

STATE OF CALIFORNIA STANDARD AGREEMENT (ERP) STD. 213 (Rev 12/07)	AGREEMENT NUMBER <contract number>
	REGISTRATION NUMBER

1. This Agreement is entered into between the State Agency and the Contractor named below:

STATE AGENCY'S NAME
DEPARTMENT OF FISH AND GAME

CONTRACTOR'S NAME
University of the Pacific

2. The term of this Agreement is: **January 1, 2009** through **June 30, 2011**

3. The maximum amount of this Agreement is: **\$2,992,933.00**
Two million, nine hundred and ninety two thousand, nine hundred and thirty three dollars and no cents

4. The parties agree to comply with the terms and conditions of the following exhibits which are by this reference made a part of the Agreement.

Exhibit A – Scope of Work	16 Pages
Exhibit A – Attachment 1 – Schedule and List of Deliverables	3 Pages
Exhibit A – Attachment 2 – Quarterly Progress Report Form	1 Page
Exhibit A – Attachment 3 – ERP Amendment Guidelines	1 Page
Exhibit A – Attachment 4 – Project Close-Out Summary Report	1 Page
Exhibit B – Invoicing Detail and Payment Provisions	3 Pages
Exhibit B – Attachment 1 - Primary Budget Summary	1 Page
Exhibit B – Attachment 1A – Equipment Detail	1 Page
Exhibit B – Attachment 2 – Subcontractor Budget Summary	3 Pages
Exhibit B – Attachment 3 – Quarterly Invoice Form	1 Page
Exhibit B – Attachment 4 – Travel Reimbursement Report	1 Page
*Exhibit C – General Terms and Conditions	3 Pages
Exhibit D – DFG Additional Provisions	4 Pages
Exhibit E – ERP Special Terms and Conditions	1 Page

Items shown with an Asterisk (*) are hereby incorporated by reference and made part of this Agreement as if attached hereto. These documents can be viewed at www.ols.dgs.ca.gov/standard+language

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR		<i>California Department of General Services Use Only</i>
CONTRACTOR'S NAME (if other than an individual, state whether a corporation, partnership, etc.) University of the Pacific		
BY (Authorized Signature) 	DATE SIGNED (Do not type)	
PRINTED NAME AND TITLE OF PERSON SIGNING Dr. Philip N. Gilberston, Provost		
ADDRESS 3601 Pacific Ave., University of the Pacific, Stockton, CA 95211		
STATE OF CALIFORNIA		
AGENCY NAME DEPARTMENT OF FISH AND GAME		
BY (Authorized Signature) 	DATE SIGNED (Do not type)	
PRINTED NAME AND TITLE OF PERSON SIGNING Cynde Jones, Assistant Deputy Director, Administration		
ADDRESS 1416 9th Street, 12th Floor Sacramento, CA 95814		

Exempt per:
Water Code 79442(d)(3)

EXHIBIT A
SCOPE OF WORK
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project

1. PURPOSE OF PROJECT

This Contract Agreement (Agreement) is entered into between the Department of Fish and Game (DFG) and University of the Pacific (Contractor).

The purpose of this project is to collect and analyze data on the sources of nutrients, phytoplankton and oxygen-consuming materials in the San Joaquin River (SJR) estuary to support the development of an estuary model. This model is needed by the Central Valley Regional Water Quality Control Board (Regional Board) to complete the SJR Dissolved Oxygen (DO) Total Maximum Daily Load (TMDL) development and allocation process.

Each principal Task and subtask of this Agreement are to be described in more detail in Section 3, "Work to be Performed". Deliverables with timelines (Exhibit A – Attachment 1, "Schedule and List of Deliverables") are matched to the appropriate Task and subtask listed in this document. Costs (budget detail) are presented in tables for each Task, by individual cost for personal and operating costs, and in summary.

A. Primary Project Goals

The goal of the project is to provide modeling tools, scientific data and other information to support management actions that will be taken by the Regional Board and stakeholders to resolve the low DO problems in the SJR estuary.

B. Study Objectives

The objectives of this project are:

- 1) To complete the necessary measurements, modeling, and other scientific investigations needed to provide a scientific foundation for the development and implementation of a DO TMDL for the SJR between Bear Creek (Lander Avenue) and Disappointment Slough.
- 2) To develop a WQ model applicable to the DO TMDL for the SJR estuary between Mossdale and Disappointment Slough.
- 3) To provide one integrated model for management of the DO TMDL for the SJR between Bear Creek (Lander Avenue) and Disappointment Slough.
- 4) To investigate the use of the SJR DO TMDL model as a broader model of WQ and food-web dynamics in the SJR and estuary.

C. Current Working Hypotheses and Investigative Approaches

The formal hypothesis of this project is that a unified water quality model encompassing the SJR from its confluence with Bear Creek to Disappointment Slough will provide a comprehensive understanding of the development of low DO conditions in the SJR estuary. This model and associated data collection effort is a necessary step in the development of a scientific management plan in response to the SJR DO TMDL. The purpose of the project is to provide modeling tools, scientific data and other information to support management actions that will be taken by the Regional Board and other stakeholders to resolve the low DO problems in the SJR estuary.

2. PROJECT OFFICIALS

Mary Menconi shall be the designated Ecosystem Restoration Program (ERP) Contract Manager for DFG under this Agreement. The ERP Contract Manager may be changed at any time by DFG by providing a ten (10) day advance written notice to the Contractor.

William T. Stringfellow shall be the designated Contractor’s Project Manager under this Agreement. The Contractor’s Project Manager may be changed at any time by the Contractor by providing a ten (10) day advance written notice to DFG.

Direct all program and project related inquiries to:

Department of Fish and Game
Water Branch

Mary Menconi
ERP Contract Manager
830 S Street
Sacramento, CA 95811-7023

Phone: 916/445-0074
Fax: 916/445-1768
Email: mmenconi@dfg.ca.gov

University of the Pacific

William T. Stringfellow
UOP Contract Manager
Ecological Engineering Research Program
3601 Pacific Avenue, Sears Hall
Stockton, CA, 95211

Phone: 209/946-2796
Fax: 209/946-2577
Email: wstringfellow@lbl.gov

3. WORK TO BE PERFORMED

This project has been broken down into eight (8) major Tasks with subtasks. Exhibit A – Attachment 1, “Schedule and List of Deliverables” provides a timeline for the completion and/or submission of corresponding Tasks and subtasks.

A. Scope of Work

1) Task 1 – Project Management and Administration

The Contractor shall provide all technical and administrative services associated with performing and completing the work for this project.

The Contractor shall be responsible for the performance of the work as set forth in this Agreement. The Contractor shall be responsible for the preparation of products and a final report, as specified by Exhibit A – Attachment 1, “Schedule and List of Deliverables”. The Contractor’s Project Manager shall promptly notify the ERP Contract Manager of events or proposed changes that could affect the Scope of Work, budget, or schedule of work performed under this Agreement.

The Contractor shall provide Quarterly Progress Reports, Quarterly Invoices, and scheduled deliverables as indicated in Exhibit A – Attachment 1, “Schedule and List of Deliverables”.

a. Subtask 1.1 – Project Management

Technical and administrative duties shall include: project management, budgeting, scheduling, coordination, crew supervision, report preparation, contract management, invoicing, equipment maintenance and data collection, storage and analysis, subcontractor management, and all other responsibilities that may be necessary to complete the Scope of Work specified in this Agreement.

The work performed in this subtask includes the preparation and submission of Quarterly Progress Reports to the ERP Contract Manager; the planning and conducting of quarterly status

meetings with all project investigators to review progress and issues from the previous quarter; the preparation and submission of the project Draft and Final Report; and the preparation and submission of deliverable products as specified in Exhibit A – Attachment 1, “Schedules and List of Deliverables”.

The Contractor’s Project Manager shall submit all reports, deliverables, etc. electronically, using one (1) or more of the following formats (as applicable): Adobe Acrobat or Microsoft Office (e.g., Word, Excel, PowerPoint, Access). In all cases, the Contractor will clearly identify the software program needed to open, view, and archive the files/deliverables being submitted. The standard three (3) digit file extension is sufficient information to determine the electronic format used.

If the document/deliverable is “write-protected”, the Contractor shall ensure that each file does not exceed two (2) MB in size. If necessary, the Contractor shall break up the report/deliverable into separate components in order to not exceed the two (2) MB size limit. The exception to breaking up deliverables would be for GIS/GPS data, CAD, models, videos, or DVDs. The information format for sending these documents/deliverables is shown below:

Attention: ERP Document Custodian/ ERP Contract Manager
Project Title: San Joaquin River Dissolved Oxygen Total Maximum Daily Load Project
Agreement No.:
Type of Document (i.e., Task 2 deliverable title, final report, etc.):

This project will be managed by the University of the Pacific (UOP) Environmental Engineering Research Program (EERP). UOP will be responsible for administering the contract. Dr. William T. Stringfellow, Director of the EERP, will be project Chief Principal Investigator (PI) and will provide administration and technical oversight. Dr. Stringfellow has prior experience with the administration of State funded water quality projects.

