Proposal Reviews

#196: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

University of California, Davis

Final Selection Panel Review	
Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Delta Regional Review	
Sacramento Regional Review	
External Scientific Review	#1 #2 #3 #4
Prior Performance/Next Phase Funding	#1 #2
Environmental Compliance	
Budget	

Final Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Final Selection Panel Review

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

Please provide an overall evaluation rating.

Fund	
As Is	**-**
In Part	**-**
With Conditions	**-**
Consider as Directed Action	**X**
Not Recommended	**-**

Amount: **$895,571.00**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

In response to public comments, the Selection Panel recommends that monitoring efforts include a coordinated outreach component to transfer information regarding methylmercury contamination of fishery resources to local stakeholders to facilitate assessment and communication of potential health risks of fish consumption.

The Panel also continues to recommends that the applicant participate in the Mercury Science Strategy Workshop being planned by CALFED, tentatively for fall 2002. The workshop will develop an integrated science strategy to address questions pertaining to potential linkages between wetland-restoration activities, the production of methylmercury, and contamination of aquatic biota, fish, and wildlife, which can influence human exposure to methylmercury. The workshop will provide a setting to coordinate CALFED-supported mercury monitoring and research with marsh restoration projects that the selection panel recommends, as suggested in the comment letter from the Clean Estuary Partnership. The applicant should consider and incorporate recommendations emanating from that workshop into a revised, integrated proposal that the Panel recommends be considered as a directed action.

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	**-**
In Part	**-**
With Conditions	**-**
Consider as Directed Action	**X**
Not Recommended	**-**

Amount: **$895,571.00**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

The scope of this proposal overlaps with two others (#130 and #131) that propose to monitor or survey mercury in aquatic biota. This proposed project would sample water, invertebrates, and small fish at four sites to develop and implement monitoring approaches focusing on bioindicator species.

The consensus of reviewers is that the proposal needs further development before funding. Scientific reviewers regarded the proposed project as overly ambitious in scope and recommended that it be limited to two sites, Cache Creek and Yolo Bypass. In addition, monitoring data in the absence of other, supporting information would not conclusively demonstrate cause and effect associations. The Selection Panel believes that the benefits of this work would be greatly increased by a stronger link to other scientific work on processes and factors that affect methylmercury concentrations in fish. Reviewers stressed that some basic ecological research on feeding habits (diet) would also be useful for identifying potential bioindicator species and for interpreting monitoring data on mercury.

The Selection Panel recommends that the applicant work with others to combine this proposal with proposals #130 and #131 into a single, integrated proposal that would (1) provide cost-effective monitoring of mercury in fish and aquatic biota, producing information relevant to assessing methylmercury exposure in humans and wildlife in upper trophic levels, and (2) be designed to facilitate linkage of fish-mercury data to information on processes and factors affecting methylmercury concentrations in fish.

Moreover, the applicants on the three proposals (#130, #131, and #196) should consider developing an analytical capability for measurement of methylmercury, as well as total mercury, in water and aquatic biota. This could substantially reduce the high analytical costs associated with contractual analyses of samples, particularly for methylmercury.

The Panel also recommends that the applicant participate in the Mercury Science Strategy Workshop being planned by CALFED, tentatively for fall 2002. The applicant should consider and incorporate recommendations emanating from that workshop into a revised, integrated proposal that the Panel recommends be considered as a directed action.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	**The panel felt that this project addresses a most relevant topic in mercury cycling the ability to generate bioindicator species -- that will be of great value to management concerns. The PI has shown significant progress with previous Hg funding and his data have been used by others to develop proposals to this call for proposals, a true indication of the quality of the previous work. The goal of addressing variability is timely, especially prior to spending large sums of money on monitoring programs. Unfortunately, in its current state the panel felt that there were some shortcomings that needed to be addressed prior to funding:** **1. The current plan is too ambitious. The panel recommends that the PI reduce the number of study sites to two. Specifically, the Cache Creek area has been an area of previous activity and the results can be used directly to generate the necessary data on variability. The Yolo Bypass area might be the next most important site, since other proposals may be funded for the site and it has direct management implications.** **2. The PIs need to address sedimentary characterization and processes that lead to bioaccumulation. This appears to be missing in the proposal and an area of research that can be partnered with others conducting related research.** **3. If the PI plans to continue in this area of research, it would be wise to acquire all of the necessary capabilities to conduct aqueous phase speciation of Hg and MeHg. This is the type of work that a graduate student could take on from an analytical chemistry viewpoint. In-house capabilities allow for the flexibility of changing project design.**
XAbove average	
-Adequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   The goals of this project are somewhat obscured by the description of the sites as a basis for defining specific goals. The PI certainly has a history of high quality work on mercury cycling in the region and the goals of his proposed research are based on extensions of previous work. This sets him ahead of others seeking funding in that his objectives can be somewhat more refined. It was however, difficult to ascertain specific hypothesis-driven goals, since there were actually ten hypotheses submitted within the four contrasting sites.

