CV-SALTS Executive Committee Meeting

Friday, September 16, 2016 – 1:00 PM to 2:15 PM

TELECONFERENCE ONLY

Teleconference (641) 715-3580 Code: 279295#

Posted 09-07-16 – Revised 09-13-16

Meeting Objectives:

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

AGENDA

1) **Welcome/Introductions - Consent Calendar** – Chair – 5 min
   - Committee Roll Call
   - Review/Approve August 5th Notes

2) **SNMP Development Status** – Richard Meyerhoff – 5 minutes
   - Status Report

3) **Surveillance and Monitoring Program (SAMP) – Status Update** – Roger Reynolds– 20 minutes
   - Approve Final Report (< Link Only)
     - Concept Level Tasks and Costs for the SAMP Implementation
     - Addendum to the Surveillance and Monitoring Program

4) **Other CV-SALTS Project/Contract Updates** - 30 min
   - CEQA/Economics/Antidegradation Analyses – Roger Reynolds/Richard Meyerhoff
   - Aggressive Restoration Scenario – Richard Meyerhoff
   - Tulare Lake MUN – Richard Meyerhoff
   - SSALTS – Roger Reynolds
   - MUN in Ag Water Bodies – Jeanne Chilcott
   - LSJRC – Mike Johnson

5) **Set next meeting objectives** – 5 min
   - Admin Meeting: October 14th
   - Policy Meeting: October 20th

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

One or more Central Valley Regional Water Quality Control Board members may attend.

CV-SALTS Executive Committee Meeting Notes

Friday, August 5, 2016 – 1:00 to 2:30 PM

TELECONFERENCE ONLY

Attendees are listed on the Membership Roster
AGENDA

1) Welcome/Introductions – Consent Calendar
   a) The meeting was brought to order by Committee Vice Chair, Debbie Webster.
   b) Roll call was completed.
   c) David Cory moved, and Roger Reynolds seconded, and by general acclamation the July 8th meeting action notes were approved with the following edits:
      - Item 2 – Add Debbie Webster's name to the small group participants for the Salinity Permitting Strategy.
      - Item 3 – Replace Elaine Archibald's comment with the following: *Elaine Archibald/CUWA expressed a concern that the work plans were sent out after close of business the day before so she had not had time to conduct a comprehensive review. Elaine's specific concern was that it appears that the work plans include a cursory analysis of the impacts of changing the secondary MCL objectives and do not include the modeling studies needed to adequately identify potential impacts. In addition, the work plans are focused on salt and nitrate and did not address any other constituents that are in the SMCL policy.*
      - Item 3 – Replace the last sentence for this item with: *Elaine Archibald requested that the notes reflect CUWA's opposition to approval of the work plans.*
      - Item 3 – second bullet, after the word review insert "and acceptance"

2) SNMP Policy Section Review
   - Richard Meyerhoff presented the Proposed Schedule to Finalize CV-SALTS Policy Documents and Incorporate into SNMP.
     - Participants for the small workgroup meeting planned for August 8th were identified as: Elaine Archibald, Debbie Webster, Jeanne Chilcott, Tim Moore, Phoebe Seaton, Laurel Firestone, Lysa Voight, J.P. Cativiela, Casey Creamer, Nigel Quinn and Josie Tellers.
     - Committee members requested that an item be added to the 8/10 or 8/11 policy meeting agenda on how surface water will be addressed.

3) Surveillance and Monitoring Program (SAMP) – Status Update
   - Daniel Cozad provided an update on the project. A draft has been completed on the estimate for costs of implementation of the SAMP. There has also been a request from the Project Committee to get a cost/scope for recalculating the SAMP at the basin/subbasin level instead of the IAZ. The SAMP Report and all attachments will be brought back for approval at the 9/16 Admin meeting.

4) Scope of Work for 'Aggressive Restoration Alternative' Modeling Scenario
   - Richard Meyerhoff presented the scope of work and provided background on its development.
     - Pam Buford asked for clarification to be added to the second bullet on page 2 of the memorandum. Karen Ashby/LWA will identify what tasks this work links to in the Economic Analysis scope of work.
     - Joe DiGiorgio asked if the report could also include a brief narrative on any additional salt impacts identified in the aggressive restoration alternative scenario.
       - After discussion, David Cory moved, and Casey Creamer seconded and the committee voted to approve the scope of work and fee proposal, with the above edits, and requested SJVDA contract with LWA for the amount in the fee proposal.

