Attachment "A"

Independent Science Board Meeting
California Bay Delta Authority, Bay-Delta Conference Room, Sacramento, CA
Thursday, April 22, 2004 8:30 a.m.–5:00 p.m.
Friday, April 23, 2004 8:00 a.m. – 1:00 p.m.
Executive Summary and Meeting Notes

Action Items

	Responsible	Items	Status
1.	Staff	Program staff will work with CALFED counsel to refine the Conflict Of Interest guidelines document for ISB activities. Staff will present the COI Guidelines at the September meeting.	Completed
2.	ISB Team	Levee Integrity Fact-finding Team (Mount and Twiss) will craft a document on uncertainty issues facing levee safety including: • Potential small, medium, large impacts, based on the eight issues identified by DWR and USACOE; • Potential low probability, high risk events; and • Two most critical issues: subsidence and seismic failure. The Team will also consider creating a document highlighting the big picture science issues facing the Levees Program, and the overarching concerns these pose for the whole CALFED plan. Mount and Twiss will identify a USGS speaker on seismicity and levees and will invite speaker to provide the brown-bag lunch science presentation at the September ISB meeting.	In-progress
3.	ISB Team	New Member Team (Ingram and Twiss) agreed that: • Twiss will update the descriptions of desired new ISB member general characteristics and disciplines. This document will not include the names of candidates. • Team will submit that document to Moore, who may ask specific questions during the September ISB meeting. • Team will be available to answer questions from Keller and Gohring regarding the Water Management Science Board (WMSB).	Completed
4.	ISB Team	Delta Improvements Plan (DIP) was delegated to Reed with support from Moore. Reed will draft a short document to include: • A long-term vision of the role of science, including a general discussion of basic "delta science," • A clear vision for the Delta, • A discussion of the risks • Interconnections between program elements in the Delta, and • Examples of how specific experience of ISB members in different systems can be pertinent to the Delta. Reed will present the information in the document to the Authority on June 10, 2004.	Completed 6/10/2004

	Responsible	Items	Status
5.	ISB Team	EWA/ERP Team (Rose and Freyberg) will continue with charge to prepare for a conversation between the EWA and the ERP Science Board. Team will frame 3-4 cross-program questions. Suggested potential topics include up and downstream effects, cross-cutting issues like purchasing water for fish, gaps in knowledge for projects such as 8500 cfs through the Delta, coordination among the agencies, and identifying barriers and opportunities for integrating the two programs.	In-progress
6.	ISB Team	PSP Team (Meyer and Patten) will meet with Moore and Taylor to provide more detailed comments on PSP and Implementation Plan. Moore will assist Taylor in incorporating comments, considering ERP examples, and re-structuring both documents. Science Program's goal is to submit the PSP to the Authority in August 2004.	Completed 8/12/2004
7.	Keller	Keller will solicit ISB recommendations (candidates and disciplines) for the Water Management Science Board. If any ISB member is also interested in serving on the Water Management Science Board, please inform Keller.	In-progress
8.	Reed	Reed will attend the June 10, 2004 Authority meeting.	Completed 6/10/2004
9.	Staff	Staff will consider arranging an optional field trip of the Delta for ISB member with DWR and USGS synchronized with the September ISB meeting.	In-progress

Upcoming Meeting Dates

Please note changes to upcoming ISB meeting dates have occurred. The new dates are:

- September 21 & 22, 2004
- November 11 & 12, 2004
    - Afternoon of November 10 will be reserved for Team work. ISB meeting will be 1½ days, ending Friday, Nov. 12 at noon.

CALFED Science Conference, October 4 – 6.
EWA Year 4 Review, Nov. 8 – 10.
Restoration Conference December 6 – 10 in Orlando.

Executive Summary

Report on April 7-8 Authority Meeting

Dunne reported that the Authority was enthusiastic in their approval of Moore as Lead Scientist. Authority members should be extended an invitation to attend an ISB meeting, with a focus on science, enhancing the understanding that science is inherently process-oriented rather than results-oriented, and understanding the respective roles of the ISB and the Science Program.

Report of Conflict of Interest Team

Slide show presentation outlined 'Conflict of Interest' issues and suggested draft language on sole source paid assignments, voluntary assignments, delegated assignments, the competitive

process, areas of concern, and disclosure. Discussion topics included: the ISB COI guidelines may influence other CBDA Science Boards, legal concerns and public reaction, and an annual disclosure discussion. ISB discussion noted that an open, competitive, peer-reviewed process will help manage potential conflicts of interest. Procedures are needed for ISB members to apply for competitive funds.

Delta Improvements Program

Wright presented a brief slideshow describing how and where California water is being used from a broad perspective.

Ramirez presented a slideshow providing background information of the Delta Improvement Plan noting that one fundamental decision of the ROD was to improve the Delta before constructing more reservoirs.

There are currently several agencies working to develop management plans regarding water quality. Eventually, there will be a need for evaluating and integrating the various efforts regarding water quality in the Delta. It was suggested that input from the ISB may have an appropriate role in this process.

The ISB agreed that Matt Kondolf's presentation that compares California to Spain and Portugal would provide useful information to the Authority.

Next steps

Reed will present a short document to the Authority explaining what role the ISB and the Science Program can play; what information, knowledge, insight, and guidance it can offer.

EWA/ERP Integration Team

The Environmental Water Program (EWP) was discussed and outlined as a tool for the ERP. The EWP has specific targets to improve habitat where the EWA is focused on minimizing the take of species. ISB members suggested the EWA/ERP team summarize all water sources onto one page, and focus on the science needs or uncertainties that would be in common between these programs. CALSIM II and other new water models may be useful to calculate quantities of flow and possible options for the EWA.

Next Steps

The ISB recommended the EWA/ERP Integration Team discuss issues with Ramirez and others and report back at the next ISB meeting.

Levee Integrity Fact-finding Team

A summary of research findings were presented regarding the organizational structure of levee agencies, staffing, and levee integrity. The Team interviewed staff of the Department of Water Resources and the Army Corps of Engineers.

It was noted that the purpose of the Levee Integrity Program is to reduce the risk of unplanned levee failures. Eight major issues were found to impact levee integrity: 1) Subsidence, 2) Seismic

risk, 3) Salinity, 4) Sediment budgets, 5) Dissolved organic carbons, 6) Exotics, 7) Mercury, and 8) Mosquitoes. In summary:

- Levee Integrity program is dependent on other programs for science
- Mercury and mosquitoes present significant levee integrity problems
- The program is absent of an adaptive management component.

ISB discussion noted that as new issues and alternatives are studied, new solutions may arise; a need for solutions that do not require expensive engineering; it is problematic to view the Delta as a static, unchanging phenomenon that will be the same in 30 years; and levee system failure would have implications for water quality.

Next Steps
The ISB should investigate this topic further to focus on potential significant risks. Team will write a short paper on this topic and circulate to the ISB for feedback. The Team will continue research and invite a USGS scientist to present on seismicity and risk analysis over lunch at the next meeting.

New Members Team

Team discussed the process of adding new members to the Water Management Science Board and the ISB. It was noted that the two boards have gaps in social science disciplines. Desired characteristics for new Science Board members include scientists who are: broad thinkers, familiar with physical/social science interactions, and are professionals. The Team identified several desired disciplines: geographers, risk and decision analysis experts, environmental economists, environmental law, and experts in organizational innovation and change. Written recommendations to thoroughly describe why these disciplines would be useful to the ISB were suggested. Another member pointed out that issues might be more important than specific disciplines.

Next Steps
The New Member Team will provide recommendations regarding Science Board member disciplines to the Lead Scientist, who will make the final selection.

Water Management Science Board

The first scheduled meeting of the WMSB is in October 2004. One or two additional board members are needed to cover the disciplines. It was agreed that attention for new member recruitment should first be given to the WMSB, then to the ISB. The ISB suggested that the WMSB aquatic ecologist position be split into two positions (Aquatic Biologist and a Ecologist familiar with nutrients and water quality) and that the New Members Team consider individuals with experience in the interaction of science and management. The need for additional water quality and public health expertise was also discussed.

Next Steps
Keller will solicit the ISB to involve interested members who would like to serve on the WMSB. Keller will request the description of desired characteristics and disciplines for new Science Board members from the New Members Team.

PSP Team Update

The Science Program's draft PSP will be completed for the August Authority meeting. ISB members who work on the draft PSP document should not participate in the PSP process.

Next Steps

Moore to provide advice on how to restructure the draft PSP and the draft implementation plan, by referring to ERP examples. Staff will incorporate detailed comments and submit the PSP to the Authority in August 2004.

Public Session

The ISB meeting was opened up to allow members of the public to attend. Discussion topics included:

- Chair Report
- Science Program Update
- Audience comments
- Brown bag presentation on Food-webs in the Delta by Jan Thompson of the USGS

Audience Comments

Jacobs from CDFG discussed two concerns: 1) delivering science to the agencies, and 2) monitoring. Jacobs stated that funding for monitoring is being lost and no comprehensive monitoring framework has been established. This initiated an ISB discussion on the importance of long-term data.

Brown noted that the IEP is facing significant budget cuts.

