Agricultural Zone Map Project

No.	Date Received	Comment Source	Deliverable	Comment	Response
1	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	General comment (closely related comments: 2, 24) - My major concern is that I think the CSZs are way too large and it makes little sense to me to make them equivalent to the Basin Hydrologic Units (which are fairly meaningless for water quality and management purposes). It seems like a wasted opportunity to develop a unit of analysis that would finally engage our stakeholders. I would have used water districts as the basic CSZ unit with major zones within each District that receive a differentiated water supply as the CSZ sub-unit. Doing this would have established a direct connection with our stakeholder population and allowed scope for CVSALTS involvement. If others agree - this might be a good point to assess a way forward. It might also help guide the SSALTS delineation effort.	The LWA team agrees that protection of AGR BU without inflicting substantial and needless economic harm in many cases requires that smaller spatial units must be analyzed. The team has attempted to describe methodology to subdivide CSZs to meet this need. With respect to this project, Task 5.2 was expressly scoped to define large zones, primarily because Task 5.3 entails a Hoffman-like analysis of each zone, and turning the crank on such an analysis, when it is done too many times, enlarges that work beyond what CV-SALTS wished to commit to at the time. The workplan states, "Up to 25 CSZs will be identified. Crop mixture summaries will be developed, and major crops identified within each CSZ. " This precludes use of smaller zones, and therefor also precludes beginning with water districts as a unit of analysis. Until discussion of these comments, after the third draft of the report was submitted, these zones were always conceived to cover R5 comprehensively, thus averaging about 1/25 of the R5 area in size, and their equation with water districts had never been mentioned. It is therefore impractical, having performed the work, to re-do the work completely and at a far greater level of spatial refinement. Work at this spatial scale and level of effort were expressly not envisioned in the workplan. The patchy distribution of sensitive crops that became evident during performance of 5.1 nevertheless informed us that these large zones would in many cases need to be subdivided later on to delineate zones in which AGR-related salinity discharge limits could appropriately be determined and incorporated into regulatory programs. The approach we took was to develop and describe a methodology to focus on areas that have the greatest influence on sensitive crop receptors. This process, when implemented, often would result in substantially smaller subunits that should likely align with the commenter's observations. When working at this finer scale, there is nothing to prevent water and drainage district boundaries and operations to be taken into account, and in many cases, they probably should be.

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2	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	The conceptual basis of the CSZs delineation is well documented – however I think that the equating of the CSZs with the hydrographic units was a mistake. As is stated in the Summary and Conclusions section of the Report: *Work such as that completed with the KRCD is extremely useful in ensuring that real water supply operations and the best local knowledge are incorporated into CV-SALTS analyses and decisions. Relatively brief, efficient communication allowed substantial refinement of applied water quality inputs. This will improve all subsequent analysis for this area. The same sort of consultation would be indispensable in refining information about applied water routing, to ensure that more stringent AGR standards are applied in areas that need this protection, and so that less stringent standards are for less sensitive areas.* Had the team chosen water districts as the primary units of analysis and subdivided these into smaller CSZs they would have realized the benefits described above and created a new unit of analysis that is more meaningful. The hydrographic units chosen are very large – of the order of the IAZs and related neither to water quality or to management and as such - aren't that meaningful to Basin stakeholders. On the other hand water quality is significantly affected by political boundaries. Water Districts with superior water rights tend to have better quality water supply since they don't need to resort to groundwater pumping. Other Districts such as Patterson Irrigation District capture surface runoff and redistribute this water supply creating internal zones within the District that have well-defined water quality. These internal zones would have made ideal CSZs – since they are well recognized within each District. Each District also has the power to influence their salinity – for example by changing the blending ratio of various water sources which in turn would affect soil salinity. In the case of Patterson ID the following CSZs could have been recognized: (a) DMC water only; (b) San Joaquin River water only; (c) groundwater only; (d) blended DMC and San Joaquin River water; blended return flow water with River water. Sensitive areas within each of these areas could have been identified. The advantage of this	The points raised regarding the challenges of large-scale units for AGR implementation are valid, and were to some extent recognized by the team. This is why methodology for definition of smaller zones was provided. Please see the response to comment 1 for additional explanation. The methodology involved hydrographic and groundwater recharge zone data for the same reason that the commenter identifies water districts as the ideal unit of implementation: it is the water used by farmers of sensitive crops that must be protected from excessive salinization, and to protect this water, it is necessary to know where it comes from. In final implementation, we envision close work with water districts of the type that is implied. At the R5 scale at which we were obliged to work, it was impossible (and forbidden by the workplan) to engage in the type of district-by-district evaluation that is suggested, however useful and necessary these evaluations may someday prove to be for localized analyses. Fortunately, hydrographic and groundwater basin data provide a means by which areas where irrigation supplies are recharged by discharges can be readily and automatically identified for further investigation. We submit that this was the most reasonable way to address issues such as those raised by the commenter at the scale of R5, within the budgetary constraints of this project.
