

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY

AGENDA

BOARD OF DIRECTORS MEETING

ELSINORE VALLEY MUNICIPAL WATER DISTRICT

31315 Chaney Street
Lake Elsinore, California 92531
951.674.3146 (EVMWD) / 951.354.4240 (LESJWA)

Thursday, June 19, 2014 – 4:00p.m.

CALL TO ORDER/PLEDGE OF ALLEGIANCE (Chair Robert Magee)

ROLL CALL: SAWPA__ EVMWD__ CITY OF LAKE ELSINORE__ CITY OF CANYON LAKE__
COUNTY OF RIVERSIDE__

PUBLIC COMMENTS:

Members of the public may address the Board on any item that is within the Board's jurisdiction; however, no action may be taken on an item appearing on the agenda unless the action is otherwise authorized by Subdivision (b) Section 54954.2 of the Government Code. Members of the public are requested to provide a public comment notice card to the Board Secretary prior to the Board meeting in order to speak. The public is given a maximum of five minutes to speak on an issue following discussion of an agenda item.

Materials related to items on this Agenda submitted to the Board after distribution of the agenda packet, are available to the public during regular business hours at the Authority's office: 11615 Sterling Avenue, Riverside, CA 92503.

Any person with a disability who requires accommodation in order to participate in this meeting may contact LESJWA Board Secretary, Dawna Munson at 951.354.4247, at least 48 hours prior to the meeting to request a disability-related modification.

CONSENT CALENDAR

Consent Calendar items are considered routine and non-controversial, to be acted upon by the Board at one time without discussion. If a Board member, staff member, or interested person requests that an item be removed from the Consent Calendar, the request will become the first item of business on the agenda.

- 1.0 MINUTES**.....3
RECOMMENDATION: Approve the Minutes of the Board of Directors meeting held April 17, 2014.
- 1.1 TREASURER'S REPORTS**.....9
RECOMMENDATION: Receive and file financial statements from March 2014.

End of Consent Calendar

LESJWA BOARD MEMORANDUM NO. 747

DATE: June 19, 2014

SUBJECT: LESJWA Governance

TO: LESJWA Board of Directors

FROM: Mark R. Norton, P.E., Authority Administrator

RECOMMENDATION

Staff recommends that the Board of Directors receive and file this report regarding LESJWA Governance and possible merger or support with WRCOG.

BACKGROUND

At the February 20, 2014, the LESJWA Board reviewed options presented by staff to generate funding necessary to meet foreseeable LESJWA expenses. Staff reviewed the revenue generation options previously evaluated under the 2011 LESJWA Business Plan. The LESJWA Business Plan laid out the preferred options to deal with a future gap in the following fashion:

1. Pursue State and Federal Grant Funding
2. Decrease annual costs
3. Establish Lake Quality Improvement Contribution
4. Establish TMDL Task Force Contribution for LESJWA
5. Increase Cost Share Among LESJWA Agencies

Each of these actions have been evaluated and implemented to some degree over recent years. During the Feb. 20 meeting, several of the LESJWA member agencies agreed to increase their annual funding share to help the agency with funding shortfall. One recommendation made was that perhaps it was time to revisit LESJWA governance and expand the number of members to increase revenue and allow more upper San Jacinto River watershed entities, those who are paying into TMDL compliance and LESJWA's Lake Elsinore and Canyon Lake Nutrient TMDL Task Force, to be represented on the LESJWA Board. The LESJWA Board directed Mark Norton, LESJWA's Authority Administrator for SAWPA, to start with the City of Menifee to determine if there was an interest.

Mr. Norton met with the City of Menifee's City Manager, CFO and Public Works Director. Overall the City of was supportive, but the City Manager asked for some time to discuss this possibility with other City Managers of cities in the San Jacinto River Watershed who also are participating in the Task Force.

At the April 17, 2014, LESJWA Board meeting, the City of Elsinore and EVMWD agreed to ask their respective governing boards to double their annual contributions to LESJWA from \$10K to \$20K. With the increases from these two LESJWA member agencies and remaining reserves, the FY 14-15 LESJWA Budget was balanced. Additionally, subsequent to the meeting, Riverside County offered to increase their annual contributions from \$10K to \$20K. Further, the Riverside County Flood Control and Water Conservation District (RCFC&WCD) also offered to request an additional \$20K for the next three years to LESJWA. The annual contribution from the City of Canyon Lake and SAWPA will remain at the past contribution of \$10K per year under the FY 14-15 Budget. With these recent changes and if approved by each respective LESJWA member agency governing board, sufficient funding will be available for the LESJWA JPA to remain sustainable for the next three years.

During the last LESJWA Board meeting, County Supervisor Kevin Jefferies recommended that SAWPA staff explore whether it would make financial sense to have LESJWA merge or work as a subcommittee to the Western Riverside Council of Governments (WRCOG). Since that Board meeting, Supervisor Jefferies also approached Rick Bishop, Executive Director at WRCOG, and asked that he also evaluate this option. In May 2014, Mr. Bishop met with Mark Norton and most of the LESJWA Board members. He also provided a briefing to the WRCOG Administrative and Financial Committee on May 14th to discuss the pros and cons of WRCOG's involvement in administering LESJWA.

Based on these discussions, there appears to be several major differences between the two organizations that would prevent any merger. EVMWD, a major part of LESJWA, is not a part of WRCOG nor are seven other agencies who are involved in the LE/CL TMDL Task Force members of WRCOG. Having a part of the Task Force agencies but not all may be perceived as unfair. However, if LESJWA does reconstitute itself to include all the cities of the LE/CL TMDL Task Force, there may be some value to logistically hold LESJWA meetings after or before the WRCOG meetings if the majority of LESJWA were composed of the 12 cities in the watershed. Mr. Bishop and Mr. Norton agreed that it is unlikely at this stage that any administrative cost savings in running the LESJWA JPA could be realized by having WRCOG operate it since outside consultant help would have to be hired by WRCOG to achieve this. SAWPA's hourly staffing rates to support LESJWA remain competitive and below comparative consultant hourly rates, based on a comparison study conducted by RCFC&WCD to perform this administrative function for commensurate services. All feedback that Mr. Bishop received indicated everyone was very happy with the support provided by SAWPA staff as the LESJWA administrator and technical support. Further with interim and final TMDL target deadlines approaching in 2015 and 2020, consistency in support is important.

LESJWA staff will continue to explore efforts to expand the governance based on interest and desire of underrepresented parties who are supporting the lake improvements. A PowerPoint presentation will be provided discussing these activities.

RESOURCES IMPACT

SAWPA is supportive of providing staff to serve as administrator for LESJWA. Funding of SAWPA staff time for LESJWA activities will be provided by the TMDL stakeholder funding, grant administration funding, and local contributions from LESJWA member agencies.

MN:dm

LESJWA BOARD MEMORANDUM NO. 748

DATE: June 19, 2014
SUBJECT: Regulatory Strategist and TMDL Compliance Support Services
TO: LESJWA Board of Directors
FROM: Mark R. Norton, P.E., Authority Administrator

RECOMMENDATION

Staff recommends that the Board of Directors approve Task Order No. RISK160-08 with Tim Moore of Risk Sciences for an amount not-to-exceed \$52,160 to serve as regulatory strategist and compliance expert to the Lake Elsinore and Canyon Lake TMDL Task Force.

BACKGROUND

Risk Sciences has provided important regulatory compliance support and facilitation to the Lake Elsinore and Canyon (LE/CL) Lake TMDL Task Force. As such, the Technical Advisory Committee (TAC) and the TMDL Task Force have reviewed and recommended for approval a new task order with LESJWA.

Under this Task Order, Risk Sciences will continue to serve as regulatory strategist and compliance expert for the Task Force. Risk Sciences also will work closely with the scientists and technical experts who are assisting the Task Force to implement actions to address the TMDLs. Risk Sciences will prepare for and participate in up to eight meetings of the TAC and /or Task Force. In FY 2014-15, Mr. Moore will coordinate with stakeholders and project consultants and make recommendations to support the following:

- 1) Developing a revised water quality monitoring plan for the nutrient TMDL.
- 2) Authorizing the AgNMP and reauthorizing the CNRP.
- 3) Evaluating the effectiveness of the alum project in Canyon Lake.
- 4) Updating the water quality model for Lake Elsinore.

To accomplish these goals, Mr. Moore will work with stakeholders to review and select alternative regulatory implementation strategies designed to achieve compliance with the TMDL.

BUDGET IMPACT

All funding for this Task Order is provided by the TMDL Task Force for an amount not-to-exceed \$52,160. All staff contract administration time for this work will be taken from the TMDL budget and funded by the TMDL stakeholders.

MN/RW/dm

Attachment:

1. Risk Sciences Task Order No. RISK160-08

III. TIME OF PERFORMANCE

Consultant shall begin work within five days of the date this Task Order was signed by the Authorized Officer, and shall complete performance of such services by **June 30, 2015**.

IV. LESJWA LIAISON

Mark Norton and/or Rick Whetsel will serve as liaison between LESJWA and Consultant.

V. COMPENSATION

For all services rendered by Consultant pursuant to this Task Order, Consultant shall receive a total not-to-exceed sum of **\$52,160** including travel expenses. Payment of the fees and expenses incurred shall be made monthly upon receipt of timely and proper invoices from Consultant, as required by the above-mentioned Agreement. Each such invoice shall be provided to LESJWA/SAWPA by Consultant within 15 days after the end of the month in which the services were performed. The compensation to be paid herein is subject to LESJWA/SAWPA's receipt of funds for this Task Order from third parties. The Consultant shall limit activities to ensure not to expend funds that have been collected, and shall curtail activities, as required, to stay within the funds available. LESJWA/SAWPA will endeavor to obtain the funds needed to fully fund the scope of work.

VI. CONTRACT DOCUMENTS PRECEDENCE

In the event of a conflict in terms between and among the contract documents herein, the document item highest in precedence shall control. The precedence shall be:

- a. The Agreement for Services by Independent Consultant/Contractor.
- b. The Task Order or Orders issued pursuant to the Agreement, in numerical order.
- c. Exhibits attached to each Task Order, which may describe, among other things, the Scope of Work and compensation therefore.
- d. Specifications incorporated by reference.
- e. Drawings incorporated by reference.

