Comment Summary Matrix

Project Name: San Joaquin River Upstream of Vernalis Salt and Boron Basin Plan Amendment
Salt Tolerance of Crops in the Lower San Joaquin River (Stanislaus to Merced River Reaches) (Draft Report March 2010)
Comment Deadline: 19 May 2010
Number of Comments: 92
Comments received from United States Bureau of Reclamation, City of Tracy, Central Valley Clean Water Association, Ecologic Engineering, San Joaquin River Group Authority

NOTES:
Actual selection of a salinity threshold(s) protective of the agriculture (irrigation) beneficial use will involve a number of policy considerations including selection of most sensitivie crops in the LSJR Use Area, selection of leaching fractions, level of precipitation considered, water uptake distribution type to be used and what level of yield to protect for. The factors listed for choice of protective salinity threshods and the development of a Basin Plan amendment involve policy considerations that CV-SALTS may need to address. The term "Policy" in this comment matrix is in reference to one or more (but is not limited to) of the above listed policy issues that needs CV-SALTS' further evaluation.

Explanation of all "Comment Response" categories
1. Regional Board Staff Change Proposed: Staff made revisions with track changes in the Partially Updated Draft Report. CV-SALTS may accept or reject these changes
2. Comment Noted: This could be just a statement made by commenter and acknowledged by Staff or it could be staff explanation for approach taken (no change proposed). CV-SALTS may accept as proposed or make changes.
3. CV-SALTS Referral: Referring to CV-SALTS for further evaluation/consideration.

#	Author	Comment	Response Level	Comment Response		
				Regional Board Staff Change Proposed	Comment Noted	CV-SALTS Referral
1	United States Bureau of Reclamation	"Salinity is regulated in the South Delta and the Lower San Joaquin River solely for the protection of agricultural beneficial uses. Drinking water is protected as a beneficial use in the western Delta at Delta intakes, at a higher salinity than the most protective existing agricultural standards. (Note, the Rock Slough chloride standard was set to protect a historic industrial beneficial use, and remains as a surrogate for bromide). There are no existing drinking water uses of the South Delta or Lower San Joaquin River, which would require permission from the California Department of Public Health."	Policy			Refer to CV-SALTS committee for further evaluation
2	United States Bureau of Reclamation	"The management of salinity in the San Joaquin basin should not be approached merely from a traditional Clean Water Act, one pollutant loading perspective. Water supply, environmental regulations, beneficial use needs, and especially economics should be fully determined and analyzed for the benefits, costs, and trade-offs of salinity regulation. CVSC should also consider the impacts/benefits of proposed actions on dissolved oxygen in the Delta."	Policy			Refer to CV-SALTS committee for further evaluation

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3	United States Bureau of Reclamation	"Unlike many other constituents, salinity impairment is neither permanent nor irreversible. The water supplies of the San Joaquin basin are prioritized to provide water supplies and to meet other environmental flow and water quality objectives. Periodic wet years already flush out these salts, and the system could be operated/regulated (through the WQCP process) to make salinity regulation a higher priority if important beneficial use protection is needed in the future."	Policy			Refer to CV-SALTS committee for further evaluation
4	United States Bureau of Reclamation	"In Section 1.1, the report identifies a list of water agencies that utilize San Joaquin River water. Unlike in the Hoffman Report, this report identifies water agencies that most likely have access to multiple water supplies. Because of the potential economic and environmental impacts, any regulation should carefully identify what actual water rights exist and under what circumstances those rights can be exercised. This information is crucial to interpreting this Draft Report. Existing water rights should not be expanded to include stored water as a result of salinity regulation."	Policy/Major		Pg. 1 of the Study Report: "Staff's purpose in developing the LSJR Irrigation Use Area was to provide a general sense of the areas that may use irrigation water rather than an exact determination of use. Staff feels that this coarse level of assessment is acceptable for the purposes of this Report, and caveats that it is not intended to confirm any party's existing or potential water rights." If CVSalts/RB Staff wishes, they may take this approach take this further.	Refer to CV-SALTS committee for further evaluation
5	United States Bureau of Reclamation	"In regards to riparian water rights on the Lower San Joaquin River, protections against crop yield reductions during drought years (low precipitation) are not warranted if the only source of flow during these time periods is stored flows. The precipitation value should be selected based on the conditions at which flow is available to riparian water right holders. These water right holders may have obtained other water supplies to improve their supply reliability. In general, protections against crop yield reductions during drought periods are not warranted if all crops within the region are suffering from drought conditions."	Policy			Refer to CV-SALTS committee for further evaluation
6	United States Bureau of Reclamation	"This Draft Report only models the application of Lower San Joaquin River water to crop types. How does the periodic use of other (higher quality) water supplies on the same crops effect their long-term yields?"	Policy/Major		It is beyond the scope of the Study Report. The model could be used to account for this. If so, we advise that CV-SALTS consults with Dr. Hoffman.	Refer to CV-SALTS committee for further evaluation
7	United States Bureau of Reclamation	"Cropping patterns in general are most likely driven by economic factors, and not water quality factors."	Comment Noted		Comment Noted	
8	United States Bureau of Reclamation	"The information in Section 3.13.2 is base on a two year study with limited sample size (1-3)."	Comment Noted		Comment Noted	

