January 26, 2015

Mr. Kenneth A Harris Jr., Executive Officer
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906

Dear Mr. Harris,

The Central Coast Groundwater Coalition (CCGC) is submitting a response to the Staff Report for Regular Meeting of January 29-30, 2015, Item 16. The subject of this item is "Irrigated Lands Regulatory Program – Water Board Review of the Manner in Which Central Coast Groundwater Coalition Groundwater Testing Results are Disclosed to the Public".

The CCGC believes that the Staff Report is incorrect in the characterization of the CCGC approach to reporting the concentration of nitrate in groundwater in the Central Coast groundwater basins. To correct the misrepresentations, the CCGC is submitting comments to be included in the material that is distributed to the Regional Water Board. In addition, CCGC representatives will discuss the CCGC responses during a presentation at the upcoming Regional Water Board meeting.

Thank you for the opportunity to provide comments to the Regional Water Board.

Thank you,

Parry Klassen
Executive Director

Central Coast Groundwater Coalition
512 Pajaro Street • Salinas • CA • 93901
(831) 585-1435 • centralcoastgc.org

Dear Mr. Harris,

The CCGC appreciates the opportunity to respond to the Staff report for the January 29 – 30th Central Coast Regional Board meeting. Included in this letter are general comments, specific narrative comments and responses to Regional Board staff comments specific to the contour maps (Table 2 of Item 16 in the Staff Report).

First the CCGC would like to clarify the purpose of the contour maps as described the Northern Counties Workplan. Regional Board staff imply that characterization across the entire region is inadequate. But as indicated below, the CCGC is required to characterize groundwater quality in the immediate vicinity of member parcels. The language from the Order (Attachment A) is provided below.

"In lieu of conducting individual groundwater monitoring, Dischargers may participate in a cooperative groundwater monitoring effort to help minimize costs and to develop an effective groundwater monitoring program. Qualifying cooperative groundwater monitoring and reporting programs may include, but are not limited to, regional or subregional groundwater programs developed for other purposes as long as the proposed cooperative groundwater monitoring program meets the Central Coast Water Board's general purpose of characterizing groundwater quality and ensuring the protection of drinking water sources. Proposals for cooperative groundwater monitoring efforts, including the use of other regional or subregional groundwater monitoring programs must be approved by the Executive Officer. <u>At a minimum, the cooperative groundwater monitoring effort must include sufficient monitoring to adequately characterize the groundwater aquifer(s) in the local area of the participating Dischargers, characterize the groundwater quality of the uppermost aquifer, and identify and evaluate groundwater used for domestic drinking water purposes.</u> Cooperative groundwater monitoring efforts must comply with the requirements for sampling protocols and laboratory analytical methods identified in this MRP, including parameters listed in Table 3, or propose a functional equivalent that meets the same objectives and purposes as individual groundwater monitoring. The cooperative groundwater monitoring program must report results consistent with individual groundwater reporting defined in part 2.B, or report results in a manner that is consistent with that approved by the Executive Officer in his or her approval of the cooperative groundwater monitoring proposal. Dischargers electing to participate in a cooperative groundwater monitoring effort must convey this election to the Central Coast Water Board within 90 days of adoption of this Order, and the individual groundwater monitoring requirements shall not apply as long as a cooperative groundwater monitoring proposal for that Discharger's area is submitted within one (1) year of adoption of this Order. If no cooperative groundwater monitoring proposal for that Discharger's area is submitted within one (1) year, then the individual groundwater monitoring provisions shall apply and the Discharger shall have one (1) year to comply with the provisions identified in Part 2."

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CCGC Response to Staff Report Comments

General Comments

The CCGC has 5 general comments regarding the Staff report. In addition to these overarching comments, the CCGC is responding to the narrative comments and has inserted a table with the CCGC responses for each of the Tech Memo staff comments received regarding the contour maps.

1. The criticisms of the CCGC analysis are premature. Judgments of the contour maps should appropriately be delayed until after the delivery and staff review of the characterization report.