5) Alta Irrigation District (AID) Management Zone Archetype Report
   - Richard Meyerhoff presented the report and comment/response tables.

- Committee members expressed concern that there was not sufficient time to review the document. After discussion, Lysa Voight moved and Casey Creamer seconded, and the committee voted to approve the AID Management Zone Archetype Report as a Final Draft, with the following conditions:
  - Committee members will be given two weeks, (until 8/19), to submit further comments, any significant comments, as appropriate, will be incorporated into the SNMP.
  - Additionally, approval of the Final Draft report is recognized as specific to the Alta area, and does not indicate an endorsement of any specific methodology, or recognition as a precedent, outside of the zone as described in the report.

6) Draft SNMP (Technical Sections)

- Richard Meyerhoff presented the final SNMP sections, appendices and comment/response table. Recognizing the concern for more time to review documents, Richard recommended these sections also be approved as Final Draft documents, and asked committee members to submit any outstanding comments by mid-September, reminding the committee that they would see all these again, with an opportunity to comment in the final SNMP.
  - After discussion, Lysa Voight moved, and Nigel Quinn seconded, and the committee voted to approve the Technical Sections as Final Drafts, with additional comments to be submitted no later than the middle of September.
- In response to a request by Debbie Webster, Richard will review the policy meeting schedule to see where the discussion on definitions can be incorporated into the agenda.

7) Other CV-SALTS Project/Contract Updates

- **CEQA/Economics/Antidegradation Analyses – Richard Meyerhoff/Roger Reynolds**
  - Project Committee met last Friday (7/29) and provided comments, which are currently being addressed by the team. The Project Committee will meet again in a couple of weeks. The work on these elements are scheduled for completion by the end of September, and will be brought back to the Executive Committee in October.
- **Tulare Lake MUN – Richard Meyerhoff**
  - This project is on hold pending receipt of comments received at the 8/17 workshop.
- **SSALTS – Roger Reynolds**
  - Phase 3 Report draft is pending.
- **MUN in AG Water Bodies – Jeanne Chilcott**
  - Pam Buford summarized items scheduled for 8/17 workshop. The LSJR Water Quality Objective will be the first item of the day. MUN in Ag Dominated Waterbodies will be the second agenda item, followed by MUN AGR for the Tulare Lake Bed.
- **LSJR Committee – Mike Johnson**
  - Per Karna Harrigfeld, LSJRC will have a panel for the 8/17 workshop comprised of committee members (David Cory, Karna, Dennis Westcot and Debbie Webster), along with Regional Board staff (Anne Littlejohn and Jim Brownell).

8) Set next meeting objectives

- August Policy Meetings:
  - August 10th, 1-4 @ Sac Regional.
  - August 11th @ Sac Regional
- September Policy Meetings:
  - September 14th, 1-4 @ Sac Regional
  - September 15th, 9-3 @ Sac Regional
- Executive Committee Admin Meeting is Friday, 9/16 from 1-3
- Daniel advised the committee that if anyone wants to participate in one of the small workgroups to contact him (dcozad@cvsalinity.org), or Daphne (dorzalli@cvsalinity.org).

Memorandum

To: *CV-SALTS Executive Committee*

From: *Joe LeClaire, CDM Smith*
Richard Meyerhoff, CDM Smith

Date: *September 13, 2016*

Subject: *Concept Level Tasks and Costs for the SAMP Implementation*

Background

The Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) is in the process of developing a comprehensive regulatory and programmatic approach to the management of salt and nitrate as nitrogen[1] in the Central Valley that is not only consistent with the State Recycled Water Policy (SRWP) but meets the broader goals of CV-SALTS to develop a workable, comprehensive plan to address salinity, including nitrates, throughout the region in a comprehensive, consistent, and sustainable manner. The CV-SALTS participants have established these goals:

- Sustain the Valley's lifestyle
- Support regional economic growth
- Retain a world-class agricultural economy
- Maintain a reliable, high-quality urban water supply
- Protect and enhance the environment

Fundamentally, CV-SALTS must ensure that safe, affordable water is available to all, that the agricultural economy is sustained, and that Central Valley communities remain viable. The work of CV-SALTS is being executed in cooperation with the Central Valley Regional Water Quality Control Board (Central Valley Water Board), the State Water Resources Control Board (State Water Board), the Central Valley Salinity Coalition (CVSC), and other stakeholders.

