A. Develop Monitoring Strategy

1. Description

Background: Pesticides are used in the Bay-Delta Ecosystem to control plant and animal pests for urban and rural applications. However, the number of pesticides is large, and monitoring for all possible pesticides is a daunting task. The purpose of this action is to develop a strategy for monitoring.

Eligible Proposals: Proposals are being solicited to prioritize pesticides for monitoring, develop pesticide analytical screens, refine toxicity identification evaluation (TIE) procedures for certain pesticides, and develop critical fate and effects information.

Proposals should first address prioritizing pesticides for monitoring. Proposals should address the following tasks:

- identifying pesticide use, by watershed (as defined by the California Unified Watershed Assessment or US Geological Survey), reported to the Department of Pesticide Regulation. (CALFED anticipates contracting with the Department of Pesticide Regulation to provide Pesticide Use Reports sorted by watershed.)
- identifying, by watershed, unreported pesticide use (e.g., home and garden, industrial, and institutional),
- completing a literature review of these identified pesticides to determine the potential for transport into surface waters, their fate, and acute and chronic toxicity effects,
- performing tests to determine transport, fate, and effects on relevant species for those pesticides not covered in the literature,
- reviewing existing monitoring data to determine which pesticides have been detected, and the toxicity of the observed concentrations,
- developing a methodology to produce a ranked list of pesticides for future monitoring by watershed,
- prioritize pesticides for future monitoring by watershed, and
- determining the analytical detection limits necessary for toxicity assessment of priority pesticides.

Second, proposals should address designing or facilitating the design of analytical schemes to measure the presence of high priority pesticides. Proposals should address the following tasks:

- evaluating available methods for measurement of the priority pesticides at the determined necessary detection limits and determining if methods can be adjusted to achieve the necessary detection limits,
- determining if available methods can be modified to detect those priority pesticides without an appropriate method, and if so, determining the detection limits,
- developing an analytical scheme to detect most, if not all, of the priority pesticides with the determined methods,
- determining recoveries and detection limits for these pesticides in a wide range of salinity, carbon concentration, and other appropriate matrices, and

- preparing a list of high priority pesticides lacking an analytical method.

Third, proposals should address improving the toxicity identification evaluation (TIE) procedures. Proposals should address the following tasks:

- determining TIE profiles for the priority pesticide in laboratory experiments and
- modifying standard TIE procedures to improve the ability of the procedures in identifying priority pesticides.

Fourth, proposals should address determining fate and effects of priority pesticides. Proposals should address the following tasks:

- determining the effects of duration, frequency, and repetition of pesticide exposure to aquatic organisms, including both intra- and inter-generational exposure,
- determining the factors affecting the bioavailability of pesticides and identifying pesticides most likely to be affected by these factors,
- determining additive or synergistic effects of co-occurring priority pesticides to aquatic organisms, and
- determining the effect of environmental conditions, including co-occurring contaminants, on the toxicity of priority pesticides to aquatic organisms.

Proposals should address summarizing and reporting the findings of these efforts.

Geographic Area: (See Section xx - Geographic Scope)

Available Funding: It is expected that up to $500,000 in state funding will be available for this topic, however, it is possible that not all of this funding will be obligated this funding cycle. It is possible that additional federal funding may be available.

Coordination: Proposals should be coordinated with representatives from entities such as the Department of Pesticide Regulation (DPR), Regional Water Quality Control Board, Department of Fish and Game, US Geological Survey (USGS), US Environmental Protection Agency (EPA), pesticide manufacturers, pesticide users, environmental groups, and as appropriate. Proposals should also be coordinated with other related research.

2. Criteria for Formal Proposal Evaluation (Possible 70 points)

To be eligible for funding all proposals must benefit one or more of the priority species or habitats listed in Section xx. Formal proposals which meet the minimum requirements shall be evaluated using the following criteria:

- Applicant's ability (15 points)
- Technical merit (20 points)
- Compatibility and benefits to non-ecosystem CALFED objectives (5 points)
- Coordination with other efforts (10 points)
- Cost (10 points)
- Assessment, and reporting (10 points)

For each of the aforementioned criteria, the considerations are as follows:

a. Applicant's Ability (15 points)