   The staff seems to imply that the CCGC has manipulated or excluded data to obtain a higher level of compliance with the nitrate MCL. Explanations of why wells were excluded are provided in both tech memos and no criticism of those explanations were provided by staff for the second technical memorandum. The two contour maps are a result of the addition of more data to the analysis and revised methodology described in the tech memo and correspondence with Regional Board staff.

2. The staff report misrepresents the requirements of the Order by stating that the CCGC needed to characterize groundwater quality in agricultural areas (p3 of staff report). In fact, the Order states: As stated in the background section above, "at a minimum, the cooperative groundwater monitoring effort must include sufficient monitoring to adequately characterize the groundwater aquifer(s) in the local area of the participating Dischargers, characterize the groundwater quality of the uppermost aquifer, and identify and evaluate groundwater used for domestic drinking water purposes." This means that the CCGC characterization effort does not need to have high confidence in the contour lines across the entire region, particularly in areas with few members.

3. The staff report misrepresents that the CCGC could have found additional wells to supplement the data and analyses in the tech memos. During discussions with staff on the morning of November 17, 2014 at Regional Board Offices in San Luis Obispo John Robertson stated that they could not find additional wells to sample and they could not therefore request that the CCGC find additional wells.

4. There appears to be confusion on the part of the staff with respect to the relationship between the standard deviations and confidence intervals and the interpretation of those terms. There is clearly a level of confidence that can be assigned based on the calculated standard deviation estimates. This has been represented in maps presented in the second Technical Memorandum.

   It is unclear what criteria staff is using to reject or accept the contour maps. CCGC consultants opine that the degree to which the mapped concentrations agree with measured concentrations should be the primary criterion. Appendix A and additional information provide below show the consistent agreement of predicted concentrations with measured concentrations in samples collected by multiple entities including the CCGC and in GeoTracker.

5. The CCGC submits that decisions to accept or reject contour maps should be based on the final maps to be presented in the Characterization Report. The technical memoranda were intended to provide progress updates.

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Narrative Comments

In addition to the above, below are responses to the narrative comments made in the Staff Report. RB = Regional Board staff comments. CCGC – CCGC response to comments.

RB: Contour maps, because of the decision-making that goes into drawing contours where data is sparse, are interpretations of the data.

CCGC: Using kriging, there is no subjective decision making that goes into drawing the contours. The semi-variogram model is selected based on the spatial distribution of the data and therefore is adjusted to optimize the fit as was done for this case. The contours were not hand-drawn based on some subjective interpretation but a grid of values was generated by the kriging program. The result of the fit for 581 points in the Salinas Valley is shown in Figure 2. For any mapping method, there is uncertainty associated with areas where there are no wells. We quantified this uncertainty by mapping the standard deviation and creating maps with varying confidence levels.

RB: In general, the level of precision and accuracy of such interpretations increases with the amount of data available. In addition, precision and accuracy of such interpretations generally decreases when the hydrogeology is complex or highly variable.

CCGC: Agreed.

RB: The CCGC contour maps provided on April 30, 2014 and December 10, 2014 provide two very different interpretations based upon similar data, and in many cases the contour maps do not coincide with the actual data (see Attachment 3).

CCGC: In the December 10 version, over 100 additional data collected by the CCGC and individuals were used to map nitrate concentrations. Also, a different kriging model was used. This resulted in an improved mapping of nitrate concentrations as demonstrated by Appendix A and Figures 1 and 2 below. Moreover, in the interest of conservatism, we used the maximum value where there were multiple concentrations (in samples collected with time) and coincident points. For the first technical memorandum, we used the average value.

RB: For example, in areas where there are only a few wells with very different nitrate concentrations and a large distance between wells, the decision regarding how to interpret the contour interval is very subjective.

CCGC: Subjectivity implies that there is some decision to create a map a certain way. This is not the case because kriging uses a semi-variogram model based on the existing data that estimates concentrations between known points. We attempted to optimize this model to map nitrate concentrations shown in the December 10 version and is illustrated in Figure 2.

RB: The difference in interpretation is also evident in the tables describing the statistics. The version submitted on April 30, 2014, indicates that the percent of the Salinas Valley map as over the drinking water standard is 58%; while the version submitted on December 10, 2014, indicates only 28% over the drinking water standard. There are similar differences for the statistics reported for the subbasins; for example the Eastside

subbasin is reported as 83% and 54%, respectively, over the drinking water standard for the April 30, 2014 and December 10, 2014, versions.

