

Task 2 - Workplan

Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
1	09/04/12	Erler & Kalinowski, Inc. (EKI)	Draft Workplan	The budget and time-frame should be increased <u>or</u> the vision and goals of the ICM should be re-defined and the scope of work modified to meet these goals.	The LWA Team responded to the scope and time-frame requested by CV-SALTS in the ICM RFP and recommended some modifications. The CV-SALTS selection committee approved the adjusted budget and schedule as proposed by the LWA Team. If the scope of work as described in the Work Plan is modified, the budget and time frame will need to be modified accordingly.
2	09/04/12	EKI	Draft Workplan	What is the overall vision of the ICM and what will it accomplish: Should there be a broader vision for what the ICM should accomplish?	The LWA Team responded to the vision for the ICM as identified by CV-SALTS within the ICM RFP. The LWA Team members have also been involved in various CV-SALTS Committees and work efforts and will continue to identify how the ICM work can be informed by and can inform other CV-SALTS initiatives. The vision and context for the ICM is described in the Work Plan. The content of the ICM will be further refined within the various task deliverables. In addition to developing analysis methodologies (Task 3, 4, 5, and 7), the ICM will provide a high-level analysis of salt and nitrate conditions throughout the Central Valley (Task 6 and 8) to address the questions developed by the Technical Committee. (See Attachment 2 to the Conceptual Model Summary Description).
3	09/04/12	EKI	Draft Workplan	What is the overall vision of the ICM and what will it accomplish: Should the ICM help stakeholders and other interested parties understand the magnitude of salt and nitrate issues facing the Central Valley?	Yes. The ICM Report (Task 8) and associated work efforts and deliverables will assist stakeholders and others in understanding the relative, Central Valley-wide magnitude of salt and nitrate issues. In addition in later phases, (a) stakeholder outreach and additional work will need to be completed at the management zone level in order to provide the specificity that will be desired by area stakeholders; and (b) stakeholder outreach and additional work will need to be completed at the local level in order to provide the specificity that will be desired by local stakeholders.
4	09/04/12	EKI	Draft Workplan	What is the overall vision of the ICM and what will it accomplish: Should the ICM provide an understanding of which portions of the Central Valley are, and are not, achieving sustainable salt and nitrate mass balances?	Yes, as requested in the ICM RFP, this information will be provided at a conceptual level for the entire Central Valley as a part of Tasks 6 and 8. (See questions 1,4,6,8 in Attachment F of Workplan)
5	09/04/12	EKI	Draft Workplan	What is the overall vision of the ICM and what will it accomplish: Does the ICM need to support CV-SALTS in its efforts to communicate the issues and garner stakeholder and government funding and support?	Yes. The ICM work will support CV-SALTS with these efforts, however, CV-SALTS is the lead for these outreach efforts. The ICM work will support CV-SALTS in two primary ways: (1) The LWA Team will communicate regularly with the CV-SALTS TPM and Project Committee so that they understand the issues in-depth and can communicate them to others (Task 1); and (2) The ICM Report (Task 8) and associated work will assist stakeholders and others in understanding the salt and nitrate issues.
6	09/04/12	EKI	Draft Workplan	What is the overall vision of the ICM and what will it accomplish: Can the ICM be used to evaluate whether local management practices, such as alternative irrigation methods, are sufficient to achieve sustainable salt and nitrate mass balances, or whether large-scale management practices are likely needed to achieve sustainable salt and nitrate mass balances?	The LWA Team will coordinate with CV-SALTS on related technical projects or analyses, such as SSALTS and the archetype projects, to promote efficiencies and information exchange (Task 1.3). In addition in later phases, (a) The applicability and effectiveness of large-scale regional management practices will be addressed in Phases 2 and 3 through coordination as appropriate with applicable Implementation Planning Efforts (see questions 13, 19 in Attachment F); (b) the applicability and effectiveness of local management practices will be addressed during development of local SNMPs (see questions 13, 19 in Attachment F); and (c) the applicability and effectiveness of local and large-scale regional management practices will be addressed as part of Implementation Planning Efforts i.e. Effective Management Practices Evaluation (see 5-Year Work Plan and questions 13, 19 in Attachment F).
7	09/04/12	EKI	Draft Workplan	Should the proposed ICM methodology be used for subsequent studies, including local SNMPs: Will CV-SALTS or local stakeholder groups control development of local SNMPs?	The ICM will provide high level, conceptual information to assist local stakeholder groups. In addition, in later phases: (a) Phases 2 and 3 will provide information to provide a framework to support local stakeholder groups; (b) local stakeholders will ultimately control development of local SNMPs; and (c) increased local involvement in SNMP development will be addressed by appropriate CV-SALTS committee(s).
8	09/04/12	EKI	Draft Workplan	Should the proposed ICM methodology be used for subsequent studies, including local SNMPs: Should CV-SALTS encourage a flexible approach in the CV-SNMP, which allows local stakeholder groups to use the models and methodologies for which they are most familiar?	The ICM is being developed based on the CVHM modeling platform so that the Initial Analysis Zones (IAZs) may be readily defined to any dimension that suits the objectives of the future SNMP efforts at the regional and/or local scales. The ICM also involves the development of analysis methods which may inform future SNMP efforts. In addition, in later phases: (a) Coordinate as appropriate with appropriate CV-SALTS committees to address this issue during the development of the CV-SNMP Master Plan; (b) Issue to be addressed by appropriate CV-SALTS committee(s).