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9	United States Bureau of Reclamation	"Using [the data in Section 3.13.2] to calculate leaching fraction and to draw conclusions about irrigation management is a premature. Given the uncertainty in the leaching factor assumption, and the significance of this assumption in determining water quality objectives, CVSC should consider funding studies to reduce this uncertainty."	Policy/Major		The additional studies suggested here would have to approved/coordinated with CV-SALTS	Refer to CV-SALTS committee for further evaluation
10	United States Bureau of Reclamation	"Similar to the existing salinity and boron TMDL, a more adaptively managed approach should be considered in any regulation. Given the sensitivity to precipitation, objectives that vary with precipitation levels could be explored, in order to minimize unnecessary impacts on water supplies."	Policy/Major			Refer to CV-SALTS committee for further evaluation
11	United States Bureau of Reclamation	"Again, the Regional Water Board and CVSC should carefully consider the economic underpinnings of salinity regulation. For example, should salinity regulations be established to protect water-intensive crops in a region with low water supply reliability, and who should bear the risk/cost of that decision?"	Policy			Refer to CV-SALTS committee for further evaluation
12	United States Bureau of Reclamation	"On page 67, the last sentence of the third paragraph, 'If the salt concentration ... full crop productivity' is repeated in the following paragraph."	Minor	Pg. 67, Par. 3, change made in Report.		
13	City of Tracy	"The City wholeheartedly supports reconsideration of the applicable salinity objectives based on more recent science and studies."	Comment Noted		Comment Noted	
14	City of Tracy	"As the Regional Board contemplates the proper salinity objectives for the lower San Joaquin River and southern Delta, the City would like to point out that hundreds of millions of dollars will be needed around the Delta for many of the municipal dischargers to consistently meet an end-of-pipe effluent limits that equate to the water quality objectives, even if those objectives are raised from current levels. Similarly, if all agricultural discharges currently regulated under the waiver need to meet these same objectives, the costs to farmers will be huge. At the same time, the City, as a water purveyor, strives to supply the cleanest drinking water available since that water, after usage by the community, ends up as influent to its wastewater treatment plant and is ultimately discharged back into the Delta. For these reasons, the City requests that the Regional Board carefully consider and balance each of the factors in Water Code section 13241 when establishing a revised Electrical Conductivity ("EC") objective for this region. Once reasonable EC objectives are determined, the Regional Board's main focus should then be on the implementation of these objectives as required by Water Code section 13242."	Policy			Refer to CV-SALTS committee for further evaluation

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15	City of Tracy	"Because the long term average values for EC have been demonstrated by years of data to maintained over time and because these objectives are not set to protect against short-term acute effects, the objectives should be set to apply only at identified, permitted water diversion points that are used to extract water from the River or Delta for irrigation or municipal supply purposes. Setting EC objectives to apply throughout the water body is unnecessary since these objectives are being set for off-stream use protection, not for instream uses such as aquatic life protection or recreational uses. This would provide dischargers (both point and non-point) with some level of dilution and mixing credit while still ensuring that the compliance points maintain the needed water quality to protect the AGR and MUN uses, where applicable. Alternatively, explicit mixing zones, dilution credit, or other variance provisions should be included in Basin Plan amendments incorporating the revised objectives."	Policy			Refer to CV-SALTS committee for further evaluation
16	City of Tracy	"Since there is no evidence that municipal discharges have caused the average values in the local waterway (outside a mixing zone) to exceed the currently applicable EC objectives, there is no need to over-regulate these sources of salinity as they have not been demonstrated to be the major drivers of salinity in the Delta. With a thoughtful and reasonable implementation policy, which does not require end-of-pipe effluent limitations equivalent to the objectives themselves, all uses can be protected while also reasonably regulating discharges to the River and Delta. In this financially difficult time for municipalities, the City urges the Regional Board to incorporate regulatory flexibility into any salinity objective adoption process."	Policy			Refer to CV-SALTS committee for further evaluation
	Central Valley Clean Water Association	CVCWA resubmitted their comments made to the State Water Board on the Draft Report put together by Dr. Glenn Hoffman				
17	Central Valley Clean Water Association	"As a preliminary matter, CVCWA encourages the State Water Board to coordinate this process for the development of South Delta objectives with the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) process. It is likely that information from the Hoffman Report will be evaluated and considered by CV-SALTS and it is imperative that the Hoffman Report not foreclose the use of other scientifically valid models by CV-SALTS."	Policy		With the transition of the Project there will be close coordination between CV-SALTS and the Central Valley Water Board going forward.	

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18	Central Valley Clean Water Association	"Therefore, the final report should clearly separate the two major recommendations: the first being the recommended model for use in the State Water Board's current revaluation of salinity objectives, and the second being the additional study and investigation required to address uncertainty of model inputs and the validity of alternate models to determine the most appropriate models for evaluating salinity objectives."	Policy or Comment Noted			Refer to CV-SALTS committee for further evaluation
19	Central Valley Clean Water Association	The climate conditions at Riverside including daily, minimum, and maximum temperature, and relative humidity are more strenuous, which result in lower salt tolerance for crops than would result in the climate of the southern Delta.	Comment Noted		This information is presented in the Draft Report (See Section 3.10.2)	
20	Central Valley Clean Water Association	"CVCWA is concerned with the levels of conservatism that may be embodied in the final model. It is entirely appropriate to review the available information to develop the model inputs and select appropriately conservative values."	Policy			Refer to CV-SALTS committee for further evaluation
21	Central Valley Clean Water Association	"Finally, the use of a steady state model over a transient model will result in a conservative salinity objective for equivalent inputs. CVCWA recommends adding a list of the conservative assumptions made in selecting model parameters, so there will be confidence that the modeled result will be protective of the irrigation use with out being needlessly stringent."	Policy		Ultimate model selection to develop WQO is outside the scope of this Report but it's an issue that the CV-SALTS committee can evaluate further	Refer to CV-SALTS committee for further evaluation
22	Central Valley Clean Water Association	"Additionally, the endpoint selected for the model is currently 100% yield of the target crops. Due to the variability in the natural environment, it is not reasonable to expect 100% yield for all conditions. Basing the objectives on 100% yield 100% of the time is analogous to setting an aquatic life or human health criteria value based on zero risk of impact, which is not reasonable. Moreover, the Porter Cologne Water Quality Control Act (Porter-Cologne) requires water quality objectives be set at a level that provides for reasonable protection of the beneficial use. (See Wat. Code §§ 13000, 13050(h), 13241.) Thus consideration should be given to determination of a reasonable yield target that reflects some level of risk. When considering a transient model, it may be appropriate to perform a continuous simulation using historical conditions, whereby the model may generate yields less than 100% due to conditions unrelated to the irrigation water quality. The historical yield generated by the model for conditions where the irrigation water quality is not a factor should be the benchmark for the yield."	Policy		Selection of acceptable yield loss is outside the scope of this Report. However, the Study Report notes that a call on what level of yield to protect for is a policy call. (See Pg. 121, Section 6.2.1)	Refer to CV-SALTS committee for further evaluation

