STATE WATER RESOURCES CONTROL BOARD

PUBLIC HEARING

CONSIDERATION OF PETITION FILED BY SOUTHERN CALIFORNIA WATER COMPANY TO REVISE DECLARATION OF FULLY APPROPRIATED STREAM SYSTEMS REGARDING THE AMERICAN RIVER, CALIFORNIA.

THURSDAY, JUNE 13, 2002

8:30 A.M.

CAL/EPA BUILDING

SIERRA HEARING ROOM

SACRAMENTO, CALIFORNIA

REPORTED BY: ESTHER F. SCHWARTZ
CSR 1564

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SACRAMENTO, CALIFORNIA

THURSDAY, JUNE 13, 2002, 8:30 A.M.

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H.O. SILVA: Good morning. I think we are all ready to go. Before we get started on procedural stuff, I wanted to introduce to you Gary Carlton, our new Board Member. I understand some of you may already now Gary from past experience. And he asked if it's okay for him to sit in and listen and learn. He wants to get up to speed on the process itself. So there is no objections or even if there is, Gary is going to be here today to listen in.

This is the time and place for the continuation of the May 31st, 2002, hearing on the petition to revise the declaration of fully appropriated stream systems regarding the American River, Sacramento County, filed by the Southern California Water Company.

This hearing is being held in accordance with the notice of hearing dated March 6, and at this time we are going to continue with the testimony of interested parties. As a note, last night we received a fax from Cal-American Water Company, which included an opening statement and written testimony of Robert Roscoe. On May 13th, 2002, the State Board received a revised notice of intent to appear for Cal-American Water Company stating, "We do not plan to call any witnesses. However, we would reserve the right to

present an opening statement, cross-examine witnesses, present rebuttal evidence and submit closing brief if permitted."

Since Cal-American Water Company did not meet the requirements for submitting --

Did you want to say something?

MS. DRISCOLL: I'm waiting for you to finish.

H.O. SILVA: I think I already ruled that I think since you didn't meet the requirements for submitting exhibits to the State Board and allows the parties to exchange information by the May 10th, 2002 deadline and waived their right to call witnesses, I will not allow the testimony of Mr. Roscoe and the joining parts of Sacramento County's case in chief.

I will allow Cal-American to present an opening statement and submit closing brief. Also, I think cross-examine.

MS. DRISCOLL: May I respond?

H.O. SILVA: Come up to the mike.

MS. DRISCOLL: I recognize that we did file that statement waiving that right. And in lieu of the testimony of Mr. Roscoe, I have spoken with the other counsel and they have agreed to a stipulation, very short stipulation, of facts, that I would ask that when the time comes I might be allowed to read that into the record.

H.O. SILVA: Perhaps. It is a good point. You can read in your opening statement if you would like.

MS. DRISCOLL: Very well.

Thank you.

H.O. SILVA: The order I have, as we continue, is Aerojet first, then Department of Fish and Game, City of Sacramento and Sacramento County.

Is that okay with the parties?

MS. GEORGE: Good morning. I represent the Regional Board, and we had intended to make a brief opening statement and/or combination policy statement this morning. We don't have any witnesses to present, however.

H.O. SILVA: Okay. I will take that into consideration.

Is the City of Sacramento here also?

Nobody from the City of Sacramento.

I guess just a quick procedural, would you mind if the Regional Board goes first?

MS. GOLDSMITH: I have no objection.

H.O. SILVA: They have a short opening statement. If the rest of the parties don't mind, maybe we will just do the parties that have opening statements only.

Would that be okay?

Get them in and if we go long, that way they don't have to wait around unless they have questions, cross-examine.

MS. GEORGE: Thank you.

Good morning, Mr. Silva, Mr. Carlton, members of the hearing team. My name is Catherine George, and I represent the Central Valley Regional Water Quality Control Board in this matter. I have a brief opening statement that I would like to provide on behalf of the Regional Board.

Just as a preface to these comments, they are largely reiterating what was stated in a letter to you that preceded the notice of hearing that was issued in this matter back in February.

The Regional Board's interest in this petition results from the Regional Board's involvement over the past several decades in remediating groundwater pollution at and around the Aerojet-General Corporation property near the Lower American River. The Regional Board's interest also stems from the need to ensure the availability of water supplies for local community in which Southern California Water Company and other local water purveyors operate. In recent years, Regional Board has directed its staff to aggressively enforce requirements that Aerojet make replacement water available when local water supplies wells are shut down due to contamination from Aerojet property.

Regional Board has also directed its staff to work with public interest groups to address the community's concerns about water supply and to continue to help facilitate

discussions between water purveyors and Aerojet to develop timely water supply alternatives. Many drinking water wells in this area either have been shut down or are threatened by contamination. Regional Board is involved in the pursuit of water supply replacement measures to provide both temporary and permanent replacement for these lost and threatened supplies.

As we stated in our earlier letter to the Division of Water Rights, one possible means for Aerojet to meet its obligations under the document governing cleanup at the site is to use the water it extracts, treats and discharges to the American River to provide replacement drinking water. Currently, portions of this extracted and treated groundwater are discharged to lands, and the groundwater is thereby recharged by injection wells and percolation. However, there are limitations and restrictions on recharge. In addition, it's both now feasible and in the public interest to accelerate the pace of cleanup. As a result, we anticipate that more of the extracted and treated groundwater will be discharged to surface water under NPDES permits.

In addition, the USEPA Record of Decision for cleanup at the western portion of the Aerojet site contemplates discharge of treated groundwater to surface water and also contemplates that this water will be made available for

reuse in the affected area to compensate for impacts to the groundwater basin caused by contamination and by the long-term extraction of the groundwater for treatment. While another possible means of providing replacement water involves construction of new water supply wells, the Regional Board is concerned that these new wells may not provide a long-term solution for two reasons.

First, the groundwater contamination in the area is extensive and the viability of long-term use of some of these wells is in question. Second, the Regional Board has concern about the impacts of the withdrawal of groundwater in the new wells combined with the withdrawals for extraction and treatment of the groundwater plumes on the sustainable yield in the groundwater basin. At least in the short term, if it is not clear what other viable sources of replacement drinking water exists in this area.

Thus, for the foreseeable future groundwater contaminants plumes from Aerojet as well as from Boeing and the United States Air Force activities in the Rancho Cordova area are in and will be subject to remedial measures that include pumping, treating and discharging extracted groundwater. If the water Aerojet extracts, treats and discharges to surface water can be made available to replace lost drinking water supplies, it would minimize the need to construct new wells, thereby resulting in no net loss of

water out of the groundwater basin and the replacement of critical lost water supplies to meet the needs of the local community.

Finally, if the State Water Resources Control Board ultimately determines that water is available for appropriation, Regional Board urges the State Board to consider whether affected water purveyors besides Southern California Water Company may also be entitled to claim a portion of the water discharged to surface water by Aerojet under its NPDES permits.

We would like to reserve the right to cross-examine witnesses and present relevant rebuttal evidence as this hearing proceeds.

Thank you.

H.O. SILVA: Thank you.

I apologize to the parties. Maybe we'll just have Cal-American go also since you only have an opening statement. Then we will go to Aerojet and their witnesses.

MS. DRISCOLL: Thank you.

My name is Jan Driscoll. I represent California American Water Company. California American Water Company is a water utility regulated by the Public Utilities Commission. It provides drinking water to approximately 55,000 customers in the Sacramento area. Cal-Am serves of

its service areas from groundwater obtained from the central Sacramento groundwater subbasins.

Cal-Am believes that this Board should not revise its declaration that the American River system in Sacramento County is fully appropriated. Like every other holder of groundwater rights, Cal-Am has been gravely harmed by the contamination in the groundwater basin. The magnitude of the current pumping by Aerojet and the proposed increase in that pumping is of great concern to Cal-Am. There seems to be no dispute, at least in the evidence so far, that the water that is being pumped by Aerojet is groundwater.

Pumping groundwater and then discharging it into surface water does not magically transform it into surface water. Cal-Am feels very strongly that it would be manifestly unjust to allow this water to be transformed into surface water and then allowed to be appropriated under the rules of surface water appropriation.

Those who have been harmed by the contamination should benefit from the remediation. Those who have been harmed are the ones that should receive the benefits of the water. That is the only way they could be fully compensated. The appropriate forum, we feel, for a resolution of this is a Regional Water Quality Control Board, but this State Board can aid in that resolution. The Board could facilitate a remedy by first denying the petition as requested, but

making findings of fact.

One, that the treated groundwater is discharged by Aerojet is not unappropriated surface water but is groundwater. Two, the treated groundwater is subject to the rights of rediversion and use by those with overlying or appropriative rights within the groundwater basin from which the water is pumped. And, three, the treated groundwater discharged by Aerojet shall not be diverted as surface water or treated as abandoned water, nor should it be subject to Term 91 requirements or any other terms or conditions limiting surface water diversions.

So we respectfully request that the petition be denied. And I would also at this time like to read into the record the stipulation of facts, if I may do that.

California-American Water Company is a water utility regulated by the California Public Utilities Commission. California-American provides drinking water to approximately 55,000 customers in the Sacramento area. Four of Cal-Am's systems overlie the central Sacramento groundwater subbasin. These systems serve about 30,000 connections. Over 90 percent of Cal-Am's water supplies for these four systems comes from groundwater pumped from the Sacramento central groundwater subbasin.

That concludes the stipulated facts. In addition to that, I would like to offer Robert Roscoe's testimony as a

policy statement.

H.O. SILVA: That is fine.

MS. DRISCOLL: Thank you.

H.O. SILVA: Any questions?

We are into parties presentation, Aerojet.

MR. SOMACH: Mr. Silva, while Aerojet is setting up I do have a question, and I am not certain that is --

For the record Stuart Somach on behalf of Sacramento County and Sacramento County Water Agency.

I notice that in the notice of intent to appear there were three witnesses listed by Aerojet. Yet -- and I have no idea whether or not Aerojet intends to call all three witnesses. But there was only written testimony for one of those witnesses. And if, in fact, all three are to testify we would object to the other two witnesses' testimony. But I don't know if that is their intent or not.

H.O. SILVA: Can you respond?

MS. GOLDSMITH: Mr. Somach is premature. We have one witness.

H.O. SILVA: That clarifies.

MR. SOMACH: Just cautious, not premature.

MS. GOLDSMITH: I have a short opening statement. There are copies up here.

For the benefit of the other counsel in the room we have attached to Mr. Johnson's testimony the particular

visuals that he will be testifying from, with the exception of one aerial photograph, which is AGC-3, which is the aerial that is up on the easel right now. So if you have his testimony you should be able to follow through, and I will just refer to those by their letter designation, O and whatever so you can find them.

Aerojet-General Corporation has been a resident of Sacramento since the early 1950s when it purchased land to build a rocket motor test facility. Unfortunately, one of the legacies of manufacturing and other business activities in the area has been soil and groundwater contamination by Aerojet and other entities in the Rancho Cordova area.

Beginning in the early 1980s Aerojet installed a groundwater extraction and treatment facility which we have been referring to in these proceedings as a GET, and there are a number of variations of the GET facility, to halt the off-site migration of contaminated groundwater. To date Aerojet has treated over 55,000,000,000 gallons of water. The GETs are operated pursuant to a 1989 Consent Decree between Aerojet and the U.S. Environmental Protection Agency. In addition, operation of GET E and F in the western groundwater operable unit are required in a year 2000 Record of Decision by the USEPA. Aerojet has voluntarily completed a construction of the on-site portion of the WGOU, which is the western groundwater operable

unit. And the western operable unit is the area that is outlined in blue on the aerial photograph on the easel, and is ready to begin operation of that facility at approximately 6,000 gallons per minute. Aerojet is ready to discharge this water to the river.

Moreover, Aerojet would like to see this water used. The discharge of treated groundwater from our ARGET, which is the American River GET facility, which was the initial phase GET unit and the future WGOU to the American River via an NPDES permit is at issue in this hearing.

Most of the extracted water is taken from land owned by Aerojet or leased by Aerojet for the expressed purpose of cleanup operations pursuant to federal decrees. Aerojet is committed to addressing the contamination from its facility, and is participating in this proceeding as a result of this commitment.

Aerojet's land is outlined in pink on the aerial photograph you see on the easel.

In designing, constructing and operating groundwater extraction and treatment facilities to address groundwater contamination issues, Aerojet has accumulated an enormous body of data concerning the nature of the underground water resource unit around its property. It has recorded geophysical logs from over 1,000 borings of wells and has taken semiannual water level readings in its wells since

1996. The collected information has been submitted to the regional, state and federal agencies with whom Aerojet is working, and much of the data is included in Aerojet's evidence offered in this hearing as Exhibits AGC-2 through AGC-7.

The issue before this Board is whether water that Aerojet is discharging or may discharge into the American River is water that was taken into account when the Board adopted this Declaration of Fully Appropriated Stream System. And as you have noted in your recent ruling on the objection, stream system is defined in the code as not including tributary groundwater or groundwater basins. Essentially, we believe the question is whether the water extracted by Aerojet is native groundwater or instead is induced recharge from the American River.

The Board must determine whether by extracting groundwater in its cleanup effort Aerojet is inducing additional recharge of water from the American River and, in essence, merely recirculating American River water, rather than extracting percolating groundwater. Such recirculation clearly would not provide any new water to the American River and would not justify a modification of the Fully Appropriated Stream System Declaration.

Aerojet's evidence will show that the water that it extracts from its wells is, in fact, percolating

groundwater that is not flowing in any known or definite channel and that its extraction does not induce substantial recharge from the American River. It is, in fact, new water to the surface stream.

The issue of Aerojet's responsibility to remediate groundwater contamination and provide replacement supplies to affected groundwater users is clearly an issue, but it is an issue that is before other agencies: EPA, the Regional Water Quality Control Board and others and is also the subject of litigation between the parties. Aerojet is working with these agencies and parties to meet this obligation. It is unnecessary for this Board to expand its jurisdiction by assertion of novel, significant and questionable powers to address replacement supply issues that are already before other regulatory bodies and the courts. Accordingly, Aerojet is participating in this hearing to offer its evidence concerning the nature of the groundwater extracted by its wells and urges the Board to continue on the path it has set out, determining in this hearing whether there is new water available in the American River as the result of Aerojet's remediation activities and leaving for future proceedings the fate of any such new water that it might find to have been made available.

Thank you.

Aerojet calls Thomas M. Johnson as its sole witness in these proceedings.

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DIRECT EXAMINATION OF AEROJET-GENERAL CORPORATION

BY MS. GOLDSMITH

MS. GOLDSMITH: Mr. Johnson, good morning.

MR. JOHNSON: Good morning.

MS. GOLDSMITH: Would you please state and spell your name for the reporter and give a little background on your firm?

MR. JOHNSON: Yes. My name is Thomas M. Johnson, J-o-h-n-s-o-n. I'm principal hydrogeologist, chief technical officer and senior vice president of the environmental engineering and water resources consulting firm of LFR, Levine Fricke. We are a firm that is based in 19 offices with approximately 450 people.

I have a Bachelor's degree in geology and Master's degree in geology and a Master's degree in water resources management, and I have completed most requirements for a Ph.D. degree in geology at the University of Illinois. I am also a registered geologist in the state of California. I'm a certified hydrogeologist in the state of California. I'm a registered geologist in six other states, and I'm a registered professional hydrogeologist with the American Institute of Hydrology.

MS. GOLDSMITH: Have you been recognized by any national associations or boards?

MR. JOHNSON: Yes, a variety. I guess most noteworthy I've served on the National Academy of Sciences panel on groundwater protection programs for state and local groundwater protection. I've also served on the Board of Directors of the National Groundwater Association and on the California Groundwater Resources Association.

MS. GOLDSMITH: Have you ever qualified as an expert in matters relating to hydrogeology?

MR. JOHNSON: Yes. I've testified at court, state and federal courts. I've also been retained as a court appointed neutral expert in the California Superior Court.

MS. GOLDSMITH: Can you describe your experience, please, in dealing with hydrogeology issues concerning the American River?

MR. JOHNSON: For the last approximately 12 years I've been working on issues related to groundwater supply, groundwater contamination in the vicinity of the Aerojet facility. And since 1986 when I joined the firm Levine Fricke I have been working on groundwater supply, groundwater contamination issues in the general Sacramento area.

MS. GOLDSMITH: Could you describe for us in general terms the locations of your various features related to the

Aerojet site?

MR. JOHNSON: Yes. I would like to use the aerial photograph that is up on the easel currently.

MS. GOLDSMITH: This is an aerial photograph that is contained in AGC-3.

MR. JOHNSON: Yes. I understand there are copies that have been distributed on this.

It is an aerial photograph that shows the general Aerojet site area and the general area of Rancho Cordova extending from the area of the American River, meandering from the northeast to the southwest across the northern portion of the aerial photograph. The Aerojet site is outlined, as you said, in pink lines here. The western groundwater operable unit, which is currently undergoing further remediation in the blue outline here, the American River Study Area, which would be the subject of the ARGET, or the American River Groundwater Extraction Treatment System, is located just to the west of Lake Natoma, Nimbus Dam in the northern part of the photograph.

MS. GOLDSMITH: Perhaps you can take my bucket of pens and color it in a distinct color.

MR. JOHNSON: The area of the American River Study Area is an area that I'm going to take some poetic license here, generally circle an area that includes the Gold River development in the area of the American River north of the

Aerojet facility.

MS. GOLDSMITH: You have colored that in red?

MR. JOHNSON: I have colored that in red, a red circle. Furthermore, the groundwater extraction you referred to earlier, the GET E and GET F extraction facilities in the western part of the Aerojet facility are located with the yellow triangles that I'm holding right here.

MS. GOLDSMITH: The extraction wells, as I understand, have triangles with the points pointed up on this exhibit?

MR. JOHNSON: That's correct. That is noteworthy because there have been historically recharge wells used, and they have a triangle pointed down. That would be the difference of the symbol on this particular figure.

MS. GOLDSMITH: Are there any other features of the Aerojet site that are of particular note with respect to the hydrogeology of the region?

MR. JOHNSON: Yes, basically two features. One is the Aerojet site is situated in the broad alluvial plan that extends from the Sierra Nevada foothills to the east, extending to the west representing the very thick and thickening sequence of alluvial materials that was deposited in this area.

Second of all, what is very noteworthy are the patterns, these curious sinusoidal patterns on the surface.

They represent the wide spread dredging that was done since the early 1900s for gold in the area till approximately 1961 to 1963 when that gold dredging was stopped.

MS. GOLDSMITH: Could you give us a general overview of the regional hydrogeology recharge aquifers source of water?

MR. JOHNSON: As I said, the sediments that underlie the Aerojet facility and underlie the American River Study Area, the western groundwater operable unit, consist of a large mixture of alluvial sediments, of alluvial volcanic derived sediments, and even alluvial glacial derived sediments that have flown and been eroded from the Sierra Nevada foothills to the east and have migrated to the west. They comprise a lens, a wedge of alluvial sediments that is on the order of maybe a hundred feet or so thick on the eastern part of the Aerojet site extending to more than 2- or 3,000 feet thick to the west, a very thick sequence.

Those sediments are comprised of either coarser grained permeable materials which we call aquifers and interbedded with relatively thick sequences also of finer grained materials, silts and clays, that we term aquitards. The groundwater that is present in these layers is flowing through these layers is derived from rainfall and from groundwater moving laterally from the east through these thick aquifer sequences and a lesser amount of water that does recharge from the American River.

MS. GOLDSMITH: Could you -- let's look at AGC-1(E) for example, or whatever feature you would like to look at, could you describe these aquifers and interbedding aquitards a little bit more?

MR. JOHNSON: Yes. I have one graphic here. It's a cross section, a hydrogeologic cross section. It is from the American River Study Area GET effectiveness evaluation report prepared by Aerojet.

MS. GOLDSMITH: This is AGC-1(H).

MR. JOHNSON: This is AGC-1(H), a hydrogeologic cross section D-D'. It is a cross section that extends from the Aerojet site from the south, and it is a line, a side view of the earth materials extending to the north across the American River and into the area on the north side of the American River. I am pointing to this line marked D-D' that is on the map in the lower left corner of AGC-1(H).

This particular diagram illustrates the representations of the various types of sediment intervals that are present in the area of Aerojet and, in fact, in the entire area of the Sacramento County/Sacramento Valley of alternating sequence or coarser grained materials here in the white with thicknesses of intervals of finer grained materials with a cross-hatch pattern here that would be the silts and the clays or silts that represent the less permeable aquitards. So we have the aquifers in white, basically, or the coarser

grained permeable materials in white and the cross-hatched aquitards.

This indicates the presence of what has been termed in the ARSA area or the American River Study Area about gray, the shallowest of the four aquifers defined in this area. It is an aquifer that extends depths -- it varies, but depths up to about a hundred feet. We have Aquifer B, deeper, and it is ten to 50 feet or so thick, and it extends to depths of approximately 150 deep or so. Aquifer C, a deeper, it's a thicker aquifer. It's more permeable in this area, and it is a thickness of up to 50 feet or more and depths up to 200 feet or so. Aquifer D in this area is defined as all the permeable aquifers below Aquifer C in the American River Study Area.

What is noteworthy is that even within some of these aquifers there are also aquitards that are present. But one thing that this cross section does illustrate is the prevailing continuity, the lateral continuity of the aquifer units that are present, not only the American River Study Area, but in areas throughout the Aerojet site, the nearby Mather field, the area to the south of the Aerojet site. In fact, extending throughout this part of the Sacramento Valley.

MS. GOLDSMITH: I know in your written testimony there are a number of exhibits that show cross sections like

this. Could you tell us how the data was obtained for developing these cross sections?

MR. JOHNSON: As you suggested in your opening statement, the cross sections are based on the extensive database of borings that have been conducted in this area for the installation of wells, either monitoring wells or extraction wells. Aerojet has installed borings, and they are represented here by the vertical lines on the cross sections, and which also illustrate the locations of monitoring wells and extraction well streams where they're present. It is the large database of well borings that have been installed.

MS. GOLDSMITH: Now a housekeeping detail that I want to make sure we get into the record. You have been asked to testify concerning the relationship between the American River and Aerojet's pumping from these various ARGET, GET E and F and potentially WGOU.

What information have you relied on in coming to your conclusions?

MR. JOHNSON: I relied on the information that's listed and attached to my report, and that is information that is contained in the Exhibits 2 through 7 listed at the end of my report.

MS. GOLDSMITH: Thank you.

What are your key conclusions concerning the

relationship between groundwater being extracted by Aerojet in the ARGET, the ARSA Area, and the American River?