In witness whereof, the parties have executed this Task Order on the date indicated below.

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY

Robert Magee, LESJWA Chair

Date

RISK SCIENCES

Timothy F. Moore, President

Date



ATTACHMENT A

3 June 2014

Rick Whetsel
Lake Elsinore - San Jacinto Watersheds Authority
11615 Sterling Ave.
Riverside, CA 92503

RE: Proposed Scope-of-Work for LECL TMDL Task Force in 2014-15

Dear Mr. Whetsel:

Per your request, I have prepared the following preliminary scope of work and cost estimate to support the Lake Elsinore/Canyon Lake TMDL Task Force in FY2014-15. In the coming year, most of our effort will be devoted to four large tasks:

- 1) Developing a revised water quality monitoring plan for the nutrient TMDL.
- 2) Authorizing the AgNMP and reauthorizing the CNRP.
- 3) Evaluating the effectiveness of the alum project in Canyon Lake.
- 4) Updating and revising the TMDL water quality model for Lake Elsinore.

As in the past, my role will be to serve as regulatory strategist and compliance expert for the Task Force. To accomplish these ends, I will prepare for and participate in up to eight meetings of the Technical Advisory Committee (TAC) and/or Task Force to review and revised the various regulatory implementation strategies as necessary to assure compliance with the TMDL. A summary schedule is shown in Table 1 on the following page.

Now that all of the major water quality improvement projects planned for Phase 1 of the TMDL have been implemented, the focus now shifts to demonstrating the effectiveness of those efforts. This will be critical to support approval of the AgNMP in the Conditional Waiver of Agricultural Discharge (CWAD) and reauthorization of the CNRP when the MS4 permit is renewed early next year.

In addition, the Task Force must develop and submit a new water quality monitoring plan for both lakes and the surrounding watershed. This plan will take the place of the one previously approved by the Regional Board in 2006 and which was temporarily suspended as BMP projects were being implemented.

And, finally, the Task Force must begin preparing all of the technical documentation needed to revise and update the TMDL itself. This includes developing new and improved lake models. The actual Basin Plan amendments to update the TMDL will likely be submitted for Regional Board consideration in FY2016-17.

Table 1: Task Summary for 2014-15

Task	Description	Due Date
1	Developing a revised monitoring plan for lakes and watershed	Dec., 2014
2	Authorizing the AgNMP and reauthorizing the CNRP	Feb., 2015
3	Evaluating the effectiveness of the alum project in Canyon Lake	May, 2015
4	Update water quality model for Lake Elsinore	June, 2015
5	Task Force & TAC Meetings (up to 8 trips)	TBD

Task 1 will be coordinated with Haley and Aldrich, the contractor selected by the Task Force to prepare the new monitoring plans. Task 2 will be coordinated with the MS4 co-permittees in Riverside County and with Pat Boldt at WRCAC. Task 3 will be coordinated with Dr. James Noblet at Cal. State-San Bernardino, the contractor selected by the Task Force to collect and analyze water quality samples. Task 4 will be coordinated with Dr. Michael Anderson at U.C.-Riverside and CDM-Smith, the contractors selected by the Task Force to update the lake model.

I intend to earmark approximately 12 hours per month to support the proposed task schedule. My professional fee is \$315 per hour plus travel expenses. All other direct expenses (postage, photocopies, telecommunications, etc.) are already included in my base fee.

Table 2: Proposed Compensation for 2014-15

Description	Amount
Professional Fees (144 hours)	\$45,360
Est. Travel Expenses (8 trips * \$850/trip)*	\$6,800
Total	\$52,160

*Trip expenses are routinely shared among multiple clients to minimize costs. This estimate is based on the historical average cost for previous travel to support the LE/CL Task Force.

I appreciate the opportunity to continue supporting with the Lake Elsinore/Canyon Lake TMDL Task Force and look forward to working together over the coming year.

Respectfully submitted,



Timothy F. Moore

Risk Sciences
125 New Dawn Rd.
Rockvale, TN 37153

Phone: 615-274-2745
Fax: 615-370-5188
Email: tmoore@risk-sciences.com

LESJWA BOARD MEMORANDUM NO. 749

DATE: June 19, 2014

SUBJECT: Watershed-wide Nutrient TMDL Monitoring Program

TO: LESJWA Board of Directors

FROM: Mark Norton, P.E., Authority Administrator

RECOMMENDATION

Staff and the Lake Elsinore and Canyon Lake Nutrient TMDL Task Force Technical Advisory Committee recommend that the Board of Directors authorize Task Order No. WES160-04 with Weston Solutions for an amount not-to-exceed \$67,429, to oversee and implement the FY 2014-15 Phase 1 watershed-wide monitoring for the Lake Elsinore and Canyon Lake Nutrient Total Maximum Daily Load (TMDL).

BACKGROUND

In 2004, the Regional Board adopted Total Maximum Daily Loads (TMDL) to control nitrogen and phosphorus concentrations in Lake Elsinore and Canyon Lake. One of the TMDL requirements is for stakeholders to prepare and implement a Watershed-wide Nutrient Monitoring Program to determine compliance of the upstream watershed with interim and/or final nitrogen and phosphorus allocations, as well as compliance with the nitrogen and phosphorus TMDLs and load allocations (LA), including waste load allocations (WLAs) to the downstream lakes.

In March 2006, the Regional Board approved and adopted a single comprehensive nutrient monitoring plan to address the requirements of the TMDLs, the Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring Plan. This plan, funded and developed by LESJWA, includes a component to conduct Phase 1 watershed-wide monitoring, the San Jacinto River Watershed Sampling Plan.

Due to staffing and resource issues, the Riverside County Flood Control and Water Conservation District has indicated it is unable to provide staff to conduct the watershed-wide nutrient TMDL compliance monitoring program, and as in recent years has requested that the Lake Elsinore and Canyon Lake TMDL Task Force utilize consultant services to perform this work.

DISCUSSION

The members of the Lake Elsinore and Canyon Lake Nutrient TMDL Task Force recommend that Weston Solutions continue to conduct the Phase 1 watershed-wide nutrient monitoring program. Weston was selected last year under a competitive proposal selection process and has provided excellent services.

The attached Task Order details the one-year agreement with Weston Solutions to conduct the watershed-wide component of the nutrient TMDL compliance monitoring program. Included with this Task Order is a scope of work and budget providing a detailed description of support services to be performed by the consultant through FY 2014-15.

Through this agreement, Weston Solutions will provide the following services to the LE&CL TMDL Task Force:

- Coordinate with RCFC&WCD staff to implement any necessary revisions to the LE&CL Watershed-wide Monitoring Plan and QAPP.
- Conduct wet season watershed-wide compliance monitoring activities for FY 2014-15 as described in the San Jacinto River Watershed Sampling Plan and Quality Assurance Project Plan (QAPP).

- Provide status updates to the TMDL Task Force.
- Prepare an annual water quality monitoring report summarizing the findings from watershed-wide storm monitoring activities, and review, format and submit data to the California Environmental Data Exchange Network (CEDEN).

BUDGET IMPACT

The TMDL Task Force FY 2014-15 Budget provided a budget of \$70,000 to conduct watershed-wide nutrient monitoring. All staff contract administration time for this contract will be taken from the TMDL budget and funded by the TMDL Stakeholders.

MN/RW/dm

Attachment:

1. Task Order No. WES160-04

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY

TASK ORDER NO. WES160-04

CONSULTANT: Weston Solutions, Inc. **VENDOR NO.** 1728
2433 Impala Drive
Carlsbad, CA 92010

COST: \$67,429

PAYMENT: Monthly, upon receipt of proper invoice

REQUESTED BY: Rick Whetsel, Sr. Watershed Planner June 19, 2014

FINANCE: _____
Karen Williams, CFO Date

FINANCING SOURCE: Acct. Coding 160-TMDL-6113-01
Acct. Description TMDL Task Force

BOARD AUTHORIZATION REQUIRED: YES (X) NO ()
Board Memo #749

This Task Order is issued by the Lake Elsinore & San Jacinto Watersheds Authority (hereafter "LESJWA") to **Weston Solutions** (hereafter "Consultant") pursuant to the Agreement between LESJWA and Consultant entitled *Agreement for Services*, dated September 29, 2011, (*expires 12-3-14*).

I. PROJECT NAME OR DESCRIPTION

San Jacinto Watershed-wide Nutrient TMDL Monitoring

II. SCOPE OF WORK / TASKS TO BE PERFORMED

Consultant shall provide all labor, materials, and equipment for the project to perform the tasks to conduct Phase 1 of the watershed monitoring program for Lake Elsinore and Canyon Lake Nutrient TMDL for FY 2014-2015 (Attachment A). Consultant shall:

1. Coordinate with the RCFC&WCD staff to discuss the history and site specific considerations;
2. Conduct water quality monitoring for up to three storm events per fiscal year, consistent with the approved San Jacinto River Watershed Sapling Plan and QAPP.
3. Attend up the three meetings per fiscal year of the Lake Elsinore/Canyon Lake (LE/CL) TMDL Task Force.
4. Prepare and submit to the LE/CL TMDL Technical Advisory Committee (TAC) a draft and final Annual Water Quality Monitoring Report for review and comment.

Please refer to Appendix X for acceptable formats, also found at www.sawpa.org/html/e_req.htm

III. PERFORMANCE TIME FRAME

Consultant shall begin work within five days of the date this Task Order is signed by the Authorized Officer and shall complete performance of such services by or before **June 30, 2015**

IV. LESJWA LIAISON

Rick Whetsel and/or Mark Norton shall serve as liaison between LESJWA and Consultant.

V. COMPENSATION

For all services rendered by Consultant pursuant to this Task Order, Consultant shall receive a total not-to-exceed sum of **\$67,429** in accordance with the rate schedule as shown in Scope of Work. Payment for such services shall be made monthly upon receipt of proper invoices from Consultant, as required by the above-mentioned Agreement for Services.