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23	Central Valley Clean Water Association	"Currently, the report focuses on the summer irrigation season of beans. The report should be expanded to also consider what are reasonable water quality objectives for winter irrigation of alfalfa."	Comment Noted		This is covered in current report	
24	Central Valley Clean Water Association	"The transient modeling approach should be utilized in the evaluation of the salinity objective. Information listed in the Hoffman Report and presented at the August 13, 2009 workshop point toward the ability of transient models to accurately replicate irrigation practices and crop responses to more robustly calculate the proper salinity objective. The steady state models calculate more conservative salinity requirements due to the fact that they cannot account for the natural variations that occur in the growing cycle. In the event the State Water Board determines the use of a steady state model is appropriate for the current salinity objective evaluation, the specific model should be carefully selected."	Policy		The Draft Report was only intended to present modeling results from a steady-state model. This is an issue that CV-SALTS can pursue further.	Refer to CV-SALTS committee for further evaluation
25	Central Valley Clean Water Association	"Because of the demonstrated large variability in ability to replicate validation tests (depending on conditions, either greatly overestimating or greatly underestimating salinity requirements), the 40-30-20-10 model used in the Ayres and Westcott United Nations work does not appear as well suited to determine the salinity objectives in the southern Delta as the exponential model developed by Hoffman and van Genuchten, which replicated the validation data reasonably well. All parameters for the recommended model should be tabularized in the report, including the recommended values for the parameters specific for the critical crops in the southern Delta."	Policy		In Section 5.2, the results from both uptake models are presented in the Report. An additional tabular presentartion of results from the exponential model is presented in Table 6.1 (Pg. 122)	Refer to CV-SALTS committee for further evaluation
26	Central Valley Clean Water Association	"...it seems appropriate to clearly define why the recommended model is selected and why other models were not selected."	Comment Noted/Policy		This report was only intended to present results from a steady state model, not to make a final decision about what model should be used to develop a new WQO	Refer to CV-SALTS committee for further evaluation
27	Central Valley Clean Water Association	"Additionally, the recommendation should clearly include: (1) additional studies necessary to provide confidence in other models or approaches, and (2) provisions for the objectives to be reconsidered when new information becomes available from the recommended studies and transient models or CV-SALTS, possibly through the triennial review process."	Policy			Refer to CV-SALTS committee for further evaluation
28	Ecologic Engineering	"Page 6 Section 2.2.2 Sodicity -- The second sentence is erroneous as written, and the first sentence does not apply to sodicity. Sodicity is a measure of exchangeable sodium in a soil relative to the entire cation exchange capacity of a soil, as opposed to salinity which is a measure of salt content."	Minor	Page 6 Section 2.2.2: Language was clarified in Study Report.		

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29	Ecologic Engineering	"Page 6 Section 2.2.2 Sodicity -- Further, sodic soils are characterized by an exchangeable sodium percentage greater than 15 percent."	Minor		Page 6 Section 2.2.2: Staff discussed sodic soils in the context of SAR vallues. While ESP is an acceptable indicator of sodicity, it was not covered in the scope of this Report	
30	Ecologic Engineering	"Page 6 Section 2.2.2 Sodicity -- [The context of SAR] needs to be provided to interpret Table 2.0 water quality data, since the table does not report soil sodicity."	Minor		Page 6 Section 2.2.2: Interpretation of SAR values in Table 2.0 has been provided based on standard thresholds from the USDA Handbook	
31	Ecologic Engineering	"Page 6 Section 2.2.2 Sodicity -- There are two forms sodium affected soils, typical Sodic soils which require cation replacement and Saline Sodic which may only require removal of soluble salts."	Comment Noted		Comment Noted	
32	Ecologic Engineering	"Page 11 4th and 5th line -- Hydrologic group does not describe characteristics of a fully saturated soil, rather it is based on physical factors that affect hydraulic properties of a soil. The Ksat is hydraulic conductivity under saturated soil conditions."	Minor	Page 11, 2nd Paragraph:Clarifying language added to Staff Report		
33	Ecologic Engineering	"Pages 13 - 16 Table 2.1. -- Ksat values exceed typical ranges of these soils, even for surface horizons."	Minor	Pages 13 - 16 Table 2.1: Staff made the necessary changes. Model results are not affected by these changes. The Units previously given in the draft Report were meant to be um/s, and were incorrectly called in/hr. Right conversion from um/s to in/hr has been made. Previous figures in the report have been multiplied by a factor 0.1417		
34	Ecologic Engineering	"Pages 13 - 16 Table 2.1. -- Moreover, for purposes relevant to soil salinity, limiting layer (slowest) saturated hydraulic conductivity should be reported."	Major		Pages 13 - 16 Table 2.1: Comment Noted. However due to limited data range, SSURGO data base dos not provide data on limiting layer. There may be additional sources of data, but they may be difficult to integrate with the SSURGO data unless they are geo-referenced.	
35	Ecologic Engineering	"Page 28 first paragraph -- The percentages are somewhat confusing, please clarify using total acres (i.e. not reduced for mixed cropping) planted to beans in each decade."	Minor	Page 28 first paragraph: Issued addressed in revised Report		

