



Memorandum

To: Daniel Cozad, Executive Director, Central Valley Salinity Coalition

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Date: April 12, 2017

*Subject: **Proposed Start-Up Scope of Work and Deliverables to Initiate the Prioritization and Optimization Study***

Background

The Salt and Nitrate Management Plan (SNMP) Salinity Management Strategy recommends a long-term Salinity Management Strategy that:

- Controls the rate of degradation (“managed degradation”)
- Achieves long-term sustainability (salt balance) where feasible, practicable, and reasonable
- Protects beneficial uses by meeting applicable water quality objectives and applying appropriate antidegradation concerns.

Because of the long-term nature of salinity management, this Salinity Management Strategy is phased over time. The first phase consists of developing and implementing a Prioritization and Optimization Study (P&O Study) for salinity management for the Central Valley Region. The overall goal of the P&O Study is to further refine the findings from the Strategic Salt Accumulation Land & Transportation Study (SSALTS) Study. In general, the P&O Study is expected to include, but not necessarily be limited to, the following activities:

- Evaluate the impact of all state policies that impact management of salinity in the Central Valley region (*e.g.*, Bay-Delta Plan) to both surface and ground waters;
- Identify physical projects and proposed locations for long-term management of salinity (*e.g.*, regulated brine line, salt-sinks, regional / sub-regional desalters, recharge areas, deep well injection, *etc.*);
- Identify non-physical projects that help with managing salinity;
- Develop governance structures for implementation of the physical projects;

- Identify funding sources necessary for implementation of large-scale capital physical projects (state and federal capital expenditures);
- Identify the various environmental permits (and time line for obtaining the permits) needed to implement the preferred physical projects;
- Identify and propose any necessary Basin Plan changes that may be necessary to implement the next Phase or Phases of the Salinity Management Strategy (*e.g.*, offset policy);
- Develop the conceptual design for applicable projects; and
- Other related activities.

Table 1 provides a general description of the tasks anticipated to be completed under the P&O Study; **Figure 1** illustrates a general timeline for completion of these various tasks over an estimated 10-year period.¹ The purpose of this memorandum is to prepare a general scope of work for the first five-year period leading to completion of the Interim Report (Task 13) and a more detailed scope for Years 1 and 2 to provide the sufficient information to support efforts to initiate or start-up the P&O Study. This start-up effort is anticipated to be funded, at least in part, by a State Water Board Cleanup and Abatement Account (CAA) Grant.

P&O Study – First Five Years

Table 1 / Figure 1 anticipate the completion of the following tasks in the first five-year period of the P&O Study:

- Task 3 – Regulatory and Policy Evaluations
- Task 5 – Governance Plan – Formation and Structure
- Task 7 – Funding Plan and Financing Strategies
- Task 9 – Prioritization of Groundwater Basins and Subbasins
- Task 10 – Prioritization within Groundwater Basins and Subbasins and Groundwater Modeling
- Task 11 – Salt Management Projects and Identification of Salt Storage Areas
- Task 12 – Interim Truck or Rail Transport of Brine to a Regulated Wastewater Treatment Plant.

¹ Table 1 and Figure 1 were originally published as Table 4-4 and Figure 4-5 in the SSALTS Phase 3 Report (CDM Smith, December 2016).

- Task 13 – Interim Report

In addition, during implementation of the above tasks, two stakeholder coordination tasks are anticipated to be ongoing and will continue until completion of the P&O Study:

- Stakeholder Coordination Meetings
- Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Agency (GSA) Coordination Meetings

P&O Study - Start-Up Scope of Work

It is recommended that available grant funding for the start-up of the P&O Study focus on the following five P&O tasks (Task numbers are consistent with Table 1):

Task 3. Regulatory and Policy Evaluations. The purpose of this task is to review strategic planning / management activities to ensure all work completed under Phase I of the Salinity Management Strategy is consistent with the needs and purpose of the P&O Study. In addition, this task includes an evaluation of existing water management and state policies and requirements that may facilitate salinity management or that may make implementation of a long-term salinity management strategy more difficult or challenging. The scope of work of this task focuses on this latter activity, including:

- Review of other state plans and policies that have or may have an impact on salinity management, including the recycled water policy, the Bay-Delta Plan, the Bay-Delta Conservation Plan, the Ocean Plan, *etc.*
- Review of SNMP policies as appropriate to consider salinity management. For example, the SNMP Groundwater Management Zone Policy currently only applies to nitrate management. In addition, the AGR Policy was deferred given the recommendations of the Salinity Management Strategy. This policy may be further developed under this task.
- Review of other regulations, policies, *etc.* as directed through the CV-SALTS Stakeholder process and that can be completed under the proposed project budget.

