WORKSHOP

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

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Subject: ***Review of Water Quality Standards for the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary***

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Held in
714 P Street Auditorium
Sacramento, California

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Monday, May 16, 1994
10:00 a.m.

VOLUME II

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A P P E A R A N C E S

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JOHN CAFFREY, Chairman

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MARC DEL PIERO

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JOHN BROWN

Staff:

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THOMAS R. HOWARD, Senior Engineer

BARBARA LEIDIGH, Senior Staff Counsel

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TUESDAY, APRIL 26, 1994

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MONDAY, MAY 16, 1994, 10:00

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MR. CAFFREY: Good morning and welcome to these proceedings. This is the second in our series of workshops on the Bay-Delta estuary.

My name is John Caffrey, Chairman of the State Water Resources Control Board.

Let the record show all Board members are present.

By way of introduction, proceeding from my far left, your far right, is our Executive Director Walt Pettit. Next to Mr. Pettit is Board Member Del Piero, next to him is Board Member Mary Jane Forster. To my immediate right is Board Vice Chairman James Stubchaer, and to Mr. Stubchaer's right is Board Member John Brown.

Welcome to all of you.

I am now going to read a statement into the record. It will be a bit repetitive of what we said last time. It isn't quite as detailed.

This is the second of four scheduled workshops for the State Water Resources Control Board to hear comments and recommendations regarding water quality standards for the Bay-Delta estuary.

If you intend to speak today, please fill out a blue speaker card and give it to us down at the front table. They look like this (holding up a card).

As you know, the comments and recommendations received during this series of workshops will be used to prepare a draft water quality plan. We expect to release a draft in December of 1994. About two months after the draft is released, we will hold a hearing on the draft, and after the hearing, we will make whatever changes are needed, provide copies of the revised draft to the interested parties, and then, hold a Board meeting to consider it for adoption.

Today's proceedings are described in the notice for today. Additional copies of the notice are available from the staff.

This workshop and the workshops in June and July will be informal.

Today we want to hear from the parties on the key issues specified for this workshop. Each party will have 20 minutes for an oral presentation. A party may be represented by one or several speakers. If a party needs additional time, the representative may request additional time at the beginning of the presentation.

Please explain why the additional time is required.

If we are not able to provide you all the time you think you need, and such decision would be based on fairness to the other parties and the number of requests that we have, we encourage you to submit your presentation in

writing.

In the interest of time, we ask that parties avoid repeating excessive details already presented by other parties whenever possible, and simply state agreement.

Alternatively, parties with the same interests are welcomed and encouraged to make joint presentations.

We would also accept and we encourage written comments, and most of you submitted your comments in writing in the last workshop. You need to provide the Board and staff with 20 copies of written comments and recommendations, and make copies available to other parties who are here today.

A court reporter is present and will prepare a transcript. If you want a copy of the transcript, you must make arrangements with the court reporter.

There will be no sworn testimony or cross-examination of the parties, but the Board members and staff may ask clarifying questions.

As you all know, and I am sure you all read the notice, we have four or five days set aside for this proceeding and at the moment we have some 14 cards. So, it doesn't look like we will need more than today, although we will see what we are presented with as time goes on.

So, we will keep you posted as the day goes on as to any scheduling for tonight or later in the week.

Today's key issues are:

What are the principal Endangered Species Act issues the State Water Resources Control Board should consider during this review?

Second, what are the effects of diversions throughout the Bay-Delta estuary on beneficial uses?

Third, what methods should State Water Resources Control Board use to analyze the water supply and environmental effects of alternative standards?

In addition to comments on the key issues, the Board welcomes written or oral comments on the timing, or placement, if you will, for discussion of specific subjects in this series of workshops.

Other key issues will be discussed at the future workshops in June and July.

Today's notice lists the key issues we currently expect to discuss during these workshops; if you look in your notice, you will see what we intend to do in today's proceedings.

I will call the parties in the following order:

1. Any elected officials for the State, Federal or local governments;

2. Representatives of State, Federal and local agencies;

3. All others in the order that your speaker

cards were submitted to staff, unless you have special time constraints that you have noted on your speaker card.

Before we begin, I also want to repeat something I said last time. The Board encourages all parties in the state to work together as much as possible to try to bring to us your best solution to the problems. We all understand the advocacy parts of this and we all know who you are and what you represent.

I think it is important, though, for all of you to avail yourselves of the time allowed by these workshops to see if there are ideas that you have and you can join together on regarding a balanced solution, so the Board very much encourages that, and is very much interested in seeing what your proposals may be and, frankly, we are looking forward with anticipation to the July workshop, which will hopefully be the culmination of those efforts that you are jointly working on, so we really are looking forward to that because this will be very helpful to the Board as we begin to write our plan for the Delta.

That completes my statement.

Do any of the other Board members wish to make comments or add to what I have said at this time?

All right. Then, I may ask Mr. Pettit, do you have anything you wish to add at this point?

MR. PETTIT: No, I don't have anything to add, Mr. Caffrey, but I think Mr. Howard is prepared to give a quick summary of what the Board heard at the first workshop just so the parties will be aware of it.

MR. CAFFREY: I was remiss in not introducing Mr. Tom Howard, our Engineer, and Barbara Leidigh, Senior Staff Counsel.

MR. HOWARD: I am Tom Howard, Engineer in the Bay-Delta program.

On April 26, the State Water Board held its first workshop to review Bay-Delta standards. The workshop identified three key issues for discussion, and I would like to review what staff heard from the commenters on those issues.

The first key issue requested comments on which standards should be reviewed during this triennial review. As you are aware, the Board is not required to undertake a detailed review of every standard during this process. Generally, only the highest priority issues are reviewed.

Based on the oral comments received at the workshop, there was consensus among the participants that fish and wildlife should be the focus of this review. Some participants expressed concern regarding -- about drinking water quality, but they agreed that the Board should concentrate on revising the fish and wildlife statements.

The subset of this first issue is, what type of fish and wildlife standards should be evaluated by the Board to provide reasonable protection for fish and wildlife resources.

As you probably recall, the 1991 Bay-Delta plan contained standards for salinity, temperature and dissolved oxygen, but it did not include standards for flow-related parameters. Consideration of flow-related standards was deferred to the water rights phase.

There appeared to be consensus among the workshop participants that during this review the Board should include consideration of flow and operational issues.

Another subject of discussion related to this first issue dealt with the legal authorities the Board should use to adopt new fish and wildlife standards, essentially standards related to flow and operational issues.

Fundamentally, the concern seems to be that the Board should clearly delineate which standards are subject to U.S. EPA review and which standards are adopted exclusively under State authority and would not be subject to review under the Clean Water Act.

The second issue requested input on the level of protection that should be afforded fish and wildlife uses in the Bay-Delta estuary.

Comments by the workshop participants generally fell

into two categories. First, some participants recommended that the Board establish a minimum level of protection consistent with the conditions that existed in the late 1960s and early 1970s. The basis for this recommendation is that this level of protection was recommended by Club Fed in its interagency statement of principles.

On the other hand, some participants felt we were putting the cart before the horse with this issue. This group believed that setting the level of protection at this stage of the process would mean that the Board would not be balancing competing needs for water in the estuary, the allocation for fish and wildlife would be set regardless of the effect on other beneficial uses.

Instead, a recommendation was made that the Board should consider a wide range of alternatives with various levels of protection for fish and wildlife, evaluate the water supply, economic and fishery effects of these alternatives, and adopt the alternative that in the Board's judgment provides the best balance.

The level of protection is, therefore, set based on this balancing process.

The third issue was comparatively straightforward. Comments were solicited on the effect of U. S. EPA's proposed standards and whether the Board should consider these standards as an alternative in this review. Most of

the participants who submitted comments to U. S. EPA also provided the Board with those comments.

There also appeared to be consensus that U. S. EPA standards or a modified version of those standards should be considered by the Board as an alternative in this review.

That concludes the comments I wanted to make.

Does the Board have any questions?

MR. CAFFREY: Any questions by Board members?

Thank you for the summary, Mr. Howard. I think that's helpful to us as well as the audience, and I think we should ask you to give us an update before each of the workshops similar to the one you just gave us. I appreciate it.

Let me also say there are some other very important staff here that are in the front row, Heidi Bradovich and Gail Linck and Jerry Johns, who will be assisting us throughout the day as well.

Thank you.

We are in a meeting place which is not one of our usual places to meet. It is not that we are trying to provide for a moving target. It is because we are trying to find facilities that will accommodate larger crowds. As time goes on, we may find ourselves back in our hearing room which is a little smaller than this, and hopefully, that won't be too discomfiting.

So, with that, then I think it is time to get started with the presentations from various speakers. The first -- in fact, let me read the order that I have the cards at the moment. This order can be changed. If somebody gets into a time constraint, if they would flag me or whatever, let us know, we will change the order.

For the moment the order is Perry Hergesell, David Anderson, Jim Lecky, Dave Schuster and Cliff Schulz in a joint presentation; Bill Baber, George Basye, Fred Schneiter, Laura King, Austin Nelson, David Whitridge and Alex Hildebrand in a joint presentation; Tim Haines, Richard Thomas, Russ Brown, Anne Schneider and Jim Easton in a joint presentation; Tom Zuckerman and B. J. Miller.

So, that will be the order that we will take the names unless, as I say, we have to make a change to accommodate somebody.

All right, let us begin then with Dr. Perry Hergesell from the California Department of Fish and Game, Stockton. Good morning.

MR. HERGESELL: Good morning, Chairman Caffrey and members of the Board and staff.

For the record again, my name is Perry Hergesell and I am Chief of the Department of Fish and Game's Bay-Delta Special Water Projects Division in Stockton, and I am here today to summarize the Department's response to those issues

that were noticed in today's workshop.

Our written statement which we have presented to you and staff already is rather lengthy and includes several appendices and figures and tables, and, therefore, I will just refer you to those documents for more detail.

The first topic of interest that was noticed in today's workshop is endangered species and as everyone knows, the estuary supports two federal and state listed species, and those are the endangered Sacramento winter-run chinook salmon and Delta smelt.

Another may soon receive federal listing, and that is the Sacramento splittail.

Simply stated, the Department of Fish and Game believes that your Board should consider the needs of these species when it sets new standards for the estuary. Your notice solicited status information on these species and we have provided such updates in our full testimony which you have and, therefore, I will be very brief today with respect to those issues, or those updates.

First of all, the winter-run salmon, the cohort that is returning to spawn in 1994 is actually the progeny of the -- of the off-spring of the 1991 return, which was 191 fish, the lowest number on record.

Needless to say, we are very seriously concerned about the survival of this cohort and will inform you when

more status is known about this organism, and again, as I said, there is a large appendix to our report that talks about the most recent status as of March 9.

Delta smelt: Delta smelt abundance, as you know, fluctuates greatly from year to year, but all the data sets that we have available have demonstrated a dramatic population decline over the years and subsequent very low populations between 1983 and 1992.

The 1993 abundance, which is the most recent data set that we have available and complete level, showed an increase, substantial increase in the apparent response to the habitat that was available that was brought about by the very wet winter that we had in 1993, in the winter and spring, and we were not, frankly, surprised by that since we know that Delta smelt do respond positively when the salinity is somewhere around two parts per thousand or less in the Suisun Bay area in the spring preceding the time when we set the abundance index.

Splittail: The splittail, which is a very large minnow that is endemic to the estuary is currently being considered by the Fish and Wildlife Service for listing on the endangered species list. An analysis prepared by them indicates the splittail have declined by about 62 percent over the past 15 years. We are currently in our office planning some yield surveys and data evaluations that will

take place this summer and fall that will further assess the status of this particular fish.

As you will expect, we will keep you informed about this effort as well as time goes on.

A word about the existing biological opinions and consultations, and how we perceive that they should interact with your efforts. Currently the State Water Project and the Central Valley Project are operating under biological opinions for winter-run salmon and Delta smelt. These opinions established reasonable and prudent alternatives that were necessary to avoid jeopardy and reasonable and prudent measures to minimize the take of those species as well.

Since your decision on the water quality control plan will need to be more comprehensive than just these opinions, we feel that you should be prepared to go beyond the measures in these opinions and provide estuarine habitat conditions that are of sufficient quality not only to avoid jeopardy as these opinions do, but also, to restore, sustain and remove these species from the endangered species list.

Parenthetically, you have requested consultation with our Department on your water quality control plan and the development of the standards for the estuary, and we would like to work with you to develop specific standards to be included in that plan that would actually result in a no-

jeopardy opinion of the plan.

But we suggest that these standards should use as a base the existing RPAs or reasonable and prudent alternatives from the biological opinions that have been issued for the State Water Project and the Central Valley Project, and then, the standards that you develop can be modified as needed to meet the State Board's other goals for the estuary.

In other words, you would be able to deal with the non-State Water Project and non-Central Valley Project operations in other ways to reflect any changes on those opinions that would be considered as the base.

Before I leave the topic of endangered species, I want to touch on a topic that was brought up at our last workshop, and that has to do with the conflicts of introduced species.

As you recall, the issue of striped bass, that and other introduced species, and how that influences recovery of listed species was raised at your April 26 workshop and presently we don't believe that the management of striped bass or, in fact, other introduced species precludes the recovery of endangered species.

In that regard, our Department, as I mentioned before, is initiating appropriate consultations on striped bass management activities as requested by the Endangered

Species Act, and we hope that this will insure that our management of that species and others is accomplished in a manner that is compatible with recovery efforts for the Sacramento winter-run chinook salmon, and the Delta smelt. In short, we feel that debating the merits of restoration of striped bass will only distract us from the pressing need to restore the estuary's habitat, the values and the functions that are associated with that.

The second issue of interest today is the effects of diversion throughout the Bay-Delta estuary on beneficial uses. We have already testified during the 1992 hearing as to the adverse impacts of the Central Valley Project and the State Water Project on the estuary's species, and these types of impacts fall into three general categories.

First, they fall into the category of direct losses of fish actually entrained in the diverted water from the system.

The second class of impacts are those impacts that are associated with reduced Delta outflows through the system, and the third set of impacts that deal with changes in flow patterns and the volumes in the internal Delta channels which would interfere with fish migration and use of the Delta as a nursery habitat.

We provide a list of exhibits that we have given you in the past and our full comments that address these impacts

in detail, and we feel they conclusively demonstrate that water project diversions have substantially degraded the estuarine ecosystem over the past three decades. So, I won't go into that in a lot of detail.

I do want to make several points in passing regarding the impacts of the diversions and issues associated with that.

First of all, the direct losses of fish that are entrained in water diverted by the Central Valley Project and the State Water Project are largely the result of the location of the export pumps in the Delta. We have mentioned in previous hearings also and urge you to consider the criteria for new water facilities that might be needed. During those previous deliberations, that suggestion was not accepted or was rejected, and, therefore, we feel that, maybe given our view of the evidence that we have, we believe that one remaining alternative for you to seriously consider is curtailing exports.

In other words, we feel that if that were to take place, we may reduce the need for some facilities in the system.

Secondly, some comments about the interactions of diversions, outflows and subsequent salinity. The only point I would like to make is that the record contains, again, various exhibits we provided which document outflow

impacts, the Fish and Wildlife Service biological opinions for smelt, and the EPA so-called Schubel Report also do the same, so I won't take a lot of time doing that.

But I do want to reiterate that whether we do consider outflow or salinity standards, it is really important to look at the cause and effect, and it really depends on which organism you are interested in.

We talked about that last time, so I won't go into that in detail as well. At certain times we might need flows, at certain times we might need salinity, depending upon what our interests are at the time.

I would like to talk a minute, if I can, about year-round protection. If we look at the record, what we find is that the total water exports have increased since the 1968 advent of the State Water Project and the Central Valley Project San Luis Reservoir diversions, and at the same time the fall and winter exports have increased at a greater rate than the spring and summer exports since the implementation of the water rights Decision 1485.

We provide some information in our comments about that, giving you a little better idea of how that has happened.

But the question is, how does that relate to the biology and fishery of the system?

I think in order to do that, you have to think about

a general rule that the monthly proportions of the total fish that are entrained in the facilities and salvaged at the Central Valley Project and the State Water Project vary annually in response to the pumping schedules that are going on, to the flows that are in the system, and to the fish spawning and the growth and the migration.

So, it is not a set thing that the time that we need to be concerned is always at one time in the spring, which we have sometimes thought in the past. The circumstances don't always occur at the same time of year for the various species.

For example, just to give a better idea, generally more than 70 percent of the annual entrainment of one species, the young American shad out-migrants, occurs in the time period August through December.

Another example that we saw, which was surprising sometime back in the record is in the winter of 1977-78, when water exports increased dramatically following the 1976-77 drought, and there was a lot of pumping that took place in the month of January, the salvage of chinook salmon, striped bass, splittail and Delta smelt increased noticeably, and there's some pretty dramatic numbers.

If you look at our presentation, you will see, particularly with respect to Delta smelt, the take during one month was equal to or greater than the take for a normal

average year.

The idea is we did a lot of pumping to make up for lack of pumping in the early part of the season and we had an impact during another part of the year.

The specifics of these circumstances, as I have said, are in our written statement, so I won't take a lot more time on that except to reiterate that we feel it is important to provide year-round protection of the habitat and fish and wildlife populations in the estuary.

Parenthetically, we recognize that there are other diversions that exist in the system. For example, there are agricultural diversions and PG&E does take water out of the system for cooling water purposes.

We also provide a treatment of that in our statement, but all things considered, we feel it is not really reasonable to conclude these additional diversions have caused the declines in the estuary. You notice I say *caused,* not contributed to, but they have not caused the declines in the estuary since the mid-1960s, and we feel in light of that the focus should be on recovery and maintenance of the estuary's fisheries and that needs to remain on the water project operations.

A final statement about diversions and outflows. We believe that any evaluation that you might make of the environmental effects of the estuarine standards should

include a full evaluation of the potential to impact fish upstream of the estuary. Specifically, we want to be sure that adequate carryover storage is maintained in the affected reservoirs and we provided information on that, again, in the past so I won't go into that.

But, in conclusion, with respect to diversions and outflow, we urge you to recognize your responsibilities and admit measures which would bring about changes in the status quo because we believe that the evidence is overwhelming that the status quo means a continuing decline in fish populations.

And we feel that with export curtailments, some improved Delta inflow and outflow regimes and non-flow measures as may be described by us and others, we feel that you could achieve significant progress towards the Governor's water policy goals.

Finally, several short comments about the third issue of interest in this workshop, and that is the methods to analyze the water supply and environmental effects of draft standards. During our 1987 and 1991 testimony, we provided several exhibits with regressions and/or correlations relating to the abundance of several species to Delta outflows.

We have updated those in today's statement and we feel that they can be used to provide a basis for the

evaluation of proposed outflow standards on those species.

There are, however, some caveats for this use and we have also provided a small discussion about such caveats in our statement. So, we are certainly willing to work with staff if they want to use those.

In our opinion, the series of regression equations that relate to Delta striped bass abundance to the antecedent flows and outflows and export conditions is probably the best available method for simulating water project impacts on striped bass. This is commonly called the Department of Fish and Game's striped bass model and is described in detail WRINT-DFG Exhibit 3.

And finally then, with respect to evaluation of methods, we note that the California Urban Water Agencies have indicated that they had independently evaluated the EPA proposed standards on the estuary's ecosystem using interagency ecological program data, and they were making their methods and results available to you for your review and use, and we certainly applaud CUWA's initiative in this area, but we have major reservations about their methods and conclusions, and we are right now in the process of developing a critical technical review of their report, and we will, after providing it to them for their consideration, will also provide it to you.

We have spent time meeting with them and discussing

some of the issues, as well as a few other folks, so we will be working on that and hopefully before the July process is over, we can get that back to you as well.

That's all the comments I have today other than those that are in our written statement, and I would be glad to address questions, if there are those.

MR. CAFFREY: Are there questions from the Board members from Dr. Hergesell?

Mr. Brown.

MR. BROWN: Perry, two questions. The 191 fish count for the winter-run salmon, where was that count taken?

MR. HERGESELL: I think that was taken at the Red Bluff diversion dam -- that's correct, Red Bluff diversion dam.

MR. BROWN: And then, the second question, on the introduced species, the striped bass, if my notes are right, debating this issue would distract from getting to the bottom line of what needs to be done, so your feeling is we should not spend any time debating or re-evaluating the issue of the striped bass effect on the endangered species?

MR. HERGESELL: Well, I'm not sure. We certainly need to do that and we are in the process of doing that, and that was the context of my statement, that we have already met with NMFS and the U. S. Fish and Wildlife Service, and we have initiated the process of a Section 7 consultation,

getting a federal nexus to do that, and we feel that we will be able to work out those issues in that process and our management plan shouldn't affect the endangered species if we go through that process and complete it in the way we would like.

We feel that having us and this Board and the staff, and all the folks debating that issue here may not be necessary since we will carry that effort out in another arena.

MR. BROWN: Maybe debate is not the proper word.

MR. HERGESELL: Consideration may be more appropriate.

MR. BROWN: Yes, thank you.

MR. CAFFREY: Anything else from Board members?

Mr. Pettit, staff?

Thank you very much, Dr. Hergesell.

Next is David Anderson representing the Department of Water Resources. Good morning, Mr. Anderson.

MR. ANDERSON: Good morning. Thank you, Mr. Chairman and members of the Board.

My name is David Anderson with the Department of Water Resources.

We would like to address our fairly brief comments to the third question that the Board asked in this notice.

The first one has to do with the principal ESA issues

and I think the issue that was focused on in the Board's notice is the one that we are going to speak to, which is how institutionally the Board should respond to the fact of ESA regulation by federal agencies.

Much has been said recently about the need for an ecosystem multispecies approach to the Delta, especially in reaction to the rigid and single-purpose approaches of the Federal Endangered Species Act and the Clean Water Act.

As we know, the ESA is a species specific approach and the Clean Water Act only considers the influence of water quality factors on beneficial uses.

I think it is interesting to note in talking about ecosystem multispecies approaches, that the Board's traditional approach has been a system-wide, multispecies, multifactor and multiuse prospective.

Under the Water Code and the California Constitution, the needs of all species and all uses are within the Board's purview and charge. So, the Board, I think, has a difficult situation in considering how it should deal with superseding federal regulation of listed species in a manner which does not simply turn a deaf ear to the other biological and water use needs of the estuary.

It seems to us that whatever the Board does, whatever sort of standards it fashions, the guiding principle ought to be with respect to endangered species, to preserve as

much flexibility as possible to water users subject to federal ESA regulation.

I think there's three choices that the Board could consider as to the type of standards that it might look at.

The first is, if the Board adopts the NMFS and the U. S. Fish and Wildlife Service ESA requirements as State standards, we think this option is extremely undesirable. It would constitute two sets of regulatory hoops for the State Water Project and the Central Valley Project to jump through, whose intention is only to accomplish a single regulatory purpose.

If the Board's standards and ESA requirements agree, then, of course, you might question whether the Board standards are needed, and if the ESA requirements change and come to disagree with the Board's, then the result is a confusing and vexatious contradiction at best.

The second problem with this approach is that the ESA requirements are not the product of balancing. They do not reflect all the public interest concerns in the estuary and, therefore, do not conform to the requirements of State standards.

The third is that the burdens that are placed upon State water uses and allocation by the ESA should remain clear and should not be confused by immitative State requirements. Much is being talked about now with respect

to the policies of the various acts and purposes and precedencies of these acts.

I think it is important that these things remain clear so they can be discussed on their own merits.

The second possibility for the Board is that the Board would adopt its own specific requirements for endangered species irrespective of what the Federal Government has done. We think this is also bad and probably suffers from the worst of the problems noted with the first in terms of creating a possibility of duplicative and contradictory regulation.

I don't have it in my comments, but I will tell you we are now involved in consultations with the National Marine Fisheries Service for winter run, and the U. S. Fish and Wildlife Service for Delta smelt.

I would note that the Department of Fish and Game is also a very active participant, has its own independent regulatory authorities under the California Endangered Species Act, is a participant in that, and to the greatest extent possible, I think consistent with the Federal and State mandates, is attempting to align its interests so that what is produced in these consultations which are really in the nature of negotiations is a single product. At times when these things can be seen to vary, we have incredible difficulties. We simply cannot have a <u>serial</u> negotiation or

a serial consultation or serial regulation on matters of these types. I can assure you it's practically impossible.

The third alternative is that the Board not adopt specific standards for listed species. This leaves a variety of things the Board can do. I would note that this alternative actually provides the greatest flexibility by allowing the regulated, by allowing the regulated parties to deal with a single regulation of NMFS or the Fish and Wildlife Service with respect to endangered species issues.

That flexibility, however small, that is found in the ESA consultation process, should not be confused or diminished or lost by duplicative requirements or approvals needed from the Board in order to respond to urgent circumstances, or to fashion alternatives as required.

The Board might be able to develop balanced, multispecies standards that also provide umbrella protection for ESA species. Certainly, the Board should consider the needs of the EPA species in a larger perspective and viewpoint on the needs of the estuary. The Board's standards could possibly be based on a broad allocation of late winter to spring water to aquatic resources, including listed species.

