

LWA Team Deliverables Summary and Schedule

The deliverables summary and schedule presented below in **Table 1** summarizes the activities and deliverables described in this Workplan and identifies which Tasks will be completing work to answer the specific conceptual model questions as identified in the CV-SALTS Questions Matrix for Conceptual Models with Performance Standards^{1,2} (**Attachment F**). This project schedule has been developed to meet the needs for work products and timing that were described in the RFQ as well as to position CV-SALTS so that the Phase 2 draft CV-SNMP Master Plan can be developed by May 2014. However, this requires compression of a great deal of analysis and consultation into a short duration. Such a schedule naturally constrains the time available for the LWA Team to develop, revise, and finalize analyses and work products, as well as time available for crucial consultation and review with CV-SALTS committees and stakeholders. Adherence to the proposed schedule will require that work product development and review timelines be met. Per the discussion in Task 1.1, the LWA Team strongly recommends that a Project Committee (PC) be established and granted the authority to provide oversight and review for this work effort to streamline the review periods and meet the aggressive schedules. The detailed schedule, which includes a breakdown by sub-tasks and tasks, is included as **Attachment A**.

¹ Attachment 2 of the Conceptual Model Summary, Version 4, March 15, 2012.

² The ICM RFQ was developed, in part, to answer the specific conceptual model questions. The ICM tasks were linked within the RFQ to the conceptual model questions that were being answered as a result of the work being completed.

Table 1. Deliverables Summary and Schedule

Task No.	Task Description	Deliverable	Schedule of Deliverables^{3,4,5,6}	Questions Addressed^{7,8}
1	Project Management Plan - Management & Coordination Activities			
1.1	Coordination Meetings			
	- LWA Team Calls	- Bi-monthly conference calls	Ongoing	N/A
	- Project Management Calls	- Bi-monthly conference calls	Ongoing	N/A
	- Project Committee Calls	- Monthly conference calls - Meeting summaries	Ongoing	N/A
	- ICM and GIS Kickoff Meeting	- Meeting with Project Committee - Meeting summary	Week of Sep 10 th or 17 th	N/A
	- ICM Workshop (Tasks 3-5 – Presentation and Discussion)	- Workshop - Meeting summary	Week of Nov 12 th or 26 th	N/A
1.2	GIS/Data Management Protocols	- Participate in development of CV-SALTS GIS/database policies and procedures <i>As part of Task 3 & 4 of the GIS Workplan:</i> - Manage data requests - Develop a geodatabase - Establish online access - Adhere to GIS standards - Populate metadata	As Needed Ongoing	N/A

³ Per the discussion in Task 1.1, the LWA Team strongly recommends that a Project Committee be established to provide oversight and review for this work effort to streamline the review periods and meet the aggressive schedules.

⁴ Formal approvals of the documents are assumed to be ten (10) days after the “Final to PC”.

⁵ EC = Executive Committee approves the deliverable; PC = Project Committee approves the deliverable

⁶ ‘Ongoing’ indicates that the task will be implemented throughout the duration of the project (September 2012-May 2013)

⁷ See Attachment F of this Workplan, *CV-SALTS Questions Matrix for Conceptual Models with Performance Standards (Revised)*

⁸ N/A – There was no corresponding conceptual model question posed for this Task.