VI. CONTRACT DOCUMENTS PRECEDENCE

In the event of a conflict in terms between and among the contract documents herein, the document item highest in precedence shall control. The precedence shall be:

- a. The Agreement for Services by Independent Consultant/Contractor.
- b. The Task Order or Orders issued pursuant to the Agreement, in numerical order.
- c. Exhibits attached to each Task Order, which may describe, among other things, the Scope of Work and compensation therefore.
- d. Specifications incorporated by reference.
- e. Drawings incorporated by reference.

In witness whereof, the parties have executed this Task Order on the date indicated below.

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY

Robert Magee, LESJWA Chair

Date

WESTON SOLUTIONS, INC.

(Signature)

Date

Print or Type Name



WESTON SOLUTIONS, INC.
 5817 Dryden Place, Suite 101
 Carlsbad, CA 92008
 (760) 795-6900 / (760) 931-1580 FAX
 www.westonsolutions.com

Attachment A

June 3, 2014

Mr. Rick Whetsel
 Sr. Watershed Planner
 Lake Elsinore & San Jacinto Watersheds Authority
 11615 Sterling Avenue
 Riverside, CA 92503

Subject: Proposal for Lake Elsinore and Canyon Lake Nutrient TMDL Watershed-Wide Storm Monitoring Program, 2014-2015

Dear Mr. Whetsel:

Weston Solutions, Inc. (Weston) is pleased to provide this scope of work and cost estimate for conducting the Lake Elsinore and Canyon Lake Nutrient Total Maximum Daily Loads (TMDL) Watershed-Wide Storm Monitoring Program during the 2014-2015 wet weather season. These monitoring activities will be continued to address the Phase 1 monitoring requirements of the Lake Elsinore and Canyon Lake Nutrient TMDL. Weston has complete familiarity with the monitoring and reporting requirements for this program. Weston’s approach to the Watershed-Wide Storm Monitoring Program is to provide Lake Elsinore and San Jacinto Watershed Authority (LESJWA) with the necessary expertise and experience to successfully complete the wet weather monitoring and reporting conducted during The Fiscal Year (FY) 2014-2015.

The FY 2014-2015 monitoring includes the following tasks:

Task 1	Coordination with RCFC&WCD and Update Plans
Task 2	Watershed-Wide Monitoring
Task 3	Attend LECL TMDL Task Force Meetings
Task 4	Draft and Final Report

The scope, approach, and deliverables for each of the listed tasks are presented as follows. A project schedule and cost summary are presented following the task specific descriptions.

Task 1: Coordination Activities with RCFC&WCD and Update of Plans

Weston will meet with the Riverside County Flood Control & Water Conservation District (RCFC&WCD) staff to discuss the history and site specific considerations involved in the wet weather monitoring program. During this meeting, we will also discuss approaches to conducting the sampling, protocols for go/no-go decisions as to whether to sample, and overall communication between Weston and RCFC&WCD staff. Weston will prepare meeting minutes that provide a summary of the discussions.

Weston will review and update as needed the existing San Jacinto River Watershed Stormwater Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for the Lake Elsinore, Canyon Lake and San Jacinto River TMDL Watershed Monitoring.

Weston will also visit each of the monitoring locations to assess the site conditions and plan any necessary repairs.

Task 2: Watershed-Wide Monitoring

In accordance with the SAP and QAPP, Weston will conduct water quality monitoring for up to three storm events during FY 2014-2015. There are four monitoring locations throughout the San Jacinto River watershed; Lake Elsinore and Canyon Lake area. The four monitoring locations are located near stream gauge stations installed by the US Geological Survey. The monitoring locations are described in Table.

Table 1. Monitoring Locations

Location Number and Description
3- Salt Creek at Murrieta Rd
4- San Jacinto River at Goetz Rd
6- San Jacinto River at Ramona Expressway
30- Canyon Lake Spillway

Weston anticipates storm monitoring at Site 3, Site 4 and Site 30 during FY 2014-2015. There is a small contingency task included in this scope to cover monitoring of Site 6 in the event that Mystic Lake overflows and triggers a sampling event. Mystic Lake has not overflowed for over ten years.

Prior to the wet weather season, Weston technicians will inspect all equipment, make necessary repairs and ensure all equipment is calibrated and functioning properly. To prepare each monitoring site, Weston will install the necessary automated sampling equipment and new Teflon lined sampler tubing to collect discrete time-weighted samples at each location. The equipment will be housed inside existing Knaack equipment boxes bolted on concrete pads at each monitoring location.

Throughout the wet weather season (October through May), Weston will continually monitor the weather forecast to keep up to date on upcoming storm events and coordinate with RCFC&WCD to determine which storms to mobilize for. The factors that will be used to proceed with sampling mobilization include; antecedent moisture conditions, National Weather Service (NWS) digital point forecasts, and NWS quantitative precipitation forecasts. The storm size criteria for mobilization is a storm rainfall total of greater than an 1 inch forecast within 24 hours from November to January, and a storm rainfall total of greater than 0.5 inch forecast within 24 hours from January to May.

The TMDL sampling methodology described in the SAP requires the collection and analysis of 8-12 discrete samples collected over the duration of the hydrograph. The first sample will be collected once the flow has started and subsequent automated samples will be conducted across the hydrograph to collect 8 to 12 discrete samples. The samples will be collected at intervals of approximately 2 to 4 hours over the rising limb of the hydrograph, depending on the forecasted size of the storm event. Some of the monitoring sites may convey flow for extended periods due to the hydrologic response of the large tributary drainage area, resulting in a lengthy sampling period for the falling limb of the hydrograph to properly distribute the samples across the storm hydrograph.

Water quality samples will be collected by Weston staff and delivered to E.S. Babcock Environmental Laboratories (Babcock), a California Environmental Laboratory Accreditation Program certified laboratory. In the field, all analytical samples will be placed on wet ice or frozen ice packs and identification information for each sample will be recorded on field data sheets and chain-of-custody forms. Chain-of-custody forms will be completed for each sample and accompany the samples to the laboratory. The collected samples are to be delivered to the laboratory for analyses as soon as practicable. Samples will be handled, prepared, transported, and stored in a manner so as to minimize loss, misidentification, contamination, and/or degradation. Samples will be analyzed by Babcock for the analytes summarized in Table 2. Analytical Constituents **Table 2 Error! Reference source not found.** Field measurements (pH, temperature, and turbidity) will be taken throughout the storm events by Weston staff using a calibrated YSI 6920 multiparameter data sonde. The complete list of

analytes including methods, reporting limits, minimum detection limits, holding times, bottles, and preservatives is presented in the SAP.

Table 2. Analytical Constituents

Parameter
Turbidity (field measurement)
Water Temperature (field measurement)
pH (field measurement)
Total Organic Nitrogen (Org-N)
Nitrite Nitrogen (NO ₂ -N)
Nitrate Nitrogen (NO ₃ -N)
Ammonia Nitrogen (NH ₄ -N)
Total Kjeldahl Nitrogen (TKN)
Total Phosphorus (TP)
Soluble Reactive Phosphorus (SRP / ortho-P)
Total Suspended Solids (TSS)
Chemical Oxygen Demand (COD)*
Biochemical Oxygen Demand (BOD)*
Total Dissolved Solids (TDS)
Total Hardness

At the conclusion of each monitored storm event, a Weston technician will visit each site to remove the unused sample bottles, download the data and turn off the equipment. Weston will communicate with RCFC&WCD staff regarding the completion of the sampling activities and provide an overall assessment of the storm event.

Analytical data will be reviewed and verified by Babcock to determine whether the data quality objectives have been met, and whether appropriate corrective actions have been taken, when necessary. The laboratory will supply analytical results in both hard copy and electronic formats. The laboratory will have the responsibility of ensuring that both forms are accurate. After completion of the data review by the laboratory, hard copy results will be placed in the project file at Weston, and the results in electronic format will be imported into Weston's database system.

Task 3: Attend Lake Elsinore and Canyon Lake TMDL Task Force Meetings

Weston staff will attend up the three meetings of the Lake Elsinore and Canyon Lake Task Force (Task Force) during the FY2014-2015 to provide updates on monitoring activities and present summaries of monitoring progress and results. As appropriate, Weston will develop and deliver PowerPoint presentations to present the monitoring results in a clear format.

Task 4: Draft and Final Report

The analytical data collected during FY 2014-2015 will be reviewed, formatted and submitted to the California Environmental Data Exchange Network (CEDEN) by Weston. Weston will prepare a draft and final FY 2014-2015 Lake Elsinore and Canyon Lake Nutrient TMDL Annual Water Quality Monitoring Report. As in previous years, this report will incorporate the results of the watershed-wide storm monitoring, along with the stormwater results collected by the US Forest Service at the Cranston monitoring site (if available), and in-lake water quality data collected by others (if available). Weston will provide an electronic copy of the draft report to LESJWA for the Task Force to review and comment. Weston will provide at least two weeks for the Task Force to review the draft report. Once all the comments have been addressed, Weston will finalize the report and submit an electronic copy of the final report to LESJWA.

Task Schedule

Weston thoroughly understands that developing a realistic completion schedule to the satisfaction of the LESJWA is the key to making this a successful project. The approach we have formulated and the Weston team we have assembled are specifically geared to meet the schedule presented in this scope. We have assumed a start date of July 1, 2014 and identified a project completion date of Sept. 30, 2015. Upon approval and Notice to Proceed, Weston will commence work and adhere to the following proposed schedule in Table 3.

Table 3. Task Schedule

Task	Description	Start Date	Finish Date
Task 1	Coordination with RCFC&WCD and Update Plans		
	Notice to Proceed	07/01/2014	07/01/2014
	Meeting with RCFC&WCD/Site Visits	09/01/2014	10/01/2014
	Update QAPP and SAP	09/01/2014	10/01/2014
Task 2	Watershed-Wide Monitoring		
	Initial Site Preparation	09/15/2014	10/01/2014
	FY 2014-2015Monitoring (three events)	10/01/2014	04/30/2015
Task 3	Attend LECL TMDL Task Force Meetings		
	Attend Three Meetings and Prepare Monitoring Updates	10/01/2014	09/30/2015
Task 4	Draft and Final Report		
	Data Submittal to CEDEN	04/30/2015	06/30/2015
	Draft FY 2014-2015Report	05/01/2015	06/30/2015
	Draft Review	06/30/2015	07/30/2015
	Final FY 2014-2015Report	07/30/2015	09/01/2015

Project Cost Summary

The estimated costs by for each task defined in Weston’s scope are provided in Table 4. All tasks are on a time and materials basis with the cost divided into labor, mileage, and equipment and materials. The mileage rate is based on \$0.56 per mile and the details for the estimated costs of equipment and materials are provided in Table 5. The hourly billing rates for each team member of the proposed Weston team are presented in

Table 6.

