have called the Little Yuba on the schematic that was up there previously?

MR. COOK: I believe the Little Yuba is this area right here. If I may point out the correlation, the South Canal travels in this direction past the town of Hammonton, and it comes out of the reservoir from Daguerre Point Dam which is right here.

MR. GALLERY: Okay. You recall the base map, the base USGS map from which this is taken, do you know the date of that map?

MR. COOK: I don't recall at the present time, but it was -- it substantially shows the area. I have been there on the ground quite often. I have always flown over and looked at it and photographed it from airplanes.

MR. GALLERY: Let me direct your attention back to what you called in your testimony the Little Yuba, and directing your attention to that channel that flows from the top of the plat down towards what you call the South Canal. That appears to be not a continuous channel but a series of dredger ponds; isn't that correct?

MR. COOK: I believe it is a continuous channel. There is a major flow of water that -- I have canoed that particular area inside the Goldfields. It's a substantial amount of water, although it does pond, but it continues to

flow. The only thing that happens, the upper portion of it is cut off by roads, which constitute basically dams. That is in the upper portion.

MR. GALLERY: Do you have the 1990 Smith Report which you referred to which I believe was Exhibit 7 in the 1992 hearings with you?

MR. COOK: I don't have that with me, no, sir.

MR. GALLERY: Directing your attention to Figure 2 in the 1990 Smith Report and to the channel which appears in that exhibit, it is on Page 4 of the Fish and Game exhibit. Does this show that there is series of ponds which are not interlinked for that section of the map?

MR. COOK: Yes, Mr. Gallery. If I may point it out on the map?

MR. GALLERY: Yes.

MR. COOK: This overlay -- the overlay on this quad sheet was taken from this particular map you've just shown me, this Figure 2. And this Figure 2 does show a crossing right there. I don't recall that. And I do point out, specifically, that above it on that same plat the words -- there is an arrow pointing up to the upper portion called "gravel pile wall adult salmon barrier."

Apparently Mr. Smith did not consider that there was a barrier below that and, therefore, I am not quite sure what he meant by that.

MR. GALLERY: But he did in the designation just below that, he pointed to a salmon spawning area which was below the lower barrier, didn't he?

MR. COOK: That's correct.

MR. GALLERY: Mr. Calvert, you testified that in the process of building this canal through the Goldfields that the upper section that we are talking about was open or disconnected in the process of building the South Canal. Did you testify to that?

MR. CALVERT: I don't believe I testified to that, no. I don't recall stating that.

MR. GALLERY: You are not saying as a part of building this canal by the districts that east-west canal that we have been talking about was opened by the districts, are you?

MR. CALVERT: Yes, I am.

MR. GALLERY: You are saying that?

MR. CALVERT: Yes.

MR. GALLERY: Do you have knowledge that the districts opened and interconnected those channels in the building of the main canal out of the Goldfields?

MR. CALVERT: Yes. It is in the 1991 Water Agreement between Yuba County Water Agency, Western Water and Western Aggregates.

MR. GALLERY: I am not asking you that. I am asking, do you know personally that those series of ponds were

interconnected as a part of this project?

MR. CALVERT: Yes.

MR. GALLERY: You observed that?

MR. CALVERT: I observed them connecting the ponds.

MR. GALLERY: You observed the actual construction activity doing that?

MR. CALVERT: Yes.

MR. GALLERY: Did you observe that that was being done by the districts or Goldfields or by whom?

MR. CALVERT: By the Goldfields people.

MR. GALLERY: That is something the Goldfields people were doing?

MR. CALVERT: Yes.

MR. FRINK: Excuse me, Mr. Gallery. I don't know if anyone else is confused, but are you referring to the series of ponds that were connected as part of building the Yuba South Canal or are you referring to the area that was described as the Little Yuba River?

MR. GALLERY: I am sorry, Mr. Frink. I am referring to the Little Yuba area described as Little Yuba. I want to come to the series of ponds that are linked up and created the South Canal itself, across the Goldfields. I have been talking about the section from east to west down. Running in the westerly direction -- southerly direction, I guess.

MR. FRINK: Mr. Calvert, did you mean to state that the

area referred to as the Lower Yuba River was also connected as part of building the South Yuba Canal?

MR. CALVERT: I am confused. But what I call the Lower Yuba River, no, I'm not.

MR. FRINK: The Little Yuba?

MR. CALVERT: Oh, the Little Yuba?

MR. FRINK: Perhaps you can use the pointer in responding to Mr. Gallery's questions. It would be helpful to us.

MR. CALVERT: In this area through here I observed them connecting the ponds.

H.O. BROWN: Make a note that you are at the top of the page on the --

MR. CALVERT: I am pointing to the top of the page where there appears to be several ponds that dot the area. Those were connected.

MR. GALLERY: By whom, Mr. Calvert?

MR. CALVERT: At the time that was connected I believe it was called Yuba Placer Gold, and it was done with a huge -- they called it a man -- a huge dragline.

MR. GALLERY: Do you know the purpose for which they were doing that?

MR. CALVERT: At that time I think it was a combination. They were moving the dredge that is actually dredging down in the area now. They were moving that from

back right along in this area. And they had to dig a canal that would let this dredge go all the way to where it is dredging, that is off the map. That was part of the digging of it.

MR. GALLERY: So you are saying now that that work, so far as you know, was done in connection with moving their gold dredge?

MR. CALVERT: No. Mr. Cradder back in those days --

MR. GALLERY: I want to ask what you personally knew, whether it was or not.

MR. CALVERT: What I personally knew, he said he was going to sell the water out of the Goldfields and make a canal down.

MR. GALLERY: Mr. Cook, your testimony referred to the Court judgment and talked about the historic riverbed of the Yuba River?

MR. COOK: Yes, sir.

MR. GALLERY: Is that -- does that historic -- well, let me ask you what you mean by "historic"? Fifty years ago? A hundred years ago? What is the -- what do you mean by "the historic riverbed"?

MR. COOK: I believe it was -- I don't recall specifically. I believe it was the riverbed as originally it was prior to the gold dredging, and it was used by the State Lands Commission in that litigation for the purpose of

showing the historic bed. Of course, the reason for that being that the public ownership of the bed of the Yuba River was related to and dependent upon the location of the bed in its natural condition, and because it was moved about a mile to the north artificially that, as far as the underlying fee title was concerned, the underlying fee title remained in the historic bed. The upper bed or new bed, the artificial bed, the public would own an easement rather than the fee title.

MR. GALLERY: How long has the river been in its existing location?

MR. COOK: I don't recall specific dates, but I think that it is toward the latter part of the last century. When I say the last century, the 1800s.

MR. GALLERY: What you call the Little Yuba River, which you called the Little Yuba River in your testimony, is that the channel of the Old River before gold dredging began?

MR. COOK: Only in part. I think it is a little further to the north to where the original channel was. It was all, I think, fairly wet. But I don't believe it was precisely in the location of the historic channel, no.

MR. GALLERY: Is it fair to say what you call the Little Yuba River Channel is past dredging ponds as much of anything; is that correct?

MR. COOK: I think that is probably right. It does

meander to some extent, but it does seem to follow the pattern of the training walls or levees or the rock levees, whatever they are, that were made by the dredgers.

MR. GALLERY: Now I want to direct your attention to the overhead, which is your Exhibit Q, and the series of ponds that run -- the series of ponds which are connecting the Yuba River to the south and what we call the South Canal. And we see an arc-like series of ponds coming away from the river and flowing to the south?

MR. COOK: Yes.

MR. GALLERY: That is the channel which is actually delivering water to the districts south of the river? That is Brophy Water District and South Yuba Water District?

MR. COOK: That is my understanding.

MR. GALLERY: You understand that also, Mr. Calvert?

MR. CALVERT: Yes.

MR. GALLERY: Isn't it true that that channel that you see there essentially existed in that condition and in that formation prior to the districts completing their South Canal and taking water out of the river?

MR. COOK: You are asking me, Mr. Gallery?

MR. GALLERY: Yes.

MR. COOK: I can't be positive on that, but it appears to me from my observations that they chose the lowest positions where they had to dig less for building the South

Canal, and that very probably was either a canal or semi-canal or some canal that they could easily connect. I think it was the path of least resistance in building the canal.

MR. GALLERY: Let me ask Mr. Calvert. Wasn't that just a series of dredger ponds running from the river in a southerly direction before the districts came there and began to use the channel?

MR. CALVERT: Ponds running to the south?

MR. GALLERY: Ponds traversing the Goldfields, going across the Goldfields, that was a series of dredger ponds that were not interconnected before 1985; isn't that correct?

MR. CALVERT: Not totally. Some had been connected by high water events. They blow out and connect to each other, and some connected by the operators of the Goldfields.

MR. GALLERY: They were all essentially dredger ponds across the Goldfields?

MR. CALVERT: They were ponds that was left from the dredging. And when they would dredge, they would leave some kind of a pond and go on and dig another, yes. They are -- I am sure a dredger was digging in every one of those ponds.

MR. GALLERY: Now then, Mr. Calvert, were you familiar with the farming operations at all in the -- do you know the

area in the Brophy Water District at all?

MR. CALVERT: Somewhat.

MR. GALLERY: It consists of about 15,000 acres south of the community of what is called Brophy and it is just west of Beale Air Force Base?

MR. CALVERT: Yes.

MR. GALLERY: Do you know the area of South Yuba Water District which is down below or south of Brophy Water District?

MR. CALVERT: Not really. I know some of the farmers that live there, but not everybody.

MR. GALLERY: Are you familiar with the problems that those farmers were having in the 1970s and 1980s in trying to pump groundwater and to farm?

MR. CALVERT: No, I am not familiar with that.

MR. GALLERY: You are not aware that their wells were being deepened and they had overdraft of groundwater?

MR. CALVERT: I have heard that farmers run into some problems and they needed to recharge the aquifers, do those kind of things. But that is something you hear all the time, and I don't really know of any particular time that it happened.

MR. GALLERY: Do you know that in the mid 1980s the two districts, Brophy and South Yuba, attempted a project which would just tap the south side of the Goldfields about the

end of that linkage that appears on the Exhibit Q and to get the water supply from the river just by taking it out of the edge of the Goldfields?

MR. CALVERT: I am not sure I know what you are talking about. You said the linkage? What linkage are we referring to? The ponds?

MR. GALLERY: On Exhibit Q, on the lower right, there is a designation "South Yuba-Brophy Canal Headwork Gates."

Do you see that right -- come on down.

MR. CALVERT: In this area?

MR. GALLERY: Yes.

MR. CALVERT: Yes, I am familiar with some of that back, like I said when Mr. Cradder was there. They tried to pump the water out and sell it. Instead they had to go back to gravity flow. They could only have water gravity flow for this area.

MR. GALLERY: I am not referring to any pumping. I'm referring to the efforts of the two districts to build a canal from about the location of the arrow there, point to arrow, where the arrow points towards the channel, right there.

MR. CALVERT: I see.

MR. GALLERY: They attempted to extract the water that they needed by taking it from that point down to their districts?

MR. CALVERT: I understand there was some going on there. I really didn't observe that too close.

MR. GALLERY: You are familiar with the fact that didn't work, so they had to undertake to get further into the Goldfields to get the water that they needed?

MR. CALVERT: When you say "they," the two districts?

MR. GALLERY: The two districts.

MR. CALVERT: I am familiar with one district, Brophy.

MR. GALLERY: Actually, the two districts were working jointly in their efforts to get water. The two districts actually proceeded to build what we call the South Canal by interconnecting those ponds and subsequently the whole project was turned over to the Yuba County Water Agency. But in the 1980s the two districts were doing what was done.

MR. CALVERT: I wasn't familiar with both districts.

MR. GALLERY: So the actual route of the South Canal is through that series of ponds which are depicted on Exhibit Q in the overhead; is that correct?

MR. CALVERT: Yes, yes.

MR. GALLERY: So the overhead that preceded that, which is more of a schematic-type of thing, is not at all representative of what the configuration is on the ground; isn't that correct? Mr. Cook, isn't that correct?

MR. CALVERT: Not necessarily. I think that does

represent the flow of the Little Yuba.

MR. GALLERY: But it does not actually depict the actual topography and the routing of the water through the Goldfields, does it?

MR. COOK: Are you asking me?

MR. GALLERY: Either of you.

MR. CALVERT: No. I don't think it accurately depicts what is on the ground, no.

MR. COOK: Can I respond to that question?

MR. GALLERY: Yes, go ahead.

MR. COOK: This, of course, is a schematic. It is not to scale. It doesn't show the same sinuosities and turns and meanders of the waterways. It merely shows -- it is for the purpose of showing how the flows operate, where they generally go and what connects to what. It is certainly not a topographic or accurate --

MR. GALLERY: It doesn't depict at all the fact that substantially all the route of the South Canal originally consisted of separate dredger ponds, does it?

MR. COOK: I really don't know that that is true. It may be, but it's not intended to depict anything historic other than what the conditions are on the ground.

MR. GALLERY: I understand that.

That is all I have, Mr. Brown.

H.O. BROWN: Thank you, Mr. Gallery.

Let's see if we have other cross.

Mr. Bezerra, do you have any?

MR. BEZERRA: No, Mr. Brown.

H.O. BROWN: Mr. Morris, do you have cross?

MR. MORRIS: I do.

H.O. BROWN: Do you want to do it after the break?

MR. MORRIS: Either way.

H.O. BROWN: We will take the morning break and then you will be up, Mr. Morris.

(Break taken.)

H.O. BROWN: Call the hearing back to order.

Mr. Morris, you are up.

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CROSS-EXAMINATION OF WALTER COOK

BY WESTERN WATER COMPANY & WESTERN AGGREGATE, INC.

BY MR. MORRIS

MR. MORRIS: Thank you, Mr. Brown. I only have a few questions because I know we want to get on to the important testimony of the Yuba County Water Agency.

Good morning, Mr. Cook and Mr. Calvert.

MR. CALVERT: Morning.

MR. COOK: Good morning.

MR. MORRIS: I want to ask you and Mr. Cook a couple of very brief questions about -- you mentioned the Little Yuba River. And just to be clear, there is really no official

name of the Little Yuba River; it's just a term that you guys have talked about for clarity; is that correct?

MR. COOK: Actually, what I have called the Little Yuba is a flow of water which looks like the Yuba River. I've attempted to describe it, to give it a name which I gave it and Mr. Calvert gave it.

MR. MORRIS: It is not on maps or denoted on the official record?

MR. COOK: It is on various quadrangles. It's on aerial photographs. It is shown. As far as I know, no one has ever called it that before. But it's so substantial and looks so much like the Yuba River itself, except somewhat smaller, that I felt that was a very appropriate way to call it.

MR. MORRIS: I just wanted to be clear. It is not on any topography maps?

MR. COOK: Yes, it is on topography maps, but not necessarily named.

MR. MORRIS: That is the answer to my question. The State Lands agreement that you mentioned previously, can you tell me what the purpose of that agreement was?

MR. COOK: What agreement?

MR. MORRIS: The State Lands agreement.

MR. COOK: There was litigation.

MR. MORRIS: Briefly, tell me what the purpose of the

litigation was.

MR. COOK: There was litigation on the part of the State Lands Commission of which I was not a party, by the way, or not involved in. But there was litigation by the State Lands Commission to establish public ownership within the historic bed of the river and the waterways, easements as they existed, based upon the navigable character of the Yuba River and the public trust and other rights within the river.

MR. MORRIS: Isn't it true that the original genesis, if you will, of that lawsuit was to provide an exchange of private lands within the Goldfields for federal land so Marysville Dam could be constructed?

MR. COOK: I don't believe that is true.

MR. MORRIS: Mr. Calvert, you were talking previously about your visits out to the Goldfields. You mentioned that your wife previously worked for a trout farm out there.

When did she cease working for that trout farm?

MR. CALVERT: I believe it was around '81 or '82, something like that.

MR. MORRIS: You have been out to Goldfields property since that time?

MR. CALVERT: Yes.

MR. MORRIS: Did you have permission from the owners to go out there?

MR. CALVERT: I have letters from BLM and the Army Corps of Engineers that says that it is recreational land and that BLM's public land was open to the public. And I think Mr. Swicker says I have the right to be there. He's area manager from Folsom.

MR. MORRIS: Is all the property visited within the, quote-unquote, BLM -- I know we are not sure where the BLM land is. Was it all within that property?

MR. CALVERT: BLM owns several parcels out there, so I am not clear on your question.

MR. MORRIS: I just wanted to know if you confined your visits to what you presumed to be BLM land?

MR. CALVERT: BLM and federal land, yes, and State of California land.

MR. MORRIS: That includes all -- would you put Exhibit Q back up for me, please? So, it is your testimony that all the places you visited when you were making testimony this morning were where you saw the salmon spawning below the headgates, where the outfall channel is, et cetera, is all on BLM land?

MR. CALVERT: Yes. Federal land.

MR. MORRIS: Do either of you know why Englebright was constructed, the purpose behind Englebright Dam?

MR. COOK: If you'd like me to respond?

MR. MORRIS: Please.

MR. COOK: It was constructed, I think in about, 1939 or '40, at least in that period of time. And as I understand it, it was constructed for the purpose of controlling hydraulic mining debris coming down the Yuba River. It is presently used as a diversion dam or basically as electric generation dam and as an after bay for the Bullards Bar Dam.

MR. MORRIS: The way it functions, and correct me if I am wrong, is that the sediment-ladened Yuba River would go behind the dam, and it would slow the velocity and the sediment would drop out. Is that the idea?

MR. COOK: That is my understanding. I think there's a lot of sediment at the present time.

MR. MORRIS: What about -- do you think that Daguerre Point Dam would have the same affect of slowing down the velocity and having sediment drop down behind the dam?

MR. COOK: Yes. And, in fact, as you go behind the Daguerre Point Dam, up above in the stream flow, you find that much of it is sediment to the very top of the dam, practically.

MR. MORRIS: We heard testimony this morning from both of you that the, quote-unquote, Lower Yuba River does not have a direct connection to the Yuba River, at least from a surface standpoint. But would you agree that that connection, whether it be underflow, is above Daguerre Point

Dam?

MR. COOK: Above Daguerre Point Dam where the water goes into what we call Little Yuba, and there are plenty of other channels inside the Goldfields. That is above the Daguerre Point Dam and water flows in above Daguerre Point Dam through the rocks, not through a direction connection. And, of course, once you get to Daguerre Point Dam, the ground hardens on the south of the river, and I don't think there is any seepage through the immediate area where the dam is, other than through the South Canal which is for that purpose of taking water.

MR. MORRIS: I believe that you both testified that there is fairly significant flow at times coming out of the outflow, what you are calling the outflow channel; is that correct?

MR. COOK: The outflow or diversion channel. There is -- I think water flows are different from time to time. But mostly my recollection is that there is a fairly good flow. It is not as much as what we call the Little Yuba. It's maybe a fifth of what you find in the Little Yuba. I am just guessing at that at this time.

MR. MORRIS: It has a noticeable velocity. If you were to throw a straw in, for example, you would see it flow past?

MR. COOK: If you tried to swim it, you would go downstream.

MR. MORRIS: And this enters below Daguerre Point Dam; is that correct?

MR. COOK: Yes, sir.

MR. MORRIS: Would it surprise you that if the water -- you mentioned that the Daguerre Point Dam most likely acts as a sediment trap, if I can rephrase your word, and, therefore, the water coming out of it would be relatively clear?

MR. COOK: Well, I think that it -- the water going into Daguerre Point Dam from up above Daguerre Point Dam is clear. The sediment that is in Daguerre Point Dam, I don't think moves or is transported over the dam or out of the dam. I think that is fairly stable. And I think the water going into the Daguerre Point Dam is very clear. And I think at that time water coming out of Daguerre Point Dam is also very clear. As you travel over it, you can see the bottom at just about every place. I didn't notice any mud or murkiness to the river, either above it, except -- I qualify that with flood stages, where you have flood stages. Muddy water does come in from up above.

MR. MORRIS: You think that is because the velocity is probably higher?

MR. COOK: I would think so. On high water stages during the winter you have the entire watershed eroding quite a bit. There is a lot of activity. I think if I

remember correctly, you have Deer Creek coming in. You have other water coming in from the South Fork, the Middle Fork and the North Fork of the Yuba, and also Oregon Creek. You have a lot of watershed to bring down sediment in stormy periods and of high water.

MR. MORRIS: I guess I asked if you would consider that pollution?

MR. COOK: Well, yes, I probably would. If it could be stopped, I would think it would be a good idea. Some erosion is essential in nature. Much of the erosion I think is artificially caused. If you asked me what I would call it, perhaps it could be considered as pollution.

MR. MORRIS: Is it your belief that the -- maybe I should ask you this: What do you believe is the source of the, quote-unquote, muddy water coming out of the lower, the outfall?

MR. COOK: I really do not know. I know that there is gold dredging going on inside. There is a certain amount of gravel extraction, I believe. I don't -- I couldn't really answer that directly. Because all I know is that when the water comes out of that diversion channel, it is far more -- it contains far more turbidity than you find in the Yuba River itself or the main stem of the Yuba River.

MR. MORRIS: Mr. Calvert, you testified previously that -- I don't know if you got an actual date, but sometime in

the past that the -- the one dredge operating now in the Goldfields and that that dredge had been moved from the upper portion, I guess, of the Goldfields down to a more lower position; is that correct?

MR. CALVERT: Yes.

MR. MORRIS: Do you know about when that occurred?

MR. CALVERT: I would say somewhere around '79 or '80.

MR. MORRIS: Is it possible for you to show us approximately on Exhibit Q where that dredge might be located?

MR. CALVERT: At the present time?

MR. MORRIS: Or when it was moved.

MR. CALVERT: I didn't follow too much of the actual moving, but it is hard to depict. You have to ride along the road. It is right along the road now. If this showed the road, I could show it but I couldn't.

MR. MORRIS: Let the record reflect that it is to the right on the Exhibit Q of the South Yuba-Brophy Canal headworks.

Would you characterize that?

MR. CALVERT: It is south and west of the old town of Hammonton that is depicted on the map, approximately two miles.

MR. MORRIS: Has it been in that approximate plat location?

MR. CALVERT: It was in that location when they first moved it. Then it dug its way south. Now it dug its way back up to that point again.

MR. MORRIS: From that position it doesn't appear to me at least that any dredging activity would be able to flow in through the lower outfall.

Would you agree with that statement or not?

MR. CALVERT: From this area?

MR. MORRIS: From the location of the dredge.

MR. CALVERT: No. They have dug channels that connect the dredge out to the Yuba River. They dug some channels and pumped their muddy water into those channels.

MR. MORRIS: Thank you, Mr. Calvert.

Have either of you -- you mentioned, Mr. Cook, that you had taken some, a jar of water or something, to that effect. Have you had any of that analyzed?

MR. COOK: No, sir. I've just looked at it myself.

MR. MORRIS: Or temperature readings?

MR. COOK: No, sir.

MR. MORRIS: I have no further questions, Mr. Brown.

Thank you very much.

H.O. BROWN: Thank you, Mr. Morris.

Mr. Cunningham.

MR. CUNNINGHAM: Your Honor, I have no questions.

H.O. BROWN: Mr. Sandio is not here.

Staff.

MR. FRINK: Staff has no questions.

H.O. BROWN: Mr. Cook, do you have any redirect?

MR. COOK: No, sir, I have no redirect.

H.O. BROWN: Would you like to offer your exhibits into evidence?

MR. COOK: Yes, I would. I think some are already in evidence. Perhaps Mr. Frink can help me on that one. I think that the 1992 exhibits were in evidence, and the one today would be that plat that was drawn showing the plumbing of the Yuba River and the Goldfields. I would like to offer that one, and my written testimony and written testimony of Mr. Calvert.

MR. MONA: The exhibits being offered in evidence, S-COOK-A, the photo of the riverbed below Bullards Bar Dam. S-COOK-Q, plat of Yuba River and Yuba River Goldfields. And S-COOK-N, the township plat. S-COOK-O, the State Lands Commission Settlement plat. S-COOK-1, three photos, and the new exhibit, S-COOK-2, which is the schematic used today.

H.O. BROWN: Are there any objections to the admission of those exhibits into evidence?

Seeing none, they are so admitted.

MR. COOK: That is all we have, Mr. Brown.

H.O. BROWN: Thank you, gentlemen.

Mr. Lilly.

MR. LILLY: Morning. Mr. Brown, members of the Board staff. As you know, I am Alan Lilly representing Yuba County Water Agency. I will make a brief opening statement before we begin with our panel, our first panel of witnesses.

First of all, I want to say at the outset I appreciate the State Board giving us the opportunity to present evidence at the supplement hearing. I believe this hearing is important for two reasons.

First of all, it gives the parties opportunities to present evidence regarding the hydrological effects that result from the implement.

H.O. BROWN: Excuse me, Mr. Baiocchi, are you standing to object to something?

MR. BAIOCCHI: Yes, sir.

H.O. BROWN: Yes, may I hear.

MR. BAIOCCHI: May I step to the podium prior to the presentation?

H.O. BROWN: No. Let's hear Mr. Lilly.

MR. BAIOCCHI: I have a major objection with the testimony filed by Yuba County Water Agency. I would like to walk you and staff through my objections, please.

H.O. BROWN: Step forward, Mr. Baiocchi.

MR. LILLY: Normally, this would be done when we were offering the testimony. I haven't gotten there.

H.O. BROWN: I understand.

MR. BAIOCCHI: Fine. If he wants to do his opening statement, but he may -- his opening statement is going to probably relate to some of the exhibits.

H.O. BROWN: I want to hear Mr. Lilly's presentation from the opening all through the direct without any interruptions. I think it would be better, Mr. Lilly. Then we apologize for the false start. I did not see Mr. Baiocchi standing.

What is the objection, Mr. Baiocchi?

MR. BAIOCCHI: What it is is this, this to me is very, very important.

Many people have submitted in these proceedings and also in the hearing in 1992 written testimony. And I have done that on a number of hearings. It is very significant that you put your name on a document and it is subject to cross-examination, and you want to speak to the truth. And during these proceedings, Alan Lilly was within his right and he has certainly cross-examined a lot of people.

The problem that I am having is that Exhibit S-YCWA-19, it says Expert Testimony on Yuba River Fishery issues, and it names four companies. This is not -- in my view this is multiple hearsay. We don't know who said what. There is no written testimony to support what is in this document.

An example, 1992 the Department of Fish and Game came

before the Board with the management plan. The management plan was something like this, we will say. But they had -- the DFG also submitted written testimony to support the document.

They have ten expert witnesses that are going to testify in this document. My concern is how many John Does that are not here, present, subject to cross-examination, prepared this document? There is no written testimony. So how are we going to be able to cross-examine the various witnesses?

H.O. BROWN: That is your concern?

MR. BAIOCCHI: That is my concern. And I point towards the hearing notice as so stated, and I point towards Section 762 of the California Code of Regulations, Title XXIII.

H.O. BROWN: Thank you, Mr. Baiocchi. You may be seated.

Mr. Lilly, your response.

Wait a minute. Mr. Cook, let's hear from you.

MR. COOK: I have the same problem with this document, as well. It isn't properly identified, and there is no witness connection as I see it. And I would like to support Mr. Baiocchi's motion.

H.O. BROWN: Thank you, Mr. Cook.

Anyone else want to raise an objection?

Mr. Lilly.

MR. LILLY: The objections are without merit. This Board frequently allows testimony from more than one witness, written testimony, when the witnesses -- the main criteria is that all the witnesses have to be available for cross-examination. We have done that. All of the authors of all of these documents will be on the panel and available for cross-examination.

I note that the Department of Fish and Game's Exhibit S-DFG-1 similarly is joint testimony from more than one witness. I also note that Fish and Game Plan which was in essence Fish and Game's primary testimony in 1992, had multiple authors, some of which were not even available for the panel. In fact, one of the principal authors of that had become a member of the State Board staff and was not available for cross-examination.