If federal ESA requirements were later to increase, then the Board would be required to rebalance to avoid an increased burden on off-stream uses; that is to say, the

non-ESA aquatic resources would be cut back, so basically, what I am describing here is a set of standards which, commensurate with the state of the science, is timed at a general time when we know it has benefit to the resources.

However, whatever its form is at the outset, if endangered species requirements were seen to increase at times during this period, then the State requirements would become more tailored to those new federal requirements and less tailored, as it were, to the requirements at other times in the spring for their species, understanding, of course, that during this period of time there are great protections that inure to the benefit of most species in the Delta.

It's even possible that a mechanism for adjustment could be built into the standards as automatic shifts in other spring standards if ESA requirements increase or change. I don't know if that's practical, but I do recommend that all practical options for this type of standard should be looked at.

If there's no automatic shift possible, then it would be incumbent upon the Board, if ESA requirements do change, to rebalance because the calculus would have changed. Hopefully, the great discretion which the endangered species agencies have, given the enormous scientific uncertainties with which they deal, can be exercised to operate within

reasonable multispecies and system-wide State standards.

In summary, the essential points are that federal ESA requirements must be recognized and dealt with as such, and that Board action should not deprive water users of that modicum of flexibility that the federal act permits.

I am going to touch upon a topic which is raised directly in the June workshop, but I would like to say something about it now with respect to the Board's standard setting. This has to do with the context of the broader management needs of the estuary. These needs, and proposals to address them, while not necessarily within the Board's regulatory jurisdiction, should be aggressively identified and set forth by the Board, so it is not only that we are placing water quality in the context of flow and diversion, but we are also taking water quality, flow and diversion, and putting those factors which have influenced the health and status of beneficial uses in the estuary in the context of all the other things outside the Board's jurisdiction that influence those things.

It is very much in keeping with the admonition in the Racanelli decision to look outside the Board's jurisdiction may be helpful given in the form of advice or recommendations and so forth.

The Department's detailed answers to the next two questions dealing with the effects of entrainment, and then

the various tools that may be available to analyze phenomena in the Delta are attached to this presentation.

I am not going to summarize and repeat them. The Board can look at them. In large measure they are material that we have submitted before, but I think they are good and useful summaries of those terms as well as updates of studies we have been doing.

One point on diversion, however, I think merits special emphasis as the Board looks at this. I think the Board has keyed in on a very important topic here.

On April 26, we noted, as we have often done before, that outflow is at times recommended to address or solve problems which may have nonoutflow or nonwater-costing solutions, and that it is essential for the Board to look for those solutions. The impacts of Delta diversions are such a problem.

Given the interim nature of the standards to result from these proceedings, however, we recognize that the Board may be inclined as a practical matter to set outflow standards for those problems. If you do, you should expressly recognize that later, diversion specific solutions may obviate or lessen the need for the flow standards that you set.

That's the end of my remarks.

I will note we have some staff here if you do have

some questions on the technical materials that are appended.

MR. CAFFREY: Thank you, Mr. Anderson.

Are there questions from the Board members?

Mr. Del Piero.

MR. DEL PIERO: One of your last comments, Mr. Anderson, referred to the interim nature of the decision the Board may make. I don't know that that's correct. That assumes the success of an organization that at this point has not previously been successful.

You are speaking of BDOC?

MR. ANDERSON: Yes. Whether the standards are interim or not, my understanding is that BDOC is still an ongoing proposition and we are still looking to that source for a longer-term solution. You may have more recent intelligence on that matter than I do.

MR. DEL PIERO: No, I don't. I was observing what the reality of the situation was with this Board under the legislation that we are charged with enforcing and the responsibility for adopting water quality standards.

The last time I checked, unless you know something else, BDOC is not charged with the responsibility anymore.

MR. ANDERSON: A regulatory approach to Delta problems is one way. I suspect it is not the only way. It may not be the efficient way. Ultimately we may be looking to physical changes in the Delta which may or may not be

within the scope of the Board's decision, and I am assuming that they are not, and consequently, that would explain any characterization of this as being interim.

MR. DEL PIERO: One additional thing: Your presentation did not mention any reference to the California Endangered Species Act. Why?

MR. ANDERSON: I think it did.

MR. DEL PIERO: The California act?

MR. ANDERSON: I did it as an aside.

MR. DEL PIERO: I was sitting here reading through very closely and I didn't see any reference to it at all.

MR. ANDERSON: Well, there are two things, as I indicated in my spoken comments, that the Department of Fish and Game is cooperating very closely on the consultations that we are engaged in with the federal agencies.

I would also point out that the scope and sway of the State act is considerably different from the federal act. Consultation is only available to the State, lead agencies, and the manner in which these State lead agencies interact with the Department of Fish and Game is very different from the way in which federal agencies interact with the federal regulatory agencies.

The second point, while this Board clearly has authority to regulate both the State Water Project and the Central Valley Project, as you know from California versus

the United States, I don't think the point necessarily has been expressly raised, but I don't think the Department of Fish and Game is asserting jurisdiction over the Central Valley Project under the California Endangered Species Act.

MR. DEL PIERO: Would you disagree that this Board is acting in the capacity as lead agency in this matter?

MR. ANDERSON: Lead agency for --

MR. DEL PIERO: On this matter that we are here on today.

MR. ANDERSON: Within the meaning of the California Endangered Species Act?

MR. DEL PIERO: Yes.

MR. ANDERSON: I would agree with that.

MR. DEL PIERO: Thank you.

MR. CAFFREY: Any other questions of Mr. Anderson?

Mr. Pettit, do you have anything? Staff?

Thank you, sir.

MR. ANDERSON: Thank you.

MR. CAFFREY: We will read with interest the other two sections of your report.

Jim Lecky. Are you representing Club Fed or just --

MR. LECKY: Yes, I am.

MR. CAFFREY: Good morning, sir. I note Mr. Wright is in the audience and others. Welcome to you all.

MR. LECKY: Good morning, Mr. Chairman and members of

the Board.

My name is James H. Lecky. I am Division Chief of the Protected Species Management Division, National Marine Fisheries Service, Southwest Region.

Today I am also representing the Federal Ecosystem Directorate, which is composed of the Bureau of Reclamation, the Fish and Wildlife Service, the Environmental Protection Agency, and NMFS.

These federal agencies have organized to integrate, insofar as possible, their respective federal activities related to the Sacramento-San Joaquin River Delta estuary and its watershed, with the goal of improving water quality and habitat with the least possible impact on the Delta and upstream water users.

We are committed to working closely with all involved agencies of the State of California so that our implementation of federal law in the Bay-Delta estuary complements the State's role in allocating water resources equitably and the State's continuing efforts to preserve, protect and enhance the natural resources of the estuary.

On behalf of the federal team, we look forward to working closely with the Board to develop standards that will protect the health of the Bay-Delta ecosystem and the economic health of the State of California.

Relative to today's workshop, I will comment on the

three areas for which the Board sought input in its announcement for this workshop.

First, the principal ESA issues the State Board should consider during this review.

To begin, I would like to present the most recent information regarding the status of both endangered species and species being considered for protection.

NMFS has been monitoring the status of the Sacramento River winter-run chinook salmon since it was proposed for listing in 1985, and we have gained considerable knowledge regarding its life history. Although significant efforts have been made to recover the species, it has continued to decline and in January of this year, NMFS reclassified winter-run chinook salmon as an endangered species.

Approximately 340 winter-run adults returned to the upper Sacramento River in 1993, and the 1994 escapement is expected to be low as well.

Critical habitat for winter-run chinook salmon was designated in June of 1993 and includes the Sacramento River, the Northern Delta, Suisun Bay, San Pablo Bay and San Francisco Bay north of the Bay Bridge.

We believe that our continuing efforts to protect winter-run chinook salmon combined with the new Bay-Delta standards will contribute to a reversal in the downward trend during the next decade.

The spring-run chinook salmon runs in the Sacramento and San Joaquin Rivers were historically the largest salmon runs in California. Spring-run chinook salmon have been extirpated in the San Joaquin River; and a petition to list those remaining in the Sacramento basin may be forthcoming because of their decline since the 1960s and persistent low numbers in recent years.

The Sacramento River late fall-run chinook salmon production has declined by approximately two-thirds since the 1960s.

The San Joaquin fall-run chinook stocks have been at critically low levels for many years and a petition for listing may be expected for this population as well.

The Fish and Wildlife Service proposed listing of Delta smelt as a threatened species on October 3, 1991, and critical habitat was also proposed at that time. Final designation as a threatened species occurred on March 5, 1993.

Critical habitat for Delta smelt was reproposed on January 6, 1994, after new scientific information was presented to Fish and Wildlife Service, and the comment period for that closed on March 11, 1994.

As part of a settlement agreement, the Fish and Wildlife Service agreed to finalize the Delta smelt critical habitat designation concurrently with EPA's final rule on

water quality standards by December 15, 1994.

The Sacramento River splittail was proposed as a threatened species on January 6, 1994, and the comment period closed on March 11, 1994, and comments are currently being considered. A final rule is due by January 6, 1995.

A petition to list the long-fin smelt was received on November 15, 1992. Although long-fin smelt have declined to low numbers in the estuary and Bay, the Fish and Wildlife Service determined the population in the San Francisco Bay and estuary did not constitute a species in the context of the ESA and on January 6, 1994, published its determination that the petition was not warranted.

However, I would point out that long-fin smelt remain as a candidate for listing.

The Delta native fishes recovery plan is being developed and should be completed in late 1994, and this document is being designed to serve as a planning tool for local, State and Federal agencies to protect and recover listed species and prevent further listings under the ESA.

In general, there is evidence that the abundance and distribution of estuarine species has been adversely affected by Delta water exports. Without limits on exports and criteria to establish suitable flow regimes, fisheries habitat in the Delta will not be protected and additional listings under the ESA are likely.

Regarding specific standards for listed species, both the NMFS and Fish and Wildlife Service have been working closely with Reclamation and the California Department of Water Resources to provide protection for winter-run chinook salmon and Delta smelt.

Biological opinions have been issued to the water projects and operations have been modified to reduce the adverse effects of the projects' Delta water export on these species.

A Biological Opinion regarding the effects of the long-term operation of the Central Valley Project and the State Water Project on winter-run chinook salmon was issued by NMFS in February of 1993. Fish and wildlife consultations for Delta smelt and splittail are ongoing with Reclamation and DWR to address the long-term operations of those projects.

Section 7 of the Endangered Species Act requires the National Marine Fisheries Service and the Fish and Wildlife Service to develop specific terms and conditions to protect listed species.

However, the State Board has a broader mandate to protect all beneficial uses of the Delta. It is the position of the federal agencies that water quality standards for the Delta should be fully protective of the health of the Delta ecosystem as a whole.

Biological opinions are limited in scope and timing because they are species specific. With proper coordination, the adopted standards can be designed to create suitable estuarine habitat conditions that will also halt the decline and allow for the recovery of the listed species.

Creation of general protective standards for the Delta should benefit listed species, species of concern, and nonlisted species. The federal agencies recommend the Board focus their efforts toward development of standards to restore late 1960s, early 1970s habitat conditions in the estuary.

The new standards should also embody the principle of all beneficial water users sharing the benefits and risks of water abundance and shortage. At present, the biological opinions for winter-run chinook salmon and Delta smelt obligate the State and Federal water projects to modify project operations for creation of suitable habitat conditions in the Delta.

New standards should be designed for a balanced reduction of water supply to all water users in times of shortage. Special management practices may be required to protect fish populations through prolonged droughts.

The NMFS Biological Opinion for winter-run chinook salmon adopted several components of draft 1630, including

the QWEST criteria, closure of the Delta Cross Channel gates, and the use of a conservative water supply forecast in the setting of water delivery allocations.

However, the winter-run Biological Opinion differs from draft D-1630 in that there are no exceptions to the QWEST criteria, and closure of the Delta Cross Channel gates is not based on fisheries monitoring.

NMFS requires the gates to remain closed continuously during February, March and April, the most probable winter-run emigration period.

At the currently low levels of abundance, monitoring programs are not effective at detecting the presence of juvenile winter-run chinook salmon. Relying on monitoring programs to trigger implementation of protective measures may result in exposure of a large portion of the population to adverse conditions before the first fish is detected; or conversely, it could result in unnecessarily early implementation of a protective measure with coincident costs to the project if an aberrant stray is caught early.

Draft D-1630 contained several positive steps toward addressing the impacts of Delta water exports that are not included in the winter run or Delta smelt biological opinions. The pulse flow requirements of draft 1630 would encourage the safe emigration of juvenile salmonids through the Delta.

The proposed user fees could greatly benefit long-term planning by funding fisheries monitoring and mitigation programs. The urban and reclamation conservation requirements would improve water use efficiency throughout the state.

Secondly, on the effect of diversions throughout the Bay-Delta estuary on beneficial uses, water diversions in the Sacramento River and Delta adversely affect listed species through reduced Delta outflow, direct loss to entrainment, and modification of local hydrological conditions.

Unscreened and inadequately screened diversions are causing losses of juvenile winter-run chinook salmon and Delta smelt.

According to a 1987 report to the California Advisory Committee on Salmon and Steelhead, there are more than 300 separate irrigation, industrial and municipal water supply diversions along the Sacramento River between Redding and Sacramento.

An unpublished examination of the possible impacts of local agricultural diversions in the Delta by DWR found that there were about 1800 small diversions. The Resources Agency of the State of California estimates more than 10 million juvenile salmonids may be lost to unscreened diversions annually.

The magnitude of these diversions, and the extent to which these diversions cause significant losses of winter-run chinook salmon and Delta smelt has not been adequately studied. However, NMFS has taken preliminary steps to address the loss of winter-run chinook salmon to unscreened diversions in the Sacramento River and Delta with the publication of an advance notice of proposed rule making in October, 1993.

The comment period for this notice closed on March 28 of this year, and we are currently reviewing the comments and developing a strategy for promulgation of a proposed rule to require screens on unscreened diversions.

Studies are also under way to determine appropriate screening requirements for Delta smelt.

Delta diversions also influence local hydrologic conditions within the Delta and lower survival rates for species dependent on the Delta for spawning and rearing of juveniles. The cumulative effect of within Delta withdrawals contributes to the lower Delta outflows and higher reverse flows in the lower San Joaquin River.

And finally, short comments on the methodology the Board should use to analyze the water supply and environmental effects of alternative standards.

The federal agencies think that the Board should primarily rely on the extensive hearing record regarding

impacts to the Delta environment and water supply. In addition, the Bureau and EPA have completed substantial analysis of water supply impacts associated with EPA's promulgation of standards and other activities of the federal agencies.

The current operational and biological models of the Delta are useful tools for evaluation of the relative water supply impacts and environmental benefits associated with alternative standards.

As part of the Programmatic Environmental Impact Statement for the Central Valley Project Improvement Act, Reclamation has prepared an Analytical Tools Report, dated April 1, 1994, to review and critique models available for analyzing alternative water management scenarios.

For example, DWRSIM operation model and Fish and Wildlife Service smolt survival model have been peer reviewed and calibrated under the current structural and operational scenarios. However, these models should be used in the decision-making process as indices of the relative impacts and benefits of proposed alternatives.

Rather than relying solely on these models, we believe that the Board should explicitly define the goals of standards and the habitat conditions necessary to achieve them.

That concludes my statement and the federal team is

available for questions.

MR. CAFFREY: Any questions by Board members?

Mr. Brown, and then Mr. Stubchaer.

MR. BROWN: Mr. Lecky, from the April hearings and Tom Howard's report on those hearings, it appears that a conclusion that you can arrive at from that hearing is that in setting the level of protection, there appears to be a desire for a wide range of alternatives with protection versus the economics of the alternatives.

How does this fit with some of the more specific standards that appear to be on the horizon with the federal involvement?

MR. LECKY: I think you are referring to conflicts between economics and the Endangered Species Act. I think the Endangered Species Act requires action to be implemented to restore the healthy populations of listed species. A lot of those decisions are done without specific implication on the State's economy.

Where we do have opportunity to consider economic impacts in deciding whether certain kinds of measures are reasonable and prudent. We rely in large part on input and analysis from the federal agencies and the permit holders to give us that information so that various alternatives can be judged to be reasonable.

MR. BROWN: Thank you.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: A question on your winter-run Biological Opinion -- was the inclusion of the QWEST criteria based upon an independent analysis by Club Fed or was it based upon the discussion at the D-1630 hearings?

MR. LECKY: Those are kind of going on coincidentally. The consultation team had under consideration flow criteria to protect out-migrating salmon at the time the Board was issuing its order, and we saw the QWEST criteria pretty much accomplishing what we were talking about, and we adopted that criteria.

MR. STUBCHAER: As a hypothetical, if the Board took another look at QWEST and determined it wasn't appropriate, would that have any influence on the consultation?

MR. LECKY: We will likely be taking a look at that ourselves over the next several months. DWR has criticized QWEST. We think there needs to be some measure of positive outflow during the critical emigration period for juvenile salmon in order to preclude poor survival in the interior Delta, which seems to be associated with reverse flows.

MR. CAFFREY: I have a question. In the ongoing discussions between, I guess, the State Water Policy Council and Club Fed, there's a term that's being used, *shelf life*, and it refers to reliability through some interpretation of the ESA that for lack of a better term might guarantee some

length of time that standards that the Board developed would last.

Now, I realize that this is a hypothetical and we are sort of at the beginning of this process, but let's say that the Board came out with a set of standards or a combination of water quality standards and some form of diversion standards, or operational standards I should say, that you felt or the Club Fed felt were reasonable and generally protective of a number of species, what is it in the Endangered Species Act that you feel would provide you the flexibility for a wait-and-see attitude, for lack of a better term?

MR. LECKY: I am not sure there is anything that provides us with that kind of flexibility. What we are hopeful will come out of this process are standards that are protective of the ecosystem that will allow the depressed species to recover to levels that occurred in the '60s and '70s.

If we have good comprehensive ecosystem management, we are confident that we can avoid future listings of the Endangered Species Act. Likewise, in the event that doesn't occur and we get to the point where we do have to add an additional species to the list, if we have a good comprehensive ecosystem approach and sound standards, then I think management of those newly listed species should occur

without additional impact on the waters of the state.

MR. CAFFREY: I think I understand what you basically said is you hope our standards don't give you a problem.

MR. LECKY: That's right.

MR. CAFFREY: Let me ask you, what if our standards are different or go far enough to appear that they will be significantly different when we get through with the water rights process insofar as operational requirements go, what if they are different from the existing Section 7 operational plans, would you be looking at those right away as soon as our plans are adopted, or the plan is adopted, to make appropriate changes there?

I guess what I am saying, this is probably a stream of consciousness, but I am really hoping there is going to be a lot of flexibility on your part and we can depart from some of the more traditional views. I am not talking about any interpretations that don't protect the species, but I am talking about creativity so we can all work together, hopefully, in more of an ecosystem approach.

MR. LECKY: Right. Mr. Anderson commented on preserving the flexibility that does exist in the act, and I think there is a fair amount of flexibility in Section 7 to review innovative approaches that will be protective.

Likewise, we view the EPA's approval as a federal action that has to be subjected to the consultation process

as well, and we will be considering those measures in that context.

MR. CAFFREY: Well, I think from the point of view of the Board, we have to do everything we can to try and balance, and that's difficult just to define, let alone implement.

And so, we think that creativity and flexibility in interpretation of something that over-reaches everything like the Endangered Species Act is really critical to this so-called joint process working, and I think it goes to the very important point of reliability for water supply, not just reliability for our cities and our farms, but reliable water supply for the public trust as well.

So, I think reliability is the key here and I think Mr. Del Piero had a question as well.

MR. DEL PIERO: On page 3 of your presentation you have a paragraph that reads in part: *The Delta native fishes recovery plan is being developed and should be completed in late 1994.*

Can you describe for me what the elements of that plan are going to consist of? Obviously, it's not finished.

MR. LECKY: I will speak in general terms what our recovery plan is. Basically, there is a broad directive in the ESA that all federal agencies should use their authorities to help recover and restore endangered species

populations. There also are opportunities for state and local agencies to use their authorities, although they are not specifically mandated.

A recovery plan is a document that's put in place to review the current status of the stock, identify all of the things that are affecting its recovery and recommend actions that can be implemented at various levels to help restore those populations, and essentially, it is a game plan for recovery and it identifies a step-down outline with priorities and obligations, and our best guess at funding those operations.

MR. DEL PIERO: The last sentence there references this document is a planning tool for local, state and federal agencies.

Do you want to clarify that for me? What does that mean?

MR. LECKY: I guess a general example would be if you have a specie that's declined and there are specific measures that could be implemented by governmental agencies at various levels, this plan would identify and set priorities for those.

For example, it would make recommendations to the State of California on how to best use the resources within its existing programs.

MR. DEL PIERO: Could this plan in characterizing

these strategies ultimately have those strategies implemented as conditions for 104 permits that might be issued?

MR. LECKY: We do not use them that way. I don't know whether Fish and Wildlife Service does either. Basically, it is an advisory document that sets out a strategy of recovery.

MR. DEL PIERO: So, it doesn't necessarily result in their application of these policies as conditions on federal permits issues?

MR. LECKY: Generally, they are a little more generic and broad reaching than that, but certainly, urging conditions under Biological Opinion , and reasonable and prudent alternatives should be consistent with the measures that are identified.

MR. DEL PIERO: When is late in 1994?

MR. LECKY: I will defer to Fish and Wildlife Service for that.

MR. CAFFREY: Good morning, sir.

MR. SCAMMELL-TINLING: Good morning. I am Jaini Scammell-Tinling and I am Assistant Supervisor for Water Resources in the Sacramento Fish and Wildlife office.

The recovery plan presently has been completed in an interim draft form by the Recovery Planning Team. The multispecies approach, they brought it into our office and

it is being presently assembled. Each part was built by individuals within that group, and so, they are now trying to basically blend it into a comprehensive document.

Our intention is for it to go to our regional office for internal review the first part of June, and I believe it will be put forward this fall with completion probably by the December 15 date.

MR. DEL PIERO: In terms of the recovery plan, does the plan deal with non-native species or just species native to the Delta or the Sacramento-San Joaquin system?

MR. SCAMMELL-TINLING: There are only natives.

MR. DEL PIERO: Only natives?

MR. SCAMMELL-TINLING: Yes.

MR. DEL PIERO: So that's what you are focusing on; right?

MR. SCAMMELL-TINLING: It is a multispecies approach.

MR. DEL PIERO: That's what I understood from the document, so I appreciate that.

Thank you very much.

MR. CAFFREY: Ms. Forster has a question, I believe.

MS. FORSTER: Is this recovery plan going to be your component of what your ecosystem approach will be?

MR. LECKY: I would say it would be a component that dealt with those species that are up for listing. Again, with all of the Endangered Species Act, it has a single-

species approach and measures will be identified in there to deal with native species in the Delta.

I should point out that the National Marine Fisheries Service also has a winter-run chinook salmon recovery plan in development and it should progress in about the same time frame as Jaini just laid out.

I think probably there still are things the Board needs to consider that are more comprehensive than those two plans together.

MS. FORSTER: One of the questions I have, it's very basic, if we are going to work together as State and Federal governments on an ecosystem approach, we have to know what is considered the ecosystem approach so that we can all study it, we can all see how all of the testimony fits into this approach.

What I am hoping is that it isn't a single species, that it is actually a multispecies approach, and we have the work shelf life we talked about through the Club Fed experience and the other people want to know what's going to be approvable, and so, early on I think that it behooves all of the people participating to have a clear understanding of what the ecosystem approach is so that at the end of this process we are not fighting over the definition of ecosystem approach.

So, is it Club Fed that has something that they have

developed in a booklet form that can be peer reviewed and studied so we start to understand your expectations on this?

MR. LECKY: No, we haven't produced anything like that.

MS. FORSTER: Is it your understanding then that we are all developing that right now when we are asking for what all the interested parties feel is the ecosystem approach?

MR. LECKY: I would agree that we need to develop a definition of what that means.

MR. CAFFREY: Are you volunteering?

MR. LECKY: I know it is tough because I have heard several definitions.

MR. DEL PIERO: Do you want to ask that question, Mr. Chairman?

MR. LECKY: I would point out the Endangered Species Act probably establishes a floor and that what we do in terms of ecosystem management needs to proceed beyond that.

MR. CAFFREY: Mr. Del Piero.

MR. DEL PIERO: I think the issue that Ms. Forster is struggling with is in the past the Board focused on a number of indicators in terms of the relative health of the Delta, and the two indicators the Board focused on -- a number of indicators in terms of the relative health of the Delta, and what I am hearing from both of the federal

agencies that had representatives here is that from the standpoint of striped bass, which is a non-indigenous, non-native species, that at this point in time it is not something we should be giving a significant amount of consideration to, at least in regard to satisfying whatever federal requirements we are obliged to satisfy, because that's not one of the things they are focusing on.

They are focusing on those native species that at this point are either endangered or threatened, or have been proposed for listing as either endangered or threatened, and when we started adding them all up between the Delta smelt and the winter-run salmon and whatever other runs of salmon ultimately get listed, and the splittail, and maybe the longfin, I think we just identified the ecosystem.

So, I think we are focusing in here on what we have been talking about and I don't think striped bass is one of them. Maybe it was in 1989, but it is not now.