Among other things, the SRWP requires that development of the SNMP include the following element (SRWP Section 6.b.3 (a)): "A basin/sub-basin wide monitoring plan that includes an

[1] By convention, nitrate is expressed in terms of nitrate as nitrogen in the NIMS. "Nitrate," "nitrate," and "NO_3-N" all refer to nitrate as nitrogen, with a maximum contaminant level (MCL) of 10 milligrams per liter (mg/L).

appropriate network of monitoring locations. The scale of the basin/sub-basin monitoring plan is dependent upon the site-specific conditions and shall be adequate to provide a reasonable, cost-effective means of determining whether the concentrations of salt, nutrients, and other constituents of concern as identified in the salt and nutrient plans are consistent with applicable water quality objectives." Furthermore, "Salts, nutrients, and the constituents identified in paragraph 6(b)(1)(f) shall be monitored. The frequency of monitoring shall be determined in the salt/nutrient management plan and approved by the Regional Water Board pursuant to paragraph 6(b)(2)." The SAMP report (CDM Smith, 2016) describes the CV-SALTS Surveillance and Monitoring Program (SAMP), which was developed to meet the monitoring requirements of the SRWP.

CV-SALTS is currently developing a groundwater management zone policy and any management zones delineated in the future could be linked with the SAMP. The SAMP domain is the Central Valley as a whole, but local monitoring programs associated with individual WDRs or the execution of Management Zone Implementation Plans established for newly defined management zones could be linked with the SAMP. In addition, the SAMP monitoring network may be adapted as information is collected; changes to the network will not require a Basin Plan amendment, but can be accomplished under the signature authority of the Central Valley Water Board Executive Officer.

SAMP stakeholders will likely include overlying cities and counties, water districts, irrigation districts, drainage districts, POTWs, food processors, other industries, agriculture, nongovernmental organizations, environmental groups, and regulatory agencies. SAMP stakeholders may include, coordinate with, or be Sustainable Groundwater Management Act (SGMA) Groundwater Sustainable Agencies (GSAs). The SAMP can be implemented through the Central Valley Water Board as a valley-wide program. Alternatively, the governance structure for each groundwater basin or management zone – agency(ies), joint powers authority, or coalition(s) or other entities – can implement the SAMP at that scale and report back to the Central Valley Water Board. Data generated by SAMP entities will ultimately be uploaded to the GeoTracker GAMA Database.

Proposed Tasks, Budget and Schedule for the SAMP Implementation

Implementation of the SAMP will require completion of a number of tasks – both to start-up and implement the program. **Table 1** summarizes the tasks that could be included in this phase and provides an estimate of the ranges of concept-level costs associated with these activities, depending on the actual scope of work and level of effort. These costs are purposely conservative to take into account the range of services and expertise needed and assume an average consultant billing rate of $200/hour. It is also assumed that consultants would complete the work in collaboration with stakeholders. The difference between the range of costs is best professional judgment and ranges between a 50% to 100% difference.

Figure 1 provides the anticipated costs (annual and cumulative) against a 10-year schedule assuming a potential alignment of tasks (based on an assumed order/priority). **Figure 2** provides

the same information but in a Gantt Chart format to better illustrate the alignment of tasks. These two figures generally relied on an average between the low and high cost estimates.

To provide this level of planning, a contingency should be included in the costs, which would likely bring the costs toward the higher end of the estimate. Therefore, it would be appropriate to budget project cost needs between $2.7M and $5.0M for the initial 10-years of the SAMP program. With the addition of administration and contracting costs, it is likely the total is between $300K to $550K per year.