Taylor suggested the ISB consider 1) what makes a monitoring program successful, 2) types of data, monitoring and research needed, and 3) distribution of effectiveness of monitoring across CALFED.

Bobker stated that the problem is not monitoring, but rather the adaptive management program. A framework is needed that identifies the program's goals and what information is needed to attain those goals.

Independent Science Board Meeting
California Bay Delta Authority, Bay-Delta Conference Room, Sacramento, CA

Detailed Meeting Notes

Thursday, April 22, 2004 8:30 a.m.–5:00 p.m.

ISB Members in Attendance

Tom Dunne, Ph.D.	David Freyberg, Ph.D.	Helen Ingram, Ph.D.
Judith Meyer, Ph.D.	Jeff Mount, Ph.D.	Duncan Patten, Ph.D.
Denise Reed, Ph.D.	Kenneth Rose, Ph.D.	Robert Twiss, Ph.D.

ISB Members in Attendance by dial-in

Ken Cummins, Ph.D.	Jack Keller, Ph.D.

ISB Members Absent

Bill Glaze, Ph.D.	John Melack, Ph.D

State Staff

Dan Castleberry	Tom Gohring	Lauren Hastings
Zach Hymanson	Heather Johnston	Sam Luoma, Ph.D
Jana Machula	Johnnie Moore	Tim Ramirez
Rhonda Reed	Kim Taylor	Patrick Wright

Consultants

Kateri Harrison	Diana Roberts

Welcome

The meeting convened at 8:40 a.m. Dunne welcomed everyone and reported that Ken Cummins is recuperating well. Minor changes to the day's agenda were reviewed and agreed upon.

Report on April 7-8 Authority Meeting

Dunne reported that the Authority was enthusiastic in their approval of Moore as Lead Scientist and Authority members expressed the expectation that the ISB should be proactive, think big and long-term, and provide new information into the CBDA processes.

Wright suggested that Authority members be invited to attend a few ISB meetings to get a sense of key issues, the direction of the Science Program (SP), and the respective roles of the ISB and the SP. There is a wide variation in the expectations of the ISB, ranging from those who hope the ISB will pass review judgments on proposed projects to those who hope the ISB will serve an oversight big-picture role. ISB members suggested that if Authority members attend an ISB meeting, the focus should be on science and enhancing the understanding that science is inherently process-oriented rather than results-oriented. It was noted that Luoma has prepared a paper regarding the relationship between science and policy.

Report of Conflict of Interest (COI) Team

Reed presented a slide show outlining "Conflict of Interest" issues and suggested draft language on sole source paid assignments (directed actions), voluntary assignments, delegated assignments, the competitive process, areas of concern, and disclosure. ISB discussion centered on the following points:

- The ISB's COI Guidelines may influence other CBDA Science Boards.
- Non-competitive service on the ISB differs from accepting non-competitive assignments.
- At issue: the terms "uniquely qualified," "open competitive process," "product," "rule."

- Timeliness might be part of "uniquely qualified."
- Science Program would determine a need and identify the "uniquely qualified" individual. The ISB would review the SP's documentation that this individual is uniquely qualified, and forward this to the Authority.
- If someone is determined to be "uniquely qualified," that should be the exception rather than the rule.
- Important to avoid the appearance of conflict of interest with students and colleagues of ISB members.
- Recusing one's self during ISB discussion is a method of avoiding COI issues.
- The State's RFQ process is unwieldy.
- There are two issues: legal concerns and public reaction.
- The ISB agreed that the term "rule" has legal implications and so should not be used in the context of guidelines.
- The most productive relationships with institutions and programs are long-term, but that such long-term relationships may compromise the impartiality of the ISB. Perhaps it is not appropriate for a person with such relationships to serve on the ISB.
- The ISB should have a disclosure discussion once a year. Most members do not know in detail what projects their fellow Board members are doing for CBDA and therefore would find it difficult to decide whether any particular situation constituted a conflict of interest.
- A benchmark is needed to maintain not just legal impartiality but also the more stringent test of public acceptance.
- The Authority would be a good group to approve the COI guidelines because they understand political implications.
- The ISB needs COI guidelines not to eliminate any possibility of conflict of interest, but rather to manage them.
- A problem arises when the directed research or sole source activity is given to a Board member.

Rose noted that if the ISB is to become more proactive with the CBDA (beyond its role as a reviewer of proposals and the "go-to" place for answers to science questions), the ISB should perhaps be completely uninvolved with non-competitive activities.

Taylor explained how a "firewall" for the Science Program's RFP process enhances SP impartiality. The SP receives advice from many sources and writes the RFP from their conglomerated understanding.

ISB discussion noted that an open, competitive, peer-reviewed process will help manage potential conflicts of interest. Precise procedures are needed for ISB members to apply for competitive funds. Directed programs, which serve an important function for CBDA, are a grey area that needs very careful analysis. The default position would be for ISB members not to participate in directed actions. Sole-source access to projects, whether funded or not, are problematic. Exceptions may include a candidate who is "uniquely qualified" or has recused himself/herself from any deliberations on awarding the project.

<u>Delta Improvements Program</u>

The ISB's role in the Delta Improvements Program was the focus of this agenda item. Reed stated three goals for this discussion:

1. *Education.* Make sure that everyone on the ISB knows and understands the terminology, "plumbing," and scope.
2. *ISB role*. The Authority will meet in June. The ISB must be ready to inform them of ISB's role by that meeting.
3. *Next steps*. Should we establish a Team?

Wright presented a brief slideshow and discussed how and where California water is being used from a broad perspective. Funding is distributed according to 12 CBDA programs and their specific multi-agency, multi-regional projects. The 2004 CBDA agenda includes both system-wide improvements and local and regional projects. In the past decade, local and regional agencies have spent billions of dollars on their own projects, including integrated regional water management plans and desalinization facilities. Now the State is moving toward giving support to local and regional agencies via financial and technical assistance. Issues include oversight coordination and science, Federal authorization, finance plan, Science agenda, re-evaluation of targets, and performance measures.

ISB members discussed the need to include previous CALFED goals, particularly CALFED's acknowledgement that the environment was damaged and needs recovery. Recovery is part of CBDA's agenda. DWR will issue a Draft EIS/EIR to increase pumping in the south Delta in Fall 2004, including public review. ISB members noted the use of the term "Delta Improvement" refers to improvement in the ability to extract water from the Delta.

ERPP Volumes I and II articulated a vision for the improved state of the Delta but it no longer corresponds to current understanding of how the Delta functions. It is hoped this will be considered during the DRERIP process.

Ramirez presented a slideshow providing additional background information of the Delta Improvement Plan and indicated that the Sacramento River Basin conveyance system design capacity is insufficient. Luoma offered a biological perspective on conditions that existed before large human populations where the steep Sierras collected snow; and snowmelt flooded the Central Valley, which was then a very large wetland. Humans have eliminated this floodplain and this has impacted floodplain dependent species. It was agreed that Matt Kondolf's presentation that compares California to Spain and Portugal would provide useful information to the Authority.

Ramirez briefly discussed the history of the CALFED Bay-Delta Program which represents coordination of the Central Valley Project (federal) and the State Water Project operations with regulatory requirements. It includes three phases:

Phase I—Identify problems and alternatives.

Phase II—CEQA/NEPA analysis. The ROD was issued in 2000. One of the fundamental decisions on the CALFED ROD was to improve the Delta before building more reservoirs.

Phase III—Implementation.

It was noted that the science in the ROD is now outdated and that as each CBDA program prepares EIRs, more recent science is incorporated.

Ramirez continued his presentation, highlighting the distribution of water in the Delta Waterways, the supply-rich but conveyance-poor federal Central Valley Project (CVP), the conveyance-rich and supply poor state project (SWP), the South Delta Improvements Project (aka 8500) that would increase the flexibility of state pumping, the Delta Cross Channel, fish salvaging in the Clifton Court Forebay, and very high predation rates on salmon in the Forebay.

Ramirez noted that water quality is a concern that many stakeholders have expressed. CALFED is supposed to provide continuous improvement, not just meet standards. There is currently a long list of water quality efforts that will be done, but there is no plan for integrating them or for evaluating how they would influence each other. He suggested that there might be a role for the ISB. State agency staff has discussed the need for a salinity management program in the San Joaquin. Several agencies are working on this and eventually their efforts will need to be integrated.

Next steps
The next step is to mold these ideas into a short document that explains what role the ISB and the Science Program can play; what information, knowledge, insight, and guidance it can offer; and offer a shorter-term proposal for what the ISB and Science Program can do. The document should interweave longer-term ideas with short-term advice. Program elements should be integrated rather than piecemeal. There needs to be a clear understanding of the Delta as it is now and a clear vision of the Delta's future. ISB members agreed that the document should inform the Authority of what science can do, and could include the following:

- General discussion of basic Delta science
- Patten's Glen Canyon experience
- Articulation of clear vision for the Delta
- Risks associated with flexibility
- Interconnection between program elements
- Principles that could be applied to science

Dunne summarized that if the ISB approves the document, the document will communicate to the Authority and to ERP the scientific issues and approaches that must be used in the long term for effective alteration of the Delta system.