MR. LECKY: Certainly, it is not something being addressed under the Endangered Species Act. You heard Dr. Hergesell say they are planning to develop a plan to manage recovery of that stock as well, and we are engaged in discussions with them about how best to manage striped bass.

MR. DEL PIERO: I am not guessing. We just heard it.

MR. CAFFREY: Anything else from the Board members?

Mr. Pettit? Mr. Howard?

MR. HOWARD: I just had a brief question. I note on page 2 of your statement that you indicate that there are two species, the Sacramento spring-run chinook salmon and the San Joaquin fall-run chinook salmon, for which you expect petitions for endangered species listing at any time.

What are the present populations of those and what leads you to believe that you will be receiving petitions in the near future?

MR. LECKY: The populations are in the low hundreds to low thousands, I guess, for those. What leads us to believe is we get weekly reports that so and so has a petition on their desk ready to send it in. Receiving a petition doesn't necessarily mean that a listing is forthcoming. We evaluate that petition on its merits.

We also take a look at each stock and decide whether we think it constitutes a specie as defined under the Endangered Species Act before proceeding with the listing.

MR. HOWARD: What are the critical migratory periods for those two chinook salmon stocks?

MR. LECKY: They are a little bit later in time than the winter run, generally April, May and June.

MR. HOWARD: Thank you.

MR. CAFFREY: All right, I think that completes the questions of Mr. Lecky and the other representatives.

Thank you all for being here. We appreciate your

input.

Next is Dave Schuster and Cliff Schulz representing the Kern County Water Agency.

Good morning, gentlemen.

MR. SCHUSTER: Thank you, Mr. Chairman.

I am Dave Schuster and I am here today representing Kern County Water Agency, and I would like to sort of have a change of tone somewhat, as I represent farmers and others, and I have a little more flexibility than they do, and I think I will use it.

I am going to try to react not in a negative way to the questions or the issues that the Board raises in reverse order, since we have been spending all morning on ESA issues. I use the word *react* in the sense of doing what I think the Board members and the staff would like, is give you some sense at least of how Kern County policy people that I work for are feeling, and to some extent, it is broader than some of these issues, and will give you a sense of what's going on outside this area, and also, some insight into our efforts to try to come up with what Mr. Caffrey is pushing hard for, to see if we can come up with a proposal in July.

We are wrestling with the same issues as you are.

The first issue that you folks raised, that hasn't been discussed much today, is some method and tools to

analyze any proposed plan's impact on both water supply and the environment.

As far as water supply, I think the Board members themselves, as well as especially the staff, have a pretty good handle on what's available in terms of how to use the DWR and the Bureau models. You can get some fairly accurate sense of how water supply impacts might be apportioned to other water users.

Also, a key issue there would be how you plan to apportion those waters. You have the capability of judging how the impacts may be apportioned out to the users.

We in Kern County have the ability to do some analysis in terms of economic impacts that may occur based on some assumed reduction in exports through ag users depending on exports from the Delta.

We can see DWR has like capabilities and is also working to see if we can assist this Board in terms of looking at urban impacts also.

So, there's tools out there in terms of economic impacts due to water supply reductions.

The strong reaction I have, and it is not negative, is what tools are available for biological assessment or scientific assessment of any kind of proposal? Today, working in the short term, and I have been working for 30 years on aquatic needs of fish species, who spend some time

of their life cycle in the Delta, and you can make the same statement upstream in terms of minimum flows upstream, that there are impacts already occurring and they are negative to a lot of ag users and some urban users.

I don't think the science is bad. Science is often misused. Its capability is stretched to make conclusions science cannot support, and by all parties on all sides, and I have nobody in mind that I am talking about. I think that's one of the mistakes that all of us make in this game we seem to play periodically before the different members of the State Board.

I do want to say, however, we should not ignore the available data and should not attack the numbers used, and used by this Board and others. Jerry there knows the data well enough in terms of how adequate it is, and more importantly, how adequate the data is in terms of not stretching its use to conclusions that science has not yet supported.

If I was showing you what you should do as members, and staff also, I think knows this, it would probably be the same thing I had to do when I found myself in charge of operating the Central Valley Project and listening to all these different biologists, none of whom agree on any specific issues.

What you do is listen real hard at the science they

are using, the basis of that science in terms of what they are proposing, and try to make the best shot you can from that data.

I guess I would urge this Board and staff to listen to the biologists that have expertise in this process and get ready for the judgment you are going to have to make.

I think we are coming down to the same type of thing I talked about before. You are going to have to make a judgment in terms of what you are balancing in terms of how much biological benefit we get on each proposal as far as increased protection and in terms of water supply and economic impacts.

You need to gain ideas. And when you get through all of these discussions about the data, what it means, how it is done, you have to make a scientific intuitional judgment of what to do.

The second issue which I will spend very little time on is the effect of other diverters, the CVP as well as other diverters, on the environment. Fish and Game have more expertise than we do and will provide you with that information.

There are other water development entities affecting the environment in addition to the CVP and SWP. Most of the actions that have occurred have been on the CVP and SWP, and I commend you for considering those other factors. I think

the Board knows the other water developments affecting those species.

I am not trying to respond to any specific question you asked. I think it is a broad question of addressing what is it we are trying to accomplish here. We, in the real broad sense, Kern County and other entities, are we just trying to address the EPA proposal or are we trying to address the total Club Fed proposal?

I think from our standpoint and many others, we use the word *certainty*. I guess the Chairman used some terminology looking for reliability. Secretary Wheeler used shelf life, which means the same in terms of certainty.

We must deal with the entire issue related to the Board's approach and Club Fed's, and the question is, how do you do that?

I think one way would be to set standards to protect existing listed species. I think federal and state regulatory agencies have the authority to do that and are doing it. I don't think the Board should do that.

One thing we have learned together, NMFS and Fish and Wildlife Service, is that we do need flexibility. There have been a number of changes to the winter-run salmon standard biological opinions and Fish and Wildlife Service set up, to their credit, a very flexible position in terms of you can reinstitute the consultation process.

It is very difficult to do through the State Board's water rights process which you are going to implement. Delegating that flexibility to the Executive Director, and we have complete faith in Walt Pettit and his willingness and ability to be fair to all sides, but it is a hell of a responsibility to lay on one person, plus we might get someone we don't like, so I don't like the precedent.

There was a good discussion by Mr. Lecky about recovery. Should you basically use a recovery plan as the basis for your standards? I think the answer is no.

We have heard a lot about winter-run salmon and Delta smelt, but there are other resident fish such as the splittail that may be listed that spend most of their life in the Delta.

To attain recovery, we are going to need a Delta fix of some kind. I am going to stay away from that issue.

I think recovery is probably not attainable in the interim for any resident fish in the Delta. Winter run, I am not sure of. I think most of the primary negative impacts on winter run have been upstream, not in the Delta.

If you had to use recovery in the balancing, you would end up not using recovery plans, so I don't think that's the right thing to use either.

I totally agree, both in terms of actions taken by the Fish and Wildlife Service and NMFS in terms of efforts

to prevent jeoparding future species.

As to the point Dave Anderson made earlier, you need to pay attention, which I am sure you will, to impacts from a water supply standpoint that have already been imposed on the CVP and SWP in the implementation of ESA requirements in your balancing. You must consider that in your balancing, and it could change in either direction, which would require further balancing, and we are relooking at this process.

Back to the point, what should you do as far as the judgment you are going to have to make that we talked about earlier in terms of adequacy of the science, in terms of how do you consider the information provided?

One thing I think you should keep in mind is the fact that I think it should be considered a living document. You are trying here to look at the whole process, and I think that is wise.

I think that anything the Board decides to do should not be considered final. I think what would be key to this would be to put together a comprehensive monitoring program so you can look to see the effect of whatever you do impose, and in a very short order, say about three years, if we have some kind of emergency, come back and do this over again.

We are going to have to live with this problem and you should keep in mind that whatever you do now is not necessarily going to be an end-all as far as the Delta is

concerned.

In terms of what do we do now, I think we need to look, and, in fact, this is the forum in which we can actually do an ecosystem approach. Many many people have been talking about doing that in other forums, especially under ESA, which I disagree with very strongly.

Most actions in ESA are for a specific purpose, such as recovering a specific entity, and we probably would end up reluctantly challenging it, especially in the Delta.

I can see going into other areas where you put money into the system to provide habitat required for the system, and also, give the agency habitat for other species that we care about, and that makes some sense.

We are not talking about dollars here, we are talking about water supply and people's life styles, people continuing to survive economically. I have never seen it applied to the Delta, but here in terms of legal authority under ESA, you have the Porter-Cologne Act and Water Rights Authority, so you do have authority to do the balancing.

Trying to figure out how to protect the ecosystem while accountin for the economic impacts related to that, that's when we start struggling. We want to come to the final answer on how to do that in a way that we continue to survive, but also, one that is biologically credible because we have to be credible.

We had been assumed to be the ones that are going to kiss off the environment. We are not trying to do that. We want to use water and we want to get the biggest bang for the buck.

We ask you to take into account what is happening under the existing ESA and to basically come up with what you think is the maximum benefit we can get for the species you decide to protect, and Mr. Del Piero has raised some of that issue in terms of probably resident fish within the Delta, habitat needs of those different species, both the ones listed and the ones that may be listed, looking at the fall-run salmon in the San Joaquin River, spring run on the Sacramento side, looking to see what we can do for all those species habitat-wise, and end up with a package that helps as many species as you can.

To give you a sense of how difficult this is, the DWR and some of our experts are helping them develop a biological assessment of potential impacts of the operation of the CVP and SWP under existing constraints, D-1485 and the NMFS's 1992 Biological Opinion 3, and we are doing operation studies. Biologists are taking it from there.

The Board will take some kind of action in the State water rights process and that obligation has been split between the SWP and CVP.

Now, we have the NMFS winter-run salmon and probably

the Delta smelt. We will do another biological assessment, go back through the process and look at what kind of effects your actions have had in terms of alleviating their concerns about jeopardizing the species.

So, I think the process works. The hard thing is that those habitat protection criteria must be both scientific and biological in terms of the economic effects they can have on the State of California.

Thank you very much.

MR. CAFFREY: Thank you very much, Mr. Schuster.

Let's see, are there questions from Board members.

Mr. Del Piero.

MR. DEL PIERO: I have a couple of questions. Given your participation in this process, do you think now, given everything that has gone on, the State Board should have adopted a comprehensive order in 1987 or 1989?

MR. SCHUSTER: You mean the first one?

MR. DEL PIERO: Yes.

MR. SCHUSTER: No, and I would rather do it at lunch.

MR. DEL PIERO: That's okay. I just wanted to know.

MR. SCHUSTER: At least not that one.

MR. DEL PIERO: Nothing was listed then, even the winter run wasn't listed then.

MR. SCHUSTER: Right. The winter run was, of course, petitioned in 1985.

MR. DEL PIERO: During the course of your presentation you talked about flexibility, a number of people have talked about flexibility. One of the things that Board members talk about occasionally is relative flexibility in terms of water use between agriculture and M&I use. Agriculture tends to be flexible in terms of its demands for water and M&I tends to be pretty inflexible for a number of reasons, but agriculture tends to have conservation technology available to it that allows it to be somewhat more flexible in terms of drought, and that's good, because if the Board is interested in adopting a standard that is flexible, it has to be flexible both ways to accommodate during wet periods as opposed to extremely dry periods.

I don't expect you to have an answer. But if you would be kind enough to address this in July when we have a discussion about economics, I would appreciate it very much.

Our Board is in receipt of a document that's maybe 300 pages, an EIR prepared by Kern County, for basically laying out the general plan for urbanization of in excess of 30,000 acres, and the source of water for that urbanization that is being circulated right now is the State Water Project and the Central Valley Project.

I would like when we talk about economics, since that appears to be all imported water, if you would just give us

some enlightenment on what Kern County is speaking about in July.

I am asking that because I am interested in understanding our obligation in terms of balancing water demands.

MR. SCHUSTER: The EIR we are doing is to look for ways to increase our ability to recharge water when it is available into the groundwater basin. Is that the EIR we are talking about?

MR. DEL PIERO: That's part of it.

MR. SCHUSTER: And that makes sense to me.

MR. DEL PIERO: I didn't read the water section on that.

MR. SCHUSTER: Basically, we are not sure what the water supply may be, if any, from the State Water Project because of all the different uncertainties at this time. I think, basically, what we are looking at is a situation where if many of our farmers can survive in Kern County, we have to have reliable supplies and you have heard that over and over again, but we don't see ourselves being financial participants in a lot of future facilities.

Basically, we see ourselves surviving by being able to store as much water as we can.

MR. CAFFREY: Any other questions? That's it.

Anything from Mr. Pettit or Mr. Howard?

Thank you very much, gentlemen.

Mr. Baber is next. Good morning, sir.

MR. BABER: Good morning, Chairman Caffrey and members of the Board and staff.

Just briefly, we want to adopt the response to the questions you have asked that we respond to here today by adopting the comments that we made at your April 26 workshop inasmuch as the material we gave in those comments which we submitted in writing would be applicable to particularly issues 1 and 2.

Our major thrust here on behalf of the Sacramento Valley Water Supply Districts and the Northwest San Joaquin Valley, is that you consider using the environmental review process in adopting these standards even before you go into the water rights supply analysis which you are planning for next year because the impacts of the water supply standard reductions depending upon which you adopt as a standard will be significant and could be catastrophic to many of the agricultural uses in this state.

So, we ask that you consider pursuing an environmental review process at the same time as you adopt water quality standards.

That's it. Thanks.

MR. CAFFREY: Any questions of Mr. Baber by Board or staff?

Thank you very much, sir.

MR. CAFFREY: Why don't we take time then to break for lunch and be back at 1:15. Thank you very much.

(Noon recess)

MONDAY, MAY 16, 1994, 1:15 P.M.

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MR. CAFFREY: We will resume our workshop. Welcome back.

Our first speaker announced earlier, keeping the same order, is George Basye.

Good afternoon, Mr. Basye.

MR. BASYE: Good afternoon, Mr. Chairman and Board members and staff.

I am George Basye of the law firm of Downey, Brand, Seymour & Rohwer in Sacramento, 555 Capitol Mall.

I am appearing this afternoon on behalf of East Contra Costa Irrigation District, North Delta Water Agency and Reclamation Districts 999 and 2068.

I will be referring to all four of those this afternoon in my comments as the Delta purveyors.

East Contra Costa Irrigation District, North Delta Water Agency and Reclamation Districts 999 and 2068 submit these comments in response to your notice of April 15. In that notice it was requested that we comment on the effects of Bay-Delta diversions on beneficial uses, including diversions other than the Central Valley Project and the State Water Project, and that, of course, would have reference to the kind of diversions that are being made by these Delta purveyors.

That notice requested comments; it specifically said diversions throughout the Bay-Delta estuary are cited as partial causes of the decline of some beneficial uses, and the Board requests participants to submit the most current information on this issue.

That's the issue that I am commenting on this afternoon.

As a threshold matter, these Delta purveyors take issue with the notice of the workshop's characterization of that issue regarding other uses. These Delta purveyors are aware of no evidence linking their diversions of water to the precipitous decline of the ecosystem of the Bay-Delta estuary that has occurred since the mid-1960s.

Furthermore, there are two reasons that it is highly unlikely that the Delta purveyors' diversions have contributed in any significant manner to the decline of the Bay-Delta estuary's ecosystem.

First, the Delta purveyors have, as a group, diverted the same amounts of water for 70 to 75 years or more. It is inconceivable, therefore, that these diversions are in some way responsible for the collapse or apparent collapse of the Bay-Delta estuary's ecosystem during the past quarter century.

Secondly, the Delta purveyors' diversions are entirely consistent with the historical operation of the

Bay-Delta estuary as a leaky reservoir, which I will explain later.

Although a number of factors are thought to have influenced the decline of the Bay-Delta estuary, including the introduction of exotic species, over-fishing by commercial fleets and by individuals, and pollution of the estuary by industrial uses, to the extent the decline of the Bay-Delta estuary may be related to water use, it is the State and Federal projects, not diversions by the Delta purveyors, that are the cause of such decline.

The Delta purveyors have, in general, diverted the same amount of water for at least 70 years. They collectively hold riparian rights, pre-1914 appropriative rights, and post-1914 appropriative rights to divert water from channels in the Bay-Delta estuary and from the Sacramento River.

In addition, we call your attention to the Department of Water Resources' contracts with the North Delta Water Agency and East Contra Costa Irrigation District entered into in 1981, which guarantees these Delta purveyors the ability to divert water of a specified quality for reasonable and beneficial uses.

Districts 999 and 2068 are located within the boundaries of the North Delta Water Agency.

Detailed summaries of the Delta purveyors' water

rights were presented to the State Water Resources Control Board as WRINT ECCID Exhibit 11, WRINT RD 999, Exhibit 11, and WRINT RD 2068, Exhibit 11, in that area, and they are incorporated into our comments today by reference as if set forth in full.

Copies of the contracts between North Delta Water Agency and the Department, and between East Contra Costa Irrigation District and the Department were introduced as evidence during Phase 1 of the Bay-Delta hearings on page 198 of the transcript of proceedings as North Delta Water Agency Exhibit 1 and East Contra Costa Irrigation District Exhibit 1, and are incorporated in these comments.

Our written comments which are submitted to you and supported by these exhibits, identified the various rights that these respective purveyors have been utilizing for a great many years. They are riparian, pre-1914, and to the extent they are post-1914, they well precede the priorities of either the State and Federal projects except for a small permit of RD 2068 to divert during the winter.

The evidence indicates that these historical diversions did not adversely impact fish populations. The concerns expressed on behalf of fish and wildlife have arisen since the operation of the State and Federal projects altered the way in which the Delta operates. There has been no significant difference in the quantity of water used by

the in-Delta diverters in approximately the last 70 years.

In addition, both the contract between the North Delta Water Agency and the Department and the contract between East Contra Costa Irrigation District and the Department acknowledge that, and I quote:

> *The construction and operation of the Federal Central Valley Project and State Water Project at times have changed and will further change the regimen of rivers to the Sacramento-San Joaquin Delta and the regimen of the Delta channels from unregulated flow to regulated flow.*

This is in the North Delta Water Agency contract recital (d).

Accordingly, the Department undertook to assure North Delta Water Agency and East Contra Costa Irrigation District of a dependable water supply of adequate quantity and quality for agricultural uses.

Again, quoting from the North Delta Water Agency contract:

> *The State of California recognizes the right of the water users of the agency to divert from the Delta channels for reasonable and beneficial uses for agricultural, municipal and industrial purposes on lands within the agency,*

and said diversions and uses shall not be disturbed or challenged by the State as long as this contract is in full force and effect.

By means of this provision, the State of California is estopped from disturbing or challenging reasonable and beneficial uses of water by the Delta purveyors, and is required to provide water to the Delta purveyors in the event of water deficiencies.

Accordingly, even if the State Water Resources Control Board were to find that the Delta purveyors had contributed to the decline of beneficial uses in the Bay-Delta estuary, the Board must recognize that the contracts between the North Delta Water Agency and the East Contra Costa Irrigation District and the Department shift the burden of mitigating for any such impact to the Department.

Our written statement also, of course, makes reference to the area of origin laws which we feel strongly about, and we assume that the Board will properly recognize.

The Delta purveyors' diversions are consistent with the historical operation of the Bay-Delta estuary. Before construction of the State and Federal Projects, the channels of the Delta functioned as a leaky reservoir. Historically, this reservoir was filled by winter and spring flows which flushed the Delta of intruding salinity.

In most years, the runoff from the Sacramento and San

Joaquin Rivers pushed the salinity line well out into Suisun Bay and beyond.

Delta water users then gradually depleted this reservoir during the growing season, which resulted in the slow intrusion of salinity from San Francisco Bay.

The delayed impact of this salinity intrusion meant that in most years adequate water was available for irrigation until nearly the end of the irrigation season, even in the most critical years. In fact, it has been suggested that the Delta lowlands, which is the major part of the Delta, may use approximately the same amount of water whether they are irrigated or not.

With the construction of upstream reservoirs, however, the Delta channels no longer store the water needed to repel salinity entering the Delta from San Francisco Bay in the same way that they did historically. Release of stored water during June, July, August and September, has had essentially the same effect as the water that was previously stored in the Delta channels and may limit the intrusion of salinity up into the Delta, but in a different way from that which was done historically.

They may also have some beneficial impact on the temperature of the Sacramento, of course.

I would like to put in a little historical context by telling you of the situation, particularly with East Contra

Costa Irrigation District that's located in the Brentwood area; their system was installed for irrigation of land in early 1914, a little bit before the act came into effect. And they have been diverting ever since and have a remarkable record of diversions and uses of water ever since 1914 in the Brentwood area. They had no difficulty irrigating with adequate water quality during all that time except for one month at the end of the season in 1931, in October of 1931, a very very dry year, when they had to shut down a few weeks earlier than they normally would have because of salinity intrusion.

But for all the rest of all the irrigation seasons from 1914 to date, and certainly, until the installation of the projects, there was no water quality problem.

In 1945, immediately after Shasta Dam closed, this district sent a telegram to the Secretary of Interior saying your operation is changing the regimen of the Delta and will have an adverse impact upon our water quality, presumably not quantity but water quality, which will be available to our pumps under our long pre-existing rights, and asked and insisted that there be a contract with the U. S. which would protect the rights of East Contra Costa Irrigation District to utilize the water in the quantity and quality that it was accustomed to do it in the 40 years before 1945.

They insisted on a contract with the Federal

Government. That's never happened. Fortunately, we have acquired a contract for that particular district with the Department of Water Resources in 1981 recognizing the quantity and quality which is available to East Contra Costa Irrigation District.

The reason that that district recognized its inherent change in the Delta even before it had been observed is it always had the great benefit of counsel from its consulting engineer, Gerald H. Jones, who retired as Assistant State Engineer a great many years ago.

I hope there are those either on the Board or in the audience besides Alice Book and myself who had the pleasure of knowing Jerry Jones. He was an outstanding consulting engineer who knew the Delta better, with all due respect to anybody I have known before or since, and Jerry was one who insisted that we recognize the fact that the Delta was a storage reservoir holding winter and spring water for local uses at that time.

It filled up every spring and winter, gradually leaking, not out but in, which, of course, was intrusion of salt water, and so, the slow intrusion of salt water would impair the reservoir effect, but there was a reservoir of stored water for Delta diverters to utilize prior to the projects.

Jerry recognized and insisted that East Contra Costa

Irrigation District send a telegram immediately even before the operation of the first diversion by the Federal Government of the Central Valley Project, pointing out that this would change inherently the regimen of the Delta adversely to the Delta users.

And he recognized the fact, of course, that once the water is stored in the winter and spring in the upstream reservoirs, and pumped by strong diversion facilities at the facilities of the Central Valley Project and, of course, subsequently, the State Water Project, you have turned that reservoir into a river. It is not any longer a reservoir of stored water available to Delta diverters, but it is a river moving north to south across the Delta to the pumps.

That was not the configuration of the Delta before the projects came into effect. And it is the position of these Delta purveyors, and I'm sure that of other users in the Delta, that if the Board considers that there is an impact by the Delta diversions on the ecosystem, that they must first determine the extent to which that impact is a result of this drastic change in the regimen which is a project effect, not a local Delta diverter effect.

And after that impact has been recognized, if there is some contribution by the local Delta diverters to whatever problems have developed in the Delta, then perhaps there is a basis for considering that, but not equally with

all other diverts because they are not the ones that have changed the regimen and the operation of the Delta in that drastic manner.

The prior operation was as a reservoir, albeit a leaky one which leaked salt water in during the course of the year, but usually didn't intrude very far until the very end of the irrigation season. That leaky reservoir obviously satisfied the uses of the in-Delta diverters until the projects came into effect.

Apparently, it also accommodated the ecology, the ecosystem and the fish which were in the Delta at that time, and so, we can assume that as far as we have been able to observe until the projects came, the operation of the Delta diverters either on the water supply or on the water quality or on the ecology was not adverse and did not result in the drastic decline which has occurred since, and we urge, if the Board is determining a way in which these impacts are apportioned, that they first recognize that there is a particular change that occurred first by the Central Valley Project and second by the State Water Project, and their combined operation upon the regimen of the Delta as it historically existed.

As to the water quality which would be applied, we, of course, would urge that it be as a minimum the qualities that are set forth in the contracts with the State of

California, the North Delta Water Agency contract and the East Contra Costa Irrigation District contract, which provides water quality assurances to those entities, and we believe that those are appropriate contracts and need to be observed and followed effectively by the State and recognized by your Board in your decision.

MR. CAFFREY: Thank you very much, Mr. Basye.

Are there questions from Board members?

Mr. Brown.

MR. BROWN: Mr. Basye, you alluded to an agreement with the Department.

MR. BASYE: Yes.

MR. BROWN: That the Department take on the responsibility of maintaining the water quality of the Delta.

MR. BASYE: Yes, these two contracting entities, Mr. Brown, not necessarily the entire Delta, but certainly, North Delta Water Agency and East Contra Costa Irrigation District with the State.