   Development of bioindicator species for the San Francisco Bay/Delta is an important goal for management. The stated goal of this project is development of a bioaccumulation-based mercury (Hg) support monitoring techniques. Aquatic biota are the key endpoints for mercury contamination, because we seek to protect these organisms, and consumers of these organisms. Further, biotic indicators of mercury contamination can provide integrative measures of methylmercury production through time and sometimes space that cannot always assessed through other measures. This study is being proposed as an applied research project to generate such indicators. Now is the time to address these concerns.

A conceptual model for Hg bioaccumulation in the Delta and its tributaries is not clearly articulated. Hypotheses are stated but they do not in summary equate to a conceptual model. Basic research on food web structure and mercury cycling in the Bay/Delta are more critical needs at this point, and more information in both of these areas is needed to develop adequate biotic indicators for Hg. The underlying basis for site selection is well-grounded and is based on either direct or indirect observations by previous studies conducted by the investigator. This is justified as a research project, although in its current state, the funding will be spread out among so many sites that it may be listed as monitoring or assessment.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   This was a very difficult proposal to evaluate. The PI will produce results that are supportive of general goals of the CalFed management objectives for the Bay-Delta area. However, the proposed research is overly ambitious and would need revision to pay dividends for the agency. If the PI limits himself to two sites, Cache Creek, where he already has abundant data collected and the site at the Yolo Bypass, he has really identified the one site with a wealth of information to base further study and one with direct management applications.

   One of the main goals of the project is to address the uncertainty with respect to bioaccumulation-based monitoring. This is an extremely worthwhile goal and one that the EPA has identified as a major goal, especially in setting National Bioaccumulation Factors for methyl Hg. The PI correctly points out that current BAFs vary by two orders of magnitude and need to be refined on a more site-specific basis. This is a key, yet the current proposal comes up short in which specific factors are hypothesized to contribute to the greatest amount of variance in the current calculations. Is it uptake into phytoplankton? Benthos? Small fish? Food chain length? Sediment organic content? These are the types of factors that need to be addressed in a logical manner. The proposal certainly could have substituted some explanation of diverse sampling sites with a rigorous treatment of factors influencing variance. That is the main issue for modelers and with proper tweaking of the current proposal, a limited number of sites could answer the question.

   The PI also indicates that episodic events could have the greatest influence on MeHg transport and redeposition. This is a point that several proposals totally miss and one that this PI has identified by previous work. It is crucial, therefore to be able to respond to events and estimate fluxes. While the PI sees the need to catch events, he proposes only monthly sampling. This is unfortunate and should be refined to make sampling dependent on the hydrograph. This would be an ideal subproject for a graduate student.

   It is really difficult to evaluate the performance measures, because those presented are merely cookbook entries based on reaching overall goals. It would be better to see a logical flow of project milestones for the three year study that shows the ability to advance to the next step of research based on the positive steps made along the way. Quarterly and annual progress reports do not really elicit a sense of actual success.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

The major product proposed from this research is a measure of the important factors affecting uncertainty of bioaccumulation-based monitoring. It is not clear what that final product might be. Will it be a new model? Quantitative? This PI is an accomplished Hg researcher and manuscripts will be submitted on his results. It would be better to see a few more publications in top-notch research journals to ensure the agency that the research is truly well-designed and reflects state of the art process level understanding of Hg cycling.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This project needs a redesign to cut back on the number of sites. This project would be ideal for graduate students. This would enable researchers to explore several important sidelights that may evolve from the research, but are unattainable on a spread out study dependent on cost-per-sample analyses. A large portion of the budget goes to a consulting firm for analyses. Several grad student-level focused studies could be developed to answer process-level questions in the study area. Sending samples out to labs really limits the flexibility of research. It is somewhat puzzling why PI would not want to bolster his current laboratory to include aqueous measurements. Since the PI has a low-level Hg lab, utilize it to the fullest and involve grad students and post-docs. A grad student could certainly tackle the episodic event sampling and produce a nice thesis on partitioning and transport.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   Delta Regional Review- Medium Generally good proposal but needs outreach component, coordination with Cosumnes Research Group and Yolo Bypass Working Group. Proposal team has demonstrated ability to accomplish similar research studies in same/similar regions of Bay Delta. All access permission secured/being secured; collection permits held; proposal points out that base restoration on Prospect Island may be delayed by legal challenge, but have contingency plan for monitoring. Builds on previously funded UC Davis mercury projects. Cache Creek work coordinated w/ RWCQB and others; N Delta coord. W/ DWR/USACE, USFWS; also USGS on the Cosumnes; RWQCB, DFG for monitoring techniques. Local participation could be stronger. commitment to regular data sharing and scientific oversight; peer review in place; track record of coordinating with Delta Tributaries Mercury Council; no mention of Cosumnes Research Group or Yolo Bypass Working Group; an outreach component would strengthen