MR. JOHNSON: With respect to the ARGET operations my key conclusions are several. Number one is based on the extensive geologic borings that define the geologic sequence, the groundwater is not flowing through known defined subterranean channel. This cross section shows the permeable intervals are laterally continuous, they extend over large distances.

Second of all, the hydrogeologic layers I just talked to are layers that are present at significant depths. They are permeable layers. They are found and traceable over long and wide distances, far beyond the immediate area of the Sacramento or -- sorry, the American River.

Thirdly, the amount of groundwater that is recharged from the American River to the subsurface is very, very small compared to the amount of groundwater flowing laterally through these thick intervals of permeable deposits and even through the aquitard intervals and between the two. And that the amount of water percolating through the land surface is very large in this area because of the dredging that has taken place that enhances rainfall infiltration and recharge.

Lastly, that the pumping from the ARGET does not induce a significant amount of recharge from the American River to

the subsurface because of the hydrogeologic setting that it occupies. The vast majority of water that the ARGET wells are pumping would not have been flowing through the American River at all if it was percolating groundwater moving laterally through the subsurface.

MS. GOLDSMITH: Having laid out your conclusions, can you give us some background on the bases of your conclusions concerning ARGET?

MR. JOHNSON: There are basically four bases.

MS. GOLDSMITH: Please refer to whatever posterboards that may be useful.

MR. JOHNSON: There are four bases. Number one has to do with the layers we were just talking about, the aquifers. There are groundwater level differences between the groundwaters in the various layers and the various aquifers. That illustrates the fact that there are intervening lower permeable layers that are present that impeded the flow of groundwater that cause the effects of what we call vertical gradients that are observed in the field. In fact, there are also differences in water levels between the groundwater and the river itself.

The area of the American River, in fact, on this particular cross section, AGC-1(H) shows on the cross section that is in the eastern portion of the area. If I look at the map that is AGC-1(D), Figure 3-1, the well

location map from the American River Study Area, in the area of extraction wells 4370 through 4380, which is the central portion of the ARGET facility area, the groundwater levels in that area below the levels of the American River, indicating separation in unsaturation zone and separation between the two, increasing to the west as the groundwater levels are lower than the river even further in the area of 4340, extraction Well 4340, where the river levels have been shown at least to be as much as 25 to 30 feet above the groundwater levels, is separation that is present between the river levels and the groundwater levels.

Second of all, the second point, has to do with the groundwater flow directions. This is a map that is 1996 observed groundwater levels. It is Figure D 2-2 from the Western Groundwater Operable Unit remedial investigation feasibility study, AGC-1(N). This is a map that shows groundwater flow directions. These are actually groundwater elevations in four layers, layer one in the upper left, layer two, layer three and layer four. These basically correspond to the aquifers A, B, C and D that we were talking about earlier. Layer one being at shallowest.

What is noteworthy here is that one of the bases for the conclusion is that if you look at the general flow direction that the groundwater flow direction in the area just north of the Aerojet facility in the American River

Study Area is transverse to the flow of the groundwater of the flow in the river, and that is important. If you note here that it flows to right angles to these contours, flow is facing in this area north of Aerojet across and beneath the American River. That is -- this is in the layer two I am pointing to currently. That would be the shallowest groundwater in that area, corresponding to the lower part of layer A or Aquifer A in the American River Study Area.

We will see that pattern again on the groundwater contamination.

Next.

The second point from these groundwater levels is it is very important to note here and for later on is the occurrence of the very large groundwater height that is present in the area east of the Aerojet facility on each one of the maps. You will note the area of highest groundwater elevations where groundwater will be flowing from is not the American River, it's an area east of Aerojet, and most obvious in layers three and four where we see the very large groundwater mound present in the area east of Aerojet.

MS. GOLDSMITH: How does that relate to the dredging tailings that we saw before?

MR. JOHNSON: That relates in part of the dredging tailings because when they did the dredging from after the early part of the century to float the dredge barge they had

to import water from the American River and they imported approximately 26,000 acre-feet a year of water to bring into the area for the dredging to be floated, and as that dredge went along it dredged the materials and then deposited behind it, and that water would be continually used to float the dredge along. That water and the dredging operation proceeded from a north and east to a south and west direction, and large amount of that water was imparted to the area east of Aerojet from the American River in the early part of 1900s.

The second point is that the large recharge area we see there reflects the large amount of groundwater flowing in from the area of the Sierra Nevada foothills and the rock mountain front runoff, we call it, moving through the subsurface and off the surface areas and rainfall in that area to the east.

MS. GOLDSMITH: As you explained to me, and this probably is just a rule of thumb, the direction of groundwater flow is at right angles to the lines?

MR. JOHNSON: Yes. For general purposes the flow of groundwater would be at right angles, perpendicular to the groundwater elevation contours.

The third point I wanted to raise and supports my conclusion has to do with contaminate flow. The diagram I'm going to show next is a map of TCE concentrations in

groundwater in what is labeled -- it's actually AGC-1(O). It is Figure 2-14, TCE in groundwater from July through September of 1995. The upper left is the upper aquifer, corresponding to the A aquifer. In the upper right here is the middle aquifer, and we have the lower aquifer and deeper aquifer below.

I have outlined in pink here the extent of the TCE plume that is present in groundwater in the upper, middle and the lower aquifers. It is very evident here that the TCE plume in the upper, the middle, the lower and to the extent there is contamination present in the deeper, it is present and across beneath the American River. It is obvious here that if you recall the groundwater flow directions I pointed to a minute ago, it is entirely consistent with the north, northwest direction or northwest direction of groundwater flow beneath the river into the area in the far side of the river. So we have concentrations of TCE migrating not -- first of all, not stopped by the river. The river was not a barrier to flow, was not a barrier to TCE contamination, and moving through, even through the shallowest zones, not just the deeper zones but the shallowest zones.

The fourth point has to do with the fact that the -- I would like to use the map of well locations again, AGC-1(D). Hydraulic testing was done by Aerojet when they did the

installation of the extraction wells. And as we recall here, there are 15 extraction wells, three wells in each of five locations. When they did the pump testing of those extraction wells, very important they monitor water levels at monitoring wells in the surrounding area, including on the other side of the river.

When they pump, for example, well 4370, they monitor water levels in monitoring wells across the river. When they pumped 4370, which is the shallowest extraction well at that location, south of the American River, they monitored and found groundwater elevation changes in the shallowest well in the opposite side of the river of .16 or .17 feet, a significant difference when you are measuring water level difference from a pump test.

MS. GOLDSMITH: Can you draw a line between the pumped test and the --

It says stopped. Do I have to stop?

H.O. SILVA: You're at 20 minutes.

MS. GOLDSMITH: I have just --

H.O. SILVA: You can go ahead and wrap up.

MS. GOLDSMITH: If you could draw lines between the pumped well and the observed wells so we can see what the relationship is, which were monitored and the aquifer level that was discussed.

MR. JOHNSON: At .17 feet the A zone. The A zone here

at 1516 and 1478 was .17 feet, and the C zone and B zone also showed effects of drawdown upwards of three feet or more in the monitoring wells across the river, on the north side of the river.

MS. GOLDSMITH: Were these comparable to changes seen on the south side of the river?

MR. JOHNSON: Yes, they were. They were very similar to levels -- changes seen on the south side of the river.

MS. GOLDSMITH: What do you draw from that conclusion?

MR. JOHNSON: That the river was not a barrier to flow. The river did not control the flow in the shallow zone beneath that river and that the groundwater migrating beneath that river did not induce a significant amount of recharge from the river.

MS. GOLDSMITH: Could you show us on probably the aerial photograph where GET E and F is located and briefly describe it?

MR. JOHNSON: GET E and F, as we said, is located in the western part of the Aerojet facility. It currently consists of 11 extraction wells, pumping approximately 3,000 --

MS. GOLDSMITH: You don't have to be a New Yorker.

MR. JOHNSON: Sorry.

-- 3,000 gallons per minute. That water is discharged to the ground surface, although there are intentions to

increase that flow to 6,000 gallons per minute and discharge that to possibly under NPDES permit to Buffalo Creek, that is in the western part of the Aerojet facility.

Pumping from the C zone, generally, and the D zone basically in the deeper aquifers than the ARGET facility pumps from on the whole.

MS. GOLDSMITH: Are your conclusions concerning the relationship of the river flows to GET E and F essentially the same as your conclusions concerning the river relationship to the ARGET pumping?

MR. JOHNSON: Yes, with an exception. There is absolutely no connection between these GET facilities and the river; they are more than -- the closest well is more than a mile from the river. They pump from deeper levels than even the shallowest wells at the river area and there is no interchange at all, much like there may be some interchange between the river and the groundwater near Nimbus Dam, there is none at all in the area of the GET facilities and GET E and F.

MS. GOLDSMITH: Would you point out briefly the areas of the WGOU unit? And are there existing wells in the WGOU unit?

MR. JOHNSON: The western groundwater operable unit is the area west of Aerojet where the contamination has migrated as far as one to two miles west of Aerojet. The

RIFS includes a proposed plan to --

MS. GOLDSMITH: What is an RIFS?

MR. JOHNSON: Remedial Investigation Feasibility Study includes extraction wells, 18 proposed extraction wells at this time, that has been approved at this point, to deal with contamination in that area. Those 18 wells would pump on the order of 4,000 gallons per minute and would be added to the treatment system at some unknown location currently and then discharged.

MS. GOLDSMITH: Are your conclusions concerning the relationship between the river and the wells proposed from the WGOU essentially the same as your conclusions for the ARGET?

MR. JOHNSON: Yes, they are. In fact, it is similar to the GET E and F. The closest well from the proposed Western Groundwater Operable Unit is only 4,000 feet from the river. It's not close to the river. The shallowest wells being pumped are C wells in the off-site areas. They are a deeper unit, more than 200 feet deep. There is a thickness of unsaturated materials near the surface of at least a hundred feet in most places.

And secondly, lastly, there are extraction wells that are municipal pumping wells that are between the area of the Western Groundwater Operable Unit wells and river that are also pumping large amounts of water. So, in fact, the

groundwater in the servicing both or providing water to the GET E and F and the groundwater providing water for the Western Groundwater Operable Unit is moving from the east to west, not from the area of the American River.

MS. GOLDSMITH: Thank you.

At this time I would like to offer into evidence Exhibits AGC-1 through AGC-7.

H.O. SILVA: Okay.

Any objection?

Hearing none, they are admitted.

Thank you.

The witness can stay there and we can get into cross.

Southern California Water Company.

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CROSS-EXAMINATION OF AEROJET-GENERAL CORPORATION

BY MR. SLATER

MR. SLATER: Good morning, Mr. Johnson.

MR. JOHNSON: Good morning.

MR. SLATER: I have a couple questions and I wanted to make sure I understood your testimony.

It is your testimony that the stratographic column that is the layers, the layering, creates a situation in which all the soils are not uniform, correct?

MR. JOHNSON: That's correct, yes.

MR. SLATER: And that would be true throughout the

American River Study area, correct?

MR. JOHNSON: Yes. The soils or the sediments are heterogeneous; they are certainly not homogeneous.

MR. SLATER: It is your opinion based upon your study that there might be lateral continuity but not vertical continuity, correct?

MR. JOHNSON: There are places where groundwater is certainly flowing vertically, but the lateral continuity of the permeable units as well as the aquitards is far more extensive than the vertical continuity.

MR. SLATER: So we can place things in time context, is the layering that you are referring to in your direct testimony, is that a new occurrence or in geologic time -- sorry.

Is that a relatively new occurrence?

MR. JOHNSON: Geologically speaking, yes, but not historically speaking. It is tens of thousands of years old.

MR. SLATER: So it is safe to say that this condition existed, say, in 1989?

MR. JOHNSON: That is correct.

MR. SLATER: And it existed in 1963?

MR. JOHNSON: Yes.

MR. SLATER: Certainly in 1958?

MR. JOHNSON: Yes.

MR. SLATER: Then I think it was also your conclusion

that the American River was not -- is not operating as a recharge boundary; is that right?

MR. JOHNSON: Yes. The movement of groundwater flow below the river of the contamination that is present on the other side of the river, and while the American River does have some water that it loses, what is more to note is that the shallowest wells across the river, the very shallowest wells have had TCE migration present in them. So that tells me it is not a significant barrier at all.

MR. SLATER: And, indeed, that was corroborated, was it not, by fact that even when you examined the flow patterns that you saw a consistency between flows on the one side of the river and the other?

MR. JOHNSON: And with the chemistry, yes.

MR. SLATER: So, again, it is your opinion that the groundwater that is pumped by Aerojet and discharged by Aerojet is percolating groundwater?

MR. JOHNSON: Yes.

MR. SLATER: And that the extraction -- the extraction by the Aerojet facilities does not induce a significant amount of recharge for the American River?

MR. JOHNSON: That's correct.

MR. SLATER: About how many hours do you think you have spent in examining the geologic conditions in and around the Aerojet site?

MR. JOHNSON: You have to ask my family that. Thousands, couple thousands; more than 12 years.

MR. SLATER: Did you call upon all of that investigation and experience in issuing your opinion here today?

MR. JOHNSON: Yes.

MR. SLATER: So is it safe to say that you have a high degree of confidence in your opinion?

MR. JOHNSON: Yes.

MR. SLATER: Have you ever met Stephen Ross?

MR. JOHNSON: Yes.

MR. SLATER: Anthony Brown?

MR. JOHNSON: Yes.

MR. SLATER: Did you discuss your testimony here today with either of those gentlemen or anybody else from Komex before you prepared your testimony?

MR. JOHNSON: No.

MR. SLATER: So you haven't collaborated with them in any way?

MR. JOHNSON: No.

MR. SLATER: Is it safe to say that your testimony here today was developed completely independent of anything Komex previously offered?

MR. JOHNSON: That is correct, yes. Aside from I have read their materials they submitted. In preparing my

testimony and my report, it is completely independent.

MR. SLATER: Indeed your testimony was submitted contemporaneously, was it not?

MR. JOHNSON: That's correct.

MR. SLATER: Have you ever talked with anyone from Southern California Water Company with regard to the preparation of your testimony here today?

MR. JOHNSON: No.

MR. SLATER: I have no further questions.

Thank you.

H.O. SILVA: Thank you.

Department of Fish and Game.

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CROSS-EXAMINATION OF AEROJET-GENERAL CORPORATION

BY DEPARTMENT OF FISH AND GAME

BY MS. DECKER

MS. DECKER: Good morning, sir.

MR. JOHNSON: Morning.

MS. DECKER: Just have a couple questions for you if I could.

When you conducted the pump test, the aquifer pump test, did you measure how much drawdown there was in the Lake Natoma?

MR. JOHNSON: When Aerojet did those, I don't believe they did, no.

MS. DECKER: Did you do any calculations for your written -- as the basis of your testimony as to the leakage from the Lake Natoma for the Folsom complex?

MR. JOHNSON: My review of their preparation for the test indicated that when you do a test like this you aside the probable maximum extent of influence, and those are the wells you would monitor, and the lake was beyond the area that would have been monitored.

MS. DECKER: But they did not do any testing to confirm that?

MR. JOHNSON: It wasn't within the area that was expected to draw down at all; it was not measured.

MS. DECKER: In your oral testimony today you discussed extraction well 4370, correct?

MR. JOHNSON: Yes.

MS. DECKER: I am not sure I got it right. I want to make sure I understand.

And this was one of the shallowest extraction wells?

MR. JOHNSON: Correct.

MS. DECKER: You said that it comes from Aquifer A or Zone A. Can you tell me once again what the drawdown was on the north side of the river?

MR. JOHNSON: On the pumped Aquifer A from 4370 I measured the water level in well 1481, which was the shallowest well on the opposite side of the river directly,

they measured 0.16 feet of drawdown.

MS. DECKER: What was the drawdown on the south side?

MS. GOLDSMITH: Excuse me, I don't think six feet was correct.

MS. DECKER: 0.16. They didn't come through. 0.16 feet, correct?

MR. JOHNSON: Yes.

MS. DECKER: Can you tell me what was the drawdown on the south side?

MR. JOHNSON: They also measured the drawdown in well 1470 on the south side of the river and a distance of approximately 1,800 or a thousand feet to the east and the drawdown on that well was relatively similar. 0.21 feet.

MS. DECKER: Are these observation wells of equidistance?

MR. JOHNSON: Roughly. I would have to measure, but I think 1470 is just a little bit further away, the one on the south side.

MS. DECKER: Do you know how much further?

MR. JOHNSON: It is not more than that hundred feet or so, I think.

MS. DECKER: Are you familiar with the aquifer test Well 4325?

MR. JOHNSON: Yes, or at least I reviewed the information. They did testing.

MS. DECKER: Are you familiar with the drawdown rates of the observation wells associated with 4325 off the top of your head?

MR. JOHNSON: I am familiar with the one that I cited, which was the drawdown in the well 1478 across the river, was 0.17 feet. There are a number of other wells they monitored that are included in their table of data.

MS. DECKER: 1478 was on the north side?

MR. JOHNSON: Correct.

MS. DECKER: You are familiar with the observation well that was on the south side that showed over four and a half times the drawdown, which would be observation well 1370 equidistance from the pump test location?

MR. JOHNSON: 1370 is cross gradient; 1478 is directly down gradient. Excuse me, 1470, is that what you said?

MS. DECKER: 1370 and 1478 were the observation wells?

MR. JOHNSON: Right.

MS. DECKER: Equidistance from the pump test location?

MR. JOHNSON: Yes. There are wells that had different water level changes that were measured both north and south of the river.

MS. DECKER: Would you say four and a half times the drawdown would be something significant?

MR. JOHNSON: It is a significant difference, but it doesn't --

MS. DECKER: Thank you, that is all I asked.

MR. JOHNSON: Significant compared to the north side of the river which would not have been expected to have any drawdown if the river were recharging.

MS. DECKER: Let me ask you one other question. Did you take samples, any samples of the sediments underlying the river to confirm your theory?

MR. JOHNSON: Which theory? I don't understand the question.

MS. DECKER: That the river is not recharging from groundwater.

MR. JOHNSON: Well, first of all, I guess there were no sediment samples that I am aware that have been sampled from the river.

MS. DECKER: Thank you very much.

No further questions.

H.O. SILVA: Thank you.

City of Sacramento.

MS. LENNIHAN: No questions.

Thank you, Mr. Silva.

H.O. SILVA: County of Sacramento.

MR. SOMACH: No questions.

H.O. SILVA: Bureau of Reclamation.

MR. TURNER: No questions.

H.O. SILVA: Regional Board.

MS. GEORGE: No questions.

H.O. SILVA: Cal-Am.

MS. DRISCOLL: No questions.

Thank you.

H.O. SILVA: Why don't we take a short break, and I think the Department of Fish and Game goes next. Why don't we come back at a quarter till, give you time to set up.

I'm sorry, staff.

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CROSS-EXAMINATION OF AEROJET-GENERAL CORPORATION

BY STAFF

MR. MURPHEY: I had one clarifying question regarding the pump test. Were the pumps test conducted where there was the pump well in one zone and observation wells were monitored in other zones in order to determine any communication between aquifers?

MR. JOHNSON: Yes, there were multiple zones that were monitored in observations.

MR. CARLTON: Did you get any idea of how much communication there was between the aquitards or between aquifers through the aquitards, generally speaking?

MR. JOHNSON: They did, and the test results are presented actually in the documents that we have submitted. There was much less vertical continuity or connection than there was laterally. There were much less changes in water

levels or observed vertically as one would expect with the fine grained materials. Some of the pump tests where there are less aquitards present, they found somewhat more connections, somewhat more changes in the water levels. On the whole, laterally, changes were a lot more.

MR. MURPHEY: That is it.

Thank you.

H.O. SILVA: Why don't we take a 15-minute break and come back at ten till. That will give you time to set up.

(Break taken.)

MS. DECKER: Morning Board Member Silva and Mr. Carlton. My name is Jennifer Decker, and I am a staff counsel for the California Department of Fish and Game.

Before we get started I would like to do a couple housekeeping issues. First is that we were ordered by the Board yesterday to produce a list of wells, well numbers and the names of the wells on which Mr. Reynolds relied in part in preparing his written testimony and in part as a basis for his expert testimony today. This is some eight to ten hours to go back through the well logs, and we are prepared to do that. And our thought is that we would serve the parties with those numbers and the party who owns those wells sometime by Wednesday. We do today have a list of the numbers of the wells that Mr. Reynolds relied on, but Fish and Game is unable to determine the owner of those wells.

And at this time the parties themselves know if they own those wells, but we do not have that information. We will get it for you.

I would be happy to pass that out to you today or to the parties. Some of them have asked for that information. We are willing to stipulate rather than the 200 wells that Mr. Reynolds looked at because many of those wells were irrelevant for his ultimate analysis. He can explain to you which wells he felt were completely irrelevant of the 200, but we have 77 in which he relied in part to prepare his written oral testimony. If that is adequate, we will stipulate to the 77. We will give you this today and we will serve the full document on the parties by Wednesday.

MS. OLSON: To clarify, he is no longer relying on the 200, but rather the 77?

MS. DECKER: The 77 wells that were relevant to this proceeding. There are many wells he looked at. They were shallow, domestic supply wells that were just irrelevant or other wells that were not relevant to the proceeding.

MS. GOLDSMITH: His testimony refers to 200 wells. I think it would be important to know which wells he thought were irrelevant as well.

MS. DECKER: We can do that. It is hours of work; he would have to go back through all that.

Do you have all of that?

MR. REYNOLDS: I didn't make copies of any of the logs that I thought were irrelevant.

MS. DECKER: Can you explain for the Board, explain why you thought some of the wells were relevant?

MR. REYNOLDS: In looking through the collection of well logs, you just go to an area, and the database presents those and you start going through microfische after microfische of well logs, not knowing what they are. They just have a number and location. And the 77 that are there are ones that were significant and presented data were important. The remainder were things like 50-foot deep dry disposal wells and cathodic protection wells for PG&E power towers, very shallow domestic wells. I am going through those. I look at them and said this does not contain pertinent data. I move on to the next one. I don't make a record of it; I didn't make a number. I come upon this record and say this one is significant. Then I print out a copy of it.

MS. DECKER: Mr. Reynolds, you did, though, keep track of how many wells you were looking at, whether you included them or did not include them, correct?

MR. REYNOLDS: Yes, I did. I just kept a tally to see how many wells did I look at in this area.

MS. DECKER: Does that help explain?

H.O. SILVA: It does. Maybe we can hear the testimony

first and then see if we have questions afterward on this point. For now why don't we --

Mr. Slater.

