STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place Suite 101
San Luis Obispo, CA 93401-7906

PUBLIC COMMENTS AND STAFF RESPONSES

FOR

TOTAL MAXIMUM DAILY LOADS FOR NITROGEN COMPOUNDS AND ORTHOPHOSPHATE FOR THE LOWER SALINAS RIVER AND RECLAMATION CANAL BASIN AND THE MORO COJO SLOUGH SUBWATERSHED, MONTEREY COUNTY, CALIFORNIA (DRAFT PROJECT REPORT - OCTOBER 8, 2012)

Central Coast Water Board staff implemented a process to inform and engage interested persons about these proposed total maximum daily loads (TMDLs). Central Coast Water Board staff's efforts to inform the public and solicit comments included a public notice and written comment period. Public notice of this proposed Basin Plan Amendment provided interested parties a public comment opportunity preceding any proposed Central Coast Water Board hearing regarding this matter. The public comment period for these TMDLs commenced on October 8, 2012, and extended through November 26, 2012. Central Coast Water Board staff received comments from:

1. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau, Salinas, in an email attachment received November 21, 2012.
2. Mr. Kirk F. Schmidt, Executive Director, Central Coast Water Quality Preservation, Inc., Watsonville, in an email attachment received November 26, 2012.
3. Mr. Steve Shimek, Chief Executive, The Otter Project, Monterey, in an email attachment received November 26, 2012.
4. Ms. Darlene Din, Ag Land Use & Public Policy Consultant, in an email received November 26, 2012.
5. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc., Watsonville, in an email attachment received November 26, 2012.
6. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI, in an email attachment received November 26, 2012.
7. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay, in an email attachment received November 27, 2012.
8. Ms. Jennifer Biringer, Central Coast Project Director – The Nature Conservancy, and Ms. Sarah Newkirk, Coastal Project Director – The Nature Conservancy, Monterey, in an email attachment received November 27, 2012.

The Central Coast Water Board appreciates the comments provided by these interested parties. Their comments have prompted us to clarify and improve technical information in the TMDL project in several areas.

Staff responses to these comments are provided in the "Comments and Responses" section beginning on page 2. Note that we reproduce direct transcriptions of the comments from each commenter and insert staff responses using ***bold, blue, italic text*.**

Summary of Changes Made to TMDL Project Report Based on Public Comments

Please review the document on our TMDL webpage entitled *"Changes made to the Basin Plan Amendment Package Subsequent to the Public Review Comment Period,"* located at:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/salinas/nutrients/index.shtml

List of Acronyms and Abbreviations

303(d)	Federal Clean Water Act Section 303(d)
Ag Order	Agricultural Order (Conditional Waiver of Waste Discharge Requirements from Irrigated Lands)
Basin Plan	Water Quality Control Plan for the Central Coastal Basin
CCAMP	Central Coast Ambient Monitoring Program
CEQA	California Environmental Quality Act
CMP	Cooperative Monitoring Program
PRISM	Parameter Regression on Independent Slopes Model (precipitation estimates)
MCWRA	Monterey County Water Resources Agency
NOAA-NMFS	National Oceanic and Atmospheric Administration−National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NRI	National Resources Inventory
RCD	Resource Conservation District
SWRCB	State Water Resources Control Board
USGS	U.S. Geological Survey
USEPA	U.S Environmental Protection Agency
Water Board	California Central Coast Regional Water Quality Control Board (RWQCB)

Comments and Staff Responses

1. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

As one of the leading Agricultural organizations in Monterey County, we are expressing concern with some of the provisions of the proposed Total Maximum Daily Load (TMDL) for the Lower Salinas River and other basins listed in this document. Overall, we find that the proposed standards are too aggressive and set up the farming community in these watersheds for ultimate failure when these standards cannot be achieved. Our concern is that while attempting to achieve these standards, farmers will expend huge amounts of capital chasing an unrealistic target. In an age where regulatory pressures from all sides are chipping away at the financial viability of farmers, particularly small farming operations, the targets suggested will exasperate a tenuous situation.

Staff response: It is important to recognize that achievement of the biostimulatory substances water quality targets is not required or contemplated for two to three decades (20 to 30 years). Staff maintains there is sufficient information about the nature and seriousness of the water quality problem and about potential mitigation strategies to begin to make progress towards complying with state water quality standards now. As noted in the project report, public agency scientists and local resource professionals have emphasized the significant degradation of freshwater aquatic habitat and decline of aquatic species in the TMDL project area as well as the serious detrimental impacts to ecologically sensitive downstream receiving waters, such as Elkhorn Slough. Legally designated

beneficial uses of surface waters in the project area have been impaired locally, including drinking water supply, groundwater recharge, aquatic habitat, agricultural supply, and recreational use.

Undoubtedly, over the next couple of decades additional helpful knowledge about nutrient pollution mitigation strategies will emerge. Currently, there are a number of mitigation strategies that have been demonstrated to be effective at nutrient pollution reduction based on pilot studies and field-scale trials in the Salinas Valley and nationwide. Some of these case studies and success stores are documented in the TMDL project report. Quite a few growers and resource professionals are reportedly actively pursuing improved irrigation management strategies, nutrient management strategies, and implementation of vegetated treatment systems and these persons should be commended for these efforts. Field trials and experimental wetland treatment systems in the Salinas Valley over the past decade and more have been demonstrated to show the efficacy of nutrient load reductions using low-maintenance vegetated systems. Also note that subsequent to the public comment period, staff also added additional narrative to the "Case Studies, Success Stories, and Existing Implementation Efforts" section of the TMDL project; for ease of reference the narrative is reproduced below:

> ***Reducing Nutrient Loading From Vegetable Production (Field Trials)***
>
> *This project was implemented by UC Davis and University of California Cooperative Extension (project leaders: T.K. Hartz,, R Smith, and M. Cahn) and included three field trials conducted in drip-irrigated lettuce fields in northern Monterey County during the summer and fall of 2007. This project was undertaken to demonstrate the potential for reducing N and P fertilization rates in lettuce production while maintaining high yield and quality. Given the rapid adoption of drip irrigation in central coast vegetable production, and the fertilizer and irrigation efficiency that can be gained with this technology, all trials were conducted in drip-irrigated fields. These trials documented that improved fertilizer management practices previously demonstrated in sprinkler-irrigated fields are equally applicable to drip-irrigated culture. The highly efficient drip irrigation scheduling done by the cooperating growers was an encouraging sign of improved management that could significantly reduce off-site nutrient loss; such real-world examples of efficient irrigation management are helpful in our educational efforts with industry groups. The potential for significant reduction in fertilizer usage demonstrated in these trials suggests that continued grower education is required to convince the industry that current fertilization practices can be improved without risk of crop loss.*
>
> *From: "Reducing nutrient loading from vegetable production" (field trials – Salinas Valley). UC Davis and Univ. of Calif. Cooperative Extension – Project Leaders: T.K. Hartz, R. Smith and M. Cahn. 2007.*

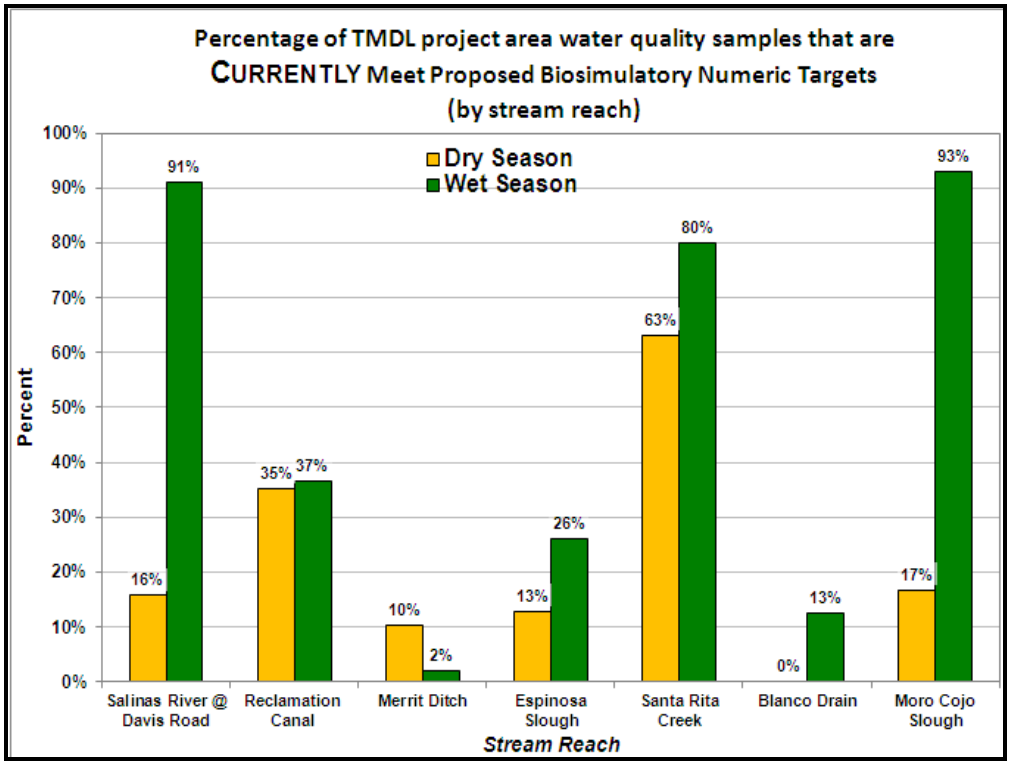
With that being said, staff acknowledges here (as was acknowledged in the March 2012 draft TMDL project report) that there is uncertainty about the feasibility of achieving the proposed water quality targets in an important agricultural watershed that produces leafy greens, vegetables, and cole crops. In recognition of these uncertainties, staff has proposed the Water Board re-consider the proposed TMDLs, if adopted, in ten years. Additional research, studies, and information over the next decade may further inform the Water Board on appropriate implementation timelines and water quality targets.

Regarding the comment on costs, the State and federal governments have made a substantial amount of money available in the form of grants to assist stakeholders in watersheds with approved TMDLs to address nonpoint source pollution. Other cost-sharing and incentive payment programs are available through public funding sources, and are identified in the TMDL project report.

Also noteworthy is that preventing and correcting threats to human health and degradation of aquatic habitat are the Central Coast Water Board's two highest identified priorities. The nitrate threat to human health and drinking water supplies is well known and well established. The degradation of aquatic habitat and decline of fish species in the Lower Salinas Valley and in the ecologically sensitive downstream receiving waters of Elkhorn Slough have been known for many years, and have been documented by various public agencies, researchers, and scientists. Nutrient-related water quality problems such as biostimulation, excess biomass, and dissolved oxygen imbalances have been recognized for many years in some stream reaches of the lower Salinas Valley and their downstream coastal confluence receiving waters.

Regarding the comments on the infeasibility of achieving the proposed water quality targets, it is important to note that the approaches staff used in biostimulatory water quality target development were based in part on USEPA-recognized statistical methods. Practically speaking, this means the approach staff employed was intended to facilitate numeric target development appropriate to local scales and local conditions. Since staff's approach included the 25th percentile approach applied at the project-area scale, as a practical matter this means that on average one out of every four (25%) water quality samples (monitoring years 1999-2010) on average are in fact already meeting the proposed biostimulatory targets. In other words, it is not accurate to suggest the targets are infeasible and cannot be achieved − they are already being achieved episodically in many stream reaches of the TMDL project area. It should be noted that achieving the targets in some stream reaches, like Blanco Drain, and Tembladero Slough, will indeed be challenging, either because upstream sources are contributing to the observed in-stream degradation (Tembladero Slough), or because control of shallow groundwater, tile drainage, and water management in a vegetable cropland setting present challenging technical issues locally. Figure 1 presents a graphical illustration of the frequency with which current and recent water quality samples already meet the proposed biostimulatory numeric water quality targets.

Figure 1 Percentage of water quality samples (1999-2010) that are CURRENTLY meeting proposed biostimulatory targets for nitrate.