MR. BROWN: Thank you.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: I was wondering if the consulting engineer you mentioned analyzed the effect of upstream storage reservoirs as opposed to the pumps in the southern part of the Delta and diminished inflow by reason of those

project diversions out of the Delta.

MR. BASYE: His comments would have indicated, and his comments in those reports would have indicated those may have had some impact, but did not have the drastic impact he was describing, which was the combination, as I say, not just the pumps but the combination of storage of the winter and spring flows upstream instead of in the Delta, and the pumps operating collectively to pump the water across the Delta.

That is why he saw that that would be inherently an impact upon the diversions in the Brentwood area.

MR. STUBCHAER: Did he address the impacts of the reservoirs separately from the pumps?

MR. BASYE: No, he was talking about the combined impacts of those two.

MR. CAFFREY: Mr. Brown.

MR. BROWN: The agreements, what's the date on those?

MR. BASYE: 1981. I don't have the dates here. They are in evidence. I guess I have a citation for those here. They are Exhibits 1 for each of the agencies, page 198 of the transcript of the proceeding in the Bay-Delta hearings.

MR. CAFFREY: Other questions for Mr. Basye by staff?

Mr. Basye, thank you very much.

I am going to go out of the order I announced earlier and bring Tim Haines up with Mr. Fred Schneiter. They have

asked for a joint presentation.

MR. SCHNEITER: We have asked for a consecutive presentation.

MR. CAFFREY: If you both would come up, we will treat it as a joint presentation.

Mr. Schneiter, you are going to start and you are the Mayor of Ukiah.

MR. SCHNEITER: Thank you, Mr. Chairman and members of the Board.

My name is Fred Schneiter and I am the Mayor of Ukiah and the current Chair of the Northern California Power Agency.

The Northern California Power Agency is a non-profit California joint-action agency which was established in 1968 to provide economies of scale for the purchase, generation, pooling, and conservation of electric energy and the capacity for its members.

Its membership consists of 11 municipal electric utilities, a rural electric cooperative, an irrigation district, and a public utility district. These members supply electric power to over 660,000 residential and business consumers throughout Northern California.

Not only is the Northern California Power Agency a major purchaser of hydroelectric power produced by the Central Valley Project, but several members own and operate

hydroelectric facilities in the Central Valley.

I am pleased to have member representatives of the NCPA in the audience with me here today along with other members of the CVP Customer Technical Committee, who share common interests in the Bay-Delta standards.

The purpose of my comments today is twofold. First, I would like to highlight the important environmental and economic benefits which California receives from the hydroelectric power produced in the Central Valley.

Hydroelectric power generation in Northern California could be substantially impacted by the standards adopted by this Board to protect the fish and wildlife of the Bay-Delta estuary. These impacts need to be considered carefully in order to promote a plan for the Bay-Delta that balances the many competing uses of this vital watershed.

Secondly, I would like to offer several specific comments on the questions posed for today's workshop. Our comments pertain to effects of diversion and the methods the Board will use to analyze the water supply and environmental effects of alternative standards.

Hydroelectric generation in Northern California shares the responsibility for producing more than 85 billion kilowatt hours of electricity for the Northern California consumers and businesses.

Behind only natural gas and nuclear power generation,

hydroelectric power is the third largest source of electricity generated in Northern California, producing more than 15 billion kilowatt hours of electricity.

A major contributor in the production of clean, renewable hydroelectric is the Central Valley Project, which generates hydroelectric power at 11 major dams located primarily along Sacramento, Trinity, American and Stanislaus Rivers.

In fiscal year 1993, the Central Valley Project produced more than 3.5 billion kilowatt hours of clean, renewable electricity. This is equivalent to the amount of annual energy to serve about 450,000 Northern California homes.

Producing an equivalent amount of power from fossil fuels would have required the burning of 32 billion cubic feet of natural gas. This would have resulted in the release of substantial quantities of carbon dioxide, nitrogen oxides and other pollutants into the atmosphere.

In addition to the environmental benefits of hydroelectric power generation, revenues from the sale of Central Valley Project hydroelectric power are used to repay a significant portion of the Federal Government's investments in the project's dams, canals and other facilities.

Power users alone will contribute more than 576

million dollars toward project construction costs, including more than 62 million dollars in irrigation aid. These Central Valley Project facilities broadly benefit the California economy and everyone that uses water from the Central Valley Project.

Furthermore, Central Valley Project power customers are major contributors to the environmental restoration work authorized by the U. S. Congress, including ESA and the 1992 Central Valley Project Improvement Act.

In fiscal year 1994, Central Valley Project power users will contribute about 8 million dollars to the Central Valley Project Improvement Act Restoration Fund through a special surcharge to power users.

To insure the continued enjoyment of these economic and environmental benefits, it is vitally important that Central Valley Project power generation be preserved as a renewable and environmentally sensible resource for Northern California.

In developing standards and policies to protect the fish and wildlife uses of the Bay-Delta, we, therefore, urge the Board to avoid imposing constraints that would unnecessarily diminish the hydroelectric power-generating capacity or the value of that resource to its consumers.

Turning now to the specific questions posed in the Board's notice, we offer some general and specific comments.

Regarding the first question of what are the principal ESA issues, we have only general comments. We are in the electric power utility business and cannot profess to be experts in ESA issues. However, NCPA hopes that the Board cooperates as closely as possible with the U. S. Environmental Protection Agency and the other Club Fed agencies to define appropriate issues and develop balanced standards for protecting the Bay-Delta estuary.

A coordinated regulatory approach should provide important benefits to California by reducing uncertainty concerning the quantity, quality and reliability of electric power from hydroelectric projects. This will help preserve the long-term use of hydroelectric power and avoid the need for costly investments in non-renewable power generation facilities and the attendant environmental effects.

In addition, NCPA urges the Board to adopt standards that give hydroelectric power operators maximum flexibility to meet the required water quality criteria. Such an approach will help insure that important fish and wildlife resources are protected at the lowest possible cost to California consumers, including Central Valley Project power customers, while enabling us to preserve our operating capability.

On the second question regarding the effects of diversion on the beneficial uses of the Northern California

water supply, we encourage the Board to include the effects of diversions on hydroelectric power generation.

Water diversions in the Delta impact the timing and level of water releases which in turn impact the timing and amount of hydroelectric generation. As stated earlier, changes in the diversions can have significant economic and environmental consequences.

On the final question regarding methods to analyze the water supply and environmental effects, NCPA recommends that the analysis be expanded to consider power generation because of its significant economic and environmental influence. These methods should include analysis of the impacts on (a) amount of electric energy produced by the Central Valley rivers and the streams; (b) seasonal timing of energy generation; and (c) capacity available from the existing projects.

Available models exist to assist in the analysis. The water supply model used by the Board in the past, DWRSIM lacks the capability to consider these issues for the Central Valley Project facilities and to explicitly address the San Joaquin basin.

With the complex, integrated effect of the entire Central Valley on the Bay-Delta, other models such as PROSIM should be included in the analysis. Otherwise, a meaningful evaluation will not be possible. The NCPA and its members

will assist in filling this important gap in the coming months in cooperation with other entities.

Thank you for the opportunity to provide comments on this important matter. We look forward to cooperating with other interests in defining a balanced path and sharing of responsibility for enhancing the Bay-Delta estuary. We hope to aid in providing pertinent technical information that portrays the important effects of hydroelectric power generation on the California consumer, business economy and the environment.

If you have any questions concerning our comments, I would be pleased to try to answer them.

MR. CAFFREY: Thank you very much, Mr. Schneiter.

Perhaps it would be just as well to ask Mr. Haines to make his remarks, and then we could ask if Board members have questions, and everybody would be available.

Would that work for you?

All right, Mr. Haines.

MR. HAINES: Good afternoon, Chairman and members of the Board.

My name is Tim Haines. I am with the Sacramento Municipal Utility District.

I would like to thank you on behalf of SMUD for giving us the opportunity to make our initial comments into the Bay-Delta estuary standards.

I am here to express SMUD's concern that a major beneficial use of water tributary to the Delta may be overlooked in the establishment of water quality standards. This beneficial use provides a basic need which none of us live without. It powers our industry, lights our homes and the costs and efficiency with which we produce it have a substantial impact on our economy and our environment.

I refer to the generation of electric power, and specifically, hydroelectric power.

The Sacramento Municipal Utility District owns and operates a 660-megowatt hydroelectric project on the American River which captures and stores spring runoff for power generation during heavier load periods of the summer, fall and winter.

The upper American River project also provides a load following and regulation services that allow the SMUD system to function in a reliable manner. This is clean, inexpensive, renewable power which we provide to our 470,000 customer owners without reaping profits for stockholders, and without worsening the air quality problem we are trying to solve.

Water quality standards for the Sacramento-San Joaquin Delta which could impact SMUD's ability to store spring runoff could have direct adverse impact on this important resource.

SMUD has also been the largest purchaser of hydroelectric power from the Central Valley Project for the last 40 years, purchasing 460 megawatts from the Central Valley Project.

This important resource could be further constrained by Delta standards in its ability to generate capacity and energy when customers demand it. Requiring massive releases during periods of low power demand, that is spring and fall, can have severe impacts on the ability of the project to generate power during peak load periods of the summer and winter.

Without the certain availability of clean, dependable peaking capacity and energy, old, inefficient thermal units will run more often, or new ones will be constructed, generating more air pollution and costing ratepayers more money.

In summary, fully one-half of SMUD's capacity resources, which supply over one million people with power, are hydroelectric plants on rivers tributary to the Delta, so SMUD customer-owners have a huge stake in the outcome of this proceeding.

SMUD does share the Board's concern about aquatic resources in the Bay-Delta system, and wishes to constructively contribute to the recovery efforts under way. Indeed, we are the largest financial contributor to the

Central Valley Project Restoration Fund, have supported the Central Valley Project Improvement Act since its inception.

SMUD's record as an industry leader in environmental achievement is well known.

This leads to the District's specific input to the development of Delta standards within the context of the three subjects for today's workshop:

1. What are the principal ESA issues the State Water Resources Control Board should consider during this review:

SMUD is concerned that a piecemeal, species by species approach cannot produce an effective recovery of Delta aquatic resources, and will result in inefficient use of the limited water resources available for this and other beneficial uses.

As a result, existing beneficial uses, including hydroelectric power, could incur more impacts than necessary to recover the Delta aquatic resources. Coordination of efforts by State and Federal agencies is essential.

The Board should also determine what role structural measures can play in recovery efforts, so as to reduce demands on inflow when possible, particularly during seasons when other beneficial uses cannot benefit from such releases.

For instance, effective screening of Delta cross-

channels, sloughs and diversions, and installation of rock barriers, can reduce the inflow needed to provide adequate environmental conditions.

Unless such options are considered as preferable from the outset, the standards and recovery efforts may not lend themselves to such solutions and other beneficial uses may be harmed unnecessarily.

2. What are the effects of diversions throughout the Bay-Delta estuary on beneficial uses?

Delta diversions have required massive releases from storage reservoirs to maintain westward Delta outflows in spite of currents created by pumping plants through Delta channels and sloughs.

The demand for these reservoir releases is compounded by needs of anadromous fish for suitable temperature and attraction flows in rivers tributary to the Delta. Demands for municipal and industrial water and agricultural water will also continue to grow.

It is difficult to rely on firm water and power yield of the Central Valley Project when demands on releases are so variable. Predictable release patterns from major reservoirs are needed to maintain the dependable capacity of the hydroelectric power systems which depend on those releases.

California cannot afford the adverse impacts of losing this valuable resource, and the environmental and economic costs of replacing hydroelectric power with thermal resources.

Flushing more and more water through a broken system is an approach which does too much damage to other beneficial uses, including hydroelectric power generation. We should work to find solutions which make the most efficient use of the water we have.

3. What methods should the Board use to analyze the water supply and environmental effects of alternative standards?

The Board should analyze the impacts of its action on power supply as well as water supply. SMUD relies on hydroelectric power generated by the rivers tributary to the Delta supplying 50 percent of the electric capacity needs of over one million people in Sacramento County. These impacts should not be overlooked.

Numerous models are available to calculate and help minimize impacts to hydroelectric power generation. SMUD is willing to work with the Board to address these impacts.

I would like to thank you for the opportunity to provide input to the Board's development of Delta standards. We at SMUD look forward to a close and cooperative relationship to insure that hydroelectric generation is

given thorough consideration by the Board in its efforts to recover the aquatic resource of the Bay-Delta system.

MR. CAFFREY: Thank you, Mr. Haines.

Are there questions from Board members of either Mayor Schneiter or Mr. Haines?

Anything from staff?

All right, thank you very much. Thank you, Mayor, for being here. We appreciate it.

Laura King from East Bay Municipal Utility District. Good afternoon, Ms. King.

MS. KING: Good afternoon, Mr. Chairman and members of the Board.

Before I begin my formal statement, I, too, would just like to mention that you will be hearing later in the afternoon from the group informally called the Urban Coalition and you will note that East Bay MUD is not listed as a member of that group, and I just wanted to clarify for the record the reason that we are not listed in that is because of the short time in preparing the document we were not able to provide it to our board to review, and the fact that we are not on that list does not denote any disagreement or problem with that statement.

In fact, I think probably if our board had had a chance to review it, they would agree with most, if not all of the content there, and our specific remarks today are

very parallel to that statement.

I am going to talk today and I am going to summarize information that's already been presented to the Board in another forum in hearings on our lower Mokelumne River Management Plan which was introduced in evidence in 1992.

I know Mr. Del Piero is familiar with this, but I don't know if the rest of you are, or whether staff has had a chance to see this.

So this summary statement is pretty much of a summary and I am going to read it. If I tried to summarize it, there wouldn't be anything left of it.

On the first issue, the Endangered Species Act issue, the District feels that actions which might be proposed to protect a single listed specie may be in conflict with what is needed for the protection of other species. For example, changes in operation of the Delta cross-channel intended to protect the winter-run chinook salmon could have a detrimental effect on anadromous stocks in the Mokelumne River and the Central Delta.

All actions related to protection of listed species must be evaluated in the broad context of overall impacts, costs and benefits. This will require balancing the needs of listed species and other important stocks, as well as water requirements for other beneficial uses.

A comprehensive and systematic approach is,

therefore, needed to evaluate the full spectrum of fisheries needs and their relationship to other beneficial uses. Providing water to meet Delta standards and salmon smolt out-migration criteria for a single river system may adversely affect water supplies needed to facilitate in-migration, spawning, rearing and out-migration of salmon fry and smolts on other river systems.

For example, operations on the Mokelumne River under the District's lower Mokelumne River Management Plan, which are designed to protect and enhance habitat conditions for various life stages of Mokelumne River salmon, may be jeopardized by operational requirements imposed for meeting Delta standards.

On the second issue, the effects of Bay-Delta diversions on beneficial uses, the District's lower Mokelumne River Management Plan was developed for the purpose of protecting and enhancing anadromous fish in the Mokelumne River, in balance with other beneficial uses.

The plan takes into consideration and accounts for existing conditions in the Delta which impacts survival of Mokelumne River salmon.

Present Delta conditions are seriously adverse to salmon survival. Any further degradation of conditions in the Central Delta will impair East Bay MUD's potential for success in restoring a Mokelumne River salmon run because of

the serious impacts on salmon migrating to and from the Mokelumne River system.

Further deterioration of Delta conditions will also impact other anadromous fish stocks passing through the Central Delta from other tributaries.

Based on an assessment of Delta conditions, as they impact and relate to development of a fisheries management plan for the lower Mokelumne River, East Bay MUD found that losses occurring to Mokelumne-origin salmon migrating through the Delta are of major consequence.

In general, the percentage of smolts that survive passage through the Central Delta ranges from 37 to 0, averaging 15 percent. In other words, Delta mortality averages 85 percent. 66 percent of the variation in survival is related to temperature in conjunction with water exported by the two projects.

During the peak of Mokelumne River smolt out-migration, from late May through June, survival is minimal because of temperature, reverse flows, increased predation, and other factors. Mortality is exacerbated in dry years because of reverse flows and increases in project diversions.

Diversions by the Central Valley Project and the State Water Project are of sufficient magnitude to alter flow patterns within Delta channels, channels through which

Mokelumne-origin salmon must migrate en route to and from the ocean.

These changes in flow can contribute to a redirection of young salmon into South Delta channels, thereby causing delay in out-migration and increases their susceptibility to predation and entrainment losses at the CVP and State Water Project facilities.

This redirection and delay can also increase the number of salmon potentially impacted by the large number of agricultural and industrial diversions and drains. There are hundreds of such diversion facilities, as other speakers have already alluded to today, many of which have no screening facilities.

Project impacts on Delta flow patterns can also influence upstream migration of salmon to the Mokelumne River. Changes in hydrologic and olfactory clues and the movement of large volumes of water from the Sacramento River across the Delta may contribute to delays in upstream migration and increased straying of adults from one tributary to another.

The impacts of Delta hydrology on Mokelumne River salmon were described in detail in evidence submitted by East Bay MUD in the Mokelumne River hearings.

For your convenience, those portions of East Bay MUD Exhibit 27 and East Bay MUD Exhibit 32 which describe the

impacts of Delta conditions on the Mokelumne River salmon are included here as Attachments 1 and 2.

One of the consequences of adverse fishery impacts associated with the operation of the CVP and SWP pumps in the Delta cross-channel is that salmon smolts are trucked around the Delta to reduce mortalities, instead of migrating naturally through the Delta from their streams of origin.

For example, this year the Department of Fish and Game has notified East Bay MUD that approximately 650,000 Mokelumne River salmon smolts will be transported from the Mokelumne River fish hatchery to a release location near Antioch in order to avoid high mortalities associated with Delta conditions.

East Bay MUD is concerned that these Mokelumne River-origin salmon smolts, if trucked from the hatchery to Antioch, will not be properly imprinted to the Mokelumne River and upon their return migration will stray to other river systems.

Consequently, adverse conditions expected to result this year from project operations within the Delta, which necessitate trucking salmon that have not been imprinted to the Mokelumne River, are likely to substantially decrease the number of salmon that will return to the Mokelumne River.

This is a significant impediment to East Bay MUD's

ongoing efforts to rebuild the Mokelumne River salmon run as part of its Mokelumne River Management Plan.

It should be noted that the smolt survival standards suggested by the U. S. Environmental Protection Agency, such as the Sacramento River salmon index, are not applicable to Mokelumne River fish. Likewise, the San Joaquin River salmon index does not have a temperature factor or represent Mokelumne River fish.

In essence, Mokelumne River fish are not being considered in the standards, even though East Bay MUD and others are continuing to make a considerable effort to maintain this run.

Substantial detriment can result to Mokelumne River fisheries if meeting proposed Delta objectives jeopardizes spawning and rearing conditions on the Mokelumne River, or depletes carryover storage needed to maintain flow in dry years.

Additional detriment can result if high Mokelumne River flow requirements are imposed to meet Delta objectives before the normal out-migration periods in April and May. High flows too early in the season can force young salmon into the Delta before they are physiologically ready and less able to withstand the stress of Delta conditions.

The trade-offs between meeting proposed Delta objectives and potential adverse impacts to upstream

fisheries must be comprehensively evaluated, and as an aside, I think this is where we are talking about ecosystem management, that we have to look at the ecosystem as a whole.

Using water year type indices based on current year runoff to determine requirements for Bay-Delta standards increases the risk of adverse impacts because they do not account for the necessity of providing carryover storage in the event of multiple dry years.

Proper management of storage is critical to maintaining water quality conditions downstream of many reservoirs in the Sacramento Valley and adjacent foothills.

Any plan to improve Delta water quality at the expense of water quality in and below reservoirs on tributaries must include consideration of the resulting adverse impacts to fisheries in those river systems, as well as impacts on water supply for other beneficial uses.

Turning to the third issue for today's workshop on methods available to analyze water supply and environmental effects of alternative standards, we have a model that we have developed known as EBMUDSIM, which we would like to bring to your attention.

In analyzing water supply and environmental effects of draft water quality standards, the State Board is urged to take into account the results of model studies performed

by the East Bay Municipal Utility District's operations simulation. EBMUDSIM is a valuable planning tool for assessing impacts of alternative operation proposals on the Mokelumne River system.

EBMUDSIM is a water balance model which operates on a monthly time step. It provides information which is similar to the types of information obtained from the Department of Water Resources DWRSIM model. However, since the District's model focuses on simulating Mokelumne River operations, EBMUDSIM provides a more accurate assessment of impacts to the Mokelumne River.

EBMUDSIM models the Mokelumne River system, the Mokelumne aqueducts and East Bay MUD's terminal reservoirs. The model is used to simulate the operation of the District's water supply system and estimate the yield of its water entitlement, consistent with the constraints within which the District must operate.

EBMUDSIM also accounts for water use by upstream users above Pardee Reservoir, and releases to meet water requirements below Camanche Reservoir.

East Bay MUD's customer demands are met through Mokelumne aqueduct drafts and by operation of the East Bay terminal reservoirs.

The input assumptions used by the model and the output produced by the model are illustrated in Figure 1.

By changing input assumptions, the model can compare the effect of proposed operational alternatives.

EBMUDSIM allows the District to assess impacts associated with alternative instream flow standards or release requirements on the Mokelumne River system. As the State Board balances competing beneficial uses, accurate information on the impacts of proposed Bay-Delta standards and implementation measures on tributaries in the Delta watershed is essential. EBMUDSIM provides an important tool for assessing these impacts on the Mokelumne River.

The District and the State Board have used EBMUDSIM in previous proceedings. During the Mokelumne River proceedings, the District submitted study results assessing impacts of alternative instream flow proposals.

In assessing environmental effects of proposed Bay-Delta standards, several biological models are available. For example, the chinook salmon population, known as CPOP, family of models can assist the State Board in predicting the response of the salmon population to changes in the amount, location and timing of water locations.

Trade-offs between spawning, rearing and out-migration flows can be evaluated, as well as multistock management and integration between river basins.

Non-flow factors such as impacts of hatchery operations, harvesting, Delta facilities operations and

improved screening can also be evaluated. These models which have been extensively peer reviewed, were developed for the California Department of Fish and Game and the National Marine Fisheries Service.

Specifically, within the CPOP family of models, the fall-run chinook salmon population model, CPOP3, has been developed for the Sacramento River. A similar model for winter-run chinook salmon, CPOP-W, is also available.

These models operate on a daily time step and can comprehensively and systemically evaluate the effects of water management on salmon populations.

By linking these models and adding a San Joaquin model, a comprehensive analysis can be completed. In addition, these models evaluate the use of water across the life stages of salmon at various locations in the Bay-Delta and its watershed, and also, considers the impacts of harvesting and hatchery management.

In developing a balanced approach to the analysis of water supply and environmental effects on the Mokelumne River, East Bay MUD integrated both water supply and biological models in its lower Mokelumne River Management Plan and we list here a number of models that were incorporated and integrated into the development of that plan.

The District evaluated several water management

alternatives using these modeling tools. A preferred management alternative was developed that maintains reservoir and river water quality as well as suitable conditions for salmon in-migration, spawning, rearing and smolt out-migration.

The lower Mokelumne River Management Plan also incorporated the impacts of hatchery management.

All of these factors were balanced with other beneficial uses. Alternatives were evaluated in terms of habitat scores as a percentage of optimum for all life stages, including spawning, fry, juvenile for chinook salmon and steelhead trout.

Out-migration mortality and attraction flows were considered and escapement, harvest and juvenile production were also evaluated.

In developing the lower Mokelumne River Management Plan, the District also evaluated the effects of water supply and cost. As a result of these analyses, a near optimal allocation of water was derived.

The SCIES analysis of the lower Mokelumne River Management Plan is particularly useful since it is readily transferrable to other data sets and complicated trade-off analyses. The models and analytical tools applied in development of the lower Mokelumne River Management Plan are available to evaluate the effects of the proposed Bay-Delta

standards on Mokelumne River fish and water supply.

Similar models are available for other watersheds, but they have not been integrated. For example, IFIM and temperature models have been completed for many tributaries of the Sacramento and San Joaquin Rivers. However, these models need to be integrated in order to facilitate a comprehensive and systematic analysis of the impacts of Bay-Delta standards.

And that concludes our comments and I would be happy to answer any questions.

MR. CAFFREY: Thanks, Ms. King.

Questions from Board members? Mr. Brown.

MR. BROWN: Ms. King, I have been up to the Camanche Reservoir and have seen that sign up there for the fishery restoration program. It's quite impressive.

Do you have any figures in mind how those fisheries have been recovering over the last few years, the winter run, fall run?

MS. KING: On the Mokelumne River, we have got a fish person from our staff here who possibly could answer that, or we may need to provide the answer to you.

Do you have the answer?

MR. MIYAMOTO: I'm Joe Miyamoto.

MR. BROWN: There was testimony earlier in the day from Mr. Hergesell that they had 191 winter-run salmon up

the Sacramento. I think that was in 1993.

I wonder -- I just wondered what your winter-run salmon might have been in 1993.

MR. MIYAMOTO: It's just fall run that we have in the Mokelumne. It is not a winter run.

MR. BROWN: I thought I heard Laura say winter run also.

MS. KING: There are models for the winter run.

MR. MIYAMOTO: There's a CPOP model for both fall and winter.