So we are actually doing far more than Fish and Game did in 1992. These witnesses all will be available. Every single word that was prepared in any of those documents was prepared by one of these six gentlemen who is here, and they will all be available for cross-examination.

If Mr. Baiocchi is not sure who wrote a certain paragraph and any of those exhibits, you can ask these witnesses and they will testify to that fact.

H.O. BROWN: Thank you, Mr. Lilly.

Mr. Baiocchi, Mr. Cook, any response?

MR. BAIOCCHI: I still believe it is multiple hearsay and primarily is an argument on behalf of Yuba County Water Agency. We don't have the availability -- as you recall, when Paul Minasian was cross-examining, he put on a transparency and he underlined when he was cross-examining U.S. Fish and Wildlife Service. He put a transparency of their testimony on the screen, and he underlined it. We don't have that opportunity.

What are they saying? What are they swearing to? I mean, I think it is very, very important. Everybody else has complied with that rule that was set up in the hearing notice and, believe me, there was some nonexpert witnesses here. As you know, when you testify it's -- I mean, it is an experience because you're testifying to the truth, and you have attorneys coming in trying to manipulate what you are testifying to or trying to show that maybe you are lying or something like that or you are not sure of yourself. We don't have this. We have nothing.

H.O. BROWN: Thank you, Mr. Baiocchi.

Mr. Cook, do you want to add anything?

MR. COOK: I have no further comment, Mr. Brown.

H.O. BROWN: Thank you, sir.

Mr. Lilly, do you have anything to add?

MR. LILLY: The objection makes no sense, Mr. Brown. They can put up a transparency of any page in these exhibits

as Mr. Minasian did yesterday, and they can ask the witnesses who wrote that and anybody can answer the follow-up questions.

H.O. BROWN: The objection is noted, and it is overruled.

Please proceed, Mr. Lilly.

MR. CUNNINGHAM: Mr. Brown, if I may just for a second?

H.O. BROWN: I've already ruled.

MR. CUNNINGHAM: I appreciate that, your Honor. Your ruling leaves us with one additional element that needs to be addressed. And if I may have 30 seconds of time, please.

The problem that Mr. Baiocchi has focused on is legitimate, I believe, and Mr. Lilly's answers are perhaps adequate rebuttal. The concern we now have is to the extent that we as the cross-examiners must first ask each witness who is the author of this statement or statements, we are forced to compound our cross-examination. Our cross-examination then will be facing a much more lengthy process. We don't get to say, "Mr. Bratovich, you said this. Explain why." We now have to ask the preliminary question, "Who said this?" We are going to be theoretically limited to a 20-minute per person cross-examination of this entire panel. All of us are going to have to ask for more time. I would ask you give us some consideration if we are

going to be faced with asking foundational questions before we even can conduct our cross-examination because of the nature of the testimony submitted by Yuba County Water Agency.

H.O. BROWN: Thank you, Mr. Cunningham, for those comments. And you're correct, there may be additional time needed to build a foundation, and I will take that into consideration.

Mr. Frink, I've already ruled unless you're supporting my ruling.

MR. FRINK: I would support your ruling, Mr. Brown. I did have one comment just so the record is clear.

Mr. Lilly referred to a member of the State Board staff as being one of the authors of the Department of Fish and Game --

H.O. BROWN: The microphone, Mr. Frink. That is all right. Unless you think that it is really important.

MR. FRINK: I think it is important to clarify that a member of the State Board staff who Mr. Lilly was referring to was not an author of the Department of Fish and Game Fisheries Management Plan.

H.O. BROWN: Mr. Lilly, please proceed.

MR. LILLY: I better start over. I only made it halfway through the first sentence.

H.O. BROWN: You may start over and the clock doesn't

start.

MR. LILLY: You want to take off the 15 seconds?

Mr. Brown, as I said before, I and Yuba County Water Agency appreciates the State Board's decision to hold this supplement hearing and give all the parties an opportunity to present evidence and argument on two very important categories of evidence. The first being the actual hydrological effects of various components of the Decision. And the second being the new evidence that has incurred over the past eight years since the 1992 hearing.

We have three panels of witnesses scheduled for the hearing. The first panel will consist of six different experts of three fisheries biologists and three hydrological experts. The fisheries experts include Mr. Bill Mitchell, who did testify during that 1992 hearing, had spent countless days on the Lower Yuba River doing professional fisheries work before then and has spent even more days on the river since then.

The second biologist is Mr. Paul Bratovich who actually performed much of the fieldwork in the late 1980s that led to what has been referred to as the PHABSIM modeling which is the way useful area versus flow curves that were used in the IFIM process. At that time he was working for Beak Consultants which had been contracted by the Department of Fish and Game to prepare those studies. Since 1995, Mr.

Bratovich and a third biologist, Dr. Michael Brian, have worked to develop an appropriate instream flow proposal for the Lower Yuba River.

Of the agencies three hydrological experts from Navigant Consulting, which has now acquired Bookman-Edmonston Engineering, are Stephen Grinnell, Stuart Robertson, who also testified in the 1992 hearing, and Dr. Yung-Hsin Sun. They have made several detailed and technical analyses, including analysis of the Draft Decision's proposed instream flow and water temperature requirement.

The second panel for the Agency will just consist of one witness, Dr. Lon House, who also testified in the 1992 hearing and will testify about the very dramatic changes in the California electricity market that have occurred since 1992. The third panel also will just consist of one witness, Donn Wilson, the Agency's engineer administrator who you all met on the field trip last week. Mr. Wilson will testify about the practical difficulties of attempting to go operate the Yuba River Project to meet the Draft Decision's water temperature requirements and various related matters concerning the Draft Decision and new evidence that has occurred since 1992.

While we are not waiving any of the arguments or objections that we made during the 1992 hearing, we are

going to focus our presentation for this hearing on the hydrological analysis of the Draft Decision and on the Agency's instream flow proposal which basically builds on the proposals in the Draft Decision with some modifications to recognize water availability.

Just very briefly regarding the hydrologic evidence, the first thing the Agency did was frankly in response to a criticism of the Agency that was in the Draft Decision. And that was to provide a mechanism where the variability of hydrology could be accounted for. We took that criticism to heart and it was legitimate. And what we did, first of all, was to develop what is going to be called the Yuba River Index. This index is modeled after the Sacramento Valley Index and the San Joaquin Valley Indexes that the State Water Board, and I am sure you are familiar with, Mr. Brown. You were on the Board when these were adopted. They were adopted in 1995 as part of the Bay-Delta Water Quality Control Plan.

Mr. Grinnell will explain how that same methodology was used to develop the Yuba River Index. And the ultimate result is some adjustments had to be made to account for specific facts in the Yuba River.

The other major criticism of the Draft Decision, which we also took to heart, was that the Yuba County Water Agency had not developed any of its own proposed instream flow

requirements. Frankly, back in 1992 we didn't have time. But we have had time since then and we have done a lot of work since then.

The result is a comprehensive set of instream flow requirements. As I mentioned, the proposal is basically the same as the proposed instream flow requirements from the Draft Decision with the adjustments in the May flows. Even as our biologists have concluded and I think even Mr. Edmondson from the National Marine Fisheries noted, there is just not sufficient biological evidence to justify the 2,000 cubic foot per second flow made. So our proposal does have that one adjustment for above normal and wet years, which incidentally do occur in a significant portion of the time. I think it is about 6o percent of all years.

Obviously, as in most water rights disputes, the crunch comes in the below, normal, dry and critical years. Obviously the proposed instream flows have to be lower in those years because there is simply less water available in the system. The Agency's proposed instream flow requirements are based on a realistic assessment of the amounts of water that actually will be available in the Lower Yuba River in those types of water years. These proposed requirements will maintain fish in good condition, while not requiring unreasonable deficiencies in the deliveries of water to water users in Yuba County and also

without bringing the risk of bringing reservoirs down to dead pool such that either any deliveries or instream flows could be met while the reservoir is at dead pool.

Mr. Bratovich will take the lead on this testimony with hydrological input from Mr. Grinnell. Because these requirements will keep the fish in good condition and not result in unreasonable deficiencies to the water users in Yuba County, we believe they are appropriate requirements for this hearing.

The most significant exhibit, and I do realize we prepared a lot of detailed technical testimony and exhibits. Frankly, there were a lot of complex technical issues that required technical analysis and discussion, and we have done that. But of all the exhibits I think the most important ones that I hope the Board, that you and Board staff, will focus on are the figures at the end of Exhibit 19. Exhibit 19 is entitled Expert Testimony on Yuba River Fisheries Issues by our various consultants. And the figures at the end show the expected flows. Some of them show historic. Most importantly, they show the expected flows for all the water year types that would occur under the Draft Decision and the Yuba County Water Agency counter proposal.

They also show the estimates of water temperatures that would occur, both at, I think I have here, Daguerre Point Dam and at Marysville under both the State Water Board Draft

Decision flows and on the Yuba County proposal. The most important point from all these graphs, and there will be detailed questions about them and there should be, is that there are not significant differences between these two graphs in most water year types. There are some differences and we will certainly be talking about those. But they are not significant; they are relatively minor and only minor differences in most water year types between the resulting instream flows and water temperatures.

Therefore, the corresponding differences in the effects on the fish also will not be substantial. Of course, the critical differences in our proposal allows the system not to go broke. It recognizes the amounts of water that are available and makes a reasonable allocation of those amounts.

The other main area we need to talk about or will talk about in this testimony is the proposed water temperature requirements. We have heard from National Marine Fisheries and Fish and Wildlife on proposed water temperature requirements. And I am sure the Department Fish and Game will summarize its written testimony on proposed temperature requirements.

The basic problem, though, these just look at optimum temperatures for fish and none of them even attempt to analyze or even consider whether or not these are feasible. There is no discussion of what the Agency can do

or can't do to meet these standards if they were adopted. Mr. Wilson will testify in detail about how the temperature control device at New Bullards Bar Reservoir, which we did see at the field tour, has been operated since 1991. Basically since 1991 he will testify that they've been releasing the water from the low level outlet continuously. Basically upon agreement with Fish and Game and Fish and Wildlife.

So they've already got the coldest water out of New Bullards Bar Reservoir. Mr. Grinnell will testify that temperatures in the Lower Yuba River can be affected to some degree by higher flows. In other words, if the flow released from Englebright Dam is increased, the temperature gained from Englebright down to Marysville will not be as great. That is the only control the Agency has on those temperatures. He will testify that there are other factors that have much greater effects on the ultimate temperature at Marysville, primarily the air temperature in that section of the river. And that, frankly, the proposed temperature standards just simply are not feasible, and even attempting to meet them would require releases of huge amounts of water to try to lower the water temperatures.

Facing that reality, the Agency concluded that the better approach was to develop instream flow requirements and evaluate the water temperatures that would result from

them and to go through an iterative process to making adjustments to the proposed flow requirements, if necessary, because of temperature issues. And, of course, as I said, our testimony does show the expected temperatures that will result from that.

The last thing I want to comment on is, I call it, perspective. It is important to keep everything in perspective here.

The Department of Fish and Game, National Marine Fisheries and Fish and Wildlife have made proposals, and I think there is no dispute that their goals are to optimize the fishery habitat in the Lower Yuba River without any details or frankly any considerations of hydrologic feasibility or the resulting impacts on water storage and water users.

This is just simply not the appropriate legal standard for this hearing and for the State Board to consider. First of all, the State Board, obviously, has to consider the reasonableness of any requirements to determine whether they are, in fact, reasonable under the circumstances. But beyond that, the legal standard of optimization may make sense for certain federal programs, like the Anadromous Fish Restoration Program that we have heard about, but it is not the good condition standard that this Board must apply in this hearing.

And as Dr. Arora testified, even just the flow requirements in the Draft Decision without any consideration of temperature or the PG&E contract could bring reservoir down to minimum pool with a repeat of the 1976-77 drought, even under existing demand levels. We just have to do something to make the standards reasonable so they fit within the system.

The second perspective point is whose fault are all these things? We've heard a lot about the fish ladders, the impacts at Daguerre Point Dam. We heard about the impacts of Englebright Dam. We heard about water quality coming out of Goldfields. And I think there is a tendency to basically on some parties to say, "Well, if it is a problem in the Yuba River, it's the Yuba County Water Agency's fault, and they ought to do something about it." Again, the Agency does have some substantial facilities in the watershed, but it by no means controls everything in the watershed.

Sometimes flows come up and down because it rains and the water flows out of the uncontrolled watershed and the Agency does not have any control over it. I do hope that the legal standard and the relative impact of different parties on the fishery conditions in the Lower Yuba River will be considered. As we've brought out through other witnesses, the project itself has actually already significantly increased summer flows and reduced summer

water temperatures.

The final thing I would like to talk about are the out-of-county water transfers, which, of course, have raised a lot of issues among the water dignitaries and have very strong feelings. I think it is clear that member parties have a feeling that water stored in New Bullards Bar Reservoir should be devoted to high instream flows and simply not to any out-of-county transfers. This feeling is incorrect and should not be followed by the State Board for two very important reasons.

First of all, Mr. Grinnell will testify in detail that water transfers are only a temporary measure for the Agency. When full department demands occur, the Agency will not have any surplus water from New Bullards Bar Reservoir for out-of-county water transfers. So it just would not be appropriate to set instream flow requirements which presumably are going to be in effect in perpetuity on the basis of a temporary water supply condition that will not last for that long.

Second of all, even during this interim period, transfers are, in fact, an appropriate way for the Agency to generate revenues. We've already heard policy statements and we will hear testimony about the fact that Yuba County is one of the poorest counties in the state, particularly with very serious flood problems, and people dying from

floods. And that the only way that the levee improvements that are desperately needed can go forward and, frankly, the only way many capital facilities relate to water can go forward is with the transfers -- from the funds from the water transfers. So I just don't think these should be looked at as something bad. They should be looked at as something good. The New Bullards Bar Reservoir is one of a few substantial assets in Yuba County. And the fact that the Agency is trying to take advantage of that storage space to make further capital improvements in the county really should not be criticized. It really is an appropriate use of a facility and of the water that is stored in it.

I have talked briefly with Mr. Frink about the timing. Obviously, our evidence is thick, and we will have some time. We have prepared overheads to try to move the summary through as quick as we can. Mr. Mitchell will kick off with the first summary, and it is expected to take about 20 minutes.

Mr. Grinnell will do the summary of the hydrologic issues for himself and Mr. Robertson and Dr. Sun. Mr. Grinnell will be the only hydrological witness testifying on direct, although all three will be available on cross. His testimony will take an hour, even slightly more than that. It will be including all three of those witnesses.

Then Mr. Bratovich will testify, provide a summary of

the proposed flow requirements for himself and Dr. Brian with one just short discussion from Mr. Grinnell on the hydrology. That is estimated to take one hour, too.

The final two witnesses will be in separate panels and I am sure or expect will stay under the 20-minute limit. So, with that we are ready to proceed.

H.O. BROWN: Off the record.

(Discussion held off the record.)

H.O. BROWN: Back on the record.

Mr. Cunningham.

MR. CUNNINGHAM: Thank you, sir.

Following the lead of Mr. Lilly, sir, I would at least on the record lodge an objection to Mr. Lilly's proposed timing for testimony. It was my understanding, having read the notice provided for this proceeding, that the testimony of each witness was not to exceed 20 minutes, and the total time to be provided for all witnesses of any one party was not to exceed two hours.

While I appreciate that Mr. Lilly may have consulted with Mr. Frink and staff to arrange for some alternative arrangement in timing, I would ask that this be formally noticed as an exception to your own notification rules, and that they are planning on already exceeding the time provided. I understand you can grant additional time for these parties to proceed and present their direct testimony.

I believe the notice itself suggested that everybody expedite presentation of their direct through comprehensive, written presentation with only the most limited oral presentation following.

If you are going to make an exception here, I would ask that you first recognize such an exception is being made for the record and, secondly, grant such a consideration for all other parties to follow.

H.O. BROWN: Thank you, Mr. Cunningham. You are a little bit ahead of me, but that is fine.

Mr. Baiocchi.

MR. BAIOCCHI: Mr. Brown, I am wondering whether or not the witnesses that submitted testimony as shown in their Exhibit 19 were sworn in.

H.O. BROWN: Thank you, Mr. Baiocchi.

MR. LILLY: That is my second question.

H.O. BROWN: We will get to that.

MR. FRINK: Mr. Brown, I did have a comment.

Mr. Lilly mentioned that he consulted with me about the time of his witnesses' presentation, and I just want it clear that in no regard did I indicate that the Yuba County Water Agency was excepted from the requirement. And I reminded him of what the requirements were and also said that the notice did provide, that upon a showing of good cause, the Hearing Officer may extend the time. In no way

did I authorize an extension of time.

H.O. BROWN: Thank you, Mr. Frink.

Mr. Lilly, do you have any response before I make my comment?

MR. LILLY: Thank you. First of all, I didn't mean to imply that Mr. Frink agreed to anything. I know he wouldn't do that because that is the Hearing Officer's decision. What had happened was he called me and asked me how much time are these people going to take, and I gave him my best estimate. And then this morning we had a similar discussion. He asked me and I told him.

So if I misrepresented that, I apologize, I did not intend to.

Regarding the comment, the other comments, I am fully aware that there is a two-hour limit listed in the hearing notice. Obviously, there is discretion for the Hearing Officer to give more time.

I will just note we have to cover many more areas than any other party. As I said before, no one else is talking about the impact of the PG&E contract. No one else is talking feasibility of the water temperature requirements. No one else besides Dr. Arora is even doing a hydrologic analysis. We have to do all of that. We are the only water agency, water district, that is doing any of that. Frankly, we are the only party besides Dr. Arora who is doing any of

that.

We also are the only party that prepared a comprehensive fishery proposal since the 1992 hearing, and that requires significant amounts of time to discuss. We have to cover a lot more territory than any other party. We are not just simply stating some conclusionary professional opinions about what we think would be good. We have gone through detailed analysis.

If we try to pare it down any more than what he have already done, it just simply -- we won't be able to get the point across to the Board, to the Board staff or to other parties.

H.O. BROWN: Thank you, Mr. Lilly.

Mr. Lilly, if I add up all this time here that you requested, five hours. Are you suggesting that you would need five hours as you submitted in order to put on your case in chief?

MR. LILLY: I don't think it came out quite that high. I got some number under four. It is definitely over two, but I don't think it is more than four. For this panel it is probably approximately three.

H.O. BROWN: Will you stipulate to three hours, Mr. Lilly?

MR. LILLY: For this panel, that is correct.

H.O. BROWN: The Hearing Officer has discretion. You

have made a solid point that you're covering issues that are important to this Board to hear. I do have latitude, but we all play by the same rules, too. When you get to the point where you have exceeded your time, I will ask you to show cause at that point in time to proceed, and we will make considerations at that time.

MR. LILLY: That is fine. May we now proceed?

H.O. BROWN: You may proceed, Mr. Lilly.

MR. LILLY: Thank you. First of all, start with you, Mr. Grinnell.

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DIRECT EXAMINATION OF YUBA COUNTY WATER AGENCY

BY MR. LILLY

MR. LILLY: Can you grab one of those microphones and tell us if you have taken the oath in this hearing.

MR. GRINNELL: Yes, I have.

MR. LILLY: Have you had a chance to look at Exhibit S-YCWA-2?

MR. GRINNELL: Yes, I have.

MR. LILLY: Is that an accurate statement of your educational and professional experiences?

MR. GRINNELL: Yes, it is.

MR. LILLY: If you could pass the microphone to Dr. Sun.

Dr. Sun, have you taken the oath in this hearing?

DR. SUN: Yes, I did.

MR. LILLY: Is Exhibit S-YCWA-3 an accurate statement of your education and professional experience?

DR. SUN: Yes.

MR. LILLY: Mr. Robertson, have you taken the oath in this hearing?

MR. ROBERTSON: Yes, I have.

MR. LILLY: Is Exhibit S-YCWA-4 an accurate statement of your education and professional experience?

MR. ROBERTSON: Yes, it is.

MR. LILLY: Mr. Bratovich, have you taken the oath in this hearing?

MR. BRATOVICH: Yes.

MR. LILLY: Is Exhibit S-YCWA-6 an accurate statement of your education and professional experience?

MR. BRATOVICH: Yes, it is.

MR. LILLY: Dr. Brian, have you taken the oath in this hearing?

DR. BRIAN: Yes, I have.

MR. LILLY: Is Exhibit S-YCWA-7 an accurate statement of your educational and professional experience?

DR. BRIAN: Yes, it is.

MR. LILLY: Finally, Mr. Mitchell, have you taken the oath in this hearing?

MR. MITCHELL: Yes, I have.

MR. LILLY: Is Exhibit S-YCWA-8 an accurate statement of your education and professional experience?

MR. MITCHELL: Yes.

MR. LILLY: Finally, just to cover the background, Mr. Grinnell, I am just going to ask you briefly, and obviously we will summarize later, are Exhibits S-YCWA-13, 14, 15, 16A, 16B, 17 and 18 accurate copies of the testimony that you, Mr. Robertson and Dr. Sun have prepared for this hearing?

MR. GRINNELL: Yes, they are. I do have two corrections, though.

MR. LILLY: That is why I included 16B and I believe we will also get to 19A in just a moment.

Mr. Bratovich, I am going to ask you are Exhibits S-YCWA-19 and 19A accurate copies of the testimony that you, Dr. Brian, Mr. Mitchell, Mr. Grinnell and Dr. Sun prepared for this hearing?

MR. BRATOVICH: Yes.

MR. LILLY: Finally, Mr. Mitchell, I am going to hand you a copy of Exhibit S-YCWA-20 and ask you whether this is a report that you prepared based on your field observations and experience.

MR. MITCHELL: Yes, I did.

MR. LILLY: Mr. Mitchell, we will start with you.

We have asked the other witnesses as other parties have

done, Mr. Brown, we've prepared some slides to summarize the testimony to try to facilitate the process.

Mr. Mitchell has overheads of those. I have copies of the papers as well so if people can't see the overheads they can look at the paper as well. I will hand six copies of those to the Board staff, and we have copies available for all parties. We will ask for the record that these overheads be marked as S-YCWA-24.

H.O. BROWN: All right, Mr. Lilly. I do appreciate your momentum that you have moving here.

MR. LILLY: I will try not to lose it. I will put them on the table for the other parties.

Mr. Mitchell, do you have those overheads ready to go?

MR. MITCHELL: Yes, we do.

MR. LILLY: Why don't you just go ahead, then, and start with the overheads and summarize your testimony.

MR. MITCHELL: Over the last eight years Jones & Stokes has been conducting annual fisheries surveys on the Lower Yuba River to provide Yuba County Water Agency with information on the condition of fish populations and to evaluate effects of operations on fish in relation to flows, water temperatures and other habitat conditions.

I have been the lead fisheries biologists for these efforts. My responsibilities have been to design and direct the field investigations and survey work. I and several

Jones & Stokes biologists working under my supervision have spent the last ten years monitoring fish populations in the Yuba River using a variety of methods, including boat and aerial surveys, snorkeling and scuba, and fish sampling by seine netting and electrofishing and trapping. In total I have personally spent over 250 days on the Lower Yuba River over the last ten years. Typically, our biologists and I spend about 40 days per year on the river conducting these fishery surveys.

Slide 1 is a summary of Jones & Stokes field activities since 1992. Jones & Stokes has conducted salmon escapement surveys every year since 1991 to estimate the annual adult spawning escapement. Spawning escapement is the total number of adult salmon returning to the river.

The Department of Fish and Game began these surveys in 1953 but discontinued them in 1990. In 1991 Yuba County Water Agency stepped in to fund a continuation of these surveys and hired Jones & Stokes to continue these surveys to the present date.

Each year annual surveys are conducted in early October to about mid-December, using a mark and capture technique that involves tagging salmon carcasses and estimating the total number of adult salmon based on the recovery rates of tagged carcasses.

The earliest spawning typically begins in September,

and these may include spring-run chinook, but carcasses are generally not observed until early October.

Since 1992, we have also conducted salmon redd surveys using ground and aerial techniques. The purpose of these surveys have been to determine the timing and distribution of salmon redds during the late summer, fall and winter periods. Much of our fieldwork has focused on juvenile and steelhead surveys since 1992. The purpose of these surveys has been to document the distribution, abundance, growth and the condition of juvenile salmon and steelhead under different flow conditions.

The results of our 1992 juvenile salmon monitoring study are presented in Exhibit S-YCWA-20.

We have also been conducting salmon and steelhead redd and juvenile stranding surveys since 1992. These surveys were conducted to assess the potential for stranding of redds and juveniles prior to proposed operational changes to assist Yuba County Water Agency in avoiding or minimizing these stranding impacts.

MR. CUNNINGHAM: Mr. Brown, please, I have to ask a question.

H.O. BROWN: Mr. Cunningham.

MR. CUNNINGHAM: I will step to the podium.

Mr. Brown, I have been looking at this exhibit and I thought we were going to have this problem when I made my

earlier objection.

I can't find any place in the written submissions of Yuba County Water Agency where this information is presented in the written testimony. And I am sorry, we've had earlier objections by other parties. I will make the objection on behalf of my party. This exceeds the scope of the written testimony provided and such is not proper direct testimony in this proceeding.

I object to this testimony.

H.O. BROWN: Thank you, Mr. Cunningham. I notice that Mr. Mitchell is reading that also.

Mr. Lilly, if he is reading it, was it submitted in his direct -- in his testimony as a summation of his testimony?

MR. LILLY: This is a summation for each -- frankly, we are doing the same thing that Dr. Arora and several witnesses since then have prepared overheads to summarize testimony. For each overhead we have listed the pages from the written testimony that it summarizes.

And this testimony of Mr. Mitchell describing the Jones & Stokes work is, in fact, a summary of pages from Exhibit 19. Frankly, all we are asking for is the same latitude that was given other parties. Mr. Cook this morning spent 30 minutes summarizing four pages of testimony, which certainly, as some of the other parties noted, may have gone

beyond the exact words of that, but we are not going beyond the scope of the written testimony that was previously submitted.

H.O. BROWN: Mr. Cunningham.

MR. CUNNINGHAM: Sir, I appreciate Mr. Lilly's attempt to say that this is somehow an expeditious summary of testimony presented. But I see attached down at the bottom of this exhibit references to Yuba County Water Agency Exhibit 19, Pages 3-8 to 3-12 and Pages 3-14 to Pages 3-21. And I'm sorry. I'm looking at that testimony and I don't find any references to all of those surveys being done, specifically by Jones & Stokes at any one time. What I see are references perhaps to reference materials, but I don't consider this a summation of any of the materials that I can see here. I don't think I see that this is any direct copy of the testimony that is being now presented. This isn't a copy of any graph contained within the materials. This is essentially a new way of presenting testimony or altogether new testimony. I don't see this anywhere in the written testimony.

This is the problem. What we have here is a combined testimony of five people in this exhibit. This is Exhibit Yuba County Water Agency 19. And we are now being asked to have one person piece out his piece that he wishes to speak to, and I can't find it. I can't find where he's made these

statements. I can't find where he says he's done these surveys on each of these days for these events. And it might be a nice argument that these are somehow summaries of his information. It is information not contained in his own written testimony.

H.O. BROWN: Thank you, Mr. Cunningham.

Mr. Cook, you rise.

MR. COOK: Mr. Lilly points -- of course, points out fairness and mentions my testimony. I should recall the fact that there was an objection while I was examining, I believe, Mr. Calvert. And I certainly apologized and I withdrew the question. And I only ask that the rules be applied equally to all of us.

H.O. BROWN: Thank you, Mr. Cook.

Mr. Baiocchi.