Finally, it should be noted that TMDL progress and success cannot solely be defined on the basis of nutrient concentrations in the water column. This is a recognition of the fact that biostimulation is the result of a combination of factors, not limited to just nutrients. Addressing biostimulatory problems and aquatic habitat degradation does not require implementing parties to be singularly focused on receiving water nutrient concentrations. Nutrients alone do not cause water quality problems (unless at high enough levels to be toxic); rather they can indirectly contribute to a cascade of effects that result in aquatic habitat degradation by excess biomass and dissolved oxygen imbalance. The proposed Basin Plan amendment and TMDL implementation plan endeavor to provide flexibility and identify a number of water quality numeric criteria, methodologies, and holistic approaches that can be used to show progress in achieving the TMDL.

2. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

We question that the link to groundwater impairment is due to current nitrogen leaching. We all are aware of legacy issues, but current farming practices utilize less nitrogen than in past generations. A direct link to the levels of nitrogen in groundwater cannot be scientifically linked to current farming practices, or that these practices are contributing further to the problem. Groundwater issues will take many decades to resolve and research has not documented that continued impairments are coming from current practices or nitrogen use levels. Until this link is fully established, the target standards place too much responsibility on the part of current farmers and their growing practices.

Staff response: TMDLs address surface waters. This TMDL does not directly address groundwater pollution problems. Shallow groundwater (recently recharged groundwater or groundwater in perched or shallow hydrogeologic horizons) is only a concern in TMDL development and implementation to the extent shallow groundwater inputs to stream flow

contributes to in-stream pollution. Also, staff must be cognizant of our statutory obligation to protect the groundwater recharge beneficial use of designated stream reaches.

Staff concurs that legacy pollution undoubtedly exists in shallow groundwater in some areas. Staff concurs that based on site-specific conditions of crop type, irrigation method, soil type and other factors, some growers may not leach nitrogen to shallow groundwater. Staff does not have the data, information, and facts that would allow us to conclude that there is no longer any nitrogen leaching to groundwater from current agricultural practices in the Salinas Valley. There are certainly well-documented cases where the weight of evidence indicates that leaching of nitrogen from agricultural practices to groundwater in some areas of the Salinas Valley is current and recent (e.g., nitrate contamination of San Lucas community well).

It should be noted that staff have received communications from other agricultural stakeholders in which they state it may not be possible to completely eliminate nitrogen "leakage" from leafy green crops or strawberries, which evidently suggests a recognition that some nitrogen leaching can and does occur in real time, locally.

Staff concurs that shallow groundwater impacts to surface waters of the lowermost Salinas Valley may continue locally, or in discrete stream reaches, for decades. This was assessed and acknowledged in the TMDL project report, and implementation timelines on the order of decades were proposed on the basis of this information. Staff is aware that growers cannot feasibly control some legacy pollution problems in the groundwater. However, it should be noted that legacy pollution in groundwater can be considered a beneficial economic resource − it is well established that resource professionals do encourage growers to credit nitrate in irrigation water towards their fertilization practices; this certainly could be considered one type of viable holistic implementation practice.

Currently, there are a number of mitigation strategies that have been demonstrated to be effective at nutrient pollution reduction based on pilot studies and field-scale trials in the Salinas Valley and nationwide. Some of these case studies and success stories are documented in the TMDL project report. Quite a few growers and resource professionals are reportedly actively pursuing improved irrigation management strategies, nutrient management strategies, and implementation of vegetated treatment systems and should be commended for these efforts.

3. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

There is a distinct lack of flexibility with the TMDL proposal for new and future technology developments. As research and technical studies accelerate in the coming years, due to emphasis on groundwater impairments, new and different techniques will be developed to sustain environmentally healthy farming practices. This may or may not include the reduction in the use of nitrogen; crops survive on nitrogen to develop and reductions in the use of nitrogen will have consequences on yield and quality. Until further research develops new practices and technology that address how crops are grown and managed in the field, any TMDL program should include the possibility that the unknown and undiscovered will further enhance our knowledge base towards solving these issues. We remain concerned, as with any new regulatory mandate, that the cost impacts to the farming community are not sufficiently addressed or known. Achieving a stretch standard, such as what is proposed, will require significant investments by farming operations when the techniques that are proven to be most successful are not yet fully identified. Characteristics such as source water, soil type, temperature, and specific crop patterns will significantly alter the possible solutions and the costs involved for each individual farmer. Unfortunately, one size does not fit all in this case, as the watersheds involved in this proposed TMDL are varied and widely disbursed.

Staff response: Staff concurs that one size does not fit all and that possible solutions will vary depending on site-specific conditions. In accordance with §13360 of the California Water Code, the Water Board cannot mandate the site-specific types of management practices necessary to achieve water quality improvements. It is recognized that landowners, researchers, and local resource professionals are in the best position to identify effective management practices based on local conditions, based on newly emerging techniques, etc., with the Water Board providing an oversight role in accordance with adopted permits and State law.

Staff has included in the TMDL proposal, as the commenter suggests, the potential for increasing knowledge regarding how to solve water quality impairments, and the evident fact that doing so will take time. For example, Staff concurs that it will take time to address nutrient pollution, degradation of drinking water supply, and degradation of aquatic habitat. The proposed Basin Plan amendment and TMDL implementation plan do not require immediate, imminent, or prompt compliance with water quality goals, nor is there a new proposed "stretch standard" as the commenter states. Achievement of the interim and final water quality goals associated with this TMDL is not required or contemplated for a significant period of time (from 12 to 30 years). In addition, the proposed Basin Plan amendment commits the Water Board to reconsider the timelines and water quality targets of the proposed TMDL based on future research, studies, and data.

4. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

Farmers may seek other sources for funding of their possible solutions when attempting to comply with the standards specified. Too many times the use of grant funding is mentioned, but the reality is that grants are difficult to apply for, the process is rigorous and intimidating, and farmers are not sufficiently qualified to navigate this complex process on their own. Grant funding in the future will be more difficult to obtain, therefore leaving a large gap in funding availability to help finance meaningful projects. Specifically, if this is a route that is intended to be used for project financing, then a strategic process should be developed to help achieve the goal of getting this funding into the hands of farmers who can utilize it best.

Staff response: The proposed TMDL is not simply a route intended to open grant funding availability. TMDLs are required through the Clean Water Act to address surface water quality impairments. That said, an approved TMDL can expand the opportunities for available grant funding; it is our hope that implementing parties continue to seize these grant opportunities, and Water Board staff will continue to do what they can to help potential grantees through the grant acquisition process. Note that individual growers do not apply for the federal and State grants identified in the TMDL project report. Resource professionals, such as those affiliated with RCDs, non-profit entities, and others are positioned to partner with growers, and these entities generally apply for the grants on behalf of their grower partners. The Central Coast Water Board grants staff oversees the grants program and grants staff is in a position to answer additional questions you may have. As for cost-sharing programs (e.g., NRCS-EQUIP) and incentive payments, staff's understanding is that local RCD and NRCS service centers can assist growers with obtaining these types of funding sources.

Also, please refer to staff response to comment 22 for further relevant information pertaining to grants.

5. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

One of the rubbing points here in the Salinas Valley has always been the vegetative growth in the Salinas River channel. Currently, farmers have been prohibited from managing their property, including the channel itself, for over four years. This has allowed an alarming rate of vegetation to develop within the channel, decreasing the flow rate of water in the channel. Because the entire Salinas River system is now operated on a year-round basis because of mechanical releases of water from the upstream reservoirs, the natural state of the river is not achieved at any time of the year. Before the dams were built the Salinas River channel was *dry* for nearly nine months of the year, minimizing the amount of vegetation that could be sustained in the channel. Because of the year-round flows, the natural state of the river has been transformed into a jungle of weeds, willows, and invasives; the overall result of all this overgrowth is the distinct possibility of flooding if a heavy storm event occurs – the channel is not sufficiently clear to manage the amount of flow that would be produced. This puts at risk not only farmland but public safety if infrastructure is damaged or destroyed, including water reclamation systems located near the river channel. Increasing riparian habitat in the Salinas River watershed will not return the river to its natural state and will only serve to enhance unintended consequences. We urge a stronger program of channel vegetation maintenance be included in the proposed TMDL document, to ensure that water flows can be properly channeled downstream and not into farmland or public areas.

Staff response: Thank you for the comment. Indeed, in section 7.12.1 of the March 2012 draft TMDL project report staff noted that invasive riparian vegetation can potentially have detrimental effects on flows, and that the removal of invasive species and increased flows and water column aeration could have a beneficial effects on water quality improvement in the context of holistic watershed management, and could potentially help in reducing the risk of nutrient-related biostimulation. Regarding channel maintenance in the Salinas River, the TMDL process is not the appropriate administrative venue for recommending changes to channel maintenance practices. Please contact the Army Corps of Engineers or the Central Coast Water Board's Stormwater Permitting and 401 Certification programs. These entities and programs have the authorities necessary to address channel maintenance permitting issues.

Regarding the comment on changing flow patterns of the Salinas River, it should be noted that the Salinas River upstream of Spreckels does <u>not</u> show evidence of nutrient-related water quality impairments based on available data. Therefore, flow associated with Nacimiento and San Antonio reservoirs dam releases (these are generally high quality waters) and changes in flow patterns are not causing in-stream water quality impairment in the lower Salinas between Gonzalez and Spreckels on the basis of designated beneficial uses and numeric water quality criteria. Downstream of Spreckels, however, it is very likely that inputs from the Blanco Drain, the City of Salinas's stormwater outfall, and other nonpoint sources of agricultural inputs to the lowermost Salinas River are causing nutrient-related impairments of the lowermost Salinas River from downstream of Spreckels to the lagoon.

6. Mr. Norman Groot, Executive Director, Monterey County Farm Bureau

Lastly, there appears to be a distinct lack of stakeholder buy-in to this process, and in particular to the proposed numerical standards within the TMDL. The models used to forecast costs do not build trust within the regulated community if details on how the models were developed and the process used to make conclusions are disclosed. This lack of transparency will bring more suspicion upon the TMDL targets and the timelines proposed. We urge your further disclosure, and further discussion, with the farming community on how the models were developed and utilized.

Staff response: The comment and concerns of Mr. Groot are acknowledged. The drinking water standard for nitrate and the Basin Plan objective for unionized ammonia are regulatory standards that exist apart from, and independent of, the TMDL. As such, these standards exist and must be complied with whether or not there is a TMDL. Staff is required to implement existing state water quality standards in the context of a TMDL pursuant to state and federal law. TMDLs are not water quality standards themselves, but constitute plans and strategies to implement existing state water quality standards, in accordance with the Clean Water Act.

The proposed biostimulatory substances water quality numeric targets in this TMDL implement an existing state narrative water quality regulatory standard that exists whether or not there is a TMDL. These numeric water quality targets are estimates of the levels of nutrients needed to be achieved in order to implement the Central Coast Basin Plan's biostimulatory substances water quality standard, but the TMDL numeric targets are not enforceable regulatory standards in and of themselves. These proposed targets are based on USEPA and SWRCB-recognized approaches that take into account local conditions, and these proposed targets are locally currently being achieved episodically in a substantial number of water quality monitoring events (please refer back to staff response to Comment 1). In other words, these proposed numeric targets are currently being achieved periodically in a number of stream reaches in the TMDL project area, and therefore at this time staff does not consider these targets to be universally unachievable or arbitrary. Also, it should be noted that achieving receiving water quality targets for nutrients is not the only metric for assessing attainment of water quality standards. As noted repeatedly in the TMDL project report, nutrient numeric concentration targets are not the only metric for assessing compliance with the biostimulatory substances water quality standard—staff has proposed a wide range of numeric water quality targets, criteria, parameters, and implementation methodologies that provide flexibility, and in recognition that receiving water targets for nutrients, alone, are not an appropriate implementation and water quality metric for this TMDL. Further relevant information regarding numeric targets and assessment criteria is also available in staff response to Comment 57.

With regard to cost estimates, staff did not create any models. A TMDL is not required to estimate costs associated with compliance with an existing order or permit which exists independently whether or not there is a TMDL. Staff is proposing that compliance with the Agricultural Order is a de facto demonstration that a grower is implementing the TMDL. However, in recognition that an approved TMDL enables the state government to prioritize grant funding towards the TMDL watershed, and in recognition that voluntary efforts, efforts pursued pursuant to approved TMDL-related grants, or efforts conducted through other local programs and plans will be addressing the serious scope of nutrient pollution in TMDL project area, staff anticipates that money will be spent to control nutrient pollution independently of the Agricultural Order.