MR. BROWN: So, I misunderstood.

MR. MIYAMOTO: I am the Superintendent of Fisheries and Wildlife for East Bay MUD. I do have the numbers of the fall salmon escapement, if you would like those.

MR. BROWN: I thought I heard Ms. King say winter run also in the Mokelumne, so that was an error, but the fall run has been improving or has it been declining?

MR. MIYAMOTO: It has been improving. For example, this past year in 1993, we had spawning escapement of 3100 compared to 1645 the year we had the State Board hearing on the Mokelumne, and then, the two previous years the escapement was 410 and 497. So it has been improving.

MR. BROWN: Good, thank you.

MR. DEL PIERO: Mr. Brown, closure of the Delta cross-channel had a significant impact on that issue, that

along with the operation of the fish spawning facility.

MR. CAFFREY: Any other questions?

Thank you very much.

I forgot to ask the staff, are there any questions?

Mr. Austin Nelson from Contra Costa Water District.

Good afternoon.

MR. NELSON: Good afternoon, Mr. Chairman and members of the Board.

I am Austin Nelson, representing Contra Costa Water District on the issue of the effects of diversions on fishery resources.

We have come before you on occasion in the past and discussed modeling studies of fish entrainment at the Contra Costa Canal intake, but we have had no data to present.

You should know that monitoring is now required at the Contra Costa Water District and Bureau of Reclamation Rock Slough, as well as the District's intake at Mallard Slough under biological opinions having to do with the effects of the Central Valley Project on Delta smelt and those programs are being implemented in cooperation with the California Department of Fish and Game, the National Marine Fisheries Service and the U. S. Fish and Wildlife Service.

Monitoring has actually been in progress at Rock Slough since January and I will give you some partial results with respect to special status of the species.

Since that time, through last Friday, we have caught in the nets two winter-sized chinook salmon and one Delta smelt and one Sacramento splittail. I wouldn't take that record as an indication of a long-term trend, but they are the data that we have and those data are being reported regularly.

MR. DEL PIERO: That would constitute two percent of the population three years ago.

MR. CAFFREY: You also said winter size.

MR. NELSON: I was trying to be careful about that.

One of the measures that has been adopted in the past and discussed here today for controlling the effects of diversions is limits on the Western Delta reverse flow as measured by the QWEST perimeters. We discussed that in the written statement and I just want to say that we are not aware of any biological data that demonstrate that entrainment of fish at the State and Federal pumps is dependent upon Western Delta reverse flow.

We have discussed with you in the past at some length our fairly detailed examination of the physical data collected in the Delta since 1967 when the Delta pumping plant went into service, and based on that analysis we have found that there is no measurable effect of QWEST on transport of salt from the Western Delta into the interior.

For that reason, we would urge the Board to be extremely careful if it chooses to consider QWEST

limitations in connection with these proceedings and to perform a careful review of any proposal to include those kinds of limitations in a plan the Board prepares.

On the issue of the DWRSIM program, we have discussed with you, and the references are in the statement, in the past the limitation --

MR. STUBCHAER: Which statement are you referring to, the one for this meeting today or a previous one?

MR. NELSON: Our statement for today is Exhibit CCWD 5, and it has references to the material that I have been discussing.

We have discussed the limitations of DWRSIM with you on occasion in the past. I don't want to go into that in detail except to note that we have identified serious limitations in the relationship used in DWRSIM between flows and salinity control in the Delta.

For the moment, the Board must use, we think, a program such as DWRSIM or the conceptually similar PROSIM model in order to account for project operations that are associated with alternative standards.

However, we would suggest that you use other independent methods when they are available to check the results that come from those programs, and in particular, we would offer the method that's described in CCWD Exhibit 2, which we have submitted to you at the last proceeding. That

exhibit is one of the reports that was prepared and sent to you by the California Urban Water Agencies, and it was used in the CUWA analysis of the X2 studies.

In the longer term, we would urge you to encourage parties to these proceedings to follow Chairman Caffrey's advice this morning and work together to try to develop improved and mutually satisfactory models that deal with this topic.

On that point, I will point out to you that there is a comment in our statement this morning, CCWD-5 that is very closely parallel to one in the Department's written material, Department of Water Resources, and that is that we are working with them in an attempt to develop alternatives, develop and test alternative procedures for dealing with these issues.

Thank you.

MR. CAFFREY: Does that complete your statement?

MR. NELSON: Yes.

MR. CAFFREY: Any questions from Board members for Mr. Nelson? Staff?

Nothing at this time, Mr. Nelson. Thank you very much.

Next, we will have a joint presentation from Alex Hildebrand and Dave Whitridge from the South Delta Water Agency.

MR. WHITRIDGE: Good afternoon.

I am David Whitridge with the South Delta Water Agency and individual agricultural water users within the Southern Delta.

Alex Hildebrand, I think, will have a few comments after I am through.

I would like to focus today mainly on your second issue that is noticed, what are the effects of diversions throughout the Bay-Delta estuary on beneficial uses?

I won't go through the long history that I thought was very well presented by Mr. Basye a little while ago.

I was pleased to hear Mr. Hergesell earlier this morning state that the Department of Fish and Game did not feel that Delta diversions were a significant cause of decline and should be given specific attention by the Board.

I would just reiterate that in the Southern Delta just about all the diversions have been there since the turn of the century, agricultural diversions, and certainly, since 1920, and since these were in operation for at least 40 years before there was any significant decline in the fishery population, they cannot be assessed as a cause of the decline.

Now, to the extent that it might be beneficial to screen some of these diversions as an offset to other causes, we are supporting some studies to that effect.

However, we think that the cost and inconvenience associated with it should be borne by the other parties, particularly the projects which, as Mr. Basye pointed out earlier, drastically changed the flow regimen in the Delta.

The primary problems we have in the Southern Delta include water circulation, reverse flows caused by the projects and null zones as a result of the great upstream diversions and export pumping.

Now, that also results in very high water temperatures, and so with the circulation problems and high water temperature problems, we have some tests which show water temperatures in some of the null zones and blind sloughs above 23 degrees Celsius which is far above the critical survival temperature for either Delta smelt or salmon.

So, the screening in certain areas where there is no circulation and high temperature problems is not really going to solve any problems.

In the South Delta we also have generally turbine pumps, the intake of which sits on the bottom of the channel, and we haven't found an effective way to screen these without their getting clogged.

We also haven't found any evidence that there's any detrimental effect of these on any endangered species.

There have been some tests that we have participated

in; one on Naglee Burk Irrigation District, which was referred to in the DWR appendix that was handed to you, and one, also that was done by the Department of Fish and Game in the McMullen Tract on a slough very near the southern end of the Delta, and I don't think DWR refers particularly to that, but we can get you some results on both of those tests if and when it appears that you may be considering any kind of this as an option.

Both of them show that no endangered species were entrapped at either of these locations, or any kind of salmon for that matter, endangered or threatened species.

The chinook salmon would not be in the Southern Delta at any rate except for the effect of the export pumps, the winter run on the Sacramento side.

In addition, the gentleman from the National Marine Fisheries Service this morning talked about the study they are doing on potential rule making. We have submitted comments on that and we think that's probably the best forum to address the fish screening issues.

Certainly, it should be addressed in terms of specific intakes and their effect rather than some sort of blanket idea that every agricultural intake has the same effect.

Finally, in addition to that, there are some other ongoing operations under the Central Valley Project

Improvement Act. A couple of very large agricultural diversions in the Southern Delta are being analyzed for screening now within the Banta-Carbona Irrigation District, and that should have a beneficial effect.

Finally, I would just like to say a word about modeling. We, of course, will undertake modeling. We use the RMA model, and the DWRSIM will not provide all the information necessary to address the upstream water supply impacts, particularly on the San Joaquin side of the proposed striped bass criteria.

So, we will analyze those if they appear to be considered as an objective and provide information to the Board.

We hope and assume that the Board also will look at all the available models.

Thank you.

MR. CAFFREY: Thank you, Mr. Whitridge.

Good afternoon, Mr. Hildebrand.

MR. HILDEBRAND: Mr. Chairman, I would like to expand a little bit on what Dave has said and what George Basye said relative to the diversions in the Delta, but first, let me just say that there was some dialogue during the course of the day here about possible effects of any Delta facility that might come along, and the question of the viability of the BDOC in coming up with some plan for that.

I am a member of BDOC and I think it is alive and well. I believe that most of those on the Board do believe that we will come up with some viable proposal in less than a year from now, hopefully somewhat sooner than that. Of course, it will be some alternatives that eventually will have to go through the environmental impact process, so we are not going to start building something next year.

However, it is my personal opinion and that of some of the other members of the Board, and that is even recognized in the council that we probably should come up with something that can be done in stages for two reasons: One is to begin to make progress sooner because there are some things you can do that are relatively simple as compared to others; and the other reason is that there's a great uncertainty as to how effective various components of these facilities might be, a large part of the uncertainty coming from the introduced species problem.

We don't know whether restoration of flows and qualities, a certain degree, whether it be caused by standards or caused by facilities will, in fact, be effective if you can't do something about the endangered species.

So, we think it is desirable to kind of move along in pieces and find out whether the introduced species or other causes besides the export facilities may be dominant, so

that even though there are surely impacts from the export facilities, but it may be that even if you shut them all down totally and let all those people in Southern California move up here, that we would still have a problem.

In other words, it may not be possible to return the aquatic ecology of the Delta to what we would all like to return it to.

Getting back then to the matter at hand, we recognize that you plan to discuss upstream diversions in your June workshop. However, as George Basye indicated, it is kind of hard to separate the two. I certainly endorse his remarks, particularly those relative to the leaky reservoir concept. That's a very valid thing.

But even though the Delta diversions clearly did not cause the decline in the fishery, you may still wish, as Dave says, to address some of this offset to things that have caused the decline.

And it's quite possible, although I think quite clear that the upstream diversions have, in fact, increased the impact of the Delta diversions, which wasn't the fault of the Delta diversions, but it had that effect.

For example, in the San Joaquin system, which is the one with which I am most concerned, there has been, as you know, an enormous decline in the inflow of the river to the Delta, both on an annual basis and also some shift on a

seasonal basis. And the result of that is to substantially increase the magnitude and frequency with which we have null zones in portions of the South Delta, portions of Middle River and Old River channels within the South Delta.

When we get a null zone like that, you have no control of temperature, you have no control of salinity. The residence time for migratory fish is greatly increased, so both from a fishery point of view and from a point of view of the agricultural diverters, it's a big problem.

Furthermore, if you try to screen fish in a null zone or in blind sloughs, of which we have many, what are you going to do with the fish you screen once you catch them on the screen? You can't flush them on by and you can't very well set up the kind of trucking system that they have at the State and Federal pumps for every little diverter.

So, it is not a simple problem. It may not be too important anyway in the South Delta from the screening aspect of it because as Dave says, we just don't seem to be getting any fish in these turbine pumps. It appears to us that what happens is the vibration of the pumps scares the fish away unless they are too little to get away.

I would point out that the tests that were made in my District, which was one of the two that Dave mentioned, the fish they caught were almost all introduced species in the first place, and in the second place, there weren't enough

of them to have kept one gray herring alive during the period of the screening, so it is not a matter of great moment to screen a pump of that sort.

And how you would handle the problems introduced by the aquatic plants is also a great problem. They plug up anything you try to do other than some sound device. As we say, the vibration of the turbine seems to be pretty effective, and it may be that the kind of devices that were used in the Georgiana Slough might be effective in some situations. Whether there is even enough potential benefit to justify that is very questionable in general.

There are, of course, other situations where it could be somewhat more viable.

So, I urge you to not waste very much time worrying about the diversion of fish by the turbine pumps in the South Delta, but to give a lot more attention to the causes of this decline in inflow which greatly exacerbates whatever problems there are there.

As you know, you even have currently before you proposals to increase the place of use upstream, further increase consumptive use, and there's an ongoing decrease in the flow of the river due to people with diversion rights consuming more of what they divert and leave us less return flow, so that's not a static thing.

You have an ongoing decline in the inflow of the

river and we also are getting some shift in the time at which the flow does come down. The inadequacy of flow to meet South Delta channel depletion is greatest in June, July and August, and if you shift the limited water supply into bringing more down during the spring, you have less coming down in the summer.

Thank you.

MR. CAFFREY: Thank you very much, Mr. Hildebrand.

Any questions from Board members of Mr. Hildebrand or Mr. Whitridge?

Anything from staff?

Thank you very much, gentlemen.

Next we have Richard Thomas from Western Area Power Administration. Good afternoon, Mr. Thomas.

MR. THOMAS: Mr. Chairman and members of the Board and staff, thank you for the opportunity to speak to you today.

I am Richard Thomas and I am representing the Sacramento area office of the Western Area Power Administration, an agency of the Federal Department of Energy. I am the Assistant Area Manager for Power Systems Operations and my responsibility includes power system dispatching and scheduling, as well as power resources planning.

The mission of the Sacramento area office is to

market the power output of the Central Valley Project hydroelectric system. We must accomplish this mission in such a way as to repay the federal debt incurred in constructing and operating the Central Valley Project water and power facilities as well as to provide quality electric power service to our customers.

In the matters before the Board today, we strongly encourage the Board to involve all interests, including power, in the detailed processes and decisions which will be used in determining the standards for the San Francisco Bay/Sacramento-San Joaquin Delta estuary.

We especially encourage you to include in these processes the determination of impacts or benefits of the new standards on hydroelectric power generation, especially that of the Central Valley Project.

The standards which may eventually be adopted will impact operation of the Central Valley Project. Since Western's ability to fulfill its mission of repaying federal debt and providing quality customer services directly tied to the operation of the Central Valley Project, we encourage the Board to select processes and tools to completely analyze the various water supply situations which not only address the water operations, but also, effectively portray consequent power impacts.

In Western's experience, one such analytical tool has

been the PROSIM model developed by the Bureau of Reclamation which was noted earlier by Mayor Schneiter. It is Western's strong desire to be actively involved in power impact assessments associated with the development of these new standards and in any decisions relating to reservoir operations as they may pertain to our responsibility of marketing Central Valley Project hydrogeneration.

In this regard, we offer our services to the Board.

Thank you for the opportunity to present this brief statement.

MR. CAFFREY: Thank you, sir, for coming here today.

Are there questions from the Board members of Mr. Thomas?

Anything from staff?

Mr. Stubchaer.

MR. STUBCHAER: Mr. Thomas, are you involved in contacts with the Club Fed agencies we heard from this morning, other sister federal agencies?

MR. THOMAS: We are not on the fun club, but we are in contact informally.

MR. STUBCHAER: Would you like us to get you in?

MR. DEL PIERO: You may have an associate membership.

MR. CAFFREY: We don't have that much influence, believe me. I think it is an excellent question.

MR. STUBCHAER: I now they are mainly concerned with

the biological issues, but the Bureau is on there and I wondered if you had input to the processes?

MR. THOMAS: It's been an informal process and we wouldn't mind being on the club. Thank you.

MR. CAFFREY: All right. Russ Brown from Jones & Stokes. Is Dr. Brown here? There he is.

DR. BROWN: I have some handouts. May I bring those in?

MR. CAFFREY: You certainly may.

DR. BROWN: And I need an overhead.

I am Russ Brown representing Jones & Stokes Associates.

My remarks address issues or question No. 3, which has to do with suggested tools for models for analyzing Delta water supply and environmental conditions.

Jones & Stokes is serving as the environmental consultants to the State Board and the Army Corps of Engineers for analyzing the possible environmental effects of an in-Delta water supply project. And in the course of these investigations and assessments which have been ongoing for approximately five years at this point, we have developed two Delta water supply environmental effects models that I would like to briefly describe and suggest them as tools to add to the inventory of models that are available for setting standards and describing the effects

of standards on Delta operations.

The first model that I would like to describe is called DeltaSOS, and this is an acronym for Delta Standards and Operation Simulation.

The basic concept is to bring together in one place the interaction of Delta standards that may be applied at a number of locations within the Delta and the operations that are required of the Delta facilities, including exports for meeting those standards.

So, this model has three basic concepts that it works on. The first is the idea that Delta standards can be efficiently expressed as equivalent flows, equivalent monthly flows, that would vary by month and may vary by year type, so each Delta standard is specified as a matrix of month-by-year type of flows that are required at a specific location.

This same matrix of specifying standards can also be used to specify flow thresholds. For example, the flow at which the cross channel will be closed for flood control can be specified as an equivalent flow, which is currently 25,000 cfs. If the flow is above that, the cross channel will be closed.

Export pumps can also be specified in terms of their capacity or allowable pumping with a matrix by month by year type.

So, that's one of the basic inputs to this model.

The second one is that the model begins with some sort of an initial monthly water budget. This could come from the historic record. You could begin modeling with the historic monthly inflows, exports and outflows that have been observed in the hydrologic record that is normally used between 1922 and 1991 or beyond, as we move beyond that.

And then, the idea is that the model will calculate for that 70-year hydrology the incremental changes that are required to satisfy the standards that you have specified. You see, you may be specifying standards that are quite different from those that applied historically, and there will be rather large changes required in the operations of the cross channel or the regulation of the QWEST flows, or the allowable exports, or the required outflows.

And so, by putting these two things together, the standards and the initial water budget, and watching the model incrementally change showing you the effects of proposed or specified standards that you may be investigating, and because this model is developed in a spreadsheet format, you can make one of these runs in five minutes, at least on my computer, which isn't anything fancy.

And so, in an afternoon of analysis you could try perhaps ten different cases and have graphics and

statistical summaries of what you have found for whatever aspects you were investigating.

So, just quickly, some of the features that are built into this DeltaSOS: The key word that I would suggest is that what we are trying to do in this model is reveal the results so that there is nothing hid anymore, starting from the initial water budget that's used, the standards that are being assumed, the coefficients that are used, the calculations that are made, and the resulting conditions that develop.

And the model is doing this simply by making calculations for several of the Delta channels. Beginning with the input it uses hydraulic relationships to determine what the cross channel and Georgiana Slough flows would be and what the Steamboat and Sutter flows would be. The major channels in the Delta are specified as a function of these inputs.

User specified standards, including the proposed EPA estuary standards which are some number of months within a control period, where certain flows are required, even something that conditional or something that flexible with the hydrology is incorporated into this model.

All of the existing facilities in the Delta, including the Montezuma Slough salinity control structure, the possibility of diversions for a through-Delta facility,

seems like we are calling it something different, like Delta facility, Old River gates, the possibility of gates on Georgiana Slough, controlling QWEST either where it is currently calculated or down at Antioch or Jersey Point, where it would actually be used, and specifying outflow standards either at Collinsville before the Montezuma Slough diversions, or at Chipps Island, and all of these can be simulated rapidly and easily.

So, just to mention some of the potential applications that might be relevant to the deliberations before you, what could this do? Well, one thing it does -- I should say one thing it does not do, it does not replace the system-wide simulation models that have been described, DWRSIM or PROSIM, because DeltaSOS is only taking more of a telescopic or detailed view of the Delta and the conditions that would exist within the Delta for a given system-wide operation.

So, in that regard, DeltaSOS cannot replace those models, but it can be a very interesting tool that you can use at your own computer to confirm the results of one of the system-wide models, to verify, indeed, that it did satisfy the standards that were stated to be simulated, because you can put the same standards in the model and run it through, and if the DWRSIM results are correct, there should be no additional adjustment required in the

spreadsheet model, so it can be used to confirm the results.

It can also be used to build on the results of the system-wide model to give the specific conditions in these major Delta channels, so it provides quite a lot of new information based on DWRSIM or PROSIM results.

Because it is spread out to make incremental changes in standards or inputs, you can quickly do a sensitivity study of closing the cross channel, let's say, for more and more months of the year and watching for effects on QWEST or on the allowable exports.

It is also able to search for additional exportable water. It will attempt to export up to the specified capacity of the exports all water that would not violate another standard you specified.

So, the idea in a nutshell is to interactively try out for yourself a wide range of standards able to take advantage of all existing and several proposed future facilities, and in this regard, for the engineers we might call it a screening model. It has the ability to try a wide range of possibilities before you get more serious with a few selective alternatives.

I would want to say that the DeltaSOS does not simulate salinity, so it is not a replacement for Delta hydrodynamic or salinity models such as the Fischer Delta, or the DWRDSM. But because it has captured the hydraulic

results from these models, it allows you to quickly see what the basic flow splits are throughout the Delta based on this more detailed modeling.

MR. STUBCHAER: I have a question -- time out so I can ask a question.

MR. CAFFREY: Certainly.

MR. STUBCHAER: This monthly model, it covers the entire base period? You say you took the input from more detailed models and put it into a spreadsheet; is that right?

DR. BROWN: That's right. This is a spreadsheet that includes the entire 70 years of record.

MR. STUBCHAER: So, what's the boundary around the Delta where you take the inflows?

DR. BROWN: The Sacramento River inflow at Freeport or above where the Hood diversion would be, the Yolo By-pass inflow, the East Side streams, the Cosumnes, Mokelumne, Calaveras, and then the San Joaquin at Vernalis, and the boundaries on the outflow is the outflow at Chipps Island and the export.

These are the normal Delta variables that come out of DWRSIM, but what you do not have in DWRSIM is what's happened internally to the Delta. Given those boundary conditions, what is going on inside, and that's what the DeltaSOS attempts to reveal.

MR. STUBCHAER: Is this for one condition of assumed upstream levels of diversion?

DR. BROWN: That's right. Each time you run the model, you are required to bring in those boundary conditions from another analysis. My favorites are to bring in the historical monthly flows and see what a given set of standards would do against the actual inflows that were observed historically, knowing that those have shifted because of upstream developments and standards.

The alternative is to bring in the DWRSIM results for a specified set of system-wide boundaries, and then decompose or look at the more detailed picture of what would have happened within the Delta given those inflows.

MR. STUBCHAER: As a hypothetical, if this Board were to look at requirements outside of the boundaries, that wouldn't be reflected in your model? There would have to be another input from more detailed models?

DR. BROWN: That's right. For the more system-wide models, we need to say how will the river inflows be shifted? Then, the DeltaSOS could be used as a tool to say what would that do to the internal flows in the Delta, and it's done on your spreadsheet right on your desk, or can be.

MR. STUBCHAER: Then, the flows among the Delta channels are based upon co-efficients and not hydrodynamics; is that right?

DR. BROWN: The hydrodynamic models, we were using our RMA Delta model, will give a consistent result. There is nothing magical about the hydraulic flow split.

So what we have done is run the RMA hydrodynamic model with the Fischer model which gives nearly identical results, and then characterize those hydraulic curves or splits with simple polynomial so that the computer always knows, and I will show an example, I hope.

For example, at the head of Old River, given a certain San Joaquin flow, how much is diverted, and we find these to be very consistently described by very single value curves. They look like hydraulic relationships, and indeed, they are.

MR. CAFFREY: Mr. Brown.

MR. BROWN: The criteria you are speaking of are based on the water quality in the Delta?

DR. BROWN: Yes, I skipped over that pretty quickly. At the moment the model is only accounting for flows, and in that case, monthly average flows, and so, if your flow standard , let's say, at Rio Vista is an actual cfs for a given year type and given month, that goes into the matrix immediately and is calculated that way.

But if your standard is salinity at Emmaton or salinity at Jersey Point, you need to outside the model have determined much the same way as is done in the other flow

models, what the equivalent Delta outflow is that would provide that salinity and that equivalent flow would then go into the matrix.

So, in all cases, the flow standards or the water quality standards need to be converted into an equivalent monthly flow that would protect that.

MR. BROWN: And the same thing for heavy metals?

DR. BROWN: Yes, for heavy metals it would have to be used as a tool indirectly. The model would give you the results to calculate dilutions, or if you knew the source of the heavy metals, the model is only going to tell you what fraction of that water made it to exports.

So, it again does not have heavy metals in it directly. You would have to be doing the analysis via a flow dilution analysis.

MR. BROWN: Okay. Have you used that, Jerry?

MR. JONS: We have the model.

DR. BROWN: I wanted to take a poll. I have sent it out to various people. I don't know if anyone has run it. I run it a lot.

I wanted to switch then into my second proposed tool or model, and this one is called the DailySOS. Now, this one stands for daily standards and operations simulation. The only difference between the monthly model and the daily model is that in the monthly model the actual hydrology that

was flowing to the Delta or the actual export or actual outflows, monthly averages have been taken of this daily pattern of monthly flow. And a monthly average certainly provides a good first estimate of what was happening that month.

But as we will see as we start through the slides, there is a great deal of daily variability in the Delta. This affects the operations of the Delta facilities because they have limited capacities, or there are some of these flow thresholds that cause gates to be opened or shut.

And so, not always would you get the same result using a monthly average as you would averaging the results of daily calculations.

So, I am wanting to suggest a transition here between month level of analysis and daily level of analysis, and since I knew this might be hard to believe, I brought some graphics with me to demonstrate, and so, before I start through the graphs, which are color copies in the handout, if you did get one, the basic advantage of a daily scale analysis is a much more accurate accounting of this precious commodity of water.

