

CV-SALTS Executive Committee Meeting

October 19, 2011 10:00 AM to 12:00 PM

Teleconference Only

(218) 339-4600 Code: 927571#

Posted 10-10-11

Meeting Objectives:

1. Program Development to mirror the policy development meetings
2. Execute business actions for CV-SALTS

AGENDA

1) Welcome and Introductions - Chair

- a) Review/Approve September 13, 2011 notes – 2 min
- b) Committee Roll Call and Membership Roster

2) City of Davis Salinity Study Workplan – Recommendation Letter - 20 min

Action: Review and Approve recommendation letter to Regional Board

3) 2011 CV-SALTS Progress Milestones Status Updated status and Program Funding - 5 min

Action: Review and discuss

4) Technical Project Management: Budget Status and Task Prioritization – Michael Steiger - 20 min

Action: Discuss and Approve Prioritization Process for technical tasks

5) State Board Hearing on CV-SALTS Progress-Winter 2011 –Jeanne Chilcott– 25 min

Action: Discuss, Edit and Approve CV-SALTS Annual Report to State Board

6) Cleanup & Abatement Fund Status Update – Jeanne Chilcott – 5 min

Review: Current status of \$3.8 million dollar contract

7) CV-SALTS Website Beta Review Request - Daniel Cozad – 5 min

8) Set next meeting objectives and date (October 20, 2011) and November conference call date

Review Schedule of Policy Discussions and other meetings - 10 min

10) Future Items

- a) 3a/3b Task Force Status
- b) Expected Future Roles of the State and Regional Boards, stakeholders, CVSC

CV-SALTS meetings are held in compliance with the Bagley-Keene Open Meeting Act set forth in Government Code sections 11120-11132 (§ 11121(d)). The public is entitled to have access to the records of the body which are posted at www.cvsalinity.org

October 4, 2011

Diana Messina
NPDES Program Manager
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, Ste. 200
Rancho Cordova, CA 95670

**CENTRAL VALLEY SALINITY ALTERNATIVES FOR LONG-TERM SUSTAINABILITY (CV-SALTS)
TECHNICAL ADVISORY COMMITTEE RECOMMENDATIONS REGARDING CITY OF DAVIS
SALINITY STUDY DRAFT WORKPLAN**

On 26 August 2011, the CV-SALTS Technical Advisory Committee reviewed and discussed the City of Davis Draft EC, Boron, Sodium and Chloride Workplan (City of Davis Workplan) to conduct a salinity study in order to determine appropriate salinity water quality objectives to protect agricultural supply water. The committee focused on the applicability of data collected as part of an earlier Woodland study to the current effort; use of the Hoffman model as a check on the Grattan model; appropriateness of using either model to evaluate boron, chloride or sodium; means of determining a leaching fraction; and other issues raised by committee members. Discussion points, findings and recommendations for the above issues have been documented in Attachment 1 (CV-SALTS Technical Advisory Committee City of Davis Draft EC, Boron, Sodium and Chloride Study Workplan Recommendations, September 2011).

In addition to discussing the technical issues related to the City of Davis Workplan, the committee also briefly examined some over-arching policy issues such as the determination of the most sensitive crop to be protected in a given sub-area, the concept of a "reasonable level of protection" (i.e., acceptable range of relative crop yield), and determining appropriate adjustments for drought years. While the committee recognizes the policy discussions will continue at the Executive Committee, some factors they agree need to be considered include:

- Evaluating seasonality of cropping and irrigation when reviewing water quality objectives to protect agricultural supply. Literature numbers typically provide a margin of safety for stress during different seasonal conditions (e.g., although winter grown crops may be more salt sensitive, they are also being grown in less stressful environment).
- Identifying whether economic viability, as opposed to the presence of a crop in the area, is a better consideration to determine the crops to be protected. Both the percentage of acreage devoted to a particular crop in a region and the economic return of those crops should be considered in establishing the crops that must be protected from salinity impacts.
- Providing adjustments to account for drought situations (e.g., most growers prefer, and can manage, sufficient quantities of poorer quality water as opposed to restrictions on the quantities of water provided to them).

The Executive Committee will consider these factors and provide recommendations in a future letter. We appreciate the opportunity to comment on the City of Davis Workplan and anticipate that our recommendations will be incorporated into the final study.

Nigel Quinn
Chair, CV-SALTS Technical Advisory Committee

Parry Klassen
Chair, CV-SALTS Executive Committee

cc: Stan Grczko City of Davis
Pamela Creedon, Executive Officer, Central Valley Regional Water Quality Control Board

**Attachment 1. CV-SALTS Technical Advisory Committee
City of Davis Draft EC, Boron, Sodium and Chloride Study Workplan Recommendations
September 2011**

1) Applicability of Woodland data to the City of Davis study.

The cropping pattern identified in the City of Woodland study¹ is likely similar to the City of Davis case since the majority of agricultural use for both studies is within the Yolo Bypass. The Technical Advisory Committee concurred with initial Central Valley Regional Water Quality Control Board (CVRWQCB) staff comments that the City of Davis must clearly delineate the areas that utilize the downstream receiving waters as agricultural supply, confirm the types of crops grown in these areas, investigate cropping patterns and growth cycles of crops, and identify the most salt sensitive crop(s) to be protected.