- Does the applicant's experience, education, or background show capability to implement the proposal?
- Does the project's key personnel possess the experience, education, or background to implement the proposal successfully?
- If the applicant has received grants or contracts previously, what is the applicant's record of performance in meeting the objectives and conditions of those grants and contracts?
- Are the facilities proposed for carrying out the proposed research adequate?
- Does the proposed work schedule show start and stop dates, and accomplishment of major milestones and products?

b. Technical merit (20 points)

- Are the study objectives appropriate?
- Are the study approach, sampling procedures, and analytical procedures clearly described for each objective?
- Are the study approach, sampling procedures, and analytical procedures appropriate to achieve the objectives?
- Are methods and techniques, equipment and facilities, data collection, statistical analysis, quality assurance procedures, and criteria to test hypothesis adequately detailed?
- How does the proposal address pesticide use not in the DPR Pesticide Use Report database?
- Does the proposal address evaluating options for performing the work?
- How reasonable is the hypotheses and experimental design?
- Are proposed protocols identified?
- How sound are the proposed steps for data collection, analysis, and synthesis?

c. Compatibility and benefits to non-ecosystem CALFED objectives (5 points)

- How is the proposal appropriate to the CALFED goals and objectives?
- Is the proposal responsive to the Proposal Solicitation Package?

d. Coordination with other efforts (10 points)

- Are the plans for a literature review adequate to identify other efforts?
- Does the proposal discuss how other researchers where surveyed to identify other efforts?
- Does the proposal discuss how it supplements or complements other efforts?
- Is the work proposed original?
- How does the work proposed relate to any legal requirement of the applicant?

e. Cost (10 points)

- How does the cost of the proposal (including direct and indirect costs) compare to other similar proposals?

- Is the level of funding requested for the proposed activity reasonable? How does the applicant plan to use its resources to maximize cost effectiveness, such as labor, equipment, and class of staff used for different items?
- Does the proposal include indirect overhead costs? If so, are they reasonable? Note: The proposal must indicate the level of indirect overhead costs for each task of the proposed project. Indirect overhead labor costs should include general, administrative, and/or fee costs, if any.
- Does the proposal contain a budget for each task?

f. Assessment and reporting (10 points)

- How does the proposal address providing for peer and technical review of the research?
- Are procedures for handling, storing, and making data accessible for other researchers adequately described?

3. Proposal Format and Content: (See Section xx)

4. Contract Requirements

The terms and conditions which will apply to successful proposals are provided in Attachment xx. Note that terms and conditions may vary depending on the type of applicant and type of project. Also, contract administration may be performed by CALFED or others, depending on the applicant and type of project.

Note also that specific documents should be submitted with the proposal and are identified in Attachment xx, Table xx.

B. Evaluate Pesticide Effects on Aquatic Resources

1. Description

Background: In many areas of Bay-Delta Ecosystem, pesticides are found at potentially toxic concentrations. Pesticides are detected in water in urban and rural areas, and even in undeveloped areas in the Sierras upstream of the direct use of these chemicals. Although this toxicity is associated with the invertebrate component of the standard US EPA freshwater bioassays (*Ceriodaphnia dubia*), there is not consensus that this toxicity extends to other invertebrates found in the areas supplying food used by priority species of CALFED. Furthermore, there is not consensus that the toxicity to certain invertebrates limits food supply for CALFED priority species.

Eligible Proposals: Proposal are being solicited to assess whether pesticides limit food supply for CALFED priority species.

Proposals should address the following tasks:

- determining the toxicity of key pesticides such as Diazinon and Chlorpyrifos to invertebrate species in the Bay-Delta Ecosystem. It is anticipated that both laboratory and field studies will be required.
- determining the impacts of pulses of pesticides on local aquatic communities, including the length of time required for the invertebrate population to recover,
- determining the additive ecological effect of multiple pesticide exposures, and
- determining the effects on the food supply for higher trophic levels, including CALFED priority species, to any toxicity found.

Proposals should address summarizing and reporting the findings of these efforts.

Geographic Area: (See Section xx - Geographic Scope)

Available Funding: It is expected that up to $1,500,000 in state funding will be available for this topic, however, it is possible that not all of this funding will be obligated this funding cycle. It is possible that additional federal funding may be available.