3				1. Figure 1a is very difficult to follow (hard to read for one thing) and would benefit by improved explanation. Really isn't clear what the color scheme is supposed to do – not sure of the difference between an abbreviated and detailed approach. The idea of a flowchart is good – but only effective if the reader can follow it.	The flow charts are indeed complex and will be moved to 11x17 to make them easier to read. They are also heavily annotated (including explanation of color coding), and discussed thoroughly in the text. An added complication is that the method for subdivision of the large CSZs was developed as part of the work, necessitating a new flow chart. Comments on earlier drafts focused on relationship between the workplan and report, and the second flow chart was added in response, , along with explanation of how it relates to the previous flow chart. We unfortunately did not discover a good way to make these complex process details appear simple.

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4	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Figure 1b is a bit better and the colors are more meaningful. However still not clear what the beginning and end points are and what the significance of the outcome is. More detailed caption explaining sequence with clearer beginning and end points in the process would help.	Please see response to comment 3.
5	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Would like to know the disposition of the data compiled for these tasks at the end of this project. What provision is being made to create a resource for CVSALTS stakeholders. Would like to see this addressed early on in the process rather than waiting until the end. After all this is supposed to provide the road map and some of the basic resources for the amended Basin Plan.	Data compiled in 5.1 is available as a geodatabase. It can be downloaded at the K/J ftp site. The link to the K/J ftp site was provided by Richard Meyerhoff when the Draft Task 5.1-5.2 Report was submitted to the Project Committee for review on the 8/18/2013 email.
6	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Can't make any sense of the colorized hydrologic networks (figures 11a and 11b). What are these supposed to show? Is the color suggestive of a single source of all this water. The crop key below suggests a range of crops – has the hydrologic network information obscured the crop information?	Hydrologic networks are stream channels, streams being defined broadly and including managed irrigation and drainage canals. The coloration shows many dispersed sources feeding to a common, downstream point, where a sensitive crop is located. Where the hydrographic network is shown on a figure, only sensitive crops are shown. This is done to avoid placing too much non-essential information on the map. Both sensitive crops and network are shown because both are essential to the analysis, the crop being the sensitive receptor, and the network being the area in which excessive salinization could affect a downstream receptor after accounting for mixing and dilution.
7	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	What is the geographic unit of analysis of the crop information? ½ mile? 1 mile? This is important if stakeholders are to believe what the analysis assigns to their region of interest.	Crops are generally mapped field-by-field by DWR, the supplier of these data.
8	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Hard to find the Figure numbers on the Figures supplied by KJ without a magnifying glass. There need to be proper caption for all of these figure so that they each can stand alone and reader doesn't have to hunt through text for the explanation.	Figures are captioned, then discussed at greater length in the text. This is standard. Captions will be enlarged so that they are easier to read. Also, all GIS figures are intended to be printed in 11X17 for readability.
9	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 2, last paragraph, regarding second sentence, "No convenient Central Valley-wide data layer of subsurface flow networks exists, and subsurface hydrography was not mentioned in the Workplan": What is a subsurface flow network?	Groundwater recharge zones are occasionally mapped, but there is no groundwater counterpart to the hydrographic data that were convenient to use at the R5 scale of analysis. A flow network directionally connects upstream recharge to downstream waters.