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
1.3	As Needed Support	<ul style="list-style-type: none"> - Provide general support and information for CV-SALTS projects - Document requests and prepare scopes of work as needed 	Ongoing	N/A
1.4	Data Management	<ul style="list-style-type: none"> - Coordination with GIS project - Management of files and data 	Ongoing	N/A
1.5	Monthly Progress Reports	<ul style="list-style-type: none"> - Invoice - Monthly progress/budget report - Updated master schedule 	Ongoing (no later than 15 th each month)	N/A
2	Develop ICM Workplan			
	ICM Workplan	<ul style="list-style-type: none"> - Draft Workplan - Final Workplan 	<ul style="list-style-type: none"> - Draft – 8/22/12 - Cmts to Team – 8/27/12 - Final to EC – 8/29/12 - Approval – 9/10/12 (EC) 	N/A
3	Data Development			
3.1	Review CV-SALTS Geodatabase and Mapping Activities	<ul style="list-style-type: none"> - Documentation of database framework [Included in Task 3.4 Report] 	See Task 3.4	N/A
3.2	Identify, Compile, and Document Data Sources Required for Project	<ul style="list-style-type: none"> - Draft Data Source List - Final Data Source List 	<ul style="list-style-type: none"> - Draft to PC – 9/19/12 - Cmts to Team – 9/28/12 - Final to PC – 10/3/12 - Approval – 10/12/12 (PC) 	N/A
		<ul style="list-style-type: none"> - Compilation of QC'd data into database framework (Task 1.2) 	Ongoing	N/A
		<ul style="list-style-type: none"> - Documentation of data refinements needed [Included in Task 3.4 Report] 	See Task 3.4	N/A
		Address Data Gaps	As needed and as budget allows	N/A
3.3	Identify and Report on Data Gaps	<ul style="list-style-type: none"> - Documentation of non-critical data gaps with recommendations - Draft Memorandum 	<ul style="list-style-type: none"> - Draft to PC – 11/19/12 - Cmts to Team – 11/28/12 - Final to PC – 12/3/12 	N/A

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
		- Final Memorandum	- Approval – 12/14/12 (PC)	
3.4	Data Summary per Initial Analysis Zone	Documentation of Task 3 work effort (overall and by IAZ) - Draft Data Summary Report - Final Data Summary Report	- Draft to PC – 12/3/12 - Cmts to Team – 12/10/12 - Final to PC – 12/17/12 - Approval – 12/21/12 (PC)	Q11 – What are the existing major data gaps for this level of analysis? Q19 – Is data of the appropriate timescale (monthly, annual, or other) available?
4	Establish Initial Analysis Zones			
4.1	Draft Initial Analysis Zone Alternatives	- Identify alternatives for delineating management zones for Phase 2 CV-SNMP and local planning efforts [Included in Task 4.4 Memo]	See Task 4.4	N/A
4.2	Evaluate Methods for Future Management Zone Delineation	- Evaluate data needs, data availability, and future zone delineation [Included in Task 4.4 Memo]		
4.3	Stakeholder Outreach	- IAZ outreach at ICM workshop (Task 1.1) - Meeting summary [Included in Task 4.4 Memo]		
4.4	ICM IAZs and Recommendations for Phase 2	Documentation of Task 4 work effort - Draft Analysis Zones Memorandum - Final Analysis Zones Memorandum	- Draft to PC – 10/26/12 - Cmts to Team – 11/15/12 - Final to PC – 11/9/12 - Approval – 11/19/12 (EC)	N/A
5	Establish Methods for Salt and Nitrate Water Quality Analyses			
5.1	Determine Methods to Estimate Ambient Groundwater Quality	- Assess available salt and nitrate data - Planned methods for determining ambient groundwater quality for each IAZ [Included in Task 5.3 Memo]	See Task 5.3	N/A
5.2	Develop Data/Decision Matrix	- Prepare matrix to summarize		N/A

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
		distribution, completeness, and/or limitations of data available for IAZ mixing model - Recommend assessment criteria to identify hotspots and high priority areas/subregion [Included in Task 5.3 Memo]		
5.3	Establish Water, Salt, and Nitrate Balance Calculation Methods	Identify methodology for calculating water, salt, and nitrate balances for surface and groundwater for each IAZ as well as methods for Task 7. - Draft Memorandum - Final Memorandum	- Draft to PC – 11/14/12 - Cmts to Team – 11/21/12 - Final to PC – 11/28/12 - Approval – 12/10/12 (PC)	Q20 – What salt load calculation methods are appropriate at each phase and why? Q35 – Identify the assumptions used in the model. Q36 – Discuss how conservative nitrogen was assumed to be. Q37 – Discuss how CVHM was used to help with calculation of loads. Q38 – Describe the level of accuracy, completeness, and confidence in the results. Q39 – Describe how the study is consistent with prior pilot and source study work
6	Complete High-Level Salt and Nitrate Analyses for Central Valley⁹			
6.1	Salt and Nitrate Source and	Apply methods from Task 5	See Task 8	Q8 - What is the water, salt, and