Coordination: Proposals should be coordinated with representatives from entities such as the Department of Pesticide Regulation (DPR), Regional Water Quality Control Board, Department of Fish and Game, US Geological Survey (USGS), US Environmental Protection Agency (EPA), pesticide manufacturers, pesticide users, environmental groups, and as appropriate. Proposals should also be coordinated with other related research.

2. Criteria for Formal Proposal Evaluation

To be eligible for funding all proposals must benefit one or more of the priority species or habitats listed in Section xx. Formal proposals which meet the minimum requirements shall be evaluated using the following criteria:

- Applicant's ability (15 points)

- Technical merit (20 points)
- Compatibility and benefits to non-ecosystem CALFED objectives (5 points)
- Coordination with other efforts (10 points)
- Cost (10 points)
- Assessment, and reporting (10 points)

For each of the aforementioned criteria, the considerations are as follows:

a. Applicant's Ability (15 points)

- Does the applicant's experience, education, or background show capability to implement the proposal?
- Does the project's key personnel possess the experience, education, or background to implement the proposal successfully?
- If the applicant has received grants or contracts previously, what is the applicant's record of performance in meeting the objectives and conditions of those grants and contracts?
- Are the facilities proposed for carrying out the proposed research adequate?
- Does the proposed work schedule show start and stop dates, and accomplishment of major milestones and products?

b. Technical merit (20 points)

- Are the study objectives appropriate?
- Are the study approach, sampling procedures, and analytical procedures clearly described for each objective?
- Are the study approach, sampling procedures, and analytical procedures appropriate to achieve the objectives?
- Are methods and techniques, equipment and facilities, data collection, statistical analysis, quality assurance procedures, and criteria to test hypothesis adequately detailed?
- Does the proposal address evaluating options for performing the work?
- How reasonable is the hypotheses and experimental design?
- Are proposed protocols identified?
- How sound are the proposed steps for data collection, analysis, and synthesis?

c. Compatibility and benefits to non-ecosystem CALFED objectives (5 points)

- How is the proposal appropriate to the CALFED goals and objectives?
- Is the proposal responsive to the Proposal Solicitation Package?

d. Coordination with other efforts (10 points)

- Are the plans for a literature review adequate to identify other efforts?
- Does the proposal discuss how other researchers where surveyed to identify other efforts?
- Does the proposal discuss how it supplements or complements other efforts?
- Is the work proposed original?

- How does the work proposed relate to any legal requirement of the applicant?

e. Cost (10 points)

- How does the cost of the proposal (including direct and indirect costs) compare to other similar proposals?
- Is the level of funding requested for the proposed activity reasonable? How does the applicant plan to use its resources to maximize cost effectiveness, such as labor, equipment, and class of staff used for different items?
- Does the proposal include indirect overhead costs? If so, are they reasonable? Note: The proposal must indicate the level of indirect overhead costs for each task of the proposed project. Indirect overhead labor costs should include general, administrative, and/or fee costs, if any.
- Does the proposal contain a budget for each task?

f. Assessment and reporting (10 points)

- How does the proposal address providing for peer and technical review of the research?
- Are procedures for handling, storing, and making data accessible for other researchers adequately described?

3. Proposal Format and Content: (See Section xx)

4. Contract Requirements

The terms and conditions which will apply to successful proposals are provided in Attachment xx. Note that terms and conditions may vary depending on the type of applicant and type of project. Also, contract administration may be performed by CALFED or others, depending on the applicant and type of project.

Note also that specific documents should be submitted with the proposal and are identified in Attachment xx, Table xx.

C. Determine Chronic Toxicity to Fish

1. Description

Background: Most of the concern about the effects of contaminants in the Bay-Delta Ecosystem has focused on acute, short-term impacts. However, there is an increasing concern with long-term, chronic effects especially on those life stages most critical, reproduction and growth. Recent analysis has shown hormonal defects in fish. The Bay-Delta Ecosystem receives a diverse mix of contaminants of manufactured chemical and metallic origin. These contaminants come from a variety of sources, urban stormwater and wastewater, agriculture, mining, and industry. These contaminants are present in locations throughout the Bay-Delta Ecosystem, varying seasonally and in the shorter term (transient pulses).