10	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 3, first bullet, regarding sentence, "The implied multivariate determination of CSZ boundaries (including several of these variables as inputs) was found to be inconsistent with the broader goal of a usable method to inform water quality criteria in narrative AGR objectives, and was thus not pursued": How do you inform water quality criteria?	The Executive Committee discussions have indicated that, when a narrative standard is established, technical analyses (such as those described in the report) serve to inform interpretation of the narrative standard.

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11	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Figure 1a: Flowchart is conceptually appealing but hard to make sense of the color scheme and what an abbreviated approach might be.	Please see response to comment 3.
12	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Figure 1b, arrow between boxes 13 and 16: How is this done - compare flow weighted salinity to Hoffman model threshold salinity?	This is to say that the salinity in the supply (flow weighted average of saline discharges and other flow) should be compared to the threshold for unacceptable yield loss by the receptor crop, as defined by CV-SALTS policy.
13	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Figure 1b, 4th bullet under figure: ?? Doesn't make sense.	The bullets mentioned are shown to the right. The fourth bullet makes the point that drainage areas and water districts are one means of investigating how water flows, but that there are others. One that is more readily translated into spatial relationships between sensitive receptors (sensitive crops) and potential upstream dischargers is hydrography. Unlike polygonal drainage and district areas, hydrographic networks are linear, directional, networked representations of actual watercourses, When analyzing at a large scale and seeking automated means to establish these relationships, hydrographic features work very well.
14	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Table 1, last row regarding Hanson et al. (2006). What does : "joined with" mean in the statement, "Salinity threshold of crops were compiled from literature and joined with DWR cropping pattern data".	DWR crop classes often do not correspond directly (in name, and sometimes in content) to crops for which salinity tolerance levels are reported by USDS. Thus, the class correspondence must be developed and sensitivity data joined to DWR crop mapping data via this correspondence. The correspondence and resulting maps of crop sensitivity are new products that were previously unavailable, made possible by joining of these two large data sets. .
15	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 19, first paragraph under section titled, "Applied Water Data Request from CV-SALTS to Stakeholders", regarding first sentence, "A data request was developed by the LWA Team to facilitate compilation of readily available irrigation water quality data from CV-SALTS stakeholders": Data request inadequate.	The data request was actually edited and sent by CV-SALTS. Its inadequacy was not mentioned at the time, although there was concern that few might respond. One impetus for the request was the paucity of data on applied water quality (a critical component to salt balances and to understanding potential salinity stresses in fields), A second impetus was a request from Coalition members that they be consulted when questions about their farming operations arise. .
16	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 19, second paragraph under section titled, "Applied Water Data Request from CV-SALTS to Stakeholders", regarding last sentence, "This effort was completed with no additional water quality data from stakeholders by the time of this Report": Stakeholders rarely respond to these never ending data requests.	As noted in the report, KRCD was a notable exception. As a result of their response, the project team was able to refine applied water quality extensively for ICM Task 7. Two other efforts to obtain applied water quality data were made. DWR was contacted and was helpful, but data delivered were inadequate and schedule did not permit follow-up. WARMF contains estimates of applied water quality, which were extracted and mapped as part of the 5.1 effort. This was an innovative way to meet this project need, since data were not forthcoming through the data request.
17	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 22, 4th paragraph under section title, "Crop Sensitivity Data", regarding sentence, "Due to the simplicity of this calculation, site-specific and climatic and management data that can be considered in Hoffman or similar analyses have not been fully considered.": Don't follow - what has this to do with simplicity?	Two equations from Ayers & Westcot can be combined to provide an initial estimate of applied water TDS to produce 95% maximum yield. While this approach is very useful to map relative levels of crop sensitivity in terms of TDS of applied water, the calculation is more approximate than a Hoffman analysis. We point this out, but think that for this application, the simplified approach is fine.