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36	Ecologic Engineering	"Page 34 Section 3.3.2 -- The depiction of saline and/or sodic soils appears to be a relic of the Soil Survey's used. Saline and sodic soils all occur in the Eastern Stanislaus Area Soil Survey, which was mapped prior to being published in 1964, and incorporated salinity classes into map units. The 1992 San Joaquin Soil Survey and 2002 Stanislaus County, Western Part Soil Survey did not incorporate salinity classes into the map units. The lack of salinity classes in the later survey's is largely attributable to high variability in the salinity of a soil series associated with irrigation water source and management (e.g. Fresno slightly saline vs. Fresno strongly saline, same soil different salinity) and to advances in surface water supply and engineered drainage in the area since the 1960's. Soil chemical data collected and provided with the later soil surveys should be reviewed to determine if there are potentially saline and/or sodic soils in this greater portion of the irrigation use area."	Major		Page 34 Section 3.3.2: Soil chemical data collected and provided with the later soil surveys wasreviewed to determine if there are potentially saline and/or sodic soils in the greater portion of the irrigation use area as suggested by the commenter. However, since the information provided by NRCS is not geo-referenced, it's challenging to translate any specific information to the LSJR Irrigation Use Area.	Refer to CV-SALTS committee for further evaluation
37	Ecologic Engineering	"Page 34 Section 3.3.2 -- Many of the soils in the irrigation use area naturally have low permeability in the subsoil and are susceptible to poor drainage. Further, much of the area on the west side of the river requires artificial drainage to minimize salt build up in the root zone as well as prevent water logging the soil. Thus, soil salinity in the area is related to the quality of irrigation water, the San Joaquin River, and the need for subsurface drainage. Moreover, widespread use of San Joaquin River water and subsurface drainage has likely resulted in lower soil salinity in the use area."	Comment Noted/Minor		Comment Noted	
38	Ecologic Engineering	"Page 34 Section 3.3.2 -- In addition to being problematic, sodic soils are indicative of soil conditions susceptible to extreme salinization, either naturally or anthropogenically induced. Their presence in the use are indicates the need for a higher level of salt management, including the potential that irrigation water could have too low of salinity. It should be noted that sodic soils generally develop where drainage is limited and evapotranspiration exceeds water applied, and sodicity can occur even with very low sodium content and SAR waters."	Comment Noted/Minor		Comment Noted	
39	Ecologic Engineering	"Page 40 Section 3.4.2 -- Soil survey reference needs to be checked, as it appears the 2002 Stanislaus County, Western Part Soil Survey was also used."	Minor	Page 40 Section 3.4.2: Issued addressed in revised Report		

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40	Ecologic Engineering	"Page 40 Section 3.4.2 -- Based on Figure 3.9a, it appears that the 1964 Soil Survey was not used for this determination."	Comment Noted	Page 40 Section 3.4.2: Comment is correct. Staff did not use the 1964 Soil Survey. Staff's assessment found that it was more appropriate to use both the 1992 and 2002 surveys over the 1964 survey.		
41	Ecologic Engineering	"Page 40 Section 3.4.2 -- Review of the coefficient of linear extensibility (COLE) for soils mapped in 1964 would allow for evaluation of shrink-swell potential."	Minor/Possibly Major		Page 40 Section 3.4.2: Staff's initial assessment found that it was more appropriate to use the shrink-swell rationale provided by NRCS for Merced (1990), San Joaquin (1992) and Stanislaus (1992 and 2002). Staff found the Eastern Stanislaus Soil Survey for 1964 and review of this survey did not yield any information related to the COLE index. In addition, Staff's ability to relate any information to the LSJR Irrigation Use Area would be limited since this data is not geo-referenced. However, this is an issue that CV-SALTS can take for further investigation to verify shrink-swell soils in the Irrigation Use Area.	Refer to CV-SALTS committee for further evaluation
42	Ecologic Engineering	"Page 40 Section 3.4.2 -- It is unlikely that the extent of shrink swell potential in the use area was overestimated. Shrink-swell potential is a factor of total clay content and clay mineralogy. Neither of which is anticipated to change significantly within a single soil series, such as the Capay. Further, the Capay is classified as a Vertisol, a soil order defined by shrink-swell processes."	Minor/Comment Noted		Comment Noted	
43	Ecologic Engineering	"Page 40 Section 3.4.2 -- Shrink-swell and bypass flow are a major process affecting water movement in the use area and needs to be addressed with respect to irrigation and soil salinity management. There is potential that high shrink-swell potential soils may require increased leaching fractions when compared to low shrink-swell soils to allow for leaching salts from the entire root zone. However, bypass flow in soil cracks may actually be beneficial to controlling soil salinity (see Crescimanno and Garofalo, 2006. Soil Science Society of America Journal 70: 1774-1787)."	Major		Page 40 Section 3.4.2: Comment Noted. Addressing high shrink-swell soils through increasing leaching fractions for the LSJR Irrigation Use Area when compared to low shrink-swell soils to allow for leaching of salts from the entire root zone is a major decision that CV-SALTS could address as is necessary.	Refer to CV-SALTS committee for further evaluation

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44	Ecologic Engineering	"Page 42 Table 3.5 -- Check Ksat values presented."	Minor	Page 42 Table 3.5: Staff made the necessary changes. Model results are not affected by these changes. The Units previously given in the draft Report were meant to be um/s, and were incorrectly called in/hr. Right conversion from um/s to in/hr has been made. Previous figures in the report have been multiplied by a factor 0.1417		
45	Ecologic Engineering	"Page 46 Section 3.5.2 -- Based on widespread shrink swell potential in the use area, there is great potential that initial rainy season storms will be largely ineffective in providing moisture to the root zone. Additionally, high clay content and low hydraulic conductivities of the soils may increase surface runoff and reduce effective precipitation. Further, subsurface drains may remove precipitation that would otherwise be stored in the root zone. Figure 3.11 shows at least five years where Png is below the Es, and several years have Png below 10 inches, the level necessary to reduce irrigation requirement by 4 inches."	Major		Page 46 Section 3.5.2: We don't have actual field soil moisture data available. Such data would be helpful in confirming the scenarios noted by the commenter. The scenarios given by the commenter are potentially feasible but site specific data would have to be collected to confirm them. CV-SALTS could follow up on these issues in case field studies are conducted in the LSJR Irrigation Use Area.	Refer to CV-SALTS committee for further evaluation
46	Ecologic Engineering	"Page 50 Section 3.6.2 -- The area irrigated by furrow irrigation is not shown in Table 3.7. However, based on the preponderance of gravity irrigation and the types of crops grown, furrow irrigation is widespread across the use area."	Minor or Comment Noted		Page 50 Section 3.6.2: DWR data only identified 'gravity irrigation' of which furrow irrigation is a component. This was stated in the Report as a footnote for Table 3.7.	
47	Ecologic Engineering	"Page 53 Section 3.10.2 -- It should be noted that during May and June, crop salinity stress is potentially greater in Patterson than in Riverside. This would likely have a considerable effect on early stage growth of bean; However, little is known about salt tolerance of bean throughout the growing season."	Comment Noted/Minor	Page 53 Section 3.10.2, last paragraph: Report was revised accordingly.		
48	Ecologic Engineering	"Page 58 Section 3.11.2 -- The WATSUIT model was developed by the USDA salinity lab and is public domain available at http://www.ars.usda.gov/services/software/download.htm?softwareid=107"	Minor	Page 58 Section 3.11.2: Report revised accordingly		