   Sacramento Regional Review Mercury is a key issue for habitat restoration in the Sacramento Region. This is an excellent team with a good track record, although the Review Panel had a few questions. Like other similar research studies, better coordination is needed with local groups and restoration efforts. The Review Panel discussed linkages with few other regional restoration projects. Natural Heritage Institute and Yolo Basin Foundation indicated that their CALFED-funded Yolo Bypass aquatic restoration planning study was not yet linked with the UCD mercury effort. Similarly, the DFG staff responsible for the expansion of the Yolo Wildlife Area (the largest project in the region) indicated that UCD had not contacted them. It is unclear if UCD has contacted FWS staff involved in the planning of the North Delta Refuge, or Nature Conservancy staff planning restoration for the Cosumnes. This is an excellent team with a good track record. One technical question raised by the Review Panel is whether the project team will be able to deal with the substantial sources of variability. The UCD work on Cache Creek suggests that higher frequency sampling is needed to understand the dynamics of mercury. The present proposal helps resolve this for Cache Creek. However, it is not clear if their less intensive sampling in the other locations will be adequate to address variability. This is probably of

greatest concern at Prospect and Liberty islands, and Yolo Bypass. In the case of the two islands, the team proposed to conduct intensive sampling to identify the optimum period that characterizes outgoing and ingoing tides. Subsequent sampling will then only be every 1.5 3 months. The Review Panel questioned whether UCD will be able to identify an optimum period, given the complex variation over the course of the day, and a tidal cycle (eg neap/spring cycles). In the case of Yolo Bypass, UCD hopes to pick transects that isolate the effects of each of the major tributaries. Work by DWR suggests that during flood events there is substantial variation in the location of the tributary bands, which may be very hard to locate. This is not to say that UCD should not proceed; rather, better coordination is needed with hydrodynamic specialists familiar with their study sites. Alternatively, the UCD team could reduce the number of sampling sites and increase their sampling frequency.

UCD may find similar variability problems with their stable isotope methods. USGS (Cloern et al.) have found substantial variability in the isotopic signatures of lower trophic levels at sites throughout the Delta. DWR and UCD (Jake Vander Zanden) found extreme variability in isotopic signatures of all trophic levels in two of the proposed study sites, Yolo Bypass and the Cosumnes River.

Does UCD need to send their MeHg samples to Battelle? USGS appears to have the capability to do the analyses locally. contingency plan for monitoring. Builds on previously funded UC Davis mercury projects. Cache Creek work coordinated w/ RWCQB and others; N Delta coord. W/ DWR/USACE, USFWS; also USGS on the Cosumnes; RWQCB, DFG for monitoring techniques. Local participation could be stronger. commitment to regular data sharing and scientific oversight; peer review in place; track record of coordinating with Delta Tributaries Mercury Council; no mention of Cosumnes Research Group or Yolo Bypass Working Group; an outreach component would strengthen

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Does UCD need to send their MeHg samples to Battelle? USGS appears to have the capability to do the analyses locally.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   No comments on specific concerns

Miscellaneous comments:

None

Delta Regional Review:

Proposal Number: 196

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

Generally good proposal but needs outreach component, coordination with Cosumnes Research Group and Yolo Bypass Working Group