CCGC: As described above, we refined our methods and used additional data in the second version of the maps.

RB: While the Revised Tech Memo for Salinas Valley submitted on December 10, 2014, includes information regarding the probability that wells in certain contours exceed the drinking water standard, the Revised Tech Memo does not provide any information regarding the certainty of the contour maps or the probability that the interpreted results are correct. For example, the CCGC contour maps shown in Attachment 3 include a contour interval of 36 - 45 mg/L Nitrate as NO3. What is the confidence or probability that a well located in that contour interval actually falls within 36 - 45 mg/L Nitrate as NO3?

CCGC: This is conveyed in the maps drawn at different confidence levels. At the 95% confidence level, any point within the area encompassing the 36 to 45 mg/L contour interval will be within the interval at 95% of the locations.

RB: As described above, the groundwater monitoring data reported to the Central Coast Water Board in compliance with the Agricultural Order may be interpreted and presented in a number of different ways. In cases where multiple interpretations are possible, it is important for the public and stakeholders to have access to the underlying data to evaluate the interpretation provided and to validate their own interpretations. Thus, staff concludes that the CCGC contour maps are not acceptable for providing reliable information to the public,

CCGC: As discussed above and as is shown in the report and Figure 2, the contours do provide useful information. When Michael Johnson, Parry Klassen and Steve Deverel met with Angela Shroeter, John Robertson and Hector Hernandez on November 17, 2014, staff stated that the maps are useful. While multiple interpretations are possible depending on assumptions about what wells to use in the mapping, we assert that the CCGC has done an excellent job of using the available data. Using the same data set and assumptions, mapping of areas of varying concentrations will not vary significantly

RB: In lieu of the actual groundwater data. In many areas, the CCGC contour maps do not provide reliable information so that the public can make informed decisions related to their drinking water quality and potential health exposure to nitrate. Additionally, staff also concludes that the CCGC contour maps do not provide reliable data for stakeholders to review characterizations of groundwater quality. Moreover, the contour maps would make it difficult for the public and other stakeholders to review the Central Coast Water Board's progress in identifying and prioritizing areas and individual farms that are at greater risk for pollutant loading and informing those domestic well users who may be affected by unsafe drinking water quality.

CCGC: The CCGC submits that there are two issues: the value of the contour maps and release of the data to the public. We have chosen to focus our responses on the former as this issue should be fully addressed and solidified prior to deciding on the need to disclose the data.