MR. SLATER: Board Member Silva, we'd just like our objection. We understand what the ruling is, and we'd just like our objection noted for the record. This witness is going to testify about well logs that we have no ability to cross-examine him on. We are in a hearing today. They haven't been presented. We don't know where they're located. We don't know anything about the information being testified upon. We have no ability to cross-examine him.

H.O. SILVA: I understand. Why don't we hear the testimony first.

MS. DECKER: I will close with we have attempted to stipulate. Anyone who wants to stipulate that their wells can be the primary wells that he is relying on, we are happy to do that. But, again, under California law we are not allowed to -- these wells are confidential logs. We cannot release them. These parties can release them to us. They can be subpoenaed by the parties; they can be subpoenaed by the Board, but they cannot be released by Fish and Game.

H.O. SILVA: Let's wait until we get to them. I have a couple questions, too.

MS. DECKER: Thank you very much.

Mr. Silva and Mr. Carlton, the California Department of

Fish and Game asks the Board not to revise the Declaration of Fully Appropriated Streams to accept any applications to appropriate treated groundwater discharged into the American River. The Department is very sympathetic to the fact that Southern California's wells are threatened or have been contaminated. But we do not support using this quorum or remedy to address those injuries.

As a policy issue, Fish and Game urges you to consider whether new precedence would be possibly established by the outcome of this hearing. We are concerned that this case could create a backdoor mechanism for pumping groundwater, recharacterizing that groundwater as surface water and then obtaining an appropriative right to that surface water that could not otherwise be obtained, as well previously stated by Cal-American, the magic transformation of groundwater right into a surface water right.

We are also concerned that if the American River basin moves into adjudication Southern California's petition essentially jump-starts this process and possibly gives Southern California priority over other groundwater users and surface water users.

On a substantive level, the Department of Fish and Game's evidence will show that this water is not new water, but rather is water that was accounted for by the Board in its original water budget for the Declaration of Fully

Appropriated Streams. Mr. Reynolds is an experienced and certified hydrogeologist who will testify on the California Department of Fish and Game's behalf. In the interest of time Mr. Reynolds will focus on only a few key areas and refer you to his written testimony for more information.

Mr. Reynolds will begin by briefly discussing the 1958 evidentiary record on which FAS was based. Because the question you asked for this hearing, the issue of whether the water is new water, can only be fully understood by reading the references directly relied on by the Board. Since the hearing record and the references are shelves of library space, many shelves, Mr. Reynolds will only testify today about one of the most important references cited in the FAS; that is, State Board Bulletin 21. Mr. Reynolds will testify that Bulletin 21 explains that the Board's staff spent over a year conducting a thorough investigation of the American River area before the FAS declaration was issued. Geology, flows, projected population increases, groundwater pumping and dozens of other factors were influencing the availability of water were thoroughly researched by the Board. Our evidence shows that the Board reviewed dozens of other comprehensive studies upon which it relied that spanned over 30 years before reaching its conclusions.

Importantly, Bulletin 21 includes numerous lengthy,

technical discussions about the various beneficial uses of American River flows. Our evidence will show that the analysis that the Board performed in 1958 included the question of how much surface water was needed from the American River to be allocated for groundwater recharge. In fact, most of Volume II of Bulletin 21, really thick document, is about groundwater recharge. And the Board did this analysis for a good reason. It recognized that an important beneficial use of American River surface water was groundwater recharge, in particular during the dry season.

Mr. Reynolds will summarize Bulletin 21's water budget which allocated some 64,000 acre-feet of American River flows per year for groundwater recharge. Our evidence will further show that the Board's '58 water budget was based on then available American River data, flow data, groundwater levels and needs. He will testify that the Board knew in 1958 that groundwater levels and surface water flows rose in the winter and they dropped in the summer on a cyclical, seasonal basis. At the time of the FAS the river and groundwater were hydraulically connected, and the river gained and lost surface flows to groundwater on a seasonal basis.

However, our evidence will show that nearly 100 years of flow and groundwater data confirm that the cyclical water pattern on the American River has changed since 1958. Since

the FAS, American River flows have steadily decreased and nearby groundwater levels have continued to drop, as you have heard from virtually every party to date. Our evidence shows that the declining water table has increased the head differential between the river and groundwater, thus increasing the driving force moving water out of the river and into the aquifers, basically inducing recharge. While the river and groundwater were hydraulically connected in 1958, there is now hydraulic continuity between the river and groundwater.

Our evidence will show that today the river is no longer a gaining and losing stream on a seasonal basis, but rather on the whole it is perennially losing stream. The river now feeds groundwater more than the Board calculated in 1958 which has resulted in a reduction in river flows. As more groundwater is pumped, there are lower flows in the river. Mr. Reynolds' testimony provides more than sufficient evidence to establish that water extracted by Aerojet's pumping system is not new water, but rather the water that was accounted for and relied on by the Board in its water budget that becomes the basis for the Declaration of Fully Appropriated Streams.

The importance of this understanding, the reason that the losses of surface water to groundwater were part of the original water budget is because if the surface water did

not leave the channel, it would have been available for appropriation. That water would have then been given to one of the many other petitioners who sought to appropriate water from the American River in 1958 but were denied. Today surface water losses are greater than anticipated in the FAS in part because of pumping of groundwater in the area.

Having looked through much of the hearing file and the documents referenced in the FAS, Fish and Game is of the opinion that the Board's staff expended a great deal of effort in 1958 to fully investigate and understand the complicated hydrology of the American River and the factors that impact flows and groundwater recharge in the area. Based on that understanding and that thorough investigation, the Board declared the American River flows were fully appropriated.

Fish and Game believes the petitioner has not provided sufficient data or an updated water budget to challenge the Board's conclusions in the declaration or otherwise prove that this treated groundwater is new water.

At this point I would like Mr. Reynolds to take the stand and present his direct oral testimony unless you have some questions.

H.O. SILVA: No.

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DIRECT EXAMINATION OF DEPARTMENT OF FISH AND GAME

BY MS. DECKER

MS. DECKER: Could you please state your name and title for the record, sir?

MR. REYNOLDS: My name is Stephen D. Reynolds. I am a senior engineering geologist with the Department of Conservation, California Geological Survey.

MS. DECKER: Have you looked at California Department of Fish and Game's Exhibit No. 1?

MR. REYNOLDS: Yes, I have.

MS. DECKER: Is that a true and correct copy of your resume?

MR. REYNOLDS: Yes, it is.

MS. DECKER: Can you give me a brief summary of your expert qualifications and your expertise in hydrogeology, for the record?

MR. REYNOLDS: I hold a Bachelor's of Science in geology. I am a California registered geologist and a certified engineering geologist and a certified hydrogeologist. I have 23 years of professional experience in the engineering geology and hydrogeology. My career as an engineering geologist has included working on projects throughout the Western United States and Alaska. In California I have worked as independent consultant and for public agencies in the area of hydrogeology and

environmental restoration.

Board Member Silva and Board Member Carlton, in the interest of brevity I refer you to my complete resume for additional information.

MS. DECKER: Mr. Reynolds, is a copy of your written testimony labeled as Department of Fish and Game Exhibit 32?

MR. REYNOLDS: Attached, yes, it is.

MS. DECKER: A copy of your written testimony.

Have you read this document?

MR. REYNOLDS: Yes.

MS. DECKER: Do you wish to make any corrections to your written testimony?

MR. REYNOLDS: Yes. I found clerical errors in the testimony. I have prepared and signed corrections to my testimony.

MS. DECKER: I would like to mark Mr. Reynolds' corrected testimony as Department of Fish and Game Exhibit 37 at this time.

Mr. Reynolds, with the corrections in Exhibit 37 and your written testimony 32, is your testimony a true and correct copy of your written testimony?

MR. REYNOLDS: Yes, it is.

MS. DECKER: Thank you.

Can you describe your conclusions regarding whether the Declaration of Fully Appropriated Streams should be revised

and give us a summary of the evidence on which you relied to reach those conclusions?

MR. REYNOLDS: It is my opinion that the Board should not revise the Declaration of Fully Appropriated streams. It is my opinion that groundwater pumped by Aerojet is not new water, but rather it is water that was accounted for in the original water budget prepared for the FAS.

I would like to start my testimony by reviewing what the Board knew that hydrogeologic conditions by the American River prior to the FAS. In 1958 when the Board reached its Declaration of Fully Appropriated Streams, the Board was aware that the river recharged the underlying aquifers. The Board considered groundwater recharge as one of the many beneficial uses of river flows. It included the need for groundwater recharge in its water budget. The evidentiary record for Decision 893 contains numerous technical discussions about the American River recharging groundwater.

In the interests of brevity, I will not read the detailed discussions, but rather I will refer you to my written testimony, Pages 16 to 24 and Exhibits 10 and 23 through 31. The Declaration of Fully Appropriated Streams for the American River relied on the Board's analysis found in Decision 893. Decision 893 relied heavily upon the comprehensive analysis found in the Board's Bulletin 21.

Given the importance of the Board's groundwater studies and water budget found in Bulletin 21, I have attached a complete copy of Volume IIA to my testimony.

Bulletin 21 explains that the Board spent over a year evaluating dozens of factors including such things as geology, native cover, temperatures in the American River basin, farming, seasons, topography, population, precipitation, flow data, water demands and fish and wildlife needs. The Board's conclusions are based on stream flow impairment under probable alternate conditions of development, using assumptions and data available at the time. In Bulletin 21 the Board concluded that an important beneficial use of stream flows from the American River was groundwater recharge to ensure safe yield in the basin. The hearing record confirms that the Board relied on the then available American River flow data and groundwater levels to determine the amount of surface water needed to replenish groundwater.

The Board looked at American River flows and groundwater levels prior to 1958 as well as reasonable projections of water use into the future. The Board concluded that for safe yield approximately 64,000 acre-feet of American River flows were needed annually to recharge groundwater. To independently evaluate what the pre- and post-FAS conditions were at and near the river, I reviewed

data sets for surface water flows and groundwater levels. For the American River flows I looked at data from the Fair Oaks gauge located near the Hazel Avenue Bridge. In addition to evaluate long-term trends of the American River flows, I completed a cumulative departure analysis for the data from 1905 to 1999.

MS. DECKER: Board Members, if you would, behind you is an overhead of this cumulative departure analysis from Mr. Reynolds' testimony.

Go ahead, sir. Mr. Reynolds, can you explain what is a cumulative departure analysis?

MR. REYNOLDS: In this case the cumulative departure analysis is a summation of the difference on a year-by-year basis of the annual flow in the river versus the mean annual flow.

MS. DECKER: Can you analogize that to something more concrete?

MR. REYNOLDS: Yes. It is like a checking account. The mean annual flow is your starting balance, and then you make a deposit above, so you get a positive balance or you have a negative balance when the flows are below mean. You keep a running total so that you know what the balance is of the total flow in the watershed for that time period.

MS. DECKER: Over time?

MR. REYNOLDS: Yes.

MS. DECKER: Keep going, we are running out of time.

MR. REYNOLDS: The mean annual flow that I used in this cumulative departure was derived from the data set 1934 to 1954. To correlate with the data set relied upon by the Board I generated, what I generated, mean flow used in the FAS.

The departure analysis shows that between 1905 and 1930 cumulative flows exceeded the established mean used by the Board. Now in this data the mean is represented by zero. Because that way there is no difference, when the flow is at the mean the difference is zero.

The red line on the chart is the trend line for the data set. The orientation of the trend line indicates that cumulative flows from the river have been steadily decreasing since 1930. In addition, the mean flow was no longer -- is no lower than the mean flow assumed in the FAS.

MS. DECKER: Mr. Reynolds, let me interrupt you. After 1930 is there any time period when the flows were above the mean?

MR. REYNOLDS: Yes. Right here during 1980 floods we had -- there was sufficient flows coming down so that the balance actually becomes positive. And this is a reflection of what would happen if the stream -- if the system was in balance, what would happen is that this graph would then

oscillate become and forth, and it would oscillate around the mean.

However, what gas happened now is the system is no longer doing that, as you can see, and is steadily in decline.

MS. DECKER: Keep going, please.

MR. REYNOLDS: I also performed a second cumulative analysis departure analysis using a mean value derived from the entire data set.

MS. DECKER: That data set is from which dates, please?

MR. REYNOLDS: That is 1905 to 1999.

MS. DECKER: Can you explain the resulting graph?

MR. REYNOLDS: Again, as you can see, here is 1930. The general character of this graph is similar to the previous one. The overall mean, of course, is slightly lower. So what we do is we now have a few positive departures that correspond. Again, here is the 1980 floods. But again, we don't see the cyclic nature if the system was in balance. It is just a downward trend on cumulative flows.

In addition to the flow data, I also looked at groundwater elevation data that pre- and postdated the Declaration of Fully Appropriated Streams. I see selected and graphed water elevation for five wells. Today I will discuss only two of the wells and refer you to my written

testimony for the remainder.

MS. DECKER: I know that the well logs and all the information data backing up this part of the testimony is in the record.

Go ahead, sir.

MR. REYNOLDS: Here I graphed the data set available for state well No. 8 north, 6 east, 8F001M. I use this well because it had the most complete record that I could find that both pre- and postdated the FAS.

MS. DECKER: Mr. Reynolds, let me interrupt you for a moment for the reporter's sake.

It if 8N 6E 8F 001M.

Go ahead.

MR. REYNOLDS: These data are attached to my testimony as DFG Exhibit 10.

This well is located north of Highway 59 and east of Mayhew Road, southeast of the American River. I prepared the graph of groundwater elevation data plotted against time, and time is expressed as a measurement number. It is from 1942 to 1977. This is a transparency of the graph I prepared.

This graph shows that groundwater elevation levels rise and fall in a seasonal pattern near the American River. For example, look at the water elevation plotted as measurements 20 through 31. You can see we start, go down, come up,

down, up, down, up. Seasonal pattern.

MS. DECKER: Can you explain further, is the down and the up, this is a year, these measurements are years, a full year's data?

MR. REYNOLDS: This is end of summer, early fall. This is spring, late winter and the same cycle repeats itself over and over again.

MS. DECKER: Thank you.

MR. REYNOLDS: These measurements correspond to groundwater elevation data from April 1949 through October of 1951. The groundwater levels are high during the winter months when the river is flowing high and groundwater recharge occurs. During summer months the groundwater levels drop. The data indicate that until 1958 the groundwater levels range from two to over 15 feet above on the thalweg or the bottom of the river. This indicates that the American River was hydraulically connected to groundwater at the time of the FAS declaration.

Moreover, one would expect that the American River was seasonally gaining and losing at that time. Since 1958, however, the conditions of the river have changed. The groundwater elevation levels for this well have not reached the elevation of the thalweg and has steadily declined. In 1774, for example, the groundwater elevation levels were in excess of 15 feet below the thalweg.

Looking at the long-term trend line on this graph I concluded today that groundwater levels have decreased to the point where the American River is no longer gaining and losing, what is overall a perennially losing stream.

The consequence of this change is that more of the American River flows are needed for groundwater recharge than estimated by the Board in 1958.

I also did a similar analysis for Well No. 9N 6E 27D 001M.

MS. DECKER: Mr. Reynolds, you have six minutes and 30 seconds.

MR. REYNOLDS: I am going as fast as I can.

MS. DECKER: I know.

MR. REYNOLDS: This well is located in Ancil Hoffman Park, northwest of the river in Rancho Cordova. The overhead is a copy of the graph record produced by plotting, again, groundwater elevation levels for this well over time.

MS. DECKER: Mr. Reynolds, let me interrupt you. How many years of data are we looking at here?

MR. REYNOLDS: The period is 1962 to 2000.

MS. DECKER: So that is 38 years, correct?

MR. REYNOLDS: Yes.

MS. DECKER: Thank you.

MR. REYNOLDS: The key feature of this graph is found

at measurement three, taken on March 21st, 1963. This is the last occurrence of the river being at a gaining stream at this location. That is this water level right here was higher than groundwater -- it was lower than groundwater level. This water level elevation here was higher than the stage in the stream and, therefore, groundwater was flowing into the river. It was a gaining river.

Note the overall trend line is also similar to the previous graph. Looking at the long-term trend line on this graph, I have concluded that today groundwater levels have decreased to the point that the American River is no longer experiencing seasonal gains and losses, but is rather a perennial losing stream. Again, the consequence of change is that more of the American River flows are being lost to groundwater recharge than was estimated by the Board in 1958.

To further illustrate the significance of the groundwater level data and its impacts on the American River flows, I performed cumulative departure analysis on long-term groundwater trends.

MS. OLSON: Can you reflect on the record where you pointed, the mark?

MS.DECKER: Can you pull up your previous graph? This should be Fish and Game Exhibit 11, an overhead of Fish and Game Exhibit 11, and he marked the top of the river

elevation at measurement number three, for the record.

MR. REYNOLDS: I selected this well, the same well that's used in Exhibit 10 because it had the most complete record and most extensive pre-1958 data available for wells in the vicinity.

This analysis indicates that prior to 1958 groundwater levels for this portion of the American River hovered around the mean groundwater elevation. This would be the mean. As you can see, we have some positive and then we drop down, come back up, and we come back down.

MS. DECKER: Can you note for the record that Mr. Reynolds put the mean at -- on the left-hand side of the graph.

And, Mr. Reynolds, can you please point out for the record which measurement is not 58?

MR. REYNOLDS: Right here.

MS. DECKER: Mr. Reynolds, for the record, just noted that it is measurement 42 that corresponds to 1958.

Thank you.

MR. REYNOLDS: Again, however, the cumulative departure analysis is evidence that since 1958 there has been a cumulative decline in groundwater levels near the American River, thereby inducing greater recharge from the American River.

The current quantity of recharge exceeds that estimated

by the Board, resulting in decreased flows previously allocated to for other beneficial uses in the 1958 water budget.

Thus, it is my opinion that the extracted groundwater pumped by Aerojet is not new water, but rather was water that the Board had counted on in its water budget. Having looked through many of the key documents referenced in Decision 893, it is my opinion that the Board staff expended a great deal of effort to fully investigate and understand the complicated hydrology of the American River and the factors that impact flows in groundwater recharge. Based on that understanding, they declared the American River flows fully appropriated. It is my opinion that the petitioner has not provided sufficient data, including an updated water budget, to change the Board's conclusions, or otherwise prove that the treated groundwater is new water.

Thank you.

Board Members, do you have any questions?

H.O. SILVA: Not at this point.

MS. DECKER: A minute under.

Thank you, Mr. Reynolds.

Does that conclude your testimony for today?

MR. REYNOLDS: Yes, it does.

MS. DECKER: Do you affirm that the exhibits that you attached to your written testimony and that you relied upon

are true and accurate copies of those exhibits?

MR. REYNOLDS: Yes, I do.

MS. DECKER: Did you rely upon all those exhibits in reaching your conclusions and preparing your written and oral testimony for today?

MR. REYNOLDS: Yes, I did.

MS. DECKER: I note for the record, Board Member Silva and Mr. Carlton, that we previously provided the Board with an updated exhibit list which included the full references to the voluminous documents that Mr. Reynolds referred to. They are also referred to throughout his written testimony because he relied extensively on them.

At this time I would like to move all Fish and Game exhibits, No. 1 through 37, including Mr. Reynolds' written testimony and his corrections to his written testimony into evidence at this time.

H.O. SILVA: Just want to note for the record, the last transparency up there was related to which exhibit? It wasn't clear, it didn't show on there.

MS. DECKER: That was Exhibit 15.

MR. REYNOLDS: Yes, Exhibit 15.

MR. SLATER: We would like the opportunity to cross before the evidence is moved into the record. We recognize the exhibit has been identified.

H.O. SILVA: We can do that. That is fine. We note

your objections, anyway.

Thank you.

Let's go to the crosses first, and then we'll get back to the issue of evidence.

Southern California Water Company.

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CROSS-EXAMINATION OF DEPARTMENT OF FISH AND GAME

BY SOUTHERN CALIFORNIA WATER COMPANY

BY MR. SLATER

MR. SLATER: Morning, Mr. Reynolds.

MR. REYNOLDS: Morning.

MR. SLATER: Let me cover a couple of points with you. To begin with, you indicated in your written testimony that you reviewed approximately 200 wells; is that right?

MR. REYNOLDS: I examined well logs for 200 wells, approximately 200 wells.

MR. SLATER: But you didn't attach that material to your testimony, did you?

MR. REYNOLDS: I did not attach all those, no. I didn't attach any of the well logs. They are confidential.

MR. SLATER: In light of your examination of those 200 well logs, you do concede that there are differences in the layers in the stratographic column for those wells logs, do you not?

Sorry, I will rephrase. Do you understand my question?

MS. DECKER: Rephrase it.

MR. REYNOLDS: Are you saying --

MS. DECKER: Let him ask the question.

MR. SLATER: Is there a -- are the well logs, do they reflect a difference in the soil character along the well column?

MR. REYNOLDS: Yes, they do.

MR. SLATER: Would you agree that there are clay layers in many of the well logs that are demonstrated by the log?

MR. REYNOLDS: Yes.

MR. SLATER: So we shouldn't assume that the vertical column for these wells is homogeneous, correct?

MR. REYNOLDS: That is correct.

MR. SLATER: Now it is your testimony that the American River is a losing stream, right?

MR. REYNOLDS: Yes.

MR. SLATER: And it is also your testimony that before Aerojet began extracting groundwater, treating it and dumping it, that the river was a losing stream, right?

MR. REYNOLDS: Can you be more specific on the time period?

MR. SLATER: It was your testimony on Page 7, Lines 15 to 18, that you indicated that it was a losing stream before Aerojet began. So what did you mean?

MR. REYNOLDS: That was in reference to the contour

lines that were shown in their documents. And those contour lines indicate that the river was a losing stream.

MR. SLATER: So that would be before they began, correct?

MR. REYNOLDS: That was -- my testimony states that they began extracting groundwater near the river.

MR. SLATER: I am looking for a temporal. I just want you to tell me when.

MR. REYNOLDS: Well, they started -- why I'm trying to narrow this down is the fact that they started operations in other parts of the facility, groundwater extraction, before they started extracting near the river, while their contour data was limited to those areas they were working in.

MR. SLATER: What did you mean when you testified, when you wrote your testimony, with regard to Page 7, Line 15 through 18, what time period did you have in mind?

MR. REYNOLDS: The time period that I am referencing is and would be groundwater contour elevations dated April 1995. So prior to that, it was a losing stream.

MR. SLATER: In addition, you reviewed some DWR studies, right?