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Proposal team has demonstrated ability to accomplish similar research studies in same/similar regions of Bay Delta. All access permission secured/being secured; collection permits held; proposal points out that base restoration on Prospect Island may be delayed by legal challenge, but have contingency plan for monitoring.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   Stragetic goal 6 (Restore shallow water habitats in the Delta for the benefit of at-risk species while minimizing potential adverse effects of contaminants) specifically addresses areas of particular interest including Yolo Bypass, Cache Creek and the Cosumnes River. Support science, development and initiation of performance measures to be used for Hg in relation to restoration, remediation, and regulatory actions.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Builds on previously funded UC Davis mercury projects. Cache Creek work coordinated w/ RWCQB and others; N Delta coord. W/ DWR/USACE, USFWS; also USGS on the Cosumnes; RWQCB, DFG for monitoring techniques

4. Does the project adequately involve local people and institutions?

   XYes **-**No

   How?

   generally, but could be stronger. commitment to regular data sharing and scientific oversight; peer review in place; track record of coordinating with Delta Tributaries Mercury Council; no mention of Cosumnes Research Group or Yolo Bypass Working Group; an outreach component would strengthen

Other Comments:

Sacramento Regional Review:

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

Mercury is a key issue for habitat restoration in the Sacramento Region. This is an excellent team with a good track record, although the Review Panel had a few questions. Like other similar research studies, better coordination is needed with local groups and restoration efforts.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The team has good experience in this region and appears to have the necessary sampling permits. One concern is that it is unclear whether the team has permission to sample on several of the study sites (eg Yolo Bypass and Liberty Island). The team has extensive experience sampling the Cache Creek, so we are assuming that they do not have access issues in that watershed.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   UCD has correctly identified several of the high priority areas for CALFED restoration. Cosumnes River, Prospect Island and Yolo Bypass are all sites of major restoration projects-- mercury is probably the most outstanding water quality issue in each. A study of this magnitude is sorely needed.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

The UCD project appears to be well-linked to the CALFED-funded USGS mercury loading study. Like many other research-oriented studies, linkages with other groups could be improved.

The Review Panel discussed linkages with few other regional restoration projects. Natural Heritage Institute and Yolo Basin Foundation indicated that their CALFED-funded Yolo Bypass aquatic restoration planning study was not yet linked with the UCD mercury effort. Similarly, the DFG staff responsible for the expansion of the Yolo Wildlife Area (the largest project in the region) indicated that UCD had not contacted them. It is unclear if UCD has contacted FWS staff involved in the planning of the North Delta Refuge, or Nature Conservancy staff planning restoration for the Cosumnes.

4. Does the project adequately involve local people and institutions?

   -Yes **X**No

   How?

   As noted above, the Review Panel checked in with some of the local groups to evaluate the degree of contact with the authors of this proposal. There appears to be good coordination between the UCD team and the Prospect Island project; however, the proposal acknowledges that several locals are not supportive of the overall restoration effort. This is not the fault of the authors. There does not yet appear to be good coordination between UCD and stakeholders in the Yolo Bypass including Liberty Island. The team has not yet met with the Yolo Basin Working Group, a CALFED-funded stakeholder group. This was a common issue for research-oriented studies submitted to the Review Panel. Funding of this study should include better coordination with the Yolo Basin Working Group, the primary forum for restoration issues in the region.

Other Comments:

This is an excellent team with a good track record. One technical question raised by the Review Panel is whether the project team will be able to deal with the substantial sources of variability. The UCD work on Cache Creek suggests that higher frequency sampling is needed to understand the dynamics of mercury. The present proposal helps resolve this for Cache Creek. However, it is not clear if their less intensive sampling in the other locations will be adequate to address variability. This is probably of greatest concern at Prospect and Liberty islands, and Yolo Bypass. In the case of the two islands, the team proposed to conduct intensive sampling to identify the optimum period that characterizes outgoing and ingoing tides. Subsequent sampling will then only be every 1.5 3 months. The Review PAenl questioned whether UCD will be able to identify an optimum period, given the complex variation over the course of the day, and a tidal cycle (eg neap/spring cycles). In the case of Yolo Bypass, UCD hopes to pick transects that isolate the effects of each of the major tributaries. Work by DWR suggests that during flood events there is substantial variation in the location of the tributary bands, which may be very hard to locate. This is not to say that UCD should not proceed; rather, better coordination is needed with hydrodynamic specialists familiar with their study sites. Alternatively, the UCD team could reduce the number of sampling sites and increase their sampling frequency.

UCD may find similar variability problems with their stable isotope methods. USGS (Cloern et al.) have found substantial variability in the isotopic signatures of lower trophic levels at sites throughout the Delta. DWR and UCD (Jake Vander Zanden) found extreme variability in isotopic signatures of all trophic levels in two of the proposed study sites, Yolo Bypass and the Cosumnes River.