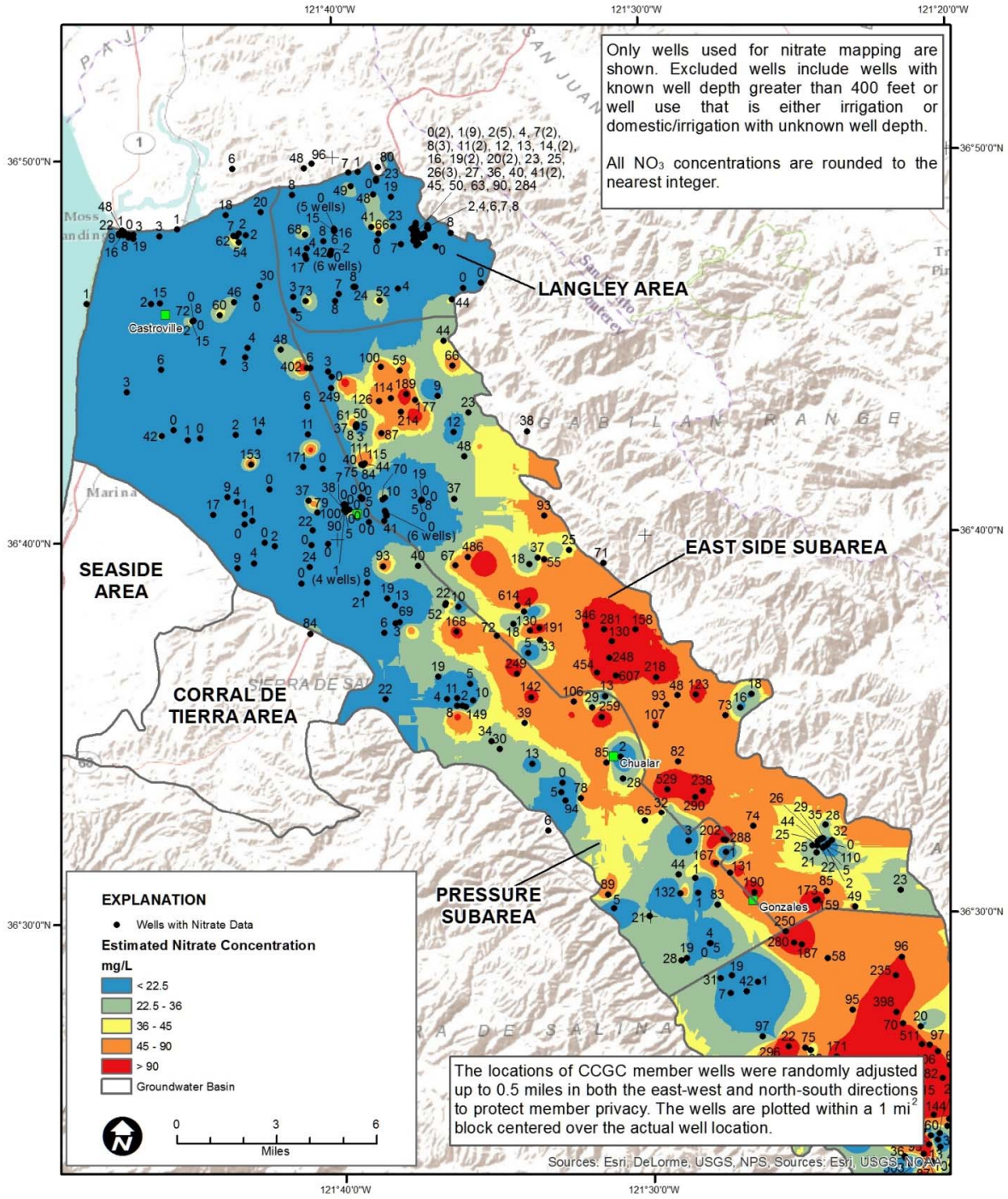

Figure 1. Example comparison between mapped estimated nitrate concentrations and observed maximum nitrate concentrations for the Langley Area, East Side Aquifer, and Pressure Aquifer subbasins from the December 10 Technical Memorandum.