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9	09/04/12	EKI	Draft Workplan	What are the goals of developing prototype templates: Is the grid-size of the model likely to be the most important factor pertaining to implementation of local SNMPs, or will other factors be more important (e.g., coordination amongst stakeholders, management practices that must be implemented)?	It is likely that many factors will be equally important for the development and effective implementation of the local SNMPs. The results of Task 7 will help to inform the answer to this question. This will be addressed within the Subarea Analysis Memo (Task 7). Additional work will be done Phases 2 and 3.
10	09/04/12	EKI	Draft Workplan	What are the goals of developing prototype templates: Should the prototypes focus on those factors that are anticipated to be most challenging to implementation of local SNMPs?	The approach for the prototype analysis (as detailed in Task 7) was developed in accordance with the scope requested in the ICM RFP. The results of Task 7 will assist in identifying, on a conceptual level, what some of the challenging factors may be for the effective implementation of the local SNMPs. This will be addressed within the Subarea Analysis Memo (Task 7). Additional work will be done Phases 2 and 3.
11	09/04/12	EKI	Draft Workplan	What are the goals of developing prototype templates: Will the prototypes proposed in the Work Plan show that the resulting salt and nitrate mass balances are more accurate or representative than those obtained by the ICM?	The different purposes and scales of work to be conducted as part of Tasks 6 and 7 are described in the ICM Work Plan. Although the Task 7 prototypes will utilize more detail with a finer grid compared to the Task 6 analyses, the results of those analyses can be compared at that time in order to help answer this question. The results of Tasks 7 will inform Phases 2 and 3. In addition, as a part of Task 3, the data gaps identified as a part of the ICM will be documented along with action items to address them in Phases 2 and 3.
12	09/04/12	EKI	Draft Workplan	How will ICM soil, water, salt, and nitrate concentrations based on WARMF water budget be demonstrated to be consistent with the CVHM water budget: The ICM Work Plan should include a task to confirm the WARMF water budget reasonably agrees with that of CVHM.....(see comment letter for full text of comment)	The ICM Work Plan preliminarily describes the step that will be taken to check recharge values from WARMF with CVHM results. Specifically, Attachment B describes how the WARMF model output of net recharge rates will be checked with the recharge values from the Zonebudget results from CVHM for each IAZ to ensure consistency. Task 5 will further describe the methodology that will be used for Tasks 6 and 7. The proposed methodologies for Task 6 will be presented in detail at the fall Workshop and in a Task 5 tech memo.
13	09/04/12	EKI	Draft Workplan	How will different groundwater zones be defined and used in the ICM: Does this depth (the upper 100 feet of the aquifer) conform to CV-SALTS Executive Committee's policy examination of establishing differing water quality objectives for shallow groundwater and underlying production zones?	As described in Task 5 and Attachment B, Task 6 will utilize the upper part of the aquifer system for the purpose of initially identifying areas where salt and nitrate are in balance, accumulating or depleting, and to prioritize those areas for more intensive evaluation in Phases 2 and 3. The Task 7 prototypes use the entire modeled aquifer system for the analysis of salt and nitrate transport. (See questions 1,2, 3, 4, 6, 8 in Attachment F). Application of ICM results to establish water quality objectives may be addressed by the appropriate CV-SALTS committee(s).
14	09/04/12	EKI	Draft Workplan	How will different groundwater zones be defined and used in the ICM: Are production zones sufficiently uniform throughout the Central Valley that a uniform thickness of 100 feet can be assumed for shallow groundwater?	Task 5 describes the use of the upper part of the aquifer system for purposes of addressing the part of the system potentially used for domestic well production. Task 5 further describes the CVHM layers to be considered; the layers are not exactly equivalent to a uniform thickness of 100 ft, i.e. the thickness for each IAZ will vary according to the physical basis for the layering in the CVHM.
15	09/04/12	EKI	Draft Workplan	How will different groundwater zones be defined and used in the ICM: Is the upper 100 feet of the aquifer consistent with near-surface groundwater as defined in the CV SALTS Salt and Nitrate Sources Pilot Implementation Study (SNSPIS)?	Yes, the approach described in Task 5 is consistent with the Pilot Study.
16	09/04/12	EKI	Draft Workplan	How will different groundwater zones be defined and used in the ICM: Does the ICM need to calculate salt and nitrate mass balances for near-surface groundwater besides the upper 100 feet?	No. As described above, Task 6 will utilize the upper part of the aquifer system for the purpose of initially identifying areas where salt and nitrate are in balance, accumulating or depleting, and to prioritize those areas for more intensive evaluation in Phases 2 and 3.
17	09/04/12	EKI	Draft Workplan	What sources and sinks will be incorporated into the mass balances for the ICM: Consideration should be given to identifying the lakes, streams, rivers, and wetlands for which salt and nitrate balances will be calculated.	Surface water bodies included in CVHM will be incorporated into the ICM in Tasks 6 and 7.