Does UCD need to send their MeHg samples to Battelle? USGS appears to have the capability to do the analyses locally.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **196**

Applicant Organization: **University of California, Davis**

Proposal Title: **Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**This is an exceptionally well documented proposal that draws much of its strength from the applicant's experience and successes with previous CALFED projects. The objectives are ambitious, but the project description indicates that the proposed study has been well thought out. The outputs of the project are likely to have an important impact on the development of future Hg monitoring programs and the provision of important baseline data will aid detection of planned management activities.**
-Good	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   This project has a number of objectives and hypotheses (all of which are clearly detailed) that relate to addressing uncertainties in the monitoring of Hg in four regions of concern. A primary goal is to initiate the development of site-specific bioaccumulation factors that are directly applicable to the new EPA guidelines and supportive of local regulatory processes.

Yes the topic is timely in that monitoring programs are now being developed and it is critical to ensure that they are designed properly so that effects of management activities (e.g. restoration) can be detected. Also is the need to obtain baseline data before management actions are undertaken will be addressed in this project.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   Justification for the project is based on uncertainties identified in earlier CALFED studies. The selection of sites is based on CALFED regions of concern. Argumentation for each site is well documented in the proposal.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   Yes, the results are likely to give a better understanding of spatial and temporal variability in Hg-related processes as well as variation in bioaccumulation (among areas, species, etc.). The information should be valuable both in terms of enhancing the science and should help in the practical design of Hg monitoring.

   No details provided on number of samples (of water or biota) or their size per collection, but presumably thought has been given to statistical power, detection limits, etc.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The methods for Hg analysis were developed during previous projects and have shown to be suitable. Other field collection methods are fairly standard and in this sense the project is technically feasible.

   The project is very ambitious for the size of the team. There are 4 regions to be covered with specific hypotheses/objectives to be addressed at each. The fact that some of the Hg analyses will be conducted by consultants should lighten the workload to some extent. The proposal indicates that the team will devote nearly full time to the project. Also the team appears to all have been involved in previous similar projects and so have demonstrated their abilities to conduct a project of this scope.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures will involve analytical QA/QC which have already been established (and are detailed in Table A-1), remaining progress will be evaluated in the usual quarterly reports and by achieving the proposed time plan, etc. There is nothing unusual here. Data handling methods are already in place from previous projects.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Expected products include development of Hg monitoring techniques and programs for 4 specific regions of concern. Important baseline data that will allow future management actions to be evaluated will also be an important product. The results should also enhance the science by aiding in interpreting variability in Hg concentrations and behavior in water and biota.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The applicant clearly has detailed knowledge and experience with the regions to be studied and therefore a good feel for the problems/challenges that may be involved. He has a proven track record and general professional expertise in Hg research. The rest of the team has worked together on previous related projects. All of the analytical equipment and field gear are available. Progress reports from previously funded CALFED projects are appended and demonstrate the success record of the applicant.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This 3 year project has a total budget of $781,850. It is for next-phase funding for an ongoing CALFED project. In addition to the PI funds are requested for a project manager and two other technician/student positions, no subcontractors indicated but consultants/services applied for.

   Overall an inexpensive budget given how much they plan to achieve.

Miscellaneous comments:

What is QAPP?

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **196**

Applicant Organization: **University of California, Davis**

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Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

None.

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The proposed study is an intesive monitoring study of Hg in biota in four areas of the Bay/Delta region, a continuation of similar work by this group. The goal is to address uncertainty associated with Hg bioaccumulation with the region. However, the underlying information needed to understand that variability and to generate good indicators is not in place, nor have the investigators proposed to generate that information in this study. The study design needs to be clarified and the rationale for choosing indicators for study needs to be better developed. Synthesis and publication of this groups bioaccumulation work to date would help to crystalize their goals and approach.**
-Good	
XPoor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   Development of bioindicator species for the San Francisco Bay/Delta is an important goal for management. The stated goal of this project is development of a bioaccumulation-based mercury (Hg) support monitoring techniques. What are support monitoring techniques? Objectives for the development of indicator species are not clearly stated.

The study is couched as both a research and monitoring project.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   Aquatic biota are the key endpoints for mercury contamination, because we seek to protect these organisms, and consumers of these organisms, including ourselves. Further, biotic indicators of mercury contamination can provide integrative measures of methylmercury production through time and sometimes space that cannot always assessed through other measures.