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18	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 24, last paragraph (ends on page 25), regarding text that states, "...figures reference hydrography but they are not extended to constitute to a direct application of the tributary rule, rather the focus is on identifying recharge areas that most greatly influence applied irrigation water quality.": text not clear.	The point made is that the use of hydrographic networks is not intended to imply that discharges in remote upstream areas will significantly impair applied water. This is because remote discharges may be extensively diluted by other flow. We recommend that such mixing be taken into account to avoid exaggerating the influence of remote discharges on downstream irrigators.
19	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 25, 3rd bullet regarding "Groundwater Recharge Areas", last sentence, "Therefore, concentration targets based on this crop patch could inform AGR water quality objectives for that groundwater and areas that recharge it with dilution and other factors appropriately accounted for": recharge with dilution?	Assuming that a groundwater body is recharged over a broad area and that some mixing occurs, a discharge on a subset of that area would be diluted by recharge in the rest of the area.
20	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 25, next to last paragraph, regarding first sentence, "The initial assessment resulted in a selection of 19 focused zones based on the Hydrologic Unit boundaries presented in Figure 3, drawing the names for each unit from their numeric designations in the original hydrographic database.": Don't see the utility in this. These hydrologic units are very coarse and have very little to do with water quality. I would have much rather seen CSZ's defined at the sub-water district level. Where individual water districts (which are the main agent of determining water quality) can be subdivided by water supply source. For example in Patterson Irrigation District subareas can be divided into (a) DMC water alone (b) River alone (c) co-mingled river and DMC (d) groundwater only (f) combined river, DMC and groundwater.	Please see response to comment 1.
21	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 27, last paragraph, regarding last sentence: "Basic data to perform this type of detailed analysis is provided in this Report, but the detailed analysis itself is beyond the scope of the current work. Please note again that these figures are not intended to imply the strict application of the tributary rule, rather that hydrographic network could be helpful in differentiating between areas that could or could not influence applied water quality in an area where sensitive crops are being grown.": It isn't really clear from the figures how this information is used. There is insufficient detail on the figures to explain what is being displayed.	The figure is explained where it is referenced in the text of the report, not on the figure itself. This is standard.

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22	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 32, paragraph under Section 4.1.2, regarding sentence: "These concentrations are flow-weighted averages of applied surface water and groundwater. Note that for some areas, WARMF predicts no applied water, so that no applied water salinity is shown.": Has Joel indicated why this occurs? Is this real? If unrealistic - how will WARMF be adjusted to better simulate reality?	As mentioned in Response 16, WARMF supplied estimates of applied water quality that were otherwise unavailable. One reason WARMF shows no application to certain lands is that they in fact are not irrigated, as indicated by their land cover class (e.g., industrial, native vegetation, or barren land cover classes). These appear to be the types of areas for which no applied water was noted. Further investigation of WARMF's interior workings were beyond the scope of the work.
23	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 36, regarding third full paragraph: I disagree with this assertion. The hydrographic basis is too crude and at best an expedient for hydrologic analysis. These CSZ's have no inherent tie either to water quality or to management. Although the alternative water district-based delineation would have produced a rather large number of CSZ's (which could have been aligned by Basin) -this at least would give a linkage to the data collection efforts underway within each District. District's would be more likely to collaborate to divvy-up their acreage according to sensitive and non-sensitive areas.	Please see response to comment 1.
24	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Page 37, last paragraph, all but last sentence (quoted in full in comment 1 above): This is basically my argument for making the CSZ a highly refined unit within a given water district - you have stated the benefit of doing just this.	Please see response to comment 1. The commenter is correct, and the report agrees with the assertion that CSZs are in many cases too large a unit of final analysis to inform AGR narrative standards. This is a finding of this work, and a responsive methodology has been proposed in the report to deal with it.
25	09/03/13	Nigel Quinn	Draft Task 5.1/5.2 Report	Large figures, e.g., Figure 2 - increase font size of figure number, file/date information in lower right corner	Font size for the large GIS figures will be increased. Also, all GIS figures are intended to be printed in 11X17 for readability.