Finding: The draft City of Davis Workplan appears to adequately address the above needs.

2) Use of the Hoffman model to evaluate the results from the Grattan model.

The committee expressed concern with using a steady state model (Hoffman) to evaluate a transient model (Grattan) and noted that according to Letey et al. (2011) steady state models are more conservative than transient models.² Thus, the committee recognized that judgment needs to be exercised when comparing model results.

The finding that a steady state model provides more conservative results than a transient model appears to be based upon the results obtained with the steady state model developed by Ayers and Westcot.³ The CVRWQCB has traditionally used the Ayers and Westcot model to assist staff in establishing NPDES permit effluent limits.

The Ayers and Westcot model assumes a plant water use pattern of 40-30-20-10, which means the plant gets 40 percent of its evapotranspiration demand from the upper quarter of the root zone, 30 percent from the next quarter, 20 percent from the next, and 10 percent from the lowest quarter. The soil-water salinity is calculated as the linear average of these four zones. This is a primary criticism of the model. According to Letey et al. (2011), the assumption that plants respond to linear average soil-water salinity is not supported by experimental evidence.² Rather, most water is extracted from the upper parts of the root zone where the salt concentration is not very sensitive to the leaching fraction.

The Ayers and Westcot model also does not consider the dilution effects of rainfall. This omission is cited as another reason why the model provides conservative results. The transient model for the City of Woodland study was specifically developed by Grattan to address the fact that rainfall is not taken into account in the Ayers and Westcot model.¹ Grattan (2006) states on page 12: "The main goal of our model is to determine the extent by which rainfall will reduce the seasonal average root zone salinity, allowing the use of higher salinity water."

The Hoffman steady state model recognizes water uptake by plants does not necessarily correspond to a linear average of soil-water salinity within the root zone.⁴ Consequently, the Hoffman model incorporates an exponential soil-water uptake factor. The Hoffman model also accounts for rainfall. Therefore, as noted on page 122 of Hoffman (2010), results obtained by the Hoffman model may not differ appreciably

¹ Grattan, S.R. and D. Isidoro-Ramirez. 2006. *An Approach to Develop Site-Specific Criteria for Electrical Conductivity, Boron and Fluoride to Protect Agricultural Beneficial Uses.*

² Letey, J. et al. 2011. *Evaluation of Soil Salinity Leaching Requirement Guidelines.* Agricultural Water Management.

³ Ayers, R.S. and D.M. Westcot. 1985. *Water Quality for Agriculture.* FAO Irrigation and Drainage Paper 29.

⁴ Hoffman, G.J. 5 January 2010. *Salt Tolerance of Crops in the Southern Sacramento-San Joaquin Delta.* Final Report.

from a transient model, such as the one developed by Grattan, particularly if the leaching fraction is greater than 15 percent, and cropping patterns and irrigation water quality are relatively stable.

Transient models have shortcomings as well. On page 122, Hoffman (2010) states:

The steady state model appears to be very reasonable at leaching fractions above 0.15. At least two groups of scientists and engineers are currently working on comparing the transient models described here and several others and attempting to resolve which model(s) should be used.

One must keep in mind that transient models require a large amount of input data which are not always available. It is hoped that within a few years transient models will have been developed and field tested so that they may be used with confidence.

The City of Davis Workplan indicates the crop tolerance model for electrical conductivity (EC) will be determined in consultation with the CVRWQCB.⁵

The preference from the committee is to shift to the use of a transient model, but the group did not recommend defaulting to the Grattan model until peer review was completed through field testing. The group also noted that building in water management (e.g. method of application and seasonality of use) may alleviate some salinity concerns.

Recommendation: Use of the Hoffman model as an initial check on Grattan model results can be tried as long as some of the basic differences between the models are understood. If the two model results are "considerably" different (e.g., greater than 100 mg/L TDS difference), conduct further review to determine why.

The Hoffman and Grattan models will provide estimates of soil salinity that will result from the conditions simulated by the models. The modeled soil salinity will be compared to a response curve that relates the relative yield of a particular crop to soil salinity.⁶ If this comparison indicates the modeled soil salinity will not result in an unacceptable crop yield then the agricultural (AGR) beneficial use of waters from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass, which receive treated effluent from the City of Davis, has been protected.

The available response curves for many crops are based on data obtained from experiments that were conducted 20 to 30 years ago. The salt tolerances of these crops may be higher today than when the experiments were performed because new and improved varieties are now probably being grown. For this reason, Hoffman (2010) on page 102 recommended that a field experiment be conducted to ensure the salt tolerance of beans is established for local conditions before setting the salinity water quality standard for the South Delta. Consideration should be given to performing similar field experiments if available response curves do not pertain to the crop varieties being grown in the City of Davis study area.

3) Is it appropriate to run the Grattan or other model to evaluate boron, chloride and/or sodium water quality objectives?

No known models were identified for sodium or chloride. Grattan tried to adapt his model to account for the behavior of boron in soil. However, after consulting with soil chemists at the U.S. Salinity Laboratory, Grattan (2006) states on page iv that boron "adsorption/desorption processes are highly dependent upon soil mineralogy, clay content, surface area, organic matter content and pH." On page 31, Grattan (2006) concluded that his model is "not appropriate to predict soil boron behavior nor could it be readily adapted

⁵ Larry Walker Associates. February 2011. *EC, Boron, Sodium and Chloride Study Workplan*. p. 4.