Now, I do not simulate fish in the DailySOS. There is a limit, but I hope that you will see or grasp the idea that protecting fish which have very high variability over time as well as space, can be more accurately pursued if the

basic framework of actual daily flows was provided, and what if this tool could be provided to all members of the interested parties here so that we were all working off the same information and were arguing over the balance and the results, and not how to get to a result? That's what I am wanting to propose by these sorts of publicly available tools.

This has a similar sort of application that I went over for the monthly SOS, but since I have lost track of my time, I want to try to get through by demonstrating the results from the DailySOS and perhaps this will bring to mind potential applications.

So, Heidi, if you would please show us Figure 1.

Now, this screen may be no better than your colored handout, so if you just want to refer to the color handout in the back of the testimony, that might be the easiest.

I am showing just six graphics that are out of the model. Now, the great advantage of the spreadsheet that goes very much with some of my theme in life is that the inputs, the outputs, your mistakes, your mess-ups are immediately displayed for you. And by flipping between trying a case and looking at the results, and saying that's not right and trying another one, it really is almost interactive in the best sense of that word.

I am using 1978 daily results just as an

illustration. The actual DailySOS model currently runs off of 26 years. And each year file the daily data out of the DWR daily flow data base are available on a spreadsheet, these 365 or 366 values for each of the needed columns comes imported into the spread sheet. The calculations are calculated, the results are saved, the next year is brought up, and that sort of thing.

But if you run it one year at a time, this is what you get. We are starting on the Sacramento and the pink line is the Sacramento daily flows in the 1978 water year. The October, November, December was sort of the dribble. There were some moderate flows in January, and then, at the end of December, you can see three real big storm events peaking at 75 or 80 thousand, which is the channel capacity of the Sacramento.

There is actually much more flow coming down the bypass in this season and we are showing the cross channel calculations as the solid green, and you can see that the cross channel was closed between early January and the beginning of May, and this was not because there was any fish requirement for closure, but rather, the daily flows were exceeding the 25,000 flood limit.

Now, I just wanted as an aside -- this may not be exactly what they did historically because that 25,000 flood limit is in my matrix of required conditions.

Whether that actually was required historically in 1978, you would have to actually look at the daily flow numbers, but if that standard, which would be a flow threshold for closure was in place, that is the period that would have been closed, and then, the remaining flow going down Georgiana Slough is the dark blue, and just shown for reference is the light blue, the exports.

Again, these are the adjusted exports out of the model, so we will look at them a little more specifically in just a moment, but you can see that almost all of the exports could have come from the flow down Georgiana even during the period when the cross channel was closed. This is simply because the hydraulic relationship of those high Sacramento flows were pushing this much water into the Central Delta even with the cross channel closed.

We better move to the second figure.

MR. BROWN: These were the exports in the DMC and the State Water Project?

DR. BROWN: We're simulating in the DeltaSOS simply the combined exports, so we are not tackling the COA split between the available exportable water, but dealing simply with the total Delta exports. So, this is the total Delta exports that are shown there in this graph. It is just for reference so we get a feel that there's daily hydrologic variability that causes the facilities to be operated in a

certain way, and other years might be much more variable in how the cross channel would have responded to that flow threshold.

In this case, you might think to yourself, we almost could have done this with the monthly models.

Let's go to the second figure, Heidi.

This one shows the other major river, the San Joaquin inflow. The scale is going up to 30,000, so this is an unusual year for the San Joaquin. The solid green is the hydraulic calculations of the Old River diversions. You can see that at the low flows the solid green and the light blue, which is the total San Joaquin at Vernalis are almost the same; that is, the hydraulic models reveal that at low flows almost the entire San Joaquin water is being diverted into Old River, whereas, at higher flows you can see that, or I will tell you, the green line peaks at about 60 percent, so during high flows about 60 percent of the flow turns left and 40 percent continues to Stockton, but as the flow decreases, a greater and greater percentage of the water is diverted.

And the dark blue this time is the adjusted or the model's exports. These are not the historical exports, but what could have been exported at a daily time scale analysis, and you can see for the middle period, let's say, from March through June, almost all of the exports would have

come from the San Joaquin or could have come from the San Joaquin, and actually, could have come from Old River.

So, this is an unusual period where the majority of the exports would have been supplied from the San Joaquin.

The next figure -- okay, those first two were practice. This one shows QWEST. Now QWEST is the calculated flow just downstream of the mouth of the Mokelumne, so this is the net flow out of the San Joaquin portion of the Delta, and the initial or historic QWEST is the bright blue generally at the top, and then because the model has found that the additional exports could have been made during the middle portion of the year, say, from March through May at least, the dark blue line, which is the adjusted QWEST, is lower.

That means that more exports were made in the model run than were made historically. By making more exports, this is reducing QWEST.

The solid green shows periods when the exports, the historical exports, had to be reduced because the historical exports were causing the QWEST standard, which I have specified to be the currently in-place NMFS requirements, would have been violated, and so, if you were running 1978 with historical inflows but trying to pump all available water, with currently specified standards you would have had to reduce the historical exports during those periods shown

by the green.

I don't know if that's clear at all.

So that QWEST is used here as a guide and we had in December and January an allowable QWEST of minus 2,000, and you can see the dark blue gets down to that minus 2,000 for a few periods. Then, there's a period of high flow where the QWEST even at maximum exports goes way above and then it comes back at the end of January.

So, again, this is a little bit confusing probably to look at for the first time. We are starting with historical conditions and we are adjusting those historical conditions in the daily SOS model to meet all specified standards which may be ones you have just dreamed up.

You may be the first person to try your standards, and it also then adjusts exports all the way up to capacity and pulling in a sense all exportable water from the Delta for the set of inputs and your standards.

Okay, we will get rid of those.

MR. CAFFREY: Dr. Brown, how much more time do you think you are going to need? You have spent the 20 minutes, but it is interesting information. You have quite a number of charts. Are you planning to go through all of them?

DR. BROWN: I can whiz through them. Can I have five more minutes?

MR. CAFFREY: We do need to take a break around 2:15.

Why don't you take another five minutes.

DR. BROWN: Okay, Heidi, the next one.

This has all the colors that are possible. What we have here is a picture of the exports. Remember we are looking in at one of the runs of the model.

MR. DEL PIERO: Dr. Brown, do you get more enthusiastic as you proceed through these?

DR. BROWN: Oh, yes, I am very enthusiastic.

Okay, the red line is the historical daily exports that were made in water year 1978. And you see that in January and February, they got very close to the allowable, or in that case, the actual capacity of the pumps at the time, just about 10,500 cubic feet per second for the combined capacity, but then, at other times of the year, they didn't pump as much as they might have, most likely because they had filled San Luis. I haven't researched 1978 and the combination of having filled San Luis and not having additional demands; this is all the pumping they needed to do, at least all they did.

What daily SOS is saying, is are there adjustments in those historical exports that would have been required to meet the standards I have specified in these matrices, and in addition, are there additional exports that could have been made, so we have the results of those columns of calculations.

The colors are the reductions in exports that were required. Dark blue is the reduced export to satisfy the QWEST standards, and we saw that occurring in December and a little in January, and that is that the historical QWEST is too low. It was less than the negative 2,000 that's allowed by the standard that I was specifying.

The green is the reduced exports in order to satisfy the D-1485 outflow requirements that are specified on the monthly for an above-normal year, which '78 was. And we see the historical pumping in combination with the historical inflows was way too much in June and July to meet the required outflows, and we had a reduction there in the order of two to four thousand cfs for that period of time.

And then, the pink is the reduced exports for pumping limits against the D-1485 pumping limits, and there was just a little bit of that in June to get it down to the 6,000 cfs allowable exports. They were just a little above in the historical record.

Next figure.

Of course, I am offering this so that lots of you could have these on your computer and spend as much time as you would like looking at them. This is a picture of outflow. The pink is required monthly outflow for an above-normal year, and then, we see the reduced export in the June and July period that was required to raise the historical

outflow up to the pink required outflow for this year.

Again, in 1978, the D-1485 criteria were not applicable, but if it would have been, this adjustment in the historical record would have been required, and that's the end of these daily plots.

Now, I want to address one last idea. Beyond getting these more detailed calculations and the possibility of blending these daily hydrologic and operation calculations with daily information of when fish are actually out of place that puts them at risk, and therefore, changing the operations on a daily basis based on fish presence or abundance, what other advantages might there be in the daily level of calculations because, of course, it does require more calculations.

Heidi, if you would turn to the next one, so I want to demonstrate that this daily level, and we were looking at 1978, this can be used in a sequence of years, and here are simply the results, monthly average results of the daily calculations for 1967 to 1992, a 26-year sequence.

The light blue are the historical monthly exports that were made. The green is the allowable monthly exports that would have been possible with the historical daily inflows and the standards that I specified which were D-1485, plus the NMFS requirement, and so, you can see especially in the early part of the record, of course, much more pumping would

have been allowable.

Notice between 1987 and the present, or at least through 1992, that I have shown actual pumping, and what the model says was possible pumping are very close even though NMFS requirements were not in place for that entire period.

Now, the blue and the pink lines at the bottom are the two major adjustments that are required moving through this sequence of 26 years of daily flows, reduction to meet the outflow requirements and reductions to meet the NMFS QWEST requirements, and finally, I am just going to breeze through this -- we can skip that.

This is outflow for the 26 years, monthly averages, but of the daily calculations, and finally, Heidi, the last one.

You can look at those yourselves. This is just, I guess we call them preliminary results. There are not many of us in the room that have tried daily calculations compared to monthly calculations, and what I found is the following. The light blue is the annual allowable exports where I pump all the available water up to the specified export capacity but still meeting all the specified standards and using monthly average inflows, and I get a reasonable sequence of annual exportable water that has an average of something like 6.2 million acre-feet, but now, in some of the years exporting is as much as 7.5 under the

current standards with the historical inflows.

Now, I want to make those same calculations showing the actual pumping capacity simulated. I find in all cases either you get the same number, but rarely; usually you get quite a bit less exportable water, and because I am out of time, I would simply give one example of that.

The cross channel closes at daily flows of 25,000 cfs, but if the monthly average flow had been just 20,000, then the gates would have remained open allowing full exports for that entire month, where the daily calculations revealed that in reality that storm event that gave rise to the 20,000 cfs monthly average occurred, let's say, for half the month, and so, for that high end of the flow month, the cross channel gate was actually closed because of the flood control criteria or threshold, so just where the peak of the flows is coming through, the cross channel is closed, and depending on what the QWEST limits are in that month, there actually might be a reduction in export required to meet the actual daily flows moving across the Delta, so that's just one example of why the daily calculations actually gives a more accurate estimate of the allowable exports, the maximum allowable.

I found that the average difference between my daily calculations and the monthly calculations for the historical daily inflow and for this set of standards was 400,000 acre-

feet, and I thought to myself, that 400,000 acre-feet might be worth a little extra computation.

Now, we have to confirm which of these is right and it could well be that there is something at this point wrong with the daily calculations and the monthly revealed the correct amount of water, but the result I found important and wanted to present to you, so Jones & Stokes in doing this one particular Delta analysis job, has come up with these two models and we now move them into the public domain in a sense, or into the domain of the Bay-Delta forum, or other appropriate groups as possible analysis tools.

Thank you.

MR. CAFFREY: Thank you very much, Dr. brown. We appreciate all your effort.

Are there questions from Board members at this time?

Mr. Stubchaer, you are overwhelmed.

All right, anything from staff?

Before we take a break, and by the way, thank you again, Dr. Brown, we appreciate all your efforts.

After the break we have seven more cards and we are going today until we finish, so that will depend on how much time each of you take to make your presentations. It looks like we are taking, in most cases, just about all of the 20 minutes and in some cases more, and I don't want to stifle anybody, but we don't have to actually take the full 20

minutes if you don't want to, and there are people who have waited late into the day, so again, I say, without stifling you, you may want to keep that in mind.

We will come back at 3:30 and resume.

(Whereupon a brief recess was taken.)

MR. CAFFREY: All right, let's resume the workshop.

Our next speaker is Jim Easton representing the Delta Wetlands.

Good afternoon, Mr. Easton.

MR. EASTON: Good afternoon, Mr. Chairman, members of the Board and staff.

I am Jim Easton with HYA Consulting Engineers representing Delta Wetlands.

I would like to address a few comments. I am not even going to take the ten minutes I signed up for, Mr. Caffrey, but I would like to address questions 2 and 3 of the notice.

We have no comments on question 1.

We have heard today that the session last month had much urging by various entities of the need of the Board to set standards for Delta water quality flow and salinity based on ecosystem approach, and responding to the need for balance.

We have also heard concern expressed about the adequacy of the existing science and the applicability of

some of that science to the Delta standards that will be set.

And in considering the effects of the Bay-Delta diversions, the Board needs to very carefully consider where those diversions are, when they are being made and in what quantity and what other conditions exist in the Delta, and what's going to happen in the Delta immediately thereafter.

We believe that the Board should use the best combination of analytical tools to assess the impact of these diversions that are available. Planning models are among these tools and all the most familiar planning models use a monthly time step and they also make some important and sometimes breath-taking assumptions that can significantly influence the results from these models.

Some important aspects of the Delta operations and conditions such as Delta cross channel gate operations and QWEST, should be considered on a daily basis, and we have heard from Dr. Brown on some of the possibilities there, rather than a monthly basis in order to allow the effective use of Delta resources while implementing standards that protect the ecosystem.

That makes sense because many of these decisions, operational decisions are made on a daily basis. The tools are available to do this. Some of these tools are familiar, such as transport models, and some of them are new such as

the models that were discussed by Dr. Brown in the previous presentation.

And when they are used together we believe that these models can help the Board to accurately assess the actual or potential impacts of current or proposed standards.

And that concludes my remarks.

Any questions?

MR. CAFFREY: All right, thank you, Mr. Easton.

Are there any questions from Board members of Mr. Easton? From the staff?

Thank you, sir.

Next is Thomas Zuckerman from the Central Delta Water Agency. Good afternoon, Mr. Zuckerman.

MR. ZUCKERMAN: Good afternoon.

I didn't make comments at the first hearing for a personal reason, I wasn't sure I had understood the other presentations correctly, and didn't want to make unnecessarily provocative comments possibly based on misunderstanding, so I got copies of some of those statements and read them, and I feel, however briefly, that some response is required to that and I will get into that in a moment.

Let me just say that a lot of what I had intended to say today I think was adequately and better said by George Basye and Dave Whitridge and Alex Hildebrand.

Without going through all the details, I would remind you that the fish populations that you are concerned about today were flourishing in the Delta in the middle sixties, the time you are trying to get back to, in spite of the fact that all of the development of the Delta had taken place by that time, all the water uses that are going on there today locally within the islands were fully usable, and that situation has not changed.

So, it becomes very difficult to assign responsibility for what's happened in the last 25 or 30 years to the people whose activities prior to that time, which have not changed subsequently, weren't really making any noticeable impact upon the problem, and I address that in terms of your second issue in terms of what impact Delta agricultural diversions may be having upon the endangered species problems.

It is tempting because some logic would certainly suggest that Delta diversions are a part of the problem, but I would also remind you to go back and look at the historical information that the Central Delta Water Agency placed into the record of the D-1630 hearings of all of the fish-screening testing that had been done on agricultural diversions, which was very inconclusive in terms of any impact, and I had a chance briefly to look at the appendix to the Department of Water Resources' presentation that they

put in earlier today, and I was struck by the lack of any indication in the testing that has gone on rather recently, that there, in fact, isn't any noticeable impact upon any of the threatened and endangered species in any of those tests that they have done.

Most of the fish they are catching, I think, are called chameleon gobies. I don't happen to know what they are, but if they have become threatened, we are in big trouble. I don't know what they are.

I was suggesting at lunch if that's -- if anybody heard me, that if that's what we are going to end up with, we are going to have to start developing very small fishing rods so we can catch little fish like that --

MR. DEL PIERO: Fileting one is real tough.

MR. ZUCKERMAN: -- in order to recreate historical recreation activities in the Delta.

So, I would encourage you not to succumb to the easy temptation to look at these things and use what appear to be logical conclusions such as the one that the Department of Water Resources is urging you to adopt, that the impact on the fishery of the Delta diversions by the farmers may be as great as that of the export projects.

There is no evidence to suggest that that might be the case. It doesn't mean we shouldn't continue to look at the subject, but the testing we have done so far just simply

doesn't bear that out.

One of the things that may have changed over time, and I think Alex or Dave Whitridge may have alluded to this, is that as a result of the way the water is being transported through the Delta now, particularly with the absence of anything like the Delta cross channel being developed as a part of the State Water Project, is that the fishery has been moved upstream because the amount of Delta outflow has decreased and the amount of diversions has increased, and the null zone and nursery area of the fishery has been moved from Suisun Bay, to make a generality, up into the channels of the Western Delta, so that may have exposed more of the fishery to siphoning into the Delta islands in the Western Delta than would have been in the absence of those projects.

But I suggest that if the Board ends up adopting the kind of standards that EPA has announced, it would move that two parts per thousand farther west in the Delta. That problem may be addressed in the process because the smaller fish during the times when they are less mobile and able to escape and so forth, probably won't be as far up into the Delta as you find them today.

To get back to what I said originally, and I don't want you to think of this as just another harangue before the Board, hopefully it is submitted in a constructive way

and with the benefit of 25 or 30 years of experience that I have on this issue before the Board and its predecessor, and so forth, but from our perspective in the Delta, we think you are being asked by certain parties here, or maybe you are even volunteering, to be what I would characterize as pawns in some sort of elaborate scheme to violate the solemn promises that were made to the people in the north in order to get permission to take some of their water south.

I was quite surprised in your April hearing to hear the comments that were made by Dave Anderson and by Dave Schuster, and so forth, because when your staff was proposing during the 1630 hearings flow or temperature standards in the first draft of your proposed D-1630, the water contractors and the Department of Water Resources told you that flow standards were beyond your authority in adopting a water quality control plan.

You dutifully removed the flow standard from the draft and that got you into hot water with EPA. EPA and the other federal stewards of fishery resources then announced their own standards for fishery protection, again expressed in terms of water quality, but substantially higher levels of protection.

The State contractors and the Department of Water Resources now tell you that fishery needs can only be addressed in terms of flow and temperature standards and

diversion standards, and not by water quality standards alone.

Now, in trying to make some sense out of this, it looks to me like the State Water Project now realizes the inevitability that meaningful water quality standards for fish and wildlife protection in the Bay-Delta estuary will, of necessity, be imposed, and are focusing their concern on whose responsibility it will be to provide flow and restricted diversions to meet such standards.

That is, the State Water Project doesn't want to be left alone with the Central Valley Project to meet such standards, and consequently, seeks to have the responsibility divided up among all the diverters at the same time water quality standards are announced.

The problem with that is that if this goes on forever in this way and you get into more and more complicated enunciations of the problem, it invites delay and what I hope I am seeing out of this is a secondary theme that people are saying, if we can put this decision off long enough, maybe some of these things we are trying to protect will be gone and the necessity for establishing meaningful water quality standards will have disappeared along with these native fishes.

In itself, this request won't be as objectionable to us if the State Water Project wasn't also asking the Board

to disregard traditionally established water right priorities in order to avoid burdens that would normally be associated with junior appropriator status, and in that regard, I am referring to the Delta Protection Act as well as the water right priorities themselves, the area of origin laws and the various statutes that exist in California and in federal law that requires some priority for the Delta and the areas north, and I would remind you unless any of you have forgotten or weren't aware of the fact that George Miller, Senator George Miller, the father of Congressman George Miller, was the author or the Delta Protection Act, which was passed by the Legislature in the same session, in the same breath, if you will, with the Burns-Porter Act that authorized the State Water Project construction bonding in the first place.

Without that concession having been made, nobody believes that the State Water Project would ever have come into existence in the first place.

My interpretation of this is that, in effect, the State Water Project is now saying, although it is true that when the Federal and State Projects were authorized, commitments were made for salinity control in the Delta and protection in order to authorize those projects, we thought we would have more water to serve our customers, and we made some grievous mistakes in terms of calculating what it would

take to meet the fish and wildlife needs in the Delta, and we thought we would have more water to serve our customers.

Since we weren't able to complete the water development plans and we underestimated the fishery requirements, and in spite of the fact that we only promised to deliver water to our customers in excess of the needs of the areas of origin and the Delta, we can no longer honor our commitments because customers to our projects have become dependent upon more water than we find ourselves able to deliver and it is no longer reasonable to require us to fulfill commitments we made to get the right to export the water in the first place.

Now, that's the way I am reading this, and I thought it may be of some benefit to you to hear it from me, and we will be around to see how you react to this over time, and thank you very much for your patience.

MR. CAFFREY: Thank you, Mr. Zuckerman.

Do Board members have questions? Anything from staff?

Thank you, sir.

B. J. Miller. Good afternoon, Mr. Miller.

MR. MILLER: Good afternoon, Mr. Chairman and members of the Board.

I am B. J. Miller and I'm here once again standing in for Dan Nelson, who is not having a good year. He is at a

funeral today for a member of his family.

I want to make a comment on what some of the others have said about a particular issue, and then briefly talk about the background of this statement that we have submitted.

There have been a number of people who have said that the diverters other than the State and Federal water projects, should not be considered here. I can understand those sentiments actually from everyone except the Department of Fish and Game, and I was amazed by what they said.

The general thing that seems to be being said is that there is somehow in California a law that first in time, first in right for killing fish. I don't think such a provision exists and it is a little bit startling that the Department of Fish and Game would stand up in front of this Board and tell you not to consider actions that are killing fish and only to concentrate on the State and Federal water projects.

Unless I misunderstood them, that's what I heard them saying.

If you had paranoid tendencies and you were receiving State or Federal water, that would make for a bad evening, I think.

The question is not whether diverters other than the

State and Federal water projects ought to be diverting water necessarily. The question is whether their method of diversion that's unscreened in most cases is a reasonable method of diversion, and reason is determined by the circumstances at hand, and because it was reasonable 70 years ago, it's not necessarily reasonable today when you have got 31-1/2 million people, 9 million irrigated acres, 2 listed species under the Endangered Species Act, and one more or several more that could be listed.

Those are entirely different circumstances and compel a look at this ladder with a new consideration of what reason might be.

As to the statement we submitted, I thought it might be useful to give you some of the background thinking in that because some of the things might be a little bit surprising.

There's a lot of talk now about process, the process of what's going on here with these federal requirements and the State requirements in the Delta. This is not really a process problem. This is a substance problem and the substance that the San Joaquin Delta Mendota Water Authority is concerned about is the requirements in the Delta that curtail their water supply, and there's nothing mysterious about these requirements.

There are, as I count, seven of them in the Delta.

There are direct export curtailments. They say things like you cannot export more than this much water during these months. That's D-1485.

There are QWEST or reverse flow requirements that say you have to have a certain amount -- you can have no less than a certain flow which in some cases is negative in the lower San Joaquin River.

There are cross channel gate closures which say that under certain conditions during certain times you have to close the cross channel, and, of course, you put the cross channel gate closure together with the way you calculate QWEST and you have got another export curtailment.

There are salinity standards that require that salinity be met at certain points in the Delta and, of course, that salinity is controlled by fresh water outflow which requires fresh water outflow.

And there are pulse flows that require that a certain amount of water come down the Sacramento or San Joaquin Rivers at specified times.

And now, we are seeing Delta outflow requirements. We have seen them in the past, at least flow requirements in the Delta, but now we are seeing Delta outflow requirements.

And finally, we see limits that say you cannot export water when the computed take of these endangered species gets up near a certain point. That's it.

Now, there are some upstream limits on carryover storage and flows that have to occur and not strand fish and things like that, but in the Delta that is kind of my count. There are seven of these things.

What the water users want, some of them want those seven things to be changed so they are not as stringent so they can export more water, use more water. Other water users want some limit on the total amount of water. They want some limit on those requirements so that the total amount of water that they have to give up relative to what they would have had under Decision 1485 they want some limits on that and maybe it's a limit above the water cost that they have now.

And they are here coming before this Board in hopes that you can do something about that. How do you do that? How can you do that? I can't think of any way you can do that except by one way or another directly or indirectly making those seven requirements and some of those upstream requirements less stringent, or at least more flexible, which is kind of making less stringent in the short run from time to time.

And when you go through all the processing and the Club Fedding and the Federal-State agreement, it seems to me it comes down to something just that simple. How can you make those requirements less stringent or how can you put

some limit on how stringent they will be? That's what the water users are here asking for.

There is a method that has been proposed as the means by which you could do that, and that is that you should balance, you should look at these requirements, at the water they cost and at the social and economic effects of those water costs, and then you should balance.

You should do what is reasonable, and as you probably know now in your darker moments what is reasonable resides in the minds of the five of you. No one has defined it.

The San Luis Delta-Mendota Water Authority at least is concerned about that basis. We see that as a basis that may not be particularly persuasive given the way things are going.

If I were an endangered species agency and I saw that you had adopted a set of Delta protection standards that were less stringent than I thought were required, that I was convinced were required, and I thought I saw that the reason you gave that your standards were less stringent than mine was that you had balanced and I had not, my response would probably be something like, well, tough luck because I really don't have to balance. The Endangered Species Act does not compel me to balance.