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18	09/04/12	EKI	Draft Workplan	What sources and sinks will be incorporated into the mass balances for the ICM: Should salt and nitrate balances be calculated for soil water and deep groundwater to be consistent with the SSALTS Work Plan?	Salt and nitrate in "soil water" as calculated in WARMF in the net salt and nitrate recharge from the root zone (see ICM Work Plan, Attachment B) will be included in Task 6. Task 7 incorporates salt and nitrate transport (to and from) deeper groundwater. In addition, in Phases 2 and 3: (a) additional coordination with SSALTS and related efforts will occur as appropriate in Phase 2 and 3; and (b) Additional coordination with SSALTS and related efforts will occur as appropriate in development of local SNMPs (see question 23 in Attachment F).
19	09/04/12	EKI	Draft Workplan	What sources and sinks will be incorporated into the mass balances for the ICM: Will mass balances include all sources and sinks like in Table ES-1 of the CV-SALTS Salt and Nitrate Sources Pilot Implementation Study (SNSPIS) that were used in the WARMF simulations?	Yes, where WARMF domains exist and to the extent applicable, these sources and sinks will be incorporated in the calculation of the root-zone concentrations in WARMF.
20	09/04/12	EKI	Draft Workplan	What level of land-use detail is needed in WARMF and CVHM: What level of land-use detail needs to be included in WARMF and CVHM?	Existing CVHM land-use layers will be used in the ICM and are considered appropriate for the level of detail targeted in the ICM model.