⁶ According to University of California, Davis, University of California Irrigation Program publication titled *Agricultural Salinity and Drainage*, revised 2006, the most common method of experimentally determining soil salinity is to measure the EC of the solution extracted from a saturated soil paste sample. This measurement is frequently called the salinity of the saturation extract (EC_e).

to account for complex soil boron chemistry.” There was some speculation that the UC Salinity Laboratory may have a boron model, but that the model would be calibrated for boron concentrations at a much higher level than those seen in the City of Davis treated effluent.

Recommendations: Rather than attempting to model boron, chloride, or sodium, the Committee recommends reviewing literature values to identify any potential concerns and to follow up on those concerns by reviewing current management practices. In particular, chloride impairment can be related to how the water is applied (sprinkler vs. furrow) and infiltration issues associated with sodium (dispersion of surface soils in the presence of higher sodium concentration water) may be offset by higher overall salinity concentrations. The Committee also recommended evaluating current sodium concentrations in groundwater and current management practices utilized by growers irrigating with groundwater to determine whether current practices already account for and mitigate elevated sodium concentrations.

4) Leaching fractions

Both steady state and transient models rely upon water and salt mass balances. According to Letey and Feng, steady state models require the constant flow of water.⁷ Under these conditions, the mass balance dictates the salinity of the drainage water leaving the root zone (EC_{dw}) is equal to the irrigation water salinity (EC_w) divided by the leaching fraction (LF). The salinity of the drainage water is given by the following equation under steady state conditions:

$$EC_{dw} = \frac{EC_w}{LF}$$

In contrast, transient models use the Darcy-Richards equation to estimate water flow and the advection-dispersion equation for a non-reactive, non-interacting solute to estimate salt transport. Information on soil properties is needed for a transient model. Besides soil properties, transient models are required to account for all of the time dependent variables encountered in the field. Letey and Feng (2007) indicate these variables include “switching crops with different salinity tolerance, variable irrigation water salinity including rainfall that is pure, timing and amount of irrigation, initial soil salinity conditions, etc.”

The Hoffman model (steady state) has typically utilized 15 to 20 percent as the leaching fraction. This fraction has been calculated in the San Joaquin Valley through a mass balance approach using tile drainage and applied water data. While the methodology is adequate, the same data set is not currently available for the Yolo Bypass. The Grattan model utilizes the Darcy-Richards and advection-dispersion equations rather than the assumption of a specific leaching fraction input. In other words, the Grattan model simulates leaching rather than assuming a fixed leaching fraction value.

Recommendation: For the Hoffman model, utilize a range of 15 to 20 percent for the leaching fraction input to represent conditions in the Yolo Bypass. If utilizing rice as the most limiting crop, recognize that the current management practice of ponding irrigation water alleviates some salt impact since salt does not accumulate in the soil profile during the growing season.

⁷ Letey, J. and G.L. Feng. 2007. *Dynamic Versus Steady-State Approaches to Evaluate Irrigation Management of Saline Waters*. Agricultural Water Management.

5) Other technical considerations

The Committee discussed in detail the importance of irrigation water management in mitigating anticipated impacts from suboptimal water quality and provided two additional recommendations.

Recommendation: Initial study results should be discussed with the local agricultural commissioner, UC Cooperative Extension, and local growers to determine if the actual users of the water have any specific concerns with the study assumptions, findings, or the numbers being developed.

Recommendation: Should consider the potential to have different objectives during different growing seasons (e.g. winter cropping).

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – CENTRAL VALLEY WATER BOARD
DECEMBER 6, 2011**

SUBJECT

INFORMATIONAL ITEM: CENTRAL VALLEY SALINITY ALTERNATIVES FOR LONG-TERM SUSTAINABILITY (CV-SALTS) ANNUAL PROGRESS REPORT

BACKGROUND

CV-SALTS is a stakeholder lead initiative developing a Central Valley-wide salt and nitrate management plan. Cleanup and Abatement (CAA) funds were authorized in two separate resolutions to provide seed money for the initiative. Resolution #2009-0023 authorized \$1.2-million and Resolution #2010-0042 authorized \$3.8-million. Resolution #2010-0042 included a requirement that the Central Valley Water Board report annual progress on the initiative at a publicly noticed State Water Board meeting. The progress report is to include a detailed accounting of expenditures, services received, a line item report of in-kind and contract services contributions from Central Valley Salinity Coalition (CVSC) members and/or additional public and private entities, a summary of work accomplishments to date and timeline for completion of work.

Details of the required information are included in the attached staff report and it is anticipated that an expanded discussion of the project will be provided at a joint State and Regional Water Board workshop in early 2012. For this informational item a brief summary is provided below.

Expenditures and Cost Share: Total expenditures for the CV-SALTS initiative since 2008, are \$1,835,138. Of this total \$1,585,249 (86%) has been expended by CV-SALTS Stakeholders, which include CVSC members, other organizations, and agencies. CVSC members have provided over \$ 1-million in financial contributions through membership fees. CVSC members and other organizations have also provided studies, grants and other support for the CV-SALTS effort totaling more than \$ 570,000. Of the \$1.2-million in CAA funding provided through Resolution #2009-0023 all funding has been obligated to contracts. As of September 2011, \$250,000 has been expended.

