



Memorandum

To: CV-SALTS Executive Committee

*From: Joe LeClaire, CDM Smith
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Date: July 27, 2016

*Subject: Concept Level Tasks and Costs for Phase 1
– Salinity Prioritization and Optimization Study*

Background

The Salinity Small Workgroup met on July 21, 2016 to discuss a first draft of the Salinity Permitting Strategy and development of key elements of the referenced Salinity Management Strategy. An outcome of that meeting was the identification of the first milestone in the Salinity Management Strategy – completion of a “Salinity Prioritization and Optimization Study” that would occur in the first 10 years of Salt and Nitrate Management Plan (SNMP) implementation. The Workgroup requested the development of a scoping document listing tasks that could be included in this effort and the potential concept-level costs for execution.

Relevant to the request for a list of tasks is the May 2015 draft Phase 3 SSALTS Report submitted by CDM Smith for CV-SALTS review. While that document continues to be revised, the draft included the following key activities that should be considered for implementation within the “short-term” phase of implementation of the development of a Central Valley Regulated Brine Line, *i.e.*, Years 1 through 20. These tasks are summarized as follows:

- **Salinity Prioritization and Optimization Study.** Fundamentally, the Salinity Prioritization and Optimization Study would determine optimal areas to locate regional/subregional treatment and transportation facilities for salinity – while accounting for nitrate issues in groundwater. The study would, in phases, evaluate the location, routing and implementation and operational feasibility of facilities including the regional regulated brine line. The Salinity Prioritization and Optimization Study also includes other technical tasks that are required to execute the short-term and long-term phases of the salinity management plan.
- **Concept Design.** Development of the Concept Design for a regulated brine line would include elements of a concept study, a feasibility study, design and capacity requirements, and a preliminary design, described as follows:

- The feasibility study would review recommended alternatives, but at a design and engineering level versus the concept level. The feasibility study will include a robust evaluation and analysis of the proposed engineering and operational approach. Ultimately, the feasibility study would determine if development of the regulated brine line can proceed to the design phase.
 - Engineering design and capacity requirements would be developed in parallel with the feasibility study and would define engineering and cost parameters that must be achieved by the project.
 - The preliminary design bridges the gap between the concept study/feasibility study and the detailed design phase. The preliminary configuration, design capacity, and routing layout of the regulated brine line would be developed and optimized during the preliminary design. The preliminary design provides the design and operational framework of the project.
- **Funding and Financing Strategy.** The funding and financing strategy would include a detailed analysis of capital and operations and maintenance (O&M) costs and importantly, when various financing and funding will be required based on the projected phased build out of the regulated brine line (as expected per the Concept Design). The funding plan would include a financial strategy to determine potential sources of funding: including federal, state, local agencies, water purveyors, agricultural communities, grants, bonds, low interest loans, and other strategies to support the development and implementation of the facilities.
 - **Governance Options Plan.** The governance options plan would identify and define the various roles and responsibilities of the key salinity implementation stakeholders. The plan would include the project governance objectives, alternative governance models and a phased plan for governing the program from describing how the regulated brine line and related facilities will be developed, implemented and ultimately administered. The plan would include discussion of various models and related administrative procedures and policies. Policies would address capacity ownership, use rights, use territory and how those and other factors affect governance issues such as voting rights. The plan would present various governance models and discuss what type of entity should be established to administer the project in development and in operation. The governance options plan would address coordination with the Management Zones, Counties, Agencies, and Groundwater Sustainability Agencies (GSAs) formed under the 2014 Sustainable Groundwater Management Act (SGMA).
 - **Environmental/Permitting.** Environmental impact analyses, meeting the requirements of California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), would be prepared after a Concept Design was completed in coordination with the later design efforts for the first construction phases.
 - **Design Phase.** The design phase would consist of the development of the detailed designs and standard specifications for each component of the project: including collection facilities,

extraction facilities, treatment facilities, the brine line, pump stations, laterals, *etc.* The detailed designs and standard specifications would be adapted to conditions of each area and their salinity management approaches. The design stage would be accomplished in phases as elements of the environmental and permitting and the governance options plan are developed.