Table 1. SAMP Implementation: Proposed Tasks

Task	Description	Range of Costs	Level of Effort (days)
1	**Field Verification of Wells.** In this task, the stakeholders implementing the SAMP for each groundwater basin, subbasin or management zone will work with local agencies to verify that the wells selected in the SAMP process exist and are the most appropriate wells to include in the SAMP, based on local hydrogeological and water quality knowledge**.** Wells that are locally-verified will fall into one of three categories. 1. Wells that are routinely sampled and reported. 2. Wells that are sampled, but that are not reported. 3. Wells that are in the CV-SALTS database, and hence were sampled at least once during the study period (2003 to 2014), but are not routinely sampled. **Category 1**. For wells in Category 1, database queries will be designed to extract the requisite data from the centralized database (GeoTracker GAMA or equivalent). These data will undergo data quality assurance/quality control (QA/QC) protocols for evaluating data quality prior to the uploading of data to the SAMP database, in order to ensure that only data of sufficient quality are used in the statistical analyses. **Category 2**. A determination of the appropriate stakeholder will need to be made concerning Category 2 wells – wells that are sampled, but not reported. Once identified, the stakeholder sampling the Category 2 well can either initiate the upload and incorporation of this well into GeoTracker GAMA, or they can report the data to the SAMP database. The data exchange will utilize an electronic data deliverable (EDD) request form for each of the identified Category 2 data sources. These data will be QA/QC'd using the same protocols as Category 1 wells. **Category 3**. Category 3 wells are not currently routinely monitored. An assumption is made that 50 percent of these wells will need to be physically verified in the field. Category 3 wells will require the following steps: a. A SAMP Sampling and Analysis Plan, Quality Assurance Plan and Health and Safety Plan will be developed. b. The well owner will be contacted and written permission will be obtained to sample the well every five years, at a minimum. c. An agent representing CV-SALTS will collect the samples from the well(s) per the Sampling and Analysis Plan and Quality Assurance Plan. d. The samples will be analyzed by a laboratory certified through the State Water Board's Environmental Laboratory Accreditation Program (ELAP). e. The laboratory will generate a SAMP-specific EDD, which will be submitted to GeoTracker GAMA as the data are generated.	$197K – $394K	112 – 224
2	**Sampling and Analysis Plan**. A Sampling and Analysis Plan (SAP) will be developed according to guidance documents, for example from EPA Region 9[2]. The SAP will include sections that describe the background, data quality objectives, sampling rationale, request for analyses, field methods and procedures, sample containers, preservatives, packaging, investigation-derived waste, sample documentation, chain-of-custody, and shipment	$53K – $106K	30 - 60

[2] https://www.epa.gov/quality/sampling-and-analysis-plan-guidance-and-template-v4-general-projects-042014

Table 1. SAMP Implementation: Proposed Tasks

Task	Description	Range of Costs	Level of Effort (days)
3	**Quality Assurance Plan**. The Quality Assurance Program (QAP) includes data quality objectives, criteria for measurement data, documentation and records, certification and training, sample handling and chain-of-custody, quality control, instrument/equipment testing, inspection, and maintenance requirements, assessment and oversight, and data validation and usability.	$70K – $141K	40 - 80
4	**Health and Safety Plan.** The Health and Safety Plan (HASP) will include a description of the known hazards and evaluations of the risks associated with program, a list of key personnel and alternates responsible for site safety, response operations, and protection of public health, description of levels of protection to be worn by personnel in work area, establishment of procedures to control site access, description of decontamination procedures for personnel and equipment, establishment of site emergency procedures, prevention of heat stress, slip trip and fall hazards, and driving safely.	$53K – $106K	30 - 60
5	**Sampling and Analysis.** Per the SAP and QAPP, samples will be collected and analyzed at an ELAP-certified laboratory.	$614K – $856K	276 - 138
6	**Report Data to the State Database**. Data from Category 2 and 3 above will report data to the state's GeoTracker GAMA relational database, using already developed upload templates.	$70K – $141K	40 – 80
7	**Query Data from the State Database.** The consultant retained by CV-SALTS for Task 8 will download the requisite data from the GeoTracker GAMA relational database. The SAMP database will be hosted on the Central Valley Water Board servers. Recall that the source groundwater quality database, GeoTracker GAMA or equivalent, will be hosted by the State Water Board (independent of the SAMP. GeoTracker GAMA has its own protocols for internal data security, and robust data backup. The intent is to query GeoTracker GAMA periodically to perform the ambient water quality/assimilative capacity recalculations, hence, an incremental backup system is not warranted. Likewise, the SAMP database will be used by the Central Valley Water Board staff and the consultant performing the recalculation of AWQ on a periodic basis, so the database can be disconnected from the Internet. A copy of the SAMP database will be archived so that the raw data used for the ambient water quality recalculation for each period is preserved	$118K – $135K	10 - 20
8	**Ambient Water Quality, Assimilative Capacity Determination, and Trend Analysis.** A consultant will be retained by CV-SALTS every five years to used utilize groundwater elevation and water quality data to assess the volume-weighted average concentrations of TDS and nitrate in each groundwater basin, subbasin or management zone; this is the ambient water quality. Assimilative capacity is the difference between the groundwater basin water quality objective and the current ambient water quality. The final work product will be a report that includes the requisite maps and tables delineating the area of interest and depicting the ambient water quality and assimilative capacity.	$1.5M – $3.1M	880 - 1760
	Totals	**$2.7M – $5.0M**	**1280 – 2560**