None of the \$3.8-million provided through Resolution #2010-0042 has been expended as of 30 September 2011, in part due to the fact that the contract encumbering the funding had not been approved. CV-SALTS has completed qualification reviews and is drafting scopes of work for contractors to conduct tasks outlined in the new contract when approved.

Services Provided: The amounts listed above do not account for the time spent by stakeholders to participate on policy and technical committees that identify tasks, scope the work, conduct and oversee work, and review and approve final products (approximately monthly policy meetings and two meetings per month for various technical subcommittees). Stakeholder produced products are discussed under accomplishments. Contracted services included a GIS based system to identify Central Valley water bodies, their beneficial uses and water quality objectives as well as a Project Management Team which provided administrative, technical and facilitation coordination to accomplish items listed below.

Accomplishments to Date:

Stakeholder Driven:

- ✓ Pilot salt source identification/ interaction studies covering 14% of the Central Valley;
 - Evaluation of completeness of the three studies conducted in the Sacramento, San Joaquin, and Tulare Basins;
- ✓ Preliminary framework for standardizing future salt source studies;
- ✓ February 2011 Leadership Team meeting to review progress;
- ✓ Interim and Subsequent Salinity Project Funding Plan
- ✓ Screening mechanism for management practices in order to develop a validated “toolbox” to support industry in reducing salt and nitrate impacts;
- ✓ Technical recommendations regarding use of modeling tools to develop site specific salinity objectives;
- ✓ Scoped salinity and nitrate water quality criteria review for stock watering; and
- ✓ Drafted revised Chapter 18 (Salt and Salinity Management) for the California Water Plan.

Contract Supported:

- ✓ GIS database and beneficial use maps for the Central Valley and Delta;
- ✓ Scoped salinity and nitrate water quality criteria review for aquatic life; and,
- ✓ Improved functionality of the CV-SALTS website.

Timeline for Completion of Work: The timeline for completion of a Central Valley Salt and Nutrient Management Plan is May 14, 2014 which satisfies the State Water Board’s Recycled Water Policy. CV-SALTS is currently updating its initial scope and workplan to meet that deadline.

DISCUSSION

Summaries of the expenditures and accomplishments to date as well as future activities and timelines will be presented. Detailed discussion is anticipated at a joint State and Regional Water Board workshop in early 2012.

POLICY ISSUE

None. Informational Item Only.

FISCAL IMPACT

None. Informational Item Only.

ENVIRONMENTAL IMPACT

None. Informational Item Only.

REGIONAL BOARD IMPACT

None. Informational Item Only.

STAFF RECOMMENDATION

None. Informational Item Only.

This information item assists the Water Boards in reaching Goal 5 of the Strategic Plan Update: 2008-2012 to improve transparency and accountability.

DRAFT

**STAFF REPORT
CV-SALTS ANNUAL PROGRESS REPORT—NOVEMBER 2011**

On September 7, 2010, the State Water Resources Control Board approved Resolution 2010-0042 authorizing \$3.8-million from the Cleanup and Abatement Account (CAA) to augment funding for the development of the Central Valley salinity and nitrate management plan (Project). The Project is being conducted by stakeholders under the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative. The funding augments \$1.2-million provided through Resolution #2009-0023.

Resolution #2010-0042, included a requirement that the Central Valley Water Board report annual progress on the initiative at a publicly noticed State Water Board meeting. The progress report is to include a detailed accounting of expenditures, services received, a line item report of in-kind and contract services contributions from Central Valley Salinity Coalition (CVSC) members and/or additional public and private entities, a summary of work accomplishments to date and timeline for completion of work. The following document provides the required information. It is anticipated that an expanded discussion of the project will be provided at a joint State and Regional Water Board workshop in early 2012.

Expenditures for Services and Contributions from Stakeholders

Table 1 provides a detailed accounting of the expenditures for services received and documents both expenditures from Clean-up and Abatement (CAA) funds as well as contributions from other stakeholder groups including members of the Central Valley Salinity Coalition and other agencies. The table dates back to July 2008, which is when the CVSC formed. A Memorandum of Agreement (MOA) was signed between the State Water Board, Central Valley Water Board and CVSC and an initial \$1.2-million of CAA funding was provided to the initiative during 2009. The table continues to 2014 with anticipated expenditures and contributions based on scopes of work currently under development and commitments from stakeholders.

Figure 1 summarizes the cumulative available funding, encumbered funding (funding allocated to specific tasks), and actual expenditures by year. Based on the summary information, total expenditures for the CV-SALTS initiative since July 2008, are \$1,835,138. Funding has been provided through CVSC member contributions (\$1,011,249), related work from other agencies (\$574,000), and CAA funding through Resolution 2009-0023 (\$250,000 expended through September 2011). To date, stakeholders have contributed 86% of the total funds expended.

None of the \$3.8-million provided through Resolution #2010-0042 has been expended as of 30 September 2011, in part due to the fact that the contract encumbering the funding had not yet been approved. (The initial version of the contract was provided to DAS in May with agreed to versions routed to DFA and OCC in August.) CV-SALTS has completed qualification reviews and is drafting scopes of work for contractors to conduct tasks outlined in the new contract, but can not move forward until the funding is accessible.