As such, staff presumed that these efforts could reasonably be deemed to be congruent and consistent with "TMDL implementation" and that they will result in the expenditures of money and resources that may go above and beyond the baseline requirements of the Agricultural Order (Ag Order). Consequently, as a matter of due diligence, staff included estimates of incremental costs attributable to TMDL implementation that go above and beyond baseline requirements of the Ag Order. Accordingly, in the TMDL project report staff did not create any economic models, but in fact used existing cost estimates produced previously by Central Coast Water Board Agricultural Program staff. TMDL staff then incrementally increased those previous cost estimates that pertained to aquatic habitat

protection, and nutrient and irrigation management in recognition of the aforementioned anticipated efforts that would go above and beyond Ag Order compliance requirements.

Regarding the comments mentioning buy-in process, further disclosure and discussion, please see staff's response to comment number 69. Staff made specific efforts to include the public and stakeholders during the TMDL development process; some stakeholders and interested parties have been involved during the course of TMDL development, and others have not been until now. Although staff would much prefer buy-in to all TMDL proposals, staff must proceed with recommendations necessary to improve water quality and address impairments, as required by law.

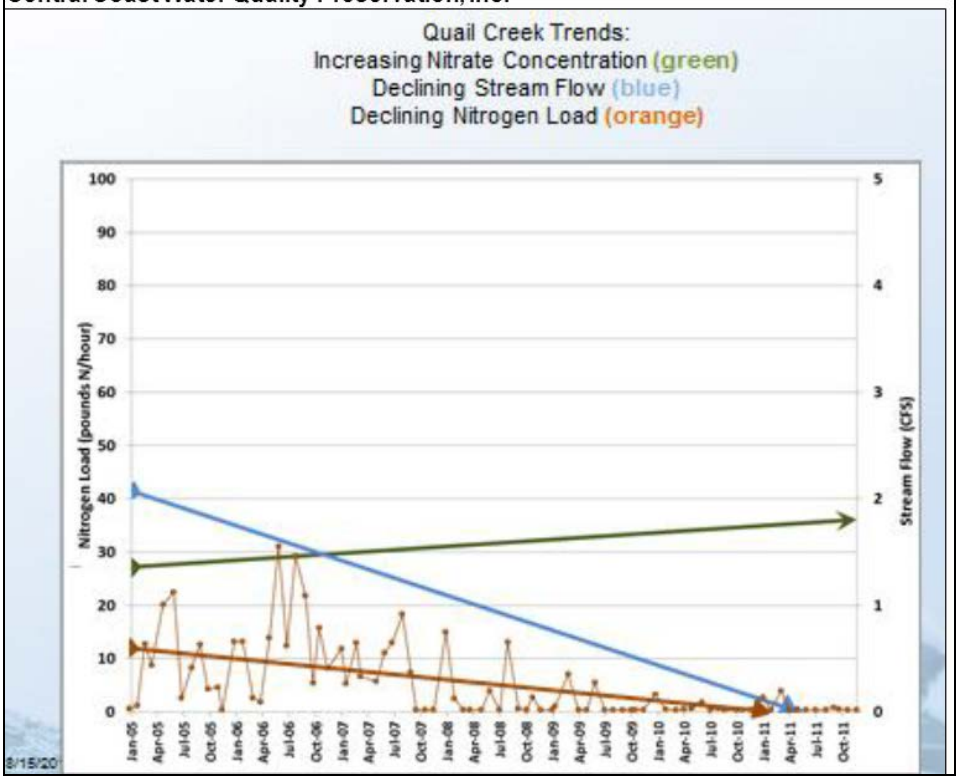
7. Mr. Kirk F. Schmidt, Executive Director, Central Coast Water Quality Preservation, Inc.

The objective of any TMDL is to establish a target goal which measures quantity of a pollutant over a period of time so that multiple dischargers to a waterbody equitably share in the responsibility of reduction of the named impairment over the time horizon set in the TMDL. The total load is then allocated between the dischargers, so each has a target to achieve. One method of establishing a load is to measure the volume of the flow of water and multiply that by the concentration of the impairment to determine how much of the pollutant by weight is discharged on a daily basis. Measurement of either the flow or concentration alone cannot determine the load. To put this in prospective, a concentration only standard values a teaspoon of salt as equivalent to a truck load of salt, even though the weight (load) of salt is substantially different. The Draft further confuses the issue of allocation of a load, as required, with the statement of a concentration which is defined as an "allocation".

The TMDL process included several meetings with interested parties and their representatives in Salinas. However, during every meeting staff stated that they were proposing a concentration based TMDL and never addressed, either in the meetings or in the proposed TMDL, a load based TMDL. Nor is there any discussion in the draft of the difference between a concentration based TMDL and a load based TMDL as it may be applied to the discharger which are subject to the TMDL. This lack of any consideration of a load based TMDL was raised by municipal and agricultural representatives at every meeting. Concentration is a vital part of calculating a time based load allocation (concentration x flow x time = load) but it is only part of the necessary calculation. The EPA states: "The in-stream water quality criterion (concentration) multiplied by daily stream flow and the appropriate conversion factor would translate the applicable criterion into a daily target." (see below)

The Draft TMDL fails to establish or allocate a load. Instead it proposes a series of numeric concentration targets without regard for flow and disregard for EPA procedures for establishing a TMDL.

Figure as provided by:
Mr. Kirk F. Schmidt, Executive Director, Executive Director,
Central Coast Water Quality Preservation, Inc.



The failure to establish a load for any of the waterbodies in the TMDL boundaries means that there is no way to measure reduction of the amount of the impairment entering the receiving waters. A good example can be seen by the CMP monitoring over the last seven years at Quail Creek in Monterey County. The following chart shows a reduction in Nitrogen load between 2005 and 2011 greater than 95%, while N concentration increased slightly.

Due to the significant decline in stream flow, with only a nominal increase in N concentration, the load at the point of monitoring has declined. Regrettably concentration did not. This illustrates why concentration is not a good proxy for load. Furthermore, as flow declines and stream depth lessens there is the potential for a greater rate of evaporation, further increasing concentration with no change in overall load.

E.P.A. regulations and guidelines: TMDL stands for Total Maximum Daily Load. Load is "An amount of matter or thermal energy that is introduced into receiving water. Loading may be either man-caused (pollutant loading) or natural (natural background loading). 40 CFR § 130.2 (e)
TMDL is "The sum of the individual WLAs for point sources and LAs for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. ..." 40 CFR § 130.2 (i) .

EPA has stated that the use of time and flow is required:

> "EPA continues to believe that the use of the word "daily" in the term "total maximum daily load" is not an unambiguous direction from Congress that TMDLs must be stated in the form of a uniformly applicable 24-hour load. ... EPA recommends that all TMDLs and associated load allocations and wasteload allocations be expressed in terms of daily time increments. In addition, TMDL submissions may include alternative,

non-daily pollutant load expressions in order to facilitate implementation of the applicable water quality standards. TMDLs must continue to be established at a level necessary to attain and maintain the applicable water quality standards, account for seasonal variations and include a margin of safety. Because water quality standards are expressed in a variety of ways and because pollutants and water bodies have different characteristics, EPA believes that there is some flexibility in how the daily time increments maybe expressed. The following are a few examples of this potential flexibility:

- If consistent with the applicable water quality standard and technically suitable for the pollutant and water body type in question, a TMDL and associated load allocations and wasteload allocations may be expressed as both minimum and, maximum daily loads, or as average daily loads. For example, a TMDL for the pollutant parameter pH may include both minimum and maximum values consistent with how the applicable WQS for the parameter pH is expressed (commonly as a range.)
- If technically appropriate and consistent with the applicable water quality standard, it may also be appropriate for the TMDL and associated load allocations and wasteload allocations to be expressed in terms of differing maximum daily values depending on the season of the year, stream flow (e.g., wet v. dry weather conditions) or other factors. In situations where pollutant loads, water body flows, or other environmental factors are highly dynamic, it may be appropriate for TMDLs and associated allocations to be expressed as functions of controlling factors such as water body flow. For example, a load-duration curve approach to expressing a TMDL and associated allocations might be appropriate, provided it clearly identifies the allowable daily pollutant load for any given day as a function of the flow occurring that day. Using the load-duration curve approach also has the advantage of addressing seasonal variations as required by the statute and the regulations.
- For TMDLs that are expressed as a concentration of a pollutant, a possible approach would be to use a table and/or graph to express the TMDL as daily loads for a range of possible daily stream flows. The in-stream water quality criterion multiplied by daily stream flow and the appropriate conversion factor would translate the applicable criterion into a daily target (TMDL)." (emphasis added) {Establishing TMDL "Daily" Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, (April 25, 2006) and Implications, for NPDES Permits, Nov. 15, 2006, EPA, http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/dailyloadsguidance.cfm }

Staff needs to develop a load allocation as an alternative to a concentration based standard so that the RWQCB Board has the opportunity to select TMDL targets which comply with EPA standards. The process could start with the minimal flow records contained in Appendix B to the draft and add seasonal diurnal flow data throughout the TMDL area. Seasonal flow information is particularly important for the realistic adoption of biostimulatory substances seasonal targets.

Staff response: Thank you for the comment and staff appreciates the opportunity to provide clarification here. Staff concurs that mass load-based expressions can provide a meaningful connection with implementation efforts. These alternative mass-based load expressions are incorporated in the final draft TMDL project report and the proposed Basin Plan amendment as will be discussed and addressed below.

First, regarding the comments on USEPA guidance, it should be noted that USEPA does not require mass load TMDLs and mass load allocations on the basis of flow. The November 15, 2006 USEPA memo reproduced by Mr. Schmidt was written by USEPA to address the fact that TMDLs and load allocations needed to include a "daily time increment"[1], which was written as a result of a federal appellate court ruling. The relevant narrative from the 2006 memo is produced below:

> *"In Friends of the Earth, the D.C. Circuit held that two TMDLs for the Anacostia River (one established by EPA and one approved by EPA) did not comply with the Clean Water Act because*

[1] *This was a result of a federal appellate court decisions, in which the Court found that when USEPA established an Anocostia River TMDL on the basis of annual loads, USEPA did not comply with the Federal Clean Water Act's requirement to incorporate and report a "daily" load.*

> *they **were not expressed as "daily" loads**… EPA recommends that all TMDLs and associated load allocations and wasteload allocations be expressed in terms of daily time increments. In addition, TMDL submissions may include alternative, non-daily pollutant load expressions in order to facilitate implementation of the applicable water quality standards." (USEPA Memorandum, Nov. 15, 2006 – Water Board staff emphasis added)*

The issue at hand addressed in the USEPA Nov. 15, 2006 memorandum dealt with the necessity of incorporating court-mandated daily time step-expressions (i.e., a "daily" load), but did not involve the legal definition of "load"; aka a total maximum daily load and its associated load allocations, which in accordance with federal regulations can be "expressed in terms of mass per time, toxicity, or other appropriate measure"[2] that relate to a state's water quality standards[3] . USEPA has, and continues, to approve concentration-based total maximum daily loads and concentration-based load allocations in California and nationwide. The SWRCB Office of Chief Counsel informs staff that concentration-based load allocations are appropriate under federal regulations, and the appropriateness of concentration-based load allocations has in fact been upheld by court precedent[4].