MR. REYNOLDS: Yes.

MR. SLATER: You looked at Bulletin 21, for example, right?

MR. REYNOLDS: Yes, I did.

MR. SLATER: You submitted that as an exhibit, right?

MR. REYNOLDS: Yes.

MR. SLATER: In that DWR analysis, did it conclude that on an annual basis the American River was a losing stream?

MS. DECKER: Could you clarify, the DWR analysis or Bulletin 21.

MR. SLATER: Sorry, Bulletin 21.

MR. REYNOLDS: Bulletin 21 in its water budget relies on roughly 64,000 acre-feet a year of recharge from the American River.

MR. SLATER: Is it testimony, then, that in 1951 the American River was a losing stream by 64,000 acre-feet?

MR. REYNOLDS: No, it was not.

MR. SLATER: Well, let me ask you this.

In 1951 did the State Board -- sorry, did Fish and Game Exhibit 29, Bulletin 21, conclude that the American River was a losing stream?

MR. REYNOLDS: They concluded that they would have to rely on 64,000 acre-feet a year of recharge from the river. That would equate to at least a periodic and cyclic loss.

MR. SLATER: That is a net loss, correct?

MR. REYNOLDS: No, it is not.

MR. SLATER: No, it is not a net loss?

MR. REYNOLDS: No, it is not a net. Their water balance accounts for 64,000 acre-feet of coming out of --

recharging the aquifer from the river over a one-year period.

MR. SLATER: What is that offset by? If it is not a net loss, what was it offset by?

MR. REYNOLDS: I have to back up. The reason I'm hesitating is the question doesn't have any hydraulic basis. The river flows and during certain periods of time it recharges groundwater. That recharge, that loss to recharge, comes out of the river flow. And there are in the case of -- there would be other inputs to the river itself would be tributaries or in the case of prior to the FAS there was sewage treatment plants that put input into the river. There would be irrigation returns that might -- would go back to the river which were all included in the water balance.

MR. SLATER: How about from groundwater?

MR. REYNOLDS: And as the data shows, groundwater would, in fact, seasonally discharge to the river.

MR. SLATER: Was that quantified in that report?

MR. REYNOLDS: No, they did not quantify that in the report.

MR. SLATER: But they did quantify or estimate that 64,000 was lost, correct?

MR. REYNOLDS: Yes.

MR. SLATER: They further stated, did they not, that

that was an estimate that was, quote, subject to revision as more data becomes available? Didn't they say that?

MS. DECKER: Don't guess. If you don't know --

MR. REYNOLDS: I don't recall reading that. I can take the time to look for it if you would like.

MR. SLATER: No. I think the document speaks for itself. If you don't remember, I'm satisfied with that.

Don't recall?

MR. REYNOLDS: I don't recall the specific citation.

MR. SLATER: I think you also looked at some aquifer tests that were conducted by Aerojet?

MR. REYNOLDS: Yes, I did.

MR. SLATER: You reviewed the test results for Well 4325?

MR. REYNOLDS: Yes.

MR. SLATER: And do you know where that well is located?

Strike that. Let me see if I can help. If I could take a moment.

I am going to approach the witness, and this is a hard copy of what is being projected, Counsel. This document has been previously introduced in evidence marked for identification as Southern California Water Company Exhibit 9A, and it is Figure 1-1.

Do you have that in front of you?

MR. REYNOLDS: Your exhibit, yes, I have the map in front of me.

MR. SLATER: Mr. Reynolds, can you tell us by identifying Well 4325 on Exhibit 9A, Figure 1-1, can you locate that well for us on that exhibit?

MR. REYNOLDS: Yes, I can.

MR. SLATER: Would that be in the western, central or eastern area?

MS. DECKER: Relative to what?

MR. REYNOLDS: Relative to what?

MR. SLATER: The exhibit divides the river into three areas, does it not?

MR. REYNOLDS: You are asking in reference to this diagram is it in the eastern area?

MR. SLATER: That's correct.

MR. REYNOLDS: Yes, it is.

MR. SLATER: Do you know what depth the well is drilled to?

MR. REYNOLDS: I know it was in Aquifer A.

MR. SLATER: You know in Aquifer A.

Do you have your testimony in front of you? Can you look at Page 11 and Page 12? Does that refresh your recollection?

MR. REYNOLDS: Yes, it does.

MR. SLATER: What depth would it be drilled to?

MR. REYNOLDS: Ninety-eight feet.

MR. SLATER: And you looked at other test results for Well No. 4330, right?

MR. REYNOLDS: Yes, I did.

MR. SLATER: Again, could you tell us as depicted in our Exhibit 9A, Figure 1-1, is that in the western, central or eastern portion?

MR. REYNOLDS: Yes, it is in the eastern portion.

MR. SLATER: Do you know the depth of that well?

Again, you might check your testimony on Pages 11 and 12.

MR. REYNOLDS: It is 147 feet.

MR. SLATER: Do you know the depth of the bottom of the river channel?

MR. REYNOLDS: The thalweg?

MR. SLATER: What do you mean by that?

MR. REYNOLDS: The deepest part of the channel.

MR. SLATER: The deepest part of the channel?

MS. DECKER: Counsel, you mean in that location near those wells?

MR. SLATER: Yes, that is correct.

MR. REYNOLDS: USGS has a gauge there and the latest calibration for the gauge shows that the elevation of the river, the thalweg, was approximately 68.62 feet.

MR. SLATER: 68.62?

MR. REYNOLDS: Yes.

MR. SLATER: I think it was also your testimony that you were of the view that the American River was a recharge boundary; is that right?

MR. REYNOLDS: Yes.

MR. SLATER: Can you help me out by explaining what you mean by recharge boundary?

MR. REYNOLDS: A stream would lose water to the aquifer, would recharge.

MR. SLATER: I'm sorry, I'm going back to basic hydrogeology or geology. If we mean something is a boundary for recharge, what do we mean?

MR. REYNOLDS: A recharge boundary is a source of water recharging a well, recharging an aquifer.

MR. SLATER: So if I went to, for example, Todd's textbook, pulled it out, looked at it, and I wanted to know what a recharge boundary is, would you say that there are various forms of recharge boundaries like, for example, a fault? Can a fault be a recharge boundary?

MR. REYNOLDS: A fault can be either recharge boundary or a total barrier.

MR. SLATER: It could be a total barrier?

MR. REYNOLDS: Yes.

MR. SLATER: You might want to conduct a pump test if you were conducting an analysis and you wanted to determine

whether or not it was an effective recharge boundary, right?

MR. REYNOLDS: Yes, you could.

MR. SLATER: Let me offer you a hypothetical, if I can.

First fact, assume there are two wells. Right?

That is the first fact I want you to assume. And then I want you to also assume that these two wells are separated by a fault. Right?

And you are trying to conduct an analysis to see whether the fault is a boundary. Right?

So what you do is you run an aquifer test. You find when you run the test, that there is a drawdown on opposite sides of the fault.

Would this indicate that there was a recharge boundary?

MR. REYNOLDS: You would have to compare the magnitude of the drawdown at equal distances from the pumped well.

MR. SLATER: Is it your testimony that some drawdown is not demonstrative, that there is connection between or across the fault?

MS. DECKER: Restate that again, please.

(Record read as requested.)

MR. REYNOLDS: If some drawdown occurs across the fault, then the fault would be a partial or ineffective barrier.

MR. SLATER: In fact, in your DFG Exhibit 6 you included a citation to a periodical, I guess, where you indicate that the key feature of a recharge boundary is that withdrawals from the aquifer do not produce drawdown across the boundary; is that correct?

MR. REYNOLDS: Actually that discussion in the Attachment 6 is with respect to impermeable boundaries such as one might look at in a bed and banks situation.

MR. SLATER: So do you -- sorry.

Do you agree with the statement in the attachment to your testimony that says that the key feature, the key feature of a recharge boundary is that withdrawals from the aquifer do not produce drawdowns across the boundary?

MS. DECKER: Counsel, can you tell me exactly where that it is located?

MR. SLATER: Sure. I will be happy to approach.

MS. DECKER: Thank you.

MR. REYNOLDS: That would be a key future of an impermeable boundary. That is what it says in the attachment.

MR. SLATER: So your interpretation of this is -- sorry.

Does it use the word "impermeable" there?

MR. REYNOLDS: Yes, it does.

MR. SLATER: I see, in the second paragraph it uses the

word "impermeable," correct?

MR. REYNOLDS: Yes, it does.

MR. SLATER: But not in the sentence I was referencing, right?

Just so the record reflects, the second paragraph that the witness was referring to reads: The key feature of an impermeable boundary is that no water can cross it.

Correct?

MS. DECKER: We apologize. We thought that was the section he was referring to, we have where he is referring to. All right.

MR. REYNOLDS: Yes, that is what it says. The key feature is that withdrawals from the aquifer do not produce drawdowns across a boundary.

MR. SLATER: Sorry, I hate to be persistent here. There are two thoughts, are there not? The first paragraph indicates that a key feature of a recharge boundary is that withdrawals from the aquifer do not produce drawdowns across the boundary, correct?

MR. REYNOLDS: That is what it says.

MR. SLATER: The second paragraph references that an impermeable boundary is one that what water cannot cross, correct?

MR. REYNOLDS: Yes.

MR. SLATER: I think also in your testimony you

reviewed aquifer tests for, I think we said, Well 4325, right?

MR. REYNOLDS: Yes.

MR. SLATER: And you looked at the impacts on Well 1478, right?

MR. REYNOLDS: Yes.

MR. SLATER: And can you point to these locations again for our assistance here on Southern California Water Company Exhibit 9A, Figure 1-1? Can you find those, those two wells?

MR. REYNOLDS: What was the other well?

MR. SLATER: Let's start with 4325. Let's start with that. So we can identify it, is it in the western, the central or eastern portion of that exhibit?

MR. REYNOLDS: It is in the eastern portion.

MR. SLATER: It is in the eastern portion. Is it north or south of the river?

MR. REYNOLDS: It is south of the river.

MR. SLATER: How about well 1478?

MR. REYNOLDS: 1478 is north of the river.

MR. SLATER: It's north of the river. Okay.

And isn't it true that the drawdown test that was conducted examining the relationship between 4325 and 1478 detected a drawdown?

MR. REYNOLDS: Yes, it did.

MR. SLATER: You also reviewed 4330, correct?

MR. REYNOLDS: Yes, I did.

MR. SLATER: Can you locate that well on Exhibit 9A, Figure 1-1?

MR. REYNOLDS: Yes.

MR. SLATER: Is that in the western, central or eastern portion of that exhibit?

MR. REYNOLDS: It is in the eastern portion.

MR. SLATER: Is it north or south of the river?

MR. REYNOLDS: South of the river.

MR. SLATER: How about well 1478? That is north of the river, right?

MR. REYNOLDS: Yes.

MR. SLATER: There was a test conducted, correct, and that test showed drawdown, right?

MR. REYNOLDS: Yes.

MR. SLATER: On the opposite side of the river, correct?

MR. REYNOLDS: Which test?

MR. SLATER: You reviewed 4330, and its impacts on 1478?

MR. REYNOLDS: Yes.

MR. SLATER: And with regard to -- you also looked at 4335, right?

MR. REYNOLDS: Yes.

MR. SLATER: Is 4335 in the western, central or eastern portion?

MR. REYNOLDS: The eastern portion.

MR. SLATER: And you looked at the impacts on Wells 1510 and 1511, right?

MR. REYNOLDS: I don't have that data with me in my notes, so --

MR. SLATER: Did you look at the impacts of 4335 on well 1480?

MR. REYNOLDS: Yes.

MR. SLATER: And it is true that they are on opposite sides of the river, right?

MR. REYNOLDS: Yes.

MR. SLATER: One's north and one's south?

MR. REYNOLDS: Yes.

MR. SLATER: Isn't it true that in every aquifer test that you submitted along with your testimony where you examined impacts of pumping on the one side of the river, on the other side or the opposite side that there was drawdown identified?

MR. REYNOLDS: Yes.

MR. SLATER: Mr. Reynolds, find us the words "consumptive use" -- Strike that. Withdraw.

What do the words "consumptive use" mean to you in the water context?

MR. REYNOLDS: Quite frankly, they don't mean anything to me.

MR. SLATER: They don't?

MR. REYNOLDS: No.

MR. SLATER: Well, let's try the following hypothetical, see where we can go.

I want you to assume for a second that hypothetically, completely hypothetically speaking, there is a groundwater basin. Assume for a second that it is roughly 26,000 acre-feet of groundwater is being pumped and distributed for use in 1958. Okay. That is fact one. So 26,000 acre-feet being pumped and distributed for use in 1958.

I want you to also assume, second fact, that all that water is used does not find its way back to the stream. Okay.

And the third fact I want you to assume is that that groundwater basin is tributary to a river in the same manner that your testimony suggests that the Sacramento groundwater basin is tributary to the American River.

Got it? You with me?

MR. REYNOLDS: Yes.

MR. SLATER: Let's assume that one of the users stops using, only user was using 26,000, stops using 10-. Right? So they were using 26,000 before and now they stop using 10-, and the year is 2002.

Does the fact that they stop using water -- Strike that. Let me withdraw.

Doesn't the fact that they have stopped using water mean that that 10,000 acre-feet of water it is going to be available for somebody else in the groundwater basin?

MR. REYNOLDS: The question is so vague and hypothetical that you would have to look at -- a depth evaluation would have to be done in a context of conditions of the basin at the time. For example, you're talking about 1958 data and conditions and you are contrasting it with 2002.

MR. SLATER: Assume everything else is equal. Make it easy for you.

MR. REYNOLDS: Assume everything else is equal?

MR. SLATER: Check.

MS. DECKER: Can I clarify? You mean population growth, withdrawals, precipitation, no precipitation decline, every single other factor is equal?

MR. SLATER: Yes.

MS. DECKER: Go ahead.

MR. REYNOLDS: With all those stipulations, then, yes, that 10,000 acre-feet would become available.

MR. SLATER: So the simple act of forbearing or stopping the use or production of groundwater that was previously used makes water available, correct?

MR. REYNOLDS: In the hypothetical that you proposed, yes.

MR. SLATER: If you assume that that groundwater basin is tributary in the same way as you have previously suggested that the Sacramento Basin is tributary to the American River, they stop using the 10-. Wouldn't that water also be made available to the American River -- sorry, to this hypothetical river?

MS. DECKER: Can you give temporal here? He's testified that there is a seasonal difference, and you're saying as a general statement that it would be available.

MR. SLATER: I asked him to use in his analysis same criteria that he applied in concluding that the river was -- the American River was tributary to the South Sacramento -- sorry, to the Sacramento.

MR. REYNOLDS: If I was to use the same criteria that I applied in my analysis, then you would have to provide me with groundwater elevation with respect to river stage and thalweg elevation. That was the context of my analysis. This was not.

MR. SLATER: So in some circumstances, then -- that was very helpful. In some circumstances, then, the fact that the groundwater basin is tributary and the fact that somebody uses or doesn't use water may not be material to the flow in the river, right?

MR. REYNOLDS: It again would have to depend on groundwater elevations, season and elevations of the river, the elevation of thalweg.

MR. SLATER: So multiple considerations?

MR. REYNOLDS: Absolutely.

MR. SLATER: The outcome is highly variable depending on a variety of factors, right?

MR. REYNOLDS: The outcome could not be determined without having data on those factors.

MR. SLATER: I have a couple more questions. I will be brief.

Mr. Reynolds, how much time did you spend preparing your testimony for this proceeding?

MS. DECKER: I'm sorry, Counsel, could you give us the date this hearing was noticed?

MR. SLATER: I will withdraw the question.

Thank you.

H.O. SILVA: Thank you.

Aerojet.

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CROSS-EXAMINATION OF DEPARTMENT OF FISH AND GAME

BY AEROJET-GENERAL CORPORATION

BY MS. GOLDSMITH

MS. GOLDSMITH: Good morning, Mr. Reynolds.

MR. REYNOLDS: Good morning.

MS. GOLDSMITH: I'm much shorter. Good morning.

I would like to refer you to your -- I am not sure if it is Tab 3 or Exhibit 3. I wish this podium were a little larger or I was a little more organized.

H.O. SILVA: If you want, you can sit down at the table.

MS. GOLDSMITH: That would be great.

H.O. SILVA: That is available. You would be more comfortable there.

MS. GOLDSMITH: It may not make me more organized, but at least things won't fall.

I would like to ask you some questions about Tab 3M. Which I understand is a generalized cross-section of, it says structure sections across the American River at Fair Oaks and at a location downstream.

Is that right?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: This came from a drawing in a field handbook for field trip that the Association of Geologists puts out?

MR. REYNOLDS: This came from a document compiled by Dr. R.J. Schlemon, who determined geology at northern Sacramento County on behalf of the Geological Society of America in conjunction with the Association of Engineering Geologists.

MS. GOLDSMITH: There were two different dates in your

testimony, and I got a little confused as to what the relevant date was. One was 1967 and the other one was, I think 2000 and 2001.

Can you explain to us what the origination of this diagram is?

MS. DECKER: Where did you get the 2000 date?

MS. GOLDSMITH: In the footnote, I believe.

MR. REYNOLDS: Yes, that was -- the field trip was repeated again in May of 2000.

MS. GOLDSMITH: Was there any change in the material that was provided to the field trip?

MR. REYNOLDS: Not that I know of. The handbook would stay the same.

MS. GOLDSMITH: Looking at the cross section A-A', there are number of different formations that are referred to. Can you tell us what the origination of the Arroyo Seco gravel formation was? How did that come to be there?

MR. REYNOLDS: I will review the stratographic column.

MS. GOLDSMITH: Where did the material originate is my question.

MR. REYNOLDS: Material was deposited by the ancestrial American River.

MS. GOLDSMITH: Where did the American River get it?

MR. REYNOLDS: From Sierra Nevada.

MS. GOLDSMITH: What about the upper Fair Oaks that is

shown on A-A', where did that material come from?

MR. REYNOLDS: Again, deposited by ancestrial American River.

MS. GOLDSMITH: How about the river bank formation?

MR. REYNOLDS: Same.

MS. GOLDSMITH: And the Modesto formation?

MR. REYNOLDS: The same.

MS. GOLDSMITH: All of these formations were deposited by the American River over a period of millennia as it debouched into the Sacramento County?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: And I notice that you have expertise in alluvial geomorphology. Isn't it true that a river when it deposits materials, deposits different materials, different sizes of sediments and cobbles and gravels, depending on both its speed of velocity and also where in the river channel those speeds occur?

MR. REYNOLDS: In general, yes.

MS. GOLDSMITH: And there would be not only cobbles but also silts and sands and other kinds of much finer material in every age?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: I notice that -- I guess it is fair to say that in all of these formations that you've got depicted here there would be variation in the materials that would be

found within them?

MR. REYNOLDS: Yes. They would be heterogeneous.

MS. GOLDSMITH: There are question marks along the bottom of virtually -- not virtually, but every single formation here that you've got shown on A-A'.

Does that indicate that the lower elevation of those formations is not clearly understood?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: What underlies them?

MR. REYNOLDS: Underlies which formation?

MS. GOLDSMITH: Well, let's say upper Fair Oaks, for example.

MR. REYNOLDS: As you can see from both section A-A' and section B-B', you would have Laguna formation and possibly the Merton formation underlying.

MS. GOLDSMITH: Are those considered water-bearing formations?

MR. REYNOLDS: From my knowledge of wells in the area and also Bulletin 21 does state that those formations do have productive zones.

MS. GOLDSMITH: In essence, all of these formations that are shown on A-A' are permeable and have lenses of varying permeability depending on where the river was and how the formation was laid down at the time?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: What is the width or the -- well, the width of the diagram that is shown here?

MR. REYNOLDS: I will take a moment to measure.

MS. GOLDSMITH: You can estimate it. We won't hold you to it. There is a scale at the bottom that is kind of -- I just want to get it in the record.

MR. REYNOLDS: Roughly eight miles.

MS. GOLDSMITH: What I understand is shown on this exhibit is basically a historical picture of the wanderings of the American River; is that correct?

MR. REYNOLDS: That is one of the elements that was discussed in the document, yes.

MS. GOLDSMITH: It does not necessarily reflect any particular permeability of any particular point; is that right?

MR. REYNOLDS: That's correct.

MS. GOLDSMITH: You have testified in your -- and I think the same thing is generally true, isn't it, for B-B' in the same general information about historical formation?

MR. REYNOLDS: Yes, in general.

MS. GOLDSMITH: My understanding is that B-B' occurs at around the area of the Sunrise Bridge?

MR. REYNOLDS: I have to look it up for you if you want the exact location, or it is downstream of A-A'.

MS. GOLDSMITH: Do you know where A-A' is generally? I

looked it up, that is why I am asking.

MR. REYNOLDS: Yes. A-A' is located generally in Fair Oaks and B-B' is in Carmichael.

MS. GOLDSMITH: I think that -- would it be safe to say that A-A' looks like somewhat like the Hazel Avenue area?

MR. REYNOLDS: Somewhat downstream of that, but in general.

MS. GOLDSMITH: In your testimony you state at Page 6 that the American River and its associated sediments are contained with a discrete isolated and finite feature, something like a trough at the bottom of the river terraces.

By that statement -- well, I should ask you: What is the isolated finite feature you were referring to?

MR. REYNOLDS: If you notice on section B-B' you notice the channel -- there is a discrete channel demarked there that is consistent of Modesto formation, which is probably underlined by Merton formation.

And also, in Bulletin 21 they showed similar or they were referring to it as the Victor formation is confined to within an incised area of the channel, delineating a discrete area. And that in turn is underlain by either some Arroyo Seco, some Laguna, but also Merton and preMerton materials.

MS. GOLDSMITH: So basically what you've told us, it does not reflect an impermeable boundary; is that correct?

MR. REYNOLDS: The Fair Oaks formation does have a significant permeability contrast to the channel graphs, but to the south. But, no, there would not be.

MS. GOLDSMITH: As I understand your testimony, turning from our historical or prehistorical approach to other areas of your testimony, you have indicated that you and I -- you have stated that you believe the number and depths of wells in the ARSA area allows, quote, the free movement of water throughout and between the various aquifers. And I didn't write down the page number. But if you want, I can look it up and find it for you, but I wrote down the quote; is that correct?

MR. REYNOLDS: What page? We'll try to find it.

MS. GOLDSMITH: Page 10, Line 12 and 13. You are talking about your 200 well logs, which is now 77 well logs. And your testimony is that the result of the interconnection, and you are talking about interconnection by wells through aquitards, I think?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: Results in the free movement of water throughout and between the various aquifers.