Table 4. Cost Estimate

Task	Description	Labor	Mileage	Equipment and Materials	Subtotal
Task 1	General Project Management	\$ 2,975	\$ -	\$ -	\$ 2,975
	Meeting with RCFC&WCD/Site Visits	\$ 2,280	\$ 112	\$ -	\$ 2,392
	Update QAPP and SAP	\$ 3,090	\$ -	\$ -	\$ 3,090
	Task 1 Subtotal- Coordination with RCFC&WCD and Update Plans				\$ 8,457

Task	Description	Labor	Mileage	Equipment and Materials	Subtotal
Task 2	Monitoring Site Preparation (includes obtaining and installing equipment, site maintenance and repairs)	\$ 7,700	\$ 140	\$ 3,556	\$ 11,466
	FY 2014-2015 Monitoring (three events- includes team of two)	\$ 24,385	\$ 504	\$ 1,650	\$ 26,539
	False Starts (Assumes two per year)	\$ 2,535	\$ 70	\$ -	\$ 2,605
	Contingency*	\$ 3,000	\$ -	\$ -	\$ 3,000
	Task 2 Subtotal- Watershed-Wide Monitoring				\$ 43,610
Task 3	Attend Three Meetings and Prepare Monitoring Updates	\$ 3,100	\$ 252	\$ -	\$ 3,352
	Task 3 Subtotal- Attend LECL TMDL Task Force Meetings				\$ 3,352
Task 4	Draft FY 2014-2015 Report	\$ 9,720	\$ -	\$ -	\$ 9,720
	Final FY 2014-2015 Report	\$ 2,290	\$ -	\$ -	\$ 2,290
	Task 4 Subtotal- Draft and Final Report				\$ 12,010
FY 2013-2014 Total Project Cost (Not to Exceed)					\$ 67,429

*Contingency is the estimated cost to sample two storm events at the Site 6-San Jacinto River at Ramona Expressway in the event that Mystic Lake overflows. A Mystic Lake overflow is not expected in FY2014-2015.

Table 5. Estimated Cost for Equipment and Materials for Task 2- Watershed-Wide Monitoring

Description	Unit Cost	Daily Rate	Monitoring Site Preparation	FY 2014-2015 Monitoring
Misc. sampling supplies (disposable sampling equipment, gloves, etc. per year cost)	\$ 150.00	\$ -	0	1
Ice (3 per event per site)	\$ 5.00	\$ -	0	18
12V deep cycle battery (one per site)	\$ 125.00	\$ -	3	0
Teflon/St. Strainers (one per site)	\$ 79.00	\$ -	3	0
Set of (24) 1 Liter Polyethylene Bottles with Caps (one set per event per site)	\$ 120.00	\$ -	9	0
Teflon lined sampler tubing, 100 ft., 3/8 in. (one per site)	\$ 527.00	\$ -	3	0
Silicone sampler tubing, 50 ft., 3/8 in. (one per year)	\$ 283.00	\$ -	1	0
YSI Calibration Solution (per event)	\$ 20.00	\$ -	0	3
YSI 6920 Multiparameter data sonde (2 days each event)	\$ -	\$ 175.00	0	6
Field computer (2 days each event)	\$ -	\$ 50.00	0	6

Total Cost	\$ 3,556.00	\$ 1,650.00
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Table 6. Hourly Billing Rates

Team Member	Classification	Hourly Billing Rate
Garth Engelhorn	Project Manager	\$ 155.00
Anthony Cotts, PE	Engineer	\$ 150.00
Sheri Dister	GIS Specialist	\$ 140.00
Damon Owen	Senior Scientist	\$ 130.00
Laurence Campagna	Scientist 3	\$ 110.00
Scott Cropper	Scientist 1	\$ 90.00
Justin Scott	Senior Technician	\$ 75.00
Michelle Patzius	Word Processing	\$ 75.00

The level of effort proposed herein reinforces the commitment of the Weston team to meet the milestones and completion dates presented in the schedule. On behalf of the entire WESTON team, we look forward to continue conducting the Lake Elsinore and Canyon Lake Nutrient TMDL Watershed-Wide Storm Monitoring. Should you require any further information, please do not hesitate to call me at 760-795-6921 or via email at garth.engelhorn@westonsolutions.com.

Sincerely,



Garth Engelhorn
 Project Manager
 Weston Solutions, Inc.

LESJWA BOARD MEMORANDUM NO. 750

DATE: June 19, 2014
SUBJECT: Education and Outreach Program
TO: LESJWA Board of Directors
FROM: Mark R. Norton, P.E., Authority Administrator

RECOMMENDATION

Staff recommends that the Board of Directors approve Task Order No. OREIL477-13 with O'Reilly Public Relations for an amount not-to-exceed \$17,000 for continuation of the LESJWA Education and Outreach Program for FY 2014-15.

BACKGROUND

O'Reilly Public Relations has provided excellent public relations consulting services for LESJWA as part of its Education and Outreach program. The LESJWA's Education and Outreach Committee and Board had agreed to scale back the outreach program from its original former budget line item of \$50,000 to a much smaller proportion, in light of limited funding availability. In budget discussions with the LESJWA Board in April 2014, and in support of the LESJWA Education and Outreach Committee recommendations, the Board has agreed that continuing these services is important, particularly in handling media coverage of lake conditions, and assuring continuance of the annual LESJWA Water Summit. A task order with the scope of work is attached for consideration.

Philip Southard from O'Reilly Public Relations will provide a brief overview of major Education and Outreach deliverables prepared over the past year, and a review of the scope of work anticipated in the proposed task order.

BUDGET IMPACT

Sufficient funding has been provided in the approved LESJWA FY 2014-15 Budget.

MN:dm

Attachment:

1. Task Order No. OREIL477-13

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY
TASK ORDER NO. OREIL477-13

CONTRACTOR: O'Reilly Public Relations **VENDOR NO.** 1649
3403 Tenth Street, #110
Riverside, CA 92501

COST: \$17,000

PAYMENT: Upon receipt of proper Invoice

REQUESTED BY: Mark R. Norton, Authority Administrator June 19, 2014

FINANCE: _____
Karen Williams, CFO Date

FINANCING SOURCE: Acct. Coding 150-NON-C-6113-01
Acct. Description Consulting General

LESJWA BOARD AUTHORIZATION REQUIRED: YES (X) NO ()
Board Memo #750

This Task Order is issued by the Lake Elsinore & San Jacinto Watersheds Authority (hereafter "LESJWA") to **O'Reilly Public Relations** (hereafter "Consultant"), pursuant to the Agreement between LESJWA and Consultant entitled Agreement for Services by Independent Contractor, dated May 17, 2001, and extended through Amendment No. 6 (*expires 6-30-2014*).

1. **Project Name or Description**

Education and Outreach Consulting Services.

2. **Scope of Work / Tasks to be Performed**

Consultant shall provide all labor, materials, and equipment for the Project to perform the tasks as outlined in the 2014-2015 Education and Outreach Work Scope (attached).

The Work Scope tasks are subject to approval by the Education and Outreach Committee and may be subject to modification depending on communications needs. The goals and tasks are detailed on **Attachment A**.

Please refer to Appendix X for acceptable formats, also available at www.sawpa.org/html/e_req.htm

3. **Time of Performance**

Consultant shall coordinate with the LESJWA representative on work tasks and shall complete performance of such services by or before **June 30, 2015**.

4. **LESJWA Liaison**

Mark Norton, Authority Administrator, will serve as liaison between LESJWA and Consultant.

5. **Compensation**

For all services rendered by Consultant pursuant to this Task Order, Consultant shall receive a total not-to-exceed sum of **\$17,000** in accordance with the attached Budget Proposal. Payment of such fees shall be made monthly upon receipt of timely and proper invoices from Consultant as required by the above-mentioned Agreement. Each such invoice shall be provided by Consultant within 15 days after the end of the month in which the services were performed.

6. **Precedence of Contract Documents**

In the event of a conflict in terms between and among the contract documents herein, the document item highest in precedence shall control. The precedence shall be:

- a. The Agreement for Services by Independent Consultant/Contractor.
- b. The Task Order or Orders issued pursuant to the Agreement in numerical order.
- c. Exhibits attached to each Task Order which may describe, among other things, the scope of work and compensation.
- d. Specifications incorporated by reference.
- e. Drawings incorporated by reference.

IN WITNESS WHEREOF, the parties have executed this Task Order on the date indicated below.

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY

Robert Magee, LESJWA Chair

Date

O'REILLY PUBLIC RELATIONS

(Signature)

Date

Print /Type Name



Lake Elsinore & San Jacinto Watersheds Authority 2014-2015 Education and Outreach Work Scope

Goals
<ol style="list-style-type: none"> 1. To provide public information support regarding the planning, design and implementation of projects to improve water quality at Lake Elsinore, Canyon Lake and the San Jacinto River Watershed. 2. To work with the LESJWA board to inform stakeholders about the need for reliable funding to operate and maintain water quality improvement projects at Lake Elsinore, Canyon Lake and the San Jacinto River Watershed. 3. To support the public education efforts of LESJWA which will serve as the administrator of the Lake Elsinore and Canyon Lake TMDL Task Force.