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49	Ecologic Engineering	"It should be noted that the dissolution of salts in the soil will increase the salinity of drainage waters discharged back to the San Joaquin River."	Comment Noted		Comment Noted	
50	Ecologic Engineering	"Page 59 Section 3.12.2 -- Well level data from the DWR is collected from wells with several purposes, and generally the wells are used for production. A production well will likely be screened at deeper interval than that associated with shallow groundwater. Therefore, data from these wells may not reflect the depth to shallow groundwater."	Major, Minor, or Comment Noted		Page 59 Section 3.12.2: Groundwater basins throughout Northern California are monitored to determine water quality and related factors affecting beneficial uses. The DWR wells referenced in this study are not production wells. The DWR data source clearly states that the wells are for monitoring shallow groundwater. DWR conducts comprehensive assessments on a 3 to 4 year rotation to determine general chemical characteristics, including mineral, nutrient, heavy metal concentrations, organic and bacterial concentrations. Most of the sampled wells are either irrigation, stock, or domestic wells.	

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51	Ecologic Engineering	"Page 64 Section 3.13.2 -- There is no discussion with respect to depth of groundwater (Figure 3-17) nor the design or depth of the drains."	Major		Page 64 Section 3.13.2: There is no discussion with respect to depth of groundwater because the study that this Report relied upon (Chilcott et al, 1988) specifically noted that data on shallow groundwater was not reported since the focus of the study was to monitor only actively discharging subsurface tile drainage systems. The Chilcott study further notes that previous studies (Deverel et al., 1984) have shown that shallow groundwater quality is closely associated with the differing soils and topographic position in the basin, however, the data collected in their study was not analyzed for this association. Staff's review of the Chilcott study did not reveal details on drain designs or depth.	
52	Ecologic Engineering	"Page 64 Section 3.13.2 -- What basis is there for the higher (0.7 dS/m) and lower (0.5 dS/m) salinity irrigation water in calculating the leaching fraction?"	Comment Noted	Page 64 Section 3.13.2, third paragraph: This has was addressed in the Report.		
53	Ecologic Engineering	"Page 64 Section 3.13.2 -- Unless Hoffman reviewed the calculated leaching fractions for the LSJR and discussed them in his 2010 Report, the last sentence should be modified to present the range of Lr's in the South Delta, which are similar to those found for the LSJR."	Minor	Page 64 Section 3.13.2, last paragraph: Comment noted and Report revised accordingly.		
54	Ecologic Engineering	"Section 4 -- Nothing new or site specific is added to this section beyond the Hoffman Report."	Comment Noted		Comment Noted	
55	Ecologic Engineering	"Page 79 Section 5.1.4 -- Surface evaporation would be reduced when soil surface is dry and there is no precipitation (i.e. August, September, and potentially October), which would increase Peff and decrease the resultant soil salinity. Bypass flow and surface (or sub surface) run off would reduce Peff and increase soil salinity."	Major or Comment Noted		Comment Noted. The scenarios mentioned by the commenter are feasible but may require doing some modifications to the steady state model to investigate their occurrence. Should CV-SALTS want to investigate this further, it's advisable to contact Dr. Glenn Hoffman before any Steady State Model modifications are performed.	Refer to CV-SALTS committee for further evaluation

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56	Ecologic Engineering	"Page 123 Section 7 -- Additional future evaluations should include the following: 1. Field studies of bean should be accompanied by comparison of uptake models to determine if one more closely predicts bean water uptake. 2. Potential leaching fractions should be evaluated as well as actual leaching fractions in the LSJR area to determine possible potential salinity control measures. 3. The extent of subsurface drains in the LSJR area should be evaluated, since several soils could not be properly managed for salinity if artificial drainage was not provided. 4. Further, the effects of soil salinity management on LSJR salinity should be evaluated."	Policy/Major		Page 123 Section 7: Section 6.2.1 of the Report notes that actual selection of a salinity threshold(s) protective of the agriculture (irrigation) beneficial use will involve a number of policy considerations some of which are mentioned by the commenter such as leaching fractions. In addition, to the degree that the requested studies go beyond date what is stated in the draft report, CV-SALTS and Regional Board staff may evaluate appropriateness of inclusion	Refer to CV-SALTS committee for further evaluation
57	San Joaquin River Group Authority	The Study Report needs to clarify the timing and cultural practices used for dry bean production in the Lower San Joaquin River to reflect present-day practices. Two issues are critical to this analysis: **Planting Dates:** 1. Dry-beans are not planted before the first weeks of May yet they are assumed to be planted as early as April 1st.	Policy/Major		Page 86, Table 5.3: The Report acknowledges that there are three possible planting dates with corresponding crop coefficients for the San Joaquin Valley. One of the example planting dates is May 1st as shown in Table 5.2. In addition, model output scenarios (exponential distribution) associated with each of the three planting dates at three varying leaching fractions are given in Table 5.3. Moving forward, CV-SALTS could choose any of the suggested dates as they see fit.	Refer to CV-SALTS committee for further evaluation
58	San Joaquin River Group Authority	**Cultural Practices:** 2.Need to verify and consider that present-day cultural practices include pre-irrigations, which minimize or eliminate any potential salinity impacts during germination and seedling emergence as well as greatly reduce salinity control throughout the growing season.	Technical/Major		Comment Noted: This would need potential adjustments to current model settings. E.g. for the "I2" term: amount of irrigation required to maintain the leaching fraction (also accounts for precipitation:See Table 5.2), consideration has to be made to exisitng soil mositure conditions resulting from pre-irrigation. Staff advises further discussion with Dr. Hoffman before making model modifications.	Refer to CV-SALTS committee for further evaluation