MR. BAIOCCHI: Mr. Brown, I support Mr. Cunningham's objections. And, secondly, Mr. Mitchell doesn't have any written testimony. There isn't any. I objected to that. There is no written testimony.

H.O. BROWN: Any other objections?

Mr. Lilly, your response.

MR. LILLY: Exhibit S-YCWA-19 lists the authors under the "prepared by" words. Third author listed is William Mitchell, M.S. Fishery biologist. So he has submitted written testimony.

The details, here he is talking about -- basically summarizing, start on Page 3-14 of that testimony and going through, I believe it's, 3-21. This is one slide to try to summarize those seven pages.

H.O. BROWN: On 19?

MR. LILLY: It's 3-14 is where it starts.

H.O. BROWN: You are on Exhibit 19.

MR. LILLY: Yes, Exhibit 19, Page 3-14.

H.O. BROWN: Start on Page 3-14 and go to 3-19 or 3-what?

MR. LILLY: Actually, Mr. Mitchell's told me there is some of it is discussed -- the salmon escapement surveys are discussed on 3-12, and most of the other studies are on 3-20, but 3-14 is where the discussion starts.

H.O. BROWN: Which part, Mr. Cunningham, has he given testimony to that is not covered in this testimony, written testimony, 3-12 to 3-21?

MR. CUNNINGHAM: Let's start, your Honor, and we'll go with just this first page. I think Mr. Lilly has told us that we should look on 3-14 to 3-19, and I am looking at 3-14 to 3-19 and I see no reference --

H.O. BROWN: Actually, he said 3-12.

MR. CUNNINGHAM: I think he mentions the 3-12 would be a relevant page. But in looking at all of those pages collectively and individually, I do not see one place where

it is identified that on October 12th through December 15th of 1992 the salmon spawning escapement survey was made. I see references to escapement surveys. This is new information. I've never seen these dates before. I've never seen any of these dates before.

H.O. BROWN: On the particular item of concern, Mr. Lilly, can you address that or can Mr. Mitchell point out in his testimony where you made reference to that?

MR. LILLY: There is not reference to the specific dates, but this is the sort of detail that the Hearing Officer has allowed other witnesses to do. We are wasting a lot of time here. I think it is perfectly appropriate.

H.O. BROWN: This is my time, not yours.

MR. LILLY: Thank you. I appreciate that.

It is perfectly appropriate for him to list the dates. This has no effect on Mr. Cunningham's ability to prepare cross-examination or anything else. This is just a summarization of very detailed testimony that has been previously submitted.

MR. CUNNINGHAM: Your Honor, this isn't testimony. These dates are nowhere. He's just admitted it. These dates are nowhere in the testimony, written testimony, provided to the rest of the parties in this proceeding. I will have some detailed questions about some of these dates, dates that Mr. Lilly considers innocuous, perhaps

insubstantial information.

If they are so innocuous, don't present them. If these are being presented for some explanatory reason, then since I've never seen any of these dates, I have reason to ask whether these people were physically on-site at each of these dates what they physically did on these dates. This dramatically expands the scope of cross-examination that I wish to ask, especially since I seem to have some information that suggests that on some of these dates, contrary to the representations made here, these events did not take place as described and, in fact, reflect much different events.

So, if we are going to talk about all these dates that I've never seen before, then I have the right to cross-examine each of these witnesses about each of the events that happened on each of those dates. We are talking about expanding the scope of this hearing. I suggest Mr. Lilly is the lead.

H.O. BROWN: Thank you, Mr. Cunningham, your concerns are very well presented.

Mr. Lilly, any last responses before I make a ruling?

MR. LILLY: We believe that this is appropriate. I think Mr. Cunningham is grossly exaggerating the fact that some new dates have been added in summary of testimony. Obviously, he has a right to cross-examine on any of these,

and he will get to do that when his time comes.

I think the Hearing Officer should get beyond the technicality. The purpose of this hearing is to get the evidence out and get the truth and come up with an appropriate decision based on the evidence.

H.O. BROWN: I understand my responsibilities, Mr. Lilly.

MR. LILLY: Good.

H.O. BROWN: Mr. Baiocchi.

MR. BAIOCCHI: Thank you. Also, this is hearsay. As so noted by Mr. Cunningham, it is hearsay. I have a problem with Page 2 when we get to it.

H.O. BROWN: Thank you, Mr. Baiocchi.

Counselor, do you wish to add something?

MR. FRINK: It doesn't appear to me that the procedure Mr. Lilly has in mind for presenting the evidence on behalf of Yuba County Water Agency complies with what was spelled out in the hearing notice. This is a report, and, certainly, there is no objection to presenting a report. There have been a number of reports presented, but the testimony of witnesses has been submitted in writing.

Mr. Cook varied a little bit from what he submitted. Most of the other witnesses have stuck very closely to what they previously submitted. Mr. Arora was virtually verbatim what he had in writing. He used overheads to make it easier

for people to follow. This does appear to be beyond the scope of what was submitted.

H.O. BROWN: Thank you, Mr. Frink.

My ruling in this issue is this: that the Hearing Officer has provided latitude to some limited extent to the other cases in chief. And certainly, Mr. Cook, when the concern was pointed out to you, you did change your direct testimony and lead and adjust it, and others have, too.

Nevertheless, it is difficult to stay exactly on track of what is always presented. I will allow some latitude, but I do advise you or request of you, Mr. Lilly, that for your witnesses to make a summary of your direct. That is the purpose. If you go beyond that and then you would have an unfair situation for the other people in the audience and the other attorneys who wish to cross-examine.

So, I will give you some latitude. Mr. Cunningham's point is well taken, to make your testimony that you're giving here a summary of what you presented in the direct.

Mr. Lilly, please proceed along those lines.

MR. LILLY: Thank you, we will.

Mr. Mitchell, maybe we should just wrap up this overhead. If you can just briefly summarize the juvenile steelhead study. I think you were to there, and then we will go on to the next slide.

MR. MITCHELL: Yuba County Water Agency is also

funding a two-year study of life history and habitat requirements of juvenile steelhead in the Lower Yuba River. This study is being conducted by Jeff Kozlowski, a graduate student at U.C. Davis, also one of our staff biologists, as part of his Master's Degree program.

This is a list of anadromous and resident fish species seen in the Lower Yuba River. While other species have been observed, these have been the most commonly observed species during our surveys over the past eight years, and also reflect the fish that were observed by the Department of Fish and Game in 1987 and 1988.

H.O. BROWN: Hold a minute.

Mr. Baiocchi.

MR. BAIOCCHI: Yes, I have an objection. A, to begin with, under anadromous species on the left-hand side, it has chinook salmon and we have threatened spring-run chinook salmon, and we have fall-run chinook salmon and late fall-run chinook salmon.

Secondly, under steelhead they are threatened. That would lead the viewer to believe those species are not in the river. An example, they are listed as species as spring-run and steelhead now.

H.O. BROWN: Mr. Baiocchi, those would make excellent cross-examination questions. Perhaps you would hold those kinds of questions until we are through with the direct and

that would be a good time to cover that and a good point, and maybe we could let Mr. Lilly proceed and get through his direct.

MR. LILLY: Mr. Mitchell, please proceed with your summary of Slide 2.

MR. MITCHELL: An important note here is that most of the species that were observed in the Lower Yuba River are native species as denoted by the letter N. The prevalence of native species in the Yuba River is also evident from the results of electrofishing surveys conducted in the summer of 1999, as shown in the next slide.

MR. LILLY: This will be Slide 3.

MR. MITCHELL: Slide 3, yes.

Slide 3 shows the relative composition of the fish species both above and below Daguerre Point Dam based on electrofishing surveys conducted in the summer of 1999. Electrofishing is used in areas of the river where this type of method is most effective. Those would be the shallower areas along the margins of the river. So this does not reflect the entire fishing community.

However, what is noteworthy is that virtually all the species that were observed in the Yuba River last summer in this sampling effort were native species.

Another point here is that there were major differences in the relative composition of species above and below

Daguerre Point Dam. Above Daguerre Point Dam the samples were predominantly comprised of steelhead rainbow trout, followed by speckled dace, Sacramento sucker, sculpin and small numbers of chinook salmon, Sacramento pikeminnow, California roach and lamprey.

Below Daguerre Point Dam the samples were dominated by sculpin, Sacramento sucker and Sacramento pikeminnow and small numbers of other species, including steelhead rainbow trout, speckle dace, chinook salmon and tule perch. I will discuss these differences a little later in my testimony.

MR. LILLY: We will now go to Slide 4.

MR. MITCHELL: Slide 4 is the next slide.

These are the target species for our fish surveys in the last eight years. Most of our surveys have focused on chinook salmon and steelhead. However, we have also conducted surveys downstream of Daguerre Point Dam to determine the presence of American shad during the spring and late summer.

Next will be Slide 5.

Slide 5 is a graph showing fall-run chinook salmon spawning escapement in the Lower Yuba River during the periods before and after construction of New Bullards Bar, which was in 1970.

I should note here that because of overlap in the time of spawning for fall- and spring-run chinook salmon, it has

not been possible to distinguish between fall- and spring-run `carcasses on the spawning grounds. And, therefore, these estimates likely include spring-run salmon as well.

During the pre-New Bullards Bar period, prior to 1970, this would be 1953 to 1971, annual spawning escapement of adult salmon in the Lower Yuba River averaged about 12,900 salmon. Following completion of New Bullards Bar Reservoir annual spawning escapement was sustained at slightly higher levels through 1991. And since 1992, there has been an upward trend, with recent spawning escapements well exceeding the historical average.

The resulting average escapement following the completion of New Bullards Bar to the present has been approximately 15,100 fish, which is a 70-percent increase over the pre-New Bullards Bar Reservoir average. Since the construction of New Bullards Bar Reservoir the returning numbers of adult chinook salmon to the Lower Yuba River have been sustained as shown by this graph. Despite two of the worst droughts on record, one that occurred during the '66-67 water years and another, '76-'77 water years and another that occurred during the 1990 -- 1987 through 1992 water years.

Next I would like to say -- next I would like to just point out that several out-of-basin factors have also

effected Lower Yuba River runs, and we all discuss those a little later.

Next I would like to discuss steelhead. Similar long-term records of adult steelhead abundance have not been possible in the Lower Yuba River because, first of all, steelhead generally spawn in the winter and early spring when high turbid flows often preclude surveys. And also, most adult steelhead do not die after spawning like chinook salmon, where carcass surveys are not possible.

However, prior to the construction of New Bullards Bar Reservoir, DFG estimated about 200 steelhead spawned in Yuba River before New Bullards Bar Reservoir was completed. Angling reports and the Department of Fish and Game records indicate that steelhead fishing all over the Lower Yuba River dramatically increased following the completion of New Bullards Bar Reservoir.

DFG estimated that in 1975 the steelhead run was estimated at 2,000 fish based on angling data. The Department of Fish and Game biologist attributed this increase to initial steelhead stocking programs, as well as to improved habitat conditions resulting from higher cold releases from New Bullards Bar Reservoir.

Since 1992, our snorkeling observations, interviews with anglers indicate the continued presence of large numbers of adult steel in the Yuba River during the winter

and spring. We have also found significant natural reproduction of steelhead from large numbers of juvenile steelhead, which I will discuss later as part of the review of our juvenile steelhead results.

With respect to shad, since 1992, we have also observed adult shad downstream of Daguerre Point Dam during the late spring and summer. But we have not been able to assess the relative size of the runs from year to rear. However, as we reported in our previous testimony, Department of Fish and Game analyses as well as results from a shad study we conducted in 1990 indicated that the distribution of adult shad in the Lower Yuba River, Feather River and Sacramento River was largely the result of differences in flows. And the relative magnitude of flows basically determine distribution of shad during shad migration.

Next, Slide 6. I would like to discuss the out-of-basin factors that affected anadromous salmonids in the Lower Yuba River, primarily chinook salmon.

MR. CUNNINGHAM: Mr. Brown.

H.O. BROWN: Mr. Cunningham.

MR. CUNNINGHAM: If I might, sir, I would like to renew my objection to this, call it an exhibit for lack of anything else right now, any testimony to follow from this exhibit.

I see again on the reference to this exhibit reference

to the Yuba County Water Agency Exhibit 19, Pages 3-12. I believe, however, this testimony or this graph is an attempt to summarize testimony from 3-12 to 3-14. I finished very quickly reading 3-12 through 3-14, and excuse me if I might stand corrected, but I see nowhere within those three pages of testimony, prepared or written, the word "El Nino" or any reference to the El Nino conditions. So once again we are entering into testimony that was presented or brought to our attention prior to this proceeding today.

This is going to take us once again into a side of avenue, and I would object to this. It is not contained within written testimony already provided.

H.O. BROWN: What pages did you say?

MR. CUNNINGHAM: 3-12 to 3-14.

H.O. BROWN: Mr. Gee.

MR. GEE: We are speeding along here, and I had some comments regarding the last exhibit, S-YCWA-19.

H.O. BROWN: This exhibit here?

MR. GEE: No. Mr. Mitchell was speeding along and made several references to the Department of Fish and Game surveys or studies. I flipped to the reference on that last graph. Can we have that back up, please. The reference to Page 3-11, Page 3-11 is an identical graph as it is. There is nothing in that reference that points to the Department of Fish and Game. And I join in Mr. Cunningham's objection

from the very beginning, that we -- I am trying to follow and trying to take copious notes. I wish I had my own report here to copy what Mr. Mitchell has offered up as testimony without -- without written testimony, I don't know where he is getting his information. I cannot flip through what is essentially a report, which is not signed under penalty of perjury.

And he is reading from a summary. I would ask for a copy of that summary that he is reading from so we can point to something during cross-examination without having to sit down and trying to figure out where he is getting his reference from.

H.O. BROWN: Thank you, Mr. Gee.

Mr. Baiocchi.

MR. BAIOCCHI: I support Mr. Cunningham's and Mr. Gee's objections.

H.O. BROWN: Thank you.

Mr. Lilly.

MR. LILLY: This is going to take a long time if we have to keep doing this, but I will.

First of all, regarding ocean conditions, there is a total of one page of text on Pages 3-13 to 3-14 of Exhibit 19, which refers to ocean conditions. Even if the exact words "El Nino" are not there, that is certainly within the scope of permissible summary of an entire page of

testimony.

Regarding Mr. Gee, he is correct the bar graph is an exact copy of 3-11 of Exhibit 19. As far as the source of those bars and data points for each year, they are listed on Page 3-10. As to who did the actual surveys, they don't use the words "Department of Fish and Game," although the names of the Department of Fish and Game biologists are mentioned on that page. And, frankly, in 1992 it was clear that there was testimony that those bar graphs and those data points were collected by Department of Fish and Game biologists.

What we have done here is used the same bar graph and updated with the last eight years of data to show the recent conditions.

H.O. BROWN: Thank you, Mr. Lilly.

Do you have any objections with making copies of their summaries?

MR. LILLY: That is normally not done. I suspect if Mr. Mitchell is like most people, he probably has handwritten notes all over them. If we give him a chance to keep it up, we want to submit that as an additional exhibit, I don't have an objection to doing that.

H.O. BROWN: That takes care of your concerns, Mr. Gee?

MR. GEE: It does to some extent. I am rather -- it raises a concern if they had time to summarize the points, I

am wondering why they didn't have to present a written testimony like all the other parties did. There have been some statements made that you have given latitude to other parties from deviating from the technicalities of the procedure.

I made every effort to comply with the procedural requirements of this hearing, and what we have here is beyond merely deviating from the procedures of this hearing. This is a gross deviation from procedures I made every effort to comply with.

H.O. BROWN: Thank you for your comments, Mr. Gee.

Mr. Cunningham.

MR. CUNNINGHAM: Thank you. I will follow Mr. Gee. I heartily support Mr. Gee's concern. I don't think summaries right now are going to help us now. I think what we are looking at is everybody else who will need to participate in this proceeding, presented their testimony in writing with the understanding that they could come in and summarize the contents of that, but not in essence provide new analysis or new data.

These documents that we are looking at now, these overheads that we are looking at now, several of these contain completely new information that nobody has seen before. If Mr. Lilly wants me to cite book and bible, I will talk about due process among other things, and we have

been denied due process in order to participate here.

Let me just focus on just this specific exhibit again. I am looking at Pages 3-13 and 3-14 of their own submitted testimony, the testimony Mr. Mitchell apparently is signatory to. If Mr. Lilly or Mr. Mitchell can tell me anywhere within the bottom half of Page 3-13, where it says social conditions and the top half of 3-14 where it continues that same discussion, it says "El Nino," I will eat my words. But I am sorry, I reread it twice more now and I don't think El Nino and I don't believe El Nino is an adequate summary of the discussion contained there.

What I find is only a glib reference to a source from David W. Welch, Committee on Energy and Natural Resources, from the United States Senate.

H.O. BROWN: What page are you on?

MR. CUNNINGHAM: This is on Page 3-14 at the top, discussing a recent decline of salmon abundance and talks about, "This may have been due to increased ocean temperatures in the Northeast Pacific, which may be caused by global warming."

I am no scientist, Mr. Brown. But last I heard El Nino and global warming are not the same thing. And any attempt here to globally say they are misstates again and does not state accurately the evidence presented to us to

cross-examine this witness.

H.O. BROWN: Mr. Baiocchi.

MR. BAIOCCHI: Mr. Brown, I was looking for the regulation. I can't find it. It's in there. This is surprise testimony. You want to call it testimony. But, anyways, it is a surprise to all of us, people at the hearing. There's been two objections consistently by Mr. Cunningham and Mr. Gee and myself.

H.O. BROWN: Thank you, Mr. Baiocchi.

Mr. Frink, do you have a comment?

MR. FRINK: I think we do have an ongoing problem here. The other parties submitted their testimony in writing in advance, and I see nothing wrong with the reports that Yuba has presented. It does not appear that several of their witnesses who intend to testify have submitted written testimony. That doesn't comply with what was set out in the hearing notice.

It could be prejudicial to the parties. Apparently most of the witnesses have prepared something in writing that they intend to work from, and perhaps an eventual solution would be to get a cleaned-up copy of that and distribute it.

I don't know how you overcome the problem of the other parties not having seen that in advance of the hearing.

MR. LILLY: Can I respond, Mr. Brown?

H.O. BROWN: Of course, Mr. Lilly.

MR. LILLY: Thank you.

The basic issue here -- the problem here is that we have presented far more detailed written testimony than any other party. And with the limitations on time that this Board has imposed, we have to summarize it. What we are doing here is no different whatsoever than what the Department of Fish and Game did in 1992 when it presented a 250-page plan, called The Lower Yuba Fishery Management Plan. It had a panel of witnesses and, incidentally, that was not even denominated testimony, and the panel of witnesses talked about that.

The Hearing Officer then -- I realize that you, Mr. Brown, were not the Hearing Officer then. The Hearing Officer then allowed them to go into detail, explaining what that plan addressed and to talk about it. They can't possibly have a summary of every single page in that. They had to carry on a summary so we could get through the hearing. They did that.

We are doing the same thing here. As far as Mr. Cunningham's comments, he apparently is no scientist because the words that he just read, increasing ocean temperatures, is exactly what El Nino is about. And the fact that we have had a one-word or one-phrase summary to summarize a page of testimony is perfectly appropriate.

I will note here on this very exhibit, there is a heading on Page 3-12 which says out-of-basin factors affecting anadromous salmonids, which is what the title of this is. We added the words "in the Lower Yuba River" just to summarize. Of course, that is listed on the cover page of the report. Then the words "ocean harvest rates, ocean conditions and delta factors" are the summaries of the subsequent sections of that report.

So, they are just incorrect. We are summarizing our written testimony. Just happens to be our written testimony is very extensive and very detailed. So the summary can't just go through paragraph and paragraph as it could if the summary were much shorter. With the constraints of this Board's hearing procedures and the amount of detailed technical information that we need to present to address the issues, this is the only way we can do it.

H.O. BROWN: Thank you, Mr. Lilly.

MR. CUNNINGHAM: Mr. Brown, I've got to have one last say, Mr. Brown. I am sorry.

I will start with the specific.

Excuse me, Mr. Lilly and Members of the Board and staff, but I believe the full phrase that they quoted here in your own written testimony is reduced survival may be reduced to increasing ocean temperatures which -- I'll admit it says may be caused by global warming.

If you have a witness who is prepared to testify, I will look at Mr. Mitchell since he seems to be the one author of this statement through the summary, if Mr. Mitchell is prepared to testify that increased ocean temperatures caused by global warming are the same as El Nino, I might have accepted this summary. But I do know enough science to know that El Nino is a periodic, cyclical effect in the eastern Pacific unrelated to global warming, or at least no evidence to my knowledge has been established to correlate such surface warming with global warming.

So, I do think this is not an accurate summary of their own testimony. Yes, some of these other pieces are. But this is gamesmanship. If what we are going to do is say, "I have a couple pieces right and I will kind of run the other stuff through because it is going to expedite our testimony," I put it to you, Mr. Brown, this is not expediting the testimony.

I take serious offense to Mr. Lilly's summary of what happened in 1992. The Department of Fish and Game put on written testimony. We submitted written testimony from each of the witnesses who participated in the 1992 hearing. We also submitted the management plan as a secondary document, a document that this Board was fully entitled to take notice of pursuant to the provisions for official notice. We did in each of our pieces of written testimony then make

references to that document as we have done in our current presentation. We have submitted written testimony and attached documents or exhibits that make reference to it.

That is not what I am looking at here. These guys have all lumped it together. I do think that if we are going to provide summaries of this right now, then let's summarize what is in their document. Let's not make up new testimony. Let's not glibly use phrases that are not documented in this testimony. Let's just do this testimony.

And I will put it to you and I will renew my objection about the timing on this. Yes, they've got lots of material. So do a lot of other parties in this proceeding. The whole idea of this oral presentation is not to reiterate every important element, every detail, to beat the Board to death with details from their testimony is to just give some context. The written testimony is already going to be submitted. We have all the information the Board will need to make its determination.

Mr. Lilly is going to drag this thing out. I would guess if I were to shut up now and not speak another word for the rest of the day, we are not going to be anywhere near finished before the end of the day.

With that, Mr. Brown, I renew my objections.

H.O. BROWN: Thank you, Mr. Cunningham.

Any other objections before I give the Board's ruling?

Mr. Gee.

MR. GEE: Again, Mr. Lilly has addressed some of the parties' objections. He has not addressed mine. My objection still stands. I cannot follow Mr. Mitchell's testimony without having some form of written testimony. I do not have the amount of time or resources to sit down and take copious notes and keep up with his testimony without some form of written testimony. That is why I thought we had written testimony, so we can refer to something outside of his oral testimony, and I agree Mr. Lilly's statement is correct; there is a lot of material to go through. But that is the purpose of having written testimony.

What Mr. Mitchell should be offering, as with all witnesses, is a summary. This is not what is being done here.

I join in Mr. Cunningham's objection, and I reiterate my previous objection.

H.O. BROWN: Thank you, Mr. Gee.

Mr. Lilly -- couple more.

Mr. Baiocchi.

MR. BAIOCCHI: Bob Baiocchi. I support Mr. Cunningham's and Mr. Gee's objections.

H.O. BROWN: Mr. Morris.

MR. MORRIS: I am sorry, I tried to avoid getting into this, but being -- I think people are ganging up on Mr.

Lilly at this point. I want to support his procedural -- we've heard since Tuesday, we have been here for two and a half days, and all of the testimony has basically been against the Yuba County Water Agency. They have had no opportunity. If you count all of those hours, it is many, many hours against Yuba County Water Agency. They need some due process ability to be able to respond to them. I see no alternative to this. I think you ought to allow them to proceed, Mr. Brown.

H.O. BROWN: Thank you, Mr. Morris.

Mr. Lilly.

MR. LILLY: I don't want to belabor this. I disagree with Mr. Cunningham's comments and personal attacks on me. I do agree with Mr. Morris. This is the only efficient way we have to summarize the volume of testimony, but we had to submit on these issues and, therefore, we request the opportunity to go forward.

H.O. BROWN: Thank you.

My conclusion is this: Both sides have merit. You are presenting testimony that certainly appears to me to be outside the direct, and it is difficult for the other folks to follow. So, again, I ask you to try and make your summations to be that of the direct testimony. There is merit in what these gentlemen are saying.

On the other hand, there is merit with Yuba County

Water Agency having to present a vast amount of testimony and respond to the numerous parties that are presenting testimony against their position.

I will grant latitude to the Yuba County Water Agency along these lines. And if you believe that they're stepping too far out of bounds of the direct testimony, I, of course, invite you to rise to the occasion and so bring it to my attention, and I will address it again at that point. But I ask you also on your half to cut some slack for the Yuba County Water Agency because of the vast amount of information they do have and the short time that they have to present it.

Mr. Lilly will not get all the time that he wants, I am sure. But I will give him enough time where this Board can understand their position and the work that they have put together.

With that we will take a break.

MR. LILLY: What time do you want us back, Mr. Brown?

H.O. BROWN: We will return at a quarter after one.

(Luncheon break taken.)

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AFTERNOON SESSION

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H.O. BROWN: Bring the hearing back to order.

MR. LILLY: Thank you, Mr. Brown.

Could we have Slide 6 back up on the screen?

Mr. Mitchell, considering the Hearing Officer's admonitions, please just summarize the important conclusions that are shown on Slide 6.

MR. MITCHELL: The main thing we wanted to make with this slide, there have been a number of out-of-basin factors, factors outside of the Lower Yuba River that have contributed to declines in wild chinook salmon populations. Yet the Yuba River has sustained this population for those periods. There is new data available on ocean harvest rates that shows that the harvest rate or the proportion of fish caught out in the ocean has increased from approximately 50 percent to about 80 percent since 1950. And that represents the proportion of fish that are caught of the total population.

Also, with respect to ocean conditions, ocean conditions have become worse since 1970. And that has been also marked by several years, several El Nino years have had impacts on salmon.

With regard to Delta factors, we have also seen increased spring water temperatures that adversely effect

the young salmon. Water temperatures are actually warmer at any given flow since the 1975. We have since looked at more recent data that shows that the relationship between water temperature and flows have persisted, and those temperatures are higher than they were prior to the drought than any given flow.

MR. LILLY: Slide 7.

MR. MITCHELL: With the next three slides I would like to review the results of the juvenile salmon and steelhead studies that we have conducted over the last eight years.

Starting with juvenile chinook salmon we have found strong evidence for successful reproduction of chinook salmon based on high population densities during the primary rearing period, March through May.

With regard to growth and condition, our length, measurements of length and weight of juvenile salmon have shown that they grow significantly during their rearing period. We also have examined fish for their physical condition and found them to be in good condition, based on a number of indicators. We also have seen no external signs of disease or stress, such as abnormalities, lesions or parasites.

Next I would like to talk about emigration timing. And the next slide --

MR. LILLY: Slide 8.

MR. MITCHELL: I would like to show a relationship that we first presented at the end of the 1992 hearings that is based on data collected at the Hallwood-Cordua fish screen. This fish screen is operated by the Department of Fish and Game for the purpose of salvaging fish that entered the canal. This facility operates as early as mid-April and goes through June, and during that time young salmon -- these are relatively large juvenile salmon that are on their smolt migration to the ocean -- appear at the trap.

One of the things that we noticed in the data before was that there was a relationship between the data of migration and flow in the river above Daguerre Point Dam. Since then we have added two more points, 1992 and 1994 that shows they actually fell along this general relationship. Just to reemphasize here, the higher the flows, the later the migration timing of juvenile chinook salmon.

MR. LILLY: Shall we go on to Slide 9.

MR. MITCHELL: We have also gained significant new information on steelhead and rainbow trout. We use the designation steelhead/rainbow trout to reflect the uncertainty we have in identifying the steelhead trout juveniles which are from sea-run rainbows versus the resident rainbow, young for the resident rainbow. They look virtually identical, and, therefore, the results may apply to both.