To support development of the Salinity Management Strategy, the small workgroup is considering establishing three phases of implementation, with each phase lasting 10 years. For the first 10 years, it is proposed that the following activities be included: Salinity **Prioritization and Optimization** studies leading to a **Concept Design**, and development of a **Governance Options Plan** and **Funding Plan**. Other activities such as environmental/permitting and engineering and design would occur in subsequent phases.

Interim Activities

The Salinity Small Workgroup also identified that critical to the success of the Salinity Management Strategy was the need for planning efforts to include continued outreach and advocacy related to counterproductive policies, positions, and efforts conducted by other agencies and entities. This planning phase must make the effort to ensure that the salinity problem is not made more difficult or impossible by other policy initiatives, even if well meaning. The program must also continue to assist regulated and unregulated entities in cooperating and utilizing the benefits of CV-SALTS. Interim activities would also include advocacy and outreach to increase interim salt management and proposal development for grants and other efforts to support implementation of the Salinity Management Strategy.

Proposed Tasks, Budget and Schedule for Phase 1

Table 1 summarizes the types of tasks that could be included in Phase 1. Table 1 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 \$7M and \$9M for the 10-year duration of the program. With the addition of administration and contracting costs, it is likely the total is between \$850K to \$1M per year.

Table 1. Phase 1 - Salinity Management Strategy: Proposed Tasks

Task	Description	Range of Costs	Level of Effort (days)
1	Stakeholder Meetings. Input from CV-SALTS stakeholders through facilitated meetings. (Consultant costs; stakeholder participation would be considered in-kind contributions). Costs range from monthly to quarterly meetings for 10 years.	\$616K – \$1.9M	360 – 1080
2	SGMA GSA Meetings. Coordination with GSAs. Assume that one meeting per quarter for all of the GSAs in each hydrologic region. For example, representatives from GSAs in the San Joaquin River Hydrologic Region will convene with CV-SALTS stakeholders once per quarter. The same assumption is made for the Tulare Lake Hydrologic Region. Fewer meetings are anticipated for the Sacramento River Hydrologic Region.	\$424K – \$954K	240 – 540
3	Implementation Strategies. Develop strategies for the equitable management of the CV-SALTS process. Resources will be allocated where salt management needs are the greatest – different strategies may be developed for different Hydrologic Regions. In this task, other water management and state policies will be reviewed to ensure that there are not negative impacts. These included individual waste discharge requirements (WDRs), Basin Plans, the Ocean Plan, the Bay-Delta plan, SGMA Groundwater Sustainability Plans (GSPs), <i>etc.</i>	\$285K – \$425K	160 - 240
4	Funding and Financing Strategy. The funding plan will include a financial strategy to determine potential sources of funding: including federal, state, local agencies, water purveyors, agricultural communities, grants, bonds, and low interest loans and other strategies to support the development and implementation on the facilities.	\$295K – \$400K	168 - 228
5	Salt Management/Storage Areas. Delineate areas where salt can be stored and managed in a sustainable manner or until the CVBL is operational. Involves hydrogeological investigation, land use and future land use studies, and the de-designation of the groundwater basin/subbasin from MUN and AGR beneficial uses. Salt management/storage areas will be strategically located in the San Joaquin River and Tulare Lake Hydrologic Regions. Segments of the Central Valley Regulated Brine Line can be constructed to transport brine to the interim or permanent salt management/storage areas.	\$225K – \$450K	120 – 240
6	Interim Truck or Rail Transport of Brine to a Regulated Wastewater Treatment Plant (WWTP), e.g., East Bay Municipal Utilities District (EBMUD). This task will involve a series of meetings with EBMUD, a detailed estimate of trucking and rail costs and a study to re-operationalize the existing rail spur to EBMUD.	\$140K – \$350K	80 - 200
7	Prioritization of Groundwater Basins and Subbasins. This task involves reviewing and potentially revising groundwater basin and subbasins priorities that were developed for the SNMP, based on new information and on the stakeholder meetings.	\$80K – \$150K	40 - 80
8	Prioritization within Groundwater Basins and Subbasins and Groundwater Modeling. The Prioritization and Optimization Study will evaluate criteria to develop a master plan for prioritization and phasing of locations for extraction wells and treatment facilities. This task will include reviewing hydrogeologic information and water quality data for each basin and subbasin. The CV-SALTS groundwater model will be refined to estimate optimal areas to located extraction wells and to build a regional/subregional treatment facility (salinity and/or nitrate). Groundwater modeling must include current groundwater pumping for irrigation and potable supply, as well as planned pumping based on GSPs being developed under SGMA. Cost sharing with GSAs should be considered. Costs borne principally by stakeholders within each groundwater basin, subbasin or management zone.	\$1.4M – \$2.1M	800 - 1200
9	Groundwater Quality Characterization of Groundwater Basins and Subbasins. CV-SALTS will conduct a study to characterize trace elements, contaminants of emerging concern (CECs), and low concentration agricultural chemicals. This information will	\$525K - \$950K	240 - 480