Estimated Budget and Level of Effort (LOE): \$42,000; 180 hours

Deliverable: Technical memorandum that summarizes the findings from the review of documents as described above and provides recommendations where appropriate to address identified challenges.

Task 9. Prioritization of Groundwater Basins and Subbasins. The consultant will work within the CV-SALTS stakeholder process to develop a prioritization approach for salinity in valley floor groundwater basins / subbasins. This task involves reviewing existing Central Valley prioritization

work for salts² and revising as appropriate based on any available new information and stakeholder discussions. Prioritization factors could include, but not be limited to³: current ambient TDS, TDS loading rate, existence of areas of high salinity within each groundwater basin / subbasin, use of water for potable supply and / or agriculture, current and projected land use, crop sensitivity to salinity, and the potential for effective salinity mitigation.

Estimated Budget and LOE: \$25,000; 110 hours

Deliverable: Development of prioritization factors and a weighting scheme; preparation of a map of prioritized groundwater basins / subbasins for the Central Valley floor based on salinity concerns.

Task 10. Prioritization within Groundwater Basins / Subbasins and Groundwater Modeling.

The purpose of this P&O Study task is to develop criteria for use in developing a master plan for prioritization and phasing of locations for salt extraction facilities and treatment facilities. This master plan will be organized by hydrologic region to take into account varying salt management priorities and priorities identified in Task 9 (see above). Ultimately, completion of this task includes reviewing hydrogeologic information and water quality data for each basin and subbasin, accounting for current and projected land use and cropping patterns, developing a work plan to refine the CV-SALTS groundwater model to estimate optimal areas to locate extraction facilities and to build regional / subregional treatment facilities (salinity and / or nitrate) taking into account current groundwater pumping for irrigation and potable supply and planned pumping based on GSPs being developed under SGMA. This effort will require considerable technical resources and several years to complete. To initiate this work, the principal tasks under this scope of work are developing the preliminary criteria for use in developing the master plan and preparing a detailed work plan to complete all work anticipated by this task.

Estimated Budget and LOE: \$65,000; 280 hours

Deliverable: Preliminary criteria for development of a master plan along with a detailed work plan to complete the work anticipated under this task.

Task 11. Salt Management Projects and Identification of Salt Storage Areas. The purpose of this task is to delineate interim areas where salt can be stored and managed in a sustainable manner and identify projects for implementation in these delineated areas. Where appropriate, these localized salinity control projects can provide a bridge to the point in time when the planned regulated Central Valley Brineline is operational and available for use. Under this scope of work, a preliminary analysis will be completed that identifies up to fifteen potential interim salt storage areas for further analysis. In addition, a detailed work plan will be developed to (a) complete the requisite hydrogeological investigations and land use studies required to support the ultimate

² An initial prioritization of groundwater basins / subbasins was completed for TDS as part of the preparation of the Nitrate Implementation Measures Study (NIMS) (CDM Smith 2016).

³ To the extent these data are available.

establishment of these strategic areas for interim salt storage and management; and (b) prepare conceptual designs of salt management projects to be implemented in these areas.

Estimated Budget and LOE: \$50,000; 210 hours

Deliverable: Preparation of up to fifteen fact sheets for each of the potential interim salt storage areas and a detailed work plan to complete the work anticipated under this task.

Task 12. Interim Truck or Rail Transport of Brine to a Regulated Wastewater Treatment. The purpose of this task was to have a series of meetings with East Bay Municipal Utilities District (EBMUD) (or other facilities as appropriate) to develop a detailed estimate and comparison of trucking and rail costs associated with implementation of an EBMUD disposal option. Under this scope of work, up to three coordination meetings with EBMUD will occur and preliminary work on the feasibility of the use of truck / rail transport to support the interim management of salt will be completed.

Estimated Budget and LOE: \$38,000; 160 hours

Deliverable: Technical memorandum that summarizes the preliminary feasibility of the use of rail and / or truck transport to existing disposal facilities for interim salt management, including a preliminary analysis of the benefits and costs.