With regard to abundance and distribution, since 1992 we have seen high population densities of juvenile trout in the Lower Yuba River; and also one of the major conclusions after observing these fish for many years and also confirmation last year --

MR. CUNNINGHAM: Mr. Brown.

H.O. BROWN: Mr. Cunningham.

MR. CUNNINGHAM: I would like to make an objection again, please. Mr. Brown, I apologize again for being quite so nitpicky, but I just heard testimony that I now see a slide here presented to us that suggests that somewhere in the testimony is a finding of high population density of steelhead/rainbow trout. I have been busily trying to go through this, that ends up being a hundred-page testimony that allegedly Mr. Mitchell wrote, as well as others. I don't find anything that says high population densities.

I found they have found juvenile steelhead. I find they can find them certain times of year. I find that they can do a lot of other things. I do not find where they have done any kind of comparison studies or bases for studies or reports of studies that indicates that there is a high population density of steelhead/rainbow trout in the Yuba River, not just a summary of their testimony. This is new information that I have never seen before. There is no evidence in this, the materials I am looking at presented as

Mr. Mitchell's testimony that suggests that a high population is a legitimate conclusion from materials available.

So, I am going to object to this kind of testimony, which is not a summary, but is essentially either new representations or new analysis that we have not had an opportunity to prepare cross-examination. Again, I apologize. I see the same thing in the previous exhibit, where there was a similar statement about the high population densities of chinook salmon. I can't find anything that specifically supports that conclusion anywhere in any of the documents submitted by the Yuba County Water Agency.

Now, I will stand corrected if they put me to someplace where they actually say high densities. But I see no differential studies that allow them to make that kind of determination.

H.O. BROWN: Thank you, Mr. Cunningham.

Mr. Lilly.

MR. LILLY: I suggest that Mr. Cunningham can bring these points out on cross-examination.

H.O. BROWN: That is -- I was about to suggest that myself. I think that would be an excellent question to bring out in cross-examination. I would ask that you do that.

MR. CUNNINGHAM: For the record, Mr. Brown, I would like to finish that is what is being recommended. For the record, Mr. Brown, I am and was entitled to cross-examination on the exhibits filed in this proceeding, the evidence presented in those exhibits and the materials that are attached to those exhibits. I have not, nor I have planned on preparing to cross-examine, for cross-examination on new testimony or new conclusions that I have yet to see presented. I have --

Yes, this would be an interesting cross-examination. But I am sorry, I thought the standard that I was arguing, the objection I am raising, this is testimony not in the direct. This is new testimony. Yeah, it would be nice if I could cross-examine. But if I am going to have to sit here and piece by piece watch every slide put up, listen to every statement made by every witness trying to discern how much of this is new so that I can try to decide whether I have identified it for examination or whether I need to cross-examine that, I suggest that that denies my client and myself reasonable opportunity to participate in these proceedings. I've got reams of notes about things I want to cross-examine, let alone trying to figure what I want to cross-examine that is new information.

We are supposed to be limited to what we put in writing. That is not in writing. If they can establish for

me someplace as an offer of proof from Mr. Mitchell that statement of high population densities somewhere in the materials that I failed to identify, I will withdraw my objection.

H.O. BROWN: Mr. Lilly.

MR. LILLY: This obviously is what we have to do to summarize a large volume of material. I suggest Mr. Cunningham has already phrased his question, and he can ask it very effectively on cross.

H.O. BROWN: I am going to overrule.

Proceed.

MR. LILLY: Please proceed, Mr. Mitchell.

MR. MITCHELL: One of the other findings that we made over the last eight years is that the primary rearing habitat is above Daguerre Point Dam for juvenile trout.

And I would like to show the next slide. Please.

The summer of 1999 electrofishing surveys were done throughout the river. This shows the relative abundance of juvenile trout collected along the river by river mile. River mile zero, just to orient you, river mile zero is the confluence of the Yuba River and Feather River. River mile 4.3 is near Marysville. And the right-hand side of the graph is approximately a hill above the Highway 20 bridge. And this point here, at 11. -- river mile 11.4 is Daguerre Point Dam.

One of the interesting results from last summer's surveys was something that confirmed our earlier observations, that substantially more juvenile steelhead, and these are, by the way, the young of the year, the fish that were born in the year 1999. Substantially larger numbers of steelhead/rainbow trout were found above the dam, while interestingly the other species here -- other species are basically the native species such as speckled dace, pikeminnow, Sacramento sucker, showed somewhat of an opposite trend. That was the major point for this slide.

MR. LILLY: Are you going to go back to Slide 9 for a minute?

MR. MITCHELL: Back to --

MR. LILLY: For the record, that was Slide 10; this is Slide 9.

MR. MITCHELL: We also have observed a broad size range of juvenile trout, representing multiple age classes, beginning with age zero, which is what we refer to as young of the year fish, all the way up to the age one and above. The next slide will illustrate this wide range of size distributions.

MR. LILLY: That will be Slide 11.

MR. MITCHELL: Slide 11 shows the size distribution of juvenile trout collected in the summer of 1999. The top graph is the results of electrofishing surveys that were

conducted in the upper Lower Yuba River above Daguerre Point Dam, showing the distribution of young-of-the-year trout. fish born in 1999.

During the same period angling was used to collect age one and older juvenile steelhead in the reach above Daguerre Point Dam. The important point here is that we have a large number of age classes, starting from the first year fish all the way up through age one and older. And this was evidence of substantial growth of young trout over a number of years as well as good survival.

Next slide, please.

MR. LILLY: Want to go back to --

MR. MITCHELL: This will be actually Slide 9.

In collecting length and weight measurements of juvenile trout, we have also observed good condition factors. Fish are in good physical condition during -- and this was especially from collections in 1992 and also in 1999, last year.

We also examined the fish for any external signs of distress and found none. Generally, the fish are healthy fish and in good condition. Finally --

MR. LILLY: Slide 12.

MR. MITCHELL: Slide 12.

The conclusion from our work over the last eight years are as follows:

First, large viable self-sustaining populations of chinook salmon and steelhead exist in the Lower Yuba River.

Secondly, the overall health and resilience of salmon and steelhead in the Lower Yuba River --

MR. CUNNINGHAM: I am sorry, Mr. Brown. I would like to make the same objection again, Mr. Brown. The word "large and viable" appear nowhere in any of the testimony presented by Mr. Mitchell or by any of his biological friends. I do not see any comparison studies contained in Exhibit 19 presented by Yuba County Water Agency to suggest that the Yuba River has a large population of any of the salmonids identified.

Large is clearly a term of understandable art. It suggests that a comparison evaluation between large-, small-, medium-sized populations. This is testimony outside. I don't care whether they call it conclusions or not. These are statements being offered to this Board that are not reflected in their own records and in their own exhibits.

I am entitled to object and ask that this information not be presented at this time as direct testimony.

H.O. BROWN: Mr. Gee.

MR. GEE: Mr. Brown, as an accommodation to Mr. Lilly he asked that the objecting parties raise, stand and be heard. However, we need to define a point of reference to a

statement being made by the witness. At this time I would ask Mr. Mitchell if he can point to somewhere in that report where he bases his conclusions on.

Thank you.

H.O. BROWN: Mr. Baiocchi.

MR. BAIOCCHI: Thank you, Mr. Brown.

Mr. Mitchell -- I am objecting to Mr. Mitchell's presentation using the terminology "chinook salmon" as a whole. He's just throwing all of the fish into one pail. We have a threatened species, spring-run`. We've got a listing of fall-run, and have a late fall-run. He is lumping them all up. And whether I go there on cross-examination or not, I am just objecting to the -- this is not testimony. I continue to object that way.

H.O. BROWN: Mr. Lilly.

MR. LILLY: Obviously, these are just conclusions of numerous graphs and figures and data tables. I suggest that we let Mr. Mitchell finish this slide and he will be done.

H.O. BROWN: Overruled. Proceed.

MR. LILLY: Mr. Mitchell, please proceed with your conclusion.

MR. MITCHELL: Secondly, the overall health and resilience of salmon and steelhead in the Lower Yuba River is demonstrated by long-term stability of populations despite out-of-basin conditions, as well as drought, severe

drought conditions that have occurred since 1970. Also high rates of natural production of juvenile chinook salmon and steelhead. And lastly, good growth rates, condition and health of individual fish.

MR. LILLY: Mr. Mitchell, does that conclude your summary of your testimony for today?

MR. MITCHELL: Yes, it does.

MR. LILLY: Next, Mr. Brown, we'd like to proceed to Mr. Stephen Grinnell, and we have his slides. And I believe with only potentially one or two exceptions, these are exact copies of pages from his numerous exhibits. We ask that those be numbered for the record as S-YCWA-25. We have six copies for the Board and copies for the interested parties as well.

Mr. Grinnell, before we get started on that, do you have two corrections, pages that you would like to put into the record right now?

MR. GRINNELL: Yes, I do. The first page is from -- it would be YCWA-18, Page 12 is a graph of Figure 10 on that page that had an incorrect data point that was incorrectly plotted, kind of stuck out.

MR. LILLY: Is that the only change on that page?

MR. GRINNELL: Yes. It is an individual data point for Colgate Powerhouse release temperature.

H.O. BROWN: Which exhibit are you in?

MR. LILLY: This is Exhibit S-YCWA-18, Page 12, there was just one data point in Figure 10 on that page that needs to be corrected. We have copies of the corrected page. We would just ask that be marked as S-YWCA-18A.

MR. GRINNELL: The other correction is also from YCWA-18, and it is for Figure 8 in the upper right-hand corner there is a temperature profile for New Bullards Bar from this date, October 16th, and the original plot had a misplot of a profile and that has been corrected, also.

MR. LILLY: We will ask that that be labeled S-YCWA-18-B.

H.O. BROWN: Everything up to speed to what happened here.

MR. BAIOCCHI: I can't keep up with Alan.

MR. LILLY: There are copies of both of those for all copies. They are numbered.

H.O. BROWN: Just take a moment to go off the record and distribute those copies.

Off the record.

(Break taken.)

H.O. BROWN: Back on the record.

MR. LILLY: Mr. Brown, following your admonition from this morning, Mr. Grinnell has considerably pared down his summary, so some of these slides we will flip through and he may mention or not mention at all. We have tried to pare

down his testimony considerably.

H.O. BROWN: The Chairman appreciates that.

MR. LILLY: With that, Mr. Grinnell, will you please summarize the testimony of the exhibits that you are prepared or contributed to the preparation of?

MR. GRINNELL: I am going to be summarizing six of the exhibits. They are listed on this first figure or first slide, Number 1. In the interest of time I won't read them off. But they're six exhibits that have been submitted with respect to hydrology of the Yuba River.

H.O. BROWN: Are these overheads marked?

MR. LILLY: Yes, they are. I will try to call those out to help the record. Thank you.

That was Slide 1 and please now he just mentioned Slide 2.

MR. GRINNELL: The first exhibit I will summarize is the water year classification system for the Yuba River.

MR. LILLY: Go to Slide 3.

MR. GRINNELL: Very briefly, this is the definition from the 1995 Water Quality Control Plan of the Sacramento Valley Index and the associated water year hydrologic classification system. The reason I put this up is that this was an appropriate approach to identifying water quality standards given the availability of water within the system, and, therefore, we have used this as a methodology

for defining a water year classification for the Yuba River and also for defining a Yuba River index.

Next slide.

MR. LILLY: Slide 4.

MR. GRINNELL: This is from Appendix A, YCWA-14. It is the definition of Yuba River Index. As you can see, it looks quite similar to the Sacramento Valley Index definition shown on the previous slide, with one significant change. That is the index formula at the very top has differing ratios from the Sacramento Valley Index, and that is in recognition of the differing hydrology of the Yuba River. And the Yuba River has quite a significant difference in hydrology from the Sacramento Valley Index.

MR. LILLY: Let's go forward to Slide 5.

MR. GRINNELL: I will next talk about present and full development demands from YCWA-18 -- I'm sorry, 15.

MR. LILLY: Slide 6.

MR. GRINNELL: The methodology that we used to develop applied water requirements are very consistent with the methodology that the DWR uses. Applied water for irrigating lands are estimated by multiplying the per acre applied water requirement for a given crop by the number of acres planted.

H.O. BROWN: Mr. Cook.

MR. COOK: The slides, 1, 2, 3, 4, 5, et cetera, I

don't believe are numbered in this handout. Where we do have numbers at the bottom of the page, I am trying to look up there, find out what document it is, look down here and write in slide such and such. I am finding it a little difficult. I am wondering maybe a reference could be made to page numbers.

H.O. BROWN: They are one in the same; are they not?

MR. LILLY: We are referring to the numbers at the bottom of each of these slides. There are two slides per page on the handout. But each of these slides does have a number at the bottom center, and that is what I am referring to.

H.O. BROWN: Same number that you are referring to, what is at the bottom of the page?

MR. LILLY: Yes.

H.O. BROWN: That is what my understanding is.

Is that yours, Mr. Cook?

MR. COOK: I didn't realize that. I saw the bottom number and thought that was the page number. I didn't realize it was also slide number. That would be very helpful.

MR. LILLY: We appreciate the clarification. Say you are referring to the numbers at the bottom center of each page.

H.O. BROWN: Thank you, Mr. Cook.

Proceed.

MR. LILLY: Mr. Grinnell, please proceed.

MR. GRINNELL: As I said, the methodology is the same methodology used by the DWR for their planning studies and also for Bulletin 160. Also, crop acreage under our demand estimates was based on county land use surveys performed by the DWR in 1984.

MR. LILLY: Let's go forward to Slide 7.

MR. GRINNELL: I won't go through all the numbers here. This is the diversion, on the demand diversions of present level of full development level of demands that we've used in our modeling studies, and noting the totals, the annual totals for the dry, critical and below normal years, present level, 311,000 acre-feet. And above normal wet years, 305,000 acre-feet. Full development, 381,000 for critical, dry and below normal. And 375,000, approximately, for the above normal wet.

MR. LILLY: Slide 8.

MR. GRINNELL: This slide I want to take a minute on because it is quite germane to some of the issues raised. It discusses a comparison of historic and estimated present level of demands. You will notice down at the bottom that there are averages for a number of different periods. One is the '87 to '98 average for historic and estimated diversions. That is about a 10 percent margin for the

estimated diversions above the historic. Also note that for the dry and critical average that margin is about 5 percent. Quite an appropriate margin for water use planning studies and for water allocations.

MR. LILLY: Go forward to Slide 9.

MR. GRINNELL: This is Page 91 of the Draft Decision. I will read it.

> The actual water demand within the Yuba County Water Agency service area may be considerably lower than estimated in Yuba County Water Agency study if the quantities are adjusted to account for the actual acreage planted in rice rather than the amount of land on which the rice could be planted. (Reading.)

Next slide.

MR. LILLY: Slide 10.

MR. GRINNELL: This is also from the Draft Decision, Page 98.

> As discussed in Section 7 through 7.4 above, the record indicates that YCWA's estimated water demand figures may substantially exceed actual water needs. The reduction in the water demand figures from the numbers assumed by YCWA would reduce the size and frequency

of projected water deficiencies. (Reading.)

I think that our testimony conclusively shows that these statements are incorrect.

MR. LILLY: Go forward to Slide 11.

MR. GRINNELL: Now I would like to spend a minute talking about the model that has been used for adjusting the -- assessing impacts of the Draft Decision, also that was submitted to the DWR for review and verification.

Go forward to Slide 12.

MR. GRINNELL: This is a schematic of the model and it shows all the nodes that are in the model. And what I would like you to note is that the upper nodes --

Yung-Hsin, could you circle those for me.

Yung-Hsin is circling essentially all of the upper nodes, including over to the left the diversion for OWID from Slate Creek. That is what we call the upstream impairments. Those are diversions in instream consumptive uses that take the first increment of water out of the watershed. The lines that lead down from those upstream impairments are the resulting flows that reach the Lower Yuba River and then become available to the Yuba Development Project.

MR. LILLY: Go forward to Slide 13.

MR. GRINNELL: Again, I won't go through all the numbers. But the upper left-hand graph shows the unimpaired

flows near Smartville for the five water year types that we have identified on the Yuba River Index. The lower left graph is the flow available to the Lower Yuba River after the upstream impairments. And the lower right graph is percentage of impairment.

As you can see, for instance, for the critical time periods, critical years time period of April to September, that upstream impairment can be over 40 percent.

MR. LILLY: Go forward to Slide 14.

MR. GRINNELL: I won't read all these, but this is a listing of regulatory constraints affecting the Yuba County Water Agency operations. Of particular note I would like to call out the last item which is 1993, the PG&E Narrows 1 FERC license. That requires --

MR. LILLY: For the record we flipped to Slide 15.

MR. GRINNELL: That 1993 FERC license required a rather complex accounting for additional flows on top of the 65 flow agreement instream flows and downstream demands. And the reason I call this out is this is an additional demand on the system that we don't model because it is so complicated. The HEC-5 model will not handle the accounting of this. We have to add it on in post-processing and becomes essentially another demand on the system.

MR. LILLY: Slide 16.

MR. GRINNELL: Also, these are some of the model

operational constraints of the system. They are physical constraints, such as the reservoir storage, the release capacity. Also we modeled that there are no shortages in the flows allowed unless New Bullards Bar is fully depleted, and that will come up when I show some of the results. Also, allow dry year reductions in instream flows and consumptive use deficiencies are applied from April to the following March as they would in reality after water year classification would be determined or the water type would be determined.

The last item there is carryover storage requirements. The next slide will show what we mean by carryover storage.

MR. LILLY: Slide 17.

MR. GRINNELL: Carryover storage requirement is used to plan for and make provision or water supply for drought years for the next year. This is the way it is calculated in the model.

Note that one of the things that carryover storage does is provide for the next year's instream flow requirement. Also in planning for the next year's demands, 50 percent of the next year's diversions are planned for along with the losses and evaporation of the system. So, New Bullards Bar is used to attempt assurance of the instream flow requirement for the next year along with half of the diversions.

MR. LILLY: You are describing how the model does this?

MR. GRINNELL: Yes. This is all description of the model.

MR. LILLY: Go on to Slide 18.

MR. GRINNELL: This is a comparison of our modeling results with the DWR simulations and, actually, they are overlaid there. They look like it is just one line. There are two lines there shown and demonstrates that we did get essentially identical results.

MR. LILLY: Slide 19.

MR. GRINNELL: This slide also demonstrates that -- except that they are not exactly identical. If you look at the dry period, there are some differences. The DWR did get slightly higher deficiencies, and that is -- we spent a little more time optimizing the runs, and so we were able to smooth out deficiencies a little bit.

MR. LILLY: Before you go to Slide 10, could you just describe the amount of detail you had in your discussions with the DWR modelers starting with the workshop that State Board staff held and just spend one or two sentences summarizing the amount of detail of information transfer and discussion.

MR. GRINNELL: We met several times, E-mailed, phone conversations, talking about the hydrology, bringing DWR modeling staff up to speed on what we had done. When they

had questions, trying to explain. HEC-5 model is a rather difficult model to just take an input file and go through and understand it. So we spent a lot of time. Also talking about the input hydrology.

MR. LILLY: Now let's go forward to Slide 20.

MR. GRINNELL: Next I would like to talk about the results of the modeling simulation flow requirement.

MR. LILLY: Slide 21.

MR. GRINNELL: This is a listing of the eight scenarios that we modeled and presented in our testimony. And it is a combination of three pairs of different modeling assumptions: Power production which is current practice of power production versus the PG&E power purchase contract operations; demand level, present and full development demands; and then as it -- to compare the 65 flow agreement versus the Draft Decision.

And so the first four scenarios, one through four, are under the 65 flow agreement and then scenarios five through eight are with the Draft Decision. We note also the DWR modeled scenarios one, two, five and six and did not model the four scenarios that included the PG&E power purchase contract. Dr. Arora also noted that he modeled scenario nine which was just incidental power. We did not model that.

MR. LILLY: Slide 22.

MR. GRINNELL: Here I am going to have to use my notes. There are a number of numbers here that I want to cull out. This is a comparison of the upper -- of the current power practice and present demands where on the upper graphs scenario one; 65 flow agreement, on the lower graph scenario five.

As you can see, since there are no impacts -- let me just go through what each one of the bars represent. There is a small blue bar, which is very difficult to see for scenario five under 1978. That is instream flow shortage below Daguerre Point Dam. As I said before, that only occurs when New Bullards Bar storage is pulled down to the dead pool.

The red bar is the consumptive use deficiency for diversions a Daguerre Point, and the yellow bar is a shortage in the carryover storage for New Bullards Bar. That shortage is a shortage from the carryover storage requirement as we calculated as shown on the previous slide.

As you can see here, there are a number of deficiencies. Just to give you some of the statistics of this, there are deficiencies of over 80,000 acre-feet. That is 25 percent of demand in 1924, '31, '34, '39, '59, '76, '77, '87, '91 and '92. The largest deficiency is 1977, and it is 155,000 acre-feet, which is about 50 percent of the

demands.

The consumptive use deficiency average 108,000 acre-feet in critical years, or about over a third of the demands.

MR. LILLY: Just for clarification, that is under scenario five.

MR. GRINNELL: All impacts of the Draft Decision is scenario five and no corresponding deficiencies under scenario one.

Again, notice the short blue bar in 1978. That is an instream flow shortage due to New Bullards Bar being pulled down to the dead pool. Actually, it is the fall of '77.

MR. LILLY: Slide 23.

MR. GRINNELL: This slide is a comparison under the full development level of demands. As you can see, in the upper, scenario two, the upper figure, that there is consumptive use deficiency for '77 and '78, which is actually the fall of '77, but in the '78 water year.

In '77 65,000 acre-feet and 11,000 additional acre-feet of deficiency for the fall of '77.

For scenario six, the Draft Decision, notice that New Bullards Bar is pulled down again in the fall of '77 to the dead pool and no consumptive use deliveries are made at that time. The average consumptive use deficiency in critical years is 150,000 acre-feet under this scenario, or 40

percent of demands. For dry years it is about 70,000 acre-feet.

Under the Draft Decision the consumptive use deficiencies are imposed one out of every two years, about half the time. For one in seven years the deficiency is about 35 percent of the total demands.

Just to go along with this, the Draft Decision allowed dry year reduction about 13 percent of the normal and wet requirements at Marysville. Because the limited definition of dry years under the Draft Decision, this reduction, which is the reduction from 2000 cfs to 1100 cfs in May, the 13 percent is only applied in 12 of 71 years or about one in six years. At that same frequency the deficiencies are at the 50 percent level.

MR. LILLY: Slide 24.

MR. GRINNELL: This slide is the current level demand now under operations that comply with PG&E power purchase contract. The contract requires two main things. One is that there are target storage levels, which are called critical line, and storage is -- releases are made to bring storage down to those levels. In addition there are power generation quotas, and those quotas apply even if the target storage levels are below the critical line. This requires quite a bit more releases from New Bullards Bar, specifically in the wintertime under the PG&E contract, and

that contract is, although not adhered to the letter right now, could be called for at any time by PG&E.

The upper graph again is under the 65 stream flow agreement and there are a number of deficiencies at that time period. The average deficiency is 11,000 acre-feet; maximum is 200,000 acre-feet, which occurs in 1977. There are ten years when deficiencies are about 50,000 acre-feet. In '77 New Bullards Bar is brought down to the dead pool, so there are instream flow shortage.

As you can see from the graph, it is pretty evident that under scenario seven with the Draft Decision and the power purchase contract, things are much worse. The maximum deficiency occurs in 1977 is 276,000 acre-feet. Only about 10 percent of the demand can be delivered for this year and that is mostly the winter, minor winter demands. New Bullards Bar is pulled down to the dead pool four times in scenario seven. Comparison of the three and seven shows that while Yuba River Development Project is somewhat stressed with feature demands -- I'm sorry, with current demands and the PG&E contract, there is generally an inability of the system to meet downstream demands with PG&E power purchase contract and the Draft Decision.

H.O. BROWN: These are current demands?

MR. GRINNELL: Yes, they are. That is under current demands.

MR. LILLY: Go forward to Slide 25.

MR. GRINNELL: This is the same scenarios only with full development demands. For scenario four which is under 65 flow agreement, there are a number of years when consumptive use deficiencies -- 1977 is the worst, with a deficiency of 254,000 acre-feet. For critical years the average deficiency is about 80,000 acre-feet.

For scenario eight conditions are pretty devistating. The maximum deficiency in 1977 is 90 percent of demand. Also as in scenario seven, New Bullards Bar that year is at dead pool from January to November and no consumptive use deliveries are made from March to November. In addition, deliveries are suspended in '24 or 1924, '31, '34, '88, '89 and from the time period of October '31 to February '92.

Although there is significant deficiencies under the 65 agreement flows and the PG&E purchase power contract, the system is just not designed to meet the full development level demand for PG&E power purchase contract and the Draft Decision.

This also shows something else, and that is that the operations under the PG&E power purchase contract do not satisfy downstream demands. The power purchase contract requires substantial winter releases, and the Draft Decision has very high spring flows. So, they are not synergistic. That is what essentially breaks the system.

MR. LILLY: Go forward to Slide 26.

MR. GRINNELL: These are summaries of the results with all the scenarios shown together. I won't go through all the numbers. I will just point out the below normal and dry years. You can see under scenario eight it is the dry year. Consumptive use deficiency averages 132,000 acre-feet. There is also a carryover storage shortage average in dry years of approximately 136,000 acre-feet. Again, that is showing that the system even in dry years is not able to meet demands, so is operating somewhat year to year. Carryover storage is not being able to be maintained.

MR. LILLY: Slide 27.

MR. GRINNELL: This is the same slide, only information set for critical years. Here you can see, again, consumptive use deficiencies of 180,000 acre-feet on average. Also significant instream flow shortages for scenario eight. In fact, you can see instream flow shortages for scenario six, seven and eight.

Again, the New Bullards Bar carryover storage shortage for critical years under scenario eight, 242,000 acre-feet. So very little drought year protection under this combination.

Also listed there is the additional FERC flow. I just note that when there are deficiencies, this additional FERC flow can be essentially added on as another demand. So,

therefore, it would be additional deficiencies because that is an additional demand on the system.

MR. LILLY: Slide 28.

MR. GRINNELL: Just quickly, these list the time periods and then in months, in parentheses in months, the consumptive use expansion and instream flow shortage. For instance, under full development level of demand, as shown on the previous slides, under the current PG&E practice there would be one time period of three months when neither consumptive use deliveries could be made or meeting the instream flow requirements of the Draft Decision. In fact, there is one month under the present level of demands.

Over to the far right, the worst situation which comes out of scenario eight. There are under the Draft Decision 22 months when consumptive use demands would be -- diversions would be suspended and instream flows would not be met.

MR. LILLY: Go to Slide 29.

MR. GRINNELL: This is Page 107 of the Draft Decision and highlighted sections.

> Since the flow standards established in this decision would require about 225,000 acre-feet less water in dry years, Yuba County Water Agency should not experience any deficiencies in supply due to revised flow

standards at the existing level of demand.

(Reading.)

Next slide.

MR. LILLY: Slide 30.

MR. GRINNELL: Page 111 from the Draft Decision.

In view of the evidence that future water demands will be less than projected by YCWA and evidence regarding the potential for water conservation and conjunctive use programs in Yuba County, the SWRCB concludes that there will be sufficient water available to meet reasonable future water demands in Yuba County and to satisfy requirements established in this decision. (Reading.)

Our evidence and studies submitted shows that these statements are not correct.

MR. LILLY: Go forward so Slide 31.

This is a summary of transferable storage. What we are doing here is examining the amount of surplus storage in New Bullards Bar at the end of September above a carryover storage requirement that would be available for transfer. Now, when I talk about carryover storage requirement for transfer, I am talking about something a little bit different from the model of carryover requirement.