26	09/04/13	Randy Hanson	Draft Task 5.1/5.2 Report	I totally agree with this suggestion (see Comment 1 and related comments) and CVHM2 is being remapped to more detailed units as well many of which are individual irrigation districts that are the fundamental units of water accounting in many ways. Ironically DWR has a map of almost the whole valley rediscritized....so I'm not sure we can get a GIS of that.....just an idea!?!?	Sounds like an interesting thing to investigate.
27	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	I completely agree with Nigel and Randall that utilizing water agency boundaries may be a more practical way of viewing application of the AGR Zones, interpretations of the narrative AGR water quality objective and a means of engaging stakeholders. However, I have some more fundamental concerns with the way the document is drafted as well as a suggestion on how to move forward to address the concerns (see Comments 28 through 32)	Please see response to comment 1.

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28	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	<u>The document deviates from the approved scope of work</u>. The draft appears to have several circular discussions and on page 3 and page 26, the following statement, "The implied multivariate determination of CSZ boundaries (including several of these variables as inputs) was found to be inconsistent with the broader goal of a usable method to inform water quality criteria in narrative AGR objectives, and was thus not pursued." The original scope of work identified utilizing the most sensitive variables input to the Hoffman model as part of the determination of the AGR zones. Much of the report is justification for NOT utilizing the approach specified in the original scope. The decision to change the scope is not up to the subcontractor, and the subcontract clearly states that "Any changes to the scope of work will require Executive Committee approval. . ." (first paragraph of scope of work). As stated as part of the draft on page 7, "The GIS Task 5 Workplan calls for analysis of spatial data (cropping patterns, soil, climate, and management) to delineate CSZs, and then to identify the most sensitive major crops grown in each CSZ and the irrigation water quality required to produce those crops." The draft started at a different scale by working backward from the location of sensitive crops.	Please see responses to comment 1. Sensitive crop distribution was investigated first. Results illustrate that plantings are often highly localized. This tells you WHERE crops needing protection are, so you need to know WHERE the water to irrigate them comes from. The workplan anticipated this by referencing drainage basins and water districts, but these are inferior to hydrography for this function when working at a large scale. Please see responses to comment 13. We thus made a tactical decision to use hydrography instead of districts and drainage basins. This decision did/does not seem as profound the commenter implies, and the reason for excluding the use of these data is unclear. Further, although climate, soils, and crop data were to be collected as part of 5.1, they are more suited (other than determining sensitive crop location) to determination of WHAT level of salinity might be harmful, and were compiled for eventual use in 5.3. No Hoffman or Hoffman-like analysis (to which these variables are inputs) was scoped in 5.1 or 5.2. Thus, this report presents all of these data, but only analyzes those related to development of zones. It was and is the technical judgment of the project team, based on reasoning that is extensively documented, that soil mapping units and climate have little to tell us about the location in which restrictions on discharges should be implemented for the purposes of crop yield protection.
29	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	<u>The document moves back and forth between detailed discussions on topics to be addressed in the future and staying on task to develop the draft AGR zone boundaries</u>. The draft appears to get a bit ahead of itself in trying to discuss how additional data may be utilized in the future (e.g. whether current surface and groundwater supplies meet potential future objectives and the role that blending and water management may play). The current task is to come up with a way to justify reasonable, broad AGR zones with like climate, soils, cropping patterns, management, etc. as specified in the scope of work. The additional layers were requested for use in the future. The additional discussion appears to stem from the justification of changing the approach to the project—again, not part of the scope. The first steps scoped were to identify like AGR zones, identify the most salt sensitive commercial crops within those zones, and then determine an applied water salinity concentration that is considered protective of the sensitive crop(s). The calculated number could then be ground truthed with actual water quality applied—as part of a future task. Knowing that water quality now is not necessary for "calculating" a protective number.	Many of the detailed discussions were added at the request of previous reviewers. We agree that they make the report less concise, but felt it important to provide detailed explanations when they were requested. See response to comment 28.

