

i. Proposal number.# 2001-F201*

ii. Short proposal title.# Microbial indicators for selenium hazard assessment and biofouling*

APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN

1a1. Link to ERP Strategic Goals: What Strategic Goal(s) is /are addressed by this proposal? List the letter(s) of all that apply.

- A. At-risk species**
- B. Rehabilitate natural processes**
- C. Maintain harvested species**
- D. Protect-restore functional habitats**
- E. Prevent non-native species and reduce impacts**
- F. Improve and maintain water quality# A, C, D, F***

1a2. Describe the degree to which the proposal will contribute to the relevant goal. Quantify your assessment and identify the contribution to ERP targets, when possible.# ERP Goal A - The project will indirectly contribute to this goal by providing information that can be used to better understand and reduce Se loads. The species that would benefit from reductions in Se entering the Bay-Delta are delta smelt, longfin smelt, splittail, and green sturgeon.

ERP Goal C - The project will contribute to this goal by providing information that can be used to better understand and reduce Se loads. Harvested species that would benefit from reductions in Se entering the Bay-Delta are white sturgeon, striped bass, and waterfowl.

ERP Goal D -The proposal would indirectly contribute to this goal.

ERP Goad F - Project will increase understanding of factors that affect SJR water quality and can be used to assess the quality of microbial habitat in relation to Se. This information could be used to assess the impact of management practices that attempt to reduce the Se load into the lower SJR and Bay-Delta. The project would also improve quality of monitoring data by reducing the biofouling problem at sensors used in the CALFED Real-Time Water Quality Management project.

ERP Targets 20,22 (Evaluate the feasibility of reducing toxic agents from agricultural land to the SJR).*

1b. Objectives: What Strategic Objective(s) is/are addressed by this proposal? List Objective (from the table of 32 objectives) and describe potential contribution to ERP Goals. Quantify your assessment, when possible.# This proposal addresses the ERP Goal F, Objective 1 (Reduce loadings of toxic contaminants to aquatic environments in the Bay-Delta and its watersheds).

ERP Goal A, Objective 2 (Contribute to recovery of at risk species in Bay-Delta and its watershed). See above discussion under #1a2 (ERP Goal A).

ERP Goal C, Objectives 1 and 3 (Enhance fisheries) and (Enhance populations of waterfowl and upland game). See above discussion under #1a2 (ERP Goal C).*

1c. Restoration Actions: Does the proposal address a Restoration Action identified in Section 3.5 of the PSP? Identify the action and describe how well the proposed action relates to the identified Restoration Action.

Restoration Action #6 (Contaminants in the Central Valley) - The proposal relates significantly to restoration action #6 as described in the PSP. The study will provide information that will be useful in evaluating the water quality impacts from changes in water management practices. This would include the creation of shallow water habitat, barriers, and other flow alterations that can alter the microbial community and could lead to changes in the Se food chain transfer and its ecological impact.*

1d. Stage 1 Actions: Is the proposal linked directly, indirectly or not linked to proposed Stage 1 Actions? If linked, describe how the proposal will contribute to ERP actions during Stage 1.

The proposal directly addresses Environmental Water Quality Stage 1 Action#7 (Conduct Se work: source control, bioavailability, real-time management of Se discharges, expand control and treatment).*

1e. MSCS: Describe how the proposal is linked to the Multi-Species Conservation Strategy and if it's consistent with the MSCS Conservation measures. Identify the species addressed and whether the proposal will "recover", "contribute to recovery" or "maintain" each species.

The proposal indirectly relates to the MSCS in that Project will increase the understanding of factors that affect SJR water quality; this information can be used to assess the quality of microbial habitat in relation to Se. This information could ultimately be used to reduce the Se load into the lower SJR and Bay-Delta and improve water quality for threatened and endangered species.*

1f. Information Richness/Adaptive Probing related to the proposal: Describe the degree to which the proposal provides information to resolve one of the 12 scientific uncertainties (Section 3.3 of the PSP), and whether the proposal offers a prudent approach to answer these uncertainties.

Scientific Uncertainty #11 (Contaminants in the Central Valley) - The proposal will provide needed information described in the PSP, which called for proposals and studies of fate and transformation of Se in the food web and identification of the impacts of Se and sources of Se that will direct the program towards effective source control measures.*

1g. Summarize comments from section 1a through 1f related to applicability to CALFED goals and priorities. Identify the strengths and weaknesses of the proposal, highlighting the applicability of the proposed project to CALFED and CVPIA goals and priorities. Focus on aspects of the proposal that may be important to later stages in the project review and selection

process.# Chemical analysis of Se in water is not considered to be a very reliable indicator of potential risk to aquatic organisms. New studies are needed to investigate the toxicity of different forms of Se. This project would provide this type of information, including new information on bioaccumulation and biogeochemical transformations of Se for the SJR (a primary source for Se to the Delta). This proposal is likely to be complimentary to other similar studies in the Delta.

The project will contribute to multiple CALFED goals, objectives and targets.