Yuba County Water Agency has a policy of meeting -- not

transferring water unless they can meet all present year demands and instream flow requirements and be assured of delivering all demands for the following year, as well as the instream flow requirements.

Assuming that the next year would be the driest year of record, which is 1977, so this is different in that it is supplying all of the demands for the following year and using a driest year condition. And so under that criteria, that is a carryover storage requirement that is listed at the top of each one of these columns. You can see that for the two scenarios, scenario five and scenario six for the Draft Decision, the carryover storage requirement for these scenarios are extremely high, 804,000 acre-feet. New Bullards Bar is 966,000 acre-foot storage capacity.

And so, therefore, in order to meet next year's Draft Decision flows and the demands, there is not going to be any transfer capability for scenario one and two. Scenario one is, again, the present level demands. There is generally in below normal, dry and critical years a storage surplus above the carryover storage requirement of 61,000 acre-feet.

Under scenario two that surplus is only 3,000 acre-feet. This demonstrates what I believe that the Yuba County Water Agency has said all along about its transfer capability. Because the Ceres area has not fully developed and, therefore, the temporary condition that they have, some

additional resiliency in their system to provide for transfers.

MR. LILLY: Go to 32.

MR. GRINNELL: This is the same tabulation now with scenarios three, seven, four and eight, which is under the PG&E power purchase contract. The power purchase contract does not impact carryover storage requirement for transfers, but what it does impact is the end of September storage. And, therefore, you can see that there are quite a few periods that now do not have the capability of generating storage surplus of 61,000 acre-feet for the present or 3,000 acre-feet for the future under 65 flow agreement. Again, you can see the columns blank for storage surplus under scenario seven and scenario eight, which demonstrate again that there would be no transfer capability under the Draft Decision.

MR. LILLY: Slide 33.

MR. GRINNELL: This is a tabulation of the transfer of storage value for below normal, dry and critical years. What we have done is taken the values from recent transfer and applied them to the amounts on the previous slide to determine the value of this transfer. The numbers here are single year transfers.

So this is essentially for the first column on the left, 3,000,000, 5.3 million and 7.6 million. That is the

61,000 acre-feet times the value per acre-foot for three year types. As you can see, this is a -- since there are no transfers under the Draft Decision, this would be a net loss in transferable storage.

So for critical year, for a single year transfer the loss would be essentially $7.6 million.

MR. LILLY: Slide 34.

MR. GRINNELL: Next I would like to talk to our Exhibit YCWA-17, which is a groundwater substitution opportunity in Yuba South Basin.

MR. LILLY: Slide 35.

MR. GRINNELL: This is Page 159 and 160 from the Draft Decision.

> Increased water conservation and water management efforts, including conjunctive use program of groundwater and surface water supplies, should allow YCWA to comply with the revised conditions of its permits while meeting reasonable future water demands in its service area. (Reading.)

MR. LILLY: Slide 36.

MR. GRINNELL: Talking to that issue, this is a graph of change in groundwater storage. This is a net change in groundwater storage for the Yuba south area from 1960 to 1998.

I will point out a couple of things. In 1983 is when the deliveries of surface water from the Yuba River Development Project started occurring in the south basin. You can see that, essentially see it is a declining net loss of the basin or net decrease in groundwater storage from 1969 to 1983, and then a general increasing trend after that time.

Next slide, please.

MR. LILLY: Go to Slide 37.

H.O. BROWN: How much more time with this witness, Mr. Lilly?

MR. LILLY: What is your estimate?

MR. GRINNELL: Next I am going to be talking about temperature, 20 minutes.

MR. LILLY: Twenty minutes more for this and Mr. Bratovich's will be considerably shorter, and that will be the end of the summaries for this panel.

H.O. BROWN: All right.

Proceed.

MR. GRINNELL: We use the information on the previous slide to look at the net change from 1982 to 1988. And in graphing the net change you see there are essentially two trends. The reason it is broken, the lines are shifted, is in 1991 there was a groundwater pumping and an in lieu transfer to the State Water Bank in that year. So there was

a shift in the basin.

But what this shows is that there is a pre-'91 trend of about 15,000 acre-feet and a post-'91 trend of 21,000 acre-feet gain. If you take these relative changes in storage or the net recharge of the basin and look at the deficiencies seen in the previous slides, I think it would be unreasonable to expect that this basin could be used to meet the deficiencies imposed by the Draft Decision without significant negative impact on the basin.

MR. LILLY: Go to Slide 38.

MR. GRINNELL: I would like to now summarize YCWA-18, which is assessment of water temperature requirements.

MR. LILLY: Slide 39.

MR. GRINNELL: We can skip these. Just the Draft Decision water temperature requirements. I guess one thing I would note here is Item 2. It says the temperature shall not exceed the average daily temperatures at the locations specified. So each day Yuba County Water Agency will have to meet the temperature standard on an average daily temperature.

MR. LILLY: Slide 41.

MR. GRINNELL: As background, this is a plot of the multi-average daily Yuba River temperatures at Marysville for pre and post Yuba River Development Project. The blue line is an average, monthly averages from 1965 to 1968 for

the preproject conditions. Then we have shown two separate series of time frames where we have temperature data for post-project, the '74 to '77 and then '89 to '99.

As you can see, both post Yuba Development Project temperatures show a significant decrease in temperature in the summertime. In fact, for the '89 to 99 time period in the months of August, September, there are over ten-degree reduction in average, monthly average of daily temperatures.

MR.LILLY: Slide 42.

MR. GRINNELL: This slide just the physical constraints of operating for temperature. One of the greatest constraints is the river geometry itself. Yuba River is wide and flat, is a wide floodplain and, therefore, is very much exposed to the heat gain from solar radiation and conductive heating. So flows are out across the floodplain. As releases are increased, the river spreads out and the benefits of increased flows are reduced by the additional surface area from those flows.

One other thing that I would like to address here and that is the two-day advance operation. To operate for temperature there is atwo-day advance required. One, because the travel time for releases from Englebright down to Marysville gauge is six to eight hours. And to try to reduce temperatures, that flow has to be at -- increased

flows should be in the river at the start of the day. Also, there is a 24-hour notice for scheduling of power and releases out of the powerhouses. So essentially adding those two up, you end up with a requirement for planning for temperature operations two days in advance.

MR. LILLY: Slide 43.

MR. GRINNELL: This is just a picture of Yuba River and those, the wide, flat geometry. This is at Daguerre Point Dam. You can see the floodplain of the river and the very shallow flows.

MR. LILLY: Slide 43.

MR. GRINNELL: This is a cross-section of river mile flow .65, and you can note that second line up or the water surface up from the bottom is the water surface at 500 cfs. You can see the width there. It is 190 feet. You go to the water surface for a thousand cfs flow, that is about 350 feet. And so again the heat gain of the river is directly proportional to the surface area. Doubling the flow does not necessarily have the desired effect of reducing temperatures as you are now exposing more of flow in surface area to the heating from solar radiation and from air temperature.

H.O. BROWN: What is the upper flow there on the --

MR. GRINNELL: The very most top line is 1250. And the second line down from the top is a hundred cfs -- I'm sorry,

thousand cfs.

MR. LILLY: Slide 45.

MR. GRINNELL: This is a graph of temperature profiles for New Bullards Bar. The reason I put this up is because in the Draft Decision there is the suggestion that using multi-level outlet could be used to moderate temperatures. As you can see here, there are -- there is a significant cold pool in New Bullards Bar. There is only warming of the reservoir at the late summer and fall at time periods when release of that warm water would not be beneficial. Therefore, as Fish and Game and Fish and Wildlife Service recommended after the temperature advisory committee in 1993 convened to use the lower outlet at all times.

Essentially releases New Bullards Bar always at the lower outlet and cold water is released at all times. There is no management other than using that very large cold pool throughout the year.

MR. LILLY: Slide 46.

MR. GRINNELL: We can go past this. This is just the portion of the Draft Decision that talks to the issue of uses multi-level outlet.

MR. LILLY: Go to Slide 47.

MR. GRINNELL: This is -- I like this slide because it gives an all-in-one shot view of the river on a specific day and what the temperatures would look like. You can see that

out of the Colgate Powerhouse 48 and a half degree water is being released. This is for October 16, 1977, a wet year. The temperature, the daily average temperature for this date in Marysville was 58.8 degrees. The temperature standard on the Draft Decision for this date is 57 degrees. Also, the flow in Marysville, the requirement in the Draft Decision is 600 cfs, and flow here was 760. And yet we still missed the -- what would have been the temperature standard by 1.8 degrees. Also would not have met the standard at Daguerre Point Dam.

MR. LILLY: Slide 48.

MR. GRINNELL: This figure shows the variability of the river temperature with the associated changes in air temperature. The top line with the small dots is the average daily air temperature at Marysville. And you can see that the river temperature is driven by that fluctuation.

Also note that a threefold increase in flow from about the mid-May time period when there is also a reduction in air temperature still does not reduce the river temperature to below what would be the temperature standard at this time. And also that that increase flow does not overcome the impacted air temperature later on in that time period.

MR. LILLY: Slide 49.

MR. GRINNELL: This slide demonstrates the impact of

Englebright. The red line with squares on it is the Colgate Powerhouse release temperature, which you can see is at most times is quite cold. However, releases out of Englebright through the Narrows Powerhouse each year in the summertime goes about 55 degrees. This is because Englebright is a heater. It does not have a cold pool and receives warm inflow from the Middle and South Yuba Rivers and, therefore, the cold releases of Colgate cannot be maintained downstream.

MR. LILLY: Slide 50.

MR. GRINNELL: I'll just quickly go through this. Basically we've developed flow temperature relationships from data from the last ten years. These relationships are for temperatures between releases at Colgate Powerhouse to the Narrows 2 Powerhouse and from Narrows 2 down to Marysville. And then we've taken that Marysville temperature relationship and brought it back up to Daguerre Point Dam in order to develop flow temperature relationships.

MR. LILLY: Go to Slide 51.

MR. GRINNELL: I do want to spend a moment on this slide. Even though it is a lot of numbers, it demonstrates the limited effect of using flow to moderate temperature of the river.

Up at the top is the formula for -- MRY is daily water

temperature at Marysville. And MYR flow is the flow at Marysville. NBB is the release temperature at Colgate Powerhouse. Air is the average daily temperature in Marysville.

By looking at the coefficients you can understand the relative strengths of each one of these drivers of river temperature. And I'll just point out one of them.

May, for instance. The coefficient for flow, which is the B coefficient, shows that a thousand cfs increase would only account for or impact the river temperature by reducing it half a degree at Marysville. Whereas, a one degree increase in the air temperature at Marysville would raise the river temperature by three-tenths of a degree.

So, that gives you the relative contributions of impact to river temperature from these various entities. Also notice there is significant error with this prediction.

MR. LILLY: By error you are referring to the standard deviation?

MR. GRINNELL: Yes. Standard deviation would give an indication of the spread of the data from the prediction.

MR. LILLY: Slide 52.

MR. GRINNELL: Again, I won't go through all the numbers, just to note here that this is a slide of the additional flow needed to meet the temperature requirements in normal wet years at various exceedance probabilities and

monthly average of daily year temperatures.

Essentially what it is showing is that in the spring and in the fall of normal and wet years in the Draft Decision large quantities of water would be needed to attempt compliance with this standard. You can see at the 99-percent confidence level for or exceedance probability for temperature for a half million acre-feet of water would be needed.

MR. LILLY: Go to Slide 53.

MR. GRINNELL: This is Page 165 from the Draft Decision. Items d, e talk to flow fluctuation criteria. I won't go through it. Basically, what it is saying is that flow that is maintained from October 15th to October 31st and needs to be maintained throughout the winter.

MR. FRINK: Could you put that last slide up?

H.O. BROWN: The last slide?

MR. FRINK: I wasn't clear what he said about it.

Thank you.

MR. LILLY: Now go to slide 54.

MR. GRINNELL: This slide shows instream flows scheduled for normal and wet years complying with the flow and temperature requirements in the Draft Decision. There are two types of additional flows needed here, depending upon the circumstances in October 15th to October 31st time frame.

Under the first type, if the 700 cfs shown for that frame of additional flow is maintained through the end of October, then according to the flow fluctuation criteria the total, which would be 1200 cfs, would be required to be maintained until March 31st. And, therefore, under this scheduling over 375,000 acre-feet would be needed to be maintained for this year type in addition to the 431,000 acre-feet of the flow standard of the Draft Decision.

If there is a possibility for reduction, then, as you can see, 164,000 acre-feet would be needed in addition to the flow standard in order to meet the water temperature requirements.

MR. LILLY: Slide 55.

MR. GRINNELL: This is for dry years, again, or exceedance probability of multi-average daily air temperature. The temperature standard at this time is at Daguerre Point Dam. And as you can see, there is additional flow required in October to meet the standard. At the 99-percent confidence level it would be over 50,000 acre-feet of water.

MR. LILLY: Slide 56.

MR. GRINNELL: Again, this is the same type one and type two operation for the time period October 15th to 31st. Having to maintain due to flow fluctuations criteria 1200 cfs throughout the winter would result in 240,000

acre-feet of additional releases required. And if there was reduction allowed, then there would be an additional 36,000. Under the type two there is additional -- almost 36,000 acre-feet required in dry years. Again, dry years on the Draft Decision are essentially critical years on the Yuba River water year classification.

MR. LILLY: Slide 57.

MR. GRINNELL: We won't go through them all here, but there are six examples in our testimony that show daily operation that demonstrate that these volumes of water would be required in order to attempt compliance with the Draft Decision.

And what I would like to do is show two of those.

MR. LILLY: Slide 58.

MR. GRINNELL: The first one is for the October '94 time frame, from October 15th to the 31st. The second column from the right is the actual flow that would be required to meet the temperature standard. The right column is the flow that would be required fully under the Draft Decision as there is a 1200 cfs cap.

As you can see, the 1200 cfs is required every day, except that there is one day when it would match the 56 degree temperature requirement at Daguerre. Now, remember, because there is a two-day advance operation for scheduling the power and actually releasing flows, that reduction is

very unlikely that that reduction would be realized as we would have to predict meeting the temperature standard exactly on that day.

MR. LILLY: Slide 59.

MR. GRINNELL: This is again another example for the October time frame for 1997, which is a wet year. When there is a temperature standard both at Marysville and at Daguerre. And, again, with the 1200 cfs cap fo the Draft Decision every day, except for two, there would -- that 1200 cfs could be required. Once again because of the two-day advance operation for temperature it is highly unlikely that these reductions would be realized. And, therefore, the 1200 cfs would be required throughout the wintertime.

MR. LILLY: Go to Slide 60.

MR. GRINNELL: There is a problem with operating for temperature, and that is that there are two major uncertainties. One is in the prediction itself for water temperature. And the second is in the prediction of weather. Here is just a clipping of the actual weather forecast. It shows both the high and low for each, and would use this information assessing what kind of capability there would be to use weather predictions to try to predict operations to meet the temperature standard.

MR. LILLY: Slide 61.

H.O. BROWN: You are past your 20 minutes, Mr. Lilly.

MR. LILLY: Why don't you just go forward to Slide 64 and 65 and then the conclusion, 66. I think we can wrap it it up in about two minutes.

H.O. BROWN: Thank you.

MR. LILLY: Go to Slide 64.

MR. GRINNELL: I'll quickly read:

> YCWA estimates of expected deficiencies appear to be based on the assumption that 1500 cfs must continuously flow past the Marysville gauge from October through February to meet DFG's proposed water temperature and flow reduction limitations. This assumption would require the release of about 240,000 acre-feet of water from New Bullards Bar Reservoir over and above the releases required to meet DFG proposed flow standard. It appears that the YWCA analysis also estimates that about 30,000 acre-feet of additional water would be required in the spring to meet the ramping requirements proposed by DFG. Less water would be needed to meet the water temperature and ramping requirements established in this decision. Consequently, a large part of the projected deficiencies identified in YWCA study would

not occur. (Reading.)

MR. LILLY: Do you need to read the next slide?

MR. GRINNELL: No. Just to say that essentially this is Page 109. And by looking at USGS data that YWCA could probably meet the temperature standards in September and October with flows less than 1200 cfs.

I think we have shown in our testimony on temperature and what I have shown here that these statements are not correct.

MR. LILLY: Let's wrap it up with Slide 66.

MR. GRINNELL: Just in conclusion and I will read this one:

> The Yuba River Development Project has already substantially reduced water temperature compared to pre-project conditions. Substantial amounts of water would be needed to attempt compliance with the Draft Decision. Even with these substantial amounts of water, full compliance with the Draft Decision temperature requirements is beyond the capacity of Yuba River Development Project. Our study and analysis show that it is inappropriate to use flow to attempt to meet a temperature standard for the Lower Yuba River.

(Reading.)

Thank you.

MR. LILLY: We are prepared to go forward with Mr. Bratovich's summary at this time. Maybe we should start with that, depending on your call on schedule, Mr. Brown.

H.O. BROWN: How much time do you need for Mr. Bratovich?

MR. LILLY: What is your current estimate, please?

MR. BRATOVICH: Truncated version probably 20, 25 minutes.

H.O. BROWN: What is your revised estimate?

MR. LILLY: That was the revised estimate.

H.O. BROWN: We will give you the 20 and see how things are going.

We will take a break now.

(Break taken.)

H.O. BROWN: Back on the record.

MR. LILLY: Thank you, Mr. Brown.

We have, as with the other witnesses, overhead slides for Mr. Bratovich's testimony. I put them on the table here and have given six copies to staff.

This will be labeled as S-YWCA-26.

For the record, Mr. Bratovich has removed several of the slides from the presentation. So, if we go from 2 to 4, that is just to speed things up. I will call out the

numbers, and they are all numbered at the bottom.

Mr. Bratovich, why don't you start with Slide 1.

MR. BRATOVICH: I am going to briefly summarize our testimony jointly prepared by our panel.

Steve Grinnell and Dr. Yung-Hsin Sun addressed hydrologic project operations, flow temperature analyses issues and Bill Mitchell provided much of the fish resource information that he's collected on the river over the past ten years, and Dr. Michael Brian and myself conducted additional analyses to evaluate instream proposal developed for Yuba County Water Agency as well as comparison of that flow proposal to historic conditions and simulations that would be expected to result and realized flows under both the State Board Draft Decision and the Yuba County Water Agency proposal and, again, to some historic flow on the temperature considerations.

I would like to add as a clarification that several of us took the lead on various -- on specific elements and aspects of the expert testimony that we have submitted. But those were in initial draft phases that those individuals took those leads. We shared those drafts. We worked collectively and cooperatively to refine and develop our expert testimony, which is why it has been presented as a panel and in the fashion in which it has.

Slide 6.

MR. LILLY: Go to Slide 6.

MR. BRATOVICH: We developed a methodology to develop proposed flow requirements for the Lower Yuba River. The first step of that methodology addresses determining and defining the amount of water available for instream flow purposes for a water year type.

The outcome from the water availability determines the minimum amount of water available within each water type, using the Yuba River Index as discussed by Mr. Grinnell.

The second step was to apply a protocol --

MR. LILLY: Slide 11 now.

MR. BRATOVICH: -- to develop instream flow requirements for defined periods of the year. The basic concept from which we initiated this process, this protocol, was to refine the State Board's Draft 1996 Decision, using the new information and further evaluation of the available data to address specific time period recommendations. But again I would like to emphasize we started using the Draft Decision flow recommendations.

Our protocol was for each water year type separately, starting with wet and above normal years, to examine the Draft Decision flow recommendations. We assessed water availability using the water budgets developed and discussed using the Yuba River Index by Mr. Grinnell. We reviewed operational constraints. For example, the Narrows 2

release capacity.

MR. LILLY: Slide 12.

MR. BRATOVICH: And then we addressed and verified biological benefits considering all relevant information. That included flow habitat relationships, flow temperature relationships, flow migration relationships, instream flow and temperature needs of salmonids and other fish species and carryover effects of period specific flow requirements.

You will recall that Mr. Grinnell stated that in certain instances adhering to the State Board Draft Decision proposed minimum instream flow requirements resulted in depleting storage at New Bullards Bar Reservoir down to dead pool and subsequent inability to meet instream flow requirements whatsoever. We examined that and determined that such effects were occurring in developing our instream flow proposal.

Our next element was to determine if the water budget was exceeded. If it was not exceeded, we accepted our proposed instream flows for that water year type and moved on to the next water year. If it was exceeded, we selected the period most appropriate for initial flow reduction. We prioritized our consideration for initial flow reduction to accommodate specific water budgets associated with water year types. Our prioritization to protect were first priority to spawning and incubation periods, September 15th

through March 31st. Steelhead and spring chinook summer rearing period, which is the summer months through mid September and then the early spring months, April through June.

We repeated this protocol for the various water year types, including below normal, dry and critical water year types.

MR. LILLY: Go forward to Slide 13.

MR. BRATOVICH: The third step in our methodology was to evaluate the proposed instream flow minimum flow requirements for the ability to maintain fish resources in good condition.

The resultant instream flow requirements, again, are minimum instream flow requirements; in essence, flows which can be guaranteed associated with each of the various water year types. For wet and above normal years, essentially, we did adopt and accept that flow requirements that were proposed in the State Board's Draft Decision with two notable exceptions.

One is that we added a requirement at the Smartville gauge for mid September to mid October of 700 cubic feet per second to accommodate spring-run chinook salmon spawning and early fall-run chinook spawning. And we reduced the flows from the Draft Decision during the month of May from proposed 2000 cubic feet per second to 1500 cubic feet per

second.

Wet and above normal years historically have occurred approximately 54 percent of the time. So 54 percent of the time this would be the operative minimum instream flow requirement. For below normal years the change from the wet and above normal year proposed minimum instream flow recommendation was decreased in flows at the Smartville gauge, again decreased from the wet and above normal condition, but added to the Draft Decision by the Board to 550 cubic feet per second and a slight decrease during the very latter part of April from 1000 to 900 cfs. These reductions from the wet and above normal minimum instream flow requirements recommendations were made to accommodate the water budget, or to not recommend flows that exceeded water availability.

MR. LILLY: That was Slide 14. Now we will go to Slide 15.

MR. BRATOVICH: Again, I would like to reiterate that those two water year types are actually three water types: wet, above normal and below normal, are anticipated to occur and have historically occurred approximately 74 percent of the time. So they are proposed minimum instream flow requirements approximately 74 percent of the time.

Dry years have historically occurred approximately 11 percent of the time. Critical years have historically

occurred approximately 15 percent of the time as Mr. Grinnell explained.

The minimum instream flow requirements were adjusted accordingly to accommodate the water budget and water availability by the various incremental steps according to the protocol as indicated here.

MR. LILLY: Now go forward to Slide 24.

MR. BRATOVICH: California Department of Fish and Game's Code 5937 requires owners and operators of dams to provide sufficient flow to maintain fishery resources in good condition. Two definitions of which we are aware have previously been developed of good condition within the context of instream flows.

One is in the Mono Lake/Mono Basin hearings. The other was much more recent, in the Putah Creek Council versus Solano Irrigation District, where both -- in both instances good condition was defined. In the latter good condition was defined at three levels. The individual level, the individual organism level, population level and community level.

We adopted the three-level approach to find good condition for the Lower Yuba River fishery sources. However, because neither of these previous definitions addressed anadromous salmonids, we also further greatly expanded upon the population level characterization and

definition of good condition. We relied very heavily upon National Marine Fishery Service published documents, including the proposed ESA 4(d) rules of Federal Register Volume 64, Number 250, dated December 30, 1999, for spring-run chinook salmon and steelhead; and the NMFS referenced document utilized in that publication, entitled McEhlany, et al., 1999, a draft document Viable Salmonid Populations and the Recovery of Evolutionary Least Significant Units.

MR. LILLY: Go forward to Slide 29.

MR. BRATOVICH: We have skipped over an extensive detailed discussion of those definitions, and I will go to the conclusions regarding the status of the Lower Yuba River fish resources.

The Lower Yuba River, as indicated by the last ten years of data and the spawning stock estimation figures, as well as other information indicates, that the fishery resources of the Lower Yuba River are in general in good condition, including fall-run chinook salmon for numerous reasons:

The health of the individual fishes, specifically as observed by Bill Mitchell in his ten years of study. Lack of lesions, deformities, parasites and disease, good growth rates. Growth rates high for the region as part of the definition. The run size of adult chinook salmon has

remained stable and, in fact, has increased in recent years, relative to the run size prior to the project. Salmonid productivity has maintained and probably has increased despite out-of-basin and ocean factors that have affected runs elsewhere, lead to the listing of particularly spring-run and steelhead.

The chinook salmon population is sustained, and is believed to be sustained largely by natural production. Multiple age classes of juvenile steelhead utilized the river. The relative abundance and condition of the juvenile steelhead is good, particularly above Daguerre Point Dam. Fish populations have not exhibited long-term declines since the project began operations. And a diverse assemblage of healthy, self-sustaining resident native and introduced fish populations persist, as indicated by the work done both in 1991, published in '91 in the Fish and Game plan regarding fish communities, and the more recent information provided by Mr. Mitchell.

I must note, however, that spring-run` chinook salmon and possibly steelhead populations do not meet some of these criteria defining good condition, primarily as a result of the run sizes. The run sizes, as we know them with the difficulties that have been mentioned regarding estimation of steelhead in the Lower Yuba River being somewhat uncertain, but not meeting many of the criteria as we have

defined it and submitted in our written testimony.

However, it must be noted that since operation of the project over the past 30 years that the instream flows and the instream temperatures have been improved and have contributed to the recovery of both of these two species.

MR. LILLY: Excuse me, Mr. Bratovich, when you say "project," what project are you referring to?

MR. BRATOVICH: The Yuba River Development Project.

MR. LILLY: So you are referring to the flows on the Lower Yuba River?

MR. BRATOVICH: Yes, sir.

MR. LILLY: Go forward to Slide 30 now, please.

MR. BRATOVICH: Having gone through this process rather quickly, we evaluated our proposed flow regime and made comparisons to historic flows and temperatures that have occurred and compared -- which have led to determination of good condition of the resources of the Lower Yuba River, particularly fall-run chinook salmon.

MR. LILLY: I know you're trying to get through this quickly, Mr. Bratovich, but I just want you to clarify, when you said you went through this process quickly, you mean your summary today, not the technical work developing the recommendations; is that correct?

MR. BRATOVICH: Yes, sir.

MR. LILLY: Thank you for the clarification.

MR. BRATOVICH: Before I get into describing the evaluation itself, two points that need to be made regarding my brief summary today.

The first point is that to address this issue that the flows realized under our Yuba County Water Agency's proposed flow regime or the State Board Draft Decision, typically exceed the minimum flow requirements. There has been some misconception in the past by parties that instream flow requirement is what will be operated to, and that is not necessarily so. At least it is not necessarily so a vast majority of the time, and that will be demonstrated in our evaluation forthcoming.

Also, the slides I am about to show represent full development level demands, rather than present level demands.

MR. LILLY: Go to Slide 31.

MR. BRATOVICH: Slide 31 is a depiction of anticipated flows that will occur at the Marysville gauge in the Lower Yuba River under -- well, under two scenarios as well as historic flows that occurred at the Marysville gauge. This graph merits some detailed explanation.

What is depicted here is simulations that were conducted by operating two of the proposed mean instream flow requirements for two scenarios. The State Water Resources Control Board Draft Decision flows represented by

a triangle on this figure, and the Yuba County Water Agency flow requirement represented by a box on this figure. And I will say that those represent the averages.

The individual monthly data points are represented by the X's for each of these scenarios. In addition, the flow under historic records since construction -- completion of the Yuba River Development Project in 1970 through 1999 are also depicted. For example, during the month of May there are three vertical lines, one representing each scenario.