The funding and expenditures documented in Table 1 and Figure 1, do not account for the time spent by stakeholders to participate on policy and technical committees that identify tasks, scope work, conduct and oversee work, and review and approve final

products (approximately monthly policy meetings and two meetings per month for various technical subcommittees). Rather than attempt detailed accounting by individual hourly rates a rough estimate can be determined by assuming a standard rate of \$100/hr per person. Based on the number of meetings and attendance, between July 2009 and August 2010, CV-SALTS Committee Members contributed more than 1800 hours participating in Committee meetings and more than 1150 hours in Subcommittees supporting CV-SALTS. This represents expenditure by the stakeholder of \$293,500 for the period.

The CV-SALTS Executive Committee has asked the regulated community Stakeholders to help provide documentation of expenditures to reduce salt or nitrates either voluntarily or as required by permit. Further information will be provided when compiled.

Services provided to date have ranged from coordinating administrative, technical and facilitation support to developing screening tools and technical recommendations to completing technical studies. The specific services are listed as part of Table 1 while the results are listed under accomplishments.

Work Accomplishments to Date

Accomplishments can be summarized by those completed by the stakeholders as committee projects and those completed as contracted elements as follows:

Stakeholder Driven:

- ✓ Salt source identification/interaction studies covering 14% of the Central Valley;
 - Knowledge Gained Subcommittee Review of Salinity Source Pilot Study and Turlock Basin Salinity Study (major salt source and interaction studies conducted in the Sacramento, San Joaquin, and Tulare Basins);
- ✓ Knowledge Gained Subcommittee Guidance for future Salinity Identification Studies;
- ✓ February 2011 Leadership Team meeting to review progress.
- ✓ Interim and Subsequent Salinity Project Funding Plan
 - New CVSC Members and Expansion Plans
- ✓ Management Practices Subcommittee Guidance for Development of a Salt and Nitrate BMP Toolbox;
- ✓ Technical recommendations regarding use of modeling tools to develop site specific salinity objectives;
- ✓ Scoped salinity and nitrate water quality criteria review for stock watering; and
- ✓ Draft revised Chapter 18 (Salt and Salinity Management) for the California Water Plan.

Contract Supported:

- ✓ GIS database and beneficial use maps for the Central Valley and Delta;
- ✓ Scoped salinity and nitrate water quality criteria review for aquatic life; and,
- ✓ Improved functionality of the CV-SALTS website.

Additional discussion of CV-SALTS activities is provided below.

During Fiscal Year 10/11, the Executive Committee has focused on the development of a more robust project policy and framework and retooling the project scope and workplan accordingly. This work builds off of the projects completed to date and is a

critical element to guide future CV-SALTS activities. Discussions have been focused on appropriate beneficial use designation in both surface and ground water (primarily for municipal/domestic supply and agricultural irrigation/stock watering) with future meetings scheduled to review appropriate salt and nitrate water quality objectives related to beneficial uses, consideration of the anti-degradation policy, and options available to amend current basin plan language.

To support and provide consistency for the stakeholder driven effort, the Executive Committee hired full-time program coordinators. An Administrative Program Coordinator was hired in January 2011, to facilitate policy meetings, update the existing workplan and initiate contracts for the needed technical work. In June 2011, following a Request for Qualifications process, a recommendation was made for a Technical Program Manager to insure technical information needed to support the initiative and a final basin plan amendment, are completed on time and on budget.

The various committees completed additional key tasks as noted below.

The Executive Committee held the annual Central Valley Salinity Leadership Group meeting in February 2011. The Leadership Group serves as the steering committee for the CV-SALTS initiative and provides for the opportunity to solicit feedback and recommendations from executive level representatives of state, federal, and local agencies as well as stakeholder representatives on the direction of the initiative, current status, and level of progress. Information was presented on major issues CV-SALTS is vetting through its prioritization process, current budget, and constraints experienced during the past year, the future vision of the program, and proposed milestones to track progress in 2011.

The Funding and Fundraising Committee developed a two phase plan for fundraising. Phase 1 continues the addition of members to the CVSC to support ongoing planning efforts and the development of matching funding for the planning efforts. Phase 2, grant support of salinity management and nitrate projects, is in the early steps. These efforts will be divided into two stages: 1. Funding within existing programs; and, 2. Developing new funding programs. Stage 1 continues support for CVSC Members and CV-SALTS participants in securing grants from existing programs at the State and federal levels. Stage 2 will engage the help of legislators and agencies to develop new funding sources for the implementation plan that will be required for CV-SALTS.

The Lower San Joaquin River Committee continued its work on developing salinity objectives upstream of Vernalis and has recently been reviewing the most recent State Water Resources Control Board public scoping document focused on southern Delta salinity and San Joaquin River flow objectives and the program of implementation for those objectives. Both efforts must remain closely integrated for reasonable management of the San Joaquin River Basin. To aid with the water quality objective evaluation, a request for proposal to evaluate criteria for aquatic life and stock watering was released in May. Dairy Cares through the California Department of Food and Agriculture will fund the criteria review for stock watering while CAA funds will be used for the aquatic life criteria review. Final reports are anticipated in late FY 11/12.

The Beneficial Use and Objectives Study Subcommittee oversaw a contract to develop a GIS database and beneficial use maps for the Central Valley and Delta. In August 2010, the beta version was released for final review. Stakeholders and the Boards will be able

to use this material to review current beneficial uses and objectives and develop recommendations for any changes. The project also provided an interactive web map utility and geo-database for future efforts. This interactive web map utility and geo-database has been recognized by the State Water Board staff and contractors developing the web portal for basin plans envisioned as part of the Strategic Plan. Discussions are occurring between State Water Board staff and CV-SALTS to determine whether the State project can build off of the existing Central Valley system.

In August 2010 the Knowledge Gained subcommittee prepared a technical memorandum providing recommendations for improving the administration of future projects. In June 2011, the subcommittee presented a completed preliminary framework for standardizing future salt source studies and completed an evaluation of completeness of two major studies conducted in the Sacramento, San Joaquin, and Tulare Basins. The studies funded by CVSC and a consultant, covered approximately 14% of the area of the Central Valley and specifically focused on: the Yolo County, Davis and Woodland area; Modesto area; Tule River area and Turlock Irrigation District. In addition, the US Bureau of Reclamation is nearing completion of a similar study for the Westside of the San Joaquin River Basin covering an additional 15% of the Central Valley. The subcommittee will utilize results from the evaluations to refine/change the approach utilized in additional watersheds in the region.

The Management Practices Subcommittee is continuing work toward developing a screening mechanism for management practices in order to develop a validated "toolbox" to support industry in reducing salt and nitrate impacts. The current tool is being beta tested using management practices supplied by various industries (agriculture, food processors, wine industry, municipalities and others).

Based on recommendations from the Education and Outreach subcommittee, funding has been directed to revise the main CV-SALTS webpage to clarify content and improve usability. Final revisions and beta testing are to be completed by October 2011. The site is currently located at: <http://cvssalinity.org> (the site address may be revised when revisions are completed).

The Technical Subcommittee has reviewed information developed by the Management Practices Subcommittee and Knowledge Gained Subcommittee. In addition, the Technical Subcommittee reviewed the City of Davis' workplan for developing site specific salinity objectives and provided technical recommendations related to: applicability of data collected as part of an earlier Woodland study to the current effort; use of the Hoffman model as a check on the Gratten model; appropriateness of using either model to evaluate boron, chloride or sodium; means of determining leaching fraction; and other issues raised by committee members. These recommendations have been provided to the City of Davis and Central Valley Water Board permitting staff and will be utilized by both the Executive Committee and the Lower San Joaquin River Committee as they move forward with identification of appropriate salinity objectives within the Central Valley.

Timeline for Completion of Work

The Executive Committee is in the process of revising the existing scope and timeline of the project so that the updated workplan better reflects resource and time constraints.

Ultimate project completion, the development of a Central Valley Salt and Nitrate Management Plan, is slated for May 2014.

To provide focus, stakeholders have identified archetypes for areas that address priorities identified including: appropriate application of municipal and domestic supply and agricultural supply beneficial uses in both surface and ground water; review of appropriate water quality objectives; and implementation alternatives in areas already impaired. Each archetype is being evaluated within a matrix of alternatives (refined beneficial uses, site specific objectives, refined compliance point/monitoring, direct solutions such as prohibition of discharge, and potential offsets within management zones) and anticipated results (potential benefits, cost, timeline, and likelihood of acceptance). Processes for addressing the archetypes will provide realistic alternatives and a structure for developing the final management plan. Archetypes currently under discussion include high priorities for the stakeholders and Central Valley Water Board (agricultural drains receiving POTW discharges, the Lower San Joaquin River, Tulare Lake ground water basin, and disadvantaged communities with elevated nitrate in their municipal and domestic groundwater supply).

Current draft timelines under considerations are:

September – December 2011

- ✓ Finalize workplan
- ✓ Scope and contract out technical studies to address archetypes
- ✓ Scope and contract out salt and nitrate source/interaction conceptual model for remaining Central Valley sub-basins

September 2011 – March 2012

- ✓ Complete policy discussions on beneficial uses and appropriate water quality objectives, including:
 - Criteria for “incidental” MUN
 - Default values for crop protection and leaching fractions for use with salinity models;
 - Guidance for determining the most limiting crop within a sub-basin

January 2012 – December 2012

- ✓ Complete conceptual model for salt and nitrate source/interaction
- ✓ Complete upgrades to Central Valley beneficial use and water quality objective geospatial data base
- ✓ Complete technical studies for archetypes
- ✓ Identify management alternatives
- ✓ Hold CEQA scoping session(s)

January 2013 – December 2013

- ✓ Identify management alternatives
- ✓ Initiate economic review
- ✓ Initiate CEQA Equivalent Documentation
- ✓ Initiate Central Valley Salt and Nitrate Management Plan

January 2014 – May 2014

- ✓ Finalize CEQA Equivalent Documentation
- ✓ Hold Public Meetings

- ✓ Finalize and Submit Central Valley Salt and Nitrate Management Plan
- ✓ Initiate Draft Basin Plan Amendment Language