Figure 1. Concept Level Tasks and Costs for Phase 1 – Salinity Prioritization and Optimization Study: Schedule and Expected Task Expenditures

Tasks		Task Cost	Year of the Prioritization and Optimization Plan									
			1	2	3	4	5	6	7	8	9	10
Task 1	Field Verification of Wells	$295,680	$295,680									
Task 2	Sampling and Analysis Plan	$79,200	$79,200									
Task 3	Quality Assurance Plan	$105,600	$105,600									
Task 4	Health and Safety Plan	$79,200	$79,200									
Task 5	Sampling and Analysis	$975,270		$243,818	$243,818				$243,818	$243,818		
Task 6	Report Data to the State Database	$105,600		$26,400	$26,400				$26,400	$26,400		
Task 7	Query Data from the State Database	$126,400			$63,200					$63,200		
Task 8	Ambient Water Quality, Assimilative Capacity	$2,323,200				$580,800	$580,800				$580,800	$580,800
	Annual Costs	**$4,090,150**	**$559,680**	**$270,218**	**$333,418**	**$580,800**	**$580,800**	**$0**	**$270,218**	**$333,418**	**$580,800**	**$580,800**
	Cumulative Costs	**$4,090,150**	**$559,680**	**$829,898**	**$1,163,315**	**$1,744,115**	**$2,324,915**	**$2,324,915**	**$2,595,133**	**$2,928,550**	**$3,509,350**	**$4,090,150**

Figure 2. Concept Level Tasks and Costs for Phase 1 – Salinity Prioritization and Optimization Study: Schedule and Expected Task Expenditures (Gantt Chart Format)

Tasks		Task Cost	Year of the Prioritization and Optimization Plan									
			1	2	3	4	5	6	7	8	9	10
Task 1	Field Verification of Wells	$295,680	■									
Task 2	Sampling and Analysis Plan	$79,200	■									
Task 3	Quality Assurance Plan	$105,600	■									
Task 4	Health and Safety Plan	$79,200	■									
Task 5	Sampling and Analysis	$975,270		■	■				■	■		
Task 6	Report Data to the State Database	$105,600		■	■				■	■		
Task 7	Query Data from the State Database	$126,400			■							
Task 8	Ambient Water Quality, Assimilative Capacity	$2,323,200				■	■				■	■
	Annual Costs	**$4,090,150**	**$559,680**	**$270,218**	**$396,618**	**$580,800**	**$580,800**	**$0**	**$270,218**	**$270,218**	**$580,800**	**$580,800**
	Cumulative Costs	**$4,090,150**	**$559,680**	**$829,898**	**$1,226,515**	**$1,807,315**	**$2,388,115**	**$2,388,115**	**$2,658,333**	**$2,928,550**	**$3,509,350**	**$4,090,150**

111 Academy Way, Suite 150
Irvine, California 92617
Telephone: 949.752.5452

September 12, 2016

Central Valley Salinity Coalition
Attention: Daniel Cozad
dcozad@cvsalinity.org

Subject: Central Valley Salt and Nitrate Management Plan
Addendum to the Surveillance and Monitoring Program (SAMP)

Dear Mr. Cozad:

The Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) is in the process of developing a comprehensive regulatory and programmatic approach to the management of salt and nitrate in the Central Valley that is not only consistent with the State Recycled Water Policy (SRWP), but meets the broader goals of CV-SALTS to develop a workable, comprehensive plan to address salinity, including nitrates, throughout the region in a comprehensive, consistent, and sustainable manner. Among other things, the SRWP requires that development of the SNMP include the development of a Surveillance and Monitoring Program (SAMP); a basin/sub-basin wide monitoring plan that includes an appropriate network of monitoring locations.

CDM Smith entered into an Agreement for Professional Services with the San Joaquin Valley Drainage Authority (SJVDA) on March 18, 2015 to develop the Central Valley SAMP. The SAMP Agreement is under Agreement No. 11-123-555 between the SJVDA and the State Water Resources Control Board.