The historic flows that have occurred during the period 1970 through 1999, the simulated flows expected to occur utilizing the simulation period 1922 through 1992 under the Draft Decision, and the simulated flows expected to occur for the same hydrologic period of record under implementation of Yuba County Water Agency's proposed minimum instream flow requirements.

This illustrates the point I made that flows that actually would occur oftentimes exceed and sometimes significantly exceed the proposed minimum in instream flow requirements. For example, under Yuba County Water Agency proposed minimum instream flow requirements, the highest proposed flow for wet and above normal conditions is 1500 cfs during the month of May. Well, clearly flows under that proposal will exceed 1500 cfs frequently. In fact, flows, average flows, including low flows will exceed 1500 cfs from

December through June. Simulations for all months are presented in Exhibit S-YWCA-19.

MR. LILLY: Slide 32.

MR. BRATOVICH: I would like to briefly address some major points and comparisons regarding these flows and temperatures at this point, particularly flows realized under these three scenarios. These word statements depicted on the slide represent major point conclusions, comparing Yuba County Water Agency's flows realized under their proposed minimum instream flow requirements relative to the historic flows that have occurred from 1970 through 1999. In general, for the period encompassing October through March which represents the primary spawning and incubation period.

The flows realized under Yuba County Water Agency's proposed minimum instream flow requirements would more frequently provide flows within the range that maximizes habitat availability for chinook salmon spawning. And during the month of March in particular it would provide somewhat higher flows in the drier years.

I would like to show a couple examples for that entire period.

MR. LILLY: Slide 33.

MR. BRATOVICH: First example is for the month of November for a full development level flow at Marysville

under historic, simulated flows for the Yuba County Water Agency proposed minimum instream flow requirements and simulated flows under the State Board's 1996 Draft Decision.

This is an exceedance plot. An exceedance is a cumulative probability distribution function. The matter in which you interpret an exceedance plot can be one of two ways. You can look at a specific flow and estimate how much of the time that flow would occur. For example, an easy interpretation is a flow of 1000 cfs under both the State Board decision and the Yuba County Water Agency proposed minimum instream flow requirement, requirements would occur approximately 20 percent of the time. Flows of a thousand or higher would occur approximately 20 percent of the time.

The other way to look at it is what percent of time would a specific flow occur. You can go to any point on the graph and say what flows would occur 40 percent of the time or less, and that would be flows approaching 1400 cubic feet per second in this example under historic flow regime.

November is a primary fall-run chinook salmon spawning month, and it serves as a good example. The curve depicting historic flows is higher than flows that would be expected to occur under either the State Board Draft Decision flow or the Yuba County Water Agency proposed minimum instream flow requirements.

Nonetheless, flows at Marysville gauge would be provided by the Yuba County Water Agency minimum instream flow requirement for spawning habitat that maximized weighted usable area for spawning, approximately 75 percent of the time. The remainder of the time those flows would be higher than those flows which maximized spawning habitat availability for spawning.

MR. LILLY: Slide 34.

MR. BRATOVICH: For the period encompassing April through June, the broad general points comparing Yuba County Water Agency's flows realized under their proposed minimum instream flow requirement relative to historic flows are as follows:

During April flows would be equal to or higher than historic flows below 1000 cfs flow level. May flows would typically be substantially higher than historic flows below a relatively high flow value, 5000 cfs, including the driest years.

High flows will continue to occur in June and below a thousand cfs, June flows generally would be equivalent or higher most of the time.

MR. LILLY: Slide 35.

MR. BRATOVICH: As an example, I would like to look at some greater detail during the month of May, flows realized under the Yuba County Water Agency proposed minimum instream

flow requirement, the State Board Draft Decision and historic flow levels. As can be seen from this exceedance figure that flows under either the Draft Decision or the Yuba County Water Agency's flow proposal generally would be higher than the historic flows would occur. Actually the Yuba County Water Agency flows that would be realized would be higher than historic flows approximately 85 percent of the time.

In addition, the flows would be higher than those extremely low flow values that were experienced during the driest year, as Mr. Grinnell indicated, would result from depleting storage in New Bullards Bar Reservoir down to dead pool and inability to meet the instream flow requirement in the driest year.

What is interesting, particularly for this exceedance plot during the month of May, is that under both the State Board Draft Decision proposed instream inflow regime and the Yuba County Water Agency minimum instream flow regime flows of 2000 cubic feet per second would be exceeded approximately 50 percent of the time. As those drier years, the flows that would be realized are essential in accordance with proposed minimum instream flow requirements.

MR. LILLY: Slide 36.

MR. BRATOVICH: For the period encompassing the summer months July through September in general, relative to

historic flows, flows that would be realized under implementation of the Yuba County Water Agency proposed minimum instream flow requirement would be higher than the historic flows in the very driest years, but lower in the wetter years. As an example --

MR. LILLY: Slide 37.

MR. BRATOVICH: We'll look at Slide 37, which depicts slow exceedance during the month of September, again for all three conditions. Historic flows, simulated Yuba County Water Agency flows and simulated State Board Draft Decision flows. And again, the curve depicting historic flows is different from the other two curves. The reason for this, as I understand, is since the early 1980s Yuba River Development Project has been operated for multiple purposes, whereas prior to that it was operated primarily for hydroelectric generation purposes.

It is anticipated and it is my understanding that it will be operated in the future still for multiple purposes. Again, very similar flows would be realized under implementation of either the State Board Draft Decision flows or the Yuba County Water Agency minimum instream flow requirements with the exception of the very driest years and particularly avoiding the very low flows and no flows that could be realized under implementation of the State Board Draft Decision flow regime.

MR. LILLY: Slide 38.

MR. BRATOVICH: This represents the flow exceedance probability that occur above Daguerre Point Dam rather than at Marysville or below Daguerre Point Dam. And I point this out to illustrate that during the month of September flows under either the State Board Draft Decision or the Yuba County Water Agency proposed flow regime would be approaching or exceeding approximately a thousand cfs roughly 50 percent of the time.

The remainder of the time flows would be in accordance with the proposed minimum instream flow requirements, again with the exception of the extremely low flow that would be anticipated to occur under implementation of the State Board Draft Decision.

MR. LILLY: Slide 39.

MR. BRATOVICH: We also looked at anticipated temperatures that occur utilizing the at flow temperature relationships developed by Mr. Grinnell's team. And I would like to start by --

MR. LILLY: Slide 40.

MR. BRATOVICH: -- reiterating that construction and operation of the Yuba River Development Project has resulted in lower flows than occurred historically. On Slide 40 --

MR. LILLY: You mean lower temperatures; you said lower flows.

MR. BRATOVICH: Did I say flows? Please excuse me, I meant temperatures.

Three scenarios are depicted: Historic temperatures that were reported and occurred from 1965 to 1968, historic for pre-New Bullards Bar Project period; flows, excuse me, temperatures from 1989 trough 1999 that were recorded which represent a post-project period; and the period that represented a post-project period that was considered previously, prior to development of this new information, from 1988 to 1999 represented by the 1974 through 1977 period.

In general, all three scenarios depict a very similar pattern, as one would expect, of declining temperatures from the fall through the winter months and increasing temperatures in the late spring and into the summer. Distinct differences, however, do occur. Those distinct differences are represented by the preproject temperatures of average temperatures during the month of October that exceeded 66 degrees, during the month of October. And the particularly high water temperatures that occurred during the summer months. In fact, during the month of August under preproject conditions exceeding 75 degrees Fahrenheit.

What is notable is that for the post-New Bullards Bar period represented from 1989 to 1999 a temperature decrease of over ten degrees has been realized on the average during

the month of August.

MR. LILLY: Slide 41.

MR. BRATOVICH: Comparisons were made between the temperatures that could be expected to occur under implementation of Yuba County Water Agency's proposed minimum instream flow requirement regime and the State Board Draft Decision regime, again, under full development level demands. In general, essentially equivalent water temperatures at Daguerre Point Dam and Marysville, under both proposals would occur from the October through June period. By that I mean that the proposals are equivalent at both locations, but some differences in expected mean monthly values do occur between those two locations.

MR. LILLY: Slide 42.

MR. BRATOVICH: Again, this is an exceedance probability distribution function plot. This time the temperature above the Daguerre Point Dam for the month of October under full development level demands for both the State Board Draft Decision scenario and the Yuba County Water Agency proposed minimum instream flow requirement scenario.

Expected mean monthly temperatures that would occur under both these scenarios are very similar at locations above Daguerre Point Dam. Simulated mean monthly temperatures would remain at or below 60 degrees

approximately 85 percent of the time.

Simulations for all months are presented in our written testimony.

MR. LILLY: Now go to Slide 43.

MR. BRATOVICH: For that period I would like to point out, however, that for the period extending from November through March temperatures expected to occur on a mean monthly basis above Daguerre Point Dam would remain at or below 56 degrees.

I would like to -- this next slide, 43, depicts expected mean monthly temperatures that would occur at the Marysville gauge during the month of October. And again, it is roughly temperatures at or below 60 degrees would be expected to occur approximately 85 percent of the time. But by contrast to temperatures above Daguerre Point Dam they do not decrease to quite as low levels.

I would like to note, that although not depicted here in my brief summary, that mean monthly water temperatures expected to occur at Marysville would be at or below approximately 57 degrees in all years of the December month period.

MR. LILLY: Slide 44.

MR. BRATOVICH: Representing the late spring period, the month of June at the Marysville gauge, again for full development level demand for the two scenarios indicate that

water temperatures expected to occur are very similar under both the State Board and the Yuba County Water Agency proposed minimum instream flow requirements. Again, simulations were performed for every month and are presented in our written testimony.

During April and May simulated mean monthly water temperatures at Marysville would be at or below approximately 58.5 degrees Fahrenheit under both proposals. In June the simulated mean monthly flows would be below approximately 63.5 degrees under both proposals in all years. Above Daguerre Point Dam mean June water temperatures, although not presented here, would be 59 and a half degrees or less in all years under both flow proposals.

MR. LILLY: Those are in your report?

MR. BRATOVICH: Yes, sir.

MR. LILLY: Now to Slide 45.

MR. BRATOVICH: Slide 45 presents exceedance probability temperature distribution plot for the Marysville gauge for the month of August for both scenarios. Again, simulations for all months are included in our written testimony.

And the results of this exceedance simulation for the month of August indicate that flows -- temperatures would be at or below 65 degrees the vast majority of time, approximately 85 percent of the time.

MR. LILLY: Finally, if you can go to your conclusions in Slide 46.

MR. BRATOVICH: Our overall conclusions are that the fishery resources that are currently in good condition will remain in good condition by Yuba County Water Agency's proposed minimum instream flow requirements and the flows realized thereunder; that operation of these flow requirements would continue to contribute to the recovery of spring-run chinook salmon and steelhead populations and that it cannot be demonstrated that the State Board Draft Decision proposed minimum instream flow requirements and implementation thereof would result in better in-river conditions for fish in the lower Yuba River.

MR. LILLY: Does that complete you whirlwind summary, Mr. Bratovich?

MR. BRATOVICH: Yes.

MR. LILLY: Mr. Brown, now our panel of all six experts is available for cross-examination.

H.O. BROWN: Does that complete your direct for these four individuals, Mr. Lilly, and then you have direct for two more later on?

MR. LILLY: Yes. Actually, this is the summary of the testimony for six individuals who are here. I believe the sixth one is coming forward. The only two remaining witnesses are Dr. Lon House and Dr. Mr. Donn Wilson whose

testimony will be on somewhat different topics, both quite short. So we thought it best to have this panel go forward with cross-examination first.

H.O. BROWN: All right.

Mr. Edmondson is not here.

Mr. Gee, you are first up.

MR. GEE: If I may, I wish to defer my cross-examination for tomorrow morning. Mr. Baiocchi and Mr. Sanders have both expressed desire to proceed before me with cross-examination today.

H.O. BROWN: So you would like to start yours in the morning?

MR. GEE: If I may.

H.O. BROWN: All right.

Mr. Baiocchi, are you ready?

MR. BAIOCCHI: I will try. Could I sit, I have back problems?

H.O. BROWN: Sure.

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CROSS-EXAMINATION OF YUBA COUNTY WATER AGENCY

BY CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

BY MR. BAIOCCHI

MR. BAIOCCHI: Good afternoon, gentlemen. How are you?

Let's start off with Mr. Mitchell. Okay. I have some

basic questions, very simple questions.

Did you submit written testimony to the Board which was signed by you?

MR. MITCHELL: Yes, I did.

MR. BAIOCCHI: It was signed by you?

MR. MITCHELL: I will have to ask Alan to help me here. I did basically submit my testimony.

MR. LILLY: It was not signed. There is no requirement that it be signed.

MR. MITCHELL: I am sorry.

MR. BAIOCCHI: Is Exhibit S-YCWA-19 your testimony, which is this document right here?

MR. MITCHELL: Yes, it is. I contributed to that document.

MR. BAIOCCHI: Isn't said exhibit, that exhibit, I call it said exhibit, a report and not your written testimony?

MR. MITCHELL: No. This represents our written testimony.

MR. BAIOCCHI: Would you please go to the Table of Contents of that document, on the Table of Contents at 1.3 on page, I guess, Page 1, I, Table of Contents.

MR. MITCHELL: Got it.

MR. BAIOCCHI: At 1.3, could you please state what that says, so noted on Page 1-4?

I want you to stay with the Table of Contents.

May I, Mr. Brown, indicate what is so stated rather than the witness? He can't find his way there.

H.O. BROWN: What is the problem, Mr. Baiocchi?

MR. BAIOCCHI: I want the witness to so state into the record what is noted on the Table of Contents.

H.O. BROWN: You are on --

MR. BAIOCCHI: At 1.3.

H.O. BROWN: -- Exhibit 19?

MR. BAIOCCHI: Yes, sir.

H.O. BROWN: The question is on table?

MR. BAIOCCHI: 1.3 under Table of Contents.

H.O. BROWN: 1.3. The purpose and intended use?

MR. BAIOCCHI: The purpose and intended use of this report.

H.O. BROWN: What is your question?

MR. BAIOCCHI: Well, the question is he stated that this is his testimony, but, in fact, it is a report. That is the point I am trying to make.

MR. LILLY: Excuse me, Mr. Brown, rather than arguing, I suggest Mr. Baiocchi can just say, "What does this say here," and Mr. Mitchell can read it. The document speaks for itself. If he wants to make his point, he should ask what the text of the document says.

H.O. BROWN: Mr. Baiocchi.

MR. BAIOCCHI: I did ask what was stated.

H.O. BROWN: Wait a minute. Questions and answers are directed toward me.

MR. BAIOCCHI: Okay, yes, sir.

What I was attempting to do was have the witness so state into the record what was stated under the Table of Contents under 1.3.

H.O. BROWN: Mr. Mitchell, do you understand the request?

MR. MITCHELL: Yes. It says "Purpose and intended use of this report."

MR. BAIOCCHI: Mr. Mitchell, that doesn't say the intent of this testimony, right?

MR. MITCHELL: Not specifically here. But it is the intent to provide testimony. This report was intended to provide testimony for this hearing.

MR. BAIOCCHI: I disagree with you, but we'll move on.

At what pages in your alleged testimony, what page did you make your testimony on? I need to know what pages you said what, where.

MR. MITCHELL: I was the lead author for Section 3.2.

MR. BAIOCCHI: 3.2?

MR. MITCHELL: Beginning with the Subsection 3.2.3 on historic population trends in anadromous fishes.

MR. BAIOCCHI: Trying to keep up with you here. Okay.

MR. MITCHELL: My testimony would continue through the

section entitled or labeled 3.2.4.2 and ending with --

MR. BAIOCCHI: 3. --

MR. MITCHELL: -- .2.4.2, ending with fish community on Page 321.

MR. BAIOCCHI: For what specific company or firm do you work?

MR. MITCHELL: I'm employed by Jones & Stokes.

MR. BAIOCCHI: Is Phil Dunn your supervisor?

MR. MITCHELL: Yes, he is.

MR. BAIOCCHI: Did Phil Dunn review this report before it was submitted?

MR. MITCHELL: I believe he did.

MR. BAIOCCHI: Thank you.

How many John Does from your firm helped you with your testimony and said exhibit?

MR. LILLY: I object. The term "John Does" is vague and ambiguous.

H.O. BROWN: Restate the question.

MR. BAIOCCHI: How many staff members from the firm of Jones & Stokes helped you with your testimony in said exhibit?

MR. MITCHELL: None. I was the only author to it.

MR. BAIOCCHI: But you indicated that Phil Dunn did look at it?

MR. MITCHELL: That's correct. He reviewed it and we

discussed it, and it was submitted to SWRI for compilation in this testimony.

MR. BAIOCCHI: Did Phil Dunn make any changes, any corrections?

MR. MITCHELL: No, he did not.

MR. BAIOCCHI: Did any attorney hired and working for Yuba County Water Agency amend, correct or make any changes in your testimony before it was submitted to the State Water Resources Control Board?

MR. MITCHELL: As I said, I prepared a draft testimony and sent it to SWRI for compilation into this Exhibit 19.

MR. BAIOCCHI: It was sent to --

MR. MITCHELL: SWRI, Surface Water Resources, Incorporated.

MR. BAIOCCHI: Thank you very much.

Mr. Mitchell, do you have a duty and a responsibility under state and federal statutes to protect threatened spring-run chinook salmon, threatened steelhead, fall-run and late fall-run chinook salmon of the Yuba River?

MR. LILY: Mr. Brown, I know that you allow questions regarding legal conclusions; and, obviously, that is fine. But I just note that his is asking for a legal conclusion, so I think the answer is only to the extent Mr. Mitchell may have knowledge of these particular legal requirements.

MR. BAIOCCHI: I am not asking for --

H.O. BROWN: Wait a minute.

MR. BAIOCCHI: I am sorry.

H.O. BROWN: Your point is well taken, Mr. Lilly.

Are you asking a legal conclusion or an opinion?

MR. BAIOCCHI: I am asking a very simple question. Does he have the duty and responsibility? Yes or no.

H.O. BROWN: If you know the answer, go ahead and answer it, Mr. Mitchell.

MR. MITCHELL: I'd rather not, I don't think I understand the legal implications of that.

MR. BAIOCCHI: I can provide some foundation for that. I plan on asking other witnesses. The foundation is this: We have biologists that work for the U.S. Fish and Wildlife Service. We have biologists that work for the Department of Fish and Game.

H.O. BROWN: Ask a question. If you are going to provide a foundation, ask the witness the foundation questions, not me, Mr. Baiocchi.

MR. BAIOCCHI: Mr. Mitchell, do you work for the U.S. Fish and Wildlife Service?

MR. MITCHELL: No.

MR. BAIOCCHI: Do you work for Department of Fish and Game?

MR. MITCHELL: No.

MR. BAIOCCHI: Do you work for NMFS?

MR. MITCHELL: No.

MR. BAIOCCHI: So, consequently, if you did work for them, then you would have a duty and responsibility to protect those species of fish, wouldn't you?

MR. LILLY: Same comment as before, calls for a legal conclusion.

H.O. BROWN: Yes, it does, Mr. Baiocchi.

MR. BAIOCCHI: I don't -- well, okay.

If we go to -- we go to a legal conclusion, Mr. Bratovich in his presentation was pointing out to all of us about the California Fish and Game Code 5937. He was making a legal determination based on his presentation. So I don't see what is so wrong with this.

H.O. BROWN: You ask the question. If you object, let me know and I will either sustain it or overrule. We will do it this way.

Ask the question again, Mr. Baiocchi. And, Counselor, you can act accordingly and then I will act accordingly.

MR. BAIOCCHI: Let's save time. Forget it. Thank you. We'll forget it. I know the answer and so does everybody else. We'll just forget it. Thank you.

Mr. Bratovich, Mr. Mitchell indicated that he submitted to you his draft report. Is that correct?

MR. BRATOVICH: That's correct.

MR. BAIOCCHI: The question is: Did any attorney hired

and working for Yuba County Water Agency amend, correct or make any changes in Mr. Mitchell's testimony before it was submitted to the Board?

MR. BRATOVICH: No, sir. But the attorneys working for Yuba County Water Agency were provided preliminary draft copies and did ask technical clarification questions on those preliminary drafts.

MR. BAIOCCHI: Were there amendments or changes based on recommendations by the attorneys?

MR. BRATOVICH: Of technical substance, no.

MR. BAIOCCHI: Any changes at all, regardless of whether it was technical or what?

MR. BRATOVICH: There were some grammatical, editorial-type changes, yes.

MR. BAIOCCHI: Thank you.

Now I want to get to -- made a presentation overhead. To start off with, you have been studying the river for a number of years, right, as I recall?

MR. MITCHELL: Yes.

MR. BAIOCCHI: Do steelhead, threatened steelhead, Yuba River threatened steelhead, do they exist in the river all year long?

MR. MITCHELL: Yes. The juveniles will rear there for at least a year.

MR. BAIOCCHI: Thank you.

With respect to spring-run chinook salmon, do they exist in the river system for a year or more?

MR. MITCHELL: Spring-run have been detected ascending the ladders at Daguerre Point Dam in the spring and holding over somewhere upstream of Daguerre Point Dam during the summer and spawning in the fall. I would say that juveniles are also present through at least the spring migration period. So in effect all lifestages would occur at some time during the year.

MR. BAIOCCHI: Thank you very much.

Shall we go to Page 2 of whatever the exhibit is. I don't know what the exhibit number is.

MR. MONA: I think it is Yuba County Water Agency Number 24.

MR. BAIOCCHI: 24. Would it be all right if I just called it 24?

MR. FRINK: For this series of questions, fine.

MR. BAIOCCHI: Thank you very much.

Let's go back to Page 1. Like '92 on the left-hand side, the dates 12-15. Does that mean two days or does that mean every day from October 12 to December 15th, 1992?

MR. MITCHELL: As I stated in my testimony, those were weekly surveys. Each week we were on the river for three days. This represents approximately nine weeks of work per year, times three is 27 days. That would be a typical

period of time, 27 to 30 days.

MR. BAIOCCHI: So, using the 1992 date base, you were not on the river from the 16th of December or prior to October 12th, right?

MR. MITCHELL: Which date are you referring to?

MR. BAIOCCHI: Well, I am going to '92, left-hand side where it says "Salmon spawning escapement survey." It is October 12th, 1992; October 12th, December 15th.

MR. MITCHELL: Please ask your question again.

MR. BAIOCCHI: You indicated you were on the river 12 days, right?

MR. MITCHELL: That would be approximately, yes.

MR. BAIOCCHI: So you weren't on the river the remaining days of the year which is 300 and whatever it might be, 338?

MR. MITCHELL: That's correct. As this indicates, we were on the river between October 12th and December 15th, 1992.

MR. BAIOCCHI: In September, it is my understanding that spring-run spawn in September, they commence their spawning. You weren't on the river in September for that year?

MR. MITCHELL: Yes, we were. We were there on September 12th doing salmon redd surveys. That was I believe an aerial redd survey. I am sorry. That was a boat

survey to look for redds as early as September 15, which you will see down in the second bullet item.

MR. BAIOCCHI: Thank you.

Now, have you done any studies on micro -- macro invertebrate species and their habitat in the river?

MR. MITCHELL: No studies, per se, on the Lower Yuba River, no.

MR. BAIOCCHI: Do you believe that they are needed? That is an open question.

MR. MITCHELL: I don't believe -- I believe it is an important aspect of the evaluations that could be done, to look at food supplies for fish. From the evidence we have and with regard to growth rates, we believe that food is in good supply for fish.

MR. BAIOCCHI: Let me ask you this question: Do threatened steelhead, Yuba River threatened steelhead, do they need cold water to exist all year long?

MR. MITCHELL: There are specific ranges for different lifestages and those have been -- there is a number of studies that have identified those ranges.

MR. BAIOCCHI: Do spring-run threatened, Yuba River spring-run chinook salmon need cold water to survive?

MR. MITCHELL: Again, cold water is a very qualitative term, and I would rather answer by saying that they do require specific ranges of temperatures for good survival

growth and reproduction.

MR. BAIOCCHI: Do cold water macro invertebrate species need cold water to survive?

MR. MITCHELL: Again, the specific requirements of the invertebrates would need to be identified before I can answer that question.

MR. BAIOCCHI: Go to Page 2, please, of Number 24.

Now, on the left-hand side anadromous species. I made comments on this. And so, what other species of salmon that the Lower Yuba River sustain?

MR. MITCHELL: When you say species, chinook salmon is a single species.

MR. BAIOCCHI: What races --

MR. MITCHELL: I believe what you are referring to are population units that are designated as races.

MR. BAIOCCHI: What races, please?

MR. MITCHELL: We basically have evidence for fall-run, which is the dominant species and we do have evidence for spring-run chinook salmon.

MR. BAIOCCHI: What about late full-run?

MR. MITCHELL: The late full-run, as we can detect, is not well-defined, at least from our observations. There is no distinct run that we have been able to detect. Therefore, I cannot make a conclusion on late fall.

MR. BAIOCCHI: Thank you.

Let's go to Page 5 of Exhibit 24. Now, you have a chart and you have a 1992 to 1999 average of 15,119; is that correct?

MR. MITCHELL: Yes. That would start in 1972.

MR. BAIOCCHI: From 1972 to 1999. Now, how many years below the average do you have? How many years below the average that that number was never attained, commencing with the year 1972? An example, 1972 is one year where that was not attained, the 15,119 average?

MR. MITCHELL: That's correct.

MR. BAIOCCHI: If we start counting the years and excluding the one year we have no data, 1990, how many years were those levels below the average?

MR. MITCHELL: Eighteen years.

MR. BAIOCCHI: Okay. And how many years were above the average?

MR. MITCHELL: Nine years.

MR. BAIOCCHI: Nine years, correct.

So, wouldn't it be true that in the year 1982 and the year 1998 and the year 1973 that those years -- those years provided you with a larger average than you really had in those other years that were very low, right?

MR. MITCHELL: The very definition of an average involves that concept.

MR. BAIOCCHI: Highs and lows.

MR. MITCHELL: As you can see, for the pre-Bullards Bar period, the same thing can be said about that period as well.

MR. BAIOCCHI: Like 1976, that was a very -- that was during the drought. The fish, were they in good condition in 1976, as an example? That was below 5,000?

MR. MITCHELL: In looking at a specific year, we really -- in evaluating the good condition part of the definition, for a population in good condition is a long-term production and survival and resilience or actually overcoming conditions like this. That is why we stated in our conclusions that when you look at it over the long term, not on single year, the fish population shows all of the signs of a very resilient population.

MR. BAIOCCHI: Doesn't -- as long as we're getting into that, is that fine? Can I discuss 5937 with Mr. Mitchell since he brought it up? Is that fine, Mr. Lilly?

H.O. BROWN: Ask me. As long as you are not giving testimony you can discuss it.

MR. BAIOCCHI: An example, doesn't 5937 apply to daily flow?

MR. LILLY: Again, I am going to object on the grounds that it is asking for a legal conclusion. I guess Mr. Mitchell can answer it to the extent that he has knowledge about that.

H.O. BROWN: I sustained the objection, but answer it

if you have knowledge.

MR. MITCHELL: I do not.

MR. BAIOCCHI: Mr. Brown, you have to understand, I just got this. It is very, very difficult. I just have been sitting over putting together some comments.

H.O. BROWN: I understand, Mr. Baiocchi.

MR. BAIOCCHI: Even though I have concerns over Mr. Mitchell's -- his hearsay testimony, I want to go to Paul Bratovich.

Hi, Paul. How are you doing?

MR. BRATOVICH: Fine, thank you.

MR. BAIOCCHI: Good.

This is going to start this game all over again. I apologize.

Did you submit written testimony to the Board which was signed by you?

MR. BRATOVICH: No.