Table 1. Phase 1 - Salinity Management Strategy: Proposed Tasks

Task	Description	Range of Costs	Level of Effort (days)
	be used in coordination with the WWTPs and for permitting.		
10	CVBL Pipeline Alignment – Fatal Flaw Analysis. A fatal flaw analysis will be conducted on the concept pipeline alignment that was described in SSALTS Phase 2 report (CDM Smith, 2014).	\$145K – \$220K	80 – 120
11	Alternative CVBL Pipeline Alignments Alternate CVBL alignments will be considered. For example, there is a natural gas easement from Naval Air Station (NAS) Lemoore to Estero Bay or other identified in the development of the project. Additional environmental permitting would be required. Permitting costs are not included in this estimate.	\$215K – \$290K	120 – 160
12	Emerging Technologies. A review of maturing and emerging technologies for salinity management and nitrate treatment will be completed in the tenth year of the 10-year Prioritization and Optimization Study. The review of technologies will, however, be conducted over the course of the Prioritization and Optimization Study. During the review of technologies, a recommendation for well-head treatment for the thousands of single-residence potable domestic wells will be made.	\$110K – \$220K	60 – 120
13	Well Head Treatment for Nitrate. This task is included in the Salinity Management Strategy because of potential health concerns with nitrate in groundwater and in order to meet the SNMP management goal 1. This task will include a public education and outreach program and an implementation plan for the installation and maintenance of these individual systems. This implementation plan does not include funding for the implementation of treatment.	\$285K – \$425K	160 – 240
14	Recycled Water Imports and Exports. This task will evaluate the importation of recycled water into the Valley through a pipeline in the same easement as the CVBL and the recycled water will be used directly or recharged through a series of IPR projects.	\$145K – \$220K	80 – 120
15	Stormwater Recharge Master Plan. Develop a comprehensive assessment of stormwater recharge current, planned and additionally needed to enhance recharge of high quality stormwater and snowmelt to the extent possible. Plan will evaluate existing and planned efforts and account for water rights and environmental impacts.	\$285K – \$425K	160 – 240
16	Concept Design for the Central Valley Regulated Brine Line. Development of the Concept Design for a regulated brine line would include elements of a concept study, a feasibility study, design requirements, and a preliminary design	\$285K – \$425K	160 – 240
17	Interim Activities. Plan and implement interim activities to support outreach and advocacy to avoid counterproductive policies and efforts by others making the project more difficult or impossible. Assist entities in cooperating and utilizing the benefits of CV-SALTS and increase the interim salt management efforts and support grants and other efforts to implement the Salinity Management Strategy.	\$285K - \$425K	160 - 240
18	Governance Options Plan. The governance plan will define the roles and responsibilities of the key stakeholders. The governance plan will include the project objectives and a detailed plan describing how the regulated brine line will be administered. The governance plan will account for coordination with the GSAs formed under SGMA.	\$145K – \$220K	80 – 120
Totals		\$5.9M – \$10.6M	3,260 – 5,888