The idea that we have had, that we mentioned, that we

alluded to as we said in the first workshop and that we want to repeat today is we think the way to go at this is to develop a comprehensive set of protections for the Delta. That's why I led off with this thing about the upstream and Delta diverters. We think the key here insofar as the State and Federal Water Projects constraints are concerned is whether or not the Board is able to develop a more comprehensive set of protections, some that come directly under your authority and maybe some that don't come directly under your authority, but that you would use your authority or your bully pulpit to cause to be implemented by others.

So, we think that if you are able to develop this more comprehensive set of protections, and that if you can assert that your set of protections is more protective than the current D-1485 endangered species protections, then you are on much sounder ground, politically at least, and probably legally, as opposed to just developing a set of comprehensive standards that are the result of the balancing that federal agencies have not done.

So, that's why we have a statement in our presentation that some people may find a little bit surprising.

Just to summarize, the San Luis Delta Mendota Water Authority's water supply, at least that of most of the 39 members, is curtailed by a whole bunch of things. It is

curtailed by your Decision 1485, by the endangered species requirements, by the provisions of the Central Valley Project Improvement Act, and it could be further curtailed by the proposed EPA standards, and we have serious concerns about these curtailments and these standards.

First, we don't think they are being developed in a coordinated way and we think the Board is capable of developing a coordinated set of protections, and together their effects on our water supply and the California economy may not be justified. We have concerns about the scientific basis of these requirements and we have a lot of concerns about the inordinate amount of attention on the State Water Project.

Again, I want to allude back to Fish and Game's remarkable statement that they really don't think you ought to look at any other effects on fish besides the State and Federal -- why an agency that wants to protect fish and wildlife would suggest that is beyond me. We are concerned about the uncertainty that these requirements impose. We now have uncertainties piled on uncertainties, and the final uncertainty being the take limits.

We hope that the Board can address these concerns of ours. What we think you bring to this is that your authority is broader and we think you have opportunities to influence matters that are not within your specific

authority.

We think, in short, that this Board can provide more comprehensive environmental protection than that provided by the piecemeal federal requirements.

Second, of course, you are obliged to balance and you have heard quite a bit about that. We have two general recommendations and we will be back later at additional workshops to be more specific.

What we would like to see the Board develop is some comprehensive protections. The exact form of them we are not clear on yet. Whether they should be as detailed as the current set of requirements, we are not clear on that. We know that there are some who would suggest that they should be general in nature. We suggest, though, that there should be a set of requirements relative to D-1485 and the current endangered species requirements; you should be able to assert in your findings that your requirements are equally or more protective of environmental values than the current requirements that we have.

We think they should encompass the endangered species, they should provide more year-to-year certainty. They should address all the factors adversely affecting these fish. They should address factors not necessarily under your direct authority. They should be closely tied to real time monitoring. They should be flexible and capable

of modification, and they should include new Delta facilities as long-term measures.

Just another word on that -- if you don't have Delta facilities in the long-term plan, then what we can look forward to in most people's minds is continued environmental degradation unless we have staggering effects on water users.

On the other hand, if somehow we could get to the point where there was some acceptance of the need for Delta facilities, what they might be, how we could guarantee they would be operated properly, then we begin to view this whole matter in a different perspective. We begin to see that we have got some long-term plan which has some real bona fide hope where you can get all the fisheries experts to stand up and say, if we can get those things built, things are going to be better.

That's an entirely different way of going at it than the way we are going at it now when you look down the road and see the possibility of even more degradation.

We suggest that these protections should put some sort of a limit on the amount of water dedicated to environmental protection from all the water users. That's our comment on the fish question.

You asked on the second one about the effects of diversions. We will have information on that later.

And finally, on the method used to analyze water supply and environmental effects, I thought Russ Brown's presentation was great. If I had been on the Board, I would have hated it. You know, I don't know what I am supposed to do with that if I'm a Board member. This is no forum for those of us who deal with these analytical methods to come in and argue our points. We have tried that before. We tried it when you were quasi-judicial. It doesn't work because you need some other method.

If you are seeking some good housekeeping seal of approval or whatever on these analytical methods, this isn't the place to develop it, I don't think. This is the worst possible when we don't even have cross-examination here, so you can't get out there and ask Russ questions about these graphs, assuming you did understand them.

We think the Board ought to establish some sort of method of review that's more appropriate to the complexity of these models. These models are inevitably going to be used.

We suggest some sort of separate peer review process, not as I suggested to give some good housekeeping seal of approval, but to just delineate for the Board the merits and limitations of these analytical methods, and you ought to have bona fide experts doing this.

Finally, a number of us in the room here have been

involved in creating the Bay-Delta modeling forum, which is a nonpartisan, straight arrow group of modelers; one of whose purpose is to provide just such peer review for just the kind of analytical methods you will inevitably be basing your decision on.

We think the Board should approach the Bay-Delta forum and discuss with them the possibility that they might carry out some or all of the peer review of these various analytical methods.

Thank you.

MR. CAFFREY: Thank you, Dr. Miller.

Any questions from the Board members? Ms. Forster.

MS. FORSTER: I have a question, B.J. You asked that the Board look at this comprehensive approach. Are the San Luis Delta Mendota Water Authority and other agencies gathering together and looking at what they would suggest as a way to do this comprehensive approach?

It is like, you know, we are looking to you for recommendations and you are looking to us for recommendations, and that doesn't move us along.

I, myself, already know that some of these things are necessary, but I personally don't know how to do them.

MR. MILLER: But you have Russ's computer --

MS. FORSTER: Maybe staff will look at all these comments and maybe they will be able to brief the Board on

how we may go about it, but I'm really hoping that Californians bring back how they think this should look, so that we can look at it and say, well, this makes sense, and that they shop it out to other interested parties and say, what do you think about this?

I'm hoping that this process, even though it's different and there is no cross-examination, is a much more collaborative, cooperative, communicative-type process so that we have more successes than we have ever had, and so you are asking us the questions that we are sitting here waiting to hear, and it's a little distressing that we are all finding it so hard to come up with the framework of how we are going to do this.

MR. MILLER: I think you raise an excellent point. I mean, I don't think some comprehensive plan, if that's what we are headed for, is going to spontaneously appear here in July on the last day of the workshops in full blown detail, that it's going to have to be developed by someone, and I'm sure the water users would be more comfortable taking a crack at it themselves than have your staff, as much as we respect Jerry and Tom and the rest of them, do it to us. We are kind of in the remaining dance of this storm routine, all of these different water users trying to figure out who is working with whom and who is going to coordinate with whom.

There are some efforts that have started. At the first workshop we commented on the problem that water users have historically had in coming to agreement on anything. And when you throw the environmental interests in there, which I assume you would like to have, if possible, we have a long track record of, you know, failure.

And what we suggested at that workshop is that maybe the Board should take a little more vigorous or leadership role. If you want something to come in before you that's a product of some consensus among certain groups, I would be disinclined to wait and see that they somehow would come together in a spirit of cooperation and produce something that would be useful to you.

We haven't been able to do it before.

MR. CAFFREY: I guess my reaction is if this isn't the format to do that, I don't know what it is, because then the Board starts dictating to you a process that may be so heavy handed it almost seems to dictate the possible answer.

Maybe I'm not really understanding, but I guess, B.J., the thing that concerns me is the train has left the station and this is our opportunity as the State of California, so to speak, to develop a plan or somebody else will do it for us, and then we will be back to the adversarial situation that we have known in the past.

So, I guess what I am saying is that the Board has

done its best to put together a series of workshops that will culminate in July with proposals hopefully on the part of the stakeholders, the parties.

We never said it was going to be easy. In fact, it may be impossible, but on the other hand, we may get differing proposals, but that they may all be in the same ballpark and that will be very helpful to the Board.

Ultimately the Board is going to have to make the decision. We are not telling you to make the decision. It is our responsibility.

This is everybody's opportunity to provide us with the kind of information that you think we need and your best shot at what a balanced solution may look like. It may be a number of different versions on what a balanced solution may look like.

I don't know of any other way to do that within the amount of time that we have. We are already on a path that many may feel is impossible in terms of how much time we have.

MR. MILLER: Could I comment briefly? I didn't mean to suggest that the Board should dictate the consensus that you desire, but I meant something much more harmless than that, that right now this does not seem to be the forum where a consensus can be forged. We don't have a table, you know, here and if I were you, and I really truly wanted

consensus, and I had some idea of whom I wanted consensus from, I would be inclined to convene the parties without dictating to them.

I would use my good offices to convene, at least I would consider this, to convene the parties that you want consensus from and to provide some sort of leadership to them in reaching consensus without dictating what this consensus should be, or without revealing your hand as to what you might ultimately decide.

MR. CAFFREY: Mr. Del Piero.

MR. DEL PIERO: Mr. Miller and I have been friends for a long time.

B.J., I have been here since about 30 months. When I first arrived here there was a process called the three-way process, and as we were getting ready to initiate the hearings for that that ultimately resulted in the issuance of draft 1630, and we would get weekly reports, and no disrespect to anybody involved in that process, weekly reports from the three-way process that they were two weeks away from consensus.

It might appear humorous in its historical context, but throughout the entire process that this Board conducted in terms of 1630, we heard literally every week they were two weeks away from a consensus. Until the day before the announcement of the draft 1630, we heard they were two weeks

away from consensus.

That was seven or eight months in terms of being two weeks away.

MR. MILLER: And they were always two weeks away.

MR. DEL PIERO: I know. There's no question in my mind they were always two weeks away. I think, candidly, that's what we are confronted with, the process of getting everyone together and achieving consensus among the parties who inherently are not going to achieve consensus, which was recognized a long time back by the State Legislature and that's why there's an organization called the Water Resources Control Board.

We hoped that ultimately all the parties were going to get together and present the Board with a wonderful compromise that was going to address the needs of agriculture in the San Joaquin Valley and the needs of the urban area south of the Tehachapis and the needs of the environmental resources in the Delta.

I think none of us believes in Santa Claus anymore, and this Board ultimately is going to make a decision. Somebody might not be 100 percent happy with the decision, but the one thing I do know, all four of my colleagues and I are convinced if we don't make a decision, about six months from now we won't have to make a decision because somebody else is going to be running the show.

MR. MILLER: I agree with everything you said. I think that probably there isn't going to be a consensus of the kind you would see that is broadly based enough to where you can simply take it with some assurance that that was your decision, or the basis of your decision and you could go with it.

I doubt that's going to happen.

But we have heard from the Board that you would like that in the ideal world, and all I was saying is I was intimately involved in the three-way process. I think the three-way process had everything going for it except one thing and that was leadership, and so, all I am saying is if you want consensus and if you want a broad consensus, then I think without the element of leadership that the Board would provide, I think that the consensus that you desire is highly unlikely just because of our proven track record.

MR. DEL PIERO: Now we need leadership and definition of the ecosystem.

MR. MILLER: Leadership is more important that the ecosystem approach.

MR. CAFFREY: Mr. Brown.

MR. BROWN: I assume you are talking, Marc, about methods of closure and models that we have been discussing here today.

What about the more primary consideration, and we

have heard arguments on both sides.

Do you have suggestions for closure between those who think that the problems within the Delta should be resolved by the contractors, State water contractors, the State Water Project and the Central Valley Project, or is there some closure suggestions of how maybe prior water right holders share in that consideration also?

There seems to be real division of opinion from the testimony which one might expect, but how do you bring about closure on this very preliminary issue? What suggestions do you have on that?

MR. MILLER: Well, if I wanted a decision that had as much support as possible, I certainly wouldn't want the one developed by the State water contractors nor would I want the one developed by the upstream water right holders, nor would I want the one developed by the San Luis Delta Mendota Water Authority.

That seems to me to be predestined to be a loser.

So, again, I guess I would come back to, if I wanted some sort of a consensus among the State water contractors and Federal contractors, and the upstream water right holders, I might be inclined to convene a meeting of these people for the purpose of discussing sort of the broad principles or policies that they might all agree to, and listen and have them air those opinions.

MR. BROWN: It seems as though there's a couple of options here. One is that the various water user groups would develop recommendations between themselves, or there's this division that would continue to exist, and then, it will end up in our hands to make that decision.

I would think that it may be to your mutual advantage to try to come together in some way with some closure where you could make a joint recommendation to this Board, and we would have the benefit of that sage counsel.

MR. MILLER: I agree. I agree. I think what we are discussing here is how active the Board's role in that should appropriately be.

MR. BROWN: Then, we go on to deciding which models.

MR. MILLER: Yes, models are about the seventh down.

MR. CAFFREY: Mr. Stubchaer.

MR. STUBCHAER: I had a question. Earlier in your presentation you suggested that there be a limit on the water cost above D-1485.

Do you have any idea what would be a reasonable number or numbers?

MR. MILLER: Eight hundred thirty-six thousand acre-feet -- I don't know what that would be. It's a popular idea and it's not one that the San Luis Delta Mendota Water Authority could reject at this point.

There are questions about the workability of that.

It still, in my mind, comes back to those seven requirements. You can do all the caps on water cost that you want. If the day after you adopt that cap, you know, you have still got that list of seven, so I don't know what the water users have got except a free for all between the State and Federal Government as to whether Federal regulations and requirements for endangered species and whatever EPA might do exceed the cap or not.

I guess we could all watch while you all had a hell of a fight over that. I don't know if that's productive or not.

MR. STUBCHAER: I thought you made that suggestion. I thought it would follow from that that various measures would have to be adjusted until the cap was attained, at least in theory.

MR. MILLER: Yes, but again, I want to go back to one of the central points. We suspect that when it is all said and done, with or without a cap, the Board has to be able to find that the set of protections that it has adopted are at least as protective as the ones that currently exist, D-1485 and the endangered species requirement. Otherwise, you have not occupied the high ground legally or politically.

MR. CAFFREY: Any other questions? Anything from staff?

MR. MILLER: I hope that in all this I didn't violate any of the sentiments of the members of San Luis Delta Mendota Water Authority, some of whom are here and probably could jump up if I did.

MR. CAFFREY: Let me say I understand what you are trying to accomplish in terms of your suggestion. I think you are to be applauded for that, but we have to be excruciatingly careful in our role on the Board because I think if we were to start from this day deciding who the stakeholders are, we might deny due process to somebody by doing that, but let me go so far as to say that if you can put together a group or consortium of folks that have a common interest, and you want to meet with Mr. Pettit and his staff about some of your ideas, that's certainly appropriate, and that information can be brought back into the workshop process.

And I guess it's our feeling that through the duration of these workshops as we're going through these semiformal proceedings, that you are certainly not disallowed from doing anything like that. It's just the role of the Board members that we have to be very careful about.

MR. MILLER: I understand and we will talk with Mr. Pettit and see what we can do.

MR. CAFFREY: In fact, we even urge you to do that.

Thank you very much.

MR. MILLER: Thank you.

MR. CAFFREY: Greg Wilkinson. Good afternoon.

MR. WILKINSON: Good afternoon, Mr. Chairman and members of the Board.

I am here representing, I think, the kind of consensus group that you were just talking about with B.J. I am representing the urban coalition, and I use the term urban coalition in the lower case. This is an informal group of Northern, Central and Southern California interests pretty much along the lines again, you were just talking about.

We have got San Francisco, Santa Clara and Alameda from the north, we have Metropolitan, Modoc, San Diego County Water Authority, Coachella Valley Water District in the south, and the Central Coast Water Authority in the middle.

And interestingly enough, I found myself, as we have been putting together these comments waiting for input from people that I had never talked to about input before, Tom Berliner from the City and County of San Francisco, for example, Laura King from East Bay MUD who, as she explained, did not participate in the comments but endorsed them, so Laura has been involved in the effort, and what you have got in terms of a written statement today, and hopefully, you

received the earlier statement that came in about two weeks after the earlier workshop are, in fact, consensus efforts.

This is a true northern, southern and central informal grouping and the comments that are presented to you in writing, hopefully the ones that I express today verbally, are consensus comments, so I hope you take it in that spirit.

We are trying to do what you were just talking to B.J. about doing. We've got comments on all three of the issues. I am going to focus principally on two. One is the first key issue which raises the question of the principal ESA issues that the Board should consider during the review, and pursuant to that key issue, you have asked a couple of questions. One is whether the Board should be developing specific standards for protection of endangered species, and I think there is at least a suggestion in your notice of the workshop, that the Board should simply incorporate standards which were developed by the National Marine Fisheries Service and the Fish and Wildlife Service for the winter-run salmon and for the Delta smelt.

The coalition that I am representing would recommend to you that you not adopt specific standards for species listed pursuant to the Endangered Species Act, and particularly we think you should not be adopting standards that are based on biological opinions that were developed by

the National Marine Fisheries Service for the winter-run salmon and by Fish and Wildlife Service for the Delta smelt.

Under the Endangered Species Act, fisheries agencies are required to prevent jeopardy and work for the recovery of listed species, a goal we think often requires extraordinary and narrowly focused action.

Your focus, we think, on the other hand, is quite a bit broader than that. It is to conserve and protect a fairly broad range of species and an even broader range of beneficial uses. In addition, there are completely different standards which are used by the State Board in developing the water quality control plan.

The essence of your proceeding is a balancing process, one in which you are trying to achieve standards that protect and promote the public interest.

Neither the Fish and Wildlife Service nor the National Marine Fisheries Service utilized a balancing approach when they put together their biological opinions. You will search in vain in those opinions for any evidence that they balanced the impacts of what they were doing to protect the fishes at issue versus the impact of those protections either in terms of economic impacts or in terms of environmental effects outside of the Delta estuary itself.

The fact is also that the fishery agencies have been

challenged in court because of that lack of balancing. There is, in fact, a Federal Court case pending in Fresno, and so far that challenge has been successful.

In an opinion that was issued on February 11 of this year, the Federal Judge rejected motions to dismiss on the basis that claims of balancing under the ESA didn't state a cause of action. According to the Judge, they did, and that case is still moving forward. We don't have a final decision, but I think you ought to be cautious about basing standards on biological opinions that are still being tested and so far successfully in courts.

Now, rather than a species-by-species approach to standards, we think and would recommend to you as others have done today that a multispecies approach ought to be used to develop protections for both listed and non-listed species.

In part, we make this recommendation to you because we think a species-by-species approach tends to be somewhat self-defeating.

For example, if you establish a protection for particular species which requires greatly enhanced outflow, one of the consequences of that may be depleted upstream storage which obviously will have impacts on temperature requirements for other listed species.

Similarly, if you develop objectives that are

intended to improve the abundance of certain sport fisheries listed or nonlisted, such as striped bass, that may have the unintended effect of increasing the predation of other listed threatened species such as the salmon or Delta smelt.

Because we think the effort to develop species-by-species standards may result in conflict between species, our coalition suggests and recommends that the Board adopt a different approach which would focus on the development of standards intended to protect a multiplicity of species, again, whether they are listed or not, and along that line, we have again followed your advice in trying to put on the table a standard which we think will provide that kind of protection. We talked about it in our earlier presentation last month. We unveiled it in our comments to the EPA, and it's our estuarine habitat standard that we talked about with you last time.

It's essentially a standard that's in narrative form, but it measures compliance in terms of the average position of the two parts per thousand salinity gradient, or providing the flow equivalent of a two parts per thousand salinity gradient at the confluence of the Sacramento-San Joaquin Rivers for a majority of the time during most hydrologic conditions, and downstream of Chipps Island for periods of time that vary depending upon hydrologic conditions.

We think that meeting the proposed standards at Chipps Island has the effect of placing the entrapment zone in the area that it should be placed; that is, in the shallow water habitat of Suisun-Honker-Grizzly Bays, and we think that doing so provides enhanced habitat protection.

Similarly, meeting the standards at the confluence of the two rivers, we believe, in turn would facilitate the movement of the eggs, larvae, and juveniles of a variety of aquatic species as they move through the Delta, species that may be listed or may not be listed. They all tend to be protected.

We think that the result of that is also to avoid predation of those fishes in the fairly narrow channels of the Delta. It pushes the critters out toward the area that they should be.

We offered that alternative to EPA. We have been having meetings with EPA staff and others, and so far we have not heard much in the way of negative comment about the proposed alternative.

One of the things that has fascinated me as we have gone through this process of colloquys that you have with people, the most recent being the one you just had with B.J.:

You asked how is it that we can get to the point of closure in terms of providing you with some idea of sort of a consensus view of what people believe the standards should

look like. In part, we have done that. we have got an urban consensus view about an estuarine habitat standard.

One thing that may be helpful, and frankly, I am not sure how you do this, for the Board to give at least some semblance or an idea whether that's a standard you can buy, it doesn't go far enough, it goes more than what you think is reasonable.

We are sort of operating in the dark. We are kind of groping about in the dark trying to understand what the other is offering or needs to hear, and I am suggesting to you that the urban folks have put something on the table. It took a considerable period of time, believe me, and much effort to get to closure among ourselves on that standard.

It's been on the table for a couple of months now. frankly, we would like to hear back from your staff or from you as to whether we are in the right ballpark on that. That's a standard that's going to have impacts for sure, but we think it does the kind of thing, getting back to the response to the issue that you have raised, it does the kind of thing for species, whether listed or not, that we think should be done.

It provides habitat protection and it avoids a species-by-species approach which gets into conflicts among competing requirements of species.

We think it is a good alternative. We need to hear

back from you; in that sense, I guess the ball is kind of in your court.

MR. CAFFREY: Mr. Del Piero has a question.

MR. DEL PIERO: I don't know if you were present this morning when I was having a discussion, I think with the gentleman from the Fish and Wildlife Service about species and whether or not striped bass was appropriate for continued protection, or for that matter, perhaps not for protection, but certainly, from the standpoint of acting as some type of monitor in terms of any restoration plan.

The question I have for you is this: In terms of the folks that you represent, do you believe that an ecosystem approach encompassing a couple of species of salmon, the Delta smelt, the splittail, the longfin, do you think those five collectively, and the water requirements for those could, in fact, be evaluated within the context of the type of ecosystem approach that you are characterizing here, or are you talking about something else?

MR. WILKINSON: I think there are conflicts within those five, and if you add striped bass --

MR. DEL PIERO: I won't add striped bass. I think we established this morning if we add the striped bass, we had a whole can of worms that we don't want to deal with.

So, the validity of adding striped bass at this point, I think has been called into question in terms of

what we are all going to be charged with responsibility for, so let's set that aside for another day. I think striped bass was something somebody wanted to talk about in 1991, but it is now 1994 and things have gone downhill since then.

I am trying to get in my mind -- what we have heard from a variety of folks today is don't do species by species standards, do an ecosystem approach and my personal favorite is the ecosystem approach with a shelf life.

I am going to look in the Water Code and find out what that means.

MR. CAFFREY: Look creatively.

MR. WILKINSON: I think it means reasonable or something like that.

MR. DEL PIERO: Okay. In any event, I guess if you could provide us with some assistance, you could tell me if you think five species and their water needs constitute enough of a ecosystem approach for us to begin doing what everybody has been asking us to do in the last two meetings.

MR. WILKINSON: In Phase 1, the same Perry Hergesell who testified this morning, and I am afraid I heard about a third of the testimony this morning, testified about a Bay-Delta study done by Fish and Game on a variety of species. I think there were 70 some species included in the survey that was done at that time.

And what he showed was that few species benefited

when outflows increased. About seven is my recollection. A few species in the Bay-Delta estuary didn't benefit. In fact, their numbers seemed to decline when outflows increased. They benefited more from declining outflows.

And the vast bulk of the species they looked at appeared to have not much impact one way or the other as outflows increased.

So, one concern I guess I would have is that the five species that have been identified may all be on that list of seven, and I don't know what that means in terms of the health of the estuary, if you will, whether that group of five constitutes the ecosystem.

I don't think it constitutes the ecosystem. I think you need to look more broadly than that. However, if you just take two of those species, the ones that are listed, I think what you find, even just looking at those two rather than just picking one, is that there are conflicts in the species.

The Delta smelt, for instance, appears not to do so well when outflows rise above a certain level. The abundance doesn't appear to increase, it plateaus about at the point where two parts per thousand reaches Chipps Island because of the outflow, and doesn't seem to increase much behind that. In fact, it may decline.

Salmon, on the other hand, tend to react the reverse,

and splittail, I think, tends to increase as outflow increases. So that, looking at even two or three species, I think you are going to find conflicts.

I guess the long and short of my answer is five species are better than one specie . I am not sure if five species encompasses the ecosystem as we know it, and moreover, remember, too, there are other factors, a lot of other factors going on here apart from simply outflow.

We have got things like pollution, things like predation, poaching --

MR. DEL PIERO: I don't disagree with you on that. A number of people, it is almost like this is the idea of the day, everybody has gotten up in one fashion or another and said they want us to focus on ecosystem management.

MR. WILKINSON: Because your question asks the reverse, should we, the Board, be going species by species, and I think in part people are responding to that, and I think what you have heard pretty uniformly is that no, you ought not to do that. You ought to do something broader.

Multispecies has a nice ring to it. The question is how do you do that, and I think what we have offered to the Board in terms of estuarine habitat standard; yes, it is a narrative standard, it does that. It gets you to the point that you are looking broader than simply a single specie . It's more than that. It is an effort to look at what's

important for a variety of species.