MR. BAIOCCHI: Thank you.

Is it Exhibit 19 of Yuba County Water Agency 19 your testimony?

MR. BRATOVICH: Yes.

MR. BAIOCCHI: Is said exhibit a report, not your written testimony?

MR. BRATOVICH: No. It is the testimony submitted by our panel listed on the front cover.

MR. BAIOCCHI: Did you submit any written testimony?

MR. BRATOVICH: As this represents our testimony, yes.

MR. BAIOCCHI: At what pages is your alleged testimony?

MR. BRATOVICH: That's very difficult for me to say. It is difficult for me to say because essentially I probably have to assume responsibility for every page.

MR. BAIOCCHI: So it is difficult.

MR. BRATOVICH: It is difficult because, as I stated in the beginning of my summary, various individuals took leads in preparation of drafts of all these sections. But we worked very closely and cooperatively in refining those drafts and developing this written testimony, and I was part of that.

MR. BAIOCCHI: I understand that.

Isn't it true it would be difficult for someone reviewing the document to try to distinguish your personal written testimony?

MR. BRATOVICH: No. Because with the exception of specific hydrologic information and the simulations presented in the appendix, I think it would be possible to say that I was participant in the remainder of it.

MR. BAIOCCHI: Let's go to -- to your -- what is the exhibit number for the exhibits summarizing expert testimony?

MR. MONA: S-YCWA-26.

MR. BAIOCCHI: 24?

MR. MONA: 26.

MR. BAIOCCHI: Can I use 26?

MR. FRINK: You can refer to it as 26.

MR. BAIOCCHI: Thank you.

H.O. BROWN: Thank you, Mr. Frink.

MR. BAIOCCHI: I will try to go to the pages in your testimony; it may be difficult. Now, you talk about water availability. Was there a water availability study that was prepared by Yuba County Water Agency that was submitted to State Water Resources Control Board?

MR. BRATOVICH: I will defer to Mr. Grinnell. As I said, I did not have the lead in the hydrology analysis.

MR. BAIOCCHI: Thank you.

This was part of your testimony, I believe.

MR. GRINNELL: As listed on the front of the cover, obviously, the hydrologic aspects. We worked very closely together to develop this proposal. Part of this proposal required significant hydrologic analysis, so that was our contribution to the biologists.

MR. BAIOCCHI: Was that water availability study, was that submitted to the State Water Resources Control Board for their review prior to the hearing?

MR. GRINNELL: The results of the proposals -- we have

shown water budgets here. We have shown resulting exceedance probability plots of proposal that we have come up with. So there is quite a bit of information about the hydrology of our proposal and the resulting flows from that proposal.

MR. BAIOCCHI: To the best of your knowledge, do you know if the Yuba County Water Agency submitted a water analysis when they filed their water rights application?

MR. GRINNELL: I am not familiar with the specifics of the water right application.

MR. BAIOCCHI: The water budget. Paul Bratovich, what is the water budget?

MR. BRATOVICH: The water budget was the amount of water from April through November that was determined according to the Yuba River Index application developed by the hydrologists on the team.

MR. BAIOCCHI: That was developed by your team. The terminology "water budget," it sounds like it is a budget.

MR. GRINNELL: Let me explain again. As Mr. Bratovich explained, there was a protocol for developing water budgets and the resulting water budgets that were used in the proposal, and those looked at hydrologic factors and also biological factors to come up with water budgets.

Initially there was a hydrologic analysis done that provided initial estimates, and then those were refined

through examination by the biologists as to whether they would meet the criteria that they needed for the flow proposal which was a good condition criteria.

MR. BAIOCCHI: I want to excuse myself, Mr. Brown. Because I just got this and it is difficult, but I want to have --

H.O. BROWN: Mr. Baiocchi, would it help you. And since you did fill in for Mr. Gee, would it help you if we adjourned a little earlier this evening so you could prepare your notes better?

MR. BAIOCCHI: I do have a few more questions, though, that I would like to ask now. And I think the --

H.O. BROWN: Would that complete your cross or would you need more time?

MR. BAIOCCHI: It is going to have to. Pretty tough. What I am concerned about, you remember the page where you have a variety of laws that Yuba County Water Agency has to comply to?

MR. GRINNELL: Right.

MR. BAIOCCHI: Do you remember what page that was?

MR. GRINNELL: Sure. That was 14. You talking about regulatory constraints?

MR. BAIOCCHI: Yes. Thank you very much.

What you don't have down here is the federal Clean Water Act. Is there any reason for that?

MR. GRINNELL: I believe I was talking about these constraints in regard to our modeling and how that affects how we develop a model for the operations.

MR. BAIOCCHI: You did indicate the FERC license for the project?

MR. GRINNELL: Right.

MR. BAIOCCHI: It is federal project, licensed project.

Consequently, and that is the reason why I bring up the question about the federal Clean Water Act. An example, Section 401 of the Clean Water Act of which the Board has the authority, that was not mentioned here for beneficial users of the state's water.

MR. GRINNELL: I am not -- we have not modeled any specifics that I am aware that would drive the operation of the Yuba River Development Project under that currently.

MR. BAIOCCHI: You did make a presentation on hydrology and you mentioned New Bullards Bar Dam. You mentioned the dead storage, 234,000 acre-feet of water?

MR. GRINNELL: Yes, I did.

MR. BAIOCCHI: Thank you.

Now, is there a bottom outlet valve on that dam?

MR. GRINNELL: Yes, I believe there is.

MR. BAIOCCHI: Do you know the capacity of that valve?

MR. GRINNELL: No, I don't.

MR. BAIOCCHI: Theoretically or operationally that valve could be opened to release that dead storage water for the protection of anadromous fisheries downstream; isn't that true?

MR. GRINNELL: Possibly.

MR. BAIOCCHI: There is a valve there?

MR. GRINNELL: There is a valve there, yes.

MR. BAIOCCHI: You don't know the capacity?

MR. GRINNELL: I am not aware of the specific operational aspects of that valve.

MR. BAIOCCHI: What I need to do -- would you say that I need to cross-examine Donn Wilson? He is probably -- is there somebody that knows? This is very, very important. Because in your hydrology analysis, you're -- it's all of a sudden we are down to dead pool. That is it, we have a dry river.

MR. GRINNELL: Mr. Robertson, do you want to --

MR. ROBERTSON: The condition under the 1965 agreement precludes Yuba from going below the 234.

MR. BAIOCCHI: By the '65 agreement, with the Department of Fish and Game?

MR. ROBERTSON: Yes.

MR. BAIOCCHI: Putting aside the agreement, is there a valve on the bottom? And that was so stated, there is. What is the capacity of that valve?

MR. ROBERTSON: I am not aware of that capacity.

MR. BAIOCCHI: Could that valve be opened to protect public trust resources, downstream resources?

MR. ROBERTSON: I don't know the operational restrictions on that.

MR. BAIOCCHI: Who would know the operational restrictions?

MR. ROBERTSON: The water agencies.

MR. BAIOCCHI: That would be Yuba County Water Agency?

MR. ROBERTSON: Yes.

MR. BAIOCCHI: Thank you.

Thank you very much, Mr. Brown. That is as far as I can go.

H.O. BROWN: Do you need more time?

MR. BAIOCCHI: I am going to have to review a lot of things, and I would like a time for additional questions, and if I don't come up with them, that's my problem.

H.O. BROWN: What I am going to do is to adjourn early this evening. We will start with you first thing in the morning and then Mr. Gee.

MR. BAIOCCHI: Thank you.

H.O. BROWN: We will continue your cross in the morning, and you can organize your thoughts.

MR. LILLY: Mr. Brown, it's certainly your call on the scheduling, but I am very concerned about stopping early

today. Because as we explained on the very first day of the hearing, Mr. Mitchell is not going to be available during our subsequent week of the hearing. I am concerned about whether or not we will finish cross-examination of this panel tomorrow. And I would suggest it might be appropriate to go forward with cross-examination of some of the other lawyers, or at least to get an estimate of the time frame to see how much time it is going to take tomorrow for this panel.

H.O. BROWN: On that basis, Mr. Lilly, would you stipulate then that Mr. Baiocchi may finish his cross tomorrow since he did step in in front of Mr. Gee?

MR. LILLY: I don't have a problem with that. I would like to continue today, however.

H.O. BROWN: On that basis, Mr. Baiocchi, we will give you a chance to organize your thoughts and continue tomorrow.

We will take your suggestion, Mr. Lilly, and continue with cross today.

Mr. Cook, I think you are next up, or Mr. Sanders is next up.

MR. LILLY: Mr. Brown, my witness requests a three-minute rest room break, if we can do that.

H.O. BROWN: All right. We will take that three-minute rest room break.

(Break taken.)

H.O. BROWN: Back on the record.

Mr. Cook, you had question?

MR. COOK: Yes, Mr. Brown. I would like to ask Mr. Lilly if he has any more of these documents or overheads, whatever they are called, prepared at this time and that he intends to pass out tomorrow when the remainder of his witnesses testify. If he has those, it would certainly save a lot of time. It would help everyone if he can do it now.

H.O. BROWN: Thank you, Mr. Cook.

Mr. Lilly.

MR. LILLY: We don't have any more overheads for this panel. I am not aware of any overheads for Mr. House or Dr. House or Mr. Wilson. But if there are some we will certainly distribute them as soon as they are available.

H.O. BROWN: Thank you, Mr. Lilly.

MR. CUNNINGHAM: Mr. Brown, I have a real short offer of something. I am not quite sure what to do with it.

Since we have been listening to the presentation of testimony and cross-examination I perceived there are some questions about geography, both local and regional, dealing with Yuba River watershed. Through the use of the Department of Fish and Game's facilities, we have obtained some overhead transparencies of USGS maps of the relative area, and I am not sure whether I want to offer them as my

exhibits. I am not sure I would use them.

I would offer somehow that they be available for those who want to use them in explanation of testimony or in question of testimony. I tendered them to the Board and its staff and will make copies if it is important or relevant. I don't want to call them my exhibits. I think they would be explanatory and informational for those who want to use them.

MR. FRINK: If there are no objections, we certainly would be happy to mark them staff exhibits, and anyone who wants to use them when they are using the overhead projector, is that agreeable?

MR. LILLY: I have no objection. I think they are already -- all the GS maps are already designated as staff exhibits in the record, so that is no problem.

H.O. BROWN: Mark them as staff exhibits and as appropriate we will put them up for clarification.

MR. FRINK: Are those ours to keep, Mr. Cunningham?

MR. CUNNINGHAM: Yes.

MR. FRINK: Thank you.

H.O. BROWN: You want to give them a number?

MR. MONA: I will designate them as S-SWRCB-9, S-SWRCB-10 and S-SWRCB-11.

H.O. BROWN: Those exhibits will be available for any who might wish to use them to clarify questions or answers.

Thank you, Mr. Cunningham.

MR. MONA: One final clarification. Number 9 will be the Smartville quad. Number 10 will be the Yuba City quad, and Number 11 the Browns Valley Quad.

H.O. BROWN: Mr. Sanders, you are up.

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CROSS-EXAMINATION OF YUBA COUNTY WATER AGENCY

BY SOUTH YUBA RIVER CITIZENS LEAGUE

BY MR. SANDERS

MR. SANDERS: Good afternoon, gentlemen. I want to thank you for rushing through your presentation, especially Mr. Bratovich who obviously shortened his. I appreciate it, for one. Not that it wasn't interesting.

I am going to ask questions hopefully of individuals, but I would encourage you all, if you have an answer to a question, to let me know about it rather than just the person that I directed the question to.

I am going to start with Mr. Bratovich. Looking at your qualifications, S-YCWA-6, specifically Page 5, this is also going to -- I think Mr. Lilly had mentioned this as well. You had worked on the Lower Yuba under contract with DFG and you had done some of the original data gathering for the DFG; is that correct?

MR. BRATOVICH: Yes.

MR. SANDERS: You were working for Beak Consultants

back then?

MR. BRATOVICH: Yes.

MR. SANDERS: Did DFG's management plan, the 1995 management plan was in part based on your findings?

MR. BRATOVICH: It was based on much of the data included the Beak report.

MR. SANDERS: You gathered data. Did you make flow and temperature recommendations to DFG at that time?

MR. BRATOVICH: Personally I did not.

MR. SANDERS: Did the Beak report?

MR. BRATOVICH: As I recollect, I don't believe that the Beak report did. To the best of my recollection, although I wasn't personally involved in that element of that report, I do seem to recollect that there were some analyses integrating IFIM and PHABSIM with discharge relationships and temperature modeling as it was conducted at that time, and evaluating various scenarios. But I don't recall that the Beak report actually came out with flow recommendations.

MR. SANDERS: About when did you make those investigations?

MR. BRATOVICH: I personally was involved in 1986, '87 and I believe '88.

MR. SANDERS: Then on Page 2 of your qualifications you have Yuba River component of AFRP U.S. Fish and Wildlife

Service. Who were you under contract to? You were still working for Beak at that time; is that correct?

MR. BRATOVICH: Yes. I believe so.

MR. SANDERS: Who were you under contract with? Who was paying for you to be at those AFRP meetings?

MR. BRATOVICH: You know, I don't recall. We may have had a small contract with Fish and Wildlife Service; we may not have.

MR. SANDERS: The AFRP made recommendations for Yuba River flows; is that correct?

MR. BRATOVICH: To my recollection, the draft working paper included flow recommendations, the revised AFRP document in '97 did not include flow recommendations, again, to the best of my recollection.

MR. SANDERS: I am not sure how to ask this question. But would it surprise you if the Department of Interior witnesses testified to specific flow recommendations and attributed them to the AFRP working paper?

MR. BRATOVICH: Oh, no, that wouldn't surprise me. You are referring to the 1995 draft working paper.

MR. SANDERS: Okay. I understand that.

Did you concur with those AFRP recommended flows at the time?

MR. BRATOVICH: Well, actually at that time Dr. Brian and I had the major role in developing the Yuba River

component of the draft working paper.

MR. SANDERS: So these flows for all years, 700 cfs from October through March 31st, that is what you agreed to back then?

MR. BRATOVICH: Dr. Brian, do you recall specifically the numeric value on a month specific basis?

DR. BRIAN: I think your question warrants a little more expanded answer.

MR. SANDERS: Go right ahead.

DR. BRIAN: First off, as the title of the draft working paper indicates, it was a working paper for restoration, not maintenance of fish in good condition, but rather restoration of fish species and management concern.

MR. SANDERS: We will get to that.

DR. BRIAN: Secondly, that effort that we participated on was essentially -- it was a brainstorming session. That is about the best way I can describe it. We were asked -- we were not asked to consider water availability. We were not asked to consider operations, anything other than listing potential, whether we had adequate data to support it, potential living factors, and describe potential restoration actions that may address those potential limiting factors, again, a brainstorming exercise.

At that time our data set was such that we did not understand very well, relative to today, flow temperature

and relationships. We had very little information on that. And we had very little information about flow emigration relation on juvenile fish. We have very little information about a lot of things. Based on the data that was available to us at that time and based on the mission of that exercise, we developed those flow recommendations.

MR. SANDERS: I guess this is for either of you guys. Why didn't the AFRP recommend reductions for below normal, dry or critically dry years?

DR. BRIAN: In our written -- actually, let me pull out something here. I have a copy of the document that you are referring to, at least a section of the document that you are referring to, Section 3-XC, as in Charlie, -12 of the '95 draft working paper. That is Page 1 of the Yuba River section. On Page 3-XC-15 there is a statement that says:

> However, it should be noted that such flows could -- (Reading.)

This is referring to spring flow recommendations that were stated in the earlier part of this page of the document.

> However, it should be noted that such flows could reduce the availability of preferred rearing habitat for young chinook salmon and steelhead remaining in the river. (Reading.)

The high flows between a thousand and 2000 that were

being recommended. It goes on to state:

> If flows of a thousand cfs or greater cannot be maintained from April through June, during dry and critically dry years, lower base flows punctuated by pulse flows should be considered. (Reading.)

So, again, our available information at the time was very limited, and we did as authors of that, although we were not asked to consider water availability and other operational issues, as scientists that tried to provide information that is useful in the real world, we needed to put those kinds of statements in there. But I remind you that this was a brainstorming exercise. We were not asked to recommend implementable flows, but rather just flows that may address potential living factors.

MR. SANDERS: Okay. I can live with that.

Just one question. Your current recommendations don't call for the use of pulse flows; is that correct?

DR. BRIAN: That's correct.

MR. SANDERS: Why is that? You just mentioned with the AFRP -- we heard a bunch about it yesterday through Mr. Minasian asking questions on pulse flows. What is wrong with pulse flows?

DR. BRIAN: I would go ahead and start it. I know Mr. Bratovich knows a lot about this topic. In the past, well,

since the early '90s, coming out of the continuing jurisdiction on the Lower American River, the Department of Fish and Game has done numerous studies, outmigration, trapping studies and for a number of years they have collected quite a lot of quantitative data and have attempted to look at other factors, such as temperature, flow, that may be able to be related and explain what triggers outmigration.

And in the -- in complying those data over the years their conclusion is that emigration of juvenile salmonids in the Lower American River is not related to flow. So at this time, that is a very similar river. Obviously, it is a somewhat bigger tributary but in close proximity to the Yuba. There is a lot of data on that issue. Fish and Game has collected a lot of information, we don't have any reason to believe that the Yuba would be significantly different from the data that has been collected there on fall-run chinook salmon, at least for fall-run chinook salmon.

Based on the data that I am personally familiar with, I would not recommend pulse flows.

MR. SANDERS: Do you have anything to add?

MR. BRATOVICH: Yes, Mr. Sanders. The issue of pulse flows I think is one that can best be characterized regarding uncertainty as to their effectiveness. There is a vast body of literature. Primarily most of the literature

comes from throughout the Pacific Northwest, that has ascribed emigration of juvenile salmonids to various sources or source of causality associated with emigration.

And first, the jury is out on what it actually is. There is uncertainty associated with that. Numerous factors, such as lunar cycle, photoperiodicity, turbidity, water temperature, increase or decrease in flow, have all been discussed and described as potential factors contributing to the outmigration of juvenile anadromous salmonids.

But to embellish slightly on what Dr. Brian stated regarding what we have learned over the past six or seven years now from the American River, is that not only do the field surveys conducted by the Department of Fish and Game in the nearby American River indicate that outmigration of juveniles is not associated with increase in flows.

Moreover, we don't have the luxury of extended sampling period of emigration on the Yuba River. As biologists, I think we all wish that we have more information on emigration, but we don't. Applying the American River information that has been collected over the past six or seven years now with outmigrant rotary screw trapping. The information collected by Department of Fish and Game also indicates that the vast majority of fall-run chinook salmon, I will specify that, in the American River, emigrate as

post-emergent fry. Post-emergent fry are very small individuals that really only rear in the river for a matter of a couple weeks after hatching and go out. In fact, in the American River varies somewhat on an annual basis. But more than 85 percent, and sometimes more than 95 percent, of all of the estimated migrants for an entire year go out as post-emergent fry a few weeks after hatching.

So based on the information presented by the Department of Fish and Game in the American River that emigration is not associated with peak flow events and that most of the outmigration occurs to post-emergent fry, most of the fish probably are not in the Lower Yuba River during the month of May. The vast majority have emigrated by that time and are not associated peak flows. So, it seems there is a body of information that has increased to a sense that for at least the American, which is proximate to the Lower Yuba River, it did not seem to be warranted.

MR. SANDERS: Okay. While we are still talking about people's qualifications, just for a minute, Mr. Brian, there was one on your qualifications I had a question about. Page 1 of your -- I think it is YCWA-8, your qualifications, there is -- the first thing there anadromous --

THE COURT REPORTER: One second, computer problems.

(Reporter adjusts computer.)

H.O. BROWN: Back on the record.

MR. SANDERS: The first item in your list of qualifications, anadromous fish enhancement activities for Yuba River, that is an AFRP program?

DR. BRIAN: Right.

MR. SANDERS: Who specifically were you working for, under contract with?

DR. BRIAN: It is actually the same program that you were asking Mr. Bratovich about.

MR. BRATOVICH: We worked cooperatively on that, Mr. Sanders.

MR. SANDERS: You helped to develop enhancement actions. So this is the same AFRP project? There is six enhancement actions. These are the ones that --

DR. BRIAN: I'm sorry, I misspoke. I was looking at the wrong paragraph. I understand the one you are talking about now. On Page 1?

MR. SANDERS: Yes.

DR. BRIAN: Okay.

MR. SANDER: Page 1, first things listed there, anadromous fish enhancement actions for the Lower Yuba River, Yuba County Water Agency. You were working for the Yuba County Water Agency?

DR. BRIAN: Right.

MR. SANDERS: You developed six anadromous fish enhancement actions for the Lower Yuba River. Can you

briefly discuss those six actions, tell us what they were?

DR. BRIAN: Best of my recollection now, one of them was answering flow recommendations.

MR. SANDERS: Was that the same instream flow recommendation that in your report --

DR. BRIAN: No, it's not.

MR. SANDERS: What were those? What were the instream flows you recommended to Yuba County Water Agency in the past?

DR. BRIAN: They were like, in this proposal, they were complex in the sense that they were multiyear, based on water type. And as I indicated with regard to the AFRP exercise, although the protocol used in that process was similar to the protocol used in this process, probably the two largest differences were an attempt to provide -- the goal for that process was more akin to providing optimal conditions as often as possible, as opposed to maintaining fish in good condition, which was the goal in this process.

MR. SANDERS: Who says? No offense. Who told you that the goal is to maintain the fish in good condition?

DR. BRIAN: That was the goal that we set when we embarked on that work.

MR. SANDERS: So, Yuba County Water Agency told you to come up with flows that will provide the fishery good condition?

DR. BRIAN: As an expert working for the Agency in the panel that you see before you, it was our collective decision along with input from Alan Lilly that that was the goal of the process for preparation of this hearing.

MR. SANDERS: So if you were asked to provide flows that -- instead of good condition, maybe great condition, you would have higher flows?

DR. BRIAN: They would not necessarily be higher flows.

MR. SANDERS: If I asked you to, perhaps, optimize the fishery conditions, would you recommend higher flows?

DR. BRIAN: If you asked me to optimize flows according to the IFIM work that Fish and Game produced that we all talked about in this hearing for chinook salmon fry, those flows are about a hundred to 150 -- actually I believe they are maximized at roughly a hundred to 200 cfs.

So, if you believe what the IFIM studies are telling you and you want to try and maximize habitat for that life stage, you would need to reduce flows over our proposal.

MR. SANDERS: Reduce flows over your proposal?

DR. BRIAN: That's correct. You are asking a very complex question.

MR. SANDERS: I understand that. That was the first one, instream flows. I'm sorry, I interrupted you. There were five others.

DR. BRIAN: One of them was investigate the efficacy of temperature control at Englebright Dam.

MR. SANDERS: Go on.

DR. BRIAN: I am trying to remember. It was years ago. Maybe Paul can help me remember. He worked on that with me.

I know that we talked about -- in a section of that report we talked about screening issues. I don't recall whether we had specific recommendations or not. I just can't really recall off the top of my head what the other recommendations were.

MR. SANDERS: That is fine.

Are any of those six enhancements actions included in your recommendations here today?

DR. BRIAN: I think that it would be fair to say that based on new information, the very reason this hearing was called, that if you look at the work that I have been involved in over recent years any scientist continues to work with new information as it becomes available. And when that new information becomes available, you integrate that new information with old information. You analyze it. You summarize it, and you make your inferences from that.

In the sense that back in -- several years ago that we worked up a flow proposal, that was really for the same purpose as this hearing in terms of an alternative flow

proposal to replace the '65 agreement. In the most recent effort there has been a tremendous body of additional information that we worked with: hydrologic information, new classification of hydrology with the Yuba River Index, flow emigration relationships on both the Yuba and American, flow temperature relationships that you heard Mr. Grinnell and Mr. Bratovich speak to.

So, in a very real sense the instream flow recommendation that we put forth in our written exhibit is an evolution of an earlier attempt at that, and it is our best recommendation today based on best available information.

MR. SANDERS: I will move on to Mr. Mitchell.

I am referring to the graphic that you had put on the board. I am not sure which page or number. It was in YCWA Exhibit 19, Page 3-11. That was also one of your overheads for today.

MR. MITCHELL: It is also Number 5.

MR. SANDERS: Page 5 from today's presentation.

In looking at this, and I am looking at years '76 through '78, that was a drought, wasn't it?

MR. MITCHELL: I believe '76, '77 were drought years.

MR. SANDERS: '76, '77; and then there was another drought mentioned, '87 through --

MR. MITCHELL: '87 through '92.

MR. SANDERS: I see the escapement is low for those years; is that correct?

MR. MITCHELL: It is low compared to other years, yes.

MR. SANDERS: Do you happen to know what the actual flows were in the river, say, in September, October during those years?

MR. MITCHELL: No, I don't have that offhand.

MR. SANDERS: Then I see escapement numbers are up for the past few years, say, '95 on through '99; is that correct?

MR. MITCHELL: Yes. They have been higher than the average.

MR. SANDERS: These have been wet years, haven't they?

MR. MITCHELL: I believe so.

MR. SANDERS: Is it fair to say escapement numbers are better during wet years?

MR. MITCHELL: No, I don't think that is a fair statement.

MR. SANDERS: You don't?

MR. MITCHELL: No. The conditions that occur in one year may affect anadromous salmonids, and those effects may not be seen until another year when the adults come back. And that may or may not be a dry or wet year.

DR. BRIAN: Mr. Sanders, which years are you referring to?

MR. SANDERS: I am referring to the most recent, say, five or six years as wet years. Again, I might not have it down with your -- I am using wet in a generic sense, not in your water index sense.

DR. BRIAN: Could you put up that overhead?

MR. SANDERS: Is it fair to say escapement numbers are better with more water in the river?

DR. BRIAN: I thought that is the question that you were asking, so I --

MR. SANDERS: That more or less is the question.

DR. BRIAN: I have some information to share with you.

You realize that when you look at escapement data like this, these are adults that come back into the river to spawn. So the conditions, in-river conditions, that produce those adults occur three years earlier. And I say three years earlier because the typical chinook salmon go out to the river or out to the ocean for three years and grow and return three years later. We all recognize that some of that year class would return after just two years and some may stay as long as four or five. But the bulk of that year class, there is a three-year delay before those adults come back.

Just to walk you through this to answer your question, 1955 you see is a very low escapement year. Those fish would have produced in 1952, which by the previous -- right

now we operate off of the Sacramento Valley Index on the Sacramento River. Obviously, we produced the Yuba River Index for this hearing. But prior to the Sacramento Valley Index, which was developed in '95, there was a Four Rivers Index that was commonly used. According to the Four Rivers Index, 1952, the year that produced the young that returned in '55, was a wet year.

The fish returning in 1959 that were produced in '56 was also a wet year. The higher return that you see in 1960 were produced in '57, which is an above normal year. What is interesting to note, is that you have these high production years. First one of which is 1962. Those fish produced in 1959, which was a below normal year. And the two subsequent years, '63 and '64, shown here, were produced in '60 and '61, respectively, which according to the Four Rivers Index were both dry years.

So, no, more water doesn't always produce higher escapement.

MR. SANDERS: Can either of you guys or any of you guys speculate on why 1982 was such a banner year?

DR. BRIAN: 1982, three years previous was a below normal year.

MR. SANDERS: So it wasn't that -- I guess you'd speculate on why it was so good, not what happened three years previous.

DR. BRIAN: This question really speaks to much of what you heard in the testimony, which in-river factors are only part of what contribute to an escapement three years later.

MR. SANDERS: So, I am looking now at the average post-New Bullards Bar Reservoir average, 15,119. Now, I am not much of a mathematician. If you -- seems to me that 1982 has some affect of skewing that average upward, wouldn't you say so, Mr. Mitchell?