The project will provide needed microbial assessment tools to assist decision makers in the development of site-specific Se objective. It also helps the Grassland farmers/Drainage District to assess the impact of their discharges on the environment. Second part of the study will be to develop a protocol to manage and eliminate biofouling on dissolved oxygen sensors and electrical conductivity sensors.*

APPLICABILITY TO CVPIA PRIORITIES

1i. Describe the expected contribution to natural production of anadromous fish. Specifically identify the species and races of anadromous fish that are expected to benefit from the project, the expected magnitude of the contribution to natural production for each species and race of anadromous fish, the certainty of the expected benefits, and the immediacy and duration of the expected contribution. Provide quantitative support where available (for example, expected increases in population indices, cohort replacement rates, or reductions in mortality rates).# This research project could lead to more effective realtime

management of wastewater

agricultural return to the San Joaquin river by understanding selenium fate and transfer through lower trophic levels such that agricultural drainage management could be maximized to reduce loading downstream. This proposed effort is consistent with Central Valley-wide Action 3 of the 1997 Revised Draft Restoration Plan for the AFRP, which reads: "Reduce toxic chemical and trace element contamination." A second task would be an improved understanding of bio-fouling of water quality sensors that are key to helping real time manage salt and DO in the lower San Joaquin River. Selenium contamination transfer through the food chain is poorly understood and its effects on anadromous fish even less so. Although body burden in species such as white sturgeon is know to exceed the EPA standard of 5 micrograms/L. Understanding the fate of selenium in the microbial food chain and its transfer to higher trophic levels could help lead to more appropriate realtime water management standards that would undoubtedly benefit the biological community, including fish such as sturgeon and salmon juveniles. However, the extent of this benefit to anadromous fish would not be direct and would be difficult to assess relative to other ecosystem stressors. The immediacy of this unknown benefit would not be near term as the technology transfer of this basic research would need to be transferred to agricultural wastewater return management.*

1j. List the threatened or endangered species that are expected to benefit from the project. Specifically identify the status of the species and races of anadromous fish that are expected to benefit from the project, any other special-status species that are expected to benefit, and the ecological community or multiple-species benefits that are expected to occur as a result of implementing the project.# Selenium effects from agricultural drainage has the potential to effect

all anadromous fish

species that use the Delta. This includes the endangered winter-run and threatened spring-run and steelhead, as well as non-listed species such as the fall and late-fall run chinook salmon and both green and white sturgeon. Because selenium has the potential to be transferred from

primary producers and consumers up through high trophic levels, the ecosystem benefits to many of the bird and fish species that are resident or transient to the San Joaquin River and the Delta are potentially great.*

1k. Identify if and describe how the project protects and restores natural channel and riparian habitat values. Specifically address whether the project protects and restores natural channel and riparian habitat values, whether the project promotes natural processes, and the immediacy and duration of benefits to natural channel and riparian habitat values.# This is a research project that could lead to agricultural drainage management practices that could help restore or balance lower trophic level processes such that the biological food chain effects of selenium contamination, although there is not a direct link to improving natural channel and riparian habitat values.*

1l. Identify if and how the project contributes to efforts to modify CVP operations. Identify the effort(s) to modify CVP operations to which the proposed project would contribute, if applicable. Efforts to modify CVP operations include modifications to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish as directed by Section 3406 (b)(1)(B) of the CVPIA, including flows provided through management of water dedicated under Section 3406(b)(2) and water acquired pursuant to Section 3406(b)(3).# Often, water from New Melones is required to help achieve water quality standards at Vernalis. If this research ultimately leads to improved management of agricultural return flows, this could possibly reduce the need for water from New Melones to maintain water quality at Vernalis, thus providing Interior with additional operational flexibility for other beneficial uses of this water. This connection appears to be tenuous at this time.*

1m. Identify if and how the project contributes to implementation of the supporting measures in the CVPIA. Identify the supporting measure(s) to which the proposed project would contribute, if applicable. Supporting measures include the Water Acquisition Program, the Comprehensive Assessment and Monitoring Program, the Anadromous Fish Screen Program, and others.# Not directly applicable to other CVPIA supporting measures*

1n. Summarize comments from section 1i through 1m related to applicability to CVPIA priorities (if applicable, identify the CVPIA program appropriate to consider as the source of CVPIA funding [for example, the Anadromous Fish Restoration Program, Habitat Restoration Program, Water Acquisition Program, Tracy Pumping Plant Mitigation Program, Clear Creek Restoration Program, Comprehensive Assessment and Monitoring Program, and Anadromous Fish Screen Program]). Identify the strengths and weaknesses of the proposal,

highlighting the applicability of the proposed project to CALFED and CVPIA goals and priorities. Focus on aspects of the proposal that may be

important to later stages in the project review and selection process.# This research project could lead to water quality management, specifically related to selenium, and salinity overall, that would most likely provide indirect benefits to anadromous fish. But, this benefit would not be realized for some time and the extent of the benefit would be difficult to assess. The research has a nexus to Central Valley-wide Action 3 from the 1997 Revised Draft Restoration Plan for the AFRP. The anadromous fish species most likely to benefit from this research would be white sturgeon, a long-lived bottom feeder most likely to be effected by selenium accumulation in the food chain. This is important research however, and is very relevant to the real-time water quality forecasting project that is currently funded by CALFED, and could help continue to make improvements to agricultural drainage management that would help improve the overall health of the San Joaquin and Bay-Delta.*

RELATIONSHIP TO OTHER ECOSYSTEM RESTORATION PROJECTS

2a. Did the applicant explain how the proposed project relates to other past and future ecosystem restoration projects, as required on page 57 in the PSP? Type in yes or no.#yes*

2b. Based on the information presented in the proposal and on other information on restoration projects available to CALFED and CVPIA staff, describe how the proposed project complements other ecosystem restoration projects, including CALFED and CVPIA. Identify projects or types of projects that the proposed project would complement, now or in the future.