Additionally, while the aforementioned Nov. 15, 2006 USEPA memorandum included what USEPA characterized as "a few examples" of flexibility in how daily time increments could be expressed, the memo also stated that USEPA would be following up the 2006 memo by issuing "additional technical guidance" pertaining to these matters:

> *"EPA will issue additional technical guidance providing specific information regarding the establishment of daily loads for specific pollutants that will take into consideration the averaging period of the pollutant, the type of water body, and the type of sources the TMDL needs to address." (USEPA memo, Nov. 15, 2006 – Water Board staff emphasis added)*

The "additional technical guidance" was provided by USEPA on June 22, 2007. To reiterate, the basis of this guidance was to facilitate the expression of a "daily" loads, consistent with the court mandate to include a daily-time step expression. The issue at hand was not to re-interpret federal regulations such that load allocations must only be presented on the basis of mass load-flow expressions. In the 2007 guidance, USEPA explicitly recognized the validity of concentration-based total maximum daily loads, and that where concentration loads were expressed as a maximum, or "never to exceed" value, then the TMDL is "already expressed on a daily basis" (aka, a "daily" time step increment), and thus the TMDL meets the requirements of federal regulations. However, in cases where "non-daily" concentration-based TMDLs were expressed in non-daily terms, such as a monthly, or annual concentration average, USEPA recommended incorporating a daily load expression in order to comply with the "daily time increment" legal mandate of the federal court ruling—this could involve the use of flow data to convert the non-daily concentration load to an estimated daily mass load:

> ***Identifying Daily Expressions for Non-daily Concentration-based TMDLs (USEPA)***
>
> *"For some criteria or targets, the duration is expressed as a daily average or never to exceed value. For concentration-based TMDLs established to meet these targets, the TMDL is already expressed on a daily basis. However, many water quality criteria or representative TMDL targets are based on longer time steps, including monthly or even annual averages. Figure 25 illustrates an example TMDL developed to attain the water quality criterion of an annual average*

[2] *40 C.F.R. 130.2(i)*
[3] *State Water Resources Control Board, Water Quality Control Policy for Addressing Impaired Waters, adopted by Resolution 2005-0050.*
[4] *Court of Appeal, Third District, California. 183 Cal.App.4th 1110, 108 Cal.Rptr.3d 290*

concentration of 25 mg/L TSS. For concentration-based TMDLs set equivalent to longer-term targets, the TMDLs should also include a daily expression."

USEPA, June 22, 2007. Options for Expressing Daily Loads in TMDLs

It should be noted that this issue was addressed in Section 6.2.1 of the October 2012 draft TMDL project report; for ease of reference the relevant narrative is reproduced below:

6.2.1 USEPA Guidance on Daily Load Expressions

In light of a court decision (Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, D.C. Cir. 2006), USEPA recommends incorporating a daily load expression for certain types of TMDLs which are based on a concentration-based loading capacity (USEPA, 2007); e.g., when the concentration-based numeric loading capacity has a time-step, or temporal component embedded in the numeric target (for example, the 30-day geometric mean Basin Plan numeric objective for fecal coliform). In other words, a loading capacity based on a 30-day average, a seasonal mean, or a mean annual numeric target does not represent a "daily load." However, the loading capacities for this TMDL are based on the Basin Plan nitrate water quality objective, the Basin Plan unionized ammonia objective, and single sample numeric water quality targets for biostimulatory substances. These are instantaneous water quality targets. USEPA considers an instantaneous water quality numeric target to be equivalent to daily-time step measurement and therefore representative of a daily load expression (USEPA, 2007a). Therefore mass-based daily load expressions are not warranted for this concentration-based TMDL. (March 2012 Draft TMDL Project Report

With that said, staff is aware that a concentration-based load allocation expression may not adequately provide meaningful connection to on-the-ground implementation decisions. Staff is also fully cognizant that simply measuring the concentration of a pollutant in a grab sample from a stream may, or may not, tell us much about how much pollution is being reduced or the efficacy of implementation practices. In other words, a water column concentration tells one something about whether or not a water quality standard or target is being attained, but it may not necessarily tell you much about how much pollutant loading to the stream has been reduced or increased over longer temporal scales, and as related to flow conditions.

In the March 2012 draft TMDL project package, staff endeavored to provide for implementation flexibility to account for these uncertainties; for ease of reference, the relevant narrative from the March 2012 draft Basin Plan amendment and project report is reproduced below:

Metrics to Assess Interim Progress towards TMDL Achievement

(from: March 2012 Draft TMDL project package)

Recognizing there are uncertainties including, but not limited to, extreme inter-annual variability in pollutant loading to surface waters based on climatic conditions, flows, water management practices, uncertainties about the nexus between receiving water pollutant concentrations and leachate concentrations5, etc., measures of TMDL implementation progress will not necessarily be limited to receiving water column concentration-based metrics and/or time-weighted average concentrations of water column pollutants.

Other metrics that can provide insight on interim progress to reduce nutrient pollution may be utilized, for example:

[5] *Pilot-scale field trials in Monterey County suggests that while substantial reduction in nitrogen loss from cropland are achievable with BMPs, there was not a corresponding reduction in nitrate leachate on a concentration (ppm) basis. Source: Michael Cahn, 2010, University of California Cooperative Extension, Monterey County, Optimizing Irrigation and Nitrogen Management in Lettuce for Improving Farm Water Quality, Northern Monterey County, Grant No. 20080408 project report*

- *assessments of mass-based load reductions;*
- *improvements in flow-weighted concentrations;*
- *estimates of the percent/scope/degree of implementation of management practices capable of ultimately achieving load allocations;*
- *improvements in receiving water nutrient-response indicators (i.e., dissolved oxygen, chlorophyll a, microcystins), etc.*

In addition, while the waste load and load allocations are based on the MUN water quality standard of 10 mg/L, or biostimulatory numeric criteria, restoration of the AGR beneficial use (based on the 30 mg/L nitrate-N Basin Plan guideline value) during TMDL implementation can be used as an indication of interim progress.

The March 2012 draft TMDL project report indeed also included subwatershed-scale mass load reduction estimates. These were intended to facilitate implementation of the water quality standards, and to provide alternative, meaningful metrics for showing progress towards water quality goals and demonstrations of compliance with proposed allocations. Mass load reductions, flow-weighted concentrations, and other criteria were identified and proposed in the March 2012 draft TMDL documents and were intended to provide for flexibility, and alternative metrics of measuring progress.

However, for the sake of clarity and to elevate the importance of mass-load alternative load expression metrics, staff modified both the proposed Basin Plan amendment and the Project Report to clearly provide for the use of mass load expressions as implementation-related assumptions of the TMDL and to facilitate practical implementation of the water quality standards. Accordingly, a new criterion for assessing TMDL implementation and progress has been written into the final draft Basin Plan amendment language to incorporate load reduction assessment (see bullet "C" in the section entitled "Determination of Compliance with Load Allocations"), which for ease of reference is reproduced below:

To allow for flexibility, Water Board staff will assess compliance with load allocations using one or a combination of the following:

A. *attaining the load allocations in the receiving water;*

B. *attaining receiving water TMDL numeric targets for nutrient-response indicators (i.e., dissolved oxygen water quality objectives, chlorophyll a targets and microcystin targets) and mitigation of downstream nutrient impacts to receiving waterbodies may constitute a demonstration of attainment of the nitrate, nitrogen and orthophosphate-based seasonal biostimulatory load allocations. Note that implementing parties are strongly encouraged to maximize overhead riparian canopy using riparian vegetation, as appropriate, because doing so could result in achieving nutrient-response indicator targets before allocations are achieved (resulting in a less stringent allocation);*

C. Demonstrating annual and seasonal receiving water mass load reductions consistent with current load reduction estimates contained in Appendix G of the TMDL project report, or as consistent with reliable and credible flow estimates developed in the future;

D. *owners/operators or irrigated lands may be deemed in compliance with load allocations by implementing management practices that are capable of achieving interim and final load allocations identified in this TMDL;*

E. *owners/operators of irrigated lands may provide sufficient evidence to demonstrate that they are and will continue to be in compliance with the load allocations; such evidence could include documentation submitted by the owner/operator to the Executive Officer that the owner/operator is not causing waste to be discharged to impaired waterbodies resulting or contributing to violations of the load allocations.*

Also, a stand-alone appendix entitled "Appendix G – Alternative Pollutant Load Expressions to Facilitate Implementation of Concentration-based Allocations" has been added to the TMDL project report. The purpose of this appendix is to provide alternative, non-daily pollutant load expressions to facilitate implementation of the daily allocations. Daily allocations, as expressed in this TMDL, are on the basis of daily time-step concentrations (e.g., instantaneous receiving water concentrations represented in grab and field samples). For ease of reference, relevant narrative from Appendix G of the final draft TMDL project report is reproduced below:

Appendix G (final draft TMDL project report) − Alternative Pollutant Load Expressions to Facilitate Implementation of Concentration-based Allocations

The purpose of this appendix is to provide alternative, non-daily pollutant load expressions to facilitate implementation of the daily allocations. Daily allocations, as expressed in this TMDL, are on the basis of daily time-step concentrations (e.g., instantaneous receiving water concentrations represented in grab and field samples).

….in addition, non-daily and alternative load expressions of the concentration-based allocations may be needed to provide a meaningful connection with implementation efforts (such as nonpoint source best management practices) where averaging periods other than daily time steps, or expressions other than receiving water concentration allocations provide the basis for water quality-based control strategies. However, in accordance with USEPA guidance, all final TMDL submissions must contain a daily time-step load component; this requirement is satisfied by the proposed concentration-based TMDLs and allocations.

Table 1 and Table 2 present alternative, non-daily mass load expressions and estimated load reductions for nitrate to facilitate implementation of the TMDLs on an annual (Table 1) and seasonal (Table 2) basis. These alternative load expressions shall be considered implementation-related assumptions of the daily time-step concentration-based allocations.

Figure 1 and Figure 2 provide graphical, map-view context regarding the spatial distribution of existing nitrate-N annual and seasonal loads in TMDL project area stream reaches.

It is important to recognize that there is uncertainty associated with these mass load expressions, as they are in many cases based on limited amounts of instantaneous flow data, or NHDplus modeled flow data and as such reflect coarser temporal load representations (annual and seasonal loads). In the absence of reliable continuous, or daily flow data (i.e., USGS gages or hydrologic modeling), there could be a high degree of error associated with estimated daily flows from limited amounts of instantaneous flows. According to USEPA, the potential for error is particularly pronounced in arid areas, areas with few USGS gages, and areas where flows are highly modified by human activities (e.g., impoundments, regulated flows, and irrigation return flows). Therefore, as noted previously, this TMDL and associated load allocation are based on instantaneous concentration-based loads – this satisfies the USEPA guidance to incorporate a daily time-step load. Also, concentration is generally a more direct linkage to the protection of aquatic habitat, than annual or seasonal mass loads.

It is important to recognize that there is uncertainty associated with these mass load expressions, as they are in many cases based on limited amounts of instantaneous flow data, or NHDplus modeled flow data and as such reflect coarser temporal load representations (annual and seasonal loads). In the absence of reliable continuous or daily flow data (i.e., USGS gages or hydrologic modeling), there could be a high degree of error associated with estimated daily flows from limited amounts of instantaneous flows[6]. According to USEPA, the potential for error is particularly pronounced in arid areas, areas

[6] *U.S. Environmental Protection Agency, 2007. Options for Expression Daily Loads in TMDLs. June 22, 2007.*

with few USGS gages, and areas where flows are highly modified by human activities (e.g., impoundments, regulated flows, and irrigation return flows)[7]. Therefore, this TMDL and associated load allocation are based on instantaneous concentration-based loads—this satisfies the USEPA guidance to incorporate a daily time-step load. Also, concentration is generally a more direct linkage to the protection of aquatic habitat than annual or seasonal mass loads.

8. Mr. Kirk F. Schmidt, Executive Director, Central Coast Water Quality Preservation, Inc.

Implementation inconsistent with existing Ag Order: Proposed implementation refers to the Ag Order, but makes changes which broaden the scope of the existing and future Ag Orders while imposing new, severely short, timelines to achieve interim mandates. In the case of nitrogen these mandated compliance standards are the same ones considered and rejected by the RWQCB Board on March 15, 2012, when the Ag Order was adopted.