Tactics	Costs	Total
Canyon Lake and Lake Elsinore Outreach		
<ol style="list-style-type: none"> 1. Community Relations <ul style="list-style-type: none"> • OPR will design and revise existing collateral materials as needed to address new milestones/developments in Canyon Lake's and Lake Elsinore's water quality. • OPR will work with EOC committee members to develop strategies and responses to provide outreach to community members. 2. Media Relations <ul style="list-style-type: none"> • OPR will provide assistance in drafting a news release, as needed, based on recommended media calendar items and/or breaking news events. • OPR will assist in coordinating reporter briefings to provide background on lake treatment programs administered by LESJWA. • OPR will also provide media response assistance in the event of a major issues or unexpected events. • Update LESJWA video to reflect current board members. 	OPR Fees: \$4,950 Video Update: \$50	\$5,000

LESJWA Water Summit		
<p>3. Invitations and Attendees</p> <ul style="list-style-type: none"> • OPR to develop design content for email invitations to event invitees (\$250) • OPR to track RSVPs and attendee count and provide follow-up (\$750) <p>4. Attendee packets</p> <ul style="list-style-type: none"> • OPR to develop and assemble informational packets for summit attendees including brochures, media coverage and follow-up briefing materials (\$500) <p>5. Logistics</p> <ul style="list-style-type: none"> • OPR to provide logistics and staffing assistance, as needed (\$1,500) • OPR to provide catering (\$250) • OPR to produce news release and follow-up with local media (\$750) 	<p>Printing: \$500</p> <p>OPR Fees: \$4,000</p>	<p>\$4,500</p>
Outreach and Administration		
<p>6. Project Management</p> <ul style="list-style-type: none"> • OPR will maintain contact with LESJWA board and staff and provide strategic counsel regarding appropriate outreach changes or additions as needed throughout the year. • OPR will identify and carry out strategies through regular communications and, when appropriate, meetings with the client. • OPR will evaluate the program mid-year to analyze its effectiveness and redirect as needed. • OPR will attend quarterly EOC committee meetings at EVMWD. 	<p>OPR Fees: \$5,000</p>	<p>\$5,000</p>
Issue Management		
<p>7. Issue Management</p> <ul style="list-style-type: none"> • OPR will assist in public outreach and responses to potential issues that may come up during the course of the contract including fish kills, etc. 	<p>OPR Fees: \$2,500</p>	<p>\$2,500</p>
<p>8. Out-of-Scope Issue Management</p> <ul style="list-style-type: none"> • OPR, upon authorization of the LESJWA Board of Directors, will perform any work above and beyond the scope of work as needed on a time and materials basis. 	<p>OPR Fees: Time/Materials</p>	<p>As Needed</p>
OPR EXPENSES: \$16,500		
OUTSIDE EXPENSES: \$500		
2014/2015 TOTAL: \$17,000		
OVERALL TOTAL: \$17,000		

LESJWA BOARD MEMORANDUM NO. 751

DATE: June 19, 2014

SUBJECT: Water Quality Modeling and Focused Studies for Lake Elsinore and Canyon Lake in Support of Nutrient TMDL and Assessment

TO: LESJWA Board of Directors

FROM: Mark R. Norton, P.E., Authority Administrator

RECOMMENDATION

Staff recommends that the Board of Directors approve Task Order No. UCR160-02 with Dr. Michael Anderson of UC Riverside (The Regents of the University of California, Riverside) in an amount not-to-exceed \$121,000 to conduct advanced water quality modeling and focused field measurements and laboratory analyses for Lake Elsinore and Canyon Lake to address key questions regarding longer term responses to watershed and in-lake management efforts.

BACKGROUND

In May 2014, the LESJWA TAC recommended an agreement with the University of California, Riverside (UCR), Dr. Michael Anderson, to perform advanced water quality modeling and focused field measurements and laboratory analyses for Lake Elsinore and Canyon Lake to address key questions regarding longer term responses to watershed and in-lake management efforts. This effort was requested as a follow-up to Dr Anderson's 2012 modeling, in which he conducted a series of technical studies to support the design of BMP implementation strategies for Canyon Lake and update TMDL Models for Lake Elsinore & Canyon Lake. This analysis indicated that hydrological conditions are of critical importance, and that particularly strong El Nino events that only occur every 5-10 years or more have a profound effect, both resetting the water budget and limnological conditions of the lakes and delivering large quantities of nutrients that potentially recycle for many years.

This follow-up modeling will seek to further evaluate not just seasonal or annual conditions but decadal and multi-decadal trends and conditions. This longer term perspective is needed to establish the appropriate reference condition for Lake Elsinore and Canyon Lake, and understand longer term responses to watershed and in-lake management efforts. New enhancements to CAEDYM allow prediction of sediment diagenesis processes, thus representing the sediments as dynamically as the water column. These new algorithms can be used to predict recycling and sequestration of P and N within the sediment, formation of hydrogen sulfide, methane and other constituents, and more accurately simulate the fate and biogeochemical transformations of algal-derived organic matter and watershed-derived sediment deposited within the lakes.

The attached Task Order provides an agreement with Dr. Michael Anderson to conduct a series of technical studies to perform advanced water quality modeling and focused field measurements and laboratory analyses for Lake Elsinore and Canyon Lake to address key questions regarding longer term responses to watershed and in-lake management efforts. Included with this Task Order is a scope of work and budget providing a detailed description of tasks to be performed by Dr. Michael Anderson through FY 2014-15.

Through this agreement, Dr. Michael Anderson will provide the following services to the Lake Elsinore and Canyon Lake Nutrient TMDL Task Force and LESJWA:

- Develop modeling tools for Lake Elsinore to guide the on-going TMDL implementation program
- Conduct focused Field Studies and Laboratory Measurements for Lake Elsinore and Canyon Lake including:
 - a-Stable-isotope and mobile-P measurements in Lake Elsinore sediments,
 - Fishery hydro-acoustic survey of Lake Elsinore,
 - Bathymetric survey and hydro-acoustic study of Canyon Lake, and
 - Mobile-P and Internal Nutrient Recycling Rates in Canyon Lake
- Prepare 12 Technical memoranda to evaluate the effectiveness of current water quality improvement projects in Lake Elsinore, and determine the need for any additional nutrient control measures

BUDGET IMPACT

The Lake Elsinore/Canyon Lake TMDL Task Force FY 2014-15 Budget provided a budget of \$125,000 to update watershed and in-lake nutrient models. All staff contract administration time for this contract will be taken from the TMDL budget and funded by the TMDL Stakeholders.

MN:RW:dm

Attachment:

1. Task Order No. UCR160-02 (with scope and schedule)

MASTER RESEARCH AGREEMENT WITH PUBLIC UNIVERSITY

THIS AGREEMENT is made this 19th day of June, 2014 by and between the **Lake Elsinore & San Jacinto Watersheds Authority (LESJWA)** whose address is 11615 Sterling Avenue, Riverside, Calif. 92503, and **The Regents of the University of California on behalf of its Riverside campus ("University")** whose address is University of California Riverside, Office of Research, Riverside, CA 92521.

RECITALS

This Agreement is entered into on the basis of the following facts, understandings, and intentions of the parties to this Agreement:

- A. LESJWA desires to engage the University to perform research as may be assigned, from time to time, by LESJWA in writing.
- B. University agrees to provide such services pursuant to, and in accordance with, the terms and conditions of this Agreement and certifies to LESJWA that University possesses the necessary skills, qualifications, personnel, and equipment to provide such services.
- C. The services to be performed by University shall be specifically described in one or more written Task Orders issued by LESJWA to University pursuant to this Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing Recitals and mutual covenants contained herein, LESJWA and University agree as follows:

ARTICLE I

TERM OF AGREEMENT

1.01 Term of Agreement. This agreement shall become effective on the date first above written and shall continue until **December 31, 2018**, unless extended or sooner terminated as provided for herein.

ARTICLE II

SERVICES TO BE PERFORMED

2.01 University agrees to provide such professional services as may be assigned, from time to time, in writing by the Board and the Authority Administrator of LESJWA. Each such assignment shall be made in the form of a written Task Order. Each such Task Order shall include, but shall not be limited to, a description of the nature and scope of the services to be performed by University, the amount of compensation to be paid, and the expected time of completion.

2.02 University may, at University's sole cost and expense, employ such competent and qualified independent professional associates, subcontractors, and consultants as University deems necessary to perform each such assignment; provided, however, that University shall not subcontract any of the work to be performed without the prior written consent of LESJWA.

ARTICLE III

COMPENSATION

3.01 In consideration for the services to be performed by University, LESJWA agrees to pay University as provided for in each Task Order.

3.02 Each Task Order shall specify a total not-to-exceed sum of money and shall be based upon the University's regular cost charged by University to its clients, as set forth on an exhibit to be attached to each Task Order issued to University.

3.03 LESJWA shall reimburse University for expenses incurred by University in accordance with the budget. Reimbursement shall be according to a schedule set forth in each Task Order.

3.04 University shall not be compensated for any services rendered nor reimbursed for any expenses incurred in excess of those authorized in any Task Order unless approved in advance by the Board of Directors and Authority Administrator of LESJWA, in writing.

3.05 Unless otherwise provided for in any Task Order issued pursuant to this Agreement, payment of compensation earned shall be made in monthly installments after receipt from University of a timely, detailed written invoice by LESJWA's Project Manager, describing, without limitation, the services performed, and the identity of individuals performing such services for the benefit of LESJWA. Such invoices also shall include a detailed itemization (by the categories identified in the budget) of expenses incurred. Such invoices shall be received in LESJWA's office on or before the 15th day of the month, for payment on or about the 15th day of the following month. All payments are made within 30 days of receipt of proper invoice. Each such invoice shall be provided to LESJWA by University within 15 days after the end of the month in which the services were performed.

ARTICLE IV **OBLIGATIONS OF UNIVERSITY**

4.01 University agrees to perform all assigned services in accordance with the terms and conditions of this Agreement and those specified in each Task Order.

4.02 Except as otherwise provided for in each Task Order, University will supply all personnel and equipment required to perform the assigned services.

4.03 Each Party shall defend, indemnify and hold the other Party, its officers, and employees, harmless from and against any and all loss, damage, cost or expenses, including attorney's fees or claims for injury or damages arising out of the performance of this Agreement, but only in proportion to and to the extent such liability, loss expense, attorney's fees, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of the indemnifying Party's officers or employees.