Did you quantify the extent of that leakage?

MR. REYNOLDS: No, I didn't.

MS. GOLDSMITH: Were the wells that you looked at active wells?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: The 77?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: So they are pumping wells?

MR. REYNOLDS: No, some are monitoring wells.

MS. GOLDSMITH: How many of those monitoring wells were put in by Aerojet or in connection with the remediation process?

MS. DECKER: I am counseling him not to release any confidential information for the record.

MS. GOLDSMITH: A number.

MS. DECKER: Go ahead.

MR. REYNOLDS: I don't have the number off the top of my head. I have to go back and go through total inventory.

MS. GOLDSMITH: Did you look at monitoring wells that were installed by other than Aerojet or related to remediation?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: Where were they located?

MR. REYNOLDS: I don't know. Does that go to grounds of confidential?

MS. DECKER: It is all subject.

MR. REYNOLDS: These were --

MS. DECKER: For the record, we have parties that are very concerned about the release of this data, that have

told us that. So we are being cautious because we do not want to infuriate anyone further than we have on this issue.

MR. REYNOLDS: Yes, they were -- a lot of them were installed between Hazel and Sunrise.

MS. GOLDSMITH: It is very difficult to ask you without knowing where they are, how many they are and how they are constructed.

MR. SLATER: If that's an objection and request that the testimony be stricken, we join.

MS. GOLDSMITH: Well, the objection has been lodged before. I think it is an illustration of the difficulty that we face.

Are you familiar with the Aerojet monitoring wells?

MR. REYNOLDS: Yes, I am.

MS. GOLDSMITH: Are you aware that those are cased between aquifers -- sealed, I'm sorry, sealed?

MR. REYNOLDS: Which ones are you referring to? Which generation? The reason I'm asking that question is my personal, direct knowledge from working on the Aerojet facility with the Department of Toxics, I was involved in reviewing and evaluating the performance of the first and second and third generations of Aerojet multiple completion wells that were installed by McClaren. And doing performance testing on the site, we found that the multiple

completion wells, the seals between the aquifer, trying to restore the aquitard had about a 30 percent failure rate, until we finally after about four years of efforts refined and developed a process.

In my review I found that, in fact, those first three generations of wells had not all yet been destroyed.

MS. GOLDSMITH: How many of those are you relying on in your testimony?

MR. REYNOLDS: I have logs for about four of them.

MS. GOLDSMITH: Now in evaluating your pump test results, you have stated that the only source of recharge for the pumped wells is from the river, the only source within the time frame that the pumping occurred. Is that right? Do you recollect that?

MR. REYNOLDS: I state the data indicates that the American River is a source of recharge.

MS. GOLDSMITH: Can you refer me to the page you are looking at?

MS. DECKER: Do you have a specific quote?

MS. GOLDSMITH: Yes, actually I do. Page 13 at Line -- between six and seven. The only recharge source within the influence of this pumped well is the American River.

MR. REYNOLDS: Yes.

MS. GOLDSMITH: The recharge source can only be the American River because the curves for the deeper observation

wells essentially flatten out.

Do you remember that?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: Even though you have formed an opinion based on the examination of these well logs, that there is free movement of water between the aquifers, you discount that entirely as any source of recharge with pump tests?

MR. REYNOLDS: That is a possibility.

MS. GOLDSMITH: You haven't quantified the amount of leakage?

MR. REYNOLDS: No, I have not.

MS. GOLDSMITH: Looking at -- I don't have a page for you on this point. Looking at Well 4340 -- I do have one more question on the pump tests.

You have cited Applied Hydrogeology as a textbook you relied in your Exhibit Number 7. That was Fedder again.

Isn't it true that Fedder has said that that aquifer pump tests should be run for a period of 24 hours in order to account for delayed yield in sediments such as those that are present in the ARSA?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: Thank you.

Just a moment please. Would you point out for us Well 4340 on the Southern California Water Company Exhibit 9A?

MR. SLATER: Figure 1-1.

MS. GOLDSMITH: I believe it is in the central area.

Yes, it is in the western area.

H.O. SILVA: It would really help if you know where it is, just point it out instead of asking where it is. It would go much faster.

MS. GOLDSMITH: It is just north of the river in the western area.

Is it your testimony that the or do you know whether or not the materials in Aquifer A are unsaturated below the river at this point or saturated, either way?

MR. REYNOLDS: As you heard in previous testimony, that determination has not been made. Nobody has done the appropriate studies to make that determination.

MS. GOLDSMITH: Let's assume that there is a vadose zone, that is the sediments are unsaturated below the river. Is it your testimony that if the water table below that unsaturated zone drops that it would increase percolation losses from the river, the rate of percolation?

MS. DECKER: Counsel, is it completely unsaturated? You are saying unsaturated.

MS. GOLDSMITH: I am saying unsaturated.

MS. DECKER: A hundred percent unsaturated?

MS. GOLDSMITH: Except what comes from the river, I guess. If the water level in the aquifer below the river is disconnected from the river, I think -- are we on the same

page here? Would a drop in that groundwater table increase the rate of percolation from the American River?

MR. REYNOLDS: Please define disconnected. Are you saying a lack of hydraulic continuity?

MS. GOLDSMITH: Could you define hydraulic continuity?

MR. REYNOLDS: The river and the aquifers are still hydraulically linked. They are part of the same system. That is hydraulic continuity.

MS. GOLDSMITH: If the water table is 20 feet below the river bottom, would the rate of recharge increase if the water table would drop another ten feet?

MR. REYNOLDS: No.

MS. GOLDSMITH: I would like to look at your Exhibit 22, which is your departure analysis. If you could put it back up on the wall, it might be helpful.

If you were to draw a cumulative departure line from 1930, which I think you have got in yellow up there, the first negative year -- first of all, are each of those blue lines a water year or seasonal or what?

MR. REYNOLDS: Water year.

MS. GOLDSMITH: What are the units that are on the side?

MR. REYNOLDS: That is cubic feet per second.

MS. GOLDSMITH: Just so I understand this chart, because I don't, are you saying that there is 10,000

acre-feet or 10,000 cfs less per year in the mean annual flow from the American River than was estimated?

MR. REYNOLDS: No. As I explained earlier, what this chart does, it's like a checking account or banking account. What we have -- what it is is the departure analysis sums the difference between the mean and the flow of the given year, subject year. So, what we have done in this case we have the flow was significant -- this year the flow was significantly above, so that is a positive in your balance. The next year --

MS. GOLDSMITH: Excuse me, if I can interrupt you. I understand cumulative departure if we are talking about finite units of amount. In your checking account example you are talking about the balance that is in the bank, not the rate at which you spend; is that right?

MR. REYNOLDS: It would be just like your checking register, a running total of pluses and minuses.

MS. GOLDSMITH: Of the amount that is in the bank?

MR. REYNOLDS: That is a good point. I don't know that that is a very good analogy. In the sense that the zero is the mean and then what we have is in this year we had flow above the mean. This year we had a significantly lower flow than the mean.

H.O. SILVA: Could you point out the year that you mentioned? Why don't you point out the year.

MS. GOLDSMITH: My question really is whether or not a cumulative departure analysis has any application to a rate of removal rather than an amount unless you're suggesting that every year it is greater and greater. I am having trouble understanding it. I hate to give you the opportunity to clarify it, but I do have trouble with this.

MR. REYNOLDS: Again, the zero values is the mean from 1934 to 1954; that's the mean value that the Board relied on in its analysis. What this shows is that, in fact, prior to 1930 flows were, on the whole, greater than that mean. And then what we show here is that once we get to about 1930, right here, there was enough flow, years of flow, that, in fact, they were far enough below the mean, that when you sum those you end up with a negative value.

The meat of this and the power of this analysis is that it shows that it takes out the variations in just straight comparison of mean flows, which we understand a mean is very sensitive to one big year. So if you look at one big event, and if you actually look at daily flow events, the annual mean on the American River has been impacted by -- there has been huge storm events that alter the mean, but when you look at cumulative flows it takes out or buffers the affect of a single large event so that you can see overall trends in flow.

Again, even here when you had several years of well

above average flows in the river, you can see that the trend comes up here to a positive value because the sum total of this flow now is positive.

MS. GOLDSMITH: So what you are saying, then, is in around 19- -- I think I can read -- 1986, that you have a positive -- it is very difficult to read -- a positive toward the right-hand side of your Exhibit 22A would be year 1986?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: In 1986 your cumulative departure analysis would show that all the prior negatives have been wiped out?

MR. REYNOLDS: Yes. That was the flood of record.

MS. GOLDSMITH: If you were to draw a trend line from 1930, which is the first negative year, to 1986, what would that trend line look like?

MR. REYNOLDS: Of course, that trend line is a linear regression, so it would -- what it would do is it would probably flatten slightly.

MS. GOLDSMITH: I am talking about just the period I mentioned.

MR. REYNOLDS: Yes. If I were to pencil the alignment, it would flatten. It would still be negative, but it would flatten. The slope would change, but not the overall trend.

MS. GOLDSMITH: Looking at the period from 1986 through the bottom, the lowest blue line that you've got, does any hydrologic circumstance come to mind that might explain, other than groundwater drafting, does any hydrologic explanation come to mind as to why departure would be that dramatic?

MR. REYNOLDS: Drought.

MS. GOLDSMITH: There was a very serious drought in that period, wasn't there?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: Since about 1984, there have been a series of wet years?

MR. REYNOLDS: Can you restate the question?

(Record read as requested.)

MR. REYNOLDS: There have been wet years and there have also been below normal dry years in that period.

MS. GOLDSMITH: In your cumulative departure analysis is it your testimony that this reflects the influence of groundwater pumping, primarily?

MR. REYNOLDS: It is my testimony that groundwater -- the lowering of the water table and the transition from the river from cyclic gaining or losing to perennial losing is reflected in this graph.

MS. GOLDSMITH: Did you consider the influence of dredging operations that occurred in the vicinity of south

of Natomas, Lake Natoma?

MR. REYNOLDS: Dredging operations?

MS. DECKER: The historic dredging operations.

MR. REYNOLDS: Historic dredging operation. In my analysis I looked at that and some of the operational histories of those, the establishment of ponds that they did. Of course, once the dredge pond is filled, it will no longer demand water from the river. So it would have a localized impact.

MS. GOLDSMITH: You are not aware from Bulletin -- DWR Bulletin 133 that the dredging operation drafted about 26,000 acre-feet per year from the American River from 1930 to 1961?

MR. REYNOLDS: I do not recall reading that.

MS. GOLDSMITH: Did your analysis take into affect the impact of deliveries upstream of Lake Natomas?

MR. REYNOLDS: My analysis was, in fact, based on the gauge at Hazel Avenue.

MS. GOLDSMITH: So deliveries to Roseville, Fair Oaks, San Juan Water District would have been reflected in those readings, but you didn't take that into account?

MR. REYNOLDS: Those deliveries are made from below the gauge or above gauge?

MS. GOLDSMITH: From Folsom Lake.

MR. REYNOLDS: They are above the gauge. Therefore,

they are disconnected from the gauge and actually is irrelevant to the measurement at the gauge.

MS. GOLDSMITH: You looked at all of the years to come up with your cumulative departure. The question I have is did you ever do any regression analysis on the flows themselves as contrasted to a cumulative departure analysis?

MR. REYNOLDS: No, I did not.

MS. GOLDSMITH: I believe that is all I have.

H.O. SILVA: Thank you.

MS. GOLDSMITH: Wait a minute. I did have one more.

H.O. SILVA: One more.

MS. GOLDSMITH: You have said that D-893 basically allocated 64,000 acre-feet of water to recharge from the American River. Am I misstating your testimony?

MR. REYNOLDS: I would have to check. My recollection is I stated that Bulletin 29 on which 893 relies on.

MS. GOLDSMITH: You're familiar with 893?

MR. REYNOLDS: I looked through the decision in order to determine the references that they based the decision on.

MS. GOLDSMITH: Isn't it true that 893 does not assign any water to recharge of groundwater?

MR. REYNOLDS: I don't recall. Again, I skimmed 893 to look at those references which formed scientific and technical and engineering basis of the decision.

MS. GOLDSMITH: Isn't it true that the 64,000 acre-feet that was in, I guess, Bulletin 21, was not an amount that was being -- that was recharging the groundwater basin at that time?

MR. REYNOLDS: In their water balance in preparation for the FAS that was -- the 64,000 acre-feet was the amount that they determined that would be necessary for recharge from the American River to maintain the safe yield of the groundwater basin.

MS. GOLDSMITH: Under what condition?

MR. REYNOLDS: Under what they called their projected ultimate development.

MS. GOLDSMITH: Thank you.

Have you quantified the amount of water that is being recharged by the American River currently?

MR. REYNOLDS: No, I have not.

MS. GOLDSMITH: Do you have any basis for doing so?

MR. REYNOLDS: The question, could you please clarify?

MS. GOLDSMITH: You stated in your testimony that you think that the American River is now feeding the groundwater more than was calculated in 1958, and I am wondering what is the basis for that conclusion.

MR. REYNOLDS: Yes. If you look at the data for wells in the area versus the thalweg elevation versus river stage, you will find that prior to the FAS, the river -- there was

extended periods of time when the river was, in fact, gaining. That is groundwater elevation was above not only the thalweg of the river, but above river stage.

MS. GOLDSMITH: But it is true, isn't it, that based on the cumulative or the ultimate development that it was expected that the groundwater level would drop as groundwater was increasingly used to meet growth in the area?

MR. REYNOLDS: Yes.

MS. GOLDSMITH: So you really have no basis for an assertion that the American River is now contributing more than 64,000 acre-feet per year to recharge, do you?

MR. REYNOLDS: Yes, I do. It would be a relative analysis in the sense that the river has gone from cyclically being gaining and losing to being perennially losing based on the comparison of groundwater levels to river thalweg at this point.

If I may expand upon that. What we are talking about is prior to the FAS the river was a gaining stream and losing stream cyclically, on a cyclic nature. That is, the river would during summer and fall months would recharge groundwater, and then as the winter storms came through, river stage rose, it would then -- and groundwater came up in the spring, it would then -- the stream would become gaining. So now the stream is perennially losing.

So, strictly on the comparison of time, the time period

over a given year that the stream would be losing versus gaining, so it is now losing for a longer period of time and, therefore, by extrapolation you would say there is more water loss.

MS. GOLDSMITH: More water loss than?

MR. REYNOLDS: Than prior to the FAS.

MS. GOLDSMITH: More water loss than was anticipated in the FAS under ultimate development?

MR. REYNOLDS: Yes. What they anticipated based on the data they had.

MS. GOLDSMITH: Thank you.

H.O. SILVA: Thank you.

Why don't we take a quick ten-minute break and come back at quarter till 12 and try to wrap up, see if we can finish the cross, then take a late lunch.

Is that okay?

MR. SOMACH: I don't have any questions.

H.O. SILVA: Maybe -- does the City have questions?

MS. LENNIHAN: No questions.

H.O. SILVA: County.

MR. SOMACH: No questions.

H.O. SILVA: Bureau.

MR. TURNER: No questions.

H.O. SILVA: Regional Board.

MS. GEORGE: No questions.

H.O. SILVA: Cal-American.

MS. DRISCOLL: No questions.

H.O. SILVA: Why don't we -- if you don't mind, why don't we --

Do you have any redirect?

MS. DECKER: I have a couple questions I would like to ask.

H.O. SILVA: Let's do a break at a quarter till 12. Let's do a quick break.

(Break taken.)

H.O. SILVA: Ms. Decker.

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REDIRECT EXAMINATION OF DEPARTMENT OF FISH AND GAME

BY MS. DECKER

MS. DECKER: Just a couple.

Mr. Reynolds, you were just -- you have testified that the petitioner, in your opinion, has not provided sufficient data to show that this water is new water and is not accounted for in the 1958 FAS. And you were just asked about whether the groundwater recharge number which the FAS is based, 64,000 acre-feet flow needed for groundwater recharge, could be updated in a future date. If I recall, you said you didn't remember that statement was in Bulletin 21.

But I would like to know, based on your review of

Bulletin 21, the factors that the Board considered, if you were to find enough evidence and data to support a determination that this is new data, what other factors or are there other factors in Bulletin 21 that would have to be investigated today and updated to provide a new water balance that is accurate for today's purposes?

MR. REYNOLDS: There would be a number of factors. A key one, for instance, that was slated in Bulletin 21 that would be needed for revision and updating would be, for instance, the ultimate projected population for the region was 500,000. We know that is pretty low now. Other things are the conversion of land from agriculture to urban and suburban development which changes the infiltration rates for all concentrations, changes the hydrograph of the river.

MS. DECKER: Has precipitation decreased, in your opinion, as a factor?

MR. REYNOLDS: The precipitation has become -- precipitation within the American River basin has now become more variable than it has been in the past. For instance, this is a cumulative departure analysis for precipitation at Placerville. Again, this is the mean that has been established by the National Weather Service for the region and by the state --

H.O. SILVA: What exhibit number is this?

MS. DECKER: It is not. I just wanted to ask the

question, and I -- if you would, I actually --

Prefer you just answer the question based on your knowledge of the region has precipitation also decreased?

MR. REYNOLDS: Precipitation on the mean basis is staying about the same. However, when you look at precipitation as delivered in the number of storms and the amount of water delivered per storm over the period, you will find that the actual wet season is declining and that the frequency of storms is decreasing, but the intensity of storms is increasing. So the overall water in the watershed stays the same, but how it is moved through the watershed has changed.

MS. DECKER: And all these factors would need to be considered and analyzed in order to prepare an updated water budget?

MR. REYNOLDS: Yes.

MS. DECKER: For current conditions?

MR. REYNOLDS: Yes.

MS. DECKER: I have no further questions for him.

H.O. SILVA: Thank you.

Any recross on the rebuttal?

Southern California Water Company.

MR. SLATER: Yes. Just one minute.

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RECROSS-EXAMINATION OF DEPARTMENT OF FISH AND GAME

BY SOUTHERN CALIFORNIA WATER COMPANY

BY MR. SLATER

MR. SLATER: Hello again.

In response to a question that was proffered by counsel, you referenced Bulletin 21 and a potential for updating that information, right?

MR. REYNOLDS: Yes.

MR. SLATER: You indicated that there were factors that might be considered, various factors, right?

MR. REYNOLDS: Yes.

MR. SLATER: And you listed population, right?

MR. REYNOLDS: Yes.

MR. SLATER: Conversion of lands?

MR. REYNOLDS: Yes.

MR. SLATER: They might have an impact on recharge, right?

MR. REYNOLDS: Yes.

MR. SLATER: In fact, Bulletin 133 prepared by the Department of Water Resources in 1964 --

MS. DECKER: Want to get 133 for him.

MR. SLATER: This was Southern California Water Company Exhibit 12. It was also referenced in your testimony, right?

MR. REYNOLDS: I would have to review that.

Yes.

MR. SLATER: Do you remember reviewing Bulletin 133 when you prepared your testimony for today?

MR. REYNOLDS: Yes, I have reviewed and read Bulletin 133.

MR. SLATER: And if I could call your attention to Page 18 of that report. Take a look at the second paragraph for a moment, will you?

MR. REYNOLDS: Yes.

MR. SLATER: Okay. Isn't it true that the report indicates that in the period between 1953 and 1963 that groundwater storage was reduced approximately 67,000 acre-feet?

MR. REYNOLDS: That is what it says.

MR. SLATER: You don't have any reason to dispute that, do you?

MS. DECKER: Counsel says it was reduced approximately 67,000, not reduced to?

MR. SLATER: Sorry. Thanks for the clarification.

Was it reduced by approximately 67,000 acre-feet?

MR. REYNOLDS: Yes.

MR. SLATER: You don't have any reason to dispute that, do you?

MR. REYNOLDS: No, I do not.

MR. SLATER: It also indicates that there is a contemplated reduction in recharge, correct?

MR. REYNOLDS: Yes.

MR. SLATER: And that reduced recharge is a reflection of a number of factors, right?

MR? REYNOLDS: Yes.

MR. SLATER: Didn't it compliment that recharge could be reduced because of urbanization?

MR. REYNOLDS: Yes.

MR. SLATER: No further questions.

H.O. SILVA: Thank you.

Aerojet.

MS. GOLDSMITH: No recross.

H.O. SILVA: Thank you.

Fish and Game.

MS. DECKER: We are done.

H.O. SILVA: City of Sacramento.

MS. LENNIHAN: No questions.

Thank you.

H.O. SILVA: County of Sacramento.

MR. SOMACH: No questions.

H.O. SILVA: Bureau is gone.

Regional Board.

MS. GEORGE: No.

H.O. SILVA: Cal-American.

MS. DRISCOLL: No questions.

H.O. SILVA: Now we move on to the issue of evidence --

I'm sorry, staff.

Thank you.

Now we go to the issue of evidence. And I know we have some -- why don't -- we have the original submittal and then we have one submitted today, and the changes to your testimony.

Move your evidence.

MS. DECKER: I would like to move Mr. Reynolds' testimony, his correction to his testimony and all of the exhibits in which he relied, which I believe is Fish and Game 1 through 37, into evidence at this time. Be happy to stipulate pending the outcome of Ms. Olson's decision and your decision, Board's decision regarding the well logs.

H.O. SILVA: Could I hear your objections again, exactly what the basis of them are, your objections?

MR. SLATER: We have a continuing objection. To the extent that the testimony is based upon confidential information which has not made been available prior to this witness testifying, we are precluded the opportunity from cross-examining this witness, and to the extent that he has developed opinions based on confidential information that is unfair or prejudicial. So we repeat our continuing objection and request that to the extent that his testimony relies upon confidential information which has not been presented by this witness before they presented their case,

that that testimony be stricken.

MS. GOLDSMITH: Aerojet would join in that. And just note that my cross-examination illustrated the difficulty of dealing with an opinion based on evidence that we have no opportunity to look at.

MS. DECKER: We agree with the problem. We are willing to stipulate that we will make public Southern California's 21 wells and we will rely on those 21, and we can come back and do some more cross of Mr. Reynolds. We've offered to limit the number of wells to those that these parties have in their possession. We cannot release them, but they can release them to you. Or the Board can subpoena those documents. They have most of these between the two parties.

So I am a little -- I don't see the prejudice to them, other than the fact that when he is talking generally, they can't specifically say this particular well, tell me about that particular well log. But they have that evidence.

H.O. SILVA: I understand.

Any objections to the other part?

MR. SLATER: No objections.

H.O. SILVA: Anybody else?