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59	San Joaquin River Group Authority	**Unrealistic leaching assumptions:** A portion of the modeling is done with unrealistic assumptions regarding leaching. The study uses leaching fractions of 0.10 or less for modeling production of almonds and alfalfa. A leaching fraction of 0.10 or less is impossible to achieve without very sophisticated irrigation technology that is presently not available in the study area.	Policy/Major		Comment Noted. A given party could use leaching fractions that are applicable for their site specific conditions using the current model framework. However, choice of leaching fractions is a policy call that needs to be decided within the CV-SALTS initiative for further Regional Board consideration (See Section 6.2.1).	Refer to CV-SALTS committee for further evaluation
60	San Joaquin River Group Authority	**Winter Rainfall assumptions used in crop models are extremely conservative:** The modeling conducted as part of this study is being done with extreme conservatism in the assumptions used. These need to be corrected. Two assumptions illustrate this: 1. Estimate of effective rainfall using soil evaporation rates that do not reflect reality during the winter period.	Technical/Major		Page 48, Figure 3.11: Comment Noted: Soil evaportation is function of the crop coefficient and estimated bare soil evaporation and is a component of effective precipitation. CV-SALTS may modify soil evaporation rates to reflect reality during the winter period. However this would need modifications to the current model settings. Staff advises to contact Dr. Hoffman.	Refer to CV-SALTS committee for further evaluation
61	San Joaquin River Group Authority	**Winter Rainfall assumptions used in crop models are extremely conservative:** Effective rainfall is assumed to be part of crop ET while in reality it also plays a major role in salinity control in any Mediterranean climate. This role of effective rainfall during the winter irrigation season has been left out of the report. This analysis needs to be conducted and the impact of winter rains on leaching and salt control needs to be fully evaluated. The lack of this analysis further validates the need for development of a transient model	Technical/Major (Addressed as comment but not in Report)		In the model, effective rainfall is not assumed to be part of crop ET. Effective rainfall is a function of growing season precipitation, non-growing season precipitation less the bare soil evaporation. Crop ET is a product of the crop coefficient and reference evaporation. As illustrated in Table 5.1, the model computes (for both exponential and 40-30-20-10) "I2" which is the amount of irrigation required to maitain a given leaching fraction, considered in this computation is the crop ET and effective precipitation. Hence, the role of effective rainfall during the winter irrigation season was not left out of this Report. (can be pursued further by CV-SALTS)	Refer to CV-SALTS committee for further evaluation

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62	San Joaquin River Group Authority	**There is no need for an independent analysis of Boron impacts**: The present study report cites the need to conduct an analysis of water quality impacts from boron in the Lower San Joaquin River. The SJRGA feel this would be a complete waste of resources. The entire study area is known to be a boron enriched area since the soils were developed from marine formations that line the western edge of the study area. In addition, it is well know that boron sensitivity is most pronounced in orchard crops including apricots, walnuts and stone fruits. The entire Western Stanislaus County is being converted to orchard crops and Patterson is known as the "Apricot Capital of the World". These two factors alone should provide sufficient evidence that a problem does not exist in the area.	Policy/Major			Refer to CV-SALTS committee for further evaluation
63	San Joaquin River Group Authority	**Actual leaching fractions may be higher than assumed:** The Study Report needs to take a closer look at actual leaching fractions (LF) in Western Stanislaus County. The tile drainage data presented in the Study Report shows that it may be 25% or higher and this is consistent with findings in the South Delta. Unfortunately the data upon which this conclusion is based is not a valid data set and the SJRGA is recommending the use of additional data that is in the Regional Board files. This new data will likely show that these high leaching fractions do exist as a result of present irrigation practices.	Policy/Major		Comment noted. Staff appreciates efforts taken by SJRGA to share additional data sources for the tile drainage analysis. Additional data provided by the SJRGA was analyzed independently and compared to data from the Chilcott et al 1988 study. It should also be noted that not all data provided by the SJRGA was used, only drains within the LSJR Use Area were considered. Considering irrigation water salinity of 0.59 ds/m, average leaching fractions from the SJRGA data set was 0.22, the Chilcott study was 0.29 and when both data sets were pooled together the leaching fraction was 0.24. This additional analysis is attached as Attachment 1 to the Draft Report.(Could be pursued further by CV-SALTS)	Refer to CV-SALTS committee for further evaluation

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64	San Joaquin River Group Authority	**Present crop tolerance curves for dry beans may be overly conservative due to the database being used:** The study report is based on the 100%-yield potential defined by the 1977 Mass and Hoffman analysis that established crop tolerance curves for major crops. Unfortunately, the dry bean data used for this analysis is now over 50 years old and does not represent more salt tolerant varieties used today and is likely over conservative. It is recommended that the Study Report strongly advise against the continued use of these data and it recommend that a new curve be established for dry beans.	Policy/Major		Comment Noted. In Section 7. "Next Steps", the Study Report recommends updated field studies for relevant cultivars of dry beans that span the entire bean growth cycle. The study Report can not recommend against the continued use of the 1977 Mass and Hoffman analysis with no current peer reveiwed study in place (with updated curves) that suggests otherwise.	Refer to CV-SALTS committee for further evaluation
65	San Joaquin River Group Authority	**Need to recommend the use of the exponential model:** The SJRGA supports the development of a transient model for evaluating the crop tolerance of crops in Western Stanislaus County but in the absence of a valid transient model, the Study Report should recommend the use of the exponential steady state model over the 40-30-20-10 steady-state model. The 40-30-20-10 model does not represent the present state of knowledge regarding crop water uptake and would only compound the Study Report shortcomings since present crop tolerance data used in the model is over 50 years old.	Policy/Major		The study Report recommends use of the exponential model (See Section 6.2.1)	Refer to CV-SALTS committee for further evaluation