Staff response: Staff is not recommending modification of the proposed milestones in the final draft TMDL. The first interim milestone to achieve the nitrate drinking water quality standard is consistent with a TMDL timeline the Central Coast Water Board has previously approved, as will be discussed shortly. To address this comment, it should first be noted that in California, TMDLs must have a time schedule to achieve water quality objectives:

> *"State law, in turn, requires that basin plans have a program of implementation to achieve water quality objectives. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law would require that a TMDL include an implementation plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDL has to be incorporated into the basin plan, And, because the TMDL supplements, interprets, or refines an existing objective, state law requires a program of implementation.*
>
> ***SWRCB Office of Chief Counsel, Memorandum March 1, 1999.***
> *Subject: Do TMDLs Have to Include Implementation Plans? (emphasis added by Water Board staff)*

For nonpoint sources, TMDLs are also expected to comport with the state's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (May 20, 2004), which requires timelines/milestones to achieve water quality requirements.

Second, it should be recognized that TMDL interim implementation milestones and timelines are performance standards that implement the assumptions of the TMDL and associated load allocations, but do not constitute legally enforceable deadlines, such as those that could be found in Board-approved Time Schedule Orders and Cleanup and Abatement Orders. However, they are intended to be informational such that the Water board, stakeholders, and the general public can gage water quality progress over longer temporal scales, and make changes if and as appropriate. In recognition of the uncertainties and assumptions inherent in the proposed TMDL, staff are proposing that the Water Board revisit and revise (if appropriate) the proposed interim and final TMDL milestone targets.

Third, the proposed interim milestone to achieve and comply with the state drinking water standard for nitrate is based on a timeline the Central Coast Water Board previously approved for the Pajaro River watershed nitrate TMDL, as follows.

[7] *Ibid.*

In 2005, the Central Coast Water Board approved a TMDL for the Pajaro River Watershed that established a 20 year time frame to achieve the drinking water quality standard for nitrate – thus, achievement of the TMDL was anticipated by the year 2025. In adopting the Pajaro River Watershed nitrate TMDL, it was presumed that compliance with the Agricultural Order (Ag Order), development of Farm Water Quality Plans, and implementation of improved management practices would be completed within the first five year cycle of the Ag Order, which began in 2004. For the current proposed Salinas River and Reclamation Canal basin TMDL, the proposed mechanism of TMDL implementation is, similarly, the Ag Order. As such, staff presumes that similar levels of compliance with the Ag Order, and implementation of farm water quality planning has been occurring in the lower Salinas Valley (well before TMDL development even began), and compliance and implementation of the Ag Order is at the same scale as it is the Pajaro Watershed TMDL area. Thus, anticipated achievement of the nitrate drinking water quality standard should be expected to be relatively concurrent between the Pajaro Watershed and the Lower Salinas Valley – by the year 2025 in both of these TMDL watershed areas.

Regarding the 20 and 30 proposed interim and final milestones for achievement of the biostimulatory substances water quality standard, it should be noted here that while agricultural stakeholders have recommended longer timeline milestones than staff proposes, a scientific peer reviewer of this TMDL project (Dr. Marc Buetel, Washington State University) and federal fisheries biologists (NOAA-NMFS) have recommended shorter timelines than proposed by staff. Staff's endeavored to propose interim and final milestones that honored the available data pertaining to attenuation of legacy nutrient pollution (e.g., shallow groundwater), and that reasonably takes into account the requests for longer−versus−shorter timelines received from various stakeholder groups and peer reviewers. Additionally, staff articulated that there are uncertainties for achieving nutrient biostimulatory numeric water quality targets in an agricultural watershed that produces leafy greens, vegetable, and cole crops, and identified opportunities for further studies, research, and future Water Board re-consideration of the proposed interim and final milestone timelines.

9. Mr. Kirk F. Schmidt, Executive Director, Executive Director, Central Coast Water Quality Preservation, Inc.

The implementation section of the TMDL, after quoting portions of the Ag Order, continues:

Determination of Compliance with Load Allocations

Load allocations will be achieved through a combination of implementation of management practices and strategies to reduce nitrogen compound and orthophosphate loading, and water quality monitoring. Flexibility to allow owners/operators from irrigated lands to demonstrate compliance with load allocations is a consideration; additionally, staff is aware that not all implementing parties are necessarily contributing to or causing a surface water impairment. However, it is important to recognize that impacting shallow groundwater with nutrient pollution may also impact surface water quality via baseflow loading contributions to the creek.

To allow for flexibility, compliance with load allocations can be demonstrated and determined in several ways. Owners/operators of irrigated lands may be deemed in compliance with load allocations by:

A. attaining the load allocations in the receiving water; and/or

B. attainment of receiving water TMDL numeric targets for nutrient-response indicators (i.e., dissolved oxygen water quality objectives, chlorophyll *a* targets and microcystin targets) and mitigation of downstream nutrient impacts to receiving waterbodies may constitute a demonstration

of attainment of the nitrate, nitrogen and orthophosphate-based seasonal biostimulatory load allocations. Note that implementing parties are strongly encouraged to maximize overhead riparian canopy using riparian vegetation, as appropriate, because doing so could result in achieving nutrient-response indicator targets before allocations are achieved (resulting in a less stringent allocation);

C. owners/operators or irrigated lands may be deemed in compliance with load allocations by implementing management practices that are capable of achieving interim and final load allocations identified in this TMDL; or

D. owners/operators of irrigated lands may provide sufficient evidence to demonstrate that they are and will continue to be in compliance with the load allocations; such evidence could include documentation submitted by the owner/operator to the Executive Officer that the owner/operator is not causing waste to be discharged to impaired waterbodies resulting or contributing to violations of the load allocations. (Proposed Order, page 15)

Dischargers cannot attain "load allocations" in subparagraphs A, C or D above as no load allocations are made or proposed in the draft TMDL. Concentration standards do not constitute an allocation.

Staff response: Please see staff response to Comment 7. Note that staff also added a fifth metric for demonstrating compliance with allocations, on the bases of mass load reduction in the final draft basin plan amendment and TMDL project report.

10. Mr. Kirk F. Schmidt, Executive Director, Executive Director, Central Coast Water Quality Preservation, Inc.

The implementation section of the draft TMDL continues with interim goals if the "implementing parties choose not to develop and propose interim goals" as follows, however there is no mechanism to propose or develop such goals. The "25% percent" (sic) progress toward a MUN 10mg/L concentration objective within three years (below), one year before the end of the recently adopted Ag Order, is not attainable without the elimination of all irrigation tailwater if a concentration standard is used instead of a daily load. Many irrigated farms receive recycled water with 30mg/L N as part of the permits for CSIP and PVWMA delivered recycled water. Others have well water with similar or higher N concentrations. If a daily load allocation was the objective instead of attainment of a concentration target the agricultural dischargers could show progress through reduction of tailwater.

Staff response: Thank you for the comment. It is important to recognize that these interim goals have no regulatory authority, are not water quality standards, and are not enforceable. It should be noted that this narrative was specifically suggested by our MS4 stormwater staff primarily for the purpose of implementing municipal MS4 permit requirements. Staff concur that there should be a process by which stakeholder feedback regarding nonpoint source categories (i.e., agriculture) will be obtained on this issue, prior to any non-regulatory interim goals being used for implementation assessment purposes. Staff added language to this section of the project report stating that it is incumbent upon water board staff to obtain the input of agricultural representatives as to feasible interim goals and identification of a credible baseline standard of measurement, prior to defaulting to the identified non-regulatory interim goals. For ease of reference, the language added by staff reads:

"While there is already a well-defined permitting process to obtain feedback from MS4 entities, it is incumbent on water board staff to obtain the input of agricultural representatives as to feasible interim goals and identification of a credible baseline standard of measurement, prior to defaulting to the identified non-regulatory interim goals."

11. Mr. Kirk F. Schmidt, Executive Director, Executive Director, Central Coast Water Quality Preservation, Inc.

Staff has commented that the MUN concentration standard should not be the target at all:

> "***Staff will propose that all water quality targets for biostimulatory substances be considered maximum concentrations*** (allowing for occasional exceedances of water quality targets consistent with the binomial distribution statistical measures provided for in the California 303(d) Listing Policy)." (Attachment 5 – Peer review comments, page 24) (emphasis added)

Staff response: The assertion is incorrect. However, staff can appreciate that TMDLs projects are large documents, and clarity and comprehension is always a challenge in TDML development, and for any persons reading TMDLs. First, it is important to recognize the context of the bolded staff statement provided (emphasis added below):

> "***Staff will propose that all water quality targets <u>for biostimulatory substances</u> be considered maximum concentrations"***

As noted repeatedly throughout the TMDL project report and in the proposed basin plan amendment, some stream reaches in the lower Salinas Valley are <u>not impaired on the basis of the Basin Plan's biostimulatory substances water quality objective</u>, nor are they contributing to downstream receiving water biostimulatory impairments. Consequently, these designated stream reaches are only required to achieve or comply with the state's drinking water quality standards for nitrate (MUN = 10 mg/L standard) and unionized ammonia standard for toxicity. In other words, the proposed biostimulatory numeric targets do not apply at all to these reaches. As noted in the draft TMDL project documentation, they are specifically: Chualar Creek, Quail Creek, Esperanza Creek, and lower Salinas River upstream of Spreckels, as well as some assessed upstream tributaries). Note that anti-degradation requirements apply to designated waters that have existing water quality that is currently better than the water quality objectives established for nitrate in drinking water supply and for unionized ammonia in the Basin Plan.

The reference to bolded staff narrative is found in the scientific peer review document. The scientific peer review document, and staff responses therein have no legal or regulatory standing or authority. The bolded narrative pertains to a scientific peer reviewer's technical comments about the proposed biostimulatory nutrient numeric endpoints (targets) (i.e., whether or not the nutrient numeric endpoints should be measured against a geometric mean statistical threshold). These comments specifically pertained to the biostimulatory substances targets, not the drinking water standard. A numeric endpoint is, by definition, a "maximum", therefore staff's comments in the peer review attachment pertained to whether the use of the numeric endpoints should be from the perspective of a statistical geomean, or as consistent with the SWRCB's binomial distributions in exceedance frequency analysis (of an instantaneous "maximum" threshold) as promulgated in the SWRCB's Impaired Waters Policy.

12. Mr. Kirk F. Schmidt, Executive Director, Executive Director, Central Coast Water Quality Preservation, Inc.

CEQA: The CEQA analysis fails to consider many aspects of farming in the lower Salinas.

1. No consideration is given to tile drain return flows. At present there is no way to reduce tile drain discharges or to treat the tile drain discharges. The only way to meet the proposed concentration standards would be a cessation of farming.

2. No consideration of alternatives to the proposed concentration based numeric standards was included in the CEQA analysis nor in the proposed order or attachments.
3. There is no discussion of the economic consequences of a reduction in agricultural acreage on the community or the environment.

Staff response: Prior to addressing the three bullets presented by Mr. Schmidt, it should be noted what the California Environmental Quality Act (CEQA) requirements are for assessing detrimental environmental "effects" in a Substitute Environmental Document (SED) produced by a certified regulatory program (aka, Water Board), pursuant to CEQA.

A significant effect on the environment is defined in regulation as:

> *"a **substantial**, or **potentially substantial**, **adverse change** in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant"*
>
> *(14 CCR section 15382)*
>
> *(emphasis added by Water Board staff)*

There is not an ironclad definition of significant physical effect on the environment. Lead agencies must determine the level of significance, if any, based on careful judgment of scientific and factual data (C14 CCR § 15064).

Staff endeavored to execute our CEQA-SED analysis on the basis of the plain written meaning of the regulation. Note that the definition of "substantial" is:

- ***"Considerable in quantity, significantly great" (****Mirriam-Webster)*
- ***"Of considerable importance, size, or worth"*** *(Oxford dictionaries)*
- ***"Large in amount or degree"*** *(Macmillan dictionary)*

Therefore, consistent with 14 CCR § 15382 staff endeavored to consider environmental effects that could reasonably be expected to result in "considerable, significantly great, or large in amount or degree" effects. To be sure, there are many practices and projects that theoretically or reasonably could be expected to result in adverse changes that are incremental, nominal, large enough to be noticeable, or of localized importance. Staff are not required to assess changes at this scale; these would not reach the threshold of a "substantial" adverse change on the environment, consistent with 14 CCR § 15382 .