Reed, with assistance from Moore, was assigned to assume the lead in developing this document and delivering it to the Authority at the June meeting. There will be two communiqués, delivered as attachments: principles of science and a transmission memo to the Authority.

Introduction of John Moore to ISB and State Staff
Approximately 40 CBDA, DFG, and other staff members were in attendance. Everyone in the room introduced himself or herself with name and affiliation.

EWA/ERP Integration Team
Rose provided an update on the Team's (Rose and Freyberg) discussions to date. Castleberry explained that the ERP has tools to achieve its aims, including the Environmental Water Program (EWP) target to achieve 100,000 acre-feet of water in streams that supports spring-run Chinook salmon and steelhead. EWP is a pilot, time-bound program with a specific focus and acquisition targets for purposes of improving habitat. The EWA is focused on minimizing the take of species. EWP has found that buying long-term water rights is difficult and has had to purchase short-term water to meet short-term needs. Battle Creek is an example.

ISB members provided the following suggestions for the EWA/ERP Team:

- summarize all water sources noted together on one page.
- focus on the science needs or uncertainties that would be in common between these programs.

It was noted that CALSIM II can calculate that information for any tributary, any year, and one could ask questions about the quantities of flows and options for the EWA. Freyberg reminded the ISB that the original context of the EWA was to deliver water to users who otherwise would have poor access because of an ESA red light. The EWA guarantees delivery of water regardless of habitat and species considerations. It would be a fundamental change to consider who would have perceived a loss if water were used differently. ISB member discussed to what extent ERP considers the water system operation as something other than a constraint. EWA might conceptualize ERP as a goal, but is the opposite true? It was noted that research is being done to consider flow sequences in relation to water system operations. New water models can plug in ERP flow targets to study ecological values.

Next Steps
The ISB recommended that EWA/ERP Integration Team discuss these issues with Ramirez and others and report back at the next ISB meeting.

Levee Integrity Fact-Finding Team
Twiss summarized he and Mount conducted research regarding organizational structure of levee agencies, staffing, levee integrity, and so forth. They also developed background questions, such as

- Is there a science element in levee integrity studies?
- Is there currently any acknowledgement of uncertainty?
- Has the interviewee identified key areas where science could help?
- To what extent does science appear in environmental documents, especially good levee projects?
- Is there anything in the adaptive management arena that is involved in every day work?

They did not ask these questions directly but looked for answers to these questions in the interviews. They spoke with Curt Schmutte (DWR) and Army Corps of Engineers staff.

Mount presented the Team's slideshow and noted the purpose of the Levee Integrity Program is to reduce the risk of unplanned levee failures. The group was originally part of the Subventions and Special Projects Program of DWR and is now a diffuse interagency group. DWR distributes funds for repair and maintenance of levees to 60 levee districts. Most work is conducted by local districts. Each island has its own levee maintenance board.

There are eight major issues impacting levee integrity and subsidence and seismic risk represent considerable risk including: 1) Subsidence, 2) Seismic risk, 3) Salinity, 4) Sediment budgets, 5) Dissolved organic carbons, 6) Exotics, 7) Mercury, and 8) Mosquitoes.

In summary,

- Levee System Integrity program is dependent on other programs for science. CALFED is not stepping up to say what it would do in case of serious subsidence.
- Show-stoppers are mercury and mosquitoes.
- No adaptive management component.

ISB members noted the following: as new issues and alternatives are studied, new solutions may arise; a need for solutions that do not require expensive engineering; it is problematic to view the Delta as a static, unchanging phenomenon that will be the same in 30 years; and levee system failure would have implications for water quality.

Next Steps
Dunne noted that the ISB should investigate this topic further, not to establish inevitabilities but rather potential significant risks. Mount and Twiss agreed to write a short paper on this topic and circulate it for comments. The Team agreed to continue the scouting activities and to invite a USGS scientist to provide a science talk (next meeting's brown bag lunch) on seismicity and risk analysis.

New Members Team (Ingram and Twiss)
Ingram discussed the process of adding new members to the Water Management Science Board and the ISB. (Attachment D of the background materials summarizes many of the details of her presentation.) Keller (WMSB) is interested in having some social scientists on his Board. Ingram noted that the two Boards together still have gaps, mostly in the social sciences. Desired characteristics of Science Board members include:

- Broad thinkers, people who are interested in areas beyond their own narrow discipline, and who like to interact with people outside their disciplines.
- People who are accustomed to thinking about physical/social science interactions, in particular ecosystems, especially how physical science interacts with social processes. A natural implication would be geographers.
- Scientists with a scientific professionalism and no clearly identifiable association with specific interests, for example, an economist who is deeply embedded in details of economic analysis of the Bay–Delta region.

The Team has identified several desired disciplines: geographers, risk and decision analysis experts, environmental economists, and experts in organizational innovation and change.

Keller said that the Water Management Science Board has decided it needs an environmental economist, and questioned whether there needed to be an additional one on the ISB. The need for a lawyer on the ISB was also questioned by some ISB members and this concern was not resolved.

Freyberg noted that if the ISB recommends these disciplines, the CBDA Authority may receive it as an expansion of the definition of science. He suggested that the ability to think broadly may be more important than the discipline, which should be secondary. He stressed that the ISB would need to explain thoroughly why they believe these disciplines would be useful and must be careful in choice of language in their written recommendations.

Reed suggested that issues might be more important than specific disciplines and asked what issues the prospective new members could help with. Reed asked whether the Drinking Water Program has a Science Board. She also wondered whether the scientist must be an academic or whether scientists active in NGOs could be candidates. For instance, Terry Young in Oakland is a specialist in aqueous geochemistry and endangered species issues.

Next steps
Dunne noted that the ISB will provide recommendations regarding Science Board member disciplines to the Lead Scientist, who will make the final selection. The Team agreed to update their document in light of today's discussion with the goal to achieve general consensus on characteristics and disciplines. The Team's document should be provided to Moore who will reflect on this and later ask for individual nominations.

<u>Water Management Science Board</u>
Keller and Gohring discussed the formation of the Water Management Science Board (WMSB). Gohring stated that the first scheduled meeting for the WMSB is in October, but they are behind schedule. One or two more members are needed to cover the disciplines.

ISB members generally all agreed that that the attention for new members should go first to the WMSB and later to the ISB. ISB members suggested that the aquatic ecologist position be split into two: a fish ecologist/aquatic biologist and an ecologist who specializes in nutrients and food web/water quality. They also suggested that Keller and Gohring consider individuals with experience with the interaction of science and management. Reed, Patten, and Meyer noted that people from out of state can offer valuable experience.

The ISB discussed whether a separate Water Quality Science Board/Committee or Team is needed because of non-point source water quality issues vs. increasing membership in existing or proposed boards to include water quality experts. Discussion included the following points: the ERPSB is already fairly large; supporting a science board requires significant investment by CBDA staff; the WMSB should

have a strong water quality component; and the ISB currently has three water quality experts; and a public health risk expert would be needed in the water quality group to address salt, mercury, selenium. Not funding public health issues carries a significant cost.

Next steps
Keller will solicit the ISB to find interested members who would also like to serve on the WMSB. Keller will request the description of desired characteristics and disciplines for new Science Board members from the New Members Team.

First day adjourned 5:30 p.m.

Friday, April 23, 2004 8:00 a.m. – 1:00 p.m.

ISB Members in Attendance: Dunne, Freyberg, Ingram, Melack, Meyer, Mount, Patten, Reed, Rose, Twiss, and Keller (by phone). ISB Members Absent: Cummins, and Glaze. State Staff: Johnston, Moore, Ramirez, Taylor, and Wright. Consultants: Harrison and Roberts.

Agenda Review, Action Items, Meeting Schedule
Dunne reviewed changes in the day's agenda. Action Items resulting from yesterday's discussion were noted as listed on pages 1-2 of this Meeting Summary. ISB members revised their meeting schedule as shown on page 2 of this Meeting Summary.

Introduction to New Lead Scientist, Dr. Moore's
Moore presented a slideshow to introduce his interests and concerns to the ISB. He noted that the CBDA and all of California's water resource managers will have to deal with a significant increase in population in future and concurrently have increasing difficulties with water availability and conveyance and with environmental stability. Management of our environment must be active in order to assure viable water resources and ecosystems. He divided CALFED's purposes into two major efforts: understand system-level processes and functions, and assist project assessment.

Wright indicated that it would be helpful for the ISB to either produce or commission a series of short papers on important topics such as water use and management, subsidence, global climate change, and other big issues, not for direct use in policy formation, but as information.

Some Board members suggested that ISB has the responsibility to mention and acknowledge the "certainties"; be willing to speak out, even when they know that knowledge will continually be updated; raise issues to the level of debate; and to study water use efficiency. Mount suggested that the ISB might consider inviting Richard Howett and Jay Lund to speak about the CALSIM model to see how it can predict water prices with population changes.

Rose noted that considering similar efforts in other geographic locales could be useful in investigating methods of doing studies and lessons learned (Where the study went wrong; surprises.) Solutions are often site-specific, but these other insights may be generally applicable.