MR. MITCHELL: Well, I wouldn't use the word "skew." But it is one year that certainly affected the average.

MR. SANDERS: I see there were no surveys conducted in 1990; is that correct?

MR. MITCHELL: That's correct.

MR. SANDERS: Do you have any idea what the escapement numbers were in 1990?

MR. MITCHELL: No idea.

MR. SANDERS: If 1990 were a poor year, would it skew the post-New Bullards Bar average downward?

MR. MITCHELL: When you say "a poor year," I am not sure I know what you mean.

MR. SANDERS: The escapement data showed that the escapement figures were low?

MR. MITCHELL: Yes. If the number of returning adults was lower than the average, it would reduce the average by a slight amount because the average is the integration of all

the years.

MR. SANDERS: Right. Is it correct to say that both before and after Bullards there are both good years and bad years in terms of escapement?

MR. MITCHELL: I would say that is correct.

MR. SANDERS: Based on the data in this graphic, is it your opinion that construction of New Bullards Bar has significantly improved salmon escapement?

MR. MITCHELL: It is one of the supporting pieces of evidence that we have presented today.

MR. SANDERS: Let me get this straight. On average we are talking about approximately 2000 more fish per year pre- and post-Bullards Bar?

MR. MITCHELL: On average, yes.

MR. SANDERS: Do you know if there were -- if YCWA or DFG predicted improvements in salmon population prior to construction of New Bullards Bar?

MR. MITCHELL: Yes. I do recall there were some projections of increased run size.

MR. SANDERS: You don't know what the projections were? Or do you know?

MR. MITCHELL: I do not recall what they were.

MR. SANDERS: Is this 15,119, is that more or less than what was predicted?

MR. MITCHELL: I would have to go back and look at

those numbers. I am afraid I don't know that answer.

MR. SANDERS: I want to go to Page 316 of your testimony. Again, this might be for Mr. Brian or Mr. Bratovich or Mr. Mitchell. I am not really certain who.

I am looking at the paragraph that starts with "Based on daily records of the number of chinook salmon salvaged in Hallwood-Cordua Canal." You say that spring emigrating of juvenile salmon can begin as early as mid-April and continue to mid-June. Is that spring-run or fall-run, or both?

MR. MITCHELL: Well, as I explained earlier, we have -- there is uncertainty as to the identification of individual fish based on size because of the broad overlap in spawning and emergence type and body sizes through the years. So, we cannot definitively say whether those include spring-run` or not.

MR. SANDERS: What about steelhead, when do they emigrate?

MR. MITCHELL: We don't have specific data on emigration of steelhead in the Lower Yuba River. Based on general Central Valley life history patterns the emigration time for juvenile steelhead during their smolt migration is in the late spring. I'd say early to late spring, in general.

MR. SANDERS: In looking at the next sentence down, I think, what do you mean by CDFG has not initiated salvage

operations early enough in the season to sufficiently address the overall migration period?

MR. MITCHELL: That refers to the timing of the operation of that facility. In some years, because of early migration, many of the fish have already passed before the stream was installed, the canal, and so there is not a complete or full record of the spring migration. And that also is in reference to the large migration of fry which are suspected to occur in the Lower Yuba River very early in the year. And, of course, those are not sampled by the facility because they do migrate much earlier than when the screen was installed.

MR. SANDERS: What happens to emigrating fish when DFG is not operating the fish screen?

MR. MITCHELL: Well, if they enter the canal, they would go through the canal, and I am not sure where they would go at that point.

MR. SANDERS: They end up in diversion in the rice fields or something like that?

MR. LILLY: Excuse me, this assumes there are any diversions in the winter. I don't think there is a foundation for that.

MR. SANDERS: I am talking about -- I didn't mention any time of the year.

H.O. BROWN: Wait, wait.

MR. SANDERS: I'm sorry.

H.O. BROWN: Address it to me. Respond.

MR. SANDERS: I didn't mention any time of year. I am not assuming there are diversions in the winter.

H.O. BROWN: I understood that.

Answer the question if you know the answer.

MR. MITCHELL: Well, I would just say that if there are fish migrating, entering the canal, and there is no screen, the fish would end up in the canal. We don't know where they would go at that point.

MR. SANDERS: It's your testimony that DFG does not operate the screen early enough in the year?

MR. MITCHELL: In some cases it appears that migration had already started by the time the screen was installed.

MR. SANDERS: What about in the summer, in mid-June and beyond, are you familiar with when they stop operating the screen?

MR. MITCHELL: Yes. The screen is operated through or as late as June, mid-June and some years late June, as I recall.

MR. SANDERS: If there is diversions going on in, say, the middle of June or late June, do juvenile steelhead and salmon enter the diversion?

MR. MITCHELL: If diversions are occurring, they would enter the canal and the fish screen, if present, would be

able to take those, pick up --

MR. SANDERS: If the fish screen isn't operating?

MR. MITCHELL: As I mentioned before, there would be no way to determine whether the fish are there. But if they are there, yes, they go into the canal and would be present in the canal.

MR. SANDERS: Based on your professional opinion, are the fish in the river in, say, early July when there is diversions going on and the screen is not being operated?

MR. MITCHELL: I am sorry, I didn't -- I misunderstood your question.

MR. SANDERS: I am calling on you to speculate whether there are salmon and steelhead in the river at times that this screen is not being operated.

MR. MITCHELL: Yes. There certainly are fish in the river when the screen is not being operated.

MR. SANDERS: I am asking you to speculate, do fish end up in the agricultural diversions, salmon and steelhead, in the agricultural diversions under the way this screen is presently operated?

MR. MITCHELL: Without a means of sampling -- the screen is acting as a sampling device. When it is not present, we don't know whether --

MR. SANDERS: Yes, I --

MR. MITCHELL: -- the fish are there.

THE COURT REPORTER: One at a time, please.

MR. MITCHELL: As I said, I am speculating. Because when the fish screen is not there, then there is no means of detecting fish in the canal.

MR. SANDERS: I've asked you to speculate as an expert witness, as an expert fisheries biologist who knows something about the fisheries on the Yuba River.

Are salmon and steelhead present in the river at times that there is diversion going on and there is no screen present?

MR. MITCHELL: At the Hallwood-Cordua Canal, yes.

MR. SANDERS: Thank you.

Mr. Grinnell, you mentioned that the Sacramento River Index was developed for water quality. Can you explain a little bit how that applies to what we are talking about, which is water quantity for fish?

MR. GRINNELL: Well, I just -- the Sacramento Valley Index was developed for the 1995 Bay-Delta Water Quality Plan. We have used that methodology to develop a Yuba River Index to talk about water hydrologic conditions within the Yuba River. So, I guess I'm -- and to look at flow requirements.

MR. SANDERS: Don't fish need water in all year types? Maybe this is for the biologists.

MR. GRINNELL: I probably could answer that one, too.

MR. SANDERS: I guess what I am saying is, I fail to see how a water year index applies to fishery habitat needs.

MR. GRINNELL: In order to develop an instream flow standard, first you have to know that you have water to meet that standard. And so by characterizing hydrology of the river, you can understand then what you have to work with, essentially, in order to stipulate some instream flows.

MR. SANDERS: Unfortunately, I don't have the page number on your overhead. You mentioned something about system losses that are accounted for in your model?

MR. GRINNELL: Right.

MR. SANDERS: About how many acre-feet of water do you account for in system losses?

MR. GRINNELL: Actually, system losses is a relationship that is developed for the modeling, and if you want to know the details of calculation of system losses, I think I would turn that over to Dr. Sun.

MR. SANDERS: Maybe I don't.

DR. SUN: To answer your -- I just have something to add on your previous question regarding the index development. The index development was designed to characterize the water availability in all different years. Before Sacramento Valley Index there are Four River Index. Before Four River Index there are just index. And what was

that for? Was used to assess the ability of the system that can provide instream flow and projects demand for the Central Valley Project and State Water Project. And so that we use the same methodology to develop a Yuba River Index to address the distinct characteristics of the Yuba River Basin so to better represent the water available in those year types and, therefore, how we can have better use of that water.

For example, I just point out one example. In 1977 the total year of unimpaired flow, the unimpaired flow is assumed. There is no impairment on the upper basin and everywhere else. The total unimpaired flow appearing in Smartville was lower than the dry year requirement in the Draft Decision. So, in that year if you are looking at that without the project report, you have no way to meet the instream flow criteria alone, that alone in those years you have to shut down all diversion. You also have to require all the upper basin water user, like NID and PG&E and OWID to stop the diversion to out-of-basin, to Bear River and American River and also Feather River. And all that effort, you still cannot meet your standard.

So, therefore, it's necessary to recognize how much water can be supported by the system in the water river basin.

Regarding the system losses, that was a term we use in

the modeling process to account for that water that cannot be controlled by the project.

MR. SANDERS: That is not what I was interested in. Thank you for telling me.

I guess what I wanted to know is how many acre-feet of water in your model were attributed to or how many acre-feet did you give for seepage and other losses?

DR. SUN: If you refer to our recent testimony, I believe it is -- there was a figure regarding the system losses in the exhibit.

MR. GRINNELL: Do you want to know seepage losses or system losses?

MR. SANDERS: You're getting me now.

DR. SUN: The system losses, if you look at Page 2-5, that was Figure 2-3 in Exhibit 16, YCWA-16, you can see this is base model simulation. The system losses, we attribute all the flow that cannot be controlled by the project.

MR. SANDERS: What page is that?

DR. SUN: Page 2-5.

MR. SANDERS: Thank you.

Go ahead.

DR. SUN: So you will see that it was actually approximated by the -- as a function of total Yuba River Basin unimpaired flow. What it means is that when you -- the basin have higher unimpaired flow, you have higher

potential that you have less control of all the water. You may have flood. You may have water coming out from Deer Creek, that you have Yuba River Development Project, no control and things like that. However, when you get into the drier year, you -- the system was forced to operate more precisely. Therefore, the system losses was greatly reduced.

Therefore, if you want me to give you a specific number, there is not really a specific number because it was a function of the unimpaired flow.

MR. SANDERS: I guess what I'm interested in is not system loss but in water that is not being used economically, seepage for instance.

MR. GRINNELL: Seepage --

MR. SANDERS: Losses from the canals going to nowhere.

MR. GRINNELL: Well, losses from the river, we do include a seepage loss at 5,000 acre-feet per year for seepage.

MR. SANDERS: That is in the river?

MR. GRINNELL: That is out of the river.

MR. SANDERS: Did you include losses in seepage out of the canals?

MR. GRINNELL: In modeling demands we use 10 percent loss on deliveries.

MR. SANDERS: Going to shift gears a tiny bit. You put

up a lot of graphics showing deficiency based on the DFG flows. You didn't -- I didn't notice any models for the flows that YCWA is recommending here today.

MR. LILLY: I will just object. Misstates prior testimony. The graphs were losses based on the Draft Decision not DFG plan.

MR. SANDERS: I stand corrected, yes.

You didn't model the YCWA recommended flows?

MR. GRINNELL: We didn't show graphs of those types, that's correct.

MR. SANDERS: Did you model them?

MR. GRINNELL: Yes. That is how we got exceedance probability plots that Mr. Bratovich showed in comparing the flows for exceedance probabilities.

MR. SANDERS: You didn't create the same kind of graphs showing when there would be deficiencies under those?

MR. GRINNELL: No, we did not.

You have to remember, we put together a proposal, both proposals, that was based on two criteria. One is to meet the two goals of the system which is to meet the demands of water users within Yuba County and also to keep the flows within the river to keep fishery in good condition. So, to the extent that to meet those goals, that is how we model the system. And that is the protocol we used.

MR. SANDERS: You are saying that the flow being

recommended by YCWA would never impose a deficiency, agricultural deficiency?

MR. GRINNELL: No, that is not correct.

MR. SANDERS: Can you correct me?

MR. GRINNELL: It would require deficiencies in some years.

MR. SANDERS: I will move on.

Do you know if YWCA's currently considering additional storage facilities on the Yuba River?

MR. GRINNELL: On the Yuba River?

MR. SANDERS: Within the Yuba River system.

MR. GRINNELL: I know they have a flood study going on right now. Specifically storage facilities? I know of the Waldo Project which is actually off-stream storage.

MR. SANDERS: Did any of your modeling include additional storage in the system?

MR. GRINNELL: No, it did not.

MR. SANDERS: You modeled for future demands, but not for future storage?

MR. GRINNELL: That's correct.

DR. SUN: May I add something?

MR. SANDERS: Sure.

DR. SUN: All those project developments for additional storage, they are just planning. There is no implementation date and a lot of review I think still going on. And there

was no definite date when that facility would be available. And then the purpose of this simulation was addressed to the Draft Decision impact, and Draft Decision supposedly implemented right away.

MR. SANDERS: You modeled for future demand, though?

DR. SUN: We modeled for future demand.

MR. SANDERS: Do you know when that would be implemented?

MR. GRINNELL: Future demands are -- there is transition from present demands to future demands. In fact, there is a very good example of that. I forgot the gentleman's name from Dry Creek Mutual Water Company that talked about starting to take deliveries last year. We have in our update of the -- from 1992 we have included Dry Creek Mutual Water Company as a present demand. Actually the modeling, we looked at comparison historic versus estimated demands, although that is included in our model as a present demand. It only came on last year.

There is a transition. Obviously, it doesn't happen all at once. As new service areas come on or as the service area is developed, then demands transition to the full development demand.

MR. SANDERS: What about additional groundwater, did you model for additional groundwater as part of a conjunctive use program in your water availability?

MR. GRINNELL: We did an analysis, and I did provide a summary of our testimony about the potential for groundwater use and showed that the net recharge of the basin was on the order of 15- to 20,000 acre-feet per year. Whereas, we are showing deficiencies of the Draft Decision that are essentially more than a magnitude above that. Therefore, conjunctive use, although a good supplement, is certainly not an answer to meeting deficiencies of the type that the Draft Decision would impose.

MR. SANDERS: What about increased conservation or increased deficiency, did you model for that?

MR. GRINNELL: Not directly, although I would say that there is -- because of the way we model demands, there is a bit of an inherent issue there with respect to -- I will give you an example. It is in our testimony, an example of rice, which is a very prevalent crop in Yuba County.

DWR estimate for applied water for rice is, I think it is out of our table of 6 or 6.1 acre-feet per acre. We model a cap of five feet applied water. So, although it is not a direct modeling of conservation, there is some limitations and some reductions on waters that otherwise would be estimated the way that DWR does in their Bulletin 113. So, it is not, per se, a conservation, but it is a reduction in applied water rates.

The only thing about conservation is that this water

for diversions is used many times. It gets diverted at a Daguerre Point at initial application. The tailwater is then utilized by downstream entities. So, conservation can be somewhat questionable as for ultimate use through a large geographic area.

MR. SANDERS: Are you aware of the proposed new intake project at Englebright?

MR. GRINNELL: Yeah, very much aware of that.

MR. SANDERS: Figured you were. Do you happen to know what are the predicted benefits in terms of temperature with the new intake?

MR. GRINNELL: Yeah. It is real range. It has to do with -- it is a very complex environment. Englebright doesn't act as a specific large reservoir with a cold pool. It is anywhere from zero to as high, I believe, as six-degree reduction for certain time periods.

MR. SANDERS: Did you model for this new intake?

MR. GRINNELL: No, we didn't. That also is in planning. It is very speculative, number one, that it would go in at the present time. I guess it is, I believe, funded through Prop 204, four I believe it is. And secondly is that, like I say, although it is shown that it would be a benefit, it is unknown as to how much the benefit would be.

MR. SANDERS: You don't know if you don't model.

MR. GRINNELL: Actually, we did analyze it in order to

understand its viability and, therefore, try to push for getting it put in.

MR. SANDERS: For instance, say, in October what sort of benefits are we looking at?

MR. GRINNELL: You know, I don't have those reports in front of me. I know it is definitely a benefit, but I don't know the specific reductions that it would be.

MR. SANDERS: So let me just get this straight, the new intake will allow Yuba County Water Agency to release colder water out of Englebright; is that right?

MR. LILLY: Excuse me, I will object. Will assumes that the project is already a done deal. I object on the grounds of speculation.

MR. SANDERS: They testified that the temperature requirement are impossible to meet, yet in Mr. Wilson's testimony he discusses the Englebright power outlet or new intake at Englebright as being a project that is in the works. And I am questioning their expert on the possible improvements in temperature if this project is built.

H.O. BROWN: Do you know the answer?

MR. GRINNELL: No. It's a pretty complex one.

H.O. BROWN: It's all right to say I don't know.

MR. GRINNELL: I don't know.

MR. SANDERS: You don't know if Yuba County Water Agency will be able to release colder water out of

Englebright after you built this?

MR. GRINNELL: I believe I said that it would come out colder. I just don't know how much and what the benefit would be, what the timing would be.

MR. SANDERS: You don't know whether Yuba County Water Agency will be able to meet the temperature requirements after installing the new intake?

MR. LILLY: Again, I am still going to object. The question assumes that the project will be built. There is still regulatory approvals and funding issues that have to be addressed before the project could be built. If he says would instead of will, I would have no problem.

H.O. BROWN: Restate your question, Mr. Sanders.

MR. SANDERS: I am a little confused by Mr. Lilly's objection. I will try to restate my question.

If built, will Yuba County Water Agency be able to meet the temperature requirements after installing the new intake?

MR. GRINNELL: I, like you say, I could not tell you if they could or could not. However, our analysis shows that there is an awful disparity between what the temperatures are now coming out of Englebright and what they would have to be in order to meet the Draft Decision. And so I find it very difficult. And I know quite a bit about, obviously, the work here and about the temperature control device, and

I find it difficult in my expert opinion that that device is going to be end-all deal for temperature certainly.

MR. SANDERS: Okay. But you did preliminary engineering and studying of this intake device; is that correct?

MR. GRINNELL: Yes.

MR. SANDERS: As part of that you predicted benefits?

MR. GRINNELL: Predicted a range of temperature reductions for a range of time periods.

MR. SANDERS: You made those predictions, but you just don't have them here today?

MR. GRINNELL: That's correct. They are embodied in our report that was submitted for authorization on the project.

MR. SANDERS: That report hasn't been introduced into evidence?

MR. GRINNELL: No.

MR. SANDERS: I am interested in a concept of water doubling. I think I understand how that works, but I think I need to run it through with one or more of you.

You start with the Yuba River index; is that correct?

MR. GRINNELL: Start with the water year classification.

MR. SANDERS: And that tells you how much water will be available in the system?

MR. GRINNELL: The classification itself does not.

MR. SANDERS: I understand. You start by classifying a year as wet, dry, whatever. The index is the tool to determine what sort of water year it is?

MR. GRINNELL: That's correct.

MR. SANDERS: Once you know the water year, there is a corresponding predicted water supply and water demand. Is that how it works?

MR. GRINNELL: Yes. There is a water availability analysis that's done looking at each of the water year types. And from that analysis we determine the amount of available water within a year type for a water budget.

MR. SANDERS: Then to get to the water budget, this might be simplifying it, to get to a water budget you take the amount of water available and you basically subtract the predicted demands?

MR. GRINNELL: No. Let's put up a slide. This is the best way to show the water budgets.

This is described in YCWA-19.

MR. SANDERS: Either I am very dense or your writing lines because I can't make heads or tails out of it.

MR. GRINNELL: This is Slide 8 of Mr. Bratovich's summarization. And what -- it shows the water budget or water availability calculation. We take scenario two, which is the one with full development demands, and so the total

water budget for April to November, takes the Yuba River outflow from April to September plus the end of September storage, surplus, that surplus above the carryover storage requirement, and then that is the initial estimation of the water budget.

There is a process that goes on beyond that, but that is the start.

DR BRIAN: Steve, in the way of clarification when you mentioned Yuba River outflow, is it fair to say that that is a volume of water passing the Marysville gauge?

MR. GRINNELL: That's correct.

MR. SANDERS: I am just having trouble following how you end up with the flows starting with this. I am just trying to figure it out.

DR. BRIAN: Maybe I can take a crack at further explanation. Since I am not hydrologic engineer sometimes it doesn't make sense to me either. But in working through it, I have a particular way of thinking about it that might help you.

When you work with the Yuba River Index, as Mr. Grinnell indicated, it simply tells you the nature of that year, for any given calendar or wet year or dry year or what have you. When they run their simulation model for the 1922 to 1992 period, they will get actual flows passing the Marysville gauge for each month of the year, for all 70

years or the 71 years of record. What they can do then is they can sort those data for all wet years, for example, and they can sort them from the greatest amount of water that passed the Marysville gauge in thousands of acre-feet for the period April through September, then add to that any end of September storage surplus. And that will give you a total volume of water in acre-feet. It may be 300,000, whatever it is. In a wet year your highest volumes will be very high, over a million acre-feet.

MR. GRINNELL: Several.

DR. BRIAN: Then it will go down to the very driest or the smallest volume of water that, A, passed the Marysville gauge April through September, plus whatever surplus was in the reservoir. That total volume for one of the wet years will be the lowest that has occurred historically. So in looking at a water budget, that is what we did, is we ranked those years. If you looked --

For example if you took the median year. Then by definition if you use that as you water budget and allocated all of that water to both the combination of deliveries and instream flows, by definition, 50 percent of the time you wouldn't have enough water. So in order to assure that you can meet instream flow requirements that you are held to every year for a given water year type, it made no sense to go to that lowest volume of water for that year type as

defined by the slide that you are looking at right now.

MR. GRINNELL: I would add one caveat. And that is that we actually used in some situations the 90 percent exceedance rather than minimum.

MR. SANDERS: Maybe I could ask you or tell you what the source of my confusion is and you can straighten it out for me. I am looking at Page 2-3, and it says for each water year type a water budget was developed that defines the minimum amount of water available for the Lower Yuba instream flow purposes.

What you guys were just describing seemed to be the total amount of water available in the system for all purposes. Where does -- how do you get to available for instream? I am just not getting it.

DR. BRIAN: Keep in mind that the April through September volume of water that we were describing is at the Marysville gauge downstream of the diversions. So by definition in that formula the diversions are accounted for.

MR. SANDERS: I guess what I'm trying to get at is in saying a dry year do the farmers get their full allocation of water before we start making reductions for fish or after we start making reductions for fish, if you follow me? I might need to restate that question.

MR. GRINNELL: I follow. The start of the process is

to -- let's say we use scenario two, which is the full, so the results that I showed there was the start of the process. And certainly for wet, above normal, below normal years -- I am sorry, even in dry years that the deliveries are made. That is the start.

As shown in testimony, once we developed those initial budgets those are passed as a total volume for use between April and November. Those are provided to the biologists and they assess them as far as instream flows, keep fishery in good condition. So then there is an iterative process that starts.

MR. SANDERS: I think I've just got one or two more questions, then I am done.

Do you happen to know how much water was in the model for flooding rice fields for waterfowl habitat?

MR. ROBERTSON: The fall flooding included one foot of applied water over 90 percent of the rice acreage.

MR. SANDERS: Do you know offhand how many acre-feet we are talking about?

MR. ROBERTSON: On the order of 30,000 acre-feet.

MR. SANDERS: That is just the rice acreage that gets flooded and not the other acreage?

MR. ROBERTSON: For waterfowl habitat and rice double decomposition, as a joint use.

MR. SANDERS: I guess my final question is -- my final

two questions, in a critically dry year -- let me go back. When does that rice double flooding occur? Do you know what time of year that is?

MR. ROBERTSON: It begins in September, usually when the fields are first drained and harvest begins, the beginning of October. In October is when the flooding starts and it tapers off quickly and until about December is the last month that there is any diverted for that.

MR. SANDERS: October and November, for critical dry years what are the flows that you recommend for October and November?

MR. BRATOVICH: For a critical dry year the minimum flow requirement recommended is from September 15th to October 14th is 400 cfs at the Smartville gauge and 150 cfs at the Maryville's gauge.

MR. SANDERS: Conceivably, we could have 150 cfs at Marysville, while at the same time rice farmers are flooding their fields with 30,000 acre-feet of water?

MR. BRATOVICH: That does go up in mid month. In October it goes 600 cfs at Smartville and 400 cfs at Marysville, starting October 15th.

MR. SANDERS: Thank you very much.

Thank you, Mr. Brown.

H.O. BROWN: Thank you, Mr. Sanders.

Esther, how are you doing?

THE COURT REPORTER: I am going down hill.

H.O. BROWN: We need to finish this panel by tomorrow, right?

Let me get a feel of how much time.

Mr. Cunningham, how much time you will need for your cross?

MR. CUNNINGHAM: Mr. Brown, I will probably be required to impose upon your goodwill multiple times. And looking at the substance that we've already heard and substantial that I still have to resolve, I am going to have to ask for almost two hours of cross-examination.

H.O. BROWN: Okay.

Mr. Morris.

MR. MORRIS: At this time we do not have any. We may develop some in the future, probably rather short, 15 minutes at the most.

H.O. BROWN: Mr. Cook.

MR. COOK: Well, Mr. Brown, I will do my best for 20 minutes, but I think that is very optimistic. And as we go along, it may well exceed that by quite a bit, with your permission.

H.O. BROWN: Okay, Mr. Cook.

Next, Mr. Bezerra.

MR. BEZERRA: On the order -- Browns Valley Irrigation District would have on the order of what Mr. Morris is

talking about, 15 to 20 minutes.

H.O. BROWN: We have Mr. Gee and Mr. Gallery. I don't know if Mr. Gallery will have any. Mr. Gee will. I think that even with Mr. Cunningham's two hours, we ought to be able to finish this panel by tomorrow. We will not run any later time. I see everybody is getting tired. I am, so Esther is the one that has the hardest job.

So we will start --

Yes, sir.

MR. MORRIS: One clarification if I could because I have some witnesses that are coming up fairly shortly. It looks to me -- I just want to get a sense. We are not going to get to our testimony by Friday. Would you agree with that?

H.O. BROWN: Well, let's see, Mr. Morris.

MR. MORRIS: That is tomorrow.

H.O. BROWN: Does anybody -- is Paul Minasian going to have any direct? Do you know?

MR. FRINK: He did submit some. He said four witnesses, but he is going to have at least a couple.

H.O. BROWN: With Mr. Minasian in front of you, Mr. Morris, I think that is probably correct. I don't know since Paul is not here.

MR. MORRIS: I will run the risk.

MR. CUNNINGHAM: Mr. Brown, also as a question, perhaps

Mr. Lilly can help resolve. To the extent this panel will hopefully finish up tomorrow, I am thinking you mentioned earlier that may be the time for Mr. Mitchell to provide any rebuttal since his availability would then be dramatically reduced in the following proceeding, the following three days. That may also be a factor to put in your time log for tomorrow.

H.O. BROWN: That is a good point, Mr. Cunningham.

Will Mr. Mitchell be able to provide rebuttal tomorrow?

MR. LILLY: It depends partly, of course, whether we get done with the cross-examination of this panel. And we also -- he is also having to work on that at the same time he's been working on this. We will try to have it ready if time is available tomorrow.

H.O. BROWN: Everybody has been moving pretty quickly. I think that this will move fairly quickly, Mr. Lilly. Be optimistic, anyway.

I thank all of you for your patience and courtesy in the way you've handled some difficult issues. I appreciate that and thank you, Panel.

See you first thing in the morning at 9:00.

(Hearing adjourned at 5:10 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, ESTHER F. WIATRE, certify that I was the official Court Reporter for the proceedings named herein, and that as such reporter, I reported in verbatim shorthand writing those proceedings;

That I thereafter caused my shorthand writing to be reduced to typewriting, and the pages numbered 472 through 732 herein constitute a complete, true and correct record of the proceedings.

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on this 17th day of March 2000.

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ESTHER F. WIATRE
CSR NO. 1564

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