Work will include reviewing and executing the contract with DFG, developing the subcontracts, finalizing and executing subcontracts, setting up and maintaining financial accounts for this project, reviewing and approving subcontractor invoices, processing payments, quarterly and annual financial progress reports, technical oversight, preparation of quarterly and annual technical reports, attending meetings of technical committees, and meetings of other groups.

A subcontract will be written between UOP and Systech Water Resources for modeling tasks. Lawrence Berkeley National Laboratory (LBNL) will be subcontracted to assist with data management, peer review, QA oversight, and WQ analysis. Subcontracts will be written with individual technical experts to attend meetings as part of the Task 6 Adaptive Management process.

Informational and technical presentations on this project will be made at the DO TMDL technical working group (TWG) meetings. Presentations will be made to CALFED, the DFG, and stakeholder groups as requested.

b. Subtask 1.2 – Quarterly Progress Reports

The Contractor shall prepare and submit Quarterly Progress Reports to the ERP Contract Manager in electronic form using the progress report format attached as Exhibit A – Attachment 2, “Sample Quarterly Progress Report Form”. Each progress report shall detail work accomplished, discuss any problems encountered and recommend potential solutions to those problems, detail costs incurred during the subject period, and document delivery of any intermediate work products. A brief outline of upcoming work scheduled for the subsequent period should also be provided. Progress reports must be submitted within thirty (30) days following each quarterly month following Agreement execution.

c. **Subtask 1.3 – Quarterly Invoices**

The Contractor shall prepare and submit Quarterly Invoices to the ERP Contract Manager using instructions detailed in Exhibit B, “Invoicing and Payment Provisions” and the invoice format attached as Exhibit B – Attachment 3, “Sample Quarterly Invoice Form”. Each invoice shall be submitted with sufficient scope and detail to define the actual work performed and specific milestones completed, including a description of the activities of the Contractor and subcontractor and the hours expended to perform or complete those activities. Invoices must be submitted within thirty (30) days following each quarterly month following Agreement execution.

d. **Subtask 1.4 – Subcontractor Selection**

The Contractor may award subcontracts as necessary, to qualified consultants or other agencies. The subcontractors shall be selected by a process that complies with applicable State and Federal regulations and prepare a legally enforceable Agreement between the Contractor and the selected subcontractors. The Agreement shall describe the Scope of Work and the products expected from each subcontractor. Submit draft subcontract documents to the ERP Contract Manager for review and approval prior to execution. Document steps taken in soliciting and awarding to the subcontractor and submit them to the ERP Contract Manager for review. In the Quarterly Progress Report, document all subcontractor activities, deliverables completed, progress, issues, and proposed resolutions.

e. **Subtask 1.5 – Data Management**

The Contractor shall prepare and submit to the ERP Contract Manager all data generated by the project for input into the DFG data system. The Contractor shall be responsible for verifying the quality of the data

f. **Task 1 Deliverable(s)**

Include project data in Quarterly Progress Reports, Quarterly Invoices, and subcontractor documentation (if subcontractors are used). Deliverables are listed in Exhibit A – Attachment 1, “Schedule and List of Deliverables”.

2) **Task 2 – Environmental Compliance and Permitting**

The Contractor shall address, document, and include all steps required to ensure compliance with CEQA/NEPA for this project. If the Contractor will not serve as the lead agency, identify the lead agency for CEQA and/or NEPA purposes for this project. If assistance is needed in determining the legal requirements for environmental compliance for this project, please contact the ERP Contract Manager listed above. The Contractor shall submit copies of approved permits to the ERP Contract Manager for inclusion in the permanent file for the Agreement.

a. **Subtask 2.1 – CEQA/NEPA Compliance**

This proposed project involves only monitoring and research, and, in accordance with Section 15306 of the California Public Resources Code, has been determined to not result in serious or major disturbance to any environmental resource. A Notice of Exemption will be submitted to the California State Clearinghouse and the counties where the project is being conducted. The lead agency for this project is not a Federal Agency and NEPA does not apply.

b. **Subtask 2.2 – Other Required Permits and Approvals**

The Contractor is to address, document, and include all steps required to obtain all other necessary permits and approvals required to implement this project. The Contractor is to include permission for access to private or public property as required.

Copies of written authorizations for property access or any other permits or approvals must be submitted to the ERP Contract Manager for inclusion in the permanent file for the Agreement.

Task 2 Deliverable(s)

The Contractor shall submit all required documentation for compliance with CEQA and/or NEPA for this project and submit copies of all written authorizations for property access or any other permits or approvals to the ERP Contract Manager in accordance with the deliverable timeline listed in Exhibit A – Attachment 1, “Schedule and List of Deliverables”.

3) **Task 3 – The Quality Assurance Project Plan (QAPP)**

The Quality Assurance Project Plan (QAPP) will establish the procedures and methods by which data will be collected and analyzed throughout the project. The QAPP for this monitoring program will be based on the QAPP for the Upstream DO TMDL Project. The QAPP for the Upstream DO TMDL Project was approved by SWAMP in early 2005 and will be updated as necessary for this project and submitted for review. Because it will be necessary to set the QA/QC requirements, the QAPP will be completed early in the first year of the project.

Task 3 Deliverables: The Contractor shall submit a copy of the approved QAPP to the ERP Contract Manager in accordance with the deliverable timeline listed in Exhibit A – Attachment 1, “Schedule and List of Deliverables.”

4) **Task 4 – Data collection and data distribution**

a. **Subtask 4.1 – Water quality and flow data from the Upstream SJR study area**

The objective of this task is to maintain a coherent data record for the region and maintain model calibration to support stakeholder confidence in the DO TMDL allocation. The University of the Pacific (UOP) Environmental Engineering Research Program (EERP) and Lawrence Berkeley National Laboratory (LBNL) will collect, compile and analyze water quality (WQ) and flow data for the upstream reach of the SJR, between Mossdale and Bear Creek in years 2009 and 2010.

EERP will continue station maintenance activities in the upstream SJR including flow ratings and calibration, repair of damaged equipment, replacement of damaged probes, and collection of flow data. Station maintenance is scheduled on a monthly basis and additional trips for specific repairs will be made as required.

b. **Subtask 4.2 – Collection of water quality, flow, and other data from the SJR estuary study area**

Nineteen key locations in the SJR estuary between Mossdale and Disappointment Slough corresponding to calibration points for the Link Node Model have been identified for sampling and measurement (Table 1). At each location depth integrated grab samples will be collected and measurements will be made using handheld YSI 6600 sondes. Samples will be collected at SJR estuary sample locations at a frequency of at least once per month for 2009 to 2010. Additional samples will be collected in the SJR estuary study area during summer months and as determined by the adaptive management program. Sites will be sampled on outgoing tides, as necessary, and samples will be analyzed at the EERP laboratories. Data will be compiled, QA checked and distributed to the modeling team and other interested parties. Sample collection and analysis will be conducted according to protocols compatible with the Surface Water Ambient Monitoring Program (SWAMP).

At key locations in the SJR estuary study area, YSI 6600 sondes will be deployed for extended periods to investigate variance in WQ between grab sampling events. Sondes will be

programmed to run unattended for the length of deployment, typically two weeks. Data will be collected from the sondes, QA checked, and provided to the modeling team and PIs for analysis.

At key locations in the SJR estuary study area, in coordination with the YSI 6600 sonde deployments described above, measurements of rate processes, including algal productivity and respiration, will be made as necessary for improving calibration and confidence of the model. Measurements from prior studies will also be used in model calibration. A complete review (and re-analysis as necessary) of the existing data and reports will be made before additional rate measurement experiments will be performed. As determined necessary, light-dark bottle experiments will be performed to provide data on algal productivity in the study reach. Light intensity will be measured as a function of depth. The pH, DO, chlorophyll a, and pheophytin a concentrations in the bottles will be quantified before and after suspension in the water column to yield algal productivity and DO response curves as a function of light intensity, data important for modeling the study reach. Measurements of zooplankton grazing rates will also be made. Short term dark bottle tests will measure rapidly labile oxygen demand. Ammonia oxidation rates will be made if warranted by the presence of ammonia discharges from treatment facilities or other sources.