- 4.04 University shall be solely responsible for the health and safety of its employees and agents in performing the services assigned by LESJWA. University hereby certifies that it is self-insured and agrees to:
- a. Maintain a comprehensive general liability and automobile self-insurance program, including contractual coverage, with combined single limits for bodily injury and property damage in an amount of not less than \$1,000,000.00.
 - b. Maintain self-insured professional liability insurance in a minimum amount of \$1,000,000.00 per claim or occurrence;
 - c. Comply with all local, state and federal laws, rules and regulations;
 - d. Provide worker's compensation insurance or a California Department of Insurance-approved self-insurance program in an amount and form that meets all applicable Labor Code requirements, covering all persons or entities providing services on behalf of the University and all risks to such persons or entities.

University shall furnish LESJWA with a certificate of self-insurance.

4.05 All Task Orders will identify a Principal Investigator for the work to be performed for each Task Order. The Principal Investigator shall be responsible for the administration, direction, and content of the project identified in the Task Order. In the event that the Principal Investigator becomes unable or unwilling to continue work under the Task Order, University shall name an alternate Principal Investigator, subject to LESJWA's consent. If LESJWA does not provide such consent, LESJWA may terminate this Agreement in accordance with Section 8.02 below.

4.06 In the event University is required to prepare plans, drawings, specifications and/or estimates, they shall conform to local, state and federal laws, rules and regulations. University shall obtain all necessary permits and approvals in connection with this Agreement, any Task Order or Change Order. However, in the event LESJWA is required to obtain such an approval or permit from another governmental entity, University shall provide all necessary supporting documents to be filed with such entity, and shall facilitate the acquisition of such approval or permit.

ARTICLE V
OBLIGATIONS OF LESJWA

5.01 LESJWA shall

- a. Furnish all existing studies, reports and other available data pertinent to each Task Order that is in LESJWA's possession; and
- b. Designate a person to act as liaison between University and the Authority Administrator and Board of Directors of LESJWA.

ARTICLE VI
ADDITIONAL SERVICES, CHANGES AND DELETIONS

6.01 During the term of this Agreement, the Board of Directors of LESJWA may, from time to time and without affecting the validity of this Agreement or any Task Order issued pursuant thereto, order changes, deletions, and additional services by the issuance of written Change Orders authorized and approved by the Board of Directors of LESJWA.

6.02 In the event University performs additional or different services than those described in any Task Order or authorized Change Order without the prior written approval of the Board of LESJWA, University shall not be compensated for such services.

6.03 University shall promptly advise LESJWA as soon as reasonably practicable upon gaining knowledge of a condition, event, or accumulation of events, which may affect the scope and/or cost of services to be provided pursuant to this Agreement. All proposed changes, modifications, deletions, and/or requests for additional services shall be reduced to writing for review and approval or rejection by the Board of Directors of LESJWA.

6.04 In the event that LESJWA orders services deleted or reduced, compensation shall be deleted or reduced by a comparable amount as determined by LESJWA, and University shall only be compensated for services actually performed. In the event additional services are properly authorized, payment for the same shall be made as provided in Article III above.

ARTICLE VII
CONSTRUCTION PROJECTS:
CHANGE ORDERS FOR CONSTRUCTION UNIVERSITY

7.01 In the event LESJWA authorizes University to perform construction management services for LESJWA, University may determine, in the course of providing such services, that a Change Order should be issued to the construction contractor, or University may receive a request for a Change Order from the construction contractor. University shall, upon receipt of any requested Change Order or upon gaining knowledge of any condition, event, or accumulation of events, which may necessitate issuing a Change Order to the construction contractor, promptly consult with the liaison and the Authority Administrator. All Change Orders necessitating a dollar amount change must be approved by the LESJWA Board of Directors.

ARTICLE VIII
TERMINATION OF AGREEMENT

8.01 In the event the time specified for completion of an assigned task in a Task Order exceeds the term of this Agreement, the term of this Agreement shall be automatically extended for such additional time as is necessary to complete such Task Order, and thereupon this Agreement shall automatically terminate without further notice.

8.02 Notwithstanding any other provision of this Agreement, Either Party at its sole option, may terminate this Agreement at any time by giving 30 day written notice to other Party, whether or not a Task Order has been issued to University.

8.03 In the event of termination, the payment of monies due University for work performed prior to the effective date of such termination and any uncancellable obligations shall be paid after receipt of an invoice as provided in this Agreement.

ARTICLE IX **STATUS OF UNIVERSITY**

9.01 University shall perform the services assigned by LESJWA in University's own way as an independent contractor, and in pursuit of University's independent calling, and not as an employee of LESJWA. University shall regularly confer with LESJWA's liaison, Authority Administrator, and ultimately the Board of Directors as provided for in this Agreement.

9.02 University hereby specifically certifies to LESJWA that the research to be performed pursuant to this Agreement shall be performed in accordance with the standards customarily applicable to the performance of research. Further, University certifies that the individual signing this Agreement on behalf of University has the full authority to bind University to this Agreement.

ARTICLE X **AUDIT; OWNERSHIP OF DOCUMENTS**

10.01 LESJWA shall own all reports, plans, drawings, specifications, prepared or developed by University and required to be delivered to LESJWA in accordance with the Task Order.

10.02 University shall retain and maintain, for a period not less than four years following termination of this Agreement, all time records, accounting records, and vouchers and all other records with respect to all matters concerning services performed, compensation paid and expenses reimbursed. At any time during normal business hours and as often as LESJWA may deem necessary, University shall make available to LESJWA's agents for examination of all such records and will permit LESJWA's to audit, examine and reproduce such records.

ARTICLE XI **MISCELLANEOUS PROVISIONS**

11.01 This Agreement supersedes all previous agreements, either oral or written, between the parties hereto with respect to the rendering of services by University for LESJWA and contains all of the covenants and agreements between the parties with respect to the rendering of such services in any manner whatsoever. Any modification of this Agreement will be effective only if it is in writing signed by both parties.

11.02 University shall not assign or otherwise transfer any rights or interest in this Agreement without the prior written consent of LESJWA. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement.

11.03 In the event University is an individual person, and University dies prior to completion of this Agreement or any Task Order issued hereunder, any monies earned that may be due University from LESJWA as of the date of death will be paid to University's estate.

11.04 University shall comply with all local, state and federal laws, rules and regulations including those regarding nondiscrimination and the payment of prevailing wages.

11.05 LESJWA expects that University will devote its full energies, interest, abilities and productive time to the performance of its duties and obligations under Agreement, and shall not engage in any other consulting activity that would interfere with the performance of University's duties under this Agreement or create any conflicts of interest. If required by law, University shall file Conflict of Interest Statements with LESJWA.

11.06 Any dispute which may arise by and between LESJWA and the University regarding the interpretation or implementation of this Agreement, including any claims for breach of this Agreement, the parties agree to try in good faith to settle the dispute by mediation pursuant to California Evidence Code Section 1115 et seq. before resorting to arbitration or litigation. The mediator(s) shall assist the parties in reaching a settlement, but shall have no authority to make a binding decision or award.

11.07 All notices or reports permitted or required under this Agreement shall be in writing and shall be delivered by personal delivery or by certified or registered mail, return receipt requested, and shall be deemed given upon actual receipt Notices shall be sent to the parties at the addresses described below or such other address as either party may designate for itself in writing.

For Scientific/Technical Matters:

University:

LESJWA

See Task Order

See Task Order

For Contractual/Agreement Matters:

University: University of California, Riverside
Office of Research
Attn: _____
900 University Avenue
Riverside, CA 92521-0217

LESJWA
Contracts & Administration
Attn: Dawna Munson
11615 Sterling Avenue
Riverside, CA 92503

11.08 During the performance of the Agreement, University, and its subcontractors, shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave. University, and its subcontractors, shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. University, and its subcontractors, shall comply with the provisions of the Fair Employment and Housing Act (Government Code, Section 12290 et seq.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 et seq., set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations are incorporated into this Agreement by reference and made a part hereof as if set forth in full. University, and its subcontractors, shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. University shall include the non-discrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

LAKE ELSINORE & SAN JACINTO WATERSHEDS AUTHORITY
TASK ORDER NO. UCR160-02

CONSULTANT: University of California, Riverside **VENDOR NO.** 1665
Office of Research Affairs
Riverside, CA 92521

COST: \$121 ,000

PAYMENT: University shall invoice

REQUESTED BY: Mark Norton, Authority Administrator June 17, 2014

FINANCE: _____
Karen Williams, CFO

FINANCING SOURCE: Acct. Coding 180PIPEL-6113-03
Acct. Description Consulting – Monitoring

COMMISSION AUTHORIZATION REQUIRED: YES (X) NO ()
Board Memo #751

This Task Order is issued by the Lake Elsinore & San Jacinto Watersheds Authority (hereafter LESJWA) to **University of California, Riverside** (hereafter “University”) pursuant to the Agreement between LESJWA and University entitled *Research Agreement*, dated June 17, 2014 (*expires 12-31-2018*).

I. PROJECT NAME OR DESCRIPTION

Water Quality Modeling and Focused Studies for Lake Elsinore and Canyon Lake in Support of Nutrient TMDL and Assessment

II. SCOPE OF WORK / TASKS TO BE PERFORMED

University shall provide all labor, materials and equipment for the Project to perform the specific tasks as described in Attachment A.

University shall conduct advanced water quality modeling and focused field measurements and laboratory analyses proposed for Lake Elsinore and Canyon Lake. This includes:

1. Develop modeling tools for Lake Elsinore to guide the ongoing TMDL implementation program.
2. Conduct focused field studies and laboratory measurements for Lake Elsinore and Canyon Lake including:
 - a. Stable-isotope and mobile-P measurements in Lake Elsinore sediments.
 - b. Fishery hydro-acoustic survey of Lake Elsinore.
 - c. Bathymetric survey and hydro-acoustic study of Canyon Lake.
 - d. Mobile-P and internal nutrient recycling rates in Canyon Lake.
3. Prepare 12 technical memoranda to evaluate the effectiveness of current water quality improvement projects in Lake Elsinore, and determine the need for any additional nutrient control measures.