We as a group, the urban contractors as a group, made a conscious decision to buy into the kind of approach that EPA was putting forward in its draft standards. We don't think they did it right. In fact, we think there were some glaring errors in what they did, and we tried to correct those in what we did.

The result is we think we have reduced the water supply impacts of that kind of an approach. You can debate whether that is an appropriate approach or not, and again, you will find biologists will come out on either side of that, but by buying into that, we kind of bought into the idea that an ecosystem approach is an appropriate thing to do, whether it is five species or seventy species.

I kind of personally feel it ought to be the large group of species. They are out there and they are part of the ecosystem as we know it.

You also in the process of dealing with this ecosystem need to allow for the changes that occur in that system, and we think again that the estuary habitat standard we propose tends to do that.

MR. DEL PIERO: I guess the concern that I have got is that there are 70 some odd species, in fact, there might be even more than that, but 70 is what was evaluated.

MR. WILKINSON: At the time, right.

MR. DEL PIERO: A large number of them aren't affected no matter what is done in terms of an ecosystem approach, and one ultimate adverse effect that might in terms of the ability to appropriate water from the Delta is not going to be driven by the gobie. That's going to be drive by the winter-run salmon or the Delta smelt, or maybe in two months the splittail, and maybe in a year the longfin.

So, from the standpoint of the Board attempting to address water quality requirements, the gobie is not going to be the driving force.

MR. WILKINSON: I don't remember the five species that didn't do so well as outflows increased, but I can tell you one specie , the Delta smelt, that doesn't do well when outflow reaches above a certain level, and in fact, that's why we suggested the Chipps Island monitoring point rather than the Rowe Island monitoring point for the two parts per thousand standard because we think that there are some problems. The abundance just doesn't continue.

There are some benefits, obviously, but then you get into the question of balancing.

MR. DEL PIERO: I am not proposing that we utilize any single specie standard. I am just trying to get a handle on this so when the Board ultimately has to discuss what we are going to be doing if, in fact, the Bay-Delta

chooses to go with an ecosystem approach, has at least some rudimentary understanding of what everybody meant by an ecosystem approach.

MR. WILKINSON: Right, understood.

MR. CAFFREY: I think Ms. Forster has a question.

MS. FORSTER: We are not robbing you of time. This is for clarification. The estuarine habitat standard, is it exactly as you depicted it in this document so when you want to know what we think of it, it's not very technical, just breezing through this.

MR. WILKINSON: This is a paraphrase of what appears in the document here. As part of the submittal that we made to you last month, we included in that a blue-covered document about an inch and a half thick which includes the comments that the urban coalition made to EPA.

And in that document we have laid out over about three pages the standard. The actual standard itself is very short. It is about a one-sentence statement about maintaining good habitat conditions in the Bay-Delta estuary.

Then, the measures of compliance are set forth over about three-quarters of a page, and then, there are additional considerations set forth, for example, as improvements are made in these other factors that affect fish species abundance, like, as you begin to get a better

handle on pollution and as poaching is more appropriately managed and so forth, there's a provision in there which allows you to come back and look at the measures of compliance, if not the standard itself, and maybe modify those so that if we begin to provide additional protections elsewhere, perhaps we can reduce the impacts on water diverters.

So, it's a standard that's set forth in this larger document, Ms. Forster, that we submitted to you as an exhibit last month, and if you have a problem locating a copy, I am sure I can find you another copy.

MS. FORSTER: One more question and then I won't interrupt you anymore.

When Club Fed presented their recovery plan today, I thought that was very telling of what they are looking for, methodology and tools, and there were seven species, not five. I am wondering if you are meeting and talking with them. That's going to be important to try to figure out how to bring the State and Federal standards together at each step as we go because it is moving fast so that we have a signal; does this fit with what they are looking at, and if it doesn't fit, then it isn't useful.

MR. WILKINSON: I think it is very important to keep doing that. I think as we go through this process we all need to be talking. We are talking to EPA, you need to be

talking with EPA, you need to be getting feedback from EPA as to whether the approach you are using, for example, as you begin to develop the draft plan which you intend to release in December, you need to get, I think, at least some tentative buy-off from EPA that that's what they think you ought to be doing.

They may have a different view about what has to be submitted to them for their approval or disapproval than you do because that gets into the jurisdictional issue, and I suspect your framework agreement deals with that, but one of the concerns I have had, and I am in court litigating this issue of Sierra Club versus EPA, is that you need to make sure your process ties into their deadline, and if it doesn't tie into their deadline, which by the consent decree was December 15, then there needs to be some notice of that so that either EPA or us can go back in and talk to Judge Carlton about extending the deadline, and we have already written to the Judge suggesting to him that either we -- we assume that EPA will do that.

If EPA doesn't, then we will be back in court telling the Judge EPA needs more time because of what you are doing, so it is very important that you get that kind of feedback.

Okay, I am going to move to the second question that you have asked, which is what are the effects of diversions throughout the Bay-Delta estuary on beneficial uses.

There is no question but that the diversion of water from the estuary has had an impact on in-stream uses. There is just no doubt about that. There is also no doubt, we think, that unscreened diversions in the Delta, and there are many of them, have also had an impact, and we have had commentary back and forth today about just what the impacts might be.

A lot of it is anecdotal in nature. There hasn't been much presented to you in terms of some of the things we are really talking about here in terms of unscreened diversions in the Delta. There are over 1800 unscreened diversions in the Delta today. The majority of those provide irrigation for the agriculture on the Delta islands. Collectively they divert about a million acre-feet of water per year with a diversion rate between 2,000 and 5,000 cfs during the active irrigation season.

That rate of extraction collectively is comparable to the Central Valley Project's Tracy pumping plant.

Now, in addition to the 1800 unscreened diversions in the Delta, there are more than 300 unscreened municipal, agricultural and industrial diversions on the Sacramento River between Redding and Sacramento that divert an additional 1.2 million acre-feet of water annually that would otherwise flow into the estuary.

In addition to those, there are another 150 unscreened diversions along the San Joaquin River upstream

of the Delta.

Now, a portion of that water obviously is returned to the Delta in the form of return-flow water that is not consumptively used by crops. A significant portion of the water that is diverted, both within the Delta and upstream of the Delta by these unscreened diversions is consumptively used by crops.

In any event, the diversion alters the timing of Delta flows.

In addition to that, the return flows contain high levels of pollutants, including THM precursors.

All of these things, we believe, have an impact on Delta beneficial uses, including in-stream uses.

We think that the Board should be considering the cumulative effect of these unscreened diversions when it attempts to apportion responsibility for meeting Delta obligations.

In your draft D-1630, as an example, the Board required diverters pumping at or above a specific level of cubic feet per second to cease their pumping during the release of required pulse flows.

Similar measures to address the flow-related impacts of small diversions, we think should be employed to apportion responsibility for meeting any flow-related requirements which the Board may adopt as a consequence of

these workshops.

While there currently is little data on the timing and magnitude of return flows and their cumulative impacts upon Delta outflow, we hope at least during some part of these workshops to be able to come in and present to you the information that we have been able to develop on what that impact may be. We are working on it now. We don't have it yet.

Just to give you some additional data, the California Resources Agency in 1993, estimated and annual loss of ten million juvenile salmonids from unscreened Delta diversions including winter-run chinook salmon.

The approach velocities of a typical Delta siphon are approximately six to seven feet per second. That's more than twenty times faster than criteria developed for the protection of ESA listed species. We think that these high approach velocities place nearby fish at significant risk.

The consequence of this is that we would strongly urge the State Board to address the increasingly well documented issue of unscreened diversions.

Our biologists tell us that the technology currently does exist for simple, modular, self-cleaning screening devices that could be employed at a reasonable cost.

We also believe that the State, through the State Board and the Department of Fish and Game has the authority

to impose screening requirements and we urge the exercise of that authority.

B.J. put it well, I thought, in his response -- it really wasn't a response to Tom Zuckerman's comments. There is no first in time, first in right rule for killing fish. Moreover, the reasonable method of diversion obligation which exists in Article 10, Section 2 applies to all water diversions, even those commenced 70 years ago.

And finally, is the obligation to incur reasonable expenses in order to make more water available for others, and that obligation was set forth in cases you brought. That obligation to incur reasonable expense applies to all diverters, even those represented by George Miller, Junior or Senior.

Finally, I will move along to the last question. This is a question that relates to the modeling effort.

Our written statement talks about some of the defects that we see in DWRSIM, and I don't want to overstate that DWRSIM is recognized also by the Department and was done so in its comments today as having some deficiencies in terms of doing the kinds of modeling that you need for the balancing user by user that we hope you would eventually undertake.

It deals with impacts in gross, not diverter by diverter. It is focused on the two projects. There are

difficulties in applying it beyond the two projects. It also has a monthly time step which, as Dr. Brown indicated, can have some deficiencies in terms of the modeling that may be necessary for the effort that you are undertaking here.

It was suggested by B. J. Miller that the Board should support and foster a technical work group. You will see our statement contains the same recommendation.

I don't know whether the Bay-Delta modeling forum is an appropriate group for that or not. It may well be. I think it is something to look at, but we would concur that this kind of proceeding is very difficult to undertake the sort of discussion that you need to do in order to advance the modeling effort, and you need some sort of peer review or at least peer-attended effort in the way of a forum similar to the kind of things that the Board had done during the final phases of the earlier process where you had a technical forum that was established.

We think it is appropriate to do that again, so we would support that as well.

If you have any questions --

MR. CAFFREY: Thank you, Mr. Wilkinson.

Mr. Stubchaer.

MR. STUBCHAER: Did you look at PROSIM as well as DWRSIM when you were analyzing models?

MR. WILKINSON: Jim, I am not sure. I didn't,

obviously, do this part, but I suspect we did. I know in the CUWA effort, there was a fairly intensive effort to analyze the different models and I am not certain of what they did as part of that. I would have to check if that's a concern.

MR. STUBCHAER: I would like to get that response.

MR. WILKINSON: Sure.

MR. CAFFREY: Any other questions?

Anything from staff?

I will just say to you, Mr. Wilkinson, and some of the others who have expressed a concern, particularly B. J. Miller, about how the Board is going to deal with some of the more technical matters like modeling, we will take a look at what capabilities we may have and we will get back to you on that.

If there is some adjustment that we should make or if there's something in existence that we might use as a forum for this kind of technical review among our staffs, I think that warrants our taking another look at that.

We appreciate your comments.

MR. WILKINSON: As part of this effort of exchange we talked about, getting together and talking back and forth, I think this is another forum for doing that.

MR. CAFFREY: All right. Thank you, sir.

Christiane Hayashi. Good afternoon.

MS. HAYASHI: Good afternoon, Mr. Chairman and members of the Board.

My name is Christiane Hayashi. I represent the San Francisco Public Utilities Commission, and San Francisco is here to offer its comments to the questions raised by the Board in its notice for this proceeding of whether it should be setting specific standards to protect the endangered species in the Delta, or whether to defer to the contents of the biological opinions that are in effect.

My comments, I think, dovetail nicely with what Mr. Wilkinson just stated. The Board's authority in this proceeding is not coextensive with the terms of the Endangered Species Act and this proceeding has been noticed under the Porter-Cologne Water Quality Control Act, and it is that statute that dictates the proper scope of the Board's focus in this proceeding.

The Porter-Cologne Water Quality Control Act provides in adopting a water quality control plan the Board is to consider all past, present and probably future beneficial uses of water. This serves to distinguish the Endangered Species Act from the Porter-Cologne Water Quality Control Act in that under the Porter-Cologne provisions, the Board should take, at the risk of sounding like a broken record, a more global or ecosystem management approach in this process than is presented by the Endangered Species Act's species-

by-species conservation strategy.

Also, the Board in this proceeding is bound to consider a variety of factors in setting water quality objectives, including characteristics of the water body, whether particular water quality conditions are reasonably achievable under the circumstances, economic and other considerations that are not part of the determination made in coming up with a biological opinion.

Also, under the Endangered Species Act, the biological opinions are directed at the operations of the individual projects, whereas, under this proceeding the Board is going to have to take into account the fact that there are multitudes of uses in the Bay-Delta system. This is not to say that the Board should disregard the biological opinions.

In the biological opinions there will be at least two important functions for this Board in the proceedings here. First, there is a great deal of scientific data underlying those biological opinions, and that data will prove invaluable to the Board in conducting its own analysis of the biology of the Delta.

Second, the biological opinions represent actual operational criteria that are being imposed on projects in the Delta, and coordination with those actual operational criteria will be important so that the Board's standards

will be more coordinated with the biological opinion criteria, and there will be a simpler regulatory system in the Delta.

In addition, the process of coordinating the Board's own plan with the biological opinion criteria will tend to set the Board in the direction of a real time management approach, which is something that is strongly supported by San Francisco.

Ultimately the Board's standards will be measured for compliance under the Endangered Species Act. Under the State act there will be consultation with the Department of Fish and Game, and under the federal act the consulting agency will have to initiate a consultation with the resource agencies of the Department of the Interior to the extent that the Board's actions are subject to EPA approval under the Clean Water Act.

Under both the State and Federal Endangered Species Acts, however, the Board or the consulting agency is under a duty to take into account the best scientific data available in evaluating the effects of its actions on endangered species.

This means that the Board will have to carefully review the scientific data presented by CUWA and other parties in this proceeding in order to satisfy its mandate under the Endangered Species Act, and as a point of

clarification, following Mr. Wilkinson's presentation, I wanted to make sure it is clear to the Board that there are two proposed urban alternatives out there.

One is the CUWA, or numerical approach that was espoused by CUWA in response to EPA's proposed standards.

The second is by the urban coalition. It is the narrative standard Mr. Wilkinson referred to, the one-page narrative standard.

I wanted to make sure the Board understands there were those two standards out there.

The CUWA numerical standard is embodied in 80 pages that were submitted to this Board. It's my understanding that's already in the record, in addition to 800 pages of scientific data supporting that standard.

So, San Francisco is confident that in reviewing those 800 pages of scientific data, according to the Board's duty under the Endangered Species Act, that it will find that that proposed standard by CUWA will provide equal or greater protection for species in the Delta at a lesser water cost.

So, that concludes my comments unless there are any questions.

MR. CAFFREY: Any questions from Board members of Ms. Hayashi? Anything from staff?

Thank you very much. Sorry you had to wait so long.

Next is Mr. Campbell. Good afternoon, sir.

MR. CAMPBELL: Thank you, sir. Good afternoon, Mr. Chairman and members of the Board and staff.

I will be very brief. I simply wanted to lay before you the organization that -- while I work for Lawrence Livermore National Laboratories, we are providing the State of California with a method of providing a scientific basis for a number of water quality and water issues.

One of those is in the Bay-Delta Modeling Forum. This is an organization that was staffed a couple of years ago. I think there are several members here. It is headed up now by Margaret Johnson of the Aquatic Habitat Institute, and I would encourage you to contact her because this could indeed provide a basis for helping you with some of the technical deliberations on the modeling aspects of all kinds of models that affect the Bay-Delta.

The group of Bay-Delta Modeling Forum was started to improve the way models are brought to bear on critical problems. It has authorized a peer review process for models. It is intended to resolve technical conflicts prior to adversarial processes, and a step along the way to link the Delta by models to treat the Delta as the system it is. It is not just the ecosystem, but an overall system, so I simply wanted to recommend this to you, especially following B.J.'s presentation and Mr. Wilkinson.

Thank you.

MR. CAFFREY: Thank you, Mr. Campbell. You may wish to, as we talked briefly during the break, you may wish to contact Mr. Pettit.

MR. CAMPBELL: I already have.

MR. CAFFREY: I talked to him at further length about the subject.

Thank you very much.

Let me ask, are there questions from Board members of Mr. Campbell, or from staff?

All right, thank you, sir.

Cynthia Kohler, National Heritage Institute.

You have met Mr. Del Piero, haven't you?

MS. KOHLER: Yes.

MR. CAFFREY: Forty-some hearing days on Mono Lake.

MS. KOHLER: Thank you for bearing with me and staying so late. I will be very brief.

I am Cynthia Kohler. I am the Senior Attorney for the National Heritage Institute.

I will briefly summarize our written comments which I have provided to counsel.

Listening to the comments today, it's gratifying to see consensus emerging that the Board should adopt an ecosystem approach in setting water quality standards. Perhaps had we done so earlier, we would have avoided the

State listings now occurring.

But it is important to bear in mind that particularly fish species are, indeed, in jeopardy and the possibility of extinction is real. Thus, the Board's standards must reflect measures necessary to protect individual threatened species. It is too late at this point to ignore the status of individual species on the brink of vanishing, so while the standards should certainly deal with the system as a whole, they must also reflect the special needs of highly stressed species.

I wish to emphasize there is no need to choose between protecting individual species and ecosystem management. We believe it would be an error for the Board to view those objectives as antagonistic or incompatible.

This brings me to my second point, that protecting the Delta smelt, the longfin smelt, various salmon runs, Sacramento splittail, accomplishes the goal of ecosystem management. It is only by identifying the biological imperative of various species that the Board can develop the type of comprehensive protective standards that they have been urged to adopt today.

Put differently, ecosystem management means addressing the habitat requirements of individual species in a coherent and comprehensive manner.

Turning to the specifics of the spring run in

response to a question asked earlier, less than 200 adults returned to spawn in 1993. A study prepared for the California Department of Fish and Game by Dr. Peter Moyle and his research team indicates that the spring-run chinook salmon run are currently eligible for listing as an endangered species.

We at the National Heritage Institute have deferred filing our petition to list this spring run in order to allow volunteer action by a unique coalition of fishermen, landowners, State and Federal agencies, and conservation groups, to identify and address problems specific to the spring run without resorting to more Draconian imperatives of the Endangered Species Act.

It now appears that Delta outflow, while not the only issue, is a major factor in the precipitous decline of the spring-run chinook salmon.

In your standard setting, therefore, you should not overlook the need of a specie simply because it is not yet listed. Rather, we recommend that the Board be guided by the reality that the spring-run chinook salmon is, in fact, an endangered specie .

I want to briefly address the longfin smelt. We do recommend that your standard setting address the jeopardized status of the longfin smelt as well.

Although the U. S. Fish and Wildlife Service declined

to list the longfin smelt at this time, this decision turned on the limited base that the Sacramento-San Joaquin Delta estuary population may not be a distinct population segment, but no one disputes for a second that this particular segment is in danger of extinction.

The Fish and Wildlife Service acknowledged this in its formal findings.

Moreover, it now appears that the Service's conclusion regarding the biological distinctiveness of the Delta population of longfin was, in fact, flawed. This conclusion that the population segment may not be biologically distinct was based on data 25 years old.

We plan to shortly ask the Service to reconsider its listing decision for the longfin smelt based on more recent data.

That concludes my oral comments. I will be happy to answer any questions, and thank you for the opportunity to be here today.

MR. CAFFREY: Thank you very much, Ms. Kohler.

Do Board members have questions? Anything from staff at this time?

Thank you for your patience as well. It's been a long wait, I know.

Our last presentation is Patrick Porgans. Mr. Porgans, good afternoon.

MR. PORGANS: Good afternoon, Mr. Chairman.

I didn't want to leave anybody up on the Board depressed. I wasn't going to make this meeting. It wasn't until 12:45 when I --

MR. DEL PIERO: You can't imagine the sense of joy.

MR. PORGANS: I appreciate that. At any rate, I am here as a member of the public and for the record, I want to say three things.

First, I would like to congratulate Mr. Zuckerman, I know he has already left, on his excellent presentation of at least what I consider to be part of the real problem here, which would be a contractually over-committed State Water Project and one which was also under-financed.

With that said, I realize that there are a multiplicity of complexities involved in this issue and I know that each time we turn around we have new data, new graphs, new models, and there's always an element of uncertainty to all the information that you are being presented, and I wouldn't sit up there for one day and have to listen and to absorb all that. You couldn't drag me up there.

So, I appreciate your being there.

The point I want to make is that I have always been pushing for an independent Bay-Delta modeling forum and I hope that this doesn't cause anybody to leave that Bay-Delta

modeling forum, but I am a member of that forum and I have already paid my dues.

I pushed in the past for a Bay-Delta modeling enhancement program through this Board and we did have some money back in '91, you know, or thereabouts, to do something like that. I think it was eight or ten million dollars, but then, there were budget cuts and we had to reappropriate the money for other purposes.

I'm suggesting that the only fair and impartial way that the Board could effectively come up with a way to resolve some of the intrinsic shortcomings or conflicts of interest that may be associated with the Department of Water Resources or others presenting information in the model, is to collect all that information and create your own model and utilize the best information that's available from all these sources, which would then allow you to effectively be in a position where you can sort of have quality control and you can be more or less in the driver's seat, whereas, now you are reacting to information that's being presented to you, and then, there's always these other questions.

I am willing to talk to my wife about cutting a few bucks from the grocery budget for that.

At any rate, getting back to the three issues at hand, I think that we need to come up with our own model. I think, too, that the issue regarding should this Board set

standards to protect the endangered species -- well, if you don't do that, then we have the fed stick, you know, coming over here threatening to do something to us. I wouldn't want to put any money on them using the stick.

But next to that, I would say that we need some -- I am going to jump right to No. 3. I know everybody is probably as hungry as I am.

I think, in essence, what we need to do here is come up with the other element of the equation which was not raised here today by Mr. Miller, with all due respect to him, a very knowledgeable individual, the eighth dimension, cut in exports.

We have to come back and realistically look at what the availability of water is, and I know everybody wanted to hear that. The availability of water is under certain types of hydrological conditions. We have to have a flexible variability into any particular plan that we develop.

See, in the absence of that plan, what we have is a whole series of things coming at us. If I didn't have to spend a few hours a week with my wife, I would develop the plan for you, okay.

Now, the second point I want to make with relation to that is if we don't have a specific plan, we have a moving target, and I have heard a lot of good comments here today, and we need to deal with the known impacts first. We know

what they are.

I mean, I can give you a lot of information that the Bureau and Department put out when they were pushing that canal deal which, for some reason, I think it may come up again, I'm not sure, but it may come up.

Now, the last part of that dimension of it is that everybody wants to protect the Delta. I have been in the Delta protecting it for years.

I could be somewhere today representing a client, but I decided to come here because I know there's an interest on this Board to do it.

Right now as we speak, money is possibly being shifted from protecting Delta levees and is being rerouted to other funds like the Environmental Water Fund for the Mono Lake replacement water. I'm in favor of that. I'm in favor of Mono Lake getting this money and replacing water, but I am not in favor of taking money out of the Delta when we know we need to protect those levees in order to move water through it.

So, that deals with what you were talking about. We have to deal with the issue entirely.

I know you are all full or questions, so I am going to conclude by just saying that let's deal with what we know already has had an impact and let's quantify the other impacts as they become quantifiable, and then, we will

facilitate whatever measures are necessary in order to mitigate those impacts. We can't wait until the year 2010.

MR. CAFFREY: Any questions?

Mr. Brown has a question, Mr. Porgans.

MR. BROWN: Mr. Porgans, just quickly dealing with the known impacts first such as the ones -- give me the ones that come up off the top of your head.

MR. PORGANS: The known impacts like DWR said, there's a reverse flow problem and those reverse flow problems are contributing to entrainment, something to that effect. We have known losses attributed to the operations of the projects.

I would then go in and I would qualify to whatever degree is possible those impacts, and I would say, okay, under these circumstances and these types of conditions, here are the known variables and come up with a reasonable way to mitigate those impacts.

MR. BROWN: Any more?

MR. PORGANS: Well, I would think that we have some issues on unreasonable use of water, you know, because that came up today and I would look at whether it is reasonable to take water out of the Delta under certain types of conditions to irrigate lands where we have known drainage problems, which may compound other public trust resources related problems. So, I would look at that.

And I would look at ways in the process of analyzing these issues to facilitate measures, economic incentives, et cetera, to help whatever is adversely impacted as a result of any sort of mitigation that is required to contaminants associated with known impacts.

I am not suggesting to you we should just say, hey, guys, you have been irrigating so long and now we are going to come in and shut you down. I'm not saying that at all.

I am saying there are ways to try to help mitigate that.

MR. BROWN: Thank you.

MR. CAFFREY: Any other questions from Board members? From staff?

Mr. Porgans, thank you. We certainly do agree with you on the urgency of the matter, and as you know, our schedule is to have a draft plan out before the end of the year. We hope it will meet with your approval.

MR. PORGANS: I appreciate that. I was wondering, was it the two-week train I missed or the twenty-year train?

MR. CAFFREY: Good night, sir. Thank you for being here.

That concludes our proceedings and we will be reconvening on June 14 for the next four subjects.

Thank you all for attending.

(The workshop was concluded.)

REPORTER'S CERTIFICATE

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THIS IS TO CERTIFY that I, ALICE BOOK, a Certified Shorthand Reporter, was present during the workshop held on May 16, 1994, by the State Water Resources Control Board to review Water Quality Standards for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary;

That I recorded in stenographic writing the statements given;

That I thereafter caused the stenographic writing to be transcribed into longhand typewriting and that pages 1 through 214 herein constitute said transcript, and that the same is a true and correct transcription of my said stenographic writing for the date and subject matter hereinabove described.

Dated: May 26, 1994

Alice Book

ALICE BOOK, CSR NO. 43