   This study is being proposed as an applied research project to generate such indicators. However, the underlying information needed to generate such indicators is not in place, nor have the investigators proposed to generate that information in this study. A conceptual model for Hg bioaccumulation in the Delta and its tributaries is not clearly articulated. Hypotheses are stated but they do not in summary equate to a conceptual model. Basic research on food web structure and mercury cycling in the Bay/Delta are more critical needs at this point, and more information in both of these areas is needed to develop adequate biotic indicators for Hg.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The proposed study would examine bioindicators in four geographical regions is proposed, upper Cache Creek watershed, north Delta wetlands, Yolo Bypass and Consumnes River. There is not overall conceptual framework to guide project design, and the proposed work is a hodgepodge of unconnected sample collection. Clear study designs are not provided for any of the regions.

   The approach for getting to the stated goal was not clear to this reviewer. The rationale for choosing indicators for study needs to be better developed.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The proposed study would be a continuation of work by the UC Davis group on mercury cycling and bioaccumulation in the tributaries and Bay Delta. This group, formerly led by Tom Suchanek, has been funded by the CALFED as part of their mercury study project for the past 2-3 years.

   Goals of the currently funded bioaccumulation project include: 1. Establish relationships (if present) between aqueous Hg chemistry and Hg bioaccumulation in lower trophic level biota. 2. Define relationships (if present) between Hg in low trophic level bioindicator organisms and higher trophic levels 3. Characterize aqueous Hg chemistry that is representative of predominant Hg exposure levels to aquatic biota, both spatially and seasonally throughout the watershed. 4. Characterize watershed biotic Hg, both spatially and seasonally. 5. Establish baseline, seasonal aqueous and biotic Hg data for representative portions of the watershed and downstream from potential remedial sites.

Characterization of Hg in biota and water has been accomplished for most of the Cache Creek basin, creating a fairly interesting data set. Missing pieces are event sampling and unimpacted controls areas. However, goals 1 through 3, which seek to find ways to explain patterns, have not been accomplished to date. It is not feasible to accomplish these goals by looking in more detail at the patterns of Hg bioaccumulation, without understanding of mercury biogeochemistry in the ecosystem.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Its not clear what the outcome of this work would be. Is it the development of a set of biotic indicators for mercury contamination and bioaccumulation? If so, the number and type of indicators needs to be laid out.

   The proposal says that the expected outcomes are: resolution of key areas of monitoring variability, development of new baseline data, development and implementation of bioaccumulation-based Hg performance measures in support of restoration, remediation, and regulatory programs, and new Hg-related strategies applicable to future efforts. More specific products are not discussed. Outcomes and performance measures are not clearly stated.

   The proposal also states that the project team has been researching the development and use of a variety of bioaccumulation-based, localized Hg indicator techniques for over a decade, at sites throughout the Bay-Delta watershed. However, a widely-accepted indicator has not been developed.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The proposal is designed to address uncertainty associated with Hg bioaccumulation-based support monitoring in the Bay-Delta watershed, explaining and/or removing some of that uncertainty. While bioaccumulation-based monitoring may ultimately prove a valuable monitoring tool for assessing the status of Hg in the San Francisco Bay Area, uncertainty in Hg bioaccumulation would be better addressed by studying the distribution and control of methylmercury production in the ecosystem.

   No clear products of this study are identified.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   Dr. Slotten and the Davis group have studied mercury cycling, focusing on Clear Lake , Cache Creek and bioaccumulation process, for many years. This request would be an extension of current CALFED funding. The group has published little of their work in the peer-reviewed literature.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

?

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **196**

Applicant Organization: **University of California, Davis**

Proposal Title: **Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The PI has extensive experience in Hg cycling in this region and has presented an ambitious proposal to expand upon current research. This proposal needs some revision to refine the number of sites and explicitly identify the factors tested that influence bioaccumulation. It would be better to include a series of graduate and postdoctoral projects to allow the flexibility of better understanding Hg dynamics and perhaps allow development of new techniques. It its current state, the proposal reads as a monitoring proposal. That is not all bad, but with proper realignment, this project could evolve into a top-notch research project.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals of this project are somewhat obscured by the description of the sites as a basis for defining specific goals. The PI certainly has a history of high quality work on mercury cycling in the region and the goals of his proposed research are based on extensions of previous work. This sets him ahead of others seeking funding in that his objectives can be somewhat more refined. It was however, difficult to ascertain specific hypothesis-driven