Task 3.2 - Data Source List

Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
1	09/27/12	Clay Rodgers	Draft TM	Just a minor comment that it appears Geotracker GAMA is listed as a data source. There may be additional data available for some of the categories in the non-GAMA Geotracker database and the California Integrated Water Quality System (CIWQS).	Table 1 of the Task 3 Data Source List has been updated to add details of the data sets to be retrieved from Geotracker. CIWQS provides data that would be considered for SNMP Master Plan (Phases 2 and 3) and would particularly be of interest for local SNMP development.
2	09/28/12	Thomas Harter	Draft TM	I am not familiar with the details of your conceptual model. But here are some additional data sources to consider (see cells below):	The team appreciates the extensive suggestions related to the areas studied as part of the SBX2-1 work and related reports. Specific responses are provided below.
				In the below I make reference to our SBX2 1 Technical Report on Nitrate Loading to Groundwater, published by Viers et al., 2012. The report is available at: http://groundwaternitrate.ucdavis.edu/files/139110.pdf . The report includes an extensive set of maps with components of Nitrogen Loading, Nitrogen Harvest, and groundwater Nitrogen Leaching, for 1945, 1960, 1975, 1990, 2005,2050 (methods described in the above report). These appendix figures are available in a separate file at: http://groundwaternitrate.ucdavis.edu/files/149916.pdf	Very helpful information relating to Nitrate Loading. The responses below indicate where the team finds applicability for the ICM work, the SNMP Master Plan and/or for local SNMPS.
				Water Supply: (1) DWR's C2VSIM groundwater model provides additional water supply data that can be compared to CVHM; (2) CH2MHill has a Sacramento Valley groundwater and surface water model, SACFEM, that provides additional water supply data that can be compared to CVHM; (3) CALVIN - Jay Lund at UC Davis (Director, Watershed Sciences Center) has a statewide water supply model that is continuously being updated; (4) Sacramento and San Joaquin Valley SWAT models - Minghua Zhang at UC Davis (Dept Land, Air, and Water Resources) has two SWAT models used for nitrate and pesticide tracking, primarily in surface waters, which can be compared to WARMF outcome for validation; (5) Groundwater pumping location and volume: see note above on C2VSIM and SACFEM	The data included in additional modeling efforts would be considered for the SNMP Master Plan and local SNMPS. For the ICM, the focus will be on the current version of the CVHM. It is recognized that water supply information can be fine-tuned locally in various areas of the CV. Water supply data from CVHM in the Kings Subbasin will be compared with water supply data used in the IGSM model for that area. We understand a review of several model platforms, including CVHM, C2VSIM and Hydrogeosphere is underway. The results of this review would help inform needs for the SNMP Master Plan, and would be of particular interest to local SNMPS, but will not be addressed in the ICM phase of work.
				Water Quality: UC Davis SBX2 1 project (Nitrate in Drinking Water) has compiled 1950 - current nitrate data from counties, dairy program (2007-2009), other programs (does not include salt data); data will be available in Geotracker by 2nd quarter of 2014. Contact: Thomas Harter, tharter@ucdavis.edu	It is very helpful to be aware of these additional data. Since it is indicated that these data will be available in Geotracker by 2nd Quarter 2014, it would be helpful to know if these data are available from the SBX2-1 project team in advance of the posting of these data on the Geotracker website.
				Land Cover: UC Davis Information Center for the Environment (Jim Quinn, Director) has a combined landuse map compiled from DWR records, Farm Mapping and Monitoring Program, and other sources. It is referred to as the California Augmented Multisource Landcover (CAML). It is likely similar to the CVHM landuse map. It was the basis for the groundwater nitrate loading analysis of the UC Davis SBX2 1 project. See Section 3.2.1.1 in Viers et al. (2012) (first link above)	Very helpful information relating to Land Use maps. The ICM effort will focus on use of such data as included in the current CVHM. Refinements to land cover would be considered for the SNMP Master Plan and/or for local SNMPS. The geographic extent of the CAML would also be helpful to document relative to its use in the Central Valley beyond the SBX2 1 study area.

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Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
				Subsurface Characteristics: C2VSIM and SACFEM should be used at least to contrast the potential range in estimates	Comment acknowledged. It is outside the scope of the ICM to conduct cross comparisons of the CVHM with other models, of which there may be many that cover local or more regional applications throughout the Central Valley. Cross comparisons of the CVHM model to other models will be limited to comparison of the water supply data in the CVHM to the IGSM model for the Kings Subbasin.
				Applied Materials: We have shared with John Dickey digital information used in the UC Davis SBX2 1 study describing Typical Applied Fertilizer N for California crops, categorized into about 58 crop designations. Discussion with John is ongoing. It is unlikely (in my opinion) that a regional breakdown will be feasible in the near future (without additional data collection, mostly using intensive surveys). Details are describe in Viers et al., 2012, section 3.2.2 and Appendix Table 7 (see first link above)	Very helpful comment on typical fertilizer application. The citation has been revised in Table 1 of the Task 3 Data Source List.
				A map of typical N fertilizer applied, for the Tulare Lake Basin, is shown in Appendix Figure 23 in the Appendix to Viers et al., 2012 (see second link above). Similarly, we have compiled and mapped nitrate in irrigation water applied to agricultural land, see Appendix Figure 15 in the appendix to Viers et al., 2012 (see second link above). The method is explained on page 69 of Viers et al., 2012, data are shown in Table 9 on page 70.	Very helpful comment on nitrate concentrations in irrigation water; this data may be used to augment information in WARMF-coverage areas and will likely serve as a primary data source in areas without WARMF coverage. The citation has been revised in Table 1 of the Task 3 Data Source List.
				Atmospheric Deposition: The California Nitrogen Assessment used recently modeled nitrogen deposition data. These were also used in the UCD SBX2 1 study. See Viers et al., 2012, Chapter 7 (first link above). For examples, see Appendix Figures 3 to 10 in the Appendix to Viers et al., 2012 (see second link above)	The citation has been revised in Table 1 of the Task 3 Data Source List.
				Uptake and Losses: Harvested Materials: For the UCD SBX2 1 Study, we used county ag commissioner reports for 2003-2007 in Fresno, Tulare, Kings, Kern, and Monterey County to determine yields and we used the USGS nutrient tool to estimate nitrogen in harvested materials. Digital data have been shared with John Dickey. Details are described in Viers et al., 2012, section 3.2.3 and Appendix Table 7 (see first link above).	Very helpful comment on nitrogen uptake and losses. The citation has been revised in Table 1 of the Task 3 Data Source List.
				A map for the Tulare Lake Basin (resolution ~ 1 acre) is shown in Appendix Figure 73, Appendix to Viers et al. (2012) (see second link above).	Comment acknowledged.
				Point Sources and Urban Non-point Sources: Point sources and non-point sources of nitrogen (other than dairies) are described, mapped, and tabularized in detail for the Tulare Lake Basin in the UCD SBX2 1 study, Viers et al., 2012, chapters 4, 5, and 6 (see first link above), with a summary map (on a ~ 1 acre basis) shown in the Appendix Figure 47 (WWTP and Food Processors), Figure 81 (Septic systems) (see second link above).	Comment acknowledged. This data on point sources and urban non point sources would be useful to the SNMP Master Plan and/or local SNMPS.
				Dairies and manure distribution are described in Viers et al., 2012, Chapter 4. We simulated several manure export scenarios, since the actual manure export from dairies is unknown. The amount of manure exported off dairies affects the amount of synthetic fertilizer applied (e.g., Appendix Figure 39). Manure nitrogen applications to cropland are shown in Appendix Figures 52 and 57, Viers et al., 2012 (see second link above)	Very helpful comment on manure distribution. This data source would be useful to the SNMP Master Plan and/or local SNMPS.