Please refer to Appendix X for acceptable formats, also found at www.sawpa.org/html/e_req.htm

June 11, 2014

Lake Elsinore-San Jacinto Watershed Authority
Santa Ana Watershed Project Authority
11615 Sterling Avenue
Riverside, CA 92503

RE: UCR Proposal Number 14121148:

On behalf of The Regents of the University of California (Riverside campus) we are presenting for your review, a request for support of the following proposal:

Principal Investigator:	Dr. Michael Anderson Department of Environmental Sciences
Title:	<i>“Water Quality Modeling and Focused Studies for Lake Elsinore and Canyon Lake in Support of Nutrient TMDL and Assessment”</i>
Support Requested:	\$121,000
Period of Support:	July 1, 2014 through August 31, 2014
Type of Request:	New Research Contract

Your favorable consideration of this proposal will be greatly appreciated. In the event this proposal is selected to be funded, the University reserves the right to negotiate terms and conditions consistent with University policy. Please forward any resulting award documentation to Awards@ucr.edu.

Should you have any technical questions concerning this proposal, please contact the principal investigator at (951) 827-3757 or via email at michael.anderson@ucr.edu. Business or administrative questions should be directed to the undersigned at (951) 827-4813 or via email at frosina@ucr.edu.

Sincerely,



Frosina Al Zgoul
Sr. Contract & Grant Officer
Sponsored Programs

**Water Quality Modeling and Focused Studies for Lake Elsinore
and Canyon Lake in Support of Nutrient TMDL and Assessment**

A Research Proposal to the:

Lake Elsinore-San Jacinto Watershed Authority
Santa Ana Watershed Project Authority
11615 Sterling Avenue
Riverside, CA 92503

Submitted by:

Michael A. Anderson
Dept. of Environmental Sciences
Univ. of California
Riverside, CA 92521

Project term and cost:

July 1, 2014 – June 30, 2015

\$ 121,000

Introduction

Advanced water quality modeling and focused field measurements and laboratory analyses are proposed for Lake Elsinore and Canyon Lake. Previous simulations of water quality in Canyon Lake conducted using the coupled Dynamic Reservoir Simulation Model (DYRESM)-Computational Aquatic Ecosystem Dynamics Model (CAEDYM) answered key questions concerning water quality and its management in Canyon Lake. For example, modeling demonstrated the importance of El Nino events in loading of nutrients to Canyon Lake; events such as the El Nino of 2005 were shown to deliver in a just a few months 40% of the total P load and 48% of total N load delivered over the past 10 years (2002-2011) (Anderson, 2012a). This intense and highly asynchronous loading of nutrients associated with large runoff events has important implications for water quality as well as effectiveness of watershed BMPs and in-lake nutrient management strategies. Moreover, by focusing on longer intervals of time, one can better quantify interannual variability in water quality and allow us to better understand the unique role that our El Nino-driven climate system has on the properties of our lakes and reservoirs. Previous model simulations also assessed the capacity for different management strategies to meet numeric targets set for nitrogen (N), phosphorus (P), chlorophyll a and dissolved oxygen (DO) (Anderson, 2012b). A separate simulation study quantified the substantive water balance and water quality benefits associated with the Lake Elsinore Management Plan (LEMP) that substantially reduced the lake surface area and increased its mean depth (Anderson, 2013).

Numerical modeling has thus offered a much more detailed understanding of water quality in Canyon Lake and Lake Elsinore than available from limited field measurements. In particular, it is clear that hydrological conditions are of critical importance, and that particularly strong El Nino events that only occur every 5-10 years or more have a profound effect, both resetting the water budget and limnological conditions of the lakes and delivering large quantities of nutrients that potentially recycle for many years.

As a result, keen interest exists in understanding not just seasonal or annual conditions but decadal and multi-decadal trends and conditions. This longer term perspective is needed to establish the appropriate reference condition for Lake Elsinore and Canyon Lake and also understand longer term responses to watershed and in-lake management efforts. New enhancements to CAEDYM allow prediction of sediment diagenesis processes, thus representing the sediments as dynamically as the water column. These new algorithms can be used to predict recycling and sequestration of P and N within the sediment, formation of hydrogen sulfide, methane and other constituents, and more accurately simulate the fate and biogeochemical transformations of algal-derived organic matter and watershed-derived sediment deposited within the lakes.

1. Water Quality Model for Lake Elsinore

The nutrient TMDL for Lake Elsinore relies on a relatively simple water quality model to estimate acceptable phosphorus and nitrogen loads. The original TMDL

model, developed more than a decade ago, assumes a static lake level (1240') and static loads based on long-term annualized averages. The model does not include any adjustment for the length of time nutrients remain bioavailable after arriving in the lake, nor does it consider the important role zooplankton play in controlling algae growth or the influence of salinity in limiting reproduction in the zooplankton population (Veiga-Nascimento, 2004).

In order to evaluate the effectiveness of current water quality improvement projects in Lake Elsinore, and determine the need for any additional nutrient control measures, it is essential to develop more powerful modeling tools to guide the on-going TMDL implementation program. Specifically, the TMDL water quality model for Lake Elsinore should be updated to take into consideration all of the following factors:

- i) **Dynamic lake levels** that rise during infrequent wet years and fall (due to evaporation) during prolonged dry periods. How do nutrient and salinity concentrations vary with lake level and how does that variability directly and indirectly affect algae growth?
- ii) **Asymmetric precipitation/runoff patterns** where new external nutrient loads contributed by storm water runoff from the upper watershed are focused in a relatively few wet years. The current model relies on three archetypical years (dry, moderate & wet) but expresses the sum as a weighted annualized average. The revised model should use a broader range of historical precipitation data to develop finer resolution and simulate year-to-year water quality conditions in the lake without using a weighted annualized average that artificially dampens the true effects of such hydrologic variability on nutrient loading.
- iii) **Slow mineralization rate** within sediments and the length of time that nutrients remain bioavailable and cycle through the water column to support algae growth, including that delivered in supplemental wastewater flows.
- iv) **Biological constraints** and particularly the role of zooplankton grazing on algae growth.
- v) **Fishery management programs** intended to reduce nutrient resuspension from lake bottom sediments by limiting carp populations, and to reduce predation of zooplankton by stocking hybrid game fish to control shad populations.
- vi) **Aeration and mixing systems** installed to reduce nitrogen and phosphorus levels in Lake Elsinore. The model should be able to evaluate the influence of such systems on lakewide water quality for a range of effectiveness assumptions.
- vii) **Alum applications in Canyon Lake** and the effect of such applications on new external nutrient loads transferred downstream to Lake Elsinore in wet years assuming continued alum applications on a biannual basis. Similar techniques may also be used to evaluate how other BMP control measures in the upper watershed might influence water quality in Lake Elsinore.

The model will be constructed to include existing infrastructure (e.g. dams, levees, etc.) as default conditions unless directed otherwise by the Task Force. (These default conditions will apply even when estimating water quality for pre-development scenarios.) The TMDL Task Force intends to rely on this more comprehensive and updated water quality model to address the following questions:

- 1) How do nutrient concentrations, salinity concentrations, dissolved oxygen (DO) concentrations and algae concentrations vary with lake level under pre-development and modern land use conditions?
- 2) How does the addition of recycled water change the natural variations in lake level that would otherwise occur and what is the net effect on nutrient, salinity and algae concentrations over time?
- 3) What is the estimated effect on water quality (nutrients, algae, DO) of limiting the carp population? (Note: similar to the question previously addressed in Dr. Anderson's 2006 sensitivity study).
- 4) What is the estimated effect on water quality (nutrients, algae, DO) of stocking hybrid game fish to reduce the shad population and protect the zooplankton population?
- 5) What is the net effect of using recycled water to stabilize water levels in Lake Elsinore over a long period of time? Specifically, how do all of the following change with and without the presence of recycled water? And, what is the net effect on each of adding more/less recycled water?
 - a) Acre-feet of aquatic habitat; surface acres of recreational reservoir
 - b) Algae and DO concentrations
 - c) Nutrient and salinity concentrations
- 6) What is the estimated effect on water quality in Lake Elsinore if additional measures are implemented to further reduce the average phosphorus concentration in recycled water (e.g. from the current 0.5 mg/L down to as low as 0.1 mg/L in 0.1 mg/L increments)?
- 7) To what extent, if any, will reducing algae populations in Lake Elsinore affect ammonia concentrations in the lake?
- 8) Based on our best understanding of dynamic lake levels, asymmetric precipitation/runoff/loading patterns and nutrient cycling in Lake Elsinore, how much reduction in new external nutrient loads and/or existing sediment loads would be required to achieve compliance with the TMDL response targets for chlorophyll-a and DO?

2. Focused Field Studies and Laboratory Measurements

While water quality modeling will be used to answer a number of critical questions concerning Lake Elsinore and Canyon Lake, focused field studies and laboratory measurements are also needed to address specific management questions.

2.1 Stable-isotope and mobile-P measurements in Lake Elsinore sediments

Nutrients present in a labile form within surficial sediments can be recycled back to the water column numerous times, and this recycling is the primary loading mechanism for nutrients in Lake Elsinore (Anderson et al. 2002). Internal recycling rates have been measured periodically at the lake for more than 10 yrs, although a comprehensive understanding of nutrient cycling in the lake remains elusive. The isotopic composition of N, C and O (on PO_4) is altered during recycling and can thus provide a measure of the frequency of recycling before nutrients are finally sequestered in bottom sediments (P) or potentially lost to the atmosphere (N). Previous studies have also found that internal recycling rates are strongly correlated with mobile-P content of sediments (Reitzel et al., 2006). Mobile-P content is generally considered to be one of the most effective ways to determine appropriate dosage rates for alum treatment of lakes (Pilgrim et al., 2007).

Stable-isotope and mobile-P measurements will be conducted from sediment grab samples and intact cores from locations across the lake. Stable-isotope composition of sediment, pore water and overlying water will be determined on a Delta-V Advantage isotope ratio mass spectrometer. Mobile-P contents will be determined following Pilgrim et al. (2007) with sequential extraction of sediment samples with 1 M NH_4Cl followed by citrate-bicarbonate-dithionite. Extracted P will be determined using a Seal discrete analyzer following Standard Methods (APHA, 1998). Stable-isotope measurements will also be evaluated for their ability to “fingerprint” N and P in recycled water and in the water column and sediments to estimate their persistence and fate.