Table 1: Proposed core sample sites for San Joaquin River Estuary

Site #	Sample Station Name	Latitude	Longitude
0	Paradise Marina (Node 70)	38.0442	-121.4195
0	Disappointment Slough	38.0415	-121.4780
0	Mosher Slough	38.0329	-121.3632
0	SJR at Light 18 (Node 96)	38.0259	-121.4682
0	5 Mile Slough	38.0135	-121.3493
0	14 Mile Slough	38.0016	-121.4057
0	Calaveras Flood Channel	37.9891	-121.2678
0	Calaveras River	37.9841	-121.3100
0	Turner Cut	37.9835	-121.4705
0	SJR at Buckley Cove (Light 40)	37.9779	-121.3817
134	SJR at Rough and Ready Island	37.9626	-121.3660
0	Smith Canal	37.9604	-121.3353
0	Turning Basin	37.9532	-121.2980
1	SJR at Channel Point	37.9503	-121.3372
0	Mormon Slough	37.9474	-121.2970
194	Burns Cutoff	37.9448	-121.3727
11	French Camp Slough	37.9161	-121.3045

127	SJR at Brant Bridge	37.8649	-121.3227
4	SJR at Mossdale	37.7871	-121.3076

"0" = site number not yet assigned

Table 2: Laboratory water quality parameters to be measured

Analyte	Abbreviation
10-Day Biochemical Oxygen Demand	BOD ₁₀
10-Day Carbonaceous and Nitrogenous Biochemical Oxygen Demand	CBOD ₁₀ /NBOD ₁₀
Chlorophyll <i>a</i>	Chl- <i>a</i>
Phaeophytin <i>a</i>	Pha- <i>a</i>
Phycocyanin	Phy
Total Organic Carbon	TOC
Dissolved Organic Carbon	DOC
Volatile Suspended Solids	VSS
Total Suspended Solids	TSS
Total Nitrogen	TN
Nitrate and Nitrite Nitrogen	NO ₃ /NO ₂ -N
Ammonia Nitrogen	NH ₄ -N
Orthophosphate, soluble	o-PO ₄
Total Phosphate	TPO ₄
Microcystin	MC
<i>Microcystis aeruginosa</i>	Microcystis

Table 3: Field water quality parameters to be measured

Parameter	Instrument
Chlorophyll-a Fluorescence	YSI 6600
Phycocyanin (Blue-green algae) Fluorescence	YSI 6600
Turbidity	YSI 6600

Parameter	Instrument
Temperature	YSI 6600
Electrical conductivity (EC)	YSI 6600
Dissolved oxygen (DO)	YSI 6600
pH	YSI 6600

Table 4: Proposed sample sites for core upstream San Joaquin River monitoring plan to be sampled monthly in 2009 and 2010.

Site Number	Sample Station Name	Latitude	Longitude
4	SJR at Mossdale	37.78710	-121.30757
5	SJR at Vernalis-McCune Station	37.67936	-121.26504
6	SJR at Maze	37.64142	-121.22902
7	SJR at Patterson	37.49373	-121.08081
8	SJR at Crows Landing	37.43197	-121.01165
10	SJR at Lander Avenue	37.29424	-120.85125
12	Stanislaus River at Caswell Park	37.70160	-121.17719
14	Tuolumne River at Shiloh Bridge	37.60350	-121.13125
16	Merced River at River Road	37.35043	-120.96196
18	Mud Slough near Gustine	37.26250	-120.90555
19	Salt Slough at Lander Avenue	37.24795	-120.85194
20	Los Banos Creek Flow Station	37.27546	-120.95532
21	Orestimba Creek at River Road	37.41396	-121.01488
25	Modesto ID Main Drain	37.67026	-121.21904
28	Turlock ID Westport Drain	37.54196	-121.09408
29	Turlock ID Harding Drain	37.46427	-121.03093
30	Turlock ID Lateral 6 & 7 at Levee	37.39782	-120.97225
34	Ingram Creek	37.60026	-121.22506
36	Del Puerto Creek Flow Station	37.53947	-121.12206

Site Number	Sample Station Name	Latitude	Longitude
44	San Luis Drain End	37.26090	-120.90520
57	Ramona Lake Drain	37.47881	-121.06850

c. Subtask 4.3 – Survey water quality in the Old and Middle Rivers

UOP will conduct surveys of 303(d) listed areas of the Old and Middle Rivers to develop more information as to the extent of low DO conditions in those rivers. Data relevant to the DO TMDL collected in this area by DWR and other agencies will be compiled, analyzed, and included in the project data sets. Surveys will be conducted during periods of high temperature and low flow, to correspond with conditions most associated with low DO events. At least two surveys will be conducted. More surveys may be conducted as determined by the adaptive management program. Work conducted under this task will be directed at closing data gaps and will not replicate existing data collection efforts by DWR and other agencies.

d. Subtask 4.4 – Zooplankton distribution in the SJR estuary

In order to develop sufficient information on zooplankton density and distribution throughout the SJR estuary study area, samples for zooplankton analysis will be collected at key locations in the study area twice per month for June, July, August, and September in 2009 and 2010. Samples will be collected at high and low slack tides and at both day and night, to determine if there is a significant daily cycle in zooplankton abundance. At each sampling, vertical profiles and measurements for temperature, conductivity, pH, DO, turbidity, phycocyanin and chlorophyll fluorescence, and PAR will be made. Samples will be collected for analysis of the complete suite of WQ parameters as shown in Tables 2 and 3. Results of initial studies will be used in an adaptive management strategy to guide procedures and frequency of zooplankton sampling.

An initial investigation will be performed to determine the ability of “mid-point” sampling to estimate zooplankton population density in the SJR estuary to establish whether a single mid-depth sample is representative of the DWSC at a given location. The lateral and vertical distribution of algae and zooplankton in the DWSC will be determined at three locations in the DWSC, one station in the Turning Basin, and two in the river. The lateral and vertical sampling will be conducted during slack, ebb, and flood tide conditions. Approximately six (3 vertical at the thalweg and 3 lateral at mid-depth) samples will be collected at each location and analyzed for zooplankton. Samples for WQ analysis (Table 2) will be taken in conjunction with zooplankton sampling. Field measurements of temperature, conductivity, pH, DO, turbidity, phycocyanin, and chlorophyll fluorescence, and PAR will also be collected at each sampling location. Data will be analyzed to determine if mid-channel sampling is adequate for characterization of zooplankton in the DWSC. Results of this study will be used in the adaptive management program and sample collection procedures for zooplankton will be modified as necessary to collect representative samples.

To conduct the grazing studies zooplankton samples will be collected, concentrated, and then added to water samples from the DWSC and the SJR containing phytoplankton at natural concentrations. The collected water will be added to multiple 1-L polycarbonate microcosm bottles inoculated with serial dilutions of concentrated zooplankton ranging from approximately 1 to 50 times the natural zooplankton concentration. The microcosms will then be lowered in the water column to a depth well below the 1 percent PAR threshold defining the photic zone (approximately 10 ft). Retrieval of selected microcosms will be performed at 2 hour intervals for 6 hours. Samples collected at each interval will be analyzed for zooplankton biomass and extracted chlorophyll and pheophytin. Zooplankton grazing will be measured directly by

comparing changes in zooplankton, chlorophyll a, and pheophytin a as a function of time and initial zooplankton biomass concentration. Light-dark bottle experiments to assess algal productivity will also be performed at each of the sampling sites. Measurements of pH, DO, extracted chlorophyll and pheophytin before and after incubation under lighted conditions will be compared to respiration in dark bottles. Three trials will be performed initially and more will be periodically conducted to monitor changes in zooplankton grazing rates over the course of the two year study.

We will be collecting appropriate statistical and geospatial data to test the hypothesis that zooplankton distribution is predictable (e.g. there are sections of the river with consistently high zooplankton biomass concentrations) and that the distribution may be related to physical features of the river (ox-bows, etc).

e. Subtask 4.5 – Microcystis and blue green algae in the SJR estuary

Data on the spatial and temporal occurrence of Microcystis, blue green algae, and algal toxins (particularly microcystin) in the SJR estuary will be determined. Samples collected as part of monitoring activities will be analyzed for the presence or absence of Microcystis and the concentration of microcystin and phycocyanin. During zooplankton studies, samples will be collected for the analysis of Microcystis concentration as well as the concentration of microcystin and phycocyanin. Samples positive for microcystin by immuno-assay and samples with high blue green algae concentrations will be examined for the presence of other algal toxins using HPLC. Data on Microcystis, microcystin, and blue green algae concentrations collected as part of the zooplankton distribution study will be combined with data collected during the SJR estuary WQ monitoring study and used to provide an analysis of the temporal and spatial distribution of blue green algae and their toxins in the SJR estuary study area. Data on the occurrence and distribution of blue-green algae will be included into the DO TMDL Model, which is capable of modeling individual sub-groups of planktonic algae.

f. Subtask 4.6 – Coordination with other projects

This project will coordinate with other WQ and environmental studies in the area, particularly ongoing efforts by the DFG, IEP, DWR, and the USFWS to avoid duplication of effort and facilitate sharing of data. Data and information will be provided to other agencies as requested. Data collected as part of this effort will be made available to the Aeration Demonstration Project as requested. Sampling schedules will be made available and field activities will be coordinated with other agencies as possible.

g. Subtask 4.7 – Collect and compile data from other sources

Utilization of flow and water quality data from other sources is an important component of the DO TMDL Project. Project Investigators will combine data from past DO studies with publicly available data from the IEP, DWR, and other programs. Data will be included in the model and in independent scientific and engineering analysis.

Flow data will be collected from existing flow-measurement stations maintained by other agencies. For each station, all available data will be compiled to maintain a complete record of minimum, maximum, and average daily flow for the entire study period. Diversion flow rates from major SJR diverters such as West Stanislaus Irrigation District (ID), Patterson ID, and Banta Carbona ID are recorded by individual districts. Diversion data will be provided to EERP by cooperating water districts. EERP personnel will visit water districts and copy or transcribe written records as requested by cooperating water districts.

Water quality data from prior studies and other sources will be collected and included in the model and scientific analysis. Data from prior DO TMDL projects will be collected and analyzed. The City of Stockton and DWR have an extensive record of data collection in the SJR estuary

study area. Data from past studies and ongoing studies will be collected and compiled for input to the estuary model database. Available water quality data from prior monitoring and surveys of Old River and Middle River will be collected and compiled for the purpose of determining the extent of the record in these sections of the Delta and to help guide future activities in these reaches. All available, relevant water quality data that can be found will be included in the analysis.

Zooplankton data from previous delta studies will be compiled and included in the model and scientific analysis. Zooplankton abundance has been monitored (by DFG and IEP programs) at two sites within the proposed study area: Disappointment Slough near Bishop Cut and SJR at Buckley Cove. All available zooplankton data from IEP, DFG, or other sources will be compiled and incorporated into the database to aid in modeling and data analysis, as possible.

h. Subtask 4.8 – Data analysis and interpretation

Prior experience with the Up-Stream DO TMDL Project has shown that insufficient resources have been directed at both analysis of new data and reevaluation of data collected in prior studies. In this project, data from prior studies will be combined with data from new studies for analysis. Trends in water quality and flow will be evaluated using combinations of historic and new data sets. Statistical analysis of data will be conducted as was done for prior studies (for examples see reports posted on www.eerp-pacific.org). Results of these analyses will be included in the final report.

i. Task 4 Deliverable(s)

An annual technical report for Task 4 will be written each year. The reports will include tables of all data collected during the year (as appendices), as well as a thorough evaluation of the data in terms of program objectives and the study questions posed. Photo-documentation of field activities will be provided. The reports will also include recommendations for modifications to the program the following year, based on an evaluation of the results from other tasks. The final technical report will include a detailed evaluation of all data collected.

5) Task 5 – Modeling

A key component of the SJR-WARMF model is the model interface which allows stakeholders to access the model. Systech will provide training in the use of the interface to the Regional Board and the DFG. Systech will incorporate a post-processing component to the interface that will allow estimation of load allocations (Gowdy Output). Systech will perform other work associated with the updating and maintenance of the model interface.

a. Subtask 5.1 – Maintenance and Support of San Joaquin River Model Interface

Systech shall update the Model Interface to incorporate data collected in the upstream SJR area as part of this project and other available data, including measured flow and water quality, meteorology, air quality, diversions, and point sources. With the incorporated data, the model will be capable of simulating the San Joaquin River and DWSC from 10/1/1999 through 9/30/2009.

The SJR-WARMF model interface will be modified to include a post-processing subroutine that will assist in using the model for load allocations. Systech shall update the Model Interface to include new built-in tools for visualization of model output. The tools shall be capable of graphically displaying the individual sources of any constituent in the water at any location and on any day of the model simulation period. There will be longitudinal display of output showing changes occurring as water flows downstream.

During the project, Systech shall support the use of the Model Interface by other investigators. This includes providing updates of the Model Interface for download on an FTP site and providing

technical support. In the first year of the project, Systech will assist the Regional Board and DFG with understanding the operation and inner workings of WARMF so that the Regional Board and DFG can better participate and provide input during the project.

b. Subtask 5.2 – Focused Agricultural Drainage Study

Where it enters the Delta downstream of Vernalis, the San Joaquin River contains a mixture of clean water sources from the Sierra Nevada and pollutant load from local agricultural drainage which is then transformed as the river flows downstream. Monitoring data accounts for tributary inflows to the San Joaquin River and the net flow and pollutant loading at Vernalis. WARMF accounts for the differences between river inputs and outputs by simulating the diffuse subsurface flow from agriculture which enters the San Joaquin River and the transformations which occur in the river. While the agricultural loading is accounted for by WARMF on a broad scale throughout the river basin, there are currently no specific locations where WARMF calculations of agricultural drainage can be compared directly with monitoring data.

The WARMF model domain will be expanded under this task to include the Orestimba Creek watershed in order to simulate the inflows to the San Joaquin River. Extensive flow and water quality data has been collected at two sites which can be used for model calibration. The area between the upstream station and the downstream station is under intensive agricultural use, so the model simulation of drainage from the agricultural lands can be tested directly. The model will be then able to demonstrate how specific agricultural practices, and changes in those practices, affect pollutant loading.

c. Subtask 5.3 – Modification of WARMF and Link-Node Model Domains

The Link-Node model domain will be extended upstream of Mossdale to the limit of tidal influence. The Model Interface will be modified to transfer flow and water quality from WARMF to the Link-Node model at the new interface point. Since the Link-Node model will extend upstream of the split at the Old River, the Link-Node model will be modified to accept a time series of diverted water as an input. To balance the remaining flow passing the Old River with the measured flow at Garwood Bridge in Stockton, estimates will be made of the agricultural diversions and return flows which occur between the Old River and Stockton. The outflows and inflows will be time series inputs to the Link-Node model.

d. Subtask 5.4 – Simulation of Local Delta Nonpoint Source Loading

Simulations of shallow groundwater and non-point source pollution loadings will be added to the tidal-estuary portion of the DO TMDL Model. To account for the agricultural drainage and urban runoff from Stockton, WARMF catchments will be added to the Model Interface adjacent to the Link-Node model and its tributaries in the Delta. Those WARMF catchments will simulate the flow and loading coming from the various land uses in the area and provide the results as inputs to the Link-Node model. In addition to the lands immediately adjacent to the San Joaquin River and DWSC, the watersheds included are the French Camp Slough / Lone Tree Creek / Littlejohns Creek, Mormon Slough, the Calaveras River downstream of New Hogan Reservoir, and Fourteen Mile Slough.

e. Subtask 5.5 – Calibration of Delta Sloughs in the Model

The Link-Node model will be calibrated using data collected in Task 4. Concurrent with data collection efforts, the Link-Node model will undergo calibration for locations off of the main stem of the San Joaquin River, including French Camp Slough, Mormon Slough, Burns Cutoff, Calaveras River, Disappointment Slough, Fourteen Mile Slough, and Turner Cut. Parameters to be calibrated include temperature, EC, ammonia, nitrate, phosphate, suspended sediment, phytoplankton, and dissolved oxygen. Parameters for the modeling of blue green algae

independently of phytoplankton will be included and calibrated against blue green algae concentration as measured in Task 4.

f. Subtask 5.6 – Simulation of Zooplankton Dynamics in the Link-Node Model

Numerical code to describe the zooplankton grazing and distribution will be added to the DO TMDL Model. For this task, the Link-Node model will be modified to simulate the population dynamics of multiple types of zooplankton. Since it is expected that zooplankton concentration will vary greatly in different sections of the river, the modeling will take this into account by being able to represent the conditions influencing zooplankton abundance independently for individual river nodes in the model. Instead of having model coefficients which are uniform over the tidal portion of the San Joaquin River, the model will be modified in such a way so that these coefficients are set for each node. This has already been included in the budget estimate for simulating zooplankton. The modeling component will work closely with Task 4 PIs to determine a set of mathematical equations which describe the behavior of each type of zooplankton. Data for zooplankton populations will be entered into the Model Interface to calibrate the Link-Node model.

g. Task 5 Deliverable(s)

The following deliverables will be submitted under Task 5:

- 1) Yearly report including updated WARMF-SJR model and supporting data. This will include electronic files containing the complete models, model coefficients, time series data, and simulation results. This deliverable will be prepared and delivered by Systech Water Resources each year.
- 2) Focused Agricultural Drainage Study Report. This will summarize the data, assumptions, model input coefficients used, and model simulation results for the modeling study of Orestimba Creek. This report will be prepared and delivered by Systech Water Resources at the end of year two.
- 3) Delta Model Calibration Report. This will document the modifications made to simulate the tributary watersheds of the Link-Node model domain, the model algorithms used to simulate zooplankton, and the results of the model calibration. This report will be prepared and delivered by Systech Water Resources at the end of year two.

6) Task 6 – Adaptive Management, Meeting Attendance, and Outreach

a. Subtask 6.1 – PI meetings

Scientists who are active in current efforts surrounding the low DO condition of the DWSC and principal investigators from prior DO directed action projects will be invited to attend technical meetings where the results of this project will be discussed and reviewed. PI meetings will be held where project participants present and discuss their results and ideas. As part of the adaptive management process, scientists and engineers who are not project PIs, including those who participated in prior DO TMDL directed actions, will be invited to participate in PI meetings, to review progress on the model, and to discuss data collection activities. Other scientists from different disciplines, including estuary biologists, will be identified and invited to participate in PI meetings and DO TWG meetings. These scientists will be encouraged to test the posted updates of the SJR model. These scientists and engineers will also be asked to review documents and reports, as appropriate. As necessary, subcontracts will be written to individual technical experts to cover time and expenses as per Task 6 budget description. The results from the PI meetings will be used in the adaptive management process.

b. Subtask 6.2 – DO TMDL TWG meetings

Project PIs will attend DO TMDL Technical Working group meetings. An important component of the development of a scientific DO TMDL is the participation of stakeholders in the collection of data and the review of model development. Annual reports completed under Tasks 4 and 5 will be presented to the TWG for review and evaluation as part of the on-going performance evaluation and adaptive management process.

c. Subtask 6.3 – Other meetings

Technical presentations of project results will be made to stakeholders, including the Regional Board, and presentations will be made at regional and national scientific meetings. As has been the practice in prior studies, the Chief PI and the project PIs will accommodate requests to attend meetings and present project results at technical and administrative meetings. Presentations will be made to the DFG, the Regional Board, the State Board, CalFed, or any other state agency requesting information. The results from these meetings will be used in the adaptive management process.

d. Subtask 6.4 – Coordination with DFG

The DFG has expressed interest in using DO TMDL Project data to support Delta restoration efforts. The DFG is also interested in the application of the SJR models to other restoration and WQ activities. As part of the adaptive management process, meetings will be held with DFG scientists and administrators for the purpose of exchanging information between project PIs and the DFG, coordinating field activities between the project and DFG, educating DFG about model capabilities, discussing the modeling needs of the DFG, and other scientific purposes.

e. Subtask 6.5 – Adaptive Management

Adaptive management was a key component of the Upstream DO TMDL Project and will be an important component of this project. On-going, internal scientific review will insure the proper allocation of project effort and resources to answer the most pressing scientific questions. The application of the adaptive management process will insure the maximum possible success in resolving scientific issues surrounding the development of a DO TMDL for the San Joaquin River.

At the end of each year, reports will be prepared that include results and analysis from the previous year, and distributed to project participants and cooperating organizations. Copies will be provided to DFG scientists and administrators. Comments and ideas will be solicited for the project as part of the adaptive management process. Any recommendations made for how project activities for the coming year can be improved will be considered. Comments from the TWG will be reviewed. Data collected the previous season will be analyzed. New priorities may be set for the coming summer. In this manner, an adaptive management plan will be instituted to narrow the focus of effort to the most critical areas of scientific investigation.

The adaptive management process will include, but is not limited to, the following:

If monitoring results identify tributaries or sub-watershed areas with high loads of oxygen-demanding substances, additional focused monitoring may be conducted upstream in that area to identify specific sources.

If review of monitoring results from this program, previous data, and data being collected under other programs indicate a need for additional winter monitoring, then more winter sampling events may be planned.

If coordination with other monitoring programs indicates a duplication of data collection efforts, the monitoring program will be structured so that sample collection activities, and possibly laboratory analysis and cost, will be shared. This restructuring would also require coordination of QA/QC practices.

If review of data indicates that some tributaries or sub-watershed areas contribute insignificant amounts of flow or load, elimination of those stations from future sampling efforts will be considered.

f. **Task 6 Deliverable(s)**

Summary reviews of all meetings and list of attendees will be provided in the quarterly reports delivered in Task 1.

7) **Task 7 – Draft and Final Report**

a. **Subtask 7.1 – Prepare Draft Final Report**

The objective of Task 7 is to produce a concise report that summarizes and explains the major findings of the overall project in a manner that is useful to stakeholders, regulators, scientists, and others who are interested in the outcome of the DO TMDL studies conducted as part of this project.

The Final Report will include a suggested long-term, streamlined watershed (upstream and estuary) monitoring plan with the objective of assessing compliance with any TMDL allocations, and associated improvements in water quality. Data and findings from previous studies will be incorporated and referenced in the Draft Final and Final reports as applicable. The report will discuss the sources of load in the watershed and how these sources are incorporated into the model.

Task PIs will write annual reports for Task 4 and 5 that will contain a complete description of all work accomplished in the previous year. These reports will be reviewed and a Summary Report will be written to summarize the finding of the overall research program in a concise document convenient for reference by stakeholders, regulators, scientists, and other interested parties.

b. **Task 7 Deliverable(s)**

After the completion of the final year of field study (December 2010) a Draft Final Project Report will be written and delivered to DFG for review. Reviewer comments will be received and incorporated in to a Final Project Report. An electronic data deliverable, including all project data will be delivered at the completion of the project.

8) **Task 8 – Project Close-Out**

The Contractor shall submit a Project Close-Out Summary Report to summarize the project accomplishments. The format is attached to the Agreement as Exhibit A – Attachment 4, “Project Close-out Summary Report”.

The Contractor shall submit a Final Invoice for payment, with separate delineation for payout of 10 percent (10%) retention.

a. **Task 8 Deliverable(s)**

The Contractor shall submit a Project Close-Out Summary Report and Final Invoice. Deliverables are listed in Exhibit A – Attachment 1, “Schedule and List of Deliverables”.

B. SCHEDULE OF COMPLETION DATES

The Contractor agrees to work with the ERP Contract Manager to submit all scheduled project deliverables in accordance with the schedule set forth in this Agreement and shown as Exhibit A –

Attachment 1, "Schedule and List of Deliverables". In the event the Contractor anticipates any delay in submitting project deliverables as scheduled, the Contractor shall inform the ERP Contract Manager in writing prior to the scheduled due date of the subject deliverable. Failure to adhere to the terms in this agreement may result in termination of this Agreement, per the guidelines set forth in Exhibit C, "California Standard Contract Language", Paragraph 7 (www.ols.dgs.ca.gov/standard+language; GTC 306).

In the event the Contractor anticipates the project cannot be completed within the period of this Agreement, the Contractor shall request in writing, an amendment extending the term of the Agreement a minimum of at least six (6) months prior to current Agreement end date. A written request to extend the term of the Agreement must be submitted and shall state the reason for the request and include a revised Schedule and List of Deliverables with revised completion dates. All amendment requests shall be approved by the ERP Program Management.

C. REPORTS

- 1) The first Quarterly Progress Report shall be submitted to the ERP Contract Manager within thirty (30) days following each quarterly month following Agreement execution and for the term of this Agreement.
- 2) The Contractor shall provide a written report containing the following information on each Quarterly Progress Report:
 - List of activities and Tasks performed and/or completed;
 - List and record of milestones accomplished and/or completed;
 - List of problems encountered while performing the Task(s) and proposed solutions; and
 - List of proposed activities and Tasks for the following quarter.
- 3) The Contractor shall submit to the ERP Contract Manager for approval any and all reports, plans, or other deliverables containing the results of the work performed in accordance with Exhibit A – Attachment 1, "Schedule and List of Deliverables".
- 4) The project will not be considered complete until the ERP Contract Manager approves and accepts the Project Close-Out requirements as complete and final.
- 5) The Contractor is required to submit project information as follows: All informational products (e.g. data, studies, findings, management plans, manuals, photos, etc.) relating to California's natural environment and produced with the use of public funds shall be cataloged in the California Environmental Information Catalog (<http://gis.ca.gov/catalog/>) maintained by the CERES Program (<http://www.ceres.ca.gov/>).

**EXHIBIT A – ATTACHMENT 1
 SCHEDULE AND LIST OF DELIVERABLES
 San Joaquin River Dissolved Oxygen
 Total Maximum Daily Load Project**

Task No.	Task Title	Deliverables	Estimated Completion Dates
1	Project Management and Administration 1.2 Quarterly Progress Reports 1.3 Quarterly Invoices 1.4 Subcontractor Selection 1.5 Data Management	Quarterly Progress Reports Quarterly Invoices Subcontractor draft subcontract related subcontractor selection documentation All data generated by the project for input into the DFG data system	Due within thirty (30) days following each quarterly month following Agreement execution. Due within thirty (30) days following each quarterly month following Agreement execution. Due with Quarterly Progress Reports.
2	Environmental Compliance and Permitting 2.1 CEQA/NEPA Compliance 2.2 Other Required Permits and Approvals	All required documentation for compliance with CEQA/NEPA, and written authorizations for property access	Within six months of Agreement execution.
3	Quality Assurance Project Plan	Quality Assurance Project Plan	Within six months of Agreement execution.
4	Data Collection and Distribution 4.1 Water Quality and Flow Data from the Upstream SJR Study Area 4.2 Collection of Water Quality, Flow, and Other Data from the SJR Estuary Study Area 4.3 Survey Water Quality in the Old and	Annual technical report including tables of all data collected and a thorough evaluation of the data in terms of program objectives and the study questions posed. Photo-documentation of field activities; and recommendations for modifications to the program for the following year.	Annually beginning 12 months of Agreement execution.

Task No.	Task Title	Deliverables	Estimated Completion Dates
	Middle Rivers 4.4 Zooplankton Distribution in the SJR Estuary 4.5 Microcystis and Blue Green Algae in the SJR Estuary 4.6 Coordination with Other Projects 4.7 Collect and Compile Data from Other Sources 4.8 Data Analysis and Interpretation		
5	Modeling 5.1 Maintenance and Support of San Joaquin River Model Interface 5.2 Focused Agricultural Drainage Study 5.3 Modification of WARMF and Link-Node Model Domains 5.4 Simulation of Local Delta Nonpoint Source Loading 5.5 Calibration of Delta Sloughs in the Model 5.6 Simulation of Zooplankton Dynamics in the Link-Node Model	Yearly report including updated WARMF-SJR model and supporting data as electronic files containing the complete models, model coefficients, time series data, and simulation results. Focused Agricultural Drainage Study Report summarizing the data, assumptions, model input coefficients used, and model simulation results for the modeling study of Orestimba Creek. Delta Model Calibration Report documenting modifications made to simulate the tributary watersheds of the Link-Node model domain, the model algorithms used to simulate zooplankton, and the results of the model calibration	Annual delivery beginning within 12 months of Agreement execution. Within 24 months of Agreement execution. Within 24 months of Agreement execution.

Task No	Task Title	Deliverables	Estimated Completion Dates
6	6.1 PI Meetings 6.2 DO TMDL TWG Meetings 6.3 Other Meetings 6.4 Coordination with DFG 6.5 Adaptive Management	Summary reviews of all meetings and list of attendees to be provided in quarterly reports.	Quarterly; Included as part of the progress reports submitted under Task 1.
7	Draft and Final Project Reports	Draft Final Report Final Project report	Delivered two months before final report. Last day of agreement
8	Project Close-Out	Project close-out summary report and final invoice	Last day of agreement

**EXHIBIT A – ATTACHMENT 2
SAMPLE QUARTERLY PROGRESS REPORT FORM
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project**

**QUARTERLY PROGRESS REPORT
AS OF JANUARY 2009**

Date: _____

Agreement No.: _____

Agreement Term: _____

Project Title: _____

Contractor: _____

FISCAL REPORT

Total Original Agreement Amount Awarded: _____

Current Total Agreement Amount:
(Applicable only if Agreement has been amended) _____

Total Amount Invoiced as of June 30, 2009: _____

Total Amount Invoiced to Cost-Share Partners: _____

Total Agreement Funds Remaining: _____

Total Amount Held in Retention: _____

PROGRAM/TECHNICAL REPORT

Activities Performed from January to June 30, 2009:

Insert narrative or bulleted list of activities performed.

Percentage of Task Completed as of June 30, 2009:

List Primary Tasks (see sample below – List all tasks shown in Scope of Work).

Task 1 – Project Management and Administration	<u>10%</u>	
Task 2 – Public Participation	<u>15%</u>	etc.

Deliverables Completed for Each Task:

List Primary Tasks (see sample below).

Task 1 – Project Management and Administration

- 1) Quarterly Invoice
- 2) Quarterly Progress Report etc.

Task 2 – Public Participation

- 1) Pre-meeting materials (attached)
- 2) Public notice (attached) etc.

Problems/Delays Proposed Resolution:

Insert narrative here.

Description of Amendments and Modifications to Agreement:

Insert narrative here. If applicable attach a copy of completed amendment justification and outcome of request for amendment. See Exhibit A – Attachment 3, “ERP Amendment Guidelines” for specific and detailed information.

**EXHIBIT A - ATTACHMENT 3
ERP AMENDMENT GUIDELINES
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project**

The Contractor shall include the following in all Amendment Request letters:

For Level 2 or 3 Amendment Requests, the recipient should attend the Amendment Workshop to present their request and answer any questions.

1. Exactly what is being requested?
 - Budget change (provide a detailed budget table by Task, line item and year),
 - Scope change, and
 - Time extension (if a time extension is requested, clearly state, the number of months requested, the previous Agreement expiration date and the proposed new Agreement expiration date).
2. Provide a complete but brief summary of the history of the Agreement and previous amendments.
 - a. Example: In (year), the (contracting agency, i.e., Resources Agency, Bureau of Reclamation, etc.) awarded an Agreement of (total dollar amount of original award) to the (recipient organization), to (one phrase description of the work to be completed). This Agreement was amended in (month) of (year) to (increase budget, change scope or extend the Agreement). If a previous amendment extended this Agreement period, include number of months and new end date (month, date, and year). The purpose of the amendment was to (one sentence description of why the amendment was requested).
 - b. Reason(s) for request (justification).
3. Is there any cost share associated with this amendment? If so, briefly describe, including the amount and contributing agency(s).
4. If there is a change in the Scope of Work, explain why the requested amendment falls within the parameters of the approved project and is not a new project.
5. What is the current project status?
6. For projects requiring environmental review and/or permits, what review and approvals have occurred to date? Does the requested amendment impact the ongoing review and approval process or timeline?
7. How does the project, as amended, continue to fall within the CALFED Program goals?
8. If applicable, discuss any adaptive management aspects of the proposed amendment, e.g., review or assessment by an advisory committee.
9. For a change in property to be acquired, indicate total acreage involved, current land use, e.g., is it currently in active agriculture, current zoning designation and proposed use for acreage.
10. If the requested amendment ultimately gets denied, how will the project be changed to work within the existing budget or time, i.e., what are the consequences of not funding the amendment?

**EXHIBIT A – ATTACHMENT 4
PROJECT CLOSE-OUT SUMMARY REPORT
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project**

The San Joaquin River Dissolved Oxygen Total Maximum Daily Load Project is identified as Contract Agreement No. <Insert Grant No.> The ERP is the principal component of the CALFED Plan designed to restore the ecological health of the Bay-Delta ecosystem.

Project Background Information:

Including, but not limited to: History; purpose of project and goals; precise location; ERP region and ecozone; map of project location; etc.

Objectives:

Including, but not limited to: Hypotheses tested; relationship to ERP goals; proposed work; etc.

Results and Findings:

Including, but not limited to: What was actually implemented or performed; expected outcomes and actual outcomes; data obtained/measured during the course of the project and why; electronic and paper reports and summaries of calculated findings; etc.

Conclusions/Recommendations:

Including, but not limited to: What worked, what didn't work; will monitoring of project continue and how; total cost and time to complete project; how will information gained be used and disseminated; are other phases of this project planned; etc.

EXHIBIT B
INVOICING AND PAYMENT PROVISIONS
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project

1. Invoicing and Payment

- A. For services rendered in accordance with the Scope of Work and accepted by the Contract Manager, the State agrees to compensate the Contractor upon receipt of an invoice for actual expenditures incurred in accordance with the rates specified herein.
- B. The Contractor shall be paid quarterly in arrears, upon submission of an original and two (2) copies of the invoice, which properly details all charges, expenses, and direct and indirect costs.

The original invoice and one (1) copy shall be submitted to:

ERP Contract Manager:
Mary Menconi
Department of Fish and Game
830 S Street
Sacramento, CA 95811-7023
Phone: 916/445-0074
Fax: 916/445-1168
Email: mmenconi@dfg.ca.gov

One (1) copy of the invoice shall be submitted to:

ERP Administration
Water Branch
Department of Fish and Game
830 S Street
Sacramento, California 95811
Phone: (916) 445-0970
Fax: (916) 445-1768

- C. The original and one (1) approved copy of the invoice will be forwarded to Department of Fish and Game's Accounting Claims Section by the Contract Manager. Payment for services of any invoice will be made only after receipt of a supported, properly documented and accurately addressed invoice. Failure to use the address exactly as provided above, may result in the return of the invoice to the Contractor. All invoices must be approved by the Contract Manager.
- E. Payments made prior to satisfactory completion of all work required by the Agreement shall not exceed, in the aggregate, ninety percent (90%) of the total earned with the balance to be paid upon satisfactory completion of the task or Agreement, and provided further, that the Department of Fish and Game shall retain from the Contractor's earnings for each period for which payment is made, an amount equal to ten percent (10%) of such earnings, pending satisfactory completion of the task or Agreement.
- F. The invoice shall contain the following information:
 - 1. The word "Invoice" should appear in a prominent location at the top of the page(s);
 - 2. Printed name of the Contractor;
 - 3. Business address of the Contractor including P.O. Box, City, State, and Zip Code;

4. Name of the Region/Division/Branch of the Department of Fish and Game being billed;
5. The date of the invoice and the time period covered;
6. The number of the agreement upon which the claim is based; and
7. An itemized account of the services for which the Department of Fish and Game is being billed. Include all of the following:
 - a. The time period covered by the invoice, i.e., the term "from" and "to";
 - b. A description of the services performed as specified in the Scope of Work;
 - c. A method for computing the amount due:

Line item budget/cost reimbursement method

Payments will be made by the State to the Contractor, in arrears, upon receipt of an itemized invoice showing the time period covered and the work items accomplished. The invoice must be itemized using the categories and following the format of the attached budget;

- d. The total amount due. This should be in a prominent location in the lower right-hand portion of the last page and clearly distinguished from other figures or computations appearing on the invoice; the total amount due shall include all costs incurred by Contractor under the terms of this agreement; and
- e. The original signature of the Contractor (not required of established firms or entities using preprinted letterhead invoices).

2. Contract Written Prior to Approval of the Budget Act/Budget Contingency Clause

- A. It is mutually understood between the parties that this agreement may have been written prior to approval of the Budget Act for the mutual benefit of both parties in order to avoid program and fiscal delays.
- B. This agreement is valid and enforceable only if sufficient funds are made available by the Budget Act for the Fiscal Year(s) involved for the purposes of this program. In addition, this agreement is subject to any additional restrictions, limitations, or conditions enacted by the Legislature and contained in the Budget Bill or any statute enacted by the Legislature which may affect the provisions, terms, or funding of this agreement in any manner.
- C. It is mutually agreed that if the Budget Act of the current year and/or any subsequent years covered under this Agreement does not appropriate sufficient funds for the program, this Agreement shall be of no further force and effect. In this event, the State shall have no liability to pay any funds whatsoever to the Contractor or to furnish any other considerations under this Agreement and the Contractor shall not be obligated to perform any provisions of this Agreement.
- D. If funding for any fiscal year is reduced or deleted by the Budget Act for purposes of this program, the State shall have the option to either cancel this Agreement with no liability occurring to the State, or offer an agreement amendment to the Contractor to reflect the reduced amount.

3. Prompt Payment Clause

Payment will be made in accordance with, and within the time specified in Government Code Chapter 4.5, commencing with Section 927.

4. Budget Flexibility

Subject to the prior review and approval of the Contract Manager, line item shifts of up to \$25,000 or ten percent (10%) of the annual contract total, whichever is less, may be made up to a cumulative maximum of \$50,000 per fiscal year. Line item shifts may be proposed/requested by either the State or the Contractor in writing and must not increase or decrease the total contract amount allocated per fiscal year.

DEPARTMENT OF FISH AND GAME

EXHIBIT D

**ADDITIONAL PROVISIONS
FOR THE
ECOSYSTEM RESTORATION PROGRAM**

1. **LICENSES AND PERMITS (If Applicable)** ~ The Contractor shall be an individual or firm licensed to do business in California and shall obtain, at his/her expense, all licenses and permits required by law for accomplishing any work required in connection with this Agreement.

If you are a Contractor located within the State of California, a business license from the City/County in which you are headquartered is necessary; however, if you are a corporation, a copy of your incorporation documents/letters from the Secretary of State's Office can be submitted. If you are a Contractor outside the State of California, you will need to submit to the DFG, a copy of your business license or incorporation papers for your respective State showing that your company is in good standing in that State.

In the event any licenses and/or permits expire at any time during the term of this Agreement, Contractor agrees to provide the DFG a copy of the renewed licenses and/or permits within thirty (30) days following the expiration date. In the event the Contractor fails to keep in effect, at all times, all required licenses and permits, the State may, in addition to any other remedies it may have, terminate this Agreement upon occurrence of such event.

2. **RIGHTS IN DATA** ~ The Contractor agrees that all data, plans, drawings, specifications, reports, computer programs, operating manuals, notes and other written or graphic work produced in the performance of this Agreement, are subject to the rights of the State as set forth in this section. The State shall have the right to reproduce, publish, and use all such work, or any part thereof, in any manner and for any purposes whatsoever and to authorize others to do so. If any such work is copyrightable, the Contractor may copyright the same, except that, as to any work which is copyrighted by the Contractor, the State reserves a royalty-free, nonexclusive and irrevocable license to reproduce, publish, and use such work, or any part thereof, and to authorize others to do so.
3. **SETTLEMENT OF DISPUTES** ~ Unless otherwise provided in this Agreement, any dispute concerning a question of fact arising under this Agreement which cannot be resolved informally, shall be decided by the following two (2) step procedure:
- a. The Contractor must provide written notice of the particulars of such disputes to the DFG Contract Manager or appointed representative. The DFG Contract Manager must respond, in writing, within ten (10) working days of receipt of the written notice of dispute. Should the Contractor disagree with the DFG Contract Manager's decision, the Contractor may appeal to the second level. Pending the decision on appeal the Contractor shall proceed diligently with the performance of this Agreement in accordance with the DFG Contract Manager's decision.
 - b. The second level appeal must indicate why the DFG Contract Manager's decision is unacceptable, attaching it to the Contractor's original statement of the dispute with supporting documents, and a copy of the DFG Contract Manager's response. This letter of appeal shall be sent to the Department of Fish and Game, Deputy Director, or duly appointed representative. The second level appeal must be filed within fifteen (15) working days upon receipt of the DFG Contract Manager's decision. Failure to submit an appeal within the period specified shall constitute a waiver of all such rights to an adjustment of this Agreement. The Deputy Director, or designee, shall meet with the Contractor to review the issues raised. A written decision signed by the Deputy Director or designee, shall be returned to the Contractor within fifteen (15) working days of the receipt of the appeal. The decision of the Deputy Director, or designee, will be final.
4. **INCOME RESTRICTIONS** ~ The Contractor agrees that any refunds, rebates, credits, or other amounts (including any interest thereon) accruing to or received by the Contractor under this Agreement shall be paid by the Contractor to the State, to the extent that they are properly allocable to costs for which the Contractor has been reimbursed by the State under this Agreement.

5. **CONFIDENTIALITY OF DATA** ~ All financial, personal, technical, and other data and information relating to the California State Department of Fish and Game operations which are designated confidential by the California State Department of Fish and Game, and made available to the Contractor in order to carry out this Agreement, or which becomes available to the Contractor in carrying out this Agreement shall be protected by the Contractor for the protection of the Contractor's data and information are deemed by the California State Department of Fish and Game's confidential information, such methods and procedures may be used, with written consent of the California State Department of Fish and Game, to carry out the intent of this paragraph. The Contractor shall not be required under the provisions of this paragraph, to keep confidential any data or information which is or becomes publicly available, is already rightfully in the Contractor's possession, is independently developed by the Contractor outside the scope of this Agreement or is rightfully obtained from third parties.
6. **DISABLED VETERAN BUSINESS ENTERPRISE (DVBE) PARTICIPATION REQUIREMENTS** ~ The Contractor agrees to use DVBE subcontractors or suppliers originally identified by the Contractor, unless the Contractor requests substitution, in writing beforehand to the DFG Contract Manager and the DFG Contract Manager has approved such substitution. At a minimum, the request must include:
 - a. A written explanation of the reason for the substitution; and
 - b. The identity of the person or firm substituted.

The request and the DFG Contract Manager's approval is not to be construed as an excuse for noncompliance with any other provision of law, including but not limited to the subletting and subcontracting Fair Practices Act or any other Agreement requirements relating to the substitution of subcontractors. Failure to adhere to at least the level of participation for DVBE proposed by the Contractor may be cause for Agreement termination and recovery of damages under the rights and remedies due the State.
7. **DISCLOSURE REQUIREMENTS** ~ Any document or written report prepared in whole or in part pursuant to this Agreement shall contain a disclosure statement indicating that the document or written report was prepared through an Agreement with the State. The disclosure statement shall include the Agreement number and dollar amount of all Agreements and subcontracts relating to the preparation of such documents or written reports. The disclosure statement shall be contained in a separate section of the document or written report.

If the Contractor or subcontractor(s) are required to prepare multiple documents or written reports, the disclosure statement may also contain a statement indicating that the total Agreement amount represents compensation for multiple documents or written reports. The Contractor shall include in each of its subcontracts for work under this Agreement, a provision which incorporates the requirements stated within this section.
8. **USE OF SUBCONTRACTOR(S)** ~ If the Contractor desires to accomplish part of the services through the use of one (1) or more subcontractors, the following conditions must be met:
 - a. The Contractor shall submit any subcontracts to the State for approval prior to starting any of the work;
 - b. The Agreement between the primary Contractor and the subcontractor must be in writing;
 - c. The subcontract must include specific language which establishes the rights of the auditors of the State to examine the records of the subcontractor relative to the services and materials provided under the Agreement; and
 - d. Upon termination of any subcontract, the State shall be notified immediately, in writing.

Further, any subcontract in excess of \$100,000 entered into as a result of this Agreement shall contain all applicable provisions stipulated in this Agreement.
9. **POTENTIAL SUBCONTRACTOR(S)** ~ Nothing contained in this Agreement or otherwise shall create any contractual relation between the State and any subcontractor(s) and no subcontract shall relieve the primary Contractor of its responsibilities and obligations hereunder. The Contractor agrees to be as fully responsible to the State for the acts and omissions of its subcontractor(s) and of persons directly employed or indirectly employed by any of them as it is for the acts and omissions of persons directly employed by the Contractor. The Contractor's obligation to pay its subcontractor(s) is an independent obligation from the State's obligation to make payments to the primary Contractor. As a result, the State shall have no obligation to pay or to enforce the payment of any monies to any subcontractor.

10. **TRAVEL AND PER DIEM** ~ The Contractor agrees that all travel and per diem paid its employees under this Agreement shall be at rates not to exceed those amounts paid to the State's represented employees under collective bargaining agreements currently in effect. No travel outside the State of California shall be reimbursed unless prior written authorization is obtained from the State.
11. **NOVATION** ~ If the Contractor proposes any Novation Agreement, the State shall act upon the proposal within sixty (60) days after receipt of the written proposal. The State may review and consider the proposal, consult and negotiate with the Contractor, and accept or reject all or part of the proposal. Acceptance or rejection may be made orally within the sixty (60) day period, and confirm in writing within five (5) days. No Novation Agreement shall become operative or otherwise binding on the State pursuant to this paragraph in the absence of a formal Novation Agreement amendment which has been approved in accordance with all applicable State policy, laws and procedures.
12. **LIABILITY INSURANCE (JANITORIAL, PORTABLE TOILET RENTAL, ETC.)** ~ When the Contractor submits a signed Agreement to the State, the Contractor shall furnish to the State, a certificate of insurance stating that there is liability insurance presently in effect for the Contractor of not less than \$1,000,000 per occurrence for bodily injury and property damage liability combined.

The certificate of insurance will include provisions a, b, and c, in their entirety:

- a. The insurer will not cancel the insured's coverage without thirty (30) days prior written notice to the State;
- b. The State of California, its officers, agents, employees, and servants are included as additional insured, by insofar as the operations under this Agreement are concerned; and
- c. The State will not be responsible for any premiums or assessments on the policy.

The Contractor agrees that the bodily injury liability insurance herein provided for, shall be in effect at all times during the term of this Agreement. In the event said insurance coverage expires at any time or times during the term of this Agreement, Contractor agrees to provide, prior to said expiration date, a new certificate of insurance evidencing insurance coverage as provided for herein for not less than the remainder of the term of the Agreement, or for a period of not less than one (1) year. New certificates of insurance are subject to the approval of the Department of General Services, and the Contractor agrees that no work or services shall be performed prior to giving of such approval. In the event the Contractor fails to keep in effect, at all times, insurance coverage as herein provided, the State may, in addition to any other remedies it may have, terminate this Agreement upon occurrence of such event.

The Department of Fish and Game will not provide for, nor compensate the Contractor for any insurance premiums or costs for any type or amount of insurance. The insurance required above, shall cover all Contractor supplied personnel and equipment used in the performance of this Agreement. If subcontractors performing work under this Agreement do not have insurance equivalent to the above, the Contractor's liability shall provide such coverage for the subcontractor, except for coverage for error, mistake, omissions, or malpractice, which shall be provided by the subcontractor if such insurance is required by the State.

13. **COMPUTER SOFTWARE (IT SERVICES)** ~ The Contractor certifies that it has appropriate systems and controls in place to ensure that State funds will not be used in the performance of this Agreement for the acquisition, operation or maintenance of computer software in violation of copyright laws.
14. **INSPECTION** ~ The State, through any authorized representatives, has the right at all reasonable times to inspect or otherwise evaluate the work performed or being performed hereunder including subcontract supported activities and the premises in which it is being performed. If any inspection or evaluation is made by the State of the premises of the Contractor or a subcontractor, the Contractor shall provide and shall require their subcontractor(s) to provide all reasonable facilities and assistance for the safety and convenience of the State representatives in the performance of their duties. All inspections and evaluations shall be performed in such a manner as will not unduly delay the work.
15. **FORCE MAJEURE** ~ Neither party shall be liable to the other for any delay in or failure of performance, nor shall any such delay in or failure of performance constitute default, if such delay or failure is caused by 'Force Majeure'. As used in this section, 'Force Majeure' is defined as follows: Acts of war, acts of God such as earthquakes, floods, and other natural disasters such that performance is impossible.

16. **FORCED, CONVICT AND INDENTURED LABOR** ~ No foreign-made equipment, materials, or supplies furnished to the State pursuant to this Agreement may be produced in whole or in part by forced labor, convict labor, or indentured labor. By submitting a bid to the State or accepting a purchase order, the Contractor agrees to comply with this provision of the Agreement. This requirement does not apply to public works (construction) Agreements.
17. **CONTRACT STAFF REQUIREMENTS** ~ The Contractor represents that it has or shall secure at its own expense, all staff required to perform the services described in this Agreement. Such personnel shall not be employees of or have any contractual relationship with the California State Department of Fish and Game or any other governmental entity.
18. **EVALUATION OF CONTRACTOR (CONSULTANT AGREEMENTS ONLY)** ~ Performance of the Contractor, under this Agreement, will be evaluated. The evaluation shall be prepared on a Contract/Contractor Evaluation Sheet (STD 4), and maintained in the Agreement file.

If the Contractor did not satisfactorily perform the work or service, a copy of the negative evaluation form will be submitted to the Contractor and the Department of General Services, Legal Division, within fifteen (15) days of the completion of the evaluation. The Contractor will have thirty (30) days to prepare and send statements defending its performance under the Agreement. The evaluation of the Contractor shall not be a public record.

19. **REQUIREMENTS FOR LEGAL AGREEMENTS ONLY** ~ In accordance with Public Contract Code § 10353.5, the Contractor shall:
 - ❖ Agree to adhere to legal costs and billing guidelines designated by the State;
 - ❖ Adhere to litigation plans designated by the State;
 - ❖ Adhere to case phasing of activities designated by the State;
 - ❖ Submit and adhere to legal budgets as designated by the State;
 - ❖ Maintain legal malpractice insurance in an amount not less than the amount designated by the State;
 - ❖ Submit to legal bills legal bill audits and law firm audits if requested by the State or by any legal cost control providers retained by the State for this purpose; and
 - ❖ Submit to a legal cost and utilization review, as determined by the State.

EXHIBIT E
ERP SPECIAL TERMS AND CONDITIONS
San Joaquin River Dissolved Oxygen
Total Maximum Daily Load Project

1. SUBCONTRACTS

The University of the Pacific is responsible for all subcontracted work.

2. SEVERABILITY

If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provision of this Agreement is constructed to remain fully valid, enforceable, and binding on the parties.

3. COMPUTER SOFTWARE

If software usage is an essential element of performance under this Agreement, the providing State agency certifies that it has appropriate systems and controls in place to ensure that the Department of Fish and Game funds will not be used in the performance of this Agreement for acquisition, operation or maintenance of computer software in violation of copyright laws.

4. ENVIRONMENTAL COMPLIANCE

The providing State agency is responsible for submitting documentation to demonstrate that any necessary compliance with the California Environmental Quality and/or the National Environmental Policy Act has been completed by the applicable federal, state and/or local agencies prior to commencing.