Task 3.2 - Data Source List

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				Leaching Water and Constituents: Prof. Minghua Zhang (Dept. Land, Air, and Water Resources) has estimated pesticide and nitrate loading to groundwater and to surface water for the Sacramento Valley and for the San Joaquin Valley, using the SWAT model. I believe her work was published in peer-reviewed scientific journals	Very helpful comment on nitrogen loading. Literature values will be considered in the estimation of leaching water and constituents. Note that pesticides are not being considered as part of the ICM, nor are they planned to be as part of the SNMP Master Plan.
				The UCD SBX2 1 study has made estimates of nitrate leaching to groundwater using leaching studies (Viers et al., Section 3.1.2), literature values and literature value-based leaching estimates for various non-agricultural sources (Viers et al., Sections 4, 5, 6, 7, 8, 9 - summary of the approach used is outlined at the end of each Section), and a rigorous mass balance approach for cropland, described in Viers et al., Section 2.6 (see first link above). Maps of groundwater nitrate leaching are shown in the Appendix Figures 89, 97, 102, 107, 112, 117 of Viers et al., 2012 (see second link above).	Very helpful comment on estimated nitrate leaching. The citation has been revised in Table 1 of the Task 3 Data Source List.
				Results of the nitrogen mass balance for Fresno, Kings, Tulare, and Kern County (also Monterey County), for the various crops, and for the SBX2 1 study area (Tulare Lake Basin and Salinas Valley) are summarized in Chapter 1 of Viers et al., 2012 (see first link above).	Very helpful comment on nitrogen mass balances in specific counties. The citation has been revised in Table 1 of the Task 3 Data Source List.
				We are currently in the process of compiling Ag Commissioner Report and dairy data for the remaining Central Valley counties. We currently do not have the resources to assess WWTPs and Food Processors in the Sacramento and San Joaquin Valley, but will compile a similarly detailed nitrogen mass balance to estimate groundwater leaching in the entire Central Valley by mid-2013.	Comment acknowledged. The information in the process of being compiled would be useful to the SNMP Master Plan and/or local SNMPs.
				The mass balance modeling approach described in Section 2.6 of Viers et al, (2012) could be applied similarly to salts, but the UCD SBX2 1 team or the UCD California Nitrogen Assessment team currently do not have those data. Similarly, the groundwater nitrate transport modeling approach described in chapter 7 of Dylan et al., (2012) can be applied elsewhere in the Central Valley and is also applicable to salts. We are considering to develop the model for at least parts of the San Joaquin Valley, if not the entire Central Valley.	Comment acknowledged. The information in the process of being compiled would be useful to the SNMP Master Plan and/or local SNMPs.
3	09/29/12	Thomas Harter	Draft TM	I forgot to mention that a detailed Table of all individual WWTPs and Food Processors (FPs) in the Tulare Lake Basin, and their N output either to percolation basins or to land application is given in Appendix Table 8 on page 313ff. of Viers et al., 2012 (http://groundwaternitrate.ucdavis.edu/files/139110.pdf)	Comment acknowledged. The information in the process of being compiled would be useful to the SNMP Master Plan and/or local SNMPs.