Tell you what, I'll rule on it during lunch. I'll talk to my staff and we'll come back. Let's just make it 1:00, resume ruling on the evidence and then we will take the City

of Sacramento next.

Thank you.

We are adjourned until 1:00.

(Luncheon break.)

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AFTERNOON SESSION

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H.O. SILVA: On the issue of the -- let's wrap up the evidence submittal for Fish and Game. I did make a ruling, as you know, by letter of 2/12. I was waiting to see if I heard anything different in the testimony. To me it is still the same. We have asked Fish and Game, and they have agreed to submit a summary of their log wells, those they did use. Those will be forthcoming. You could review them. You have the opportunity if you see there is other information that you feel compelled to, you can always reopen, request to have the hearing reopened.

So I'm going to stick with my ruling on the June 12th letter on that point. With that we will take the evidence submitted by Fish and Game, noting your objection.

MR. SLATER: Thank you.

MS. GOLDSMITH: There was a small clerical error in your ruling.

H.O. SILVA: I'm sorry. Two things. At the end of Page 3 and 4 it was reversed where it said the last sentence in Page 3 where it says, in summary, regarding Fish and Game's Exhibit 32, I will allow the testimony and withhold rulings on, instead of Aerojet's motion, it would be Southern California Water Company's. And similarly Page 4 where it says, top of Page 4, first full sentence where it

says Southern California Water Company's motion, it should be Aerojet's motion.

Thank you. We did note that. For the record I will make that correction.

With that, I don't see -- is the City of Sacramento here?

Not seeing them, is the County of Sacramento ready to proceed with their --

MR. SOMACH: I think we can get started.

H.O. SILVA: I appreciate you going out of turn.

Thank you.

MR. SOMACH: I will call the witnesses up and I'll give my opening statement, and they could be up there.

H.O. SILVA: Sure, that's fine.

You weren't here, and we went to the County first.

MS. LENNIHAN: We appreciate that.

MR. SOMACH: We have prepared a written opening statement and, in fact, I think I faxed and E-mailed it to everybody. I know I provided copies to the Board. I do have extra copies, however, there if anybody in the audience wants a copy, I'll autograph those later if anybody cares to have them autographed.

Because it is written out I am not going to simply read, but I did want to highlight a couple points that we made in the opening statement because I think that they are

critical to the analysis that you ultimately are going to have to make at the Board on how to proceed with respect to the petition.

In some respects the whole issue revolves around an interesting question, and I think I posed it or raised it in the context of some cross-examination questions I asked last time. And that is what are we talking about when we are talking about "new water"?

The reality of this situation is that none of this water is new water. This water, it is water that is in the ground and is being pumped, treated and discharged based upon a regulatory scheme that is out there. And that if we've had a quibble, if we've had a problem, if we've had any kind of a issue with the way this process has proceeded it is that at least to our appearances or as we look at what is being dealt with here, there is somewhat of a piecemeal-type of approach that is being employed, and I don't know that that is by design. I think it just simply is a result of circumstances that have resulted in this water being available the way it is being made available. And I think it does present a process-related problem for the Board and it does present an analytical problem for the Board. And I am not certain that the Board will find much in the way of prior precedent to be able to guide itself as it decides how it wants to proceed.

In my opening, in my written opening statement I noted that the Board had posed five key issues. And I think I suggested there, I know I suggested there, that perhaps there should have been a preliminary key issue. And that issue should be or would have been should the "new water" in question be treated as "surface water" or as "groundwater"? Our response to that question would be that it should be treated as groundwater in a classic sense of groundwater.

And if that had been the initial question, then following from that would be a response to the first key issue that was listed in the notice and that is the State Board should not revise the declaration to allow the Division of Water Rights to accept and process water right applications to appropriate, and this comes right out of the notice, again, "treated groundwater discharged into the American River," and reason for that is because it should be dealt with as groundwater and it shouldn't be dealt with as surface water. The rest of the key issues kind of stem from that issue and they're merely the question of data, the data that gets collected if one takes a look at the first two questions as I've postulated them, that data is somewhat neutral as you move through the process.

In terms of Aerojet's motion to strike and in terms of the Board ruling with respect to certain of that testimony, the problem that we face in the context of trying to address

the question is a contextual question. And where in the process is the appropriate time to raise the questions and issues that we attempted to address fully in Mr. DeVore's testimony? We are told on one hand by the Regional Water Quality Control Board and EPA that it is not within their province, even though, in fact, I am highlighting in some respects because they asked me to do so, but even though their desire, their intention, their preferred alternative is to have the water that is being pumped, treated and discharged, earmarked for entities who are losing water supplies in the groundwater basin, they don't believe that they have the power to order that to be done.

So what we do is we find ourselves in a regulatory synapse or space here where we have clearly groundwater being pumped and treated and discharged. We are told on one hand that that is not something that the Regional Water Quality Control Board could address in the context of the why is it being produced, the whole history of its production. On the other hand, as we take a look at whether this is "new water" or not we are being told that we can't take a look at the context or the history of how the water was developed and the whole story what's being done there. So it is a very difficult situation to deal with.

But I suggest as you are grappling with the question of fully appropriated stream and how to deal with this water

that you can't ignore the context how the water was developed, how it was produced, how it was placed where it is. In that context there are certain undisputed facts that exist in this situation.

There is no dispute that the so-called new water which is the subject of the petition comes from the central Sacramento County subbasin. And there appears to be no dispute that it is percolating groundwater as opposed to surface water, as it is being pumped out of the groundwater basin. It also appears to be no dispute that there are entities that currently rely upon that water, which include many of the participants here from Southern California Water Company to Cal-Am to the County itself, and that they have certain rights, existing rights, to that water.

So treating it as new water without any of that context really ignores a very fundamental aspect of what the Board needs to dwell on and look at as it analyzes this question. It is not purely just simply a physical hydrologic question of is this water that would or wouldn't be in the river. You know where it is coming from. There is no question about it. And the real question is can you legitimately characterize it as new water subject to appropriation by someone.

The other point that I just wanted to raise, and I don't want to go into it because it is done fairly in detail

in the opening statement, is a mechanism for the Board to actually proceed down in and do what I believe it ought to do. And on Page 7 of that testimony is a theoretical, or to use something that has happened lighter, a hypothetical way that the Board might want to address this issue, which gives recognition to the fact that when the Regional Board and EPA moved forward with the pump, treat and discharge scenario they didn't do so with the intention of just making this water free for anybody to take. They did it in the context of what is a rational and reasonable decision to earmark this water in some way, shape or form for those who are being deprived of it. To do otherwise would be essentially to double penalize the purveyors in this area. They were once penalized by the contamination which shut down their wells, and now they are being victimized again by the very process that sought to help them by being told that this isn't their groundwater, that this is somehow new surface water available through the appropriation process for presumably anybody or even a limited number of people.

One final mention, and we will give limited testimony to the notion of environmental compliance. It was an issue that has been noticed and so forth. And here it is not my intention to put on evidence that goes to the ultimate question of environmental analysis, but merely the question of whether or not this is new water or whether or not this

water affects or doesn't affect the given environmental setting that exists there.

With that, I would like -- Mr. Bratovich and Mr. Link have not been sworn in yet. Mr. DeVore has, I believe.

(Oath administered by H.O. Silva.)

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DIRECT EXAMINATION OF

COUNTY OF SACRAMENTO/COUNTY WATER AGENCY

BY MR. SOMACH

MR. SOMACH: Let me begin questioning Mr. DeVore.

Can you state your name and spell it for the record?

MR. DEVORE: My name is Keith DeVore. That is K-e-i-t-h D-e-V-o-r-e.

MR. SOMACH: What is your job title?

MR. DEVORE: I am Director of Water Resources for the County of Sacramento.

MR. SOMACH: What does that entail?

MR. DEVORE: That entails -- I am in charge of drainage for the unincorporated area of the County, that includes the cities of Elk Grove and Citrus Heights and includes advising the Board on water policy matters. I also am in charge of a water district, Zone 41 of the Sacramento County Water Agency, which provides water service to about 25,000 customers. I've served in this capacity in charge of water resources for the last 12 years.

MR. SOMACH: Are you familiar with the various orders, generally, that have been issued by the EPA, and the Regional Water Quality Control Board with the central Sacramento County subbasin?

MR. DEVORE: I am generally familiar with those orders.

MR. SOMACH: In general what do they provide?

MR. DEVORE: In essence they provide that there is contaminated groundwater that has been caused by Aerojet and others, and that those orders provide that groundwater would be pumped and treated and then discharged to some point. In one particular case an NPDES permit has been approved, about 3,450 gallons per minute, would allow the water to be discharged to the Buffalo Creek and then to the American River. In other cases there have been applications for additional -- under that same scenario supplies that would be treated and discharged somewhere, either to the American River or yet to be specified.

MR. SOMACH: Can you give me an idea of the order of magnitude of what we are talking about in acre-feet?

MR. DEVORE: That is something I need to correct in my testimony. My testimony says 23,000 acre-feet; it actually exceeds 30,000 acre-feet, the order of magnitude.

MR. SOMACH: What exceeds 30,000 acre-feet?

MR. DEVORE: The amount of water that is planned to be

pumped, treated and discharged either to the American River or to, like I say, some yet to be determined location.

MR. SOMACH: Is that the -- again, I'm -- is that the so-called new water that is -- in your view, is that the so-called new water that is the subject of this hearing?

MR. DEVORE: Yes. This is groundwater that is pumped, treated and then discharged to the American River and termed new water, but it actually is groundwater.

MR. SOMACH: Does Sacramento County have a view of how this new water should be dealt with?

MR. DEVORE: This new water needs to be, if you will, preserved for those that have been damaged or those overlying groundwater basins, particularly those that have lost supplies as result of this contamination.

MR. SOMACH: Does the County view this new water as groundwater?

MR. DEVORE: Yes, we do.

MR. SOMACH: Were you a participant in the -- first of all, can you describe the Sacramento Water Forum process?

MR. DEVORE: The Water Forum process was a coalition of business, environmental, institutional or governmental entities, water purveyors, agricultural interests, all which tried to come together on a plan, how to deal with water supply for Sacramento County and the American River, primarily, the whole balance between groundwater, surface

water and how should that appropriately be handled in the future.

MR. SOMACH: Were you a participant in that process?

MR. DEVORE: Yes. I was one -- I was the County's representative and an original member of the Water Forum.

MR. SOMACH: Did the Water Forum process culminate in any kind of final product?

MR. DEVORE: Yes. The County -- the Water Forum did make recommendations that were adopted by some 39 stakeholder organizations. In 1999 -- I guess 2000 is when they were actually adopted.

MR. SOMACH: How did the Water Forum agreement deal with groundwater?

MR. DEVORE: What the Water Forum did is it made specific recommendations for sustained yield for each of three groundwater subbasins: north of the American River, the central basin we talked about, and south of the Cosumnes River in the southern part of the County. In particular in the basin that we are talking about they developed a recommendation for an annual average sustained yield of 273,000 acre-feet annually.

MR. SOMACH: What did the Water Forum agreement assume with respect to the quantity of new water that is being pumped out of the groundwater basin? How did it address that?

MR. DEVORE: The Water Forum based its recommendations on -- well, what it did is it looked at things, like, in establishing those recommendations it looked at the American River and flows in the American River and also looked then at what is the safe level of pumping that should be established based on things like contaminants, drying up wells, those types of things. It looked at what influence would these recommended sustained yields have on the picture at large and did a balance between surface water and groundwater.

MR. SOMACH: You're familiar, again, with the EPA ROD; is that correct?

MR. DEVORE: Yes.

MR. SOMACH: The Regional Water Quality Control Board orders?

MR. DEVORE: Yes.

MR. SOMACH: Do you have an opinion about what -- and I want to be careful that I articulate this correctly, I am asking whether they ordered this. Do you have an opinion as to whether or not they intended the water that was subject to the pump, treatment and discharge scheme to be used in any particular way in terms of its reuse?

MR. DEVORE: The intentions that we saw of staff is that intention was that the people that were damaged could benefit or, if you will, get back to even by trying to use

those supplies as replacement supplies for that which was lost. And then also there was a desire to, if you will, neutralize the effect of any supplies that would be pumped and treated and discharged, for instance, to the American River. Try to get that water back just so they wouldn't be lost.

MR. SOMACH: Is Exhibit No. 1 an accurate transcription of your full testimony?

MR. DEVORE: Yes, it is. I had one other correction. I used an example of the 23,000 was some 30,000 homes. So, obviously, as I corrected the statement to say more than 30,000 acre-feet that translates into more than 40,000 homes. It is like adding, treating and discharging that much groundwater is like instantaneously adding some 40,000 homes of demand to the groundwater basin. So just put an order of magnitude on it.

MR. SOMACH: Let me turn to Mr. Link and Mr. Bratovich.

I assume you will want cross-examination of the panel as a whole?

H.O. SILVA: Yes.

MR. SOMACH: Mr. Link, does Exhibit No. 2 include your testimony?

MR. LINK: Yes, it does.

MR. SOMACH: Are your qualifications and background provided for in Exhibit No. 2?

MR. LINK: That is a good summary of my qualifications, yes.

MR. SOMACH: Could you summarize that portion of your qualifications, background and knowledge that focus on the American River?

MR. LINK: Yes. My background with the American River begins in 1977 as an operator for the Bureau of Reclamation in the Central Valley operations office, and I was a supervising hydraulic engineer of that organization, beginning in 1977. I was there for about eight years. Subsequent to that time I have been in the consulting business working on issues, primarily environmental documentation and issues associated with the American River and Federal and Central Valley Project to date since 1985.

MR. SOMACH: Have you run hydrologic models of the American River?

MR. LINK: Yes, I have. That is the primary focus of the work that I'm involved in and the firms that I have been with has been the performance of hydrologic surface water models on the combined Central Valley Project and, excuse me, the State Water Project.

MR. SOMACH: As part of those hydrologic models is there an assumption of the depletions from the American River into the groundwater basins?

MR. LINK: There is a representation of depletions from

the river, that is from the American River and for all rivers, for that matter, in these models, but primarily on the American River. There is one that captures both seepage to the river and other unmonitored or unknown depletions or accretions to the river, yes.

MR. SOMACH: And what is the figure? Do you know that off the top of your head?

MR. LINK: The figure changes based upon level of development, that is whether we are looking far into the future or current levels of development. That is land use development and land use. Those vary, and it is not a single figure for any particular year. We do a 70-year representation of conditions, and that varies somewhere on an annual basis between 50- and a hundred thousand acre-feet, and that is always a depletion.

MR. SOMACH: It is a loss from the river into the groundwater basin?

MR. LINK: That is correct. Or to wherever it is going, but, yes, we presume the groundwater basin.

MR. SOMACH: Mr. Bratovich, does Exhibit No. 2 include a summary or does it include your qualifications, background and experience?

MR. BRATOVICH: It includes a summary of them, yes.

MR. SOMACH: I guess it couldn't include them themselves.

Could you briefly summarize that portion of your background, qualifications and experiences that focuses on the American River?

MR. BRATOVICH: I first began working on the American River in 1984, and I have worked consistently on American River issues since then and I continue to today.

I was asked and I did author the section in the Anadromous Fish Restoration Program for the use of Fish and Wildlife Service as well as for the California Department of Fish and Game. I have been retained on continuing jurisdiction technical committees and am currently involved in -- actually I was the principal scientist in the Water Forum EIR that Mr. DeVore referred to, and I continue to be involved in developing a flow management plan as an updated standard for the Lower American River today.

MR. SOMACH: Mr. Bratovich, can you explain -- Exhibit No. 2 both includes both your testimony as well as Mr. Link's. Can you explain how that testimony was put together?

MR. BRATOVICH: We jointly prepared the testimony. We always work together on trying to evaluate potential impacts on the American River system, as Mr. Link indicated, based upon computer simulation of -- using hydraulic models. But we jointly prepared the background section. We jointly prepared descriptions of recent regulatory processes and

environmental documentation. And then Mr. Link took the lead in preparing elements specifically referring to hydrologic and modeling issues, and I took the lead in preparing sections pertaining to biologic interpretations of those results.

MR. SOMACH: Can you briefly summarize what your conclusions are with respect to the impacts of reuse of the so-called new water that is the subject of this hearing?

MR. BRATOVICH: Yes. Briefly, it is my professional opinion that a change in flow of that which is permitted under the NPDES permit of 3,450 gallons per minute, which equates to approximately 7.7 cubic feet per second, changes in flow in the Lower American River of that magnitude would not result in any significant environmental effect, positive, negative or otherwise.

MR. SOMACH: That is it. That is our testimony.

MS. DECKER: Mr. Silva, could I object? We have not presented our fishery evidence or public trust evidence as noted in the hearing and as you directed us to do. We have no need to cross him at this point, but we want to make it clear for the record that we do not agree which his conclusion and are not prepared at this time to testify on that issue.

H.O. SILVA: Objection noted.

Down the list. Southern California Water Company.

CROSS-EXAMINATION OF

COUNTY OF SACRAMENTO/COUNTY WATER AGENCY

BY SOUTHERN CALIFORNIA WATER COMPANY

BY MR. SLATER

MR. SLATER: Good afternoon.

MR. DEVORE: Good afternoon.

MR. BRATOVICH: Good afternoon.

MR. LINK: Good afternoon.

MR. SLATER: Mr. DeVore, I just have a few questions for you. Again, I think you testified on direct that you have personal knowledge of the Regional Board orders regarding the extraction, treatment and discharge of groundwater?

MR. DEVORE: Yes, I have general knowledge of those.

MR. SLATER: I believe you testified, again on direct, that it was your understanding of the Regional Board's intention that the water pumped, treated and discharged should be reserved for those parties who were harmed by the contamination?

MR. DEVORE: Yes.

MR. SLATER: Sorry, that was yes?

MR. DEVORE: Yes, that is a yes.

MR. SLATER: If the State Board were to limit the revision of the FAS petition to only those parties who had been harmed by the contamination so that only they could

process applications for the discharged water, would that be consistent with the Regional Board's intent, in your mind?

MR. TURNER: I would object to that, Mr. Silva. We are -- I think we're starting to get into the issue that was supposed to be dealt with in the second phase. If the Board is going to be addressing appropriation of this water to who should it be appropriated, that is --

MR. SLATER: May I be heard?

H.O. SILVA: As long as you don't go too far. Couple more questions.

MR. SLATER: I only have two more questions. And the reason it is relevant is, again as I indicated in my opening statement, the question of who succeeds in the application is for a separate hearing. But the Board has jurisdiction. There is precedent for the Board limiting who may process an application under the FAS declaration.

So, with that question?

MR. DEVORE: Yes.

MR. SLATER: Mr. Somach in his written opening referenced a condition known as Term 91. Are you aware of Term 91?

MR. DEVORE: Yes.

MR. SLATER: Is it the County's view that if water, groundwater, is extracted, treated and discharged into the known and defined channel of Buffalo Creek and then

ultimately the American River, that Term 91 should be applied to that water?

MR. DEVORE: Term 91 should not be applied to that water.

MR. SLATER: Isn't that because the application of Term 91 would serve to undercut or diminish the benefit that the Regional Board intended in making that treated water available for the harmed parties?

MR. DEVORE: Yes. The reason I hesitated is that I believe Term 91 is applicable to surface water, and this is not surface water.

MR. SLATER: So even though the water was discharged into an open or a known and defined channel, which is Buffalo Creek, and even though it may be present in the American River, thus, because its origin is groundwater, Term 91 ought not to apply?

MR. DEVORE: Yes, it doesn't change the nature of the water.

MR. SLATER: Thank you.

H.O. SILVA: Thank you.

Aerojet.

MR. ROBINSON: No questions.

H.O. SILVA: Fish and Game, I think you noted you have no questions?

How about the City of Sacramento?

MS. LENNIHAN: No questions.

H.O. SILVA: Bureau.

MR. TURNER: I just had one question. I want to make sure in connection with the objection I raised a minute ago. There are numerous questions that I would be interested in posing to these witnesses with respect to the manner in which this water should be allocated among the affected parties, assuming it is treated as groundwater, but I assume that is premature at this phase.

Correct?

H.O. SILVA: It would go a little bit farther, but I allowed it. Noted that we are going to do this in the second phase if we get to a second phase.

MR. TURNER: So I have no questions.

MR. SOMACH: Mr. Silva, may I just simply pose this in the way of a question to the Board, and that is: If there is no second phase and that was, of course, how I responded to the motion to exclude evidence, but if there is no second phase, the type of position that has been articulated in the opening and will be amplified in the closing legal brief, that very question, the issue becomes very material to the Board's deliberations. I want to make certain that in the context of my addressing Mr. Turner's comment to the Board that at least that position or that assertion of position is not lost.

H.O. SILVA: Go on.

MR. SLATER: I will be brief, just for clarification. If this Board were to do nothing, by default this discharged water would become available and potentially subject to use by others. We filed a petition to revise the fully appropriated stream status. We have said by open stipulation that it is relevant to the Board's consideration of that to what parties it allows to process an application. So in the context of its reopening the FAS designation, we think the Board has jurisdiction to decide for whose benefit and on what circumstances it is open. If the Board elects to open, there still remains the question that relates to each party's filing as to whether they should receive the water.

H.O. SILVA: Fully noted. We understand it is a very complicated issue. We are treading on some new ground.

Thank you.

How about Regional Board?

MS. GEORGE: I do have a couple of questions.

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CROSS-EXAMINATION OF

COUNTY OF SACRAMENTO/COUNTY WATER AGENCY

BY CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

BY MS. GEORGE

MS. GEORGE: Good Afternoon. My questions are for Mr.

DeVore.

You don't speak for the Regional Board, do you?

MR. DEVORE: No.

MS. GEORGE: You don't purport to actually know the intent in issuing the order?

MR. DEVORE: I based -- I won't purport to know the full intent.

MS. GEORGE: The existing NPDES permit that you referred to that authorizes discharge to surface water does not actually express an intent regarding a source of replacement water for contaminated water supplies, does it?

MR. DEVORE: Well, I would think that it does. I think that there are some implications when you talk about replacement water supplies. I grouped perhaps -- I grouped my response as to the orders.

MS. GEORGE: Which orders were you referring to?

MR. DEVORE: We talked about the Record of Decision. We talked about the partial consent decree. I talked about those collectively.

MS. GEORGE: The Record of Decision was issued by USEPA?

MR. DEVORE: Yes.

MS. GEORGE: The Regional Board was not a party to that?

MR. DEVORE: That's correct.

MS. GEORGE: There is a revised existing -- a revised NPDES permit that was recently circulated for public review.