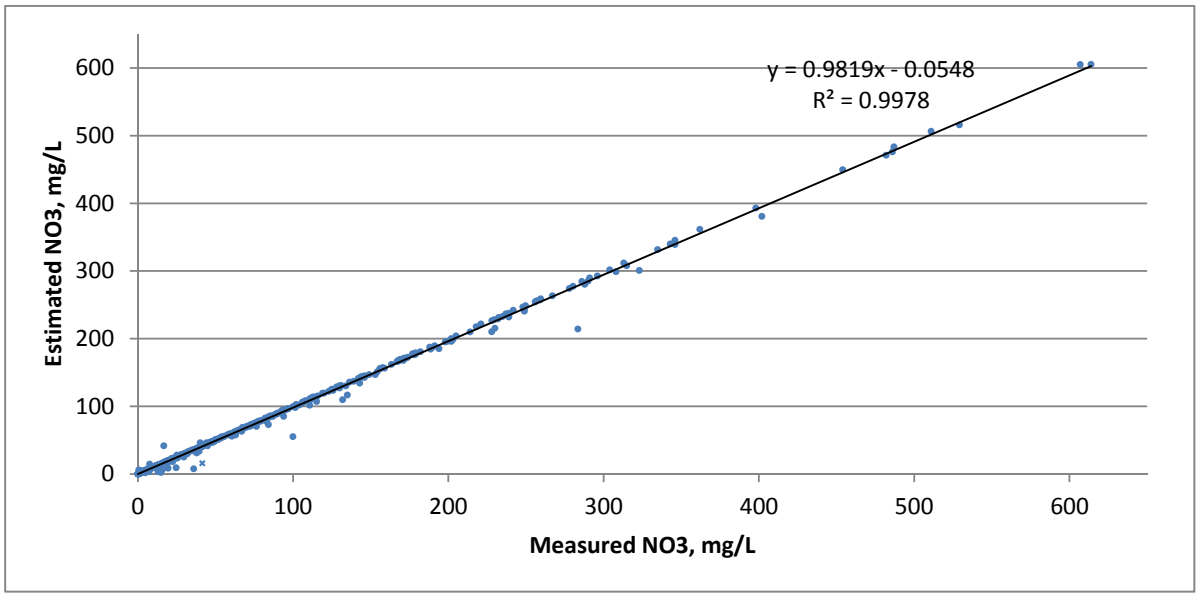

Figure 2. Relation of estimated and measured nitrate concentrations in the Salinas Valley.

Text of email exchange, Angela Schroeter (Regional Board staff) and Dave Leighton (Hydrofocus)

From: **Schroeter, Angela@Waterboards** <Angela.Schroeter@waterboards.ca.gov>
Date: Mon, Dec 29, 2014 at 12:32 PM
Subject: RE: Pajaro TM nitrate map
To: Dave Leighton <leighton@hydrofocus.com>
Cc: Steve Deverel <sdeverel@hydrofocus.com>, "Robertson, John@Waterboards" <John.Robertson@waterboards.ca.gov>, "Hernandez, Hector@Waterboards" <Hector.Hernandez@waterboards.ca.gov>

Dave –

Thanks for your email. Our primary concern is related to the intervals >45 mg/L.. When the maximum can be 300+ mg/L, a top interval of >90 is not informative. The contour intervals should effectively inform the viewer about where the concentrations are increasing and where maximum concentrations exist, even above the MCL. If 10 mg/L intervals will not work, please let us know what you recommend.

Thanks,

Angela

From: leightonhf@gmail.com [mailto:leightonhf@gmail.com] **On Behalf Of** Dave Leighton
Sent: Tuesday, December 23, 2014 3:10 PM
To: Schroeter, Angela@Waterboards
Cc: Steve Deverel
Subject: Pajaro TM nitrate map

Hi Angela,

We are currently addressing comments on the Pajaro basin report and I have a question for you regarding the display of estimated nitrate concentrations. Comment 20 requests that we use a 10 mg/L contour interval below 45 mg/L and then a variable interval above 45 mg/L, depending on the data. We are concerned that too many colored intervals will make it difficult for the eye to perceive the differences. For the Salinas report we left the intervals below 45 mg/L as is and replaced the >45 interval with two intervals (45-90 and > 90). Is this scheme adequate for the Pajaro report? I've attached an example map for Pajaro basin with these intervals.

Thanks.

Dave Leighton
HydroFocus, Inc.
530-759-2484

Table 1. Specific CCGC responses to Staff comments from Table 2 of the Staff Report for Item 16. The first three columns are reproduced from Table 2.