Table 1. Phase I – Prioritization and Optimization Study Proposed Tasks (from Table 4-4 in SSALTS Phase 3 Report)

Task	Description	Range of Costs	Level of Effort (days)
Stakeholder Coordination			
1	Stakeholder Meetings. Input from CV-SALTS stakeholders through facilitated meetings to support implementation of the Prioritization & Optimization Study. These same stakeholder coordination meetings would serve as the mechanism for development of additional guidance / policies to further support SNMP implementation (<i>i.e.</i> , items identified for resolution after submittal of the SNMP) Costs based on consultant costs for meeting support; stakeholder participation would be considered in-kind contributions. Costs range from monthly to quarterly meetings for 10 years. Costs for development of additional policies / guidance, which may or may not be related to salt management are not included in this Phase I table.	\$616K – \$1.8M	360 – 1080
2	Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Agencies (GSA) Meetings. Coordination with GSAs: assume 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. It is critical that the Groundwater Sustainability Plans (GSPs) developed for each groundwater basin and the Salinity and Nitrate Management strategies be coordinated, both technically and institutionally.	\$424K – \$954K	240 – 540
Strategic Planning			
3	Regulatory and Policy Evaluations. This task serves a number of purposes: (a) Phase I strategic planning / management activities to ensure all work completed under Phase I is consistent with the needs and purpose of the Prioritization & Optimization Study (P&O Study); (b) evaluation of existing water management and state policies and requirements that could make implementation of a long-term salinity management strategy more difficult or challenging.	\$317K – \$634K	180 – 360
4	Phase II Planning. Based on the findings of other Phase I activities, (a) review the Central Valley Basin Plans to identify amendments required to continue implementation of the Salinity Management Strategy in Phase II; (b) determine the need to update the interim permitting strategy; (c) complete preliminary assessment of environmental permitting requirements that will need to be completed.	\$211K – \$422K	120 – 240
Governance			
5	Governance Plan - Formation and Structure. Develop the Governance Plan which will define the structure and roles and responsibilities of the key stakeholders. The Governance Plan will include the project objectives and a detailed plan describing how the salinity management strategy will be implemented over time. The structure of governance will be defined, including development of appropriate agreements, <i>e.g.</i> , memorandum of	\$211K – \$528K	120 – 300

Table 1. Phase I – Prioritization and Optimization Study Proposed Tasks (from Table 4-4 in SSALTS Phase 3 Report)

Task	Description	Range of Costs	Level of Effort (days)
	understanding, charter, joint powers authority, etc. The governance plan will also account for coordination with the GSAs formed under SGMA.		
6	Implementation and Refinement of the Governance Plan. The agreed upon Governance Plan will be legally adopted and then implemented. As needed, additional stakeholders will join the governance structure during implementation. The administration of regional components of long-term salinity management projects conceptually developed during Phase I (e.g., the Central Valley regulated brine line) will be refined during implementation of the Governance Plan. Memoranda of understanding with agencies that are not part of the original Governance Plan (e.g., EBMUD for long-term agreements on brine disposal) would be written, negotiated, and executed. Refinement of the Governance Plan will continue as needed during Phases II and III of the Salinity Management Strategy.	\$211 – \$528K	120 – 300
Funding			
7	Funding Plan and Financing Strategy. Development of a Funding Plan will include a preparation of 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 of salinity management facilities. The Funding Plan will include strategies for the equitable management and funding of long-term salinity management projects (e.g., the Central Valley regulated brine line). Resources will be allocated where salt management needs are the greatest; different strategies may be developed for different Hydrologic Regions of the Central Valley.	\$317K – \$528K	180 – 300
8	Implementation of the Funding and Financing Strategy. This task includes the execution of the Funding Plan and the acquisition and administration of the funding dollars. In this task, it is anticipated that an independent, third-party audit firm will conduct a program-specific audit to ensure that the funds are administered in accordance with state and federal laws, regulations, using generally accepted auditing principles and government auditing standards, and other audit guides relative to the source of funding.	\$317K – \$528K	180 – 300
Prioritization and Salinity Management Analyses			
9	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.	\$70K – \$141K	40 – 80

Table 1. Phase I – Prioritization and Optimization Study Proposed Tasks (from Table 4-4 in SSALTS Phase 3 Report)

