

Initial Phase Conceptual Model - Scope of Work Outline

Task 1 – Planning and Coordination

Scope Elements: Ensure close coordination with the management structure of CV-SALTS through completion of the following tasks:

- 1.1 Coordination meetings with the CV-SALTS management structure, in particular:
 - Periodic meetings with the Technical Committee
 - Periodic meetings with the Technical Program Manager and/or Executive Director
 - Periodic presentations to Executive Committee
- 1.2 Participate in development of a Conceptual Model Management Policy (Technical Committee should establish policies and procedures for long term management of the Conceptual Model GIS/Database Platform developed under Task 4 (e.g., how to address data updates, shape file updates, QA/QC issues, etc.)
- 1.3 Coordinate with or support other CV-SALTS-related technical projects or analyses, including, but not limited to SSALTS, archetype/prototype projects, beneficial use studies, LSJR studies
- 1.4 Maintain relevant project documents and data (in an appropriate format and location) that may become part of the administrative record for a Basin Plan Amendment

Task 2 – Workplan Development

Scope Elements: Develop detailed Workplan that describes the approach that will be used to develop the Conceptual Model (as required by Tasks 3 to 10 below), including, but not limited to, data sources to be used to populate the model, approach for addressing data gaps, GIS/Database Platform that will be used, and data analysis methods. The outcome of Task 2 is an approved Workplan (with schedule and budget) and authorization to implement remainder of Scope of Work.

Task 3 – Data Development

Scope Elements: Complete all necessary data development activities associated with the establishment of the Conceptual Model. This effort includes the following key tasks (Questions 11, 19):

- 3.1 Identify all relevant data sources (many of which are already identified per the Conceptual Model white paper) and gather/compile the these data
- 3.2 Create a data source record that provides the metadata associated with each source, including summary of the available timescale of the data
- 3.3 Perform data QA/QC activities, as needed, and verify data are in usable formats
- 3.4 Identify data gaps and prepare recommendations to address gaps (e.g., gather new data with additional scope/budget, implement work around solutions, or recommend data surrogates)
- 3.5 Complete data development activities as directed per the outcome of Task 3.4

Task 4 – Establish Conceptual Model GIS/Database Platform

Scope Elements: Create the GIS/Database Platform that will be used to support the Central Valley Salt/Nutrient Management Plan. Effort includes two key subtasks (Question 20):

- 4.1 Delineate and recommend for approval management zones that provide the basis for subsequent analyses
- 4.2 Establish tools for data input/output, manipulation, analyses at varying scales (e.g., management zones vs. smaller management areas), and data presentation
- 4.3 Populate the established Platform with the data compiled under Task 3

Task 5 – Establish Methods for Salt and Nutrient Analyses

Scope Elements: Establish the data analysis methods for calculating salt and nutrient balances for surface water and groundwater at varying hydrologic conditions, geographic scales, and time series. The outcome is a demonstration that the selected analysis methods are sufficient (i.e., within approved bounds of uncertainty) to answer the data analysis questions described in Tasks 7 and 8.

Task 6 – Beta Test Demonstration of Tasks 4 and 5

Scope Elements: For selected management zones of the Central Valley, conduct a beta test of the Platform developed under Task 4 and the analysis methods established under Task 5. The outcome is a satisfactory demonstration that the products of Tasks 4 and 5 provide the tools needed to answer Conceptual Model questions and support development of the Salt/Nitrate Management Plan. While the outcome focuses on the management zone level, the beta test should also demonstrate that the developed tools and methods may be applied at smaller geographic scales.

Task 7 – Conduct Baseline Salt/Nutrient Analysis for the Central Valley

Scope Elements: Considering variation associated with different hydrologic conditions (e.g., dry, average, wet), the project team will prepare an analysis that addresses the following areas (Questions 8, 9 and 10):

- 7.1 Establish the water, salt, and nitrate transport pattern within the Central Valley and determine the rates of transport
- 7.2 Identify the major sources of water, salt, and nitrate in the Central Valley and determine where and at what rate they enter the Central Valley
- 7.3 Determine where, how, and at what rate water, salt, and nitrate leave the Central Valley

Task 8 – Complete Regional or Area-Specific Salt/Nitrate Analyses

Scope Elements: Considering (1) variation associated with different hydrologic conditions (e.g., dry, average, wet) and (2) conditions associated with surface water and vadose zone, shallow and deep groundwater, the project team will prepare an analysis that addresses the following areas (Questions 1, 4, 6, and 18):

- 8.1 Identify which management zones are achieving water, salt, and nitrate balance.

- 8.2 Identify which management zones are accumulating water, salt, and nitrate, and determine the rates of accumulation.
- 8.3 Identify which management zones are depleting water, salt, and nitrate, and determine where the water, salt, and nitrate are going and at what rates.
- 8.4 Determine the rate of change for concentrations of salt and nitrate in the groundwater and vadose zone.

Task 9 – Complete Salt and Nitrate Assessment

Scope Elements: Prepare a salt/nitrate assessment for the Central Valley that identifies areas or hotspots with elevated salt and/or nitrate (regardless of source of elevated constituents, e.g., natural or anthropogenic) (Question 3).