2.2 Fishery hydroacoustic survey of Lake Elsinore

Fishery management at Lake Elsinore has been very successful in reducing carp populations and their impact on water quality. These conclusions are based upon beach seining yields and supported by electrofishing surveys as well as hydroacoustic surveys conducted in 2008 and 2009 (Anderson, 2009). In addition to carp, threadfin shad are also considered an undesirable species at large population levels, due to their grazing pressure on beneficial zooplankton. Zooplankton can regulate phytoplankton abundance through top-down control; for example, large populations of zooplankton in 2005 helped control algal levels despite high concentrations of dissolved nutrients. Indirect evidence indicates that crappie and other piscivorous fish regulated the threadfin shad population that, combined with reduced salinity, allowed the zooplankton to reach levels not seen in the lake over the past decade.

A hydroacoustic survey will be conducted to quantify the fishery in the lake for comparison with earlier survey results. The hydroacoustic survey will be conducted using a BioSonics DT-X echosounder with 430-kHz and 38-kHz single beam transducers with integrated pitch-roll sensors multiplexed with a 201-kHz split beam transducer. Data will be acquired at 5 pps on each of the 3 frequencies. Each of the 3 transducers will be calibrated using tungsten-carbide calibration spheres every day in the field prior to collection of acoustic data and at the end of the day's survey. Echograms will be analyzed using VisualAnalyzer and/or Sonar5 Pro. Of particular interest is the status of the threadfin shad population, although based upon target strength and habitat use,

carp and sport fish levels will also be estimated. The survey will be coordinated with DFG electrofishing and/or gill-net surveys to ground-truth interpretation of fishery hydroacoustic data.

2.3 Bathymetric survey and hydroacoustic study of Canyon Lake

A bathymetric survey and hydroacoustic sediment characterization is also proposed for Canyon Lake. As described above, a BioSonics DT-X echosounder with 38-, 201-, and 430-kHz transducers will be used in the survey. The 430-kHz echosounder has a small near-field and has low acoustical penetration of bottom sediments, thus offering a very accurate way of determining sediment depth and acoustical properties (e.g., hardness, roughness, fractal dimension) of the surficial sediments (Anderson and Pacheco, 2011) (Fig. 1). The lower frequency of the 38-kHz echosounder, in contrast, has much lower absorption by bottom sediments and can thus be used to determine sediment thickness (Elci et al., 2009). Penetration depths into fine organic sediments can be many meters, until the sound wave is reflected off of a strong density contrast such as granite bedrock or a compacted clay lens or desiccation layer (Fig. 1a).

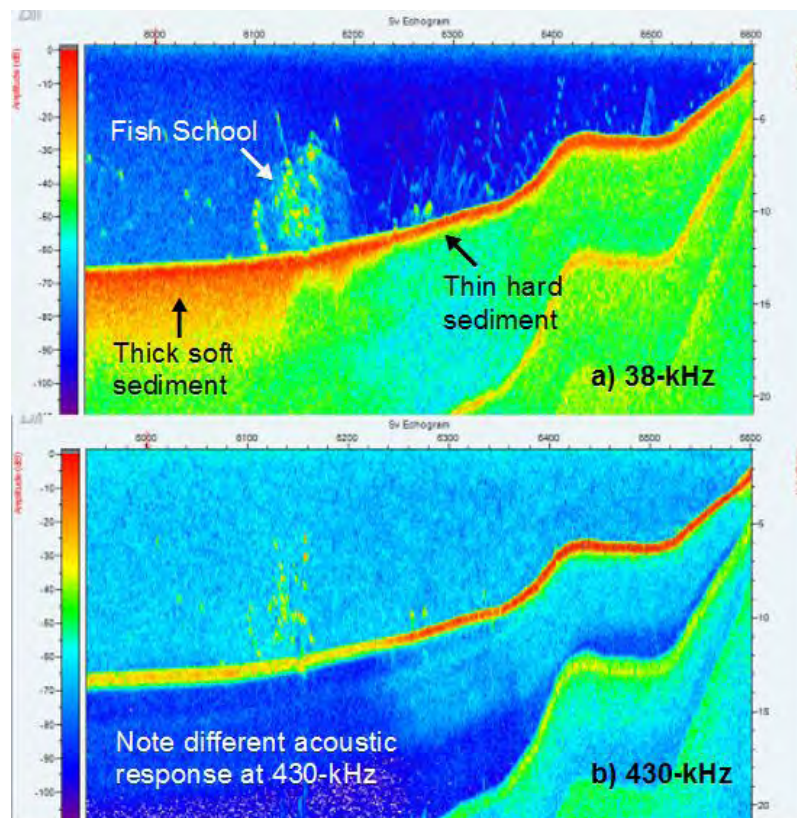


Fig. 1. Example echograms showing sediment and water column features: a) 38-kHz and b) 430-kHz.

The 201-kHz frequency split-beam transducer provides a unique 3rd acoustic signature of the bottom sediments and assessment of the fishery (population, size,

distribution, and habitat use). Georeferenced hydroacoustic data, collected with a JRC 212W realtime DGPS, will be used to develop a detailed bathymetric map for Canyon Lake, and maps of sediment thickness and acoustically-inferred sediment properties correlated with nutrient release, oxygen demand, deposition, and habitat quality for benthic invertebrates. Bathymetry and acoustical characterization of the bottom sediments and fishery in Canyon Lake will be conducted on a regular grid with a nominal 10-20 m spacing and survey speed of 3-4 knots. In regions of greater slope or bottom contour heterogeneity, more closely-spaced measurements will be made. Data will be acquired at 5 pps on each of the 3 frequencies. Each of the 3 transducers will be calibrated using tungsten-carbide calibration spheres every day in the field prior to collection of acoustic data and at the end of the day's survey. It is expected that the total survey will take about 15 h of acquisition time on the water.

Sediment samples will be collected from at least 6 sites to ground-truth the acoustic data, including sites where historical data are available (Anderson and Oza, 2003; Anderson, 2007). Sediment cores collected with a gravity or percussion corer will also be collected from 3-6 sites to ground-truth measurements of sediment thickness based upon echograms from the 430- and 38-kHz transducers (Fig. 1).

2.4 Mobile-P and Internal Nutrient Recycling Rates in Canyon Lake

Measurements of mobile-P, Al-P and internal nutrient recycling rates in Canyon Lake will assess progress made by alum additions in sequestering bioavailable/mobile-P. Mobile-P contents of sediments will be determined on grab samples and cores following Pilgrim et al. (2007) as previously described and will also include extraction of Al-P using NaOH. Nutrient flux measurements will be made on triplicated intact sediment cores collected from the 5 sites previously sampled for water quality and nutrient flux measurements (Anderson and Oza, 2003; Anderson, 2007). Cores will be collected following Beutel (2000) and Anderson (2001). An Ekman dredge is used to collect a grab sample, which is then subsampled by carefully inserting a 30.5 cm by 6.3 cm diameter Lucite tube approximately 10 cm into the sediment. The bottom of the core is sealed using a rubber stopper. The core is then carefully topped off with bottom water sampled using a van Dorn sampler, stoppered with zero headspace and transported back to the lab.

Cores will then be incubated in the dark at the temperature and DO levels measured at the time of sampling. Approximately 10 mL of water will be removed daily, filtered and analyzed for soluble $\text{NH}_4\text{-N}$, $\text{NO}_3\text{-N}$ and SRP using an Seal discrete analyzer following standard methods (APHA, 1989). Dissolved oxygen will be measured using a YSI Model 55 DO meter, with the water briefly sparged with N_2 or lab air as needed to maintain DO and to very gently mix the water column within the core. The measured change in concentration is used in conjunction with water volume and sediment-water interfacial area to calculate nutrient flux rates and compared with previously measured values.

Deliverables and Reporting

1. Technical memoranda will be developed from water quality simulations for each of the questions posed above:
 - 1.1 Variation in nutrients, salinity, DO and chlorophyll concentrations
 - 1.2 Recycled water additions and influence on lake level, salinity nutrients, algae
 - 1.3 Effect of carp population on water quality
 - 1.4 Effect of hybrid striped bass and other piscivores on threadfin shad, algae
 - 1.5 Long-term effect of recycled water addition
 - 1.6 Benefits from further reductions in P concentrations in recycled water
 - 1.7 Effect of reductions of algae on ammonia concentrations
 - 1.8 Reductions in loading needed to achieve compliance with TMDL targets
2. Technical memoranda will also be developed for each of the focused studies:
 - 2.1 Stable-isotope and mobile-P measurements for Lake Elsinore
 - 2.2 Fishery hydroacoustic survey for Lake Elsinore
 - 2.3 Bathymetric and hydroacoustic fishery survey for Canyon Lake
 - 2.4 Mobile-P contents and internal loading rates in Canyon Lake
3. Regular meetings and presentations summarizing progress provided to LESJWA, SARWQCB staff, and others.
4. Data reports which will include bathymetric measurements, sediment characterization, etc. provided to LESJWA by June 30, 2015.

Budget and Schedule

An itemized budget by task is provided in Table 1 below, however please note that all project costs are incurred according to our cost accounting standards and charged upon actual expenditures of the project. Dr. Anderson and graduate and undergraduate students under the direction of Dr. Anderson will be conducting the research described above. Project period: 12 months, July 1, 2014 - June 30, 2015.

Task	Completion ¹	Total Cost
1. Water quality modeling	March 2015 ²	\$ 70,000
2.1 Stable isotope and mobile-P in Lake Elsinore	December 2014	\$ 16,000
2.2 Fishery hydroacoustic survey of Lake Elsinore	June 2015	\$ 10,000
2.3 Bathymetric/hydroacoustic survey of Canyon Lake	January 2015	\$ 17,000
2.4 Mobile-P and internal recycling rates in Canyon Lake	March 2015	\$ 8,000
Total		\$ 121,000

¹The completion dates are provided as estimates; the actual completion dates may differ slightly.

²Technical memoranda will be developed and submitted periodically through fall 2014, with modeling and reports expected to be completed by March 2015.

References

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- APHA 1998. *Standard Methods for the Examination of Water and Wastewater*. 20th Edition. American Public Health Association, Washington, D.C.
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- Pilgrim, K.M., B.J. Huser and P.L. Brezonik. 2007. A method for comparative evaluation of whole-lake and inflow alum treatment. *Water Res.* 41:1215-1224.
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