⁹ The “Central Valley” for purposes of the ICM focuses on the model area for the Central Valley Hydrologic Model (CVHM). Surface water flows from outside the model boundary will be incorporated to the extent these flows have been included in the CVHM model. The CVHM includes 41 surface water inflow locations.

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
	Transport	<ul style="list-style-type: none"> - Determine ambient water quality - Develop budgets on IAZ scale and conduct 20 year simulation - Assess salt and nitrate trends - Determine overall rate of salt and nitrate movement <p style="text-align: center; color: blue;">[Included in Task 8 Report]</p>		<p>nitrate transport pattern within the Central Valley and what are the rates of transport?</p> <p>Q9 - 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?</p> <p>Q10 - Where, how, and at what rate do water, salt, and nitrate leave the Central Valley?</p>
6.2	Initial Analysis Zone Analysis	<p>Apply methods from Task 5</p> <ul style="list-style-type: none"> - Evaluate salt and nitrate concentrations in surface and groundwater for 22 IAZs for simulation period <p style="text-align: center; color: blue;">[Included in Task 8 Report]</p>		<p>Q1 - Which areas/regions/subareas (initial analysis zones) are achieving water/salt/nitrate <u>balance</u>? Including surface water, vadose zone¹⁰, shallow and deep groundwater¹¹.</p> <p>Q4 - Which areas/regions/subareas (initial analysis zones) are <u>accumulating</u> water/salt/nitrate; and what are the rates of accumulation?</p> <p>Q5 – 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 (20) years?</p> <p>Q6 - Which</p>

¹⁰ This will be addressed, to the extent feasible, as a part of future CV-SNMP and/or local SNMP efforts

¹¹ This will be addressed as a part of Task 7

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
				<p>areas/regions/subareas (initial analysis zones) are <u>depleting</u> water/salt/nitrate; and what are the rates of depletion, and where is it going?</p> <p>Q7 - For areas/regions/subareas (management zones) depleting water, salt, nitrate, what is the estimated water, salt, nitrate volume/load that will accumulate over the next (20) years?</p> <p>Q18 – What is the rate of change for concentrations in groundwater and vadose zones¹²?</p>
6.3	Preliminary Salt and Nitrate Assessment	<ul style="list-style-type: none"> - Summarize salt and nitrate hot spots on the IAZ scale - Develop salt and nitrate assessment criteria - Identify preliminary ranking and prioritization of IAZs <p>[Included in Task 8 Report]</p>		<p>Q2 - What are the <u>high priority</u> (salt, nitrate, or regulatory) areas/regions/subareas (initial analysis zones)?</p> <p>Q3 - Where are the known <u>impaired areas</u> (natural and anthropogenic) and/or hotspots?</p>
6.4	Analysis	<p>Documentation of the Task 6 work effort will be incorporated into the Task 8 report.</p> <p>[Included in Task 8 Report]</p>		<p>Summary of findings regarding Q1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 18 (see above)</p> <p>Q12 - What are the primary drivers of salts and nitrate accumulation?</p> <p>Q13 – How do the primary drivers of accumulation of salt and nitrate result in different management</p>

¹² This will be addressed, to the extent feasible, as a part of the future CV-SNMP and/or local SNMP efforts