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30	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	<u>The approach proposed, while likely scientifically and technically sound, is at a more detailed level than may be practical to implement.</u> On the valley floor, hydrologic basins do not necessarily equate to units of management. Water is on many occasions moved across basin boundaries through agreements between water agencies and then recirculated. Figure 6 overlays the proposed CSZ's based on hydrologic units with the drainage basins developed in 1992 with water agency input. While there is some overlap, from a practical management perspective, grouping some of the drainage basins (that already incorporate district boundaries) may provide a good initial broad base since those boundaries were based on like hydrology, cropping and management and vetted with the ag community. The more detailed analysis of recharge areas for specific sensitive crops may be a second layer of analysis that could occur within the broader zones at the discretion of the districts, rather than as an initial criteria for development of the AGR zones.	The tiered analysis described by the commenter, first of broad zones, and then (as necessary) of areas within those zones, is the methodology described in the report. Where dischargers are faced with severe limitations to salt discharges that may be quite costly to comply with, and where the type of management complexity the commenter cites needs to be taken into account, the cost of a more detailed analysis may be well justified. Detailed methods that take account of water flow and management should therefore be provided for as an option to properly inform AGR narrative standards under such circumstances.
31	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	<u>Current approach to identify recharge areas relies on one year of cropping data.</u> The emphasis of the current approach relies on protection of supply water for the most sensitive crops. Yet, only one snapshot of cropping pattern was utilized. Identification of zones needing special levels of protection may be better pursued at the district level where they would understand the history of the cropping pattern within their area and be able to better identify recharge areas based on their water management. (Also, I had thought that the recommendation from the policy committee was to look at the top 95% of commercial crops grown over the last several years within an area when determining sensitive crops—though that data may only be available at the county level.)	Rationale for use of the most recent land cover data is presented in the report, and has been supported by agricultural producers with whom the methodology has been discussed. Location of sensitive (often high-value) crops is a result of decisions farmers make based on a myriad of variables too extensive be reliably represented or analyzed in some sort of behavioral model. Further, new technology, such as new varieties, pest control, and irrigation, as well as market conditions such as demand for heart-healthy nuts and fruits, are not likely to be reversed and trigger a return to cropping patterns of the 1990s. Thus, the most accurate representation of likely future behavior (planting patterns) is actual present land cover. As changes in this pattern develop, adjustments to relocations of sensitive crop plantings may well be needed, but they cannot be reliably predicted. As for the 95%, this was the basis of determining major and minor crops. These calculations were done within each CSZ on the basis of acreage in the land cover data, and results are shown on the maps in the report as "sensitive major crops".

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32	09/10/13	Jeanne Chilcott	Draft Task 5.1/5.2 Report	Moving Forward - The project appears to have deviated from its original scope without any discussion at the Executive Committee. Also, there has not yet been an opportunity to discuss the approach and proposed boundaries with the ag community—who would be most knowledgeable about appropriate zoning and who may also be the most impacted by potential results of this project. I would suggest a focused discussion on this draft report, approach, results and options with the project committee AND representatives from the ag community before finalizing and moving forward.	The discussion with representatives of the Ag Community is scheduled for November 13, 2013. Commenters find the use of hydrographic data to be alarming and out of scope. However, the employment of water districts in the manner suggested was not envisioned either, and the workplan's explicit limitation of the number of CSZs would seem to preclude this creditable idea.. This illustrates the fact that interpretation of the workplan is something all parties are engaged in, throughout the work. In the case of the Project Team, our focus was solving the problem of developing a spatial framework to protect crop yield without creating unnecessary and costly economic impacts on dischargers who have no influence on sensitive crops, and achieving this goal within the major constraints of the workplan, without requesting additional budget from CV-SALTS. In the course of a complex analysis of this kind, it is not always evident which of the hundreds of decisions that must be made will later pique the interest of reviewers. It was not in the least obvious that hydrographic data, which seemed to have evident advantages for protecting crop yield with spatially focused restrictions, would become such a point of concern.