Task	Description	Range of Costs	Level of Effort (days)
10	Prioritization <i>within</i> Groundwater Basins and Subbasins and Groundwater Modeling. The Prioritization and Optimization Study will develop criteria for use in developing a master plan for prioritization and phasing of locations for extraction facilities and treatment facilities. This master plan will be organized by hydrologic region to take into account varying salt management priorities. This task will include reviewing hydrogeologic information and water quality data for each basin and subbasin. Current and projected land use and cropping patterns will be accounted for. The CV-SALTS groundwater model will be refined to estimate optimal areas to locate extraction facilities and to build regional / subregional treatment facilities (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.	\$1.5M – \$2.3M	880 – 1320
11	Salt Management Projects and Identification of Salt Storage Areas. Delineate areas where salt can be stored and managed in a sustainable manner and identify projects for implementation in these delineated areas. Where appropriate, these localized salinity control projects can provide a bridge to the point in time when the Central Valley Brine Line (CVBL) is operational and available for use. This task involves hydrogeological investigation, land use and future land use studies, and the potential de-designation of the groundwater basin / subbasin from MUN and AGR beneficial uses. Salt management / storage areas will be strategically located in each Hydrologic Region. Where feasible, segments of the CVBL could be constructed to transport brine to the interim or permanent salt management / storage areas.	\$211K – \$422K	120 – 240
12	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 or other facilities, a detailed estimate of trucking and rail costs and specific to an EBMUD disposal option, a study to re-operationalize the existing rail spur to EBMUD.	\$141K – \$352K	80 – 200
13	Interim Phase I Report. The findings from Tasks 9 through 12 will be compiled into a report that identifies recommended salt management projects for implementation by hydrologic region. Projects may range from those that would be implemented on a local or subregional basis separate from larger, regional projects (e.g., CVBL) to the regional proposed CVBL. Ultimately the purpose of this report is to provide recommendations for the further development of projects under Tasks 14-15 that will result in sustainable salt management by hydrologic region.	\$70K – \$141K	40 – 80
Conceptual Design of Salt Management Projects			
14	Concept Designs for Central Valley Subregional Salt Management. – Based on the approved recommendations from Task 13, CV-SALTS will develop a concept design for each planned subregional project. Development of concept designs for these projects would include elements of a concept study, feasibility study, design requirements, and a preliminary design. The budget assumes that up to five projects would be developed further under this task.	\$352K – \$528K	200 – 300

Table 1. Phase I – Prioritization and Optimization Study Proposed Tasks (from Table 4-4 in SSALTS Phase 3 Report)

Task	Description	Range of Costs	Level of Effort (days)
15	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. Included in this task are: (a) a fatal flaw analysis of the concept pipeline alignment that was described in SSALTS Phase 2 report (CDM Smith, 2014); and (b) consideration of alternate CVBL alignments. For example, there is a natural gas easement from Naval Air Station (NAS) Lemoore to Estero Bay in addition to other potential alignments identified in the development of the project. Additional environmental permitting would be required to implement this option (Note: Costs for environmental permitting of salt management projects is a Phase II element of the Salinity Management Strategy.	\$704K - \$1.3M	400 - 720
<i>Special Studies</i>			
16	Groundwater Quality Characterization of Groundwater Basins and Subbasins for Trace Constituents. CV-SALTS will conduct a study to characterize trace elements, contaminants of emerging concern (CECs), and low-concentration agricultural chemicals. This information will be used in coordination with the WWTPs and for permitting. This work will be coordinated (perhaps incorporated into the Surveillance and Monitoring Program [SAMP]) to minimize duplication of effort.	\$522K - \$945K	240 - 480
17	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 P&O Study. The review of technologies will, however, be conducted over the course of the P&O Study.	\$106K – \$211K	60 – 120
18	Recycled Water Imports. This task will evaluate the efficacy and economics of 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 Indirect Potable Reuse (IPR) projects.	\$141K – \$211K	80 – 120
19	Stormwater Recharge Master Plan. Develop a comprehensive assessment of stormwater recharge – current, planned and additionally needed – in order 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.	\$282K – \$563K	160 – 320
Totals		\$6.8M – \$13.1M	3,800 – 7,400

Figure 1. Proposed Phase I Prioritization and Optimization Study Schedule (from SNMP Attachment A-3, Salinity Management Strategy)

Category	Year of Implementation									
	1	2	3	4	5	6	7	8	9	10
Stakeholder Coordination	T1. Stakeholder Coordination Meetings (as needed frequency)									
	T2. SGMA GSA Coordination Meetings (as needed frequency)									
Strategic Planning	T3. Regulatory and Policy Evaluations							T4. Phase II Planning		
Governance	T5. Governance Plan – Formation and Structure					T6. Implementation and Refinement of Governance Plan				
Funding	T7. Funding Plan and Financing Strategy					T8. Implementation of the Funding Plan and Financing Strategy				
Prioritization & Salinity Management Analyses	T9-12. Prioritization / Salt Management Analyses to Support Identification of Salt Management Projects				T13. Interim Report					
Conceptual Design of Salt Management Project						T14-15. Concept Design for Subregional Salt Management Projects and Regional CVBL Project				
Special Studies				T16. Groundwater Quality Trace Constituent Stud						
			T17. Emerging Tech Update No. 1			T17. Emerging Tech Update No. 2			T17. Emerging Tech Update No. 3	
						T18. Recycled Water Imports Study				
								T19. Stormwater Recharge Master Plan Study		