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66	San Joaquin River Group Authority	**Water management practices for dry bean production will not change as water conservation measures are introduced:** One of the factors of that will need to consider in reviewing the water quality objectives for Lower San Joaquin River is the State mandate for increased water conservation by both urban and agricultural users. Mandated water conservation needs will not likely change the water management practices for dry bean production. The present production returns on dry beans will not allow the level of investment needed for improved irrigation practices. As dry beans are planted for various reasons, including soil fertility improvement, it is unlikely that farmers will switch to a higher income cropping pattern. It is unlikely that water conservation will significantly change the leaching fraction. The primary reason is the continued need to pre-irrigate and the continued use of furrow irrigation. In water conservation efforts, the first and easiest water losses to control are those of surface water runoff. As these are a big component of the irrigation practices in Western Stanislaus County, they are likely to be the first to be controlled. This will leave deep percolation in the same range as it is now, in the range of 20-25%. This is the leaching fraction that should be assumed in future modeling when water conservation is assumed to occur.	Policy/Major			Refer to CV-SALTS committee for further evaluation
	San Joaquin River Group Authority	**Detailed comments on Report**				
67	San Joaquin River Group Authority	Page 1, Paragraph 1, final sentence: Neither Turlock or Modesto IDs have any rights to the San Joaquin River and would not be using water from the SJR. They should be removed from the sentence.	Minor	Page 1, Paragraph 1, final sentence: Comment addressed. IDs were omitted from Report		
68	San Joaquin River Group Authority	Page 1, Paragraph 3, fourth sentence: It is unclear what dairies and feedlots mean. Does this include the dairy milk barns and corrals or the reuse areas as well? This should be explained as the reuse areas could be significant areas.	Minor		Page 1, Paragraph 3, fourth sentence: The term dairies and feedlots was used in reference to constructed areas primarily used for dairy production as presented in the GIS data from DWR. THe DWR data source does not explain details related to milk barns, corrals and reuse areas.	

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69	San Joaquin River Group Authority	Page 1, Paragraph 3, fifth sentence: Normally river descriptions are from upstream to downstream. Suggest the two river names be reversed here and throughout the document.	Minor	On pages i, iii, iv, 2,5,83,120122 and 123: Comment noted and revisions made throughout the Report		
70	San Joaquin River Group Authority	Page 2, Paragraph 2, second, third and fourth sentences: It is unclear what the inconsistencies were. When is the boron analysis scheduled and what will it include? Will it be done on a separate track from this effort? This same comment applies to Page 9, Paragraph 2. Also see our comments above on there not being a need for a boron analysis	Policy/Major			Refer to CV-SALTS committee for further evaluation
71	San Joaquin River Group Authority	Page 5, Paragraph 1, final sentence: This sentence should be referenced as (Ayers and Westcot, 1985).	Minor	Page 5, Paragraph 1, final sentence: Comment addressed in revised Report		
72	San Joaquin River Group Authority	Page 5, Paragraph 3, second sentence: The words “of units” should be taken out.	Minor	Page 5, Paragraph 3, second sentence: Comment addressed in revised Report		
73	San Joaquin River Group Authority	Page 5, Paragraph 3, final sentence: The units of millimho per centimeter are not outdated. The units of dS/m are being used to be consistent with the international SI units.	Minor	Page 5, Paragraph 3, final sentence:Comment addressed in revised Report. Staff deleted "an outdated unit of measure for electrical conductivity".		
74	San Joaquin River Group Authority	Page 5, Final Paragraph describes a figure on water quality for a series of years. It would be more helpful if this analysis was conducted by water year types to see whether the water quality differences shown are related to the water year type. This would require a larger data set than used here.	Policy/minor		Page 5, Final Paragraph: Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman which was by calendar year. As noted by the commenter, consideration of water year could be helpful and can be pursued should CV-SALTS consider it necessary.	Refer to CV-SALTS committee for further evaluation
75	San Joaquin River Group Authority	Page 6, Second Paragraph, first sentence. Recommend that you strike the words “on soil sodicity”.	Minor	Page 6, Second Paragraph, first sentence:Comment addressed in revised Report; issued revised from prior comments		
76	San Joaquin River Group Authority	Page 8. It would be helpful if a similar presentation could be done based on water year types as the cropping pattern likely also varies by water year type.	Policy/minor		Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman which was by calendar year. As noted by the commenter, consideration of water year could be helpful and can be pursued should CV-SALTS consider it necessary.	Refer to CV-SALTS committee for further evaluation

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77	San Joaquin River Group Authority	Page 10, Final Paragraph. Suggest that you break this into two separate paragraphs as they are two distinctly different thoughts. The break should occur after the third sentence.	Minor		Comment addressed in revised Report	
78	San Joaquin River Group Authority	Page 17, Third Paragraph. There is no reason to spend additional time on developing the information for San Joaquin County as it makes up less than 2% of the total area.	Policy/Major		Page 17, Third Paragraph: This Report addresses only the protection of one beneficial use agriculture (irrigation) of the many listed in the Basin Plan for the LSJR. Protection of each of the beneficial uses must be evaluated as part of the development of site specific water quality objectives. Thus irrespective of it's small size, adequate information needs to be developed for San Joaquin County not to inadvertently overlook any vital issue.	Refer to CV-SALTS committee for further evaluation
79	San Joaquin River Group Authority	Page 18, Final Paragraph. The discussion shows an 8% decline in moderately sensitive crops and an 8% increase in moderately tolerant crops in 2000. In looking at the data in the table, you need to be careful in making too many interpretations from only two surveys. In 2000, the tomato processing plants were shifting to overseas and there was a serious reduction in tomato production. This may account for the changes in cropping patterns when only looking at two distinct years. The tomato production has since recovered in California. It may have been more helpful to look at the crop production figures complied by the individual water districts as these are done annually. To keep the amount of effort in perspective, the SJRGA recommends this be done for the three crops analyzed in this report.	Policy/Major		Page 18, Final Paragraph: Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman. However, as noted by the commenter, should CV-SALTS consider it necessary, further data could be solicited from individual water districts.	Refer to CV-SALTS committee for further evaluation
80	San Joaquin River Group Authority	Page 26, First Full Paragraph. This same comment applies here. This decision may be based on economics, water supply availability and a variety of other factors none of which may be related to water quality. This is the short comings of using a survey that was only conducted once every ten years.	Policy/Major		Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman. However, as noted by the commenter, should CV-SALTS consider it necessary, further data could be solicited from individual water districts.	Refer to CV-SALTS committee for further evaluation