goals, since there wee actually ten hypotheses submitted within the four contrasting sites.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   A study on causes and effects of Hg and MeHg loading to this ecosystem is timely and fully justified. The underlying basis for site selection is well-grounded and is based on either direct or indirect observations by previous studies conducted by the investigator. This is justified as a research project, although in its current state, the funding will be spread out among so many sites that it may be listed as monitoring or assessment.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   This was a very difficult proposal to evaluate. I am certain that the PI will produce results that are supportive of general goals of the CalFed management objectives for the Bay-Delta area. I do think, however, that the proposed research is overly ambitious and would need significant revision to pay dividends for the agency. The work is simply too spread out to provide succinct results that are pertinent to management concerns. I feel that if the PI limits himself to the first two sites, Cache Creek, where he already has abundant data collected and the site at the North Delta wetlands, he has really identified the two major sites of possible MeHg production in the ecosystem.

   One of the main goals of the project is to address the uncertainty with respect to bioaccumulation-based monitoring. This is an extremely worthwhile goal and one that the EPA has identified as a major goal, especially in setting National Bioaccumulation Factors for methyl Hg. The PI correctly points out that current BAFs vary by two orders of magnitude and need to be refined on a more site-specific basis. This is a key, yet the current proposal comes up short in which specific factors are hypothesized to contribute to the greatest amount of variance in the current calculations. Is it uptake into phytoplankton? Benthos? Small fish? Food chain length? Sediment organic content? These are the types of factors that need to be addressed in a logical manner. The proposal certainly could have substituted some explanation of diverse sampling sites with a rigorous treatment of factors influencing variance. That is the main issue for modlers and with proper tweaking of the current proposal, a limited number of sites could answer the question.

   The PI also indicates that episodic events could have the greatest influence on MeHg transport and redeposition. This is a point that several proposals totally miss and one that this PI has identified by previous work. It is crucial, therefore to be able to respond to events and estimate fluxes. While the PI sees the need to catch events, he proposes only monthly sampling. This is unfortunate and should be refined to make sampling dependent on the hydrograph. This would be an ideal subproject for a graduate student.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The current approach may not be technically feasible with the current number of sites. With a reduction in sites, and corresponding hypotheses, this could be a nice, tight project on specific ecosystems. The PI has the opportunity to refine his work at an ongoing site while branching out

to one of a constructed wetland. Those two sets of sites make a perfect comparison and one that would achieve some selected goals.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   It is really difficult to evaluate the performance measures, because those presented are merely cookbook entries based on reaching overall goals. It would be better to see a logical flow of project milestones for the three year study that shows the ability to advance to the next step of research based on the positive steps made along the way. Quarterly and annual progress reports do not really elicit a sense of actual success. Most just read like a datebook of time spent on the research.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The major product proposed from this research is a measure of the important factors affecting uncertainty of bioaccumulation-based monitoring. I am not sure, however, what that final product might be. Will it be a new model? Quantitative? I am sure that the data on HgT and MeHg will be of high quality and will be valuable for future modeling of Hg in the Bay-Delta region.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   This PI is an accomplished Hg researcher and I have no doubt that manuscripts will be submitted on his results. It would be better to see a few more publications in top-notch research journals to ensure the agency that the research is truly well-designed and reflects state of the art process level understanding of Hg cycling. The infrastructure is there at UCD for analyses. I am troubled by the fact that a large portion of the budget goes to a consulting firm for analyses. This project would be ideal for graduate students. Several focused studies could be developed to answer process-level questions in the study area. Sending samples out to labs really limits the flexibility of research. Since the PI has a low-level Hg lab, utilize it to the fullest and involve grad students and post-docs. A grad student could certainly tackle the episodic event sampling and produce a nice thesis on partitioning and transport.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This project needs a redesign to cut back on the number of sites. I am not so concerned about the overall budget if the funding for analytical labs were directed to graduate students and postdocs. I am not aware of any reason why the PI would not want to bolster his current laboratory to include aqueous measurements. This would enable researchers to explore several important sidelights that may evolve from the research, but are unattainable on a spread out study dependent on cost-per-sample analyses.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **196**