The scope of work for the SAMP was to develop the monitoring program using statistical tools at the Initial Analysis Zone (IAZ)-level of spatial resolution, in order to be consistent with other technical reports that, at the time, had been conducted at that scale. CDM Smith was also directed to use the CV-SALTS database[1] that was developed for use in other CV-SALTS studies. The CV-SALTS database categorized wells associated with a "shallow" aquifer zone; a "deep" aquifer zone; and unknown – where well construction information was not available. The definition of a shallow aquifer zone – developed as part of the Initial Conceptual Model – is the "…vertical distance [that] represents the distance that the water, at the water table, would travel downward or upward over a 20-year period."

[1] LWA and LSCE. 2014. Phase II Conceptual Model - Task 3: Groundwater Data Refinements and Updates. Memorandum from Dylan Boyle to Richard Meyerhoff. June 18, 2014.

Subsequent to the development of the SAMP Workplan, the CV-SALTS Executive Committee authorized new work to develop water quality characteristics for Central Valley groundwater basins/sub-basins, which provides a higher resolution of groundwater quality than provided by the use of IAZs. As part of this effort, CV-SALTS revised the CV-SALTS database with new definitions of aquifer zones: "Upper," "Lower," "Production," and unknown based on newly available well construction information. Dr. Thomas Harter's group at UC Davis has conducted further quality assurance/quality control (QA/QC) protocols on the data and have further refined the CV-SALTS database.

The Central Valley Water Board staff member participating on the SAMP Project Committee posed the following request in their comments on the draft SAMP report (dated April 29, 2016):

> *"Will it be much work to modify the SAMP to reflect the higher resolution groundwater data for basins and sub-basins instead of the IAZ scale? From using the Shallow and Deep Zones to Upper, Lower and Production Zones?"*

While it was recognized that the SAMP, as drafted, was consistent with the approved Workplan, the same request was made during the SAMP Project Committee conference call on May 3, 2016. The Project Committee decided that the draft SAMP report should be finalized addressing all of the other comments from the Project Committee and other stakeholders; however, CDM Smith was directed to prepare a scope of work and cost estimate to revise the SAMP analyses and develop new monitoring well networks at the groundwater basin / subbasin-scale and utilizing the refined CV-SALTS database. This would allow the most likely basis to be used to develop a draft implementing strategy that was coordinated with CV-SALTS nitrate and salinity permitting strategies. Further this effort would assist with the most accurate cost estimation which would be critical to being able to identify the economic impacts of this element of the CV-SALTS Basin Plan Amendment. In this scope of work, the SAMP report would not be modified, but the results of the new SAMP basin analyses would be published as an addendum with costs and incorporated into the Economics Report and Substitute Environmental Documents in preparation for the SNMP. The following sections of this memorandum provide a proposed scope of work, budget, and schedule to complete the SAMP addendum.

Scope of Work – SAMP Addendum

The following tasks are similar to work previously completed at the IAZ level and using the previous version of the CV-SALTS database. The same methodology will be repeated, but at the groundwater basin/sub-basin level and using the refined CV-SALTS database with implementation and costs provided.

Task 1. Power Analysis

Power analysis involves determining the sample size required to obtain a statistical result within a specified level of confidence, and thus one that effectively satisfies project-defined or representative objectives. It incorporates a cost/benefit analysis from the standpoint that results can be used to inform and assist with defining overall project goals. With regard to the SAMP

development, power analyses will be used in conjunction with bootstrap resampling to examine changes in uncertainty (levels of confidence) inherent in selecting various grid cell sizes and randomly selecting wells as monitoring points. The specific steps are as follows:

1. Assign grid number, fraction of the grid cell within a groundwater basin / subbasin, and basin number to updated database.
2. Select the grid cell size to evaluate, in sequence, beginning with the largest grid cell size (16 square mile grid) and ending with the smallest grid cell size (1 square mile grid).
3. Randomly select one well from each of the *n*-populated grid cells.
4. Calculate the mean value of the *n*-selected wells.
5. Repeat Steps 2-3 for *m* = 1000 random resamples with replacement (bootstrap samples).
6. Calculate the mean of the resamples and determine the lower and upper confidence limits (LCL and UCL) of the mean as the 2.5th and 97.5th percentiles, respectively.
7. Calculate the lower and upper margins of error as the mean minus the LCL and the UCL minus the mean, respectively; and the lower and upper percent margins of error as the margins of error divided by the mean times 100.
8. Repeat Steps 1-6 for the next grid cell size, until all 10 grid cell sizes have been evaluated.
9. Grid Size Selection using 15 percent upper margin of error (UME)