Patten suggested that considering "what if" would be a useful approach, to make projections about what might be done. For example, what if we change the way we distribute water? This could help us consider the science underlying causal theory.

Moore indicated that flexibility to ask individual ISB members for periodic assistance with short-term projects is desirable, and noted that longer-term projects would have to be competitive. ISB member contracts include a clause that they will "work with staff," which covers short-term advice however, it might be more appropriate for ISB members to provide Moore with referrals to other experts. It was agreed to consider these issues in more detail after the Board's Conflict of Interest Guidelines were formalized.

PSP Team (Meyer and Patten)
Meyer reported that the Science Program's draft PSP draft is still a work in progress but is on a tight timeline, and will be completed for the August Authority meeting. Those who work on the draft PSP document should not participate in the PSP process.

Next Steps
Moore will provide advice on how to restructure both the draft PSP and the draft implementation plan, and will refer to ERP examples. The Team will provide more detailed comments on the PSP and Implementation Plan. Staff will incorporate these comments and submit the PSP to the Authority in August 2004.

April 23, Public Session

ISB Members in Attendance

Tom Dunne, Ph.D.	David Freyberg, Ph.D.	Helen Ingram, Ph.D.
John Melack, Ph.D.	Judith Meyer, Ph.D.	Jeff Mount, Ph.D.
Duncan Patten, Ph.D.	Denise Reed, Ph.D	Kenneth Rose, Ph.D.
Robert Twiss, Ph.D.		

ISB Members Absent

Ken Cummins, Ph.D.	Dr. Bill Glaze, Ph.D.	Dr. Jack Keller, Ph.D.
Dr. Jeffrey Koseff, Ph.D.		

State Staff

Marina Brand	Dan Castleberry	Lauren Hastings, Ph.D
Heather Johnston	Jana Machula	Kim Taylor, Ph.D.
Patrick Wright		

Stakeholders

Patrick Akers	Gary Bobker	Larry Brown
Lauren Buffaloe	Rob DuVall	Dave Harlow
Diana Jacobs	Kristen Larson	Ladd Lougee
Kate Marie	Tom Mongan	Lorna Smith
Ramona Swenson		

Consultants

Kateri Harrison	Diana Roberts

Chair Report
Dunne stated that on May 5, ISB Teams reported on the work they were charged with during the January meeting. The EWA/ERP Integration Team will continue its work and report back at the next ISB meeting. The Levee System Integrity Team distilled a report on eight major topics of significance to those who do levee improvements. The ISB asked for further investigation on the seismology and changing topography issues specifically. There will be a report and perhaps a guest speaker at the next meeting. The Conflict of Interest Team engaged the ISB and staff in a discussion on how to manage potential conflicts and bias. The Team will work further on the development of COI guidelines prior to the next ISB meeting.

The New Members Team report was given by Ingram who noted the kinds of expertise currently on the ISB and other kinds of expertise that would be desirable has been discussed with the ISB. Social sciences, economics, and risk evaluation were among the disciplines discussed. Team will report back at next meeting.

The ISB appointed a new Delta Improvements Plan Team to discuss what scientific investigations should be done on the Delta and to develop a draft document on science related recommendations to be distributed at the June Authority meeting.

Introduction of Lead Scientist

Wright welcomed Moore and presented him with an official CBDA ball cap. Wright noted that Moore's attendance at an ISB meeting before his official start date reinforces their positive regard for him. Moore thanked Wright and those present. He said that the CBDA is an impressive operation with its integration of agencies.

Science Program Update

Workshops

Taylor reported that two workshops had taken place since the January ISB meeting:

1. Contaminants and identifying the effects on fish. See website at: http://science.calwater.ca.gov/workshop/past_workshops.shtml#.
2. Suisun Marsh with a discussion on the geographic distribution of native fish, technical issues, and the current state of knowledge. See website at http://science.calwater.ca.gov/workshop/past_workshops.shtml#. Thanks to Ladd Lougee and the Bay Delta Consortium.

A future workshop is planned for July focusing on gravel replacement projects and river processes. See website at: http://science.calwater.ca.gov/workshop/future_workshops.shtml.

ISB members discussed the value of these workshops and noted that workshops are a good medium for distributing current scientific knowledge, effective for forward movement when the participation number stays relatively small, helpful in reaching agreement about the certainties and the data, and gets participants involved in the idea development process. ISB members also noted that in other regions, targeted scientific workshops not open to the public.

Taylor noted that the white papers delivered at the end of the workshop, which are not generally peer reviewed, are less important than how the participants think about the problems during the workshops. Ingram warned that the programs and Boards must avoid allowing the workshops to have any overtones of advocacy.

Publications

Buffaloe reported the next edition of the San Francisco Estuary and Watershed Science Journal (on-line) will be released in mid-May and will contain a monograph on open water processes by Wim Kimmerer. The Journal has a potentially nation-wide audience and it is a cost-effective way to share information. ISB members are encouraged to submit manuscripts. Taylor reported that ERP has started a white paper on open water processes which links X2 and the food web. The Science Notebook contains non-peer reviewed comments on previously presented topics, information on other workshops, and other material. The next issue is currently in development.

Audience comments

Jacobs from CDFG discussed two concerns: (1) delivering science to the agencies, and (2) monitoring. Jacobs questioned how the ISB and the SP verify that science is delivered to the implementing agencies. For instance, CDFG took the lead in developing a simple diagram of a conceptual model for Delta smelt. It would be useful to feed this kind of information back into ERPP Vol. I and Vol. 2. There is currently no provision for a peer review of this Delta smelt model. It would be a good addition to the Science Program's public outreach documents.

Jacobs stated that funding for monitoring is being lost. Two examples are salmon counts and stream gauge operation. Jacobs asked whether monitoring programs like these should be part of the Delta Improvements Package. No comprehensive monitoring framework has been established. This sparked a discussion on the importance of long-term data which focused on the following points: science clearly depends on the collection of long-term data; short funding periods of 3 or 4 years are inadequate for long-term monitoring, which is the kind of data CBDA and the Science Boards need; budgetary concerns threaten monitoring of data with broad impact such as snowmelt changes; monitoring is not perceived as "real science" and thus is subject to neglect; and monitoring is considered a "luxury" by some which makes it vulnerable to budget cuts.

Brown noted that the IEP (composed of CDFG, USFWS, USGS, Bureau of Reclamation, USCOE) is facing significant budget cuts. It provides hydrodynamic data, continuous flow data, and water quality data. IEP decides what projects to fund based on their mandates and on recommendations by scientists. Since no one has ownership of the monitoring issue, no one advocates for it and he suggested that the ISB might be an appropriate body for this responsibility.

Brown noted that most CALFED science investigation funds go toward research rather than monitoring. Jacobs said that water projects provide a stable source of funding and also the Delta Improvements Package may provide an opportunity to fund monitoring. CDFG has taken the lead on salmon monitoring, both juvenile and adult.

Ingram noted that monitoring data is inherently affected by the project for which it is gathered. Data collected in the past for specific projects may or may not be useful now for more holistic studies.

Taylor would like the ISB to take on the question of monitoring and discuss (1) what makes a monitoring program successful, (2) types of data, monitoring and research needed, and (3) distribution of effectiveness of monitoring across CALFED.

Bobker stated that the problem is not monitoring, but rather the adaptive management program. It is unclear how new data and new information should feed back into implementation projects and into all programs. A framework is needed that identifies the program's goals, what information is needed to attain those goals, how to get that information, and what the consequences will be on the decision-making process if that information is not obtained. Clarification of the respective roles of the various Science Boards is needed in regard to monitoring, especially for active and passive adaptive management. The ISB could take a lead with passive adaptive management. He urged the ISB not to become too involved in implementation, but rather to maintain its independence. He suggested that Moore consider how the Science Program could be more embedded.

Board discussion noted that the ISB should take this concern on through the work of the DIP Team and through the development of a Strategic Plan for the Science Program.

<u>Brown Bag Lunch</u>
Presentation by Jan Thompson, USGS, on food webs in the Delta. Slideshow is available as a handout.

<u>Meeting adjourned at 1:00 p.m.</u>

Attachment B-1

Memorandum

To: **The Independent Science Board**
From: **Dr. Johnnie Moore, Lead Scientist, CBDA Science Program**
Date: **August 24, 2004**
Subject: **Conflict of Interest and Open Meeting Guidelines**

The hard work that the Independent Science Board (ISB) has done on conflict of interest has finally come to fruition! Using the ideas developed at the last Independent Science Board (ISB) meeting, I have worked with Science Program Staff and consultants, Dr. Denise Reed (Vice-Chair of ISB) and the State Attorney General's Office to finalize the "Conflict of Interest and Open Meeting Guidelines" for the California Bay-Delta Authority Independent Science Board. This has been a very arduous effort, involving many levels of discussion and numerous exchanges of versions of the guidelines to the various parties for final approval by the State's attorneys. The attached guidelines meets all the requirements set by California State law and will allow us to function within those laws to meet our goals. With the help of staff, consultants and the attorneys, we have outlined the basics of the requirements below.