Modeler's Meeting Memorandum

Task	Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
Modeler's Meeting	1	11/7/12	Nigel Quinn	Draft Meeting Summary	<p>This is a very good summary of the meeting. There were some revelations that came out in the discussion that I was unaware of going in. I think you have hit on the majority of these. In the discussion about tile drainage I would quibble that WARMF explicitly simulates tile drainage. The methodology is more a calibration to achieve the same approximate volume of water removal. However since the layer extends over both tiled and non-tiled areas and there is nothing in the algorithm I would argue against the word "explicit". The revelation for me is that I was under the impression that the drainage package was invoked in CVHM-1 - it will be used in the SJWHM (westside model) that Claudia is finishing up for Reclamation and may not be available in time for use in the ICM study. So it appears that WARMF and CVHM may be using somewhat equivalent methods for estimating loss to tile drainage.</p>	Text has been changed to reflect this concern regarding the term "explicit".
Modeler's Meeting	2	11/7/12	Thomas Harter	Draft Meeting Summary	<p>This summary nicely hits all the important points. I thought this was an extremely helpful discussion</p>	Comment Noted

Task 4 - Initial Analysis Zones Phase 2 Recommendations

Task	Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
Task 4	1	11/7/12	Randy Hanson	Draft TM	p. 5 – Summary: Definition of groundwater basins by DWR should be subject to review and potential revision. Several other basins defined through Bulletin 118 are not consistent with modern studies carried out by the USGS or others. We are redefining the extent of some basins in other ongoing studies and the extent of these basins has implications for monitoring (ex. GASGEM) and regulation.	A footnote has been added to the document in Section 6 to discuss DWR's initial definition of groundwater basins and how the USGS and others have reviewed and redefined the extent of some basins.
Task 4	2	11/7/12	Randy Hanson	Draft TM	p.7 - DWR/CVHM Water Balance Subregion Boundaries –C2Vsim does not explicitly simulate individual wells or land use so only the more refined grid version starts to approximate the "computational grid" of CVHM with MF-FMP. Also the Diversions are a mixture of approximations, estimations, and reported data some of which are measured. A legitimate network of measured diversions (with EC, nitrate, temperature and salinity monitoring) are desperately needed for all models and for CVSALTS. Several irrigation systems have SCADA systems to automate diversions and deliveries. These regions should be IAZs where we could get funding to implement a monitoring network.	A footnote has been added to the document that states that C2VSIM does not explicitly simulate individual wells or land use, so only the more refined grid version begins to approximate the "computational grid" of CVHM with the FMP. The footnote also notes that the diversions included in C2VSIM include a mixture of approximations, estimations, and recorded data.
Task 4	3	11/7/12	Randy Hanson	Draft TM	p. 13 – Periodic updates of CVHM-2 and related input data streams for both CVHM-2 and CVSALTS such as diversion flows, returnflows, and related salinity and nitrate would be very helpful for this process and later phases of CVSALTS. Funding will be required for data networks and updates of the model to keep it current.	At the end of Section 5, further discussion was inserted to the text regarding periodic updates to CVHM-2 (and later versions) benefiting from additional data (measured diversion flows, return flows, tile drain locations, etc. along with corresponding water quality monitoring data), and how this would benefit future phases of CV-SALTS for long-term planning needs.
Task 4	4	11/7/12	Randy Hanson	Draft TM	p. 18 – The definition of watershed may want to include a description of the level of definition. Will these be subwatershed at the HUC-12 delineation as is now being developed by NHDPlus by the USGS? Or will there be another level of delineation?	Additional text was added further discussing the various levels of watersheds from the WBD document. This additional discussion serves to complement the WARMF watershed discussion and does not intend to assign any HUC-level of delineation.
Task 4	5	11/7/12	Randy Hanson	Draft TM	p. 20 – We can also anticipate that child or embedded models that are more refined could be used for SNMP or other forms of detailed analysis. MF-FMP has the capability to facilitate this type of scaling or linkages if needed.	An additional bullet was entered into the text to reflect to potential of the FMP to facilitate scaling and/or linkages for local model (i.e. "child" or embedded model) purposes.

Task 5 - Salt, Water Nitrate Balance Methodologies

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Task 5	1	11/27/12	Randy Hanson	Draft TM	p. 7 - Requests for irrigation water quality data could be checked against the pesticide permitting database of the state to see how pesticides are being applied in conjunction with irrigation.	Unfortunately the request for irrigation water quality data will not allow for receipt of data that would be usable for the ICM effort. This text was removed from the document. Otherwise, pesticides are not the focus of CV-SALTS and are purposely not addressed in the ICM.
Task 5	2	11/27/12	Randy Hanson	Draft TM	p. 9 - Figure 3a. Gridded approach could probably get the shape files from GAMA project to use their irregularly shaped gridding polygons. Figure 3b. May want to consider spline interpolations or cokriging if data distributions are problematic.	We will be creating our own grids for the gridded approach, based on locations of all of the different types of wells that we have collected data for in Task 3. This is a different dataset from what GAMA worked with, and so using their grids, while helpful for educational purposes, will not be pursued for the ICM work. Additional text has been added to a footnote regarding the possibility of using spline interpolations or cokriging as an option when data distributions are problematic.
Task 5	3	11/27/12	Randy Hanson	Draft TM	p. 20 - IAZ Delineation: What is the basis for the 20 year period?? Is the 1983-2003 period just a convenient period that overlaps the most recent period simulation of CVHM and/or WARMF?	The LWA Team initially proposed to do a 10-year simulation period for the water, salt, and nitrate balance calculation. Input from CV-SALTS at the Team's July 10, 2012 presentation increased that to a 20-year period. The most recent 20-year time period in CVHM is 1983 to 2003, so that is the significance of that time period, which still allows for the inclusion of all hydrologic year types (dry, wet, normal)
Task 5	4	11/27/12	Randy Hanson	Draft TM	p.29 - Lateral surface-water leakage? from CVHM. This is best captured as inefficient runoff from precipitation and irrigation which can be retrieved from the secondary SFR output file and summed up as the runoff component that is being added back into stream reaches.	A footnote has been inserted to discuss the difference between terminology - WARMF uses lateral flow as the main category for stream leakage, while CVHM actually has a water budget component named 'stream leakage.' Another form of lateral flow to surface water from CVHM is the runoff component from precip and irrigation, values for which will be extracted from the SFR output file.
Task 5	5	11/27/12	Randy Hanson	Draft TM	p. 31 - Mass Components and potential discrepancies between CVHM and WARMF. The percent of cell area for the major land use within each cell are available for delineating the mass application with respect to acreage in CVHM. This may help identify, along with the cell assignments by land use, which cells and how much of the cells are being used versus the WARMF acreage specifications.	A footnote has been added addressing the possible availability of this percent land use information from CVHM acreages.
Task 5	6	11/27/12	Randy Hanson	Draft TM	p. 33 - Does WARMF explicitly simulate tile drainage of water coming from above and/or below the root zone? (fig. 10). CVHM1 does not but does have additional runoff to compensate for this feature for selected crops. There will be drains in selected regions of CVHM2.	WARMF simulates tile drainage using a layer of high conductivity to move water laterally to surface water. A footnote has been added discussing the two methods of accommodating tile drainage and notes that the apportioning mechanism for allocating mass to vertical flow vs horizontal flow will be engaged when necessary.
Task 5	7	11/27/12	Randy Hanson	Draft TM	p. 41 - Surface-water Mixing model: The amount of water diverted and nonrouted deliveries do not necessarily represent the amount of water applied as irrigation. Nonrouted and semirouted deliveries may be reduced to the amount calculated by FMP as the TFDR. If additional NRD water occurs, it is not delivered under option 0 and if more water is diverted than is needed for TFDR the additional water goes back into the stream network. Thus mixing models need to be reviewed carefully.	A footnote has been added to address this subtlety in the surface water mixing model components. Very helpful comment - thank you for the insight.

ICM Workshop - Action Items

The following section documents the action items identified during the project workshop held on November 26, 2012. Source of this information is the Workshop Summary and Action Items Memorandum

Task	Action Item	Date Received	Source	Applicability	Action Item	Comments/Follow-Up
Workshop	1	11/29/30	LWA Team	Task 3	The LWA Team has identified a data gap for surface water quality for Los Gatos Creek. If you have data for this area or suggestions for data, please forward the information to Karen Ashby (karena@lwa.com).	Input Pending
Workshop	2	11/29/30	LWA Team	Task 3	As part of the Task 5, 6, and 7 work, the LWA Team will use temporal and site specific TDS-EC ratios where readily available for water quality sites and ratio's obtained from literature when a site specific ratio is unattainable.	Input Pending
Workshop	3	11/29/30	LWA Team	Task 3	The LWA Team will look into the tile drain sumps as a source of data for use in analyzing shallow groundwater quality.	Input Pending
Workshop	4	11/29/30	LWA Team	Irrigation Water Data Request	The LWA Team will modify the data request and spreadsheet based on the feedback that was provided, and re-submit to Richard Meyerhoff for distribution as a letter signed by the Technical Advisory Committee Co-Chairs.	Input Pending
Workshop	5	11/29/30	LWA Team	Irrigation Water Data Request	The LWA Team will follow up the request with phone calls to key agricultural coalition participants within CV-SALTS.	Input Pending
Workshop	6	11/29/30	LWA Team	Irrigation Water Data Request	Any data gaps noted as a part of this effort will be documented in the ICM Task 8 Report.	Input Pending

ICM Workshop - Action Items

The following section documents the action items identified during the project workshop held on November 26, 2012. Source of this information is the Workshop Summary and Action Items Memorandum

Task	Action Item	Date Received	Source	Applicability	Action Item	Comments/Follow-Up
Workshop	7	11/29/30	LWA Team	Task 4	The LWA Team will note the distinction between the two model updates (SJWHM and CVHM-2) as needed within the Task 4, Task 5, and Task 8 ICM reports.	Input Pending
Workshop	8	11/29/30	LWA Team	Task 4	Randy Hanson will follow up with Vicki Kretsinger regarding the CVHM-2 update	Input Pending
Workshop	9	11/29/30	LWA Team	Task 4	Barbara Dalgish and Randy Hanson will discuss the use of nested models for the local refinements. This information will be described within the Task 8 ICM Report.	Input Pending
Workshop	10	11/29/30	LWA Team	Task 4	The LWA Team will identify the uncertainty (either numerically or qualitatively) as well as the sensitivity of the models and approach within the Task 8 ICM Report.	Input Pending
Workshop	11	11/29/30	LWA Team	Task 5	The LWA Team will identify the analysis approach and assumptions used for the determination of ambient groundwater and surface water quality for each IAZ within the ICM Task 8 Report.	Input Pending

ICM Workshop - Review of Workshop Summary Action Items

The following section summarizes comments received on the Workshop Summary and Action Items Memorandum from the Project Committee which was asked to provide conditional approval to move forward with Task 6. Conditional approval was granted as long as the following comments were addressed.

Task	Comment No.	Date Received	Comment Source	Deliverable	Comment	Response
Workshop	1	12/3/12	Nigel Quinn	Workshop Summary & Action Items	<p>I've reviewed the notes and it looks like a pretty fair summary of the main discussion. I noticed that the SJWHM and CVHM-2 distinction still appears a bit uncertain. SJWHM is a "child" model of CVHM-2 that just addresses the west-side. This model (SJWHM) has a more refined (1/4 mile) model mesh and increased layering in the above-Corcoran aquifer to address tile drainage and shallow aquifer pumping that affect water table response. The SJWHM uses the WESTSIM subareas as the unit of analysis called "farms" in the MODFLOW farm package. It isn't clear whether Claudia plans to keep the WESTSIM discretization for CVHM-2 (she has been talking of lumping some of the Districts). However CVHM-2 will be much more discretized on the west-side than the current CVHM model. Both models will use Randy Hanson's new deformable mesh grid and the latest algorithms used to simulate aquifer subsidence. I am already running a version of CVHM-2 and will be running SJWHM by the new year. I suspect SJWHM will be available to the public before CVHM-2 given that it was developed under a Reclamation contract and will not likely require the same level of review as CVHM-2. However this is just speculation. We have noted that CVHM ignores wetland hydrology and that Joel has a rudimentary conceptual model (I'd have preferred a bathtub analog be used) in WARMF for simulating wetlands (as a very slow moving river). How does the team plan to develop salt loads from seasonally managed wetland areas in both the San Joaquin (where they receive much higher salt concentrations) and in the Sacramento Basin. We are dealing with a sizable area in both Basins. One other note is that if it appears we have drift in EC/TDS ratios over time/season - we may need to re-run WARMF with these new time series factors in play. Since EC/TDS is critical to the computation of accurate (or at least good estimation) of salt loads - this is one thing that ought not be overlooked. In fact a separate side-bar analysis of this issue wouldn't be remiss. With some plan to address the EC/TDS transients and clarification on the simulation of seasonally managed wetland salt balance - I am OK with the LWA team moving into ICM Task 6.</p>	Addressed in Final Task 5 Report under PC Review.