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 Stakeholder Meetings	\$1,258,000	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800	\$125,800
Task 2 SGMA GSA Meetings	\$689,000	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900	\$68,900
Task 3 Implementation Strategies	\$355,000	\$71,000	\$71,000	\$71,000	\$71,000	\$71,000	\$71,000					
Task 4 Funding and Financing Strategy	\$347,500	\$153,100	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600	\$21,600
Task 5 Salt Management/Storage Areas	\$337,500		\$168,750	\$168,750								
Task 6 Interim Truck or Rail Transport of Brine	\$245,000			\$122,500	\$122,500							
Task 7 Prioritization of Groundwater Basins...	\$115,000		\$115,000									
Task 8 Prioritization <i>within</i> Groundwater Basins...	\$1,750,000		\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000			
Task 9 Groundwater Quality Characterization	\$737,500			\$105,357	\$105,357	\$105,357	\$105,357	\$105,357	\$105,357	\$105,357		
Task 10 CVBL Pipeline Alignment – Fatal Flaw Analysis	\$182,500		\$91,250	\$91,250								
Task 11 Alternate CVBL Pipeline Alignment	\$252,500				\$126,250	\$126,250						
Task 12 Emerging Technologies	\$165,000		\$55,000				\$55,000					\$55,000
Task 13 Well Head Treatment for Nitrate	\$355,000		\$177,500	\$177,500								
Task 14 Recycled Water Imports and Exports	\$182,500							\$91,250	\$91,250			
Task 15 Stormwater Recharge Master Plan	\$355,000			\$177,500	\$177,500							
Task 16 Concept Design for the Regulated Brine Line	\$355,000									\$118,333	\$118,333	\$118,333
Task 17 Interim Activities	\$355,000	\$71,000	\$71,000	\$71,000	\$71,000	\$71,000						
Task 18 Governance Options Plan	\$182,500									\$60,833	\$60,833	\$60,833
Annual Costs	\$8,219,500	\$489,800	\$1,215,800	\$1,451,157	\$1,139,907	\$839,907	\$626,657	\$662,907	\$842,074	\$500,824	\$450,467	
Cumulative Costs	\$8,219,500	\$489,800	\$1,705,600	\$3,156,757	\$4,296,664	\$5,136,571	\$5,763,229	\$6,426,136	\$7,268,210	\$7,769,033	\$8,219,500	

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 Stakeholder Meetings	\$1,258,000	[Gantt bar]									
Task 2 SGMA GSA Meetings	\$689,000	[Gantt bar]									
Task 3 Implementation Strategies	\$355,000	[Gantt bar]									
Task 4 Funding and Financing Strategy	\$347,500	[Gantt bar]									
Task 5 Salt Management/Storage Areas	\$337,500	[Gantt bar]									
Task 6 Interim Truck or Rail Transport of Brine	\$245,000	[Gantt bar]									
Task 7 Prioritization of Groundwater Basins...	\$115,000	[Gantt bar]									
Task 8 Prioritization <i>within</i> Groundwater Basins...	\$1,750,000	[Gantt bar]									
Task 9 Groundwater Quality Characterization	\$737,500	[Gantt bar]									
Task 10 CVBL Pipeline Alignment – Fatal Flaw Analysis	\$182,500	[Gantt bar]									
Task 11 Alternate CVBL Pipeline Alignment	\$252,500	[Gantt bar]									
Task 12 Emerging Technologies	\$165,000	[Gantt bar]									
Task 13 Well Head Treatment for Nitrate	\$355,000	[Gantt bar]									
Task 14 Recycled Water Imports and Exports	\$182,500	[Gantt bar]									
Task 15 Stormwater Recharge Master Plan	\$355,000	[Gantt bar]									
Task 16 Concept Design for the Regulated Brine Line	\$355,000	[Gantt bar]									
Task 17 Interim Activities	\$355,000	[Gantt bar]									
Task 18 Governance Options Plan	\$182,500	[Gantt bar]									
Annual Costs	\$8,219,500	\$489,800	\$1,215,800	\$1,451,157	\$1,139,907	\$839,907	\$626,657	\$662,907	\$842,074	\$500,824	\$450,467
Cumulative Costs	\$8,219,500	\$489,800	\$1,705,600	\$3,156,757	\$4,296,664	\$5,136,571	\$5,763,229	\$6,426,136	\$7,268,210	\$7,769,033	\$8,219,500