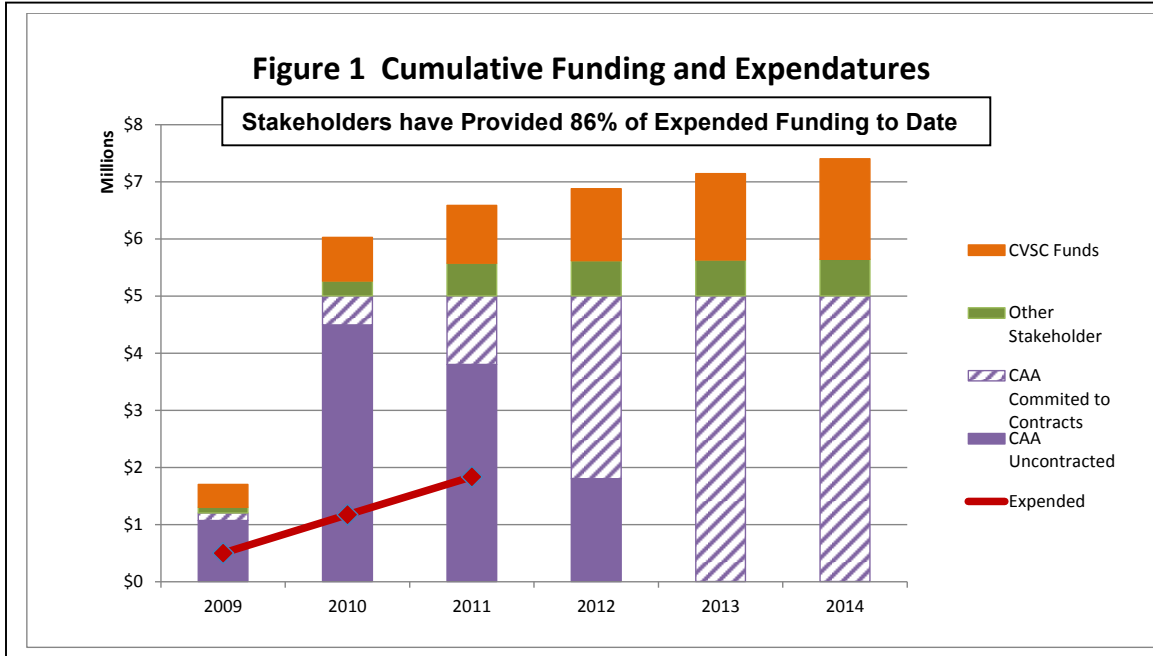
A more thorough review of the process is anticipated at a joint State and Regional Water Board workshop in early 2012.

DRAFT

Table 1. CV-SALTS Funding, Expenditures and Services: 2008 - 2014

Stakeholder Contributions	Calendar Year					Total Amount	
	2008-2009	2010	Projected 2011	Projected 2012	Projected 2013		Projected 2014
Contracted by CVSC							
Project Support	\$228,491	\$206,942	\$113,784				\$549,217
Technical Studies							\$0
a. Salt Source Pilot Study	\$170,228	\$100,000	\$100,000	\$68,896			\$439,124
b. Consultant Contribution		\$55,588					\$55,588
Subtotal CVSC Expenditures:	\$398,719	\$362,530	\$213,784	\$68,896			\$1,043,929
Other Sources							
Studies							
a. USBR Westside Studies	\$100,000	\$100,000	\$200,000				\$400,000
b. EKI Turlock Basin Study		\$50,000					\$50,000
c. Animal Drinking Criteria				\$29,000			\$29,000
Grants							
FREP Low Salt Peeling			\$100,000				\$100,000
Pledges							
CVSC Membership			\$58,717	\$156,104	\$250,000	\$250,000	\$714,821
Other Support							
a. Co-Chair Support		\$12,000	\$12,000	\$12,000	\$12,000	\$12,000	\$60,000
Subtotal Stakeholder Committed:	\$100,000	\$162,000	\$370,717	\$197,104	\$262,000	\$262,000	\$1,353,821
Annual Total:	\$498,719	\$524,530	\$584,501	\$266,000	\$262,000	\$262,000	\$2,397,750
Cummulative Annual Total:	\$498,719	\$1,023,249	\$1,607,750	\$1,873,750	\$2,135,750	\$2,397,750	

CAA Funding	Fiscal Year					Total
	FY09/10	FY10/11	Projected FY11/12	Projected FY12/13	Projected FY13/14	
Resolution 2009-0023 (\$1.2-mil)						
Contracted SJVDA						
a. SJVDA Mgt. Services	\$82,262					\$82,262
b. BUOS Phase I	\$49,982					\$49,982
c. Program Mgt/Facilitation		\$376,185	\$291,571			\$667,756
d. Technical Support			\$400,000			\$400,000
Subtotal Contracted:	\$132,244	\$376,185	\$691,571			\$1,200,000
Expended						
a. SJVDA Mgt. Services		\$29,006	\$11,421			\$40,427
b. BUOS Phase I		\$49,982	\$0			\$49,982
c. Program Mgt/Facilitation		\$70,015	\$89,465			\$159,480
d. Technical Support						
Subtotal Expended:		\$149,003	\$100,886			\$249,889
Remaining						
a. SJVDA Mgt. Services						\$41,835
b. BUOS Phase I						\$0
c. Program Mgt/Facilitation						\$508,276
d. Technical Support						\$400,000
Subtotal Remaining:						\$950,111
Resolution 2010-0042 (\$3.8-mil)						
Pending Contract SJVDA						
a. SJVDA Mgt. Services			\$176,500	\$142,500		\$319,000
a. Technical Support			\$486,000			\$486,000
b. BUOS Phase II			\$75,000			\$75,000
c. Conceptual Model			\$750,000			\$750,000
d. Technical Studies			\$512,500	\$307,500		\$820,000
e. Economic Analysis				\$250,000		\$250,000
f. CEQA Documentation				\$750,000		\$750,000
g. CV Salt/Nitrate MP				\$300,000		\$300,000
h. Draft BPA Language				\$50,000		\$50,000
Subtotal Expended:			\$0	\$0		\$0
Subtotal Remaining:			\$2,000,000	\$1,800,000		\$3,800,000
Total Expended:		\$149,003	\$100,886	\$0		\$249,889
Total Remaining:	\$1,200,000	\$1,050,997	\$2,950,111	\$4,750,111	\$4,750,111	\$4,750,111