Task 2. Basin Statistics

The power analyses results will be evaluated in order to select appropriate grid cell sizes for each groundwater basin. Theoretically, as the grid cell size decreases, the number of populated grid cells increases and the variability (margin of error) decreases. Therefore, the number of wells to include in the monitoring network depends on selecting a set of grid cell sizes that results in a practical and consistent margin of error across all groundwater basins (to the extent possible given the data contained in the CV-SALTS database, the spatial distribution of wells with total dissolved solids (TDS) and nitrate data and the variability of the data). Average nitrate and TDS concentrations for each groundwater basins are independently calculated and compared to verify the validity of the power analyses results.

1. Calculate time-weighted well average for TDS and nitrate. Then calculate basin average TDS and nitrate in Upper, Lower, and Production Zones for each groundwater basin.
2. Determine the percentage of wells with TDS and nitrate concentrations that exceed the MCL and half the MCL in the Upper, Lower, and Production Zones of each groundwater basin.

3. The spatial distribution of wells varies widely from basin to basin and zone to zone. GIS tools will be used to identify data gap areas in the Upper, Lower and Production zones and select a grid cell(s) where an additional monitoring point is warranted.

Task 3. Select Monitoring Well Network

ESRI's ArcGIS ModelBuilder is a "visual programming language for building geoprocessing workflows." The workflow described below will be programmed into ModelBuilder and then ModelBuilder will be run to semi-randomly select wells for the revised SAMP monitoring network in the Upper, Lower, and Production Zones for each groundwater basin.

1. Assign land use to all grid sizes. (This subtask was already completed as a component of the original SAMP analyses and will not need to be repeated in the addendum analyses.)
2. Only use wells with nitrate and/or TDS data between 2003 and 2014.
3. Wells with an active status were preferentially selected over wells with inactive status.
4. Randomly select wells.
    a. Community water system (CWS) well preference for urban land use areas, CWS wells selected randomly.
    b. No other preferences for other land uses – random selection from any active well.
5. For unpopulated grid cells, assign an inactive well.
6. Assign water quality value (TDS and nitrate) to grid cell.
7. Compute area weighted concentrations (for cells that are not entirely contained within a groundwater basin).
8. Estimate area weighted concentrations for SAMP wells.
9. Selection verifications.

Task 4. Develop SAMP Addendum Report

A brief addendum will be developed, which will provide the context for the additional analyses, explain the procedures, and present the results of the additional analyses. The addendum will include all of the appropriate tables and maps, consistent with the existing SAMP Report. The addendum report will propose a likely scope and estimate costs for the implementation of the SAMP after the Basin Plan amendments adopted to implement the SNMP become effective. The addendum will also propose a methodology and process for coordinating the requirements and distributing the costs of the SAMP among participants in the implementation of the nitrate and salinity permitting strategies. This part of the addendum is critical to the most accurate

completion of the Economics study and Substitute Environmental Document. The budget includes time for coordination with the Project Committee.

Budget

The estimated cost to conduct Tasks 1 through 4 is summarized in Table 1 (attached), including a detailed breakdown of the estimated hours and costs for each task. The cost to redo the SAMP analyses, as described above, is $53,100.

Schedule

The work on the additional scope will begin upon approval of the proposed scope and budget. The technical work and draft Addendum Report should be completed in approximately two months from notice to proceed. A final Addendum Report will be provided within two weeks following completion of CV-SALTS review of draft materials.

The re-analysis of the SAMP on a groundwater basin / subbasin basis and using the updated CV-SALTS database is important to the implementation of the SNMP; however, this work can either be executed as part of the current economics study and published as the SAMP Addendum or as one of the preliminary tasks in the implementation of the SAMP. Please call or email if you have any questions.