There are three particular areas that form the legal framework for the attached Guidelines. The California Political Reform Act pertains to financial interest within the government decision making process. Common Law Conflict of Interest Rules apply to both financial and non-financial personal interests. Lastly, the California Government Code Section 1090 describes issues related to contracts and proposal selection processes within decision-making boards. The main points discussed in the guidelines include direction on expert opinions and analysis, participation in workshops, avoidance of conflicts, peer review process, proposal processes, and directed actions. Members of the Independent Science Board will be asked to publicly disclose potential Conflict of Interest activities such as related consulting and volunteer duties. The Bagley-Keene Open Meeting Act is applicable to the ISB and we have added wording to detail how the ISB will conform to that Act. The objectives of the Bagley-Keene Open Meeting Act include appropriate public noticing and posting of agenda items whenever three or more committee members convene.

I think that these are good guidelines, they are what we need to do legally and, I think, will set the framework for developing similar policy for other scientific boards across CALFED program elements. We will present the guidelines "officially" at the September ISB meeting and staff, consultants, and attorneys from the State of California will be there to answer questions you may have about the guidelines. I look forward to seeing you at the September 21-22 meeting.

Attachment B-2

DRAFT

SCIENCE PROGRAM POLICY ON OPEN MEETINGS AND CONFLICT OF INTEREST FOR CALIFORNIA BAY-DELTA AUTHORITY INDEPENDENT SCIENCE BOARD

The charge of California Bay-Delta Authority's Independent Science Board (ISB) is to 1) understand the technical underpinnings of the CALFED Bay-Delta Program and provide insights on progress toward addressing those premises; 2) evaluate the balance and credibility of analyses and the use of science across all individual program areas and science agendas for building critical new knowledge; 3) approve performance measures developed within the program; and 4) identify impending issues and significant interconnections across programs.

Individuals nominated to the ISB are required to have national-level stature in their fields of research. Also by design, membership in the ISB includes individuals who conduct research directly related to the Bay-Delta system as well as individuals with experience in other systems and programs with no previous connection to the program. This balance between deep local knowledge and external perspectives is necessary for meeting CALFED's needs.

Several questions have arisen with respect to the application of California's open meetings and conflict of interest laws to the Independent Science Board. This policy is an attempt to address some of those questions.

Open Meetings Laws

California's Bagley-Keene Open Meetings Act applies to advisory bodies that are created by law. The California Bay-Delta Authority Act provides for the creation of the ISB. Thus meetings of the ISB must be noticed 10 days in advance and held in public in compliance with the requirements of the Bagley-Keene Act. The Act also applies to subcommittees of three or more members formed by the ISB or by its chairman, which are considered to be advisory committees to the ISB. Larger subcommittees may be formed for particular purposes, but they must meet the agenda and open session requirements of the Bagley-Keene Act. Small advisory subcommittees of two members are not subject to the open meeting requirements.

Conflict of Interest Laws

A. Political Reform Act

The California Political Reform Act prohibits public officials from making government decisions in which they have a financial interest. The disqualification provision of the Act hinges on the effect a decision will have on a public official's financial interests. When a decision is found to have the requisite effect, the official is disqualified from making, participating in the making, or using his or her official position to influence the making of that decision. (Gov. Code, section 87100.)

The Act also requires public officials to file statements of economic interests. (Gov. Code sections 87302, 87500.) Members of decision-making boards are subject to this requirement, but an advisory board is not, unless it has made substantive recommendations that have been, over an extended period of time, regularly approved without significant amendment by another government agency. Because the ISB is advisory in nature, does not make final government decisions or have the power to compel or prevent governmental decisions, and does not have a track record of having its recommendations adopted without change by the California Bay-Delta Authority, individuals serving on the ISB are not considered government officials for purposes of compliance with the California Political Reform Act, and are not required to file disclosures of financial interests (Form 700) as a result of their participation on the ISB. This may change in the future if the ISB does acquire a track record of having its recommendations adopted.

Certain members of the ISB do, however, carry out other activities for the CALFED Science Program, and may be considered "consultants" to the Authority or to the Association of Bay Area Governments as a result of those activities, and in that case, they will be required to file Form 700s.

B. Common Law Conflict of Interest Rules.

Even though members of the ISB are not formally covered by the Political Reform Act, they are still bound by common law conflict of interest rules. A clear expression of the common law doctrine is found in *Noble v. City of Palo Alto* (1928) 89 Cal. App. 47, 51:

> A public officer is impliedly bound to exercise the powers conferred on him with disinterested skill, zeal, and diligence and primarily for the benefit of the public.

If a situation arises where a common law conflict of interest exists as to a particular transaction, the official is disqualified from taking any part in the discussion and vote regarding the particular matter. The common law doctrine applies to *non-financial* as well as financial personal interests.

C. California Government Code Section 1090

Although members of the ISB are not considered public officials for the purposes of the Political Reform Act, they are considered public officers or employees for purposes of compliance with California Government Code section 1090, which prohibits a public officer or employee from making a contract in which he or she is financially interested.

The prohibition applies to virtually all officers, employees, and multi-member bodies, whether elected or appointed, at both the state and local level. It also includes the members of advisory bodies if they participate in the making of a contract in their advisory function. *Any participation by an officer or employee in their public capacity in the process by which such a contract is developed, negotiated, and executed, including planning and priority-setting through a PSP process or otherwise, is a violation of section 1090.*

For decision-making boards, if a member of the board has a financial interest, unless it is defined as a "remote" interest or non interest in Government Code sections 1091 or 1091.5, the entire board is precluded from acting on the contract. The Attorney General's Office has not applied this restriction to bodies that are advisory only. If a member of the ISB has a financial interest in a proposed contract or grant, or a remote interest as defined in Government Code section 1091, the ISB may still make recommendations regarding that contract or grant, so long as the interested member discloses his or her interest, and disqualifies himself or herself from *any* involvement in or discussion of the contract.

If a member of ISB has a "non interest" as defined in Government Code section 1091.5, he or she may participate in the discussions leading to a recommendation regarding a future contract. For ISB members who are employed by public universities, section 1091.5 (a) (9) provides that an officer or employee shall not be deemed to be interested in a contract if his or her interest is "that of a person receiving salary, per diem, or reimbursement for expenses from a government entity, unless the contract directly involves the department of the government entity that employs the officer or employee, provided that the interest is disclosed" and noted in the official records.[1] Thus, an ISB member may not participate in recommendations regarding a contract or grant that may be awarded to a member of his or her own department at a public university, but the member is not precluded from acting on other contracts to his or her home university. If

[1] The remote interests of Government Code section 1091 and non-interests of Government Code section 1091.5 are discussed in the Attorney General's Conflict of Interest pamphlet, but the language of 1091.5 (a) (9), cited in this paragraph has been amended to read as quoted here.

the member's university is a private institution, the member's interest is not considered a non-interest, but would be a direct or remote interest that would require disqualification.

Guidelines for ISB members

The following sets of guidelines apply these principles and others to specific activities members of the ISB are likely to engage in as part of their ISB service.

Representing ISB

The ISB as a body deliberates and provides advice to the Authority and the Bay-Delta Public Advisory Committee, as well as to the Science Program and the Lead Scientist, on the science relative to implementation to all Program elements. ISB members should avoid situations where they speak for the Board unless specifically delegated to do so by the Board.

Open Meetings

ISB meetings and deliberations will be held as a public meeting and public notice for these meetings will be distributed 10 days in advance. Once the agenda has been distributed, matters may not be added to the agenda (with certain exceptions specified in the Bagley-Keene Act), and the ISB may not make recommendations on items not listed on the agenda.

The ISB may form subcommittees of 1 or 2 people to work on an issue to prepare it for deliberation by the broader ISB at a public meeting, and meetings of these small subcommittees are not required to be public. Subcommittees of 3 or more, formed by the ISB or its chair, will be considered advisory committees and will be subject to the open meetings requirements.

The Open Meeting Act contains a specific prohibition against so-called "serial meetings"-that is, a series of communications employed to develop concurrence as to actions to be taken by the ISB, each of which involves less than a quorum, but which taken as a whole involves a majority of the ISB members. Conversations that advance or clarify a member's understanding of an issue, or facilitate an agreement or compromise communications that contributes to the development of a concurrence of action to be taken. Serial meeting issues arise most commonly in connection with **rotating staff briefings, telephone calls or e-mail communications** among a quorum of board members.

For example, the Attorney General's Office has previously opined that a majority of board members may not e-mail each other to discuss current topics related to the board's jurisdiction even if the e-mails are also sent to the secretary and chairperson of the agency. The e-mails are posted on the agency's Internet website, and a printed version of each e-mail is reported at the next public meeting of the board.

In a related context, the AG's Office has advised that staff may receive spontaneous input from board members on the agenda or on any other topic, but cautions that problems arise if there are systematic communications involving a quorum of the body acquiring

information or engaging in debate, discussion, lobbying or any other aspect of the deliberative process, either among themselves or between board members and staff. If staff receives the same question on substantive matters to be addressed in an upcoming agenda from a quorum of the body, the AG's Office recommends that a memorandum be prepared by staff addressing these issues so that members of the body and the public will receive the same information.