Did you include that in your grouping?

MR. DEVORE: I did.

MS. GEORGE: That revised permit does express an intent that discharged water be used for replacement water to the extent other water supplies are not available. Is that your understanding?

MR. DEVORE: That is my understanding.

MS. GEORGE: Thank you.

H.O. SILVA: Thank you.

Cal-American.

MS. DRISCOLL: No questions.

H.O. SILVA: Any redirect?

MR. SOMACH: No, I have no redirect.

Thank you. I think we are done.

MR. SOMACH: I have to get my exhibits in. If I could offer my exhibits, and I also want to make an offer of proof with respect to those portions of Exhibit No. 1 that were ordered excluded. I would like the record to reflect that offer of proof.

MR. SLATER: No objection here.

H.O. SILVA: I don't think we understand the offer.

MR. SOMACH: We have excluded evidence. Theoretically that means it is stricken from the record. I believe that it is appropriate evidence, and the only way I can make certain that the record preserves that evidence in case

there is an appeal of this Board's order is to make an offer of proof with respect to that evidence. And that is the purpose, and it would obviously be the rest I am offering as evidence, that which you have said should be excluded I am offering in the form of an offer of proof.

H.O. SILVA: That helps.

No objection.

So we accept your evidence into the record.

Thank you.

Move on, City of Sacramento.

MS. LENNIHAN: Thank you, Mr. Silva. I have a written opening statement. I've just given you the original and five copies. I will put copies for the other parties out on the table.

H.O. SILVA: Thank you.

MS. LENNIHAN: Thank you.

My name is Martha Lennihan. I am here representing the City of Sacramento. We have a very brief presentation for you this afternoon. The City is a major downstream water rights holder, as most of you know, on the American River. The sites of the City's points of diversion are all well downstream of the area at issue in this proceeding, i.e., the discharge of the treated groundwater to Lower American River.

We are concerned, of course, that our water rights not

be adversely affected by whatever determination the Board might make in this proceeding.

The issue before the Board in our view is whether any of this groundwater being and in the future proposed to be pumped, treated and discharged would have tributary to the American River at the time that the orders of the Board upon which the fully appropriated determination were premised were made. There has been a variety of different dates in the different testimony and opening statement, and it is our view that it is that time period dating back to 1958 through the early 1960s that is at issue.

If there is any of this so-called new water that was not taken into account by the Board at that time, then an additional very significant issue which has been in part debated is what happens to that water, who should have the benefit of that water. The Board has, I think, made it clear that that is not a subject for today's testimony and, therefore, we are not putting on any evidence in that respect.

While the Board has narrowly scoped this proceeding, as we just saw in the discussion that preceded this and otherwise, you are allowing considerable testimony that goes outside of the scope that you defined. And in addition, a number of written submittals that we have seen contain statements which either go beyond the scope or

mischaracterize the scope. So we would just like to strongly recommend that this will not be a problem, provided that the Board is very careful in the findings and determination it makes and avoids compromising the due process of this proceeding but limiting itself as articulated by you during the prehearing conference and, of course, the correspondence that preceded that prehearing conference.

The Southern California Water Company and others, including the County that have wells that are being impaired and taken out of production, are in, in our view, a very sympathetic position. We do not know whether this source of supply is the appropriate source of supply to replace their water, but we do know that they need an adequate municipal supply, and we would support them in that respect.

Our goal in this proceeding isn't to engender any particular outcome, but to make sure that the City's water rights are not adversely affected while the Board proceeds with the business before it, whether the water be characterized as ground or surface water, new water or whatever.

Subject to that criterion, i.e., no harm to the City, we would encourage the parties, particularly Aerojet, Southern California Water Company and perhaps the County, to get together. I understood Ms. Goldsmith to say that you

are getting together and negotiating, but it seems to us that really there could be a physical solution arrived at that would resolve this in a more productive way than perhaps the proceedings that we are now engaged in. And we encourage the Board to support the parties to do so.

Turning to today's hearing, the very narrow question presented, we did what I will call a reconnaissance level review at the very onset. You will recall the prehearing conference there was a very limited set of material that had been submitted by Southern California Water Company to the Board and to the parties. And so the testimony that the City is providing today is a reconnaissance level-type analysis of that information. At that time, of course, we did not have the direct evidence of the other parties because all parties submit concurrently. We do not see fit to proceed with a more in-depth analysis seeing as being the role of other parties to this proceeding.

With that, what I would like to do is ask the two witnesses of the City to come forward. Actually, I think that Mr. Reents has not been sworn. He needs to be sworn in. I think that Mr. Wagner has been sworn in.

(Oath administered by H.O. Silva.)

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DIRECT EXAMINATION OF THE CITY OF SACRAMENTO

BY MS. LENNIHAN

MS. LENNIHAN: Thank you.

Mr. Reents, you have two exhibits. The first exhibit is Exhibit A, which is the written testimony of Gary Reents. The second one is Exhibit B, which is the City's four American River water rights.

Do you affirm that your testimony and those exhibits are true and correct?

MR. REENTS: I do.

MS. LENNIHAN: Mr. Reents, if you could give us an outline of your background and also a brief summary of your testimony.

Thank you.

MR. REENTS: My name is Gary Reents. I am a registered civil engineer in the state of California, and since July of 1995 I have held the position of Engineering Services Manager for the Department of Utilities in the City of Sacramento.

The Department of Utilities manages the City's water diversions, treatment and distribution, including its diversions from the Lower American River. That is at the Fairborn Water Treatment Plant. I am familiar with the City's water supply facilities and all of its operations. As Ms. Lennihan stated, we have listed -- the City holds

four water rights permit, and they are listed in my testimony, included as City Exhibit B.

The City's primary points of diversion for these permits are near the confluence of the American and Sacramento River, downstream of the location of Aerojet's remediation project and Southern California Water's proposed diversion of groundwater. The City uses and relies upon this water supply derived from these water rights to provide municipal and industrial water for our residents and businesses within our places of use. And the City also has a water right contract, settlement contract -- let me back up. The City has a water right settlement contract with the U.S. Bureau of Reclamation.

As Ms. Lennihan stated, we are appearing in this proceeding for the purpose of protecting the City's water rights and because a reduction in flows in the American River, particularly under low flow conditions, can cause a significant burden on the City. The City believes the State Board should not grant relief from the Declaration of Full Appropriation for the American River unless it is clear that this new water is not taken into account in the decision upon which the existing determination of full appropriation is premised.

That is the extent of it.

MS. LENNIHAN: Thank you, Mr. Reents.

With your permission I'll just go forward with Mr. Wagner now and allow cross-examination as a panel.

H.O. SILVA: Yes.

MS. LENNIHAN: Mr. Wagner, your written testimony is City Exhibit C and then attached to that are exhibits through City Exhibit J; is that correct?

MR. WAGNER: Yes.

MS. LENNIHAN: Do you affirm that those exhibits, your testimony and the exhibits attached thereto, are true and correct?

MR. WAGNER: Yes.

MS. LENNIHAN: Would you please describe for the Board your background and expertise?

MR. WAGNER: Yes. My name is Robert Wagner, W-a-g-n-e-r. I am a licensed civil engineer in the state of California and practice primarily in the areas of water resources, management, hydrology studies, things of that nature related to water rights determinations and evaluations. Presently I serve in the capacity as an engineer for the Mojave Basin Area Watermaster. The watermaster administers major groundwater adjudication in San Bernardino County, involving about 500 parties and approximately 1,500 wells.

MS. LENNIHAN: Mr. Wagner, have you been qualified as an expert in hydrology before?

MR. WAGNER. Yes, I have.

MS. LENNIHAN: Where was that?

MR. WAGNER: In Riverside County Superior Court, San Bernardino County Superior Court and before this Board in 1995, I believe.

MS. LENNIHAN: Thank you.

Mr. Wagner, if you could briefly summarize your written testimony and we'll allow the Board and parties to look at it in detail, given it has been submitted in writing.

MR. WAGNER: Briefly summarize the issue that I focused on, which I think was set forth by the Board in a letter dated May 1st, 2002 -- I'm sorry, excuse me, April 26th, 2002, which sort of defined, I think, the issue before us, which is whether the water sought by the petitioner, Southern California Water Company, is new water. And new water is defined in that direction from the Board, water that was not previously considered at the time the Lower American River became fully appropriated or was declared fully appropriated by the decisions that led to its listing in 1989.

In order to do that we conducted a reconnaissance level investigation of material that had been submitted by the petitioner, as well as some documents that were prepared by Aerojet and available. And concentrated on the interaction between the groundwater system and the surface water

system. And in doing so, I focused that investigation on the ARGET project, roughly, although I think it has been described in some detail in testimony. But generally that area is located in the vicinity of Nimbus Dam between Hazel Avenue and Sunrise Boulevard on both not the north and south side of the American River. The ARGET program, the American River Groundwater Extraction Treatment program, that Aerojet is implementing, there is a significant amount of data in that area of monitoring wells, extraction wells, and I think it gives a good picture of the surface groundwater interactions in that area.

There is a summary that I prepared, actually an exhibit, City Exhibit E, which shows the area and its location and also the location of the extraction wells and monitoring wells. Also on City Exhibit E, is shown groundwater elevations as measured in those monitoring wells in the various wells, and they are shown in relationship to the location of the wells on City Exhibit E. What this exhibit indicates is that on the far eastern end of ARGET area there is clear interaction between the groundwater and the surface water, or between the groundwater system and the river system. That interaction becomes less defined as we move in a down gradient direction, which would be toward the west, and would appear to, at some point, become the groundwater system becomes disconnected from the surface

water system.

In order to get a little more insight into what that means I wanted to have some idea of where the groundwater surface was relative to the bottom of the channel. What was I think previously discussed or called the thalweg or the lowest point of river channel. And what I did was I looked for some indication of what the elevation of river bottom was, and I obtained that from the United States Geological Survey. They indicated in the area where they make a measurement for the USGS gauge, at what is called USGS gauging station at Fair Oaks, which is downstream from Hazel Avenue. At the point where they make their measurement on a particular date, they gave me an average channel bottom elevation of 68.26 feet above mean sea level. I think it is significant to point out that that really represents an average elevation of the river, not the actual bottom of the river. But I think for to the purposes of the analysis I have done, it is sufficient.

I want to point out that that information that was obtained from USGS is contained in City Exhibit H.

And I want to move on to City Exhibit I which is a bar graph of water surface elevations in various monitoring wells that are shown on City Exhibit E. And these elevations were taken from those monitoring wells on three dates: October '98, April '99 and October '99.

Exhibit I, taken together with Exhibit E, I think, gives us a pretty good picture of what is happening in the groundwater-surface water system in the eastern end of the Lower American River and the interconnections between the groundwater and the surface water. And it would appear that there is some interconnection.

To understand at least to some extent what happened in the past, which I think is fairly important here, I looked at -- reviewed Department of Water Resources Bulletin 133. And the purpose was to get some idea of whether there was more connectiveness, more hydrologic connectivity with the groundwater and surface water system in the past than there is at the point in time that we are talking about for the ARGET study.

And I think that Bulletin 133 indicates and the information that I have included here in City Exhibit J is a page of text from that bulletin, Page 18, and two plates, Plate 5 and Plate 6, both from 133. They are entitled Lines of Equal Elevation of Water in Wells. One of them, Plate 5, is elevations spring 1946 and spring 1953. And the other, Plate 6, is spring 1962 and spring 1963. I think the indication from City Exhibit J is that there was some degree of -- additional degree of hydraulic connectiveness in the past, more so than there is presently.

MS. LENNIHAN: Thank you, Mr. Wagner.

With that, we would offer our witnesses for cross-examination and thereafter move the evidence into the record.

H.O. SILVA: Thank you.

Southern California Water Company.

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CROSS-EXAMINATION OF THE CITY OF SACRAMENTO

BY SOUTHERN CALIFORNIA WATER COMPANY

BY MR. SLATER

MR. SLATER: Mr. Wagner, good afternoon. Actually, good afternoon, to you all. I only have a few questions and they are all for Mr. Wagner.

I would like to lay a little foundation, if I can. On Page 3 of your testimony I think you indicate that you described the ARGET project and that it pumps contaminated water into a treatment system and ultimately it discharges into the American River via Buffalo Creek.

Do you remember that?

MR. WAGNER: Yes.

MR. SLATER: Have you ever been out to Buffalo Creek?

MR. WAGNER: Yes.

MR. SLATER: When you were there did you observe flow in Buffalo Creek?

MR. WAGNER: I've been out there several times. I

don't actually remember ever going out there for that purpose.

MR. SLATER: When was the last time you were out there?

MR. WAGNER: A few weeks ago, maybe.

MR. SLATER: Your City Exhibit H, and I think you described you wanted to ascertain what the bottom of the stream channel was, so you contacted USGS, right?

MR. WAGNER: Yes, that's correct.

MR. SLATER: They provided you a mean channel bottom; is that right?

MR. WAGNER: Yes.

MR. SLATER: That mean channel bottom was thought to be about 68.62 feet above sea level?

MR. WAGNER: Yes.

MR. SLATER: Then for purposes of preparing your analysis you then estimated a drop in that elevation over a specific distance, correct?

MR. WAGNER: Yes, that is correct.

MR. SLATER: And was about one foot per thousand feet?

MR. WAGNER: Per thousand?

MR. SLATER: And that was an estimate, right?

MR. WAGNER: There is some basis for the estimate. The answer to your question is, yes, it was an estimate.

MR. SLATER: My follow-up question was: You didn't go out and perform independent measurements?

MR. WAGNER: No. I estimated if you'd like -- no, I did not go out and take measurements.

MR. SLATER: I think I am fine.

MR. WAGNER: Okay.

MR. SLATER: Then with regard to your Exhibit I, you essentially took that information and compared that level versus the plotted well levels, right?

MR. WAGNER: Yes.

MR. SLATER: Because you were looking at the relative comparison of bottom of the river channel versus well levels?

MR. WAGNER: Yes.

MR. SLATER: Did you undertake an examination of what the actual level of the river was?

MR. WAGNER: No. I did not personally measure the water surface elevation.

MR. SLATER: Wouldn't that matter?

MR. WAGNER: Well, yes and no. Which one do you want?

MR. SLATER: I like yes.

In a sense wouldn't it affect the prospect of how the -- of whether the river was actually discharging?

MR. WAGNER: It would affect whether or not water was discharging from the river system to the groundwater system. The answer to that question is yes. In answer to the purpose of my investigation is no, because what I really

wanted to find out was the, I'm going to call, the potential for the groundwater system to be connected to the river system. And that potential I think would be better defined by the groundwater surface elevation relative to the bottom of the river channel.

MR. SLATER: Good. I thought you'd say that.

So in some circumstances it would and some it wouldn't. For purposes of discharge it would matter?

MR. WAGNER: Absolutely.

MR. SLATER: Also on Page 4 of your testimony you indicate that after roughly 14 months of pumping at the GET the potentiometric surface in some wells were still higher than the bottom of the river channel, right?

MR. WAGNER: Yes.

MR. SLATER: That was for some wells, not all the wells you looked at, right?

MR. WAGNER: Yes, that's correct.

MR. SLATER: Can I have you look behind you, which is Figure 1-1 to Southern California Water Company Exhibit 9A. And if you have your, I believe it is Exhibit I, I just want your confirmation in which segment they're in, so we can hopefully move pretty quickly here.

You looked at series 1525 through 1527?

MR. WAGNER: Yes.

MR. SLATER: And in looking at that one, you found that

the surface, the elevation of the river, was above the water table?

MR. WAGNER: Yes.

MR. SLATER: Do you know what segment they were in? Were they in the western, central or eastern portion?

MR. WAGNER: According to this exhibit behind me --

MR. SLATER: Assuming it is accurate.

MR. WAGNER: It is in the western portion.

MR. SLATER: Conversely, if you looked at series 1370 to 72, where you are seeing a higher elevation than the bottom of the river channel, that is in the eastern portion, right?

MR. WAGNER: Yes, it is.

MR. SLATER: The same question again for 1383 through 84.

MR. WAGNER: I can't see it.

Yes.

MR. SLATER: Thank you so much, appreciate that.

Then do you know whether 1475 through 77, you know where that was taken? It is actually not plotted on the map. If you don't know -

MR. WAGNER: I don't know:

MR. SLATER: Would you be surprised to learn it is in the eastern section?

MR. WAGNER: Not at all.

MR. SLATER: This is going quick.

You referenced DWR Bulletin 133?

MR. WAGNER: Yes.

MR. SLATER: You examined that report, right?

MR. WAGNER: Yes, to some extent.

MR. SLATER: You recall -- is it true that that report indicated that there had been historical loss to the groundwater basin in the period roughly 1953 and 1963?

MR. WAGNER: I believe that is one of its conclusions.

MR. SLATER: I have no further questions.

Thank you.

H.O. SILVA: Thank you.

Aerojet, any questions?

MS. GOLDSMITH: No.

H.O. SILVA: Thank you.

Fish and Game.

MS. DECKER: No questions, Mr. Silva.

H.O. SILVA: Sacramento County.

MR. SOMACH: Just a question, perhaps two.

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CROSS-EXAMINATION OF THE CITY OF SACRAMENTO

BY SACRAMENTO COUNTY/WATER AGENCY

BY MR. SOMACH

MR. SOMACH: With respect to your discussion of connectivity. When the County, Cal-Am, Southern California

Water Company pump their wells in the central Sacramento subbasin, does that adversely affect the city's ability to divert American River water?

MR. WAGNER: You know, I didn't look specifically at that issue, whether the pumping by those entities or other entities would directly affect the city, and its ability to divert water out of the American River.

MR. SOMACH: No other questions.

H.O. SILVA: Bureau.

MR. TURNER: No questions.

H.O. SILVA: Regional Board.

MS. GEORGE: No questions.

H.O. SILVA: Cal-Am.

MS. DRISCOLL: No questions.

H.O. SILVA: Thank you.

I'm sorry, any redirect?

MS. LENNIHAN: No redirect. But if we are complete with that portion, what I would like to do is move all of the City's exhibits into evidence.

MR. SLATER: No objection.

H.O. SILVA: So moved, and all accepted.

Just to get a sense, is everybody -- we are going to get into rebuttal stage.

Everybody have rebuttal?

MR. SLATER: Thank you for asking.

We potentially have two witnesses, one by subpoena and in that context I would like to ask a clarification, a question of clarification. And that is in my experience that with regard to offering a rebuttal witness the cross-examination is limited to the testimony offered on rebuttal and that is true irrespective of whether or not it is an expert, so we don't have a prospect.

Thank you.

Then we have two witness.

H.O. SILVA: Aerojet, are you into rebuttal?

MS. GOLDSMITH: We do not have any rebuttal.

H.O. SILVA: Fish and Game, any rebuttal.

MS. DECKER: We are fine.

H.O. SILVA: City?

County?

MR. SOMACH: No rebuttal.

H.O. SILVA: Bureau?

MR. TURNER: No rebuttal.

H.O. SILVA: Regional Board?

MS. GEORGE: No.

H.O. SILVA: And Cal-Am?

MS. DRISCOLL: No rebuttal.

H.O. SILVA: Let's take a ten-minute break and come back at 2:15 and we will do your rebuttal then.

(Break taken.)

H.O. SILVA: We are all set to go.

MR. SLATER: Thirty seconds.

I think we have two witnesses. Their testimony is unrelated. We would like to cover a little ground with Mr. MacDonald and move to our second witness.

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DIRECT EXAMINATION OF SOUTHERN CALIFORNIA WATER COMPANY

BY MR. SLATER

MR. SLATER: State and spell your name for the record?

MR. MACDONALD: My name is Alexander MacDonald. A-l-e-x-a-n-d-e-r M-a-c-D-o-n-a-l-d.

MR. SLATER: Were you sworn in originally?

MR. MACDONALD: Yes, I was.

MR. SLATER: Can you briefly describe your educational background and professional experience?

MR. MACDONALD: I have an Associate Arts' degree from Mill Valley College. I have a Bachelor of Science in civil engineering from Stanford University. Have a Master's degree in civil engineering and environmental engineering from Sacramento State University. I'm currently a senior engineer at the Regional Water Quality Control Board in Central Valley region. And I have been there working with the state for the last 18 years.

MR. SLATER: And are you familiar with the Aerojet extraction, treatment and discharge facilities?

MR. MACDONALD: Yes, I am.

MR. SLATER: Are you familiar with their discharge plans?

MR. MACDONALD: Yes, I am.

MR. SLATER: If the proposed -- Strike that.

If the plans proposed and authorized by the Regional Board are implemented, is it true that more than 25,000 acre-feet of groundwater may be pumped and discharged by Aerojet?

MR. MACDONALD: That's a good approximation.

MR. SLATER: And are you familiar with the discharge facilities that Aerojet maintains?

MR. MACDONALD: Yes, I am.

MR. SLATER: Do you know whether the discharge of water is metered?

MR. MACDONALD: It is metered.

MR. SLATER: And are you familiar with the location of the discharge facilities as they relate to Buffalo Creek?

MR. MACDONALD: Yes, I am.

MR. SLATER: In your opinion, given the fact that the discharge points are metered and with the use of a gauge in Buffalo Creek, would it be possible to quantify the flow added by the discharge facility at Buffalo Creek?

MR. MACDONALD: That's correct.

MR. SLATER: I have no further questions for this

witness.

H.O. SILVA: Do you have two witnesses?

MR. SLATER: Yes.

H.O. SILVA: Do you want to do them as a panel?

MR. SLATER: Sure.

H.O. SILVA: Do that; it's easier, save some time.

MR. SLATER: Mr. Ross, can you again please spell your last name for the record?

MR. ROSS: My name is Stephen Ross, S-t-e-p-h-e-n R-o-s-s.

MR. SLATER: And, Mr. Ross, have you been present through the hearing today?

MR. ROSS: Yes, I have.

MR. SLATER: Did you hear the testimony from Mr. Reynolds?

MR. ROSS: Yes, I did.

MR. SLATER: Did you hear his testimony that, paraphrase, summarize, that increased extraction of groundwater and a lowering of the groundwater elevation could and would induce greater recharge in the American River?

MR. ROSS: Yes, I heard that statement.

MR. SLATER: Do you agree with that opinion?

MR. ROSS: No, I do not agree with that opinion.

MR. SLATER: Why not?

MR. ROSS: In our evaluation we looked at several different aspects in the vicinity of the American River. First was water levels. We found that water levels were in many cases quite well below the bottom of the river. In some cases 25 feet or more. In a very permeable environment you would not expect that to be if there was direct hydraulic connection between the river and the underlying and adjacent sediments.