Eligible Proposals: Proposal are being solicited to assess the chronic effects of contaminants. Proposals should address the following tasks:

- reviewing and summarizing existing information on the chronic effects of contaminants to priority fish species,
- identifying resident fish suitable for chronic impairment testing in both laboratory and field studies,
- developing tests that can be used to assess chronic effects in a large number of places and a variety of times,
- identifying biomarker responses of exposure, growth and reproductive health using laboratory-held fish exposed to contaminants, and
- determining impairment and establishing links between contaminant exposure and impairment.

Proposals should address summarizing and reporting the finding of these efforts.

Geographic Area: (See Section xx - Geographic Scope)

Available Funding: It is expected that up to $700,000 in state funding will be available for this topic, however, it is possible that not all of this funding will be obligated this funding cycle. It is possible that additional federal funding may be available.

Coordination: Proposals should be coordinated with representatives from entities such as the Department of Pesticide Regulation (DPR), Regional Water Quality Control Board, Department of Fish and Game, US Geological Survey (USGS), US Environmental Protection Agency (EPA), pesticide manufacturers, pesticide users, environmental groups, and as appropriate. Proposals should also be coordinated with other related research.

2. Criteria for Formal Proposal Evaluation

To be eligible for funding all proposals must benefit one or more of the priority species or habitats listed in Section xx. Formal proposals which meet the minimum requirements shall be evaluated using the following criteria:

- Applicant's ability (15 points)
- Technical merit (20 points)
- Compatibility and benefits to non-ecosystem CALFED objectives (5 points)
- Coordination with other efforts (10 points)
- Cost (10 points)
- Assessment, and reporting (10 points)

For each of the aforementioned criteria, the considerations are as follows:

a. Applicant's Ability (15 points)

- Does the applicant's experience, education, or background show capability to implement the proposal?
- Does the project's key personnel possess the experience, education, or background to implement the proposal successfully?
- If the applicant has received grants or contracts previously, what is the applicant's record of performance in meeting the objectives and conditions of those grants and contracts?
- Are the facilities proposed for carrying out the proposed research adequate?
- Does the proposed work schedule show start and stop dates, and accomplishment of major milestones and products?

b. Technical merit (20 points)

- Are the study objectives appropriate?
- Are the study approach, sampling procedures, and analytical procedures clearly described for each objective?
- Are the study approach, sampling procedures, and analytical procedures appropriate to achieve the objectives?
- Are methods and techniques, equipment and facilities, data collection, statistical analysis, quality assurance procedures, and criteria to test hypothesis adequately detailed?
- Does the proposal address evaluating options for performing the work?
- How reasonable is the hypotheses and experimental design?
- Are proposed protocols identified?
- How sound are the proposed steps for data collection, analysis, and synthesis?

c. Compatibility and benefits to non-ecosystem CALFED objectives (5 points)

- How is the proposal appropriate to the CALFED goals and objectives?
- Is the proposal responsive to the Proposal Solicitation Package?

d. Coordination with other efforts (10 points)

- Are the plans for a literature review adequate to identify other efforts?
- Does the proposal discuss how other researchers where surveyed to identify other efforts?
- Does the proposal discuss how it supplements or complements other efforts?

- Is the work proposed original?
- How does the work proposed relate to any legal requirement of the applicant?

e. Cost (10 points)

- How does the cost of the proposal (including direct and indirect costs) compare to other similar proposals?
- Is the level of funding requested for the proposed activity reasonable? How does the applicant plan to use its resources to maximize cost effectiveness, such as labor, equipment, and class of staff used for different items?
- Does the proposal include indirect overhead costs? If so, are they reasonable? Note: The proposal must indicate the level of indirect overhead costs for each task of the proposed project. Indirect overhead labor costs should include general, administrative, and/or fee costs, if any.
- Does the proposal contain a budget for each task?

f. Assessment and reporting (10 points)

- How does the proposal address providing for peer and technical review of the research?
- Are procedures for handling, storing, and making data accessible for other researchers adequately described?

3. Proposal Format and Content: (See Section xx)

4. Contract Requirements

The terms and conditions which will apply to successful proposals are provided in Attachment xx. Note that terms and conditions may vary depending on the type of applicant and type of project. Also, contract administration may be performed by CALFED or others, depending on the applicant and type of project.

Note also that specific documents should be submitted with the proposal and are identified in Attachment xx, Table xx.