Task 10 – Prepare Initial Phase Conceptual Model Report

Scope Elements: Prepare report that (a) summarizes the relevant elements or findings from Tasks 3, 4, 5, 7, 8 and 9; and (b) address the following issues:

- Assumptions used to develop the Conceptual Model and data analysis methods
- How conservative nitrogen was assumed to be
- How CVHM was used to support calculation of loads
- Level of accuracy, completeness and confidence in the results
- Consistency with prior CV-SALTS pilot and source study work
- How results have been validated to date or still need to be validated by stakeholders impacted by the study findings

Remaining Questions Applicable to the Initial Phase

Three Conceptual Model Initial Phase questions have not been included in the above Scope of Work Outline. It is recommended that these questions be incorporated into the Scope of Work for SSALTS (Questions 2, 12, 21):

- What are the high priority (salt, nitrate, or regulatory) areas/regions/subareas (management zones)?
- What are the primary drivers of salts and nitrate accumulation?
- What management areas may require a higher level of regulatory oversight and why?

Each of the above questions relates more towards policy, practices, institutional, or regulatory aspects of salt and nitrate management.

Attachment 2 CV-SALTS Questions Matrix for Conceptual Models with Performance Statements

Question Number	Reference to Version 1*	Conceptual Model Question	Answered			
			Initial Planning	SNMP Master Plan	Local SNMP	
11	11	What are the existing major data gaps for this level of analysis?	X	X	X	Data
19	NA	Is data of the appropriate timescale (monthly, annual or other) available?	X	X	X	Data
20	NA	What salt load calculation methods are appropriate at each phase and why?	X	X	X	Methods
8	4	What is the water, salt, and nitrate transport pattern within the Central Valley and what are the rates of transport?	X	X	X	CV Baseline
9	4, 7 & 8	What are the major sources of water, salt, and nitrate into the Central Valley; and where and at what rate do they enter the Central Valley ?	X	X	X	CV Baseline
10	4	Where, how and at what rate do water, salt, and nitrate leave the Central Valley ?	X	X	X	CV Baseline
1	1	Which areas/regions/subareas (management zones) are achieving water/salt/nitrate balance? Including surface water, vadose zone, shallow and deep groundwater.	X	X		Regional Analyses
4	3 & 5	Which areas/regions/subareas (management zones) are accumulating water, salt, nitrate; and what are the rates of accumulation?	X	X	X	Regional Analyses
6	3	Which areas/regions/subareas (management zones) are depleting water, salt, nitrate; and what are the rates of depletion, and where is it going?	X	X	X	Regional Analyses
18	22	What is the rate of change for concentrations in groundwater and vadose zone?	X	X	X	Regional Analyses
3	2	Where are the known impaired areas (natural and anthropogenic) and/or hotspots?	X	X	X	Assessment
2	2	What are the high priority (salt, nitrate, or regulatory) areas/regions/subareas	X	X	X	SSALTS
12	12	What are the primary drivers of salts and nitrate accumulation?	X	X	X	SSALTS
21	24	What management areas may require a higher level of regulatory oversight and why?	X	X	X	SSALTS
5	6	For areas/regions/subareas (management zones) accumulating water, salt, nitrate, what is the estimated water, salt, nitrate volume/load that will accumulate over the next __ years?		X	X	
7	6	For areas/regions/subareas (management zones) depleting water, salt, nitrate, what is the estimated water, salt, nitrate volume/load that will be depleted over the next __ years?		X	X	
13	13	How do the primary drivers of accumulation of salt and nitrate result in different		X	X	
14	14	Does seasonal variability impact salt concentrations / loading / transport?		X	X	
15	14	How does water year type and variability impact salt concentrations / loading /		X	X	
15	15	Describe the future water, salt, nitrate scenarios and results?		X	X	
16	17	What is the assimilative capacity of each management zone?		X	X	
17	19	How do changes in management practices effect baseline salt loads/concentrations within one or more management zones?		X	X	
		PERFORMANCE STATEMENTS				
#	#	If the above questions are answered satisfactorily, the Conceptual Model will:				
22	18	Support required elements of the SNMP	X	X	X	
23	20	Support SSALTS, initial development /refinement /impact of implementation plans		X	X	
24	21	Support offsets, credits, trading related assessment?		X	X	
25	26	Support BPA, CEQA, Economic, Antideg, etc.		X		
26	27	Support Tier 1 efforts regarding Waterbodies	X			
27	28	Support Tier 2 efforts regarding Standards	X	X		
28	29	Support Tier 3 efforts regarding Assessment		X	X	
29	30	Support Tier 4 efforts regarding Implementation		X	X	
30	31	Support monitoring planning and periodoc reassessment		X	X	
#	#	The Conceptual Model should be capable of:				
31	10	Integrating additional studies by others		X	X	
32	16	Integrating archetype and prototype efforts		X	X	
33	23	Incorporating changes to beneficial uses and objectives (standard) and updateassimilative capacity		X	X	
		Reports based on the Conceptual Model should:				
35	NA	Identify the assumptions used in the model	X	X	X	
36	NA	Discuss how conservative nitrogen was assumed to be	X	X	X	
37	NA	Discuss how CVHM was used to help with calculation of loads	X	X	X	
38	NA	Describe the level of accuracy, completeness and confidence in the results	X	X	X	
39	NA	Describe how the study is consistent with prior pilot and source study work	X	X	X	
40	NA	Discuss how results were or will be validated by stakeholders impacted by the study	X	X	X	

NA indicated no initial question is related to this item, questions and performance statement were developed in several phases Management Zones as areas to be regulated together will need additional discussion and definition

* This table was reorganized and checks replaced the more detailed information which may provide additional understanding of the levels; this document is posted at:

http://cvsalinity.org/index.php/documents/doc_download/861-cv-salts-conceptual-model-qaq-matrix