CBDA staff will maintain the public record and members of the public may view the record and make copies of specific documents. Meeting agendas, meeting summaries and background reading materials provided as a packet prior to the ISB meeting will be posted on the Science Program website. In addition, e-mail correspondence from staff or other individuals to the entire ISB will be considered a public document and may be posted on the CBDA website and/or distributed to the public during the next ISB meeting.

Conflicts of Interest

Disclosure: Although membership on the ISB does not, by itself, trigger the need to file financial disclosure statements under the California Political Reform Act, the Science Program has determined as a matter of policy that disclosure of an individual member's activities is an important element of managing the public perception of bias.

It is the responsibility of Board members to disclose any professional activities they are engaged in, including service as an expert witness or advisor, that may be perceived as being related to the CALFED Program and it is the desire of the ISB to construe this responsibility broadly (i.e. included funded and unfunded work, and disclosure when there is uncertainty about the relevance of work to CALFED). Disclosures should be timely, for example before discussing a specific agenda item at a meeting.

It is also important for individuals being asked to serve as peer reviewers for specific proposals and products to disclose any professional and financial connections to the authors or work being reviewed prior to CALFED staff prior to performing any peer review work.

Fact-Finding

ISB members may be requested or assigned by the Board, as part of a subcommittee or otherwise, to engage in various CALFED activities or conduct limited research or investigations as part of the process of learning more about the management context and specific technical issues. However, such assignments will not be used as a means of circumventing the conditions under which ISB members may engage directly in original work through directed action processes. Members' contracts will contain a limit on the amount which can be expended for these purposes.

Providing Expert Opinions and Analysis
One of the goals of the CALFED Science Program is to bring scientific expertise into all areas of the program by engaging experts in standard practices of the research community including peer review, information synthesis, and the development of new knowledge through inquiry and investigations. Most of the individuals serving on the ISB have worked in one or more of these capacities for the Program on topics ranging from the Environmental Water Account and wetlands monitoring program reviews; to demonstrations of approaches for applying sophisticated modeling techniques to Delta smelt population questions.

Individual experts, including members of the ISB, may accept invitations from the Lead Scientist, Science Program staff, and other CALFED Programs to serve in these capacities (paid or unpaid), so long as public contracts requirements are met, and so long as they have not in any way participated in a public capacity in recommending that the particular work be done.

Participation in Workshops
Individuals who serve on the ISB may participate in public workshops, and report on their past or ongoing work. ISB members shall take care, however, not to participate in their public capacity in making recommendations for future work for which they themselves would seek funding, or in which they would have a financial interest.

Review Panels
Individuals who serve on the ISB may also agree to serve on other review panels and Boards in CALFED. These activities fall under those that should be disclosed to the public in a timely manner and individuals serving on the review panels must not have a financial interest in any of the projects being reviewed.

Avoidance of Conflicts. In order to minimize or avoid conflicts of interest, the ISB as a body will not be asked to provide advice to the Authority, BDPAC or the Science Program on specific elements within any request for proposals. The ISB may, however, advise on peer review processes in general.

Peer Reviews
Individuals who serve on the ISB and other standing CALFED Science Boards may agree to conduct a peer review of an individual proposal, subject to the standard condition that reviewers should not have any financial or professional interest in the proposal. As with disclosure guidelines, individuals should construe financial and professional interests broadly. A potential reviewer should not review a proposal in which he would have a direct interest, or a remote interest as defined in Government Code section 1091. An example of a clear conflict of interest is when an individual has assisted in the development of a proposal, or will receive financial benefit from the funded project, it would be a clear violation to agree to conduct a peer review for CALFED of that proposal. If the individual's interest would be considered a non interest under Government Code section 1091.5, the individual could review the proposal. Because proposals by others in the same department are not considered non-interests, scientists in

public universities should not review proposals by their own graduate students or others in their department, but are not precluded from reviewing proposals from parts of the university other than their own employing unit or department. As a matter of policy, an ISB member may want to preclude reviewing any proposals from a reviewer's home university.

Calls for Proposals (PSPs, RFPs, IFBs, etc.)
Individuals who serve on the ISB may serve as reviewers and advisors to the Science Program and other CALFED Programs on specific calls for proposals and as members of panels in the proposal selection process. These activities include reviewing implementation and Proposal Solicitation Process (PSP) documents, reviewing multiple proposals, and participating as members of technical synthesis and selection panels. While the ISB as a body will not be asked to participate in these activities, individual board members who have elected to do so must disclose these activities in ISB deliberations.

The Science and Ecosystem Restoration Program's selection processes are comprised of 5 main steps. The first is preparing documents describing programmatic scientific priorities. The second is a mail review by at least three experts of each proposal received. The third is a technical synthesis panel whose charge is to prepare an integrated and balanced technical evaluation of all proposals received based on the individual mail reviews. The fourth step is a selection panel whose charge is to select and prioritize the high quality technical proposals based on program need, and to recommend the full package to the Authority for approval.

Individual board members who elect to participate as advisers or reviewers in any specific calls for proposals are prohibited from submitting a proposal to the same process. Individuals may submit proposals to CALFED PSPs they have not participated in—for example, an individual who advises the Science Program on its PSP may apply for funding through the Ecosystem Restoration PSP so long as they have not participated in the Ecosystem Restoration PSP process in any specific manner. Individuals who have advised a CALFED program in general terms on peer review and RFP processes, for example by communicating the sequence and rationale used by the National Science Foundation, are not presumed to have participated in a specific PSP.

The general rule for avoiding conflict in the review of individual proposals in this process is that individuals should not review proposals in which they have a direct or remote financial interest and should disclose associations.

Directed Actions
Individual researchers who are members of the ISB may also engage directly in original work for CALFED through directed action processes if all of the following conditions are met:

Condition (1): The Science Program (or other CALFED Program) explicitly defines the need for the specific study topic, without input from individuals who will seek to do the work. Any ISB member who may wish to apply for funds must fully disqualify himself from any discussion of the possible studies at an ISB meeting and must not attempt to influence staff...

Condition (2): An open solicitation process has been used by the Program. The Science Program or other CALFED program has conducted an open solicitation for the critical study need. The solicitation can be anything from a broad PSP as described above, a limited request for specific proposals, or a request for qualifications such as might be used in identifying team members for a multidisciplinary study. The goal of this open process is to ensure fairness.

Condition (3): The funding agency is satisfied that qualified individuals who are not Board and panel members have had an opportunity to apply to conduct the study.

Attachment C.
Delta Atlas

The Sacramento-San Joaquin Delta Atlas was authored by the Department of Water Resources and can be found at the following website:

http://rubicon.water.ca.gov/delta_atlas.fdr/daindex.html

A CD of the Delta Atlas is available from the Department of Water Resources and this CD has been mailed to ISB members.

Attachment D.
Science in Action (August edition)

The Science in Action publication is produced by the California Bay Delta Authority Science Program staff and has been mailed to ISB members.

- 1978 —Issuance of Decision 1485, which ordered U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) to meet the water quality standards in the 1978 Water Quality Control Plan (WQCP);
- 1987—Draft updated WQCP withdrawn because of intense opposition;
- 1991—Adoption of 1991 WQCP for Salinity for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (1991 WQCP);
- 1991—Disapproval of 1991 WQCP by Environmental Protection Agency (EPA);
- 1992—Issuance of Decision 1630, to provide interim water rights terms and conditions for Central Valley Project (CVP) and State Water Project (SWP);
- 1993—Governor requests SWRCB to cease work on Decision 1630 and begin work on developing long-term standards;
- 1993—U.S. Fish and Wildlife Service (USFWS) issues a biological opinion for delta smelt;
- 1994—National Marine Fisheries Service (NOAA Fisheries) issues a biological opinion for winter-run Chinook salmon;
- 1994—State and Federal Agencies sign Framework Agreement including interim agreement for meeting Delta WQ standards and creating CALFED;
- 1995—SWRCB issues 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (1995 Bay-Delta Plan);
- 1995—SWRCB adopts Water Right Order 95-6 to amend permits for CVP and SWP to be consistent with the 1995 Bay-Delta Plan; and
- 1999—SWRCB adopts Decision 1641 (D-1641), which implements the objectives contained in the 1995 Water Quality Control Plan.

In general, each subsequent adoption of water quality standards or water rights decision by the SWRCB supersedes the previously adopted one. However, they do not supersede regulations based on other authorities such as the biological opinions issued under the Endangered Species Act. Reclamation (CVP) and DWR (SWP) are among the most junior water rights holders in the Delta and are by far the largest diverters. Therefore, they have born the largest burden for meeting the water quality standards in D-1641.

An important factor affecting implementation of the current water quality standards (as stipulated in D-1641) is whether the Delta is in "balanced conditions" or "excess conditions" (also referred to as "out-of-balance"). Balanced water conditions are defined as periods when DWR and Reclamation agree that releases from upstream reservoirs plus unregulated flow approximately equal the water supply needed to meet Sacramento Valley in-basin uses, plus exports. Excess water conditions are defined as periods when DWR and Reclamation agree that releases from upstream reservoirs plus unregulated flow exceed Sacramento Valley in-basin uses, plus exports (*i.e.*, water is available in the system). When the Delta is in balance, water quality standards typically control operations. Some operational standards also change depending on whether upstream reservoir releases are for flood control or delivery.