Annual	Year					
	2009	2010	2011	2012	2013	2014
CVSC	\$398,719	\$362,530	\$250,000	\$250,000	\$250,000	\$250,000
Other Stakeholder	\$100,000	\$162,000	\$312,000	\$41,000	\$12,000	\$12,000
CAA Committed	\$132,244	\$376,185	\$691,571			
CAA Projected				\$2,000,000	\$1,800,000	
Expended	\$498,719	\$673,533	\$662,886			
Cumulative						
	2009	2010	2011	2012	2013	2014
CVSC Funds	\$398,719	\$761,249	\$1,011,249	\$1,261,249	\$1,511,249	\$1,761,249
Other Stakeholder	\$100,000	\$262,000	\$574,000	\$615,000	\$627,000	\$639,000
CAA Uncontracted	\$1,067,756	\$4,491,571	\$3,800,000	\$1,800,000	\$0	\$0
CAA Committed to Contracts	\$132,244	\$508,429	\$1,200,000	\$3,200,000	\$5,000,000	\$5,000,000
CAA Expended	\$0	\$149,003	\$249,889			
Expended	\$498,719	\$1,172,252	\$1,835,138			
% of Expended by stakeholders	100%	87%	86%			

CV-SALTS Annual Meeting Calendar 2011

JANUARY						
MON	TUE	WED	THU	FRI	SAT	SUN
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Sac Regional

FEBRUARY						
MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

Sac Regional

MARCH						
MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Sac Regional

APRIL						
MON	TUE	WED	THU	FRI	SAT	SUN
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Sac Regional

MAY						
MON	TUE	WED	THU	FRI	SAT	SUN
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Sac Regional

JUNE						
MON	TUE	WED	THU	FRI	SAT	SUN
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Sac Regional

JULY						
MON	TUE	WED	THU	FRI	SAT	SUN
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Sac Regional

AUGUST						
MON	TUE	WED	THU	FRI	SAT	SUN
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Sac Regional

SEPTEMBER						
MON	TUE	WED	THU	FRI	SAT	SUN
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

ACWA Downtown

OCTOBER						
MON	TUE	WED	THU	FRI	SAT	SUN
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Sac Regional

NOVEMBER						
MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

ACWA Downtown

DECEMBER						
MON	TUE	WED	THU	FRI	SAT	SUN
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Cal EPA?

SALTY 5 Coordination Meetings

1/3/2011	Salty 5 January
2/7/2011	Salty 5 February
3/7/2011	Salty 5
4/4/2011	Salty 5
5/2/2011	Salty 5
6/6/2011	Salty 5
7/11/2011	Salty 5
8/1/2011	Salty 5
9/12/2011	Salty 5
10/3/2011	Salty 5
11/7/2011	Salty 5
12/5/2011	Salty 5

CV-SALTS Committee Meetings

2/24/2011	Salinity Leadership Group
1/20/2011	Committees Meetings
2/10/2011	Committees Meetings
3/17/2011	Committees Meetings
4/12/2011	Committees Meetings
4/22/2011	Committees Meetings
5/12/2011	Committees Meetings
5/24/2011	Committees Meetings
6/16/2011	Committees Meetings
6/23/2011	Committees Meetings
7/21/2011	Committees Meetings
8/9/2011	Committees Meetings
8/18/2011	Committees Meetings
9/13/2011	Committees Meetings
9/15/2011	Committees Meetings
10/19/2011	Committees Meetings
10/20/2011	Committees Meetings
11/17/2011	Committees Meetings
12/15/2011	Committees Meetings
1/11/2011	LSJR Committee
2/17/2011	LSJR Committee
3/24/2011	LSJR Committee

Potential Conflicting Meetings

6/7/2011	State Board Meeting
6/8/2011	Regional Board Meeting
6/8/2011	State Board Meeting
6/9/2011	Regional Board Meeting
6/10/2011	Regional Board Meeting
6/21/2011	State Board Meeting
6/22/2011	State Board Meeting
7/5/2011	State Board Meeting
7/6/2011	State Board Meeting
7/19/2011	State Board Meeting
7/20/2011	State Board Meeting
8/2/2011	State Board Meeting
8/3/2011	Regional Board Meeting
8/3/2011	State Board Meeting
8/4/2011	Regional Board Meeting
8/5/2011	Regional Board Meeting
8/16/2011	State Board Meeting
8/17/2011	State Board Meeting
9/6/2011	State Board Meeting
9/7/2011	State Board Meeting
9/20/2011	State Board Meeting
9/21/2011	State Board Meeting