Contour Map Criteria Identified in July 11, 2013 CCGC Workplan Approval	Staff Reponses to CCGC Contour Map Submitted April 30, 2014	Staff Responses to CCGC Contour Map Submitted Dec. 10, 2014	CCGC Response
Condition 10: Sampling density, resolution and scale must be sufficient such that individual domestic well owners that reside in agricultural areas within the cooperative groundwater monitoring program boundary can make informed decisions related to their drinking water quality and potential health exposure to nitrate.	Tech Memo accompanying contour map does not include any information to describe well density or to determine if this density is sufficient. Well density on maps appears sparse in some areas.	Revised Tech Memo describes a range in well density from 1 well per 25 acres, to 1 well per 14 acres only for wells where the standard deviation was less than 2.5 mg/L NO3. The Revised Tech Memo does not describe the well density for all wells. The Revised Tech Memo indicates that the well density values appear generally sufficient for mapping of areas where groundwater is likely to be over the MCL. However, there is no evaluation of whether the well density is sufficient given the spatial variability of the aquifer and specific local conditions.	The well density varies with the wells sampled in the various locations within the Central Coast region. The CCGC sampled every domestic well from enrolled parcels and used eNOI data from the individual monitoring program and additional data described in the memoranda to develop the contours and characterize the quality of shallow groundwater. The relevant issue is the density of wells and uncertainty in the vicinity of member parcels, not across the entire region. Moreover, the statement that well density is sufficient is based on agreement with measured and estimated values as shown in figures in Appendix A. (Also, see example figure below, Figure 1). Specifically, we show maps with posted nitrate concentrations and comparisons with GeoTracker values. As stated in the report, there is very good agreement. Moreover, herein in Figure 2, we provide an example comparison of measured vs. predicted values for 581 points in the Salinas Valley that will be included in the Characterization Report. The geostatistical model predicts measured values within plus or minus 0.2 mg/L or 0.03% of the range of measured values (based on the calculation of the root mean square error) for the range for concentrations from less than detection to over 600 mg/L.

Contour Map Criteria Identified in July 11, 2013 CCGC Workplan Approval	Staff Reponses to CCGC Contour Map Submitted April 30, 2014	Staff Responses to CCGC Contour Map Submitted Dec. 10, 2014	CCGC Response
Condition 10: Contour maps must characterize groundwater nitrate concentrations at specific depth, focus on shallow groundwater, and indicate depth represented on the map.	Tech Memo states that data for wells that are shallower than 400 feet are used to develop contour maps, but depth range is not indicated on the contour map.	Contour maps state that wells with depths greater than 400 feet are excluded. Contour maps do not specifically describe the 180 foot aquifer or discreet aquifer zones.	The rationale for selecting the upper 400 feet is stated in the report. We reviewed and processed over 3,000 well logs to determine that the large majority of over 1,500 domestic well completion reports in the Salinas Valley are completed within 400 feet of land surface. Moreover, groundwater within 400 feet of land surface is generally considered shallow groundwater. In the interest of first characterizing the domestic supply water and second the shallow groundwater we selected 400 feet as the depth of groundwater for mapping. (See pages 10 and 24-31 for the hydrologic context discussion and for information about well completion report depths) We discussed the aquifers in the Salinas Valley which are limited in extent primarily to the Pressure, northern Forebay and parts of the Eastside subbasins. The aquifer delineations are of first order importance for drinking water throughout the Valley because the "confining zones" separating aquifers are not continuous. Moreover, Fogg and others[1] demonstrated that the traditional view of distinct aquatards and aquifers in the Salinas Valley is more appropriately viewed as a heterogeneous mixture and layering of permeability. We therefore deemed it more appropriated to use a depth interval rather than specific aquifers.

[1] Fogg, G. E., LaBolle, E. M., and Weissmann, G. S., 1999. Groundwater vulnerability assessment: Hydrologic perspective and example from Salinas Valley, California, Assessment of Non-Point Source Pollution in the Vadose Zone (Geophysical Monograph 108). American Geophysical Union.

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Contour Map Criteria Identified in July 11, 2013 CCGC Workplan Approval	Staff Reponses to CCGC Contour Map Submitted April 30, 2014	Staff Responses to CCGC Contour Map Submitted Dec. 10, 2014	CCGC Response
Condition 10: The analysis will be performed to achieve the highest level of certainty possible with the wells that are selected for sampling, and the analysis will explicitly provide the confidence value for any location on the map. If the CCGC determines that there are more wells that may be sampled in order to achieve a higher confidence interval, they must immediately inform the Executive Officer and present a plan, including schedule, for additional sampling as appropriate, to be approved by the Executive Officer. *Condition 11:* The CCGC must include additional sampling for use as a validation data set to confirm adequacy of contours.	No additional sampling was attempted or suggested to increase confidence or confirm adequacy of contours. CCGC members may have numerous irrigation and drinking water wells on their property. For the Salinas Valley, sampling focused on only domestic drinking water wells – no additional sampling from irrigation wells was attempted to assist with groundwater characterization or development of contour maps. In addition, wells may also exist in the program area that do not belong to CCGC members but are available for sampling. These additional data points could assist to increase confidence or confirm adequacy of contours. CCGC did not bring additional wells to the attention of the Executive Officer.	Same as April 30, 2014, version.	Every domestic supply well on every member parcel was sampled (with the exception of 7 wells on properties that would not grant access (of those 7 wells, 6 will be sampled in April 2015). That means every domestic well that could be sampled was sampled. Additional wells could not be identified by the CCGC. In discussions with Regional Board staff in San Luis Obispo on the morning of November 17 in Regional Board offices, John Robertson stated that Regional Board staff could not identify additional wells to sample and could not place that burden on the CCGC. The CCGC used data from all additional wells that could be identified and for which sufficient construction information was available to allow the well to be assigned to a depth of 0 – 400 ft. As stated on pages 22-23 of the December 10 Technical Memorandum, irrigation wells and irrigation/domestic well were considered to be deeper than 400 feet. This was based on information obtained in the field and well completion reports.