Sincerely,

Joseph P LeClaire

Joseph P. LeClaire, PhD
Associate
CDM Smith Inc.

cc: Richard Meyerhoff, PhD | CDM Smith
Roger Reynolds, PE | Summers Engineering

Table 1
Cost Estimate and Work Breakdown Structure: SAMP Addendum

Task		Description	Labor							ODCs	Total Task Costs
			Associate	Grade 2 Scientist	Grade 3 Scientist	Word Processor	Outside Professional	Total Labor Hours	Total Labor Dollars		
1	Power Analysis		3	24			28	55	$6,495		$6,495
	1a	Data Preparation	1	8			8	17	$2,045		$2,045
	1b	Power Analyses	1				16	17	$1,685		$1,685
	1c	Grid Size Selection	1	16			4	21	$2,765		$2,765
2	Basin Statistics		3	76	8			87	$12,155		$12,155
	2a	Mean TDS & Nitrate in Upper/Lower/Production Zones	1	48				49	$6,725		$6,725
	2b	Percentage of Exceedances	1	20				21	$2,945		$2,945
	2c	Identify Data Gaps	1	8	8			17	$2,485		$2,485
3	Select Monitoring Well Network		2	20	40			62	$8,990		$8,990
	3a	Update ModelBuilder			20			20	$2,900		$2,900
	3b	Review Results	1	20				21	$2,945		$2,945
	3c	Deliverables	1		20			21	$3,145		$3,145
4	Develop SAMP Addendum Report		72	52		8		76	$25,460		$25,460
	4a	Cost Estimate and Permitting Strategy for SAMP Implementati	40	16					$11,960		$11,960
	4b	Draft Addendum Report	16	20		4		40	$7,020		$7,020
	4c	Final Addendum Report	16	16		4		36	$6,480		$6,480
		TOTAL COSTS	***80***	***172***	***48***	***8***	***28***	***280***	***$53,100***	***$ -***	***$ 53,100***

CV-SALTS Meeting Calendar

2016

1 January

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1						1	2
2	3	4	5	6	7	8	9
3	10	11	12	13	14	15	16
4	17	18	19	20	**21**	22	23
5	24	25	26	27	28	29	30
6	31						

2 February

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
6		1	2	3	4	5	6
7	7	8	9	10	11	12	13
8	14	15	**16**	17	18	19	20
9	21	22	23	24	25	26	27
10	28	29					

3 March

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
10			1	2	**3**	4	5
11	6	7	8	9	10	11	12
12	13	14	15	16	17	18	19
13	20	21	22	23	24	25	26
14	27	28	29	30	31		

4 April

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
14						1	2
15	3	4	5	6	**7**	8	9
16	10	11	12	13	14	15	16
17	17	18	19	20	21	22	23
18	24	25	26	27	28	29	30

5 May

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
19	1	2	3	4	**5**	6	7
20	8	9	10	11	12	13	14
21	15	16	17	18	19	20	21
22	22	23	24	25	26	27	28
23	29	30	31				

6 June

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
23				1	2	3	4
24	5	6	7	8	**9**	10	11
25	12	13	14	15	16	17	18
26	19	20	21	*22*	23	24	25
27	26	27	28	29	**30**		

7 July

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
27						1	2
28	3	4	5	6	7	8	9
29	10	11	12	13	**14**	15	16
30	17	18	19	20	21	22	23
31	24	25	26	27	28	29	30
32	31						

8 August

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
32		1	2	3	**4**	5	6
33	7	8	9	10	11	12	13
34	14	15	16	**17**	18	19	20
35	21	22	23	24	25	26	27
36	28	29	30	31			

9 September

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
36					**1**	2	3
37	4	5	6	7	8	9	10
38	11	12	13	14	15	16	17
39	18	19	20	21	22	23	24
40	25	26	27	28	29	30	

10 October

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
40							1
41	2	3	4	5	**6**	7	8
42	9	10	11	12	13	14	15
43	16	17	18	19	20	21	22
44	23	24	25	26	27	28	29
45	30	31					

11 November

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
45			1	2	**3**	4	5
46	6	7	8	9	10	11	12
47	13	14	15	16	17	18	19
48	20	21	22	23	24	25	26
49	27	28	29	30			

12 December

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
49					**1**	2	3
50	4	5	6	7	8	9	10
51	11	12	13	14	15	16	17
52	18	19	20	21	22	23	24
53	25	26	27	28	29	30	31

Notes/Key

Light Red conflicts

January is a Thursday/Friday

Wed/Thurs 4th or 3rd

Dark Green Exec Comm Policy

Fridays at 1:00 pm

Lt. Green Hatch Exec Comm Admin

or **State Board Presentation**

Yellow Salty 5

Lower SJ River Committee

Regional Board Breifing 8/17

TAC Meeting

Regional Board Presentation 6/22

Wednesday Meetings are DRAFT

May be held by Webinar or

in person in Sacramento half day