With that said, staff addresses the comments Mr. Schmidt provides, below:

Staff are not required in a CEQA-SED to consider alternatives the concentration-based numeric targets and TMDLs for biostimulatory substances. However, in the Basin Plan Amendment documents, staff did develop a range of alternative methodologies and metrics to facilitate implementation of the concentration-based targets and load allocations (please refer back to staff response to Comment 7, also please see public comment 9).

Staff indeed gave consideration to the potential for substantial adverse changes to agricultural resources, consistent with the CEQA-SED checklist provided by the State Water Resources Control Board (see Attachment 3 to the Staff Report). Staff concluded that there could be potentially substantial adverse changes to agricultural resources in the TMDL project area, but that these effects could be reduced to less than significant with mitigation incorporation. Water Board staff have made this determination based on best available information in an effort to fully inform the interested public and the decision makers of

potential environmental impacts. Recall, as noted previously, that a "significant" effect is defined in regulation as a "substantial" adverse impact; meaning "considerable, significantly great, or large in amount or degree." Note that CEQA provides that impacts can be reduced to less than substantial. It does not require that adverse impacts be totally eliminated below the "substantial" threshold of the regulation. Staff also addressed mitigation incorporation that addresses the public comment regarding tile drainage, in recognition of the fact that eliminating all tile drainage to receiving waters is reportedly infeasible in the context of agricultural production in this region of the Salinas Valley.

"Mitigation strategies to reduce the adverse impacts of these systems to less than significant have been provided to Water Board staff by reputable local resource professionals….these included: building vegetated treatments systems on small parcels that are already out of production and with minimal intrinsic habitat (e.g., woodchip reactors on the small vacant area that is often adjacent to existing tile-drain pumps)…" − from, CEQA Substitute Document, Attachment 3 to the Staff Report

For ease of reference, the full CEQA-SED analysis on agricultural resources and mitigation incorporations is reproduced in the text box, below.

Nutrient management strategies to protect drinking water and aquatic habitat in agricultural watersheds have been underway for many years across the nation as well as in Europe; staff are unaware of any examples of nutrient water quality management strategies, including TMDLs, having a substantial, adverse economic impact resulting in the cessation of farming. That said, staff recognize the proposed water quality goals are challenging, and have endeavored to provide for flexibility, adaptation, and re-consideration of the water quality targets and timelines.

Environmental Evaluation Discussion (from Attachment 3 of the Staff Report)
AGRICULTURE RESOURCES: --Would the project:
(a) *– Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*

Answer: *Less than significant with mitigation incorporation.*

Discussion*: The proposed TMDL project does not propose or require any person to take agricultural lands out of production. Rather, the proposed TMDL project relies on implementation based on an existing regulatory program adopted by the Water Board (the Agricultural Order). The Agricultural Order requires growers to comply with the Water Code and the Basin Plan by reducing or eliminating discharges of pollutants into surface and groundwater using management practices. None of the reasonably foreseeable non-structural (e.g., nutrient management, and other source controls) compliance methods identified in Section 2 would be expected to cause a substantial adverse change in Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, because non-structural methods of compliance do not reasonably include changes to land use patterns. Structural methods (e.g., vegetated treatment systems) compliance methods identified in Section 2 could result in a substantial adverse change pertaining to conversion to non-agricultural use of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance because some incidental amounts of these lands could be converted to non-agricultural uses (e.g., constructed wetlands) as described below. These actions can be expected to be less than significant with mitigation incorporation as described below.*

Nutrient control strategies and measures in agricultural watersheds have been underway for many years in various agricultural watersheds in the State and throughout the nation. Based on the literature, research, and information staff has surveyed for this project, we are unaware of any

cases where nutrient control strategies have directly been responsible for substantial or widespread adverse impacts resulting in the conversion of farmland to non-agricultural uses.

Dischargers may choose to install riparian habitat buffer strips or vegetated treatment systems as identified in Section 2 to implement the proposed TMDL and comply with the Agricultural Order. These actions could result in taking incidental amounts of land out of crop production. Where dischargers choose to install riparian habitat buffers to control discharges of waste, some farm land could be taken out of production.

Some structural treatment practices identified in Section 2, such as riparian buffers and vegetated treatment systems (e.g., wetlands) could result in conversion of farmland to non-agricultural uses. As discussed in the Final Subsequent Environmental Impact Report (March 17, 2011) Agricultural Order, if all growers in Tier 3 chose to install buffer strips to comply with the Agricultural Order, approximately 82 to 233 acres or 0.002 to 0.004% of the 540,000 acres of agricultural lands within the Region, would be taken out of production. This is because riparian buffers only affect a very narrow band of land on either side of a waterbody. Given the total number of acres farmed in the Central Coast Region, the impact on acres farmed does not constitute a substantial adverse conversion of farmland to non-agricultural uses even if all 233 acres in the Central Coast Region were converted to some other use. This estimate represents the acreage of land that would be taken out of production if all growers chose to install riparian habitat buffers and all of those buffers did not yield any agricultural products. The estimate may be less than this because of alternative means of compliance and/or mitigation. The TMDL project and the Agricultural Order which is proposed to implement the TMDL do not require the use of buffers; other methods may be used or the discharges may not be significant due to existing practices.

Constructed wetlands or other types of vegetated treatment systems could potentially result in a substantial adverse conversion of farmland because these types of systems are anticipated to require more acreage than buffer strips. Mitigation strategies to reduce the adverse impacts of these systems to less than significant have been provided to Water Board staff by reputable local resource professionals[8]; these include appropriate design and location strategies as outlined below:

1) building vegetated treatments systems on small parcels that are already out of production and with minimal intrinsic habitat (e.g., woodchip reactors on the small vacant area that is often adjacent to existing tile-drain pumps);

2) Use larger-area cooperative systems – larger systems have a low circumference: area ratios, and thus less agricultural/habitat contact per unit of water quality improvement;

3) Utilize other location strategies to mitigate impacts; e.g., using the lowest lying areas whose inundation is already increasingly problematic (for example, due to sea level rise, urban expansion, and higher impervious area), or identifying areas of currently non-productive agricultural land adjacent to waterbodies that could be used for treatment wetlands. Indeed, a prominent local resource professional has indicated to Water Board staff that they have already identified hundreds of acres of non-productive agricultural land (left fallow because it is too wet to be used for viable crops) adjacent to channels and waterbodies that might be used for vegetated treatment systems (personal communication, Mr. Ross Clark, Director of Central Coast Wetlands Group at Moss Landing Marine Laboratories, May 2, 2012).

***(b)** – Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

[8] Dr. Fred Watson, Assistant Professor, California State University Monterey Bay and Mr. Ross Clark, Director of Central Coast Wetlands Group at Moss Landing Marine Laboratories.

Answer: *No Impact. None of the reasonably foreseeable non-structural or structural compliance methods identified in Section 2 would be expected to conflict with existing zoning for agricultural uses, or a Williamson Act contract. Also noteworthy is that the overwhelming majority of Williamson Act Lands in the TMDL project area are located in upland, rangeland, and headwater reaches which are not anticipated to require widespread implementation of compliance methods.*

(c) *– Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?*

Answer: *Less than significant with mitigation incorporation.*

Discussion*: Refer back to previous responses under Heading II.(a). Further, an additional potentially substantial adverse conversion of farmland to non-agricultural land could possibly indirectly result from food safety issues. Concerns have been raised about vegetated treatment systems attracting wildlife which might impact leafy green production and risk food safety, thereby indirectly taking viable farmland out of viable production due to issues arising from food safety risks. Possible mitigation strategies to reduce these adverse impacts to less than significant have been provided to Water Board staff by a prominent local resource professional (Mr. Ross Clark, Director Central Coast Wetlands Group at Moss Landing Marine Laboratories, via personal communication May 2, 2012). There are several food safety task forces working to develop better guidelines describing what wetland, creek and treatment wetland related sources and vectors can potentially impact leafy green production and risk food safety. Resource professionals at the Central Coast Wetlands Group at Moss Landing Marine Laboratories could be working with these experts to design treatment wetlands that do not attract wildlife. It should be noted that many animals (birds, rodents, dear etc.) in fact presently use degraded drainages. Food safety risk can be mitigated through rodent fencing, raptor poles to reduce rodent populations, proper selection of plant species that deter pest species, and proper wetland feature design and planting to minimize open water habitat that attract geese and other waterfowl. Also, because these are isolated systems within the landscape they cannot be used as migration corridors by animals.*

13. Mr. Kirk F. Schmidt, Executive Director, Executive Director, Central Coast Water Quality Preservation, Inc.

The draft Nutrient TMDL should be withdrawn and revised to incorporate load based standards. While this will require preparation of new analysis of existing loading and allocate the responsibility to achieve load based standards, it is the only way to meet the EPA mandates for all TMDLs and to allocate load reduction responsibility between dischargers.

Staff response: The load allocations in this TMDL fully comply with federal regulations and USEPA guidance; please refer back to staff response to Comment 7 for relevant information.

With regard to the request for load expressions, alternative, non-daily mass load expressions to facilitate implementation of the concentration-based allocations were presented in the March 2012 draft TMDL project package that was made available for public review. For improved clarity and to elevate the significance of alternative mass-based load expressions, the final draft basin plan amendment language has been modified and a stand-alone appendix for alternative pollutant load expressions to the final draft TMDL project report has been added – staff response to Comment 7 contains relevant information pertaining to this issue.

14. Mr. Steve Shimek, Chief Executive, The Otter Project

Thank you for the opportunity to comment on the Lower Salinas TMDL. Our comments reflect the interests of The Otter Project, our water quality program Monterey Coastkeeper, and our 3000 members and Board of Directors.

We want to begin by recognizing the tremendous amount of work that goes into creating a TMDL. We understand and appreciate staff's good efforts. We further understand and appreciate that the Board has consistently recognized the Lower Salinas sub-watershed as heavily polluted by a variety of discharges, including agriculture, and has made resolution of these impairments a high priority.

Staff response: Staff appreciates the comments.

15. Mr. Steve Shimek, Chief Executive, The Otter Project

We generally support the findings and objectives of this TMDL. However, we believe the allocations are overly generous. As an example, we do not see how we will ever reach a Nitrate-N biostimulatory objective of 2 or 3 (mg/L) while allowing concentrations of 6.4 and 8.0 in the Reclamation Ditch and Tembladero Slough. While the proposed targets are perhaps more realistic, we do not see how they meet the requirement of "Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses." Our example of the Reclamation Ditch and Tembladero Slough are but one example – the allocations are consistently over-generous and not protective against biostimulation.

Staff response: First, it is important to recognize that the proposed 8 mg/L nitrate-N water quality target is a seasonal target that applies universally to impaired streams in the TMDL project area during the wet season. As noted in the March 2012 draft TMDL project report and associated Appendix D (biostimulatory target development), based on available information, it is not necessary to have targets on the order of 2 or 3 mg/L nitrate-N during the wet season. There is no systematic evidence of biostimulation in the wet season. For ease of reference, relevant narrative from the March 2012 draft TMDL project report-Appendix D is reproduced below:

> ***Additionally, winter nutrient loads are often associated with higher velocity stream flows which are likely to scour filamentous algae and transport it out of the watershed. These higher flows also flush nutrient compounds through the watershed and ultimately into the ocean; in other words the residence time of nutrients in inland streams is typically shorter than in lakes, reservoirs, or other static waterbodies. In short, evidence of algal impairment is less conclusive for winter time than for summer conditions.***
>
> ***However, there is some evidence of episodic excessive chlorophyll concentrations in the winter months. There is also substantial scientific uncertainty about the extent to which winter-time nitrogen phosphorus and nitrogen loads from valley floor and headwater reaches of the project area ultimately contribute to summer-time biostimulation problems in downstream receiving waterbodies. To account for these uncertainties staff conclude that it is necessary to set numeric targets for winter months, but at this time these targets should be less stringent than dry-season nutrient targets in acknowledgement of these uncertainties. Previous California nutrient TMDLs have similarly incorporated seasonal targets for nutrients for the same reasons.***

With regard to the comment about not being able to reach 2-3 mg/L nitrate-N while "allowing concentrations of 6.4 mg/L in the Reclamation Canal and Tembladero Slough, it should be noted that the Reclamation Canal Watershed (including Tembladero Slough) is hydrologically a distinct drainage from the Lower Salinas Watershed, and is not in hydrologic communication with the lower Salinas River and Salinas River lagoon (where

stream reach-specific conditions indicate lower nitrate water column concentrations are necessary to reduce the risk of biostimulation). As such, proposed nitrate water quality targets in the Reclamation Canal and Tembladero Slough have no effect on the Lower Salinas River. Based on stream reach-specific conditions and established nutrient target development methodologies, as presented in the March 2012 draft TMDL project repot, the risk of biostimulation in the Reclamation Canal and the Tembladero slough occur at relatively higher levels of nitrate (aka, 6.4 mg/L).