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
				practices? Q21 – What initial analysis areas may require a higher level of regulatory oversight and why?
7	Salt and Nitrate Analyses in Selected Subareas of the Central Valley			
7.1	Establish Geographical Boundaries	- Establish the boundaries for the sub-areas as the Merced/ Stanislaus and Kings Subbasin [Included in Task 7.6 Memo]	See Task 7.6	N/A
7.2	Characterize Key Subareas	- The subareas will be characterized using a number of parameters from the GIS database and groundwater flow model documentation [Included in Task 7.6 Memo]		Q11 – What are the existing major data gaps for this level of analysis? Q19 – Is data of the appropriate timescale (monthly, annual, or other) available?
7.3	Identify Major Sources and Sinks of Salt and Nitrate	- Identify major sources and sinks of salt and nitrate in each subarea - Comparison of results to Task 6.2 [Included in Task 7.6 Memo]		Q1 - Which areas/regions/subareas (initial analysis zones) are achieving water/salt/nitrate <u>balance</u> ? Including surface water, vadose zone ¹³ , shallow and deep groundwater. Q4 - Which areas/regions/subareas (initial analysis zones) are <u>accumulating</u> water/salt/nitrate; and what are the rates of accumulation? Q6 - Which areas/regions/subareas (initial analysis zones) are <u>depleting</u>

¹³ This will be addressed, to the extent feasible, as a part of future CV-SNMP and/or local SNMP efforts

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
				water/salt/nitrate; and what are the rates of depletion, and where is it going? Q18 – What is the rate of change for concentrations in groundwater and vadose zones ¹⁴ ?
7.4	Identify Zones of High, Low, and Moderate Groundwater Quality	- Categorize/map zones where groundwater is high quality, low quality, or moderate quality within the subareas [Included in Task 7.6 Memo]		Q3 - Where are the known <u>impaired areas</u> (natural and anthropogenic) and/or hotspots?
7.5	Establish and Quantify Transport Patterns	- Using a new model code, analyze the transport patterns - Evaluate the trends and transport of salt and nitrate for each prototype [Included in Task 7.6 Memo]		Q14 – Does seasonal variability impact salt and nitrate concentration/loading/transport? ¹⁵ Q15(a) – How does water year type and variability impact salt concentrations/loading/transport? ¹⁶ Q16 – What is the assimilative capacity of each management zone? ¹⁷
7.6	Subarea Analysis Memo	Documentation of Task 7 work effort - Draft Memorandum - Final Memorandum	- Draft to PC – 4/11/13 - Cmts to Team – 4/19/13 - Final to PC – 4/29/13	Summary of findings regarding Q1, 3, 4, 6, 11, 14, 15(a), 16, 18, 19 (see above) ¹⁸

¹⁴ This will be addressed, to the extent feasible, as a part of the future CV-SNMP and/or local SNMP efforts

¹⁵ Seasonality and water year type will be considered on a conceptual level, by identifying qualitatively any trends or patterns on an IAZ-scale.

¹⁶ Seasonality and water year type will be considered on a conceptual level, by identifying qualitatively any trends or patterns on an IAZ-scale.

¹⁷ The concept of assimilative capacity will be preliminarily assessed in the ICM and further examined in the Phase 2 CV-SNMP.

¹⁸ Note that Q15(b) and Q17 will not be addressed as part of the scope of the ICM; these questions will be addressed later in Phase 2 & 3 and/or local SNMP efforts.

Task No.	Task Description	Deliverable	Schedule of Deliverables ^{3,4,5,6}	Questions Addressed ^{7,8}
			- Approval – 5/10/13 (EC)	More detailed spatial analyses and results will be developed with the prototype models.
8	Prepare Initial Conceptual Model Report			
	ICM Report	Documentation of ICM work effort & recommendations for Phase 2 and 3 of the CV-SNMP - Draft Report - Final Report	- Draft to PC – 2/21/13 - Cmts to Team – 3/5/13 - Final to PC – 3/15/13 - Approval – 3/29/13 (EC)	Summary of findings regarding Q1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 19, 20, 21, and 35-39 ¹⁹ . (see above)

¹⁹ Q40 will be addressed, to the extent feasible, as a part of the future CV-SNMP and/or local SNMP efforts