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81	San Joaquin River Group Authority	Page 28, First Full Paragraph and Figure 3.5b on page 31. The reduction in dry beans could be related to tomato prices, water availability or a number of factors. It is doubtful that it was related to water quality as bean production like many field crops in the Westside is cyclic and primarily based on economics, not water quality. Again this is the difficulty of using two surveys which were often conducted ten years apart.	Policy/Major			Refer to CV-SALTS committee for further evaluation
82	San Joaquin River Group Authority	Page 34, Fourth Paragraph, final sentence. It is unclear what this sentence means. A sodic soil is not likely to impact water quality as the only way sodium would leave the sodic soils is by reclamation with a calcium source and the sodium would then go to groundwater, not to surface water. This sentence should be stricken from the report.	Minor	Page 34, Fourth Paragraph, final sentence: Comment addressed in revised Report. Staff deleted sentence from Report.		
83	San Joaquin River Group Authority	Page 40, Figure 3.8. Although not prominent, this figure is very illustrative. What it says is that present irrigation and leaching practices along with present water quality are good enough to allow moderately sensitive crops to be grown extensively on saline soils in the LSJR area. This should be a strong indicator that present water quality is not impacting yields or these crops would not be grown on saline lands which would only complicate a water quality problem.	Comment noted		Comment Noted	
84	San Joaquin River Group Authority	Page 50, Second Paragraph, Second Sentence. The second sentence implies that wheat and barley are irrigated by furrow. This is not true; it is flood or basin irrigation. Have you ever tried to harvest wheat or barley with a combine in a furrow irrigated field? The bumps and jarring would destroy a combine and at close to $1 million each, I don't think they would risk this equipment to furrows.	Minor	Page 50, Second Paragraph, Second Sentence: Comment addressed in revised Report		
85	San Joaquin River Group Authority	Page 51, Final Paragraph. The word "Chlorine" is used twice in the paragraph and it should be "chloride".	Minor	Comment addressed in revised Report		
86	San Joaquin River Group Authority	Page 52, First Full Paragraph. We are unsure what this paragraph is suppose to say and recommend that it be eliminated from the report.	Minor		Page 52, First Full Paragraph: This sentence is a continuation of text from pg. 51 and further elaborates on Table 3.8. It should not be eliminated from the Report.	
87	San Joaquin River Group Authority	Page 67, Last Line in the Third Paragraph and the First Line in the Fourth Paragraph. These two sentences read exactly the same. Should one come out?	Minor	Page 67, Last Line in the Third Paragraph and the First Line in the Fourth Paragraph: Comment addressed in revised Report		

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88	San Joaquin River Group Authority	Page 73, Second Paragraph, Third Sentence. It implies that not having the 5% estimated salt dissolution in the model is a negative. In fact it is not. If you assume a 5% estimated salt dissolution, you can also figure approximately the same level of salt extracted by the plant (crop) that is also not accounted for in a steady state model. Both of these would likely cancel each other out.	Comment noted		Comment Noted	
89	San Joaquin River Group Authority	Page 74, Third Paragraph. This assumes that the first cutting of alfalfa occurs by March 13th. This needs to be confirmed with the growers in the area as this seems very early for this growing area. An early date like this may be applicable to the Southern San Joaquin Valley, but not here. It is unlikely also that any irrigations would take place prior to the middle of March as the ground is still wet from the winter and putting on additional irrigation water at this time would delay the soil warming up from the winter period and this is most important to an alfalfa grower.	Policy/Major		Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman based on dates given by Goldhammer and Snyder, 1989. As noted by the commenter, additional information from alfalfa growers could be helpful and can be pursued should CV-SALTS consider it necessary.	Refer to CV-SALTS committee for further evaluation
90	San Joaquin River Group Authority	Page 74, Fourth Paragraph. The dates for almond production need to be confirmed with growers on the Westside of the San Joaquin River. An almond tree begins to shut down with the onset of short days and colder night time temperatures. The largest change in night time lows occurs in October and it could be assumed that little crop growth or water use would occur after October 15th. It is also unlikely that an almond grower would irrigate his trees prior to the first two weeks of April. Because of winter rains and cold soil temperatures, irrigating prior to this time may cause root oxygen stress that could cause fruit drop or fruit delay due to the cold soil temperatures. It takes a wet soil much longer to warm up than one that is dryer. While you can define the growing season (and it does vary from year-to-year), you need to focus the steady-state modeling on the irrigation season which will normally not start until April 1st and will likely end by October 15th even though growth will be occurring outside that period. The irrigation period is when San Joaquin River water may be used.	Policy/Major		Comment Noted. Staff endeavored to follow a similar approach to Dr. Hoffman based on dates given by Goldhammer and Snyder, 1989. As noted by the commenter, additional information from almond growers could be helpful and can be pursued should CV-SALTS consider it necessary. Staff notes that modeling of alfalfa presents a bigger challenge than bean or almond due to the numerous harvest cycles. Consultant with Dr. Hoffman may be necessary should CV-SALTS want to pursue this further.	Refer to CV-SALTS committee for further evaluation
91	San Joaquin River Group Authority	Page 89, First Paragraph, Line 10: Westcott should be "Westcot".	Minor	Page 89, First Paragraph, Line 10: Comment addressed in revised Report		

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92	San Joaquin River Group Authority	Page 96, Alfalfa Write-up. The analysis shows that at no time would a yield loss occur at .15 LF even under the most extreme conditions and EC levels near 2.0 dS/m. This is consistent with the production practices in the Imperial Valley of California where similar conditions exist and no yield losses occur. There is extensive discussion however about high evaporative demand and not being able to get enough water into the soil to meet both ET and LF. This does occur during short periods in the hottest summer periods but stored soil water normally meets all crop demands during this period. The impact of salinity is not short-term; it is a buildup of salts over a season or several seasons. This does not occur in the San Joaquin Valley due to soil conditions and irrigation practices. The alternative LFs of .07 and.10 are unreasonable and unachievable with present technology and irrigation practices in the San Joaquin Valley. LF is likely to be closer to 0.20 and should have been included in the modeling effort results presented in Table 6.1. We recommend that the .20 LF model results be presented in Chapter 6 as a large portion of the alfalfa is grown on or near the high water table lands in the LSJR area. Table 3.10 shows that these lands are well drained and likely to have LF closer to .20 than to .07.	Policy/Major		The current model framework allows for choice of different leaching fractions based on site specific conditions.	Refer to CV-SALTS committee for further evaluation.