With respect to the Old Salinas River (which is the receiving water for the Reclamation Canal-Tembladero Slough), it should be recognized that there is a large amount of dilution with seawater occurring within the Old Salinas River between the Potrero Tide Gage and Monterey Dunes Way. CCAMP data indicate that at Monterey Dunes Way on the Old Salinas River, average salinity is 5.3 parts per thousand (ppt), whereas Old Salinas River salinity just downstream at Potrero Rd. is on average 14.6 ppt. Global mean seawater salinity is 35 ppt; practically speaking this means that the Old Salinas River, downstream of Monterey Dunes, is on average an almost equal mixture of fresh riverine water and seawater (due to tidal mixing), and therefore freshwater inputs are being substantially diluted by seawater. In other words, the water column in the Old Salinas River downstream of Monterey Dunes can be considered to be a mix of close to about half fresh riverine water, and half seawater. Note that seawater typically has very low nitrate concentrations (generally well below 1 mg/L). As a practical matter, this means it can be expected that Old Salinas River nitrate inputs resulting from riverine waters associated with the Reclamation Canal and Tembladero Slough (at the 6.4 mg/L nitrate threshold) should be substantially diluted by very low-nitrate seawater inputs (nitrate well below 1 mg/L) in the Old Salinas River Channel downstream of Monterey Dunes, rendering the 3.1 mg/L nitrate target proposed for the Old Salinas River potentially achievable.

Also note, in recognition of the uncertainties and assumptions associated with the proposed TMDL, staff have provided for future reconsideration of the TMDL, and associated water quality targets, based on new information, data, and research.

16. Mr. Steve Shimek, Chief Executive, The Otter Project

Our major concern however is with the implementation of this TMDL. We very strongly disagree with the primary implementation mechanism being the Condition Waiver of Waste Discharge Requirements for Discharges from Agricultural Lands (Ag Order).

The provision in the Ag Order that best controlled nutrient discharges -- the requirement to report and meet nutrient applied/crop uptake ratios -- was removed from the Order in its final revision. Without that requirement we fear little can be done to control nutrient discharges. The Otter Project / Monterey Coastkeeper has petitioned the SWRCB to restore that provision, but it is currently not part of the Order.

The SWRCB has stayed key provisions of the Ag Order until all petitions can be heard and resolved. Specifically, the provision requiring management practice efficacy in the electronic compliance form leaves us with no measure – other than CMP water quality monitoring – to know what measures are working or if they are working at all.

The provision requiring individual monitoring of Tier 3 farms is far off and is being petitioned. Without individual monitoring we believe there will be no measure or even sense of compliance.

Staff response: Thank you for the comment. First, it should be noted that the TMDL not only relies on an existing regulatory order for implementation, but another important aspect of TMDLs is to make grant funding available to implement the TMDL goals and address

relevant water quality issues. In general, approved TMDLs constitute the administrative basis on which the State and the Water Board prioritize and focus nonpoint source pollution grant funding. An approved nutrient TMDL for the lower Salinas Valley would be expected to make grant funding available to address nutrient pollution in a systematic and on a longer term basis. Therefore, staff anticipates that in addition to compliance with an existing regulatory order, local resource professionals and nonprofit entities will partner with some growers to use grant funding to implement nutrient-related water quality solutions.

The Agricultural Order requires discharges to achieve compliance with applicable water quality standards, and the TMDL establishes expectations and water quality goals pertaining to nutrient pollution to be achieved consistent with the Agricultural Order. For example, finding 10 of the Agricultural Order states: "This Order requires compliance with water quality standards. Dischargers must implement, and where appropriate update or improve, management practices, which may include local or regional control or treatment practices and changes in farming practices to effectively control discharges, meet water quality standards and achieve compliance with this order." Note that existing numeric water quality standards include the nitrate standard protective of drinking water, the unionized ammonia standard protective against toxicity, and dissolved oxygen standards protective of aquatic life and are indicative of compliance with the biostimulatory substances objective. Verification that progress is made towards achieving these standards is outlined in the Agricultural Order and allows for flexibility. Agricultural Order finding 15 states: "The Central Coast Water Board will evaluate various types of information to determine compliance with this order such as a) management practice implementation and effectiveness, b) treatment or control measures, c) individual discharge monitoring results, d) receiving water monitoring results, and e) related reporting." Additional findings (Attachment A of the Agricultural Order) 118, 120, and 121 state that "…it is the Central Coast Water Board's intent to provide flexibility in the implementation of this Order to encourage discharger participation in such efforts. The Central Coast Water Board will evaluate proposed local or regional treatment strategies based upon the anticipated effectiveness, time schedule for implementation, and proposed verification monitoring and reporting to measure progress towards water quality improvement and compliance with this Order." "Dischargers are responsible for implementing management measures to achieve water quality improvement…" "The Farm Plan is an effective tool to identify the management practices that have been or will be implemented to protect and improve water quality…" Finally, monitoring and reporting requirements require dischargers to submit a Sampling and Analysis Plan that describes how dischargers will evaluate compliance with the Agricultural Order, and therefore progress toward achieving water quality objectives, and hence, progress towards achieving the proposed TMDL. Therefore, dischargers must demonstrate progress, and demonstration of progress towards achieving the Agricultural Order, and therefore this TMDL, is not simply dependent on stayed provisions pertaining to nitrate loading risk factor or practice effectiveness; there is flexibility regarding how dischargers can demonstrate progress.

These objectives and water quality standards will take some time to achieve. The Central Coast Water Board has the authority to revise adopted orders and permits in the future, if necessary, on the basis of failure to demonstrate progress towards improved protection of water quality and compliance with applicable water quality standards. If the TMDL is approved, TMDL staff will use all available data, including water quality data obtained by CMP, CCAMP, and others, in conjunction with information submitted pursuant to the Agricultural Order to evaluate efforts on croplands and as appropriate, information generated by the County Farm Bureaus, University of California Cooperative Extension,

and/or Natural Resources Conservation Service as part of existing and future projects (i.e. Clean Water Act Section 319(h) grants) to determine that existing efforts continue to protect or improve water quality. Staff will also review annual reports submitted under the Phase II NPDES MS4 General Permit and the monitoring and reporting program to evaluate if MS4 entities are continuing to meet waste load allocations.

17. Mr. Steve Shimek, Chief Executive, The Otter Project

And finally, the entire Ag Order is being petitioned and we have no sense of whether it will move forward any time soon and most importantly, we have no sense of what the Ag Order will look like when it emerges from the political/regulatory sausage making. We fear, as I imagine you do as well, that the final Ag Order may be rendered ineffective.

We are sorry, but with the Lower Salinas Nutrient TMDL being of such high priority, we do not believe the TMDL implementation strategy is near adequate and it should be re-thought. The TMDL should not move forward in its current form.

Staff response: While it is possible that the revisions to the existing Central Coast Water Board-approved Ag Order will occur, At this time, staff is not able to conclude that compliance with the Agricultural Order, compliance with revisions of the Agricultural Order, and anticipated grant-funded nonpoint source implementation projects, are insufficient to implement TMDL water quality goals and objectives, and to ultimately attain water quality standards. Staff maintain the TMDL should be brought forth for consideration by the Water Board and should not be deferred or delayed. The Agricultural Order requires discharges to make progress towards and achieve compliance with applicable water quality standards, and the TMDL establishes expectations and water quality goals pertaining to nutrient pollution to be achieved consistent with the Agricultural Order. These objectives and water quality standards will take some time to achieve. The Central Coast Water Board has the authority to revise adopted orders and permits in the future, if necessary, on the basis of failure to demonstrate progress towards improved protection of water quality and compliance with applicable water quality standards. Please also see staff response to comment no. 16.

18. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

I would request that that you develop a source standard for wildlife as a baseline if you're going to use domestic animals as a source or remove them from this TMDL as an element.

Staff response: Note that source analysis was not based on animals, either domestic or wild. Source contributions largely were land-use based. These source land use category contributions were based on scientifically-based nutrient export metrics that are credibly associated with certain land use categories, such as grazing lands, and forest and undeveloped lands. However, from the implementation perspective it is necessary to consider what the controllable and non-controllable sources plausibly could be within those individual land use categories. Within the grazing lands source category, domestic animal waste was identified as the main controllable source associated with the grazing lands category. For forest and undeveloped lands, "natural background" (which would include wildlife, ambient soil conditions, and geology) was considered to be the non-controllable nutrient source occurring within this land use category.

19. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

I would also request that the within the TMDL implementation the standard and requirements clearly state the timeline and intent as to the ag order and how the TMDL will be used as a part of the ag order.

Staff response: Please see staff response to comment number 53. Numeric targets in the TMDL do not establish quasi water quality standards or discharge limits enforceable through the Ag Order; such limits need to be set forth in the Ag Order itself, which of course requires Water Board approval and associated public process. Staff cannot predict what future versions of the Agricultural Order will contain in five, ten, or fifteen years. Additionally, the State may adopt a nutrient policy or nutrient water quality standards action in the future that could render the targets in the proposed TMDL moot.

With that said TMDL Staff interfaced Ag Order staff during TMDL implementation and informed them of our proposals. TMDL staff is not recommending that biostimulatory nutrient water quality targets be incorporated as numeric water quality effluent limitations in the Ag Order that could lead to enforcement. Indeed, it is quite well established in the administrative record for the Ag Order that the Central Coast Water Board will not take enforcement action against dischargers that are implementing and improving management practices to address water quality:

> *"While the Agricultural Petitioners are correct that the Agricultural Order contains no explicit compliance schedule for meeting water quality standards, the Central Coast Water Board has made it sufficiently clear in the Agricultural Order that it will not take enforcement action against a discharger that is implementing and improving management practices to address discharges impacting water quality."*
>
> *See* Agricultural Order, finding 10 and provision 12, and Attachment A, finding 2; Schroeter Testimony (Aug. 30, 2012); Thomas Testimony (Aug. 30, 2012).
>
> *From: State Water Resources Control Board Order WQ 2012-0013 In the Matter of the Petitions Of Ocean Mist Farms And Rc Farms; Grower-Shipper Association Of Central California, Grower-Shipper Association Of Santa Barbara And San Luis Obispo Counties, And Western Growers For Review of Conditional Waiver of Waste Discharge Requirements Order No. R3-2012-0011 Discharges from Irrigated Lands (emphasis added by Water Board staff)*

TMDL staff informed Ag Program staff that we are proposing flexibility and different methodologies in allowing irrigated agriculture to demonstrate compliance with load allocations. These methodologies are not simply limited to receiving water concentrations. It is widely understood that biostimulatory problems are a function of many confounding factors, not simply limited to nutrient concentrations in the water column. In addition, the California NNE approach (which was used by staff in this TMDL) contemplates the use of a variety of water quality indicators (chlorophyll, dissolved oxygen) to assess primary biological response to nutrient loading and as a direct linkage to impairment of beneficial uses. However, is should be recognized that at this time, nutrient concentrations are at such high levels in this watershed they cannot reasonably be expected to limit biostimulation.

Further, immediate compliance with state water quality standards is not required. It is recognized that it will take many years to attain nutrient-related water quality standards.

Finally, the proposed basin plan amendment, if adopted, would legally express the Water Board's intent that a range of methodologies, criteria, and practices (not simply receiving water concentrations) would be deemed sufficient to show compliance with load allocations.

20. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

After reviewing the document there has not been a thorough evaluation of the unintended consequences of standards without management practices that are effective to meet the objectives of the regional board basin plan.