Applicant Organization: **University of California, Davis**

Proposal Title: **Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**Overall, the proposal has significant merit in terms of establishing patterns of Hg distribution in the four regions, which may lead to better understanding of the processes that create them. Further, establishment of relations between Hg in tissues and aqueous fractions may be of predictive use. I believe that the investigators are well qualified to conduct the work, and the budget is reasonable. My main concern is that this project, being principally monitoring and decription-focused, does not investigate specific process mechanisms or utilize lab experiments to aid in interpretation of field data, such as controls on MeHg production in sediments or rates of uptake by aquatic biota. Such supplemental lab-oriented work would support field observations, and make the findings more portable to other aquatic systems. This is a good proposal, and deserves funding if CALFED doesn't mind its site specificity.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

The goals of this project are clearly focusing on site specific characterization and monitoring activities, rather than on determining the rates or specific controls on specific biogeochemical processes. Such goals are obviously within CALFED's stated objectives for the region, and would contribute greatly to knowledge of these particular systems. Further, such information will be valuable for planners and managers within the immediate future. Objectives and hypotheses were crafted for each Task, and were for the most part, general in scope.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The study objectives are clearly within the scope of CALFED's goals. Basic knowledge must be gathered for these impacted regions, both over time and space, for pre/post comparison to management activities. The proposal adequately provides reasoning for why such measurements need to be made.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach is well suited for meeting the objectives in all four tasks. Spatial and temporal collections of Hg(II) and MeHg, ranging from water to small fishes will be collected. I think that a basic weakness of a measurement/monitoring-focused proposal is that (while the data may be useful) new methods and process-level information may not be portable for other aquatic systems. This may not be a specific concern for CALFED, but it would be nice to see more process-oriented experimental work (eg, methylation rates versus sediment type, incubation experiments, etc..) that could apply to other systems.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   I believe the likelihood of success for this project is high, given the prior technical and local experience of the investigators. Dr. Slotton has been a leading Hg investigator in impacted California sites for many years, and he and his crew have demonstrated technical proficiency.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Standard quarterly and annual progress reports will be submitted, and the use of an external lab for intercalibration is a good idea. With the focus being on determining Hg and MeHg distributions in various sytstems, performance will be primarily based upon staying on schedule with the proposed sampling scheme. I believe that the author adequately detailed a timetable for getting each Task done.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

Products will likely have great local value, but perhaps lesser value in contrasting aquatic systems in other regions. For instance, choices of specific bioaccumulator species (such as a particular benthic organism) may be important in one region and not another. Baseline data will prove invaluable when large-scale changes are made to these systems, which is a real strength of this proposal.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   I believe that the author and his co-workers are qualified to perform the proposed tasks, particularly in light of their CALFED work to date, and their interaction with USGS studies in the region. One drawback is that much of the analyses will be performed by outside consultants, which raises issues of numbers of samples analyzed, and financial pressure to keep sample sizes low.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Given the amount/scale of work proposed, I believe that a reasonable budget has been presented. Successful implementation will likely result in detailed knowledge of Hg and MeHg distributions within the four systems, as well as details on bioaccumulation patterns.

Miscellaneous comments:

Prior Performance/Next Phase Funding: #1

New Proposal Number: 196

New Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   CALFED #99-B06, USBR #99-FC-20-0241 - San Jose State University Foundation - Assessment of Ecological and Human Health Impacts of Mercury in the Bay-Delta Watershed

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   N/A

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   -Yes -No **X**N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   -Yes -No **X**N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

-Yes -No **X**N/A

If no, please explain:

Other Comments:

No personal knowledge of performance of UC Davis who is applicant for this proposal.

Prior Performance/Next Phase Funding: #2

New Proposal Number: 196

New Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   97-C05 Effects of Wetland Restoration on the Production of Methyl Mercury in the San Francisco Bay-Delta System

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   XYes -No -N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   XYes -No -N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   XYes -No -N/A

If no, please explain:

Other Comments:

Environmental Compliance:

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   -Yes **X**No

   If no, please explain:

   If sampling involves potential take of listed species, the project would need permits under CESA and FESA, with corresponding CEQA and NEPA documentation.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   -Yes **X**No

   If no, please explain:

   No time or funds are allocated for environmental compliance.

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 196

Applicant Organization: University of California, Davis

Proposal Title: Development and Implementation of Bioaccumulation-Based Mercury Monitoring in Support of Restoration, Remediation, and the Regulatory Process for Cache Creek, Prospect Island and Adjacent Tracts, the Yolo Bypass, and Cosumnes River

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   XYes **-**No

   If no, please explain:

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   XYes **-**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

If no, please explain:

7. Are there other budget issues that warrant consideration?

   -Yes **X**No

   If yes, please explain:

Other Comments: