

**EXHIBIT A
SAMPLE SCOPE OF WORK TEMPLATE**

I. PURPOSE OF PROJECT

A. Background Information

The purpose of this project is to develop routine, multi-residue methods for analysis of pyrethroid insecticides in water, colloids, sediments, and biota.

B. Project Objectives

The primary project goals are to develop, test, and validate methods for analysis of six or more pyrethroid insecticides in water, colloids, sediments, and biota. As part of the method development, each step of sample collection, processing, and analysis will be carefully tested, and modified if needed, to insure quantitative recovery and sufficient sensitivity. The analysis of pyrethroid insecticides in water will be a joint venture between three laboratories: U.S. Geological Survey's Organic Chemistry Laboratory in Sacramento (USGS), California Department of Fish and Game's Water Pollution Control Laboratory in Rancho Cordova (CDF-WPCL), and the California Department of Food and Agriculture's laboratory in Sacramento (CDFA). This approach gives us maximum expertise and access to a wide variety of instrumentation. The method will be validated by analysis of a limited number of environmental water samples by all three laboratories. The final result will be a routine method for water analysis that is operational in the three different laboratories. The CDFG laboratory will also develop methods for bed sediments and biota while the USGS laboratory will focus on methods for colloids and suspended sediments. Both laboratories will be able to build upon knowledge gained during the development of the method for water and their own experience with these matrices.

II. PROJECT FUNDING SOURCE(S) – PROPOSITION 204 CHAPTER 7

Single Funding Source

The funding required to complete this scope of work is \$ 800,000, all of which will be contributed through the Proposition 204 grant that is the subject of this Agreement.

(Cost Share- California Department of Fish and Game- \$60,000 Equipment Purchase)

III. WORK TO BE PERFORMED

A. Scope of Work

This project has been broken down into 5 tasks with subtasks and list of deliverables per task and sub-task.

Task 1 Project Management and Administration

(Project Management and Administration costs are incorporated within tasks 2 and 3 rather than listed separately.)

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 as well as for the preparation of products and a final report as specified in this Exhibit A. The Contractor Representative shall promptly notify the GCAP Contract

EXHIBIT A SAMPLE SCOPE OF WORK TEMPLATE

Management Entity's, herein after referred to as GCAP Contract Manager of events or proposed changes that could affect the scope, budget, or schedule of work performed under this agreement.

The Contractor shall provide all quarterly progress reports, invoices, and scheduled deliverables as indicated in **Section B– List of deliverables**.

Subtask 1.1 Project Management

The Contractor shall provide all technical and administrative services associated with performing and completing the work for this project. Technical and administrative tasks shall include: project management, budgeting, scheduling, coordination, crew supervision, report preparation, contract management, invoicing, equipment maintenance and data collection, storage and analysis, subcontract management, and all other tasks that may be necessary to complete the scope of work specified in this agreement.

The work performed in this subtask also includes the preparation and submission of Quarterly Progress Reports (using California Bay-Delta Authority (CBDA) Report Format) to GCAP 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 Final Report; and the preparation and submission of deliverable products as specified.

Subtask 1.2 Quarterly Progress Reports

Prepare and submit quarterly progress reports to GCAP Contract Manager in electronic form using CBDA's progress report format shown as Exhibit A – Attachment # 1. Each progress report shall detail work accomplished, discuss any problems encountered, and recommend potential solutions to those problems; detail costs incurred during the subject quarter, and document delivery of any intermediate work products. A brief outline of upcoming work scheduled for the subsequent quarter should also be provided. Progress reports must be submitted by the 10th day of the month following each calendar quarter (April, July, October, January) throughout the duration of the project.

The description of activities and accomplishments of each task during the quarter shall be in sufficient detail to provide a basis for payment of invoices and shall be translated into percent of task completed for the purposes of calculating invoice amounts.

Failure to submit any two (2) consecutive quarterly progress reports may result in forfeiture of the contract funds awarded for this project.

Subtask 1.3 Subcontractor Selection

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. 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 contract documents to GCAP's Contract Manager for review and approval prior to execution. Document steps taken in soliciting and awarding the subcontract and submit to GCAP Contract Manager for review. In the quarterly progress report, document all subcontractor activities, deliverables completed, progress, issues and proposed resolutions.

Subtask 1.4 Data Management

EXHIBIT A SAMPLE SCOPE OF WORK TEMPLATE

Prepare and submit all data generated by the project for input into CBDA's data system. Data format and report guidance for CBDA's data system shall be provided by GCAP Contract Manager. Data shall be submitted to the GCAP Contract Manager on computer diskettes or on forms provided by the GCAP Contract Manager. The Contractor shall be responsible for verifying the quality of the data.

Task Deliverable(s): Quarterly progress reports and invoices. Deliverables are listed with the schedule below.

Task 2 Project Design and Oversight

Subtask 2.1 Formation of a Technical Advisory Committee (TAC)

Form a Technical Advisory Committee (TAC) to oversee the progress and technical aspects of the project. The TAC shall include representatives from State Water Resources Control Board, Regional Water Quality Control Boards and Sacramento River Watershed Program.

Guide the overall management of the project through periodic formal reviews with the TAC. Document TAC meetings by preparing a summary of each meeting that includes the following materials: meeting agenda, attendance record, and meeting minutes. The TAC will be asked to review interim project reports and the draft project final report. To the extent possible, TAC comments on the draft project final report shall be addressed and incorporated into the project final report. Additional activities of the TAC are described in the appropriate tasks below.

Subtask 2.2 Public Meeting

Conduct at least one publicly noticed meeting near the completion of the method development to describe the goals, objectives, and progress of the study and to receive comments and suggestions from public agencies, affected entities, and interested persons. We will also invite scientists conducting or proposing studies related to pyrethroid toxicity. Meetings must be publicly noticed at least 30 days prior to the meeting.

Document public meetings by preparing a meeting summary for each meeting that includes the following materials: evidence of public notice, meeting agenda, attendance record, and meeting minutes. Submit meeting summaries to GCAP's Contract Manager with the quarterly progress report for the quarter in which the meeting was conducted. Meeting summaries shall be made available to the public upon request.

Subtask 2.3 Study Design

The study design task includes review of the literature and pesticide use, modifications to the method development, and design of the method validation. The literature review will focus on toxicity and fate information to help define targets for environmentally relevant detection limits in the various matrices. The most recent pesticide use information will be reviewed by the Department of Pesticide Regulation to determine changing use patterns. At this time, the six highest-use pyrethroid insecticides are targeted for analysis: bifenthrin, cyfluthrin, cypermethrin, efenvalerate, lambda-cyhalothrin, and permethrin. If necessary, other pyrethroid insecticides can be added to the analyte list. Details of the method development will be modified based on laboratory results and consultation between the three laboratories. Design of the method validation will include input from the TAC as needed.

EXHIBIT A
SAMPLE SCOPE OF WORK TEMPLATE

Task Deliverable(s): Form TAC, hold meetings, and present study design to TAC. Conduct a public meeting, prepare and submit public meeting summary. Deliverables are listed with the schedule below.

Task 3 Analytical Method Development and Validation

The goal of this study is to develop and validate sample extraction and analysis procedures that give accurate and reproducible results for the determination of trace levels of selected pyrethroid insecticides. The procedure(s) developed should be: (1) compatible with both gas chromatography and high performance liquid chromatography analyses; (2) applicable to water, colloids, sediment, and biota; (3) applicable at trace level concentrations and give high and reproducible analyte recoveries for fortified samples; (4) amenable to automation for high sample throughput; (5) cost efficient.

Subtask 3.1 Development of Analytical Methods

Develop and validate routine analytical method(s) for the analysis of currently-used pyrethroid insecticides (both home use and commercial use) in water, colloids, sediments, and biota with special attention to decreasing the detection limits in water to parts per trillion (ppt) levels or lower. The objective is to achieve reporting limits in water equal to or lower than the LC₅₀ of sensitive species such as *Daphnia magna*. Reporting limits at the low parts per billion (ppb) level are the objective for sediment and biota analyses so that the methods will be useful for monitoring ambient concentrations of these pesticides.

Method development will include optimizing instrumentation methods, standard preparation and handling, and techniques for extraction and concentration (table 2). Various analysis and confirmation instrumentation methods will be investigated with a focus on instrument sensitivity and selectivity and the reduction or elimination of matrix interferences associated with sediments and tissue extracts. Solubility and stability of pyrethroid insecticides will be investigated to determine holding times of analytical standards used for instrument calibration and sample fortification. Different water extraction and concentration methods will be tested. Preliminary work will be performed using laboratory water fortified with target pesticide solutions. Subsequent studies will evaluate the extraction procedures using fortified surface water to determine the efficiency of multi-residue extraction techniques on samples containing suspended matter.

A variety of sediment and tissue extraction techniques will be evaluated (table 2). This phase of the study will focus on multi-residue extraction efficiencies and sample matrix separations to eliminate interferences. Total organic carbon analyses will be performed on sediment samples and the methods will be evaluated using different types of sediments to determine and verify application.

Subtask 3.2 Sample Collection and Preservation Methods

Due to the hydrophobic nature of these compounds, studies will be conducted on analyte loss due to sorption onto container walls and on differences between various container materials. Tests will be performed to determine for how long samples can be stored before sample processing and the effect of time on analyte sorption and degradation. Studies will test different container materials (e.g. glass, polycarbonate), storage temperatures (refrigeration vs. freezing), and pH effects on recoveries and holding times.

Subtask 3.3 Validation of Analytical Methods

EXHIBIT A
SAMPLE SCOPE OF WORK TEMPLATE

Method validation procedures will follow EMAP Method Validation procedures that have been adapted from the "Single-Laboratory Method Validation Protocol" by U.S.EPA. Data quality indicators that will be used for method validation are bias, percent recovery, precision, Method Detection Limit (MDL), and selectivity. Control limits for the data quality indicators will be established and used to prepare and maintain control charts. In addition, method validation will include laboratory intercalibrations between USGS, CDFG and CDFA laboratories.

Task Deliverable(s): Validated routine, multi-residue methods for analysis of a series of pyrethroid insecticides in water, colloids, sediments, and biota.

Task 4 Methods for Toxicity Testing

This task will be conducted by the USGS and is entirely funded by USGS matching funds. Methods will be modified and developed for toxicity testing with pyrethroid insecticides. Methods will include: 1) sample handling of environmental samples for standard toxicity tests; 2) spiking water samples to maintain a constant concentrations during 7-day laboratory studies; and 3) testing of the fate of pyrethroid insecticides during phase I toxicity identification procedures.

Task Deliverable(s): None.

Task 5 Draft and Final Report

(Draft and Final Report costs are incorporated within task 3 rather than listed separately.)

Subtask 4.1 Prepare Draft Final Report/Plan for Project

Prepare a draft final report. The draft final report will consist of clear Standard Operating Procedures and validation of the analytical methods. Submit the draft report to the GCAP Contract Manager. The draft final report will also be distributed to the TAC for comments. Analytical methods will also be submitted to scientific journals for peer-review and publication.

Subtask 4.2 Revise, Complete, and Distribute Final Report/Plan

Incorporate all relevant comments into the final report. Forward the final report to the GCAP Contract Manager. The final report will also be made available on-line through our web sites.

Task Deliverable(s): Draft Final Report and Final Report.

Task 6 Project Closure

Submit Project Closure Summary Report to summarize project accomplishments. The format is attached to the Recipient Agreement as Exhibit A - Attachment 4 - Project Close Out Summary Report

Submit Final Invoice for payment, with separate delineation of payout of 10 percent retention (if applicable).

Task Deliverable(s): Project Closure Summary Report, final invoicing and supporting documentation.

**EXHIBIT A
 SAMPLE SCOPE OF WORK TEMPLATE**

B. Schedule of Completion Dates:

The Contractor agrees to submit all scheduled project deliverables in accordance with the schedule set forth in this agreement. Failure to submit any scheduled project deliverable within 30 days after the specified deliverable due date may result in forfeiture and/or reduction of the grant funds awarded for this project. In the event the Contractor anticipates any delay in submitting project deliverables as scheduled, the Contractor shall inform the GCAP Contract Manager in writing prior to the scheduled due date of the subject deliverable. In the event the project cannot be completed within the period of the Recipient Agreement, the Contractor shall request in writing an amendment (in accordance with the guidelines in Exhibit A - Attachment 3) extending the term of the Recipient Agreement at least 6 months prior to its end date. A written request to extend the term of the Recipient Agreement shall set forth the reason for the request, and must include a revised Schedule of Completion Dates.

All requests for amendments shall be presented at the Ecosystem Restoration Program (ERP) Amendment Workshop. GCAP will prepare and execute amendments as approved by the Resources Agency/CBDA during the ERP Contract Amendment Workshop.

Task	Task Title	Deliverable	Completion Dates
1	Project Mgmt & Adm	<ul style="list-style-type: none"> Quarterly Progress Report 	Quarterly as needed
2	Project Design & Oversight	<ul style="list-style-type: none"> Formation and meeting of TAC Conduct public meeting 	Annually or more as needed 270 days prior to close
3	Analytical Method Development & Validation	<ul style="list-style-type: none"> Validated, routine analytical methods 	180 days prior to close
4	Methods for Toxicity Testing	<ul style="list-style-type: none"> No deliverables ^a 	None
5	Draft & Final Report	<ul style="list-style-type: none"> Draft Report Final Report 	90 days prior to close At close of project
6	Project Closure Requirements	<ul style="list-style-type: none"> Project Closure Summary Report Final invoice & supporting documentation 	At close of project

^a Task 4 is not funded by the Resource Agency and has no deliverables.

C. Reports:

1. The first quarterly report shall be submitted to GCAP's Contract Manager no later than 10 days following the end of the first quarter and quarterly thereafter, for the term of this agreement. The Contractor shall provide a written report to the GCAP's Contract Manager providing the following information on each quarterly 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;
- List of proposed activities and tasks for the following quarter.

The Contractor shall submit quarterly reports within no more than 10 days after the end of each quarter. Each quarterly report shall include the information noted above.

EXHIBIT A
SAMPLE SCOPE OF WORK TEMPLATE

2. The Contractor shall submit to GCAP's Contract Manager for approval any and all reports, plans, or other deliverables containing the results of the work performed in accordance with Section B - Schedule of this exhibit.
3. The project will not be considered complete until the CBDA Contract Manager approves and accepts the Project Closure Requirements as complete and final.