<u>For additional background information see</u>:

- Littleworth and Garner, *California Water*, pp. 121–137
- 1995 Water Quality Control Plan (www.waterrights.ca.gov/baydelta/1995%20Quality%20Plan.htm)

3.0 Delta Water Quality Standards

The 1995 Bay-Delta Plan was adopted by the SWRCB to establish water quality control measures that contribute to the protection of beneficial uses in the Bay/Delta Estuary. Together these beneficial uses and the water quality objectives established to protect them are referred to as *water quality standards* under the terminology of the federal Clean Water Act (the terms *objectives* and *standards* are used interchangeably in this briefing report). The objectives, or standards, protect the following beneficial uses:

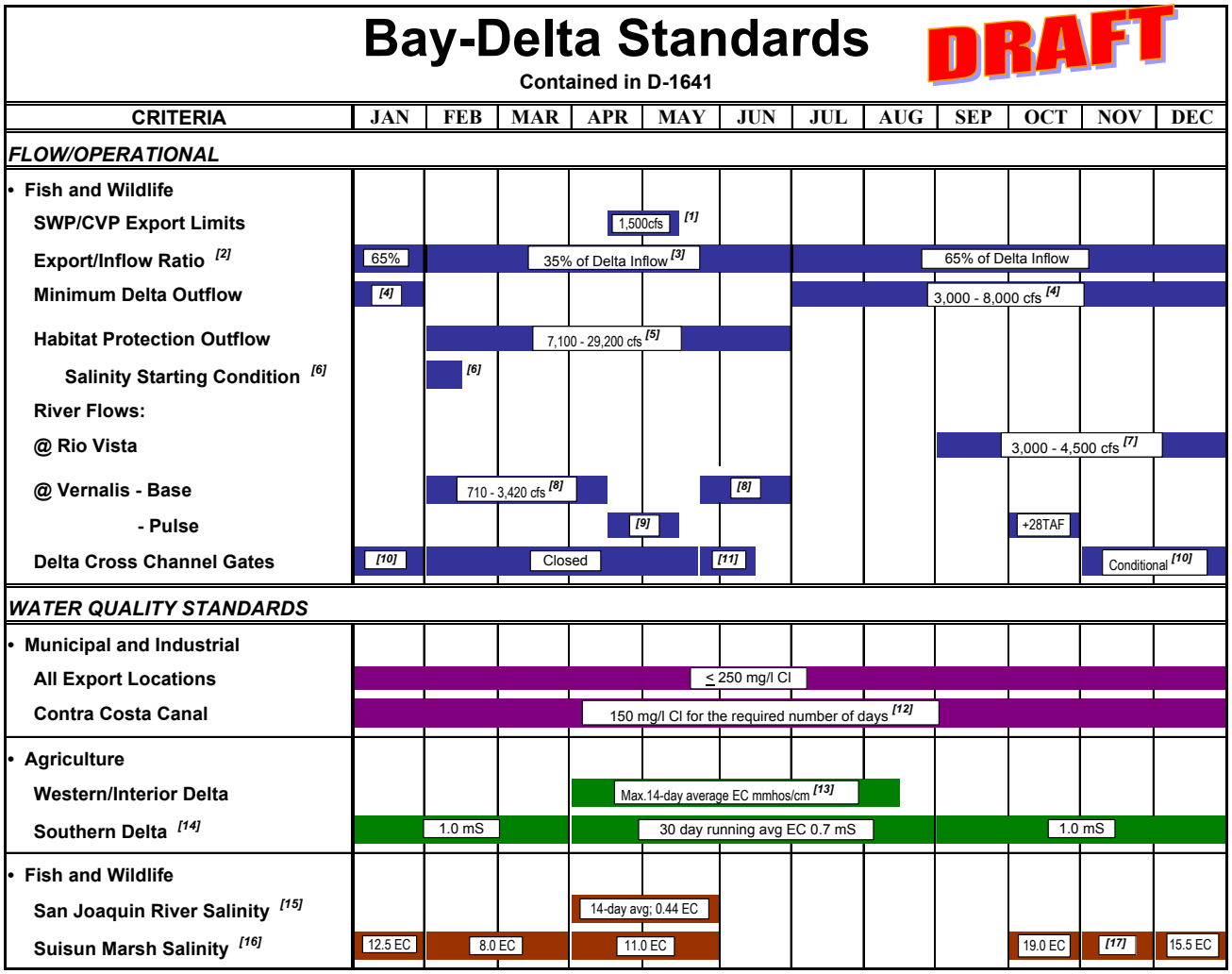
1. municipal and industrial uses;
2. agricultural uses; and
3. fish and wildlife uses.

Standards are established for chemical parameters such as salinity (as represented by electrical conductivity [EC]), chlorides, and dissolved oxygen (DO), as well as flow/operational parameters such as river flows, delta outflow, and export limitations. These physical parameters are interrelated as inflow and exports influence outflow, which in turn influences salt field dynamics. The standards vary according to the time of year and the water year type (wet, above normal, below normal, dry, critical dry). One standard (X2, see Section 3.2 below) is based on precipitation in the preceding month, and thus the requirement is different every year, reflecting the variable patterns of precipitation in the region.

The municipal and industrial standards focus on chloride concentrations for water being extracted from the Delta for use as drinking water or industrial uses, principally the SWP exports in the southern Delta, and the diversions of the Contra Costa Water District. The agricultural standards focus on salinity levels for Delta farmers in the western Delta, in the interior Delta, and in the southern Delta. The fish and wildlife standards focus on salinity levels in the San Joaquin River in the western Delta and in Suisun Marsh, DO in the San Joaquin River, and a series of flow/operational measures such as Delta outflow, river flows at specific locations, export limits, and Delta Cross Channel (DCC) gate operations.

Table 1 and its accompanying footnotes provide an overview of the Bay/Delta Estuary standards contained in D-1641. This table was developed by SWP operators to assist them in project operations to meet the standards. The table is divided into two main sections: Flow/Operational Criteria and Water Quality Standards. The Water Quality Standards section is further divided into three sections: Municipal and Industrial, Agriculture, and Fish and Wildlife. As indicated by the footnotes to Table 1, the standards are very complex, changing based on present conditions, predecessor conditions, water year type, and time of year. The following sections provide a general overview of each standard, the purpose for the standard, and the general scientific basis for the standard.

Table 1—Bay-Delta Standards



*Footnotes for Table 1 are in Appendix A

3.1 Export Limits and Export/Inflow Ratio (E/I Ratio)

Delta exports limitations are included in the 1995 Bay/Delta Plan in order to "protect the habitat of estuarine-dependent species by reducing the entrainment of various life stages by the major export pumps in the southern Delta." (1995 Plan, p.15). To implement this goal, the SWRCB limited exports of water to a specific percentage of total inflow (export/inflow ratio [E/I ratio]), which varies by hydrologic conditions and the time of year. Inflow and export rates are defined by running averages, with a 14-day running average used for inflow, and a 3-day running average used for export. Combined CVP and SWP exports are limited to 35% of Delta inflow between February 1 and June 30, and to 65% of Delta inflow between July 1 and January 31. Although not included in D-1641, exports may be voluntarily further limited during the April/May 31 day pulse flow period based on San Joaquin River flows (see "River Flows" below). These further pumping restrictions are implemented using water dedicated through Section 3406(b)(2) of the Central Valley Project Improvement Act and the Environmental Water Account (EWA).

The percentage of Delta inflow diverted may be varied up by as much as 5% or down any amount based on agreement of the operations group established under the 1994 Framework Agreement and real-time data regarding the presence, or absence, of sensitive species in the southern Delta. Diversions greater than 35% of inflow have been allowed so long as the total volume of diverted water does not change (*i.e.,*

For the CVP, the following are typical: the E/I ratio or VAMP is controlling in spring; minimum Delta outflow, E/I ratio, or Delta agricultural salinity requirements are controlling in summer, either the minimum Delta outflow index or the Contra Costa Canal salinity standards are controlling in fall, and X2, the E/I ratio, or minimum Delta outflow are controlling in winter.

For the SWP, the E/I ratio is activated almost every year, particularly in the February–June timeframe. The agricultural water quality standards become controlling in the summer months. The E/I ratio often is controlling in September. The San Joaquin River and Suisun Marsh salinity standards can be controlling in late summer and fall during dry years. The delta smelt biological opinion take restrictions can be controlling in the May–July timeframe, although the advent of the EWA has reduced its impact.

Typically, X2 has not been a controlling regulation, but because of a series of dry years, it has ended up being the controlling regulation more frequently in recent years.

5.0 Periodic Review of Standards

The SWRCB is currently conducting a periodic review of the 1995 Bay-Delta Plan in accordance with California Water Code and federal CWA requirements. This review is also commonly referred to as a "triennial" review based on CWA language that requires review every 3 years. The purpose of the review is to evaluate new information for consideration of new water quality objectives or changes to the objectives specified in the 1995 Bay-Delta Plan.