33	09/10/13	Roger Reynolds	Draft Task 5.1/5.2 Report	Page 5, Section 1.1 Description of GIS Task 5 – States the "main purpose of Task 5 is to develop a Crop Sensitivity Tool Set (CST) which is intended to provide a method to analyze GIS layers to produce results that inform AGR designations and implementation." It goes on to state the main potential water quality impairment is elevated salinity, yet states that will be not be developed until Phase 2. Elevated salinity water levels are known by individual water suppliers or districts. Areas with elevated salt levels are also known by the ag community in these areas. Therefore, the comments of other committee members to use water district boundaries for AGR zones seems to make more sense than using the hydrologic areas proposed. It may be more complicated to set up and utilize in a model, but discussion on this issue is needed to make sure we are moving in the right direction.	Please see response to comment 1. We agree that water districts have an important role at the implementation level, and have attempted to set the stage for this as well as we could, given the coarse spatial level of analysis that was defined in the workplan.
34	09/10/13	Roger Reynolds	Draft Task 5.1/5.2 Report	Much of the discussion tries to explain or justify why the hydrologic area methodology was chosen. This appears to be the primary purpose of Section 1.3.	Indeed it was. Please see response to comment 29.
35	09/10/13	Roger Reynolds	Draft Task 5.1/5.2 Report	Nigel Quinn and Jeanne Chilcott also raise some good questions regarding practical implementation aspects of the proposed CST and the accuracy or reliability of the cropping data used. The comments and questions raised deserve further discussion.	Please see responses to comments 30 and 31.

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36	10/03/13	Randy Hanson	Draft Task 5.1/5.2 Report	First while the DWR land use was helpful it is woefully inadequate to assess the dynamics of some sectors of agriculture. Other mechanisms of monitoring land use must be explored and developed. Other alternatives such as the USDA CropScape may be useful alternatives but are also erroneous and inadequate in other ways. We are also doing this for CVHM2 for example. While the study has created new information about the distribution of salt-sensitive crops based on recent land use, our ability to plug this information back into the WARMF and CVHM2 models will also need to be addressed either through better data streams as input to the models and/or better simulation capabilities that capture more of these aspects of the system. Will these become rate limiting aspects of water availability or water reuse (through re-circulation)? We have a plan for MODFLOW to potentially include more connectivity with salt but the implementation of connectivity can occur at several levels of detail and connectivity and this will need to be evaluated periodically as well to see what levels of connectivity are most effective for this setting and application.	We agree that superior crop cover data would improve analyses, but do not find that DWR mapping is inadequate to the purpose of locating concentrations of sensitive crops. The maps seem to show clear concentrations in many cases. In a few CSZs, sensitive crops are more generally distributed. These patterns seem too clear to be an artifact of DWR's methodology. An acknowledged challenge with DWR land cover data is that, in some cases, it is several years old and may not capture recent and important land cover conversions, such as the recent expansion of microspray and drip irrigation, and expanded permanent crop acreages. Updating of mapping in these areas for future analyses was recommended in the ICM report.
37	10/03/13	Randy Hanson	Draft Task 5.1/5.2 Report	Second to address the reconciliation of yesterdays teleconference I am in concurrence with Nigel, yourself, and others that up to 25 zones within an intersection of salt sensitive crops, hydrologic units, irrigation districts, and drainage basins could be proposed as an initial way to focus the next steps of detailed analysis and management/policy strategies in a relevant context for the farmers, dairies, cities, and ecosystems. This should help to address Jeanne's issues and concerns and better connect their efforts with this project.	The comment seems to encourage the tiered analysis previously described (comment 30).
38	10/03/13	Randy Hanson	Draft Task 5.1/5.2 Report	Third, these focused regions could be somewhat analogous to the Active Management areas used in Arizona by the Arizona Dept of Water Resources but different from the Arizona AMA's could be reevaluated every few years to see if their extent is adequate (needs to be changed?), if they no longer need active management (either changes in land use or local management in place?), or if other regions are now a concern because of changes in land use, climate, or sources of water being used. This would provide a flexible and an iterative process that does not lock anything into a set structure and a structure that can change with changing conditions that really sets up a dynamic process.	Agree. Please see comment 31.