The next thing that we looked at was groundwater flow directions. Groundwater flow in the immediate area was either from the Aerojet facility, going towards the northeast -- sorry, northwest in the area of the ARGET or directly towards the south or southwest away from the river. So groundwater extraction in that area would not be pulling water, which originally would have been in the recharge which would not have recharged from the river because the recharge areas would have been located upgradient.

The next thing that we looked at was aquifer tests. As was discussed earlier, the aquifer tests have been completed. Many of these have shown that by pumping on either side of the river there is drawdown on the other side of the river. The only way that could happen is if drawdown cones detached from the bottom of the river, and, therefore, there isn't a connection. The most compelling piece of evidence was that there was a contaminant plume of TCE,

dissolved TCE, in the groundwater, the shallow groundwater, on the south side of the river, and that has migrated in the direction of groundwater flow towards the north side of the river.

The only way that could happen if the river and the aquifer were not directly hydraulically connected. So, therefore, if there isn't a direct hydraulic connection between the river and the adjacent underlying sediments, lowering the water table in this area would not induce greater flow out of the American River.

MR. SLATER: Thank you.

I believe you also -- did you hear Mr. Wagner's testimony?

MR. ROSS: Yes, I did.

MR. SLATER: He made reference to Exhibit I. Remember that?

MR. ROSS: Yes.

MR. SLATER: Specifically he indicated that he had obtained some information regarding the bottom of the stream channel. Remember that?

MR. ROSS: Correct.

MR. SLATER: Did Komex actually do any studies regarding the elevation of -- the height of the river as opposed to the bottom of the channel?

MR. ROSS: Yes. We looked at -- for our evaluation we

looked at the actual height of the river. The height of the river will dictate -- height of the river in comparison to groundwater level will dictate if water is either flowing out of river in a recharge situation or if the groundwater levels are higher than the elevation of the river then groundwater would discharge into the river.

If we took hypothetical situation where we had a 50-feet deep river, and the river -- the groundwater level was halfway or at 25 feet and the American River was at, say, a river was 50 feet, so there is a 25 foot difference, but the bottom is at zero. In Mr. Wagner's analysis that would indicate that the groundwater would be recharging the river. In fact, that would not be the case because the height of the river is much higher than the level in the adjacent underlying sediments.

So for our evaluation we were looking at whether groundwater -- the groundwater levels in comparison to the river level to determine whether it is recharging or discharging.

MR. SLATER: Just a couple more questions.

Did you review DWR Bulletin 133 in preparing your underlying analysis?

MR. ROSS: Yes, I did.

MR. SLATER: Are you familiar with Plate 6 of that analysis?

MR. ROSS: Yes, I am.

MR. SLATER: What does that describe?

MR. ROSS: Plate 6 describes lines of groundwater elevation in the spring of 1962 and the spring of 1963 in the -- that south of the American River in the area of the ARGET system as well was the Aerojet site and west of the Aerojet facility.

MR. SLATER: Did you also look at Plate 8, also an exhibit to that report?

MR. ROSS: Yes, I did.

MR. SLATER: What does that plate describe?

MR. ROSS: That plate describes the changes in water levels between the spring of 1953 and the spring of 1963.

MR. SLATER: What do you conclude in comparing Plate 6 and Plate 8?

MR. ROSS: In the area west of Nimbus Dam near the American River that the groundwater levels have basically remained the same, i.e., there was a zero change in elevation between 1953 and 1963.

MR. SLATER: You are also familiar with the GET effectiveness evaluation, right?

MR. ROSS: Yes, I am.

MR. SLATER: For purposes of identification, this is Southern California Water Company Exhibit 18, Figure 3-14; is that right?

MR. ROSS: Yes, it is.

MR. SLATER: When you compare the water levels in Plate 6 with the GET effectiveness evaluation, what do you conclude?

MR. ROSS: In general, Plate 6 is the groundwater elevations in the uppermost aquifer or Aquifer A. Plate 6 from the DWR report is a composite, composite groundwater levels from various zones based on their monitoring. What it shows, and when you compare these two, is that the approximate positions of the equipotential lines are similar or within seasonal fluctuations. So that means that the groundwater levels in the area near the Aerojet between 1999 and the spring of 1963 are similar.

MR. SLATER: So, Mr. Ross, was Plate 6 and Plate 8 to the DWR report and the GET effectiveness evaluation part of your or the original Komex analysis?

MR. ROSS: Yes, it was, I believe that was contained on Pages 38 and 39 of our analysis, to compare historic water levels with the present-day water levels.

MR. SLATER: Winding down here.

I think you also heard Mr. Wagner identify that there were some wells in which the water elevation was higher than the river. Remember that?

MR. ROSS: Yes. I think he was looking at -- he did his analysis on the bottom of the river, whereas ours was

the river surface elevation.

MR. SLATER: Do you know what portion of Southern California Exhibit 9A, Figure 1-1, those wells were in?

MR. ROSS: Yes, I do.

MR. SLATER: Can you tell us?

MR. ROSS: These wells were located in the easternmost section of the study area. I will point to it. In this area here.

MR. SLATER: Does the fact that some of the wells referenced by Mr. Wagner and in his testimony, that some of the wells have water elevations higher than the bottom of the river channel affect or change your conclusions previously offered in this case?

MR. ROSS: No, it does not.

MR. SLATER: And specifically does it change your opinion that the groundwater is substantially nontributary?

MR. ROSS: No, it does not.

MR. SLATER: Why is that?

MR. ROSS: That is because in our analysis we looked at all of the water that is going to be extracted present and future, and the only place that there could be considered nontributary water would be in this far eastern section that is located there. And we took two wells, two of the extraction wells, 4325 and 4340 out of our analysis and said they could be nontributary water. Therefore, that

represented 350 gallons. And the total amount of water that is going to be extracted is 17,000. So that represents 2 percent of the total value, total volume of water that is going to be extracted or alternatively 98 percent of the water that is going to be extracted is considered nontributary to the American River.

MR. SLATER: To briefly summarize, one could say that you took into account Mr. Wagner's points?

MR. ROSS: Yes.

MR. SLATER: Based upon all the testimony that you heard -- withdraw.

Were you here for the full original day of testimony on May 31st?

MR. ROSS: Yes, I was.

MR. SLATER: And you have been here all day today?

MR. ROSS: Correct.

MR. SLATER: And you've read the written testimony submitted by the parties, all the parties to this proceeding?

MR. ROSS: Yes, I have.

MR. SLATER: Does anything that you have heard thus far or that has been presented that you have read change your opinion regarding whether the groundwater that is pumped, treated and discharged by Aerojet is nontributary?

MR. ROSS: No, it does not. Actually, through this it

has been further substantiated.

MR. SLATER: Does anything change your opinion that the groundwater was also nontributary in 1963?

MR. ROSS: No, it does not.

MR. SLATER: I have no further questions.

Offer for cross.

H.O. SILVA: Aerojet.

MS. GOLDSMITH: We have no questions.

H.O. SILVA: Fish and Game.

MS. DECKER: No. We asked Mr. Ross last time.

Thank you, Mr. Ross.

H.O. SILVA: The City of Sacramento?

MS. LENNIHAN: No questions.

H.O. SILVA: County of Sacramento.

MR. SOMACH: No questions.

H.O. SILVA: Bureau.

MR. TURNER: No questions.

H.O. SILVA: Regional Board.

MS. GEORGE: No.

H.O. SILVA: Cal-American.

MS. DRISCOLL: No questions.

H.O. SILVA: I guess we are done.

Thank you.

I just want to ask all the parties, does anybody need more than five minutes for their closing statements? We

want to try to keep everybody honest. We don't want people taking more than that.

MR. SOMACH: Mr. Silva, I am curious. I had actually maybe misread the notice. I thought that closing statements, as it was dealt with in the notice, included or anticipated legal briefs. So the closing statement and legal briefing would be together, and I want to make certain that if I don't make a verbal closing statement I am not prejudiced in terms of putting together a legal brief would be argument also.

MS. DECKER: I would support Mr. Somach's concern.

H.O. SILVA: How much time are we talking about, then? How much time do you want? It is 2:30. We've got 11 parties.

MR. SOMACH: I would prefer deferring to the written closing brief. If I had an idea of how long the Board was going to allow the record to be open so that we could submit those closing briefs.

H.O. SILVA: I think we already did agree, we are going to allow written closing arguments, so written briefs. With that I think that is two weeks. We are agreeing to two weeks after we get the transcripts.

Talking to the Court Reporter will probably be done within three weeks, so you are going to have five weeks.

MS. GOLDSMITH: Mr. Silva, I was hoping for more than

two weeks after we get the transcript, just for personal scheduling reasons.

H.O. SILVA: We can talk about that.

MS. GOLDSMITH: The other thing is I wanted to make sure that we have a period of time after we get the list of wells from the Department of Fish and Game to evaluate and make any motion to reopen.

MS. DECKER: Mr. Silva, we do have the numbers from the wells here. We will pass that out to the parties today. And if they want us to identify the wells for them, that is expedited, otherwise we will serve them with a complete list of well numbers and the parties that we believe own the wells this week.

MS. GOLDSMITH: I would like two weeks after we get the identity of the well owners, to take a took at what wells these are.

H.O. SILVA: How long does that -- is it going to take?

MS. DECKER: By mid next week we can have this served on the parties.

H.O. SILVA: Hopefully by next week.

MR. SLATER: Mr. Silva, if the wells' identification is going to precede the conclusion of providing the written transcript --

H.O. SILVA: I think it is.

MR. SLATER: -- we would urge on behalf of the good

people of Rancho Cordova that we move forward and we would accept a short briefing schedule. If you're proposing two weeks, we will live with that.

MS. DECKER: I have another problem. I am leaving the Department of Fish and Game. Harllee will be taking over writing the closing brief. And both he and Mr. Reynolds have limited availability through July. Harllee will be out of the country at the end of July. So he would be completely unavailable. Could we make this final closing date in mid August?

H.O. SILVA: As far as I know, there is really no hurry to this. I am open to that, middle of August, that gives everybody plenty of time.

MR. SLATER: I'm sorry, was there a proposal?

H.O. SILVA: The proposal that they were requesting to about the middle of August to have the closing briefs, written briefs.

MR. SLATER: It just means that in terms of trying to find a remedy to a water supply problem, we are further delayed in being able to process the application. There is some urgency in trying to secure that water supply.

H.O. SILVA: I'm trying to balance your request, also I am looking at the well data. See if we can do a compromise. Seemed like a good compromise.

What is the earlier you can do?

MR. SLATER: We will waive the objection to well data. If it means that we have an opportunity to expedite this.

MS. MURRAY: Mr. Silva, Nancee Murray, from the Department of Fish and Game, we do have the main lawyer leaving the case and we have our witness being gone for the month of July. We have a new lawyer coming in to write this in August. I would say we need late August.

H.O. SILVA: Late August?

MS. GOLDSMITH: Mr. Silva, we do not waive the objection to the well data.

H.O. SILVA: You need more time is what you are saying?

MS. GOLDSMITH: Certainly, we need an opportunity to look at the well data.

H.O. SILVA: She said that they would have it by next week.

MS. DECKER: And if Southern California removes its objection from looking at the wells and stipulate to whichever wells that are yours that you have records from and restrict Mr. Reynolds' testimony to that, to those wells. Try to work out a stipulation with the folks as well. This is a minor point in light of the bigger picture. We would like to address their concerns.

H.O. SILVA: Mr. Slater.

MR. SLATER: Let me be clear. We remove our objection to their testimony on the confidential well logs, which

precipitated this issue. We again say that in any event we are prepared to brief within two weeks from the date the transcript is prepared.

MS. GOLDSMITH: We had orally joined in their objection, and I would like to maintain that objection until I see the well data.

H.O. SILVA: Which we have said would come next week, so I don't see a timing issue, given that the transcript is not going to be done in at least two to three weeks.

MS. GOLDSMITH: I think that we probably will be able to figure out whether we want to reopen by the time the transcript is done. But I would like more than two weeks to brief after that.

H.O. SILVA: I hate for the world to fall apart for you, Fish and Game, but we -- I hate to hold it up for just one party.

MS. MURRAY: If they do object and need to bring Steve back, that is in August.

H.O. SILVA: He's already removed his objection to the well data.

MS. MURRAY: Janet did not. If she is going to bring Steve back, that is August because he is gone the month of July.

H.O. SILVA: When we get to that bridge -- we'll cross

that bridge when we get to it, if we ever get to it.

MS. GOLDSMITH: Hearing Officer Silva, if we do need to reopen, that kind of makes the briefing schedule moot at that point.

H.O. SILVA: Sure.

MS. DECKER: We will do our best if there are still objections to stipulate to closure of this issue so that we can meet the schedule that you are asking for.

H.O. SILVA: I am still -- we'll take a break in a little bit.

So how is everybody feeling on closing statements? I am willing to going late. My flight is late tonight. Again, we do have the opportunity for written. I'm not trying to limit. I am just asking what your feeling is on closing statements.

MR. SLATER: We would just like, say, five minutes to summarize.

H.O. SILVA: Mr. Somach.

MR. SOMACH: We'll waive in favor of a written closing statement. We don't need to have verbal.

MS. DECKER: We waive in favor of written.

H.O. SILVA: We have allowed that.

MS. GOLDSMITH: We did not anticipate oral closing statement. We are going to brief.

H.O. SILVA: Why don't we just take a quick ten-minute

break until about ten till. Come back with the timing issue. We'll go over again. I will look at my schedule, see how we are doing. Get all that together, and then we will go -- if it is more than five minutes, don't worry about it. We have enough time. You've an opportunity for written briefs, so.

With that, just a ten-minute break. Then we will go with the way we had it originally. Southern California will go first and then same order we had, Aerojet and rest of the parties.

(Break taken.)

H.O. SILVA: Why we get to closing statements. You want to make.

MR. SLATER: Again, I will try to be brief.

We thank the Board for its indulgence in allowing us this opportunity to put on a case for what we think is a very important matter, both to the company and to its customers in the Rancho Cordova area.

I would like to again set the stage. In my opening statement I indicated that Southern California Water Company had filed this petition to modify the FAS petition for a very limited purpose in the context of a very specific circumstance and for the benefit of a limited number of parties. We have not sought a wholesale revision of the status of fully appropriated stream system for the American

River. The context is the context of the precipitating events which was the contamination and the loss of wells and followed by the program of groundwater extraction, groundwater treatment and groundwater discharge.

We also proposed that the petition itself only be opened or, sorry, the status of the FAS petition be treated as such that it was only requesting a lifting for the benefit of those parties, Southern California Water Company, the County, Cal-Am and potentially others that were, in fact, injured by the contamination. And only, again to the extent that the groundwater extraction, treatment and discharge, is adding water to Buffalo Creek and ultimately the American River.

In the context of the evidence itself there is substantial and uncontroverted, completely uncontroverted evidence that the groundwater which is pumped and discharged, treated and discharged from the Buffalo Creek and then the American River, is going to exceed 25,000 acre-feet. You didn't hear anybody contest that. That was testified to by a number of witnesses.

There is substantial and uncontroverted evidence that this activity began in 1998, and it is continuing now and will continue into the foreseeable future. You didn't hear anybody say that that wasn't a reality, that was the state of events or that it wouldn't occur. There is substantial,

uncontroverted evidence that that supply is metered, both at its discharge point and can be accounted for in Buffalo Creek. It was finally corroborated again by Mr. MacDonald here this afternoon. A man who has personal knowledge of the Aerojet discharge system.

In addition, one of the key issues established by the Board focused on whether the groundwater which was being pumped, treated and discharged was tributary or not. You will recall that we began our testimony with a Komex report, an elaborate, exhaustive examination of groundwater conditions and their or its relationship to the American River. They undertook a four-prong analysis. They looked at water levels, they looked at flow direction, they did aquifer tests and they examined chemistry.

Remember what they said about aquifer tests. They ran the aquifer test and they were able to find that by producing water on one side or the south side of the American River that there was an affect on the north side. That wasn't just a single, isolated instance. It happened in multiple occasions. Indeed, there is no testimony in the record that where you ran a pump test on wells on the south side that there wasn't an impact on the north side. No evidence to that effect. In fact, all of the evidence goes in the other direction, which suggests that when you do it there is an impact. That is important.

That is important because it demonstrates that the American River is not a recharge boundary. There is not direct hydraulic connection between the river and the groundwater basin. That is corroborated again. It's corroborated by tracking the plume, which was the fourth prong of the analysis. Remember, there was testimony that said that a TCE plume which started on the south side migrated to the north side. Right? And that was uncontroverted. No one denied that. That is substantial uncontroverted credible evidence that there is not direct hydrologic continuity between the river bottom and the groundwater basin.

There is also an investigation of well levels. And there was an acknowledgement by the Komex experts that there was the prospect in the far extreme portion of Exhibit 9A, which is Figure 1-1. We've had that up all day today. And there was an acknowledgement that in the upper end there might be under certain circumstances some interconnection. You heard Mr. Wagner testify to that. You also heard Komex testify to that on direct, and they again mentioned it today. But that must be understood in context. The extreme eastern portion is only a small portion of the overall project. And indeed, Stephen Ross, testified that he considered, Komex had considered the potential integration of that extreme eastern portion in its total analysis. But

only two of the overall wells, only two, are located in the extreme portion.

So consequently when you look at the magnitude of the entire project, a conservative, that is a key point, assuming a conservative analysis which is that there is contact in those two wells, you still operate at a 90 percent or substantially all figure. Substantially all the groundwater produced, treated and discharged by Aerojet is nontributary. There was some opposition offered on that. But you have to ask yourself was it credible.

Mr. Reynolds testified, in fact, he submitted a groundwater text, said that a boundary to recharge, if you have a boundary to recharge, you shouldn't be able to see the impact across the boundary. Yet his own testimony referenced, in fact, he admitted on cross, that every pump test that he submitted demonstrated an impact across boundary. Every one of them.

So the question is how credible is that testimony given the fact that it wasn't operating as a recharge boundary? He also references earlier DWR reports. Well, we reference them, too. In fact, we like them. We think they demonstrate our case. And that is that the American River has long been a losing stream. It is not new condition. In fact, Bulletin 21, Bulletin 133 suggest very strongly that the American River was losing. But was anybody able to

demonstrate that that condition has increased significantly since 1958. Answer is no. Mr. Ross offered testimony to say that there has been essentially no change in that regard and explained why.

In summary, there were also a couple other arguments that were in a sense a policy position directed at the fact that others may need or rely upon this water. I think that, Mr. Silva, you've ruled pretty consistently that that is not part of this process, and we would subscribe to the opening statements, comments made by Martha Lennihan on behalf of the City of Sacramento, in a sense this is a relatively narrow process. But we do not forebear or change our argument and request that although this Board reserves the power and the discretion to act on any potential application, that this FAS petition does not provide the Board with the opportunity to lift the FAS petition for limited circumstances, for the benefit of limited parties.

Does that mean that the Bureau and Department of Fish and Game and others won't have an opportunity to weigh in and protest an application? Of course not. And we should not forget that the status quo means that the Bureau, the Department of Fish and Game and all others who presently use water from the American River will be beneficiaries. It would be a de facto approval of their ability to use the water. It is only if this Board lifts the FAS petition that

American States, Southern California Water Company, potentially Cal-Am, the County can move forward and make beneficial use of that water.

With that, we thank you, again, for your time and allowing us this opportunity.

H.O. SILVA: Thank you, Mr. Slater.

Aerojet, did you want to give a quick closing?

MS. GOLDSMITH: No, we will reserve for our brief.

H.O. SILVA: Thank you.

Fish and Game, did you?

MS. DECKER: We will reserve for written.

H.O. SILVA: Thank you.

City of Sacramento.

MS. LENNIHAN: The same.

H.O. SILVA: County.

MR. SOMACH: Same.

H.O. SILVA: Bureau.

MR. TURNER: Same.

H.O. SILVA: Regional Board.

MS. GEORGE: Same.

H.O. SILVA: Cal-Am.

MS. DRISCOLL: We will reserve.

H.O. SILVA: We've talked it over and I think as far as the timing, we talked a lot about timing, I think what we want to do now is, again, my understanding is that the Fish

and Game will get the information on the wells within the week to the parties.

MS. DECKER: By Wednesday.

H.O. SILVA: I'm holding that to you.

And then transcripts are going to be ready within three weeks or less is my understanding. And given all that information, then, what I would like to do is set August 5th as the date for submittal of closing written briefs. That is a Monday, and we are going to say at noon on Monday, August 5th.

Just to do this formally, as I mentioned, I will allow the participant to file closing briefs in accordance with Page 11 of the March 2, 2002 hearing notice. Participants who wish to file briefs shall submit five copies to the State Board and shall serve one copy on each of the other participants on the service list. Every participant filing a brief shall file a statement of service with the brief, indicating the manner of service. Briefs shall be submitted to State Board no later than noon on Monday, August 5th, 2002.

Before I go to the final, taking this under submission by the Board, I do have a question for the parties. I made light of it earlier on. Mr. Carlton did sit in on the hearing. He does have a lot of expertise in underground systems and wells. And if we were to use him, would there

be any objection to using his expertise on this matter? I know I am asking of the parties. Do you have any concerns or any objections?

MS. GOLDSMITH: No objection.

H.O. SILVA: Anybody else?

MS. LENNIHAN: No objection.

H.O. SILVA: I think his background will be pretty valuable in this case, that is the reason I am asking. He has sat in on one of the two days and certainly can go back and look at the record on the remaining matters. That would be helpful to staff if we could have his expertise.

I am just asking. I know I made light of it earlier. But I just want to make sure nobody has any problems with that.

With that, the Board will take this matter under submission. All persons who participated in this hearing will be sent notice of the Board's proposed decision on this matter and any forthcoming Board meeting in which this matter will be considered.

After the Board adopts an order on this matter, any person who believes the order is in error will have 30 days within which to submit a written petition for reconsideration by the Board.

With that, I thank you all very much for your participation, and the hearing is adjourned.

Thank you very much.

(Hearing adjourned at 3:05 p.m.)

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REPORTER'S CERTIFICATE

STATE OF CALIFORNIA)
) ss.
COUNTY OF SACRAMENTO)

I, ESTHER F. SCHWARTZ, 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 138 through 322 herein constitute a complete, true and correct record of the proceedings.

IN WITNESS WHEREOF, I have subscribed this certificate at Sacramento, California, on this 27th day of June 2002.

_____
ESTHER F. SCHWARTZ
CSR NO. 1564