The SWRCB initiated the current periodic review with a workshop in December 2003. Based on information obtained at the workshop, the SWRCB has issued a staff report (http://www.waterrights.ca.gov/baydelta/Triennial%20Plan.htm) summarizing comments received and detailing plans for additional workshops to address specific standards. The staff report recommends additional workshops beginning in fall 2004 on the following topics:

1. Objectives related to Delta outflow
2. San Joaquin River pulse flow
3. Salinity objectives
4. Salmon protection and Delta Cross Channel
5. Program implementation

Appendix A—Footnotes for Table 1

1) Maximum 3-day running average of combined export rate (cfs) which includes Tracy Pumping Plant and Clifton Court Forebay Inflow less Byron-Bethany pumping.

Year Type	All
Apr15 - May15*	The greater of 1,500 or 100% of 3-day avg. Vernalis flow

* This time period may need to be adjusted to coincide with fish migration. Maximum export rate may be varied by CalFed Op's group.

2) The maximum percentage of average Delta inflow (use 3-day average for balanced conditions with storage withdrawal, otherwise use 14-day average) diverted at Clifton Court Forebay (excluding Byron-Bethany pumping) and Tracy Pumping Plant using a 3-day average. (These percentages may be adjusted.)

3) The maximum percent Delta inflow diverted for Feb may vary depending on the January 8RI.

Jan 8RI	Feb exp. limit
≤ 1.0 MAF	45%
between 1.0 & 1.5 MAF	35%-45%
> 1.5 MAF	35%

4) Minimum monthly average Delta outflow (cfs). If monthly standard < 5,000 cfs, then the 7-day average must be within 1,000 cfs of standard; if monthly standard > 5,000 cfs, then the 7-day average must be > 80% of standard.

Year Type	All	W	AN	BN	D	C
Jan	4,500*					
Jul		8,000	8,000	6,500	5,000	4,000
Aug		4,000	4,000	4,000	3,500	3,000
Sep	3,000					
Oct		4,000	4,000	4,000	4,000	3,000
Nov-Dec		4,500	4,500	4,500	4,500	3,500

* Increase to 6,000 if the Dec 8RI is greater than 800 TAF

5) Minimum 3-day running average of daily Delta outflow of 7,100 cfs OR: either the daily average or 14-day running average EC at Collinsville is less than 2.64 mmhos/cm (This standard for March may be relaxed if the Feb 8RI is less than 500 TAF. The standard does not apply in May and June if the May estimate of SRI IS < 8.1 MAF at the 90% exceedance level in which case a minimum 14-day running average flow of 4,000 cfs is required.) For additional Delta outflow objectives, see TABLE A.

6) February starting salinity: If Jan 8RI > 900 TAF, then the daily or 14-day running average EC @ Collinsville must be < 2.64 mmhos/cm for at least one day between Feb 1-14. If Jan 8RI is between 650 TAF and 900 TAF, then the CalFed Op's group will determine if this requirement must be met.

7) Rio Vista minimum monthly average flow rate in cfs (the 7-day running average shall not be less than 1,000 below the monthly objective).

Year Type	All	W	AN	BN	D	C
Sep	3,000					
Oct		4,000	4,000	4,000	4,000	3,000
Nov-Dec		4,500	4,500	4,500	4,500	3,500

8) BASE Vernalis minimum monthly average flow rate in cfs (the 7-day running average shall not be less than 20% below the objective). Take the higher objective if X2 is required to be west of Chipps Island.

Year Type	All	W	AN	BN	D	C
Feb-Apr14 and May16-Jun		2,130 or 3,420	2,130 or 3,420	1,420 or 2,280	1,420 or 2,280	710 or 1,140

9) PULSE Vernalis minimum monthly average flow rate in cfs. Take the higher objective if X2 is required to be west of Chipps Island.

Year Type	All	W	AN	BN	D	C
Apr15 - May15		7,330 or 8,620	5,730 or 7,020	4,620 or 5,480	4,020 or 4,880	3,110 or 3,540
Oct	1,000*					

* Up to an additional 28 TAF pulse/attraction flow to bring flows up to a monthly average of 2,000 cfs except for a critical year following a critical year. Time period based on real-time monitoring and determined by CalFed Op's group.

10) For the Nov-Jan period, Delta Cross Channel gates may be closed for up to a total of 45 days.

11) For the May 21-June 15 period, close Delta Cross Channel gates for a total of 14 days per CALFED Op's group. During the period the Delta cross channel gates may close 4 consecutive days each week, excluding weekends.

12) Minimum # of days that the mean daily chlorides < 150 mg/l must be provided in intervals of not less than 2 weeks duration. Standard applies at Contra Costa Canal Intake or Antioch Water Works Intake.

Year Type	W	AN	BN	D	C
# Days	240	190	175	165	155

13) The maximum 14-day running average of mean daily EC (mmhos/cm) depends on water year type.

	WESTERN DELTA				INTERIOR DELTA			
	Sac River @ Emmaton		SJR @ Jersey Point		Mokelumne R @ Terminous		SJR @ San Andreas	
Year Type	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *
W	Aug 15		Aug 15		Aug 15		Aug 15	
AN	Jul 1	0.63	Aug 15		Aug 15		Aug 15	
BN	Jun 20	1.14	Jun 20	0.74	Aug 15		Aug 15	
D	Jun 15	1.67	Jun 15	1.35	Aug 15		Jun 25	0.58
C		2.78		2.20		0.54		0.87

* When no date is shown, EC limit continues from April 1.

14) As per D-1641, for San Joaquin River at Vernalis, however, the April through August maximum 30- day running average EC for San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge shall be 1.0 EC until April 1, 2005 when the value will be 0.7 EC>.

15) Compliance will be determined between Jersey Point & Prisoners Point. Does not apply in critical years or in May when the May 90% forecast of SRI < 8.1 MAF.

16) During deficiency period, the maximum monthly average mhtEC at Western Suisun Marsh stations as per SMPA is:

Month	mhtEC
Oct	19.0
Nov	16.5
Dec-Mar	15.6
Apr	14.0
May	12.5

17) In November, maximum monthly average mhtEC = 16.5 for Western Marsh stations and maximum monthly average mhtEC = 15.5 for Eastern Marsh stations in all periods types.

Table A)

Number of Days When Max. Daily Average Electrical Conductivity of 2.64 mmhos/cm Must Be Maintained. (This can also be met with a maximum 14-day running average EC of 2.64 mmhos/cm, or 3-day running average Delta outflows of 11,400 cfs and 29,200 cfs, respectively.) Port Chicago Standard is triggered only when the 14-day average EC for the last day of the proevious month is 2.64 mmhos/cm or less. PMI is previous month's 8RI. If salinity/flow objectives are met for a greater number of days then required for any month, the excess days shall be applied towards the following month's requirement. The number of days for values of the PMI between those specified below shall be determined by linear interpolation.

PMI (TAF)	Chipps Island (Chipps Island Station D10)				
	FEB	MAR	APR	MAY	JUN
≤ 500	0	0	0	0	0
750	0	0	0	0	0
1000	28*	12	2	0	0
1250	28	31	6	0	0
1500	28	31	13	0	0
1750	28	31	20	0	0
2000	28	31	25	1	0
2250	28	31	27	3	0
2500	28	31	29	11	1
2750	28	31	29	20	2
3000	28	31	30	27	4
3250	28	31	30	29	8
3500	28	31	30	30	13
3750	28	31	30	31	18
4000	28	31	30	31	23
4250	28	31	30	31	25
4500	28	31	30	31	27
4750	28	31	30	31	28
5000	28	31	30	31	29
5250	28	31	30	31	29
≥ 5500	28	31	30	31	30

PMI (TAF)	Port Chicago (continuous recorder at Port Chicago)				
	FEB	MAR	APR	MAY	JUN
0	0	0	0	0	0
250	1	0	0	0	0
500	4	1	0	0	0
750	8	2	0	0	0
1000	12	4	0	0	0
1250	15	6	1	0	0
1500	18	9	1	0	0
1750	20	12	2	0	0
2000	21	15	4	0	0
2250	22	17	5	1	0
2500	23	19	8	1	0
2750	24	21	10	2	0
3000	25	23	12	4	0
3250	25	24	14	6	0
3500	25	25	16	9	0
3750	26	26	18	12	0
4000	26	27	20	15	0
4250	26	27	21	18	1
4500	26	28	23	21	2
4750	27	28	24	23	3
5000	27	28	25	25	4
5250	27	29	25	26	6
5500	27	29	26	28	9
5750	27	29	27	28	13
6000	27	29	27	29	16
6250	27	30	27	29	19
6500	27	30	28	30	22
6750	27	30	28	30	24
7000	27	30	28	30	26
7250	27	30	28	30	27
7500	27	30	29	30	28
7750	27	30	29	31	28
8000	27	30	29	31	29
8250	28	30	29	31	29
8500	28	30	29	31	29
8750	28	30	29	31	30
9000	28	30	29	31	30
9250	28	30	29	31	30
9500	28	31	29	31	30
9750	28	31	29	31	30
10000	28	31	30	31	30
> 10000	28	31	30	31	30

* When 800 TAF < PMI < 1000 TAF, the number of days is determined by linear interpolation between 0 and 28 days.