Identify source of information.#Data collected for this project are consistent with CALFED data for the real-time water quality management in SJR (97C08), VAMP, management of flows and experiment to control selenium loads projects for the Grasslands Bypass project, and an adaptive management project for salinity loading at Grasslands(00B05), and the dissolved oxygen study for the Stockton Deep Water Channel (99B16). Provides basic monitoring and decision support tools to help improve water quality in the San Joaquin River Basin. Information Source: Proposal and CALFED tracking table.*

RESULTS AND PROGRESS ON PREVIOUSLY FUNDED CALFED AND CVPIA PROJECTS, INCLUDING REQUESTS FOR NEXT-PHASE FUNDING

3a1. Based on the information presented in the proposal and on project reports and data available to CALFED and CVPIA staff, has the applicant previously received CALFED or CVPIA funding? Type CALFED, CVPIA, both, or none.#CALFED*

3a2. If the answer is yes, list the project number(s), project name(s) and whether CALFED or CVPIA funding. If the answer is none, move on to item 4.#

98B14 - Bacterial Treatment of Selenium in the Panoche Drainage.

99N08 - Assessment of Pesticide Effects on Fish and their Food Resources in the

3b1. Based on the information presented in the proposal and on project reports available to CALFED and CVPIA staff, did the applicant accurately state the current status of the project(s) and the progress and accomplishments of the project(s) to date? Type yes or no.#yes*

3b2. If the answer is no, identify the inaccuracies:#

3c1. Has the progress to date been satisfactory? Type yes or no.#yes*

3c2. Please provide detailed comments in support of your answer, including source of information (proposal or other source):#Project 98B14 is in the second year of implementation and is progressing satisfactorily. 99 projects were awarded in 2000 and should be under contract soon. Source: Progress reports and CALFED tracking table.*

REQUESTS FOR NEXT-PHASE FUNDING

3d1. Is the applicant requesting next-phase funding? Type yes or no.#no*

3d2. If the answer is yes, list previous-phase project number(s) here. If the answer is no, move on to item 4.#*

3e1. Does the proposal contain a 2-page summary, as required on pages 57 and 58 of the PSP? Type yes or no.#*

3e2. Based on the information presented in the summary and on project reports available to CALFED and CVPIA staff, is the project ready for next-phase funding? Type yes or no.#*

3e3. Please provide detailed comments in support of your answers, including source of information (proposal or other source):#*

LOCAL INVOLVEMENT

4a. Does the proposal describe a plan for public outreach, as required on page 61 of the PSP? Type yes or no.# Yes*

4b. Based on the information in the proposal, highlight outstanding issues related to support or opposition for the project by local entities including watershed groups and local governments, and the expected magnitude of any potential third-party impacts.# None. However, the research would be in combination with a pilot effort with the Panoche Water District, which could serve as a valuable outreach component to other irrigation districts that discharge agricultural returns to the San Joaquin River.*

ENVIRONMENTAL COMPLIANCE

4d. List any potential environmental compliance or access issues as identified in the PSP checklists.# It does not appear to have field collections of organisms. Fish are to be raised in the lab therefore, no permits are needed. If there is field sampling of non-threatened and non-endangered animals, they need to obtain a collection permit from CDFG.*

4e. Specifically highlight and comment on any regulatory issues listed above that may prevent the project from meeting the projected timeline.# None*

COST

5a. Does the proposal include a detailed budget for each year of requested support? Type yes or no.# Yes, for 2 years*

5b. Does the proposal include a detailed budget for each task identified? Type yes or no.# Yes*

5c. Is the overhead clearly identified? Type yes or no.# Yes, it is at 51%*

5d. Are project management costs clearly identified? Type yes or no.# No
mention of project management costs*

**5e. Please provide detailed comments in support of your answers to questions
5a - 5d.#** Project management costs need to be included in the budget table*

COST SHARING

6a. Does the proposal contain cost-sharing? Type yes or no.# No*

**6b. Are applicants specifically requesting either state or federal cost
share dollars? Type state, federal, or doesn't matter.#** Doesn't matter*

**6c. List cost share given in proposal and note whether listed cost share is
identified (in hand) or proposed.**

6c1. In-kind:# n/a*

6c2. Matching funds:# n/a*

**6c3. Show percentage that cost sharing is of total amount of funding
requested along with calculation.#** n/a*

**6d. Please provide detailed comments in support of your answers to questions
6a - 6c3.#** n/a*