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Condition 11: Any contour maps produced must include the confidence interval for estimated values. Contour map must present the data within an adequate confidence interval that is acceptable for providing reliable information to the public.	Confidence intervals are not addressed in the report or contour maps. Kriged nitrate concentration maps do not include any information regarding range of confidence interval and do not state that contours reflect predicted nitrate concentration. Contour maps do not indicate when data has been excluded from the interpretation.	Kriged nitrate concentration maps are identified as estimated values, but do not include any information regarding range of confidence interval. CCGC excluded data from contour maps for wells greater than 400 feet, in addition to other reasons. For example, data was also excluded due to very high concentrations which CCGC suspects are from a localized contamination site or where data was collected prior to the year 2000. Contour maps indicate data has been excluded from the interpretation only based on depth, but do not identify data excluded for other reasons. Maps are included that display standard deviation of the nitrate concentration contour map, estimated probability of exceeding the drinking water standard, and distribution of nitrate concentration at the 66% and 95% confidence intervals. CCGC consultants describe that the 66% and 95% upper bound maps are produced by adding one or two standard deviations, respectively, to the estimated concentrations, and that this indicates that there is a 66% or 95% confidence level that the actual concentration is between the upper and lower bound concentrations However, no confidence intervals are provided relative to the	The term “range of confidence interval” is not commonly used and it is not clear what it means. The CCGC did not provide confidence intervals for contours as it is impossible to do this on a two-dimensional map. The CCGC did create maps which show the magnitude and distribution of the standard deviation. The standard deviation was used to create contours for different confidence levels, 66% and 95%. In addition, the CCGC provided a second type of kriging, indicator kriging, which provides a probability of exceedance at any location in the Salinas Valley. We understand that Regional Board staff would like an overarching statement on all figures saying we excluded some wells at contaminated sites. On the contour maps we stated: "Excluded wells include wells with known well depth greater than 400 feet or well use that is either irrigation or domestic/irrigation with unknown well depth." In Appendix B, Figure B1 states. "Excluded wells include wells with known well depth greater than 400 feet or well use that is either irrigation or domestic/irrigation with unknown well depth, and environmental monitoring wells in the Salinas area with possible nitrate or fertilizer contamination." Actually, as was described to Angela Schroeter, for every estimated point, 1 or 2 standard deviations were subtracted from the values to determine the lower bound of the contour interval. This process was used to map the distribution of concentrations at the 66 and 95% confidence levels. We are unclear what staff is requesting relative to providing confidence intervals for kriged nitrate concentrations. This can be provided on a point by point basis but is difficult to display on a map. Actually, as was described to Angela Schroeter, for every estimated point, 1 or 2 standard deviations were subtracted from the values to determine the lower bound of the contour interval. This process was used to map the distribution of concentrations at the 66 and 95% confidence levels. We are unclear what staff is requesting relative to providing confidence intervals for kriged nitrate concentrations. This can be provided on a point by point basis but is impossible to display on a map.

Contour Map Criteria Identified in July 11, 2013 CCGC Workplan Approval	Staff Reponses to CCGC Contour Map Submitted April 30, 2014	Staff Responses to CCGC Contour Map Submitted Dec. 10, 2014	CCGC Response
		kriged nitrate concentration contour map.	
Condition 11: Contour maps should use the State Drinking Water Standard of 45 mg/L Nitrate as NO3 and the initial contour intervals must be approximately every 10 mg/L Nitrate as NO3. After reaching the 45 mg/L Nitrate as NO3, contour, you may increase the size of the contour interval, if appropriate.	Nitrate concentration contour map includes appropriate contour intervals up to 45 mg/L Nitrate. After 45 mg/L, map only indicates 45-390.5 mg/L. This uppermost contour interval does not appropriately identify areas above the drinking water standard, including maximum concentrations reported as high as 690 mg/L Nitrate as NO3. This lack of information (contour differentiation above 45 mg/L) would provide substantial value.	Same concerns as April 30, 2014 version. After 45 mg/L Nitrate, map indicates a 45-90 mg/L and > 90 mg/L Nitrate range in concentration. The map does not provide adequate data and information for concentrations ranging from 90 – 690 mg/L Nitrate.	The intention of the CCGC was to provide readable maps for concentration with meaningful ranges of concentrations relevant to MCL. Too many contour intervals prevent the reader from making sense of the map. HydroFocus Hydrologist Dave Leighton corresponded with Angela Shroeter on this issue relative the Pajaro Technical Memorandum and she stated that: "If 10 mg/L intervals will not work, please let us know what you recommend". (Please see email transcript below.) We provided additional contour levels in the Pajaro Technical Memorandum as per Angela's response and will do so for the Salinas Valley in the Characterization Report.
Condition 12: The sampling density, resolution and scale must be approved by the Executive Officer, in advance of contour map preparation, to avoid the problem of not having sufficient data to produce an acceptable contour map.	CCGC did not provide specific information regarding sampling density, resolution, and scale to the Executive Officer in advance of the submittal of the contour map, and so none was approved.	CCGC did not provide specific information regarding sampling density, resolution, and scale to the Executive Officer in advance of the submittal of the contour map, and so none was approved.	The CCGC informed the Regional Water Board that the CCGC would use every domestic well available. As discussed above, we could not, nor can Regional Board staff, identify additional domestic wells to be sampled.

Contour Map Criteria Identified in July 11, 2013 CCGC Workplan Approval	Staff Reponses to CCGC Contour Map Submitted April 30, 2014	Staff Responses to CCGC Contour Map Submitted Dec. 10, 2014	CCGC Response
Condition 12: Contour maps for the cooperative program must be developed by, or under the review of a registered Professional Geologist or Professional Engineer	Contour maps were prepared by Steven Deverel, a registered Professional Geologist in the State of California.	Contour maps were prepared by Steven Deverel, a registered Professional Geologist in the State of California.	Steven Deverel a Professional Geologist developed the contour maps.
Condition 12: Contour maps must be based on a sampling design that is statistically defensible given the spatial variability of the aquifer (i.e., hydrogeological heterogeneity, etc.) and specific local conditions.	Contour maps are based on CCGC sampling and available data, with some data excluded. There is no discussion to evaluate whether the data is sufficient given the spatial variability of the aquifer and specific local conditions.	Same as April 30, 2014, version. Revised Tech Memo does include discussion related to standard deviation.	The Technical Memorandum shows good agreement with measured and simulated values at local scales. The standard deviation values are discussed on pages 43 and 53.
Condition 12: Contour maps must be provided as a geographic information systems (GIS) shapefile according to a specific time schedule.	CCGC provided GIS files to the Water Board.	GIS files not provided at time the Staff Report was written.	Files will be provided at the time of the submission of the characterization report.
Condition 13: Contour maps must clearly describe the method used to contour the groundwater monitoring data, the associated confidence intervals and the areas of uncertainty.	Contour method used is kriging. Confidence intervals are not included on the map or in the report. Areas of uncertainty are not represented on contour map.	Kriged nitrate concentration maps are identified as estimated values, but do not include any information regarding range of confidence interval. See discussion above.	This is an incorrect statement as maps with varying confidence levels are provided and explanations of those intervals are also provided. (see Figures 20 and 21)