Staff response: The evaluation of consequences of the water quality standards were previously addressed when the water quality standards were adopted, in accordance with the California Water Code. The Substitute Environmental Document (attachment 3 to the Staff report), provides an analysis of the substantial, or potentially substantially adverse environmental impacts that could be associated mitigation measures.

The commenter should bear in mind that immediate, imminent, or prompt compliance with state water quality standards are not contemplated in this TMDL. It is recognized that it will take many years to identify, and implement management practices to reduce nutrient pollution on the scale contemplated by this TMDL project. Therefore, the unintended consequences of progress towards achieving the TMDL, and therefore water quality standards, will likely not be dramatic and occur immediately, but will occur gradually over an extended period of time. Also, please see staff response to Comment 1 and Comment 2 for additional relevant information.

21. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

The verbal comments that were presented as the workshop need to be addressed as a part of this process.

Staff response: Staff's notes captured the fact that agricultural stakeholders were concerned with the proposed water quality targets for biostimulatory substances, how they would be implemented in the Ag Order, facilitating TMDL implementation with mass load calculations, and there were comments about the grants process being unpalatable to growers. Relevant information pertaining to these issues can be found in staff responses to Comments 7, 22 and 53.

22. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

My final comment is that the current source of grant funding and programs do not allow for new and creative projects to improve water quality.

Staff response: Staff are aware that some of the provisions associated with grant funding and grant applications is unpalatable for some growers. Central Coast Water Board staff have been in contact with the State Water Resources Control Board in attempts to address this issue; however at this time staff can report that we are not able to change the provisions of grants and grant applications.

It should be noted that one concern growers have, is how the data collected pursuant to grants will be used by the Water Board. In the case of some recently approved grants, the executive management of the Central Coast Water Board explicitly provided written assurance that data collected pursuant to these specific grants are for informational purposes to assist with water quality improvement decisions, and that the Water Board would <u>not</u> use data and site information for enforcement purposes[9]:

[9] *The letter from Water Board executive management is provided for informational purposes, but does not necessarily imply these conditions apply universally to all other types grants. Water Board staff do not have the authority to speak for management on the universal range of grants.*

Letter from Executive Management of the Central Coast Water Board

Dear Grantees:

CENTRAL COAST WATER BOARD USE OF WATER QUALITY DATA GENERATED IN THE COURSE OF IRRIGATION AND NUTRIENT MANAGEMENT GRANT IMPLEMENTATION

The subject grants are intended to assist irrigated farming operations to improve the efficiency of their irrigation and fertilization practices. We understand that some people are concerned about how the data from these grants will be used, since we are a regulatory agency. We appreciate that concern and provide our response here.

We view these grants as an important component of our efforts to improve water quality in agricultural areas and want to encourage farmers' participation. To that end, we want to assure you and the grant participants that we will not use these grant water quality data and site information for enforcement purposes. We want the data to be used for educational purposes to illustrate what works to improve water quality and what does not. We realize that using the data for regulatory enforcement would be a major disincentive to participation in the grants, which would defeat their purpose. Moreover, we consider those operations and landowners who are participating in these grants and who are making improvements to be proactively addressing water quality issues and we laud their efforts. In some cases, a grower may choose to participate in these types of grants in order to obtain information required by a regulation, such as the Ag Order. For example, if a grower was required by the Water Board to provide specific information on the implementation of irrigation and nutrient management practices, and the grower had that information as a result of participating in this grant, then it would be up to the · grower to choose if he or she wanted to use that grant information as a means to comply with the requirement.

Therefore, participation in these types of grants is an opportunity to implement solutions, without the threat of regulatory enforcement actions related to this effort in any way.

Michael Thomas

Assistant Executive Officer

Central Coast Water Board

November 1, 2011

Finally, while staff understands that the grants process is unpalatable to some growers (and Central Coast Water Board staff have attempted to facilitate some changes to the process) it should also be noted that the Water Board's grants staff report to us that there are growers who are indeed currently partnering with resource professionals to use grant funding to implement water quality solutions.

23. Ms. Darlene Din, Ag Land Use & Public Policy Consultant

I also support the two comment letters provided by GSA/Mercer on the many issues regarding this watershed to improve water quality in the non-point source systems with a number of factors, in this very complex system, and the CCWQP Inc. letter regarding the challenges of measurement of load and concentration in determining water quality improvement.

We look forward to being a part of the ongoing process in finding tools towards a solution our water quality issues.

Staff response: Staff appreciates the comment.

24. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Thank you for the opportunity to comment on the Draft Project Report for the TMDL for Nitrogen Compounds and Orthophosphate for the Lower Salinas River and Reclamation Canal Basin, and the Moro Cojo Slough Subwatershed (hereafter referred to as "Draft Report"). The Draft Report

provides many useful tables and figures, and the large amount of data reviewed and considerable staff time that must have gone in to preparing the report are evident.

Several comments specific to tables, figures, or discussion points in the Draft Report are listed below. But first, a general comment would be that the Report devotes considerable discussion and data analysis to loading patterns throughout the Project area, and to implications for downstream water bodies related to biostimulatory substances in tributaries that do not themselves exhibit biostimulatory problems, but which drain to receiving waters that do. That whole discussion seems to argue for the use of load-based TMDL targets for tributary water bodies. Thus, the allocations in section 6.4 were somewhat surprising in this context.

Staff response: The October 2012 draft project report indeed contained mass load expressions intended to facilitate implementation and provide an alternative load expression to implement the concentration-based allocations. For increased clarity and ease of reference, staff have created a new stand-alone Appendix (Appendix G of the final draft project repot) which presents alternative, mass-based load expressions intended to facilitate implementation of the TMDL and implementation of the concentration-based allocations. Staff also added language to the basin plan amendment that compliance with load allocations may be demonstrated on the basis of mass load reductions, in addition to other methods of demonstrating compliance. Please refer to staff response to Comment 7 for further relevant information on this issue.

Regarding allocations, expressing the allocations as receiving water concentrations provides a higher level of scientific confidence that water quality objectives will be attained and designated beneficial uses protected. At this time, due to the very limited amounts and lack of reliable daily flow data, the daily, seasonal, and annual hydrologic flow regimes are not well characterized in most project areas stream reaches. Therefore, at this time, expressing allocations as daily mass-based loads would result in more uncertainty in terms of assessing attainment or non-attainment of water quality standards. The uncertainties and dearth of flow data are also addressed in staff response to Comment 30. Further, with regard to nutrient pollution, aquatic life and algae respond to water column concentrations, not mass-based loads, and thus the proposed nutrient allocations are the criteria that will most directly protect applicable beneficial uses.

USEPA typically expects mass-based allocations to be developed on the basis of reliable daily flow records, or where there are continuous or frequently measured daily flows[10]. In cases where daily flow records are not available, it is sometimes possible to use flow estimation techniques to derive a synthetic daily flow record; however USEPA cautions that there could be a high degree of error associated with making these synthetic flow estimates. In the case of the lower Salinas Valley, surface water flow regimes are substantially influenced by artificial drainage, return flows, and regulated flows which overprint, obscure, and modify the natural hydrologic flow regime. Additionally, allocations should be consistent with the desired water quality objectives. Current water quality objectives for nutrients, as well as environmental response to nutrients, are expressed in terms of concentration. As such, staff maintains that mass-based allocations on the basis of limited and unreliable flow data are not appropriate. As more flow data becomes available in the future, allocations may potentially be revised on the basis of reliable flow data during reconsideration of the TMDL.

[10] USEPA, 2007. Options for Expressing Daily Loads in TMDL. June 22, 2007.

With that said, staff fully recognizes that concentrations in a grab sample bottle may or may not tell us much about pollution reduction efforts or be a viable metric to inform implementation decisions. It should be noted that concentration-based targets indicate attainment or non-attainment of a water quality objective, but they may not be a reliable indicator of the scope and degree to which nutrient pollutant load reductions are occurring on a mass basis as a result of implementation of management measures. As such, we have developed a tool box of metrics, identified in the TMDL project report and the draft Resolution, including but not limited to water column concentrations, mass loads, flow weighted concentrations, and BMPs to assess progress towards attainment of water quality standards.

Indeed, USEPA provides that TMDL submissions may include alternative expressions of the load or allocation in order to facilitate implementation of the applicable water quality standards and to provide a meaningful connection with implementation efforts[11]. Note that the TMDL project report contains estimates of annual and dry season existing mass-based loads and estimated necessary mass-based load reductions which are developed to facilitate implementation, and staff have added a stand-alone appendix presenting the alternative load expressions based on a mass basis (pounds) and non-daily expressions.

25. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

For example, Table 3-25 lists Natividad Creek as *not* showing biostimulatory impairment (based on lack of algal biomass) and Table 4-1 lists Natividad Creek as *not* expressing a full range of biostimulatory indicators (based on the NNE model); however the dry season TMDL allocation in Table 6-4 is given as a concentration of 2.0 mg/L nitrate as N, with no regard to the effect of loading from Natividad Creek relative to other sources of nitrate and streamflow which contribute to the Reclamation Canal. So an overarching general suggestion would be to build upon the considerable analysis of flows, loading patterns, and reach-specific biostimulation evidence to develop load-based targets for tributaries that will ultimately result in achievement of the necessary conditions in receiving water bodies that currently express biostimulatory problems, and will provide dischargers with targets for reduced inputs that are readily measurable. In the main stem Salinas, for example, there should be some ability to predict stream flows in lower reaches based on releases from the two reservoirs. The mass-based input of nitrogen from tributary water bodies that would be acceptable given the anticipated stream flows would provide a basis for load-based numeric objectives.

Staff response: Staff concur that mass load-based expressions are potentially useful from the perspective of facilitating implementation. Estimates of existing loading and predicted load reductions necessary to meet water quality targets were presented in Section 6.2 of the October 2012 draft project report. Staff added additional language to the proposed Basin Plan Amendment providing for the use of nutrient mass load reductions to facilitate TMDL implementation and to demonstrate compliance with the concentration-based load allocations. In addition, for improved clarity and reference, staff created a stand-alone appendix in the final draft project report which tabulates our estimates of necessary subwatershed-scale nutrient load reductions needed to meet water quality goals and objectives. This is intended to provide alternative load expressions (supplementary to the

[11] USEPA, 2006. Memorandum, Nov. 15, 2006: Establishing TMDL "Daily Loads" in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, at al., No. 05-5015, and Implications for NPDES permits.

concentration-based allocations) to facilitate implementation and as consistent with USEPA guidance.

Regarding the comment that there is no regard for loading and streamflow contributions from Natividad Creek to the Reclamation Canal, note that indeed, Section 6.2 of the October, 2012 draft TMDL project report contains tabular estimates of existing mass-based loads, load reductions necessary to attain water quality targets, and estimated flows from Natividad Creek, and other stream reaches, on both an annual and a seasonal basis. Based on the this data in the project report, nitrate loading contributions (pounds) from Natividad Creek and Gabilan Creek to the lower Reclamation canal downstream of Carr Lake (between Boronda and San Jon Rd.) are estimated to constitute almost half the total observed existing load in this reach of the Reclamation Canal[12]. Natividad Creek alone accounts for an estimated existing nitrate load equivalent to 30% of the load observed in the lower Reclamation Canal. As such, staff estimated that downstream nutrient impacts from Natividad Creek and Gabilan Creek are locally substantial.

Therefore, the dry season biostimulatory target for nitrate in Natividad Creek (2.0 mg/L) are based on data and observations available in the project report: 1) nitrate loading, from the alluvial fan and plains stream grouping to the lower Reclamation Canal appears to be substantial based on available data; 2) nitrate loading observed in the Reclamation Canal is not attributable to sources just with the lower Reclamation Canal, a substantial part of the loads in the Reclamation Canal are attributable to upstream tributaries like Natividad and Gabilan creeks; 3) therefore an equitable amount of management effort amongst implementing parties to reduce nitrate loadings in both the alluvial fan and plains stream grouping, as well as the alluvial basin floor stream grouping is merited at this time. Note that since all TMDL project nutrient numeric targets (2.0 mg/L for alluvial fan streams, 6.4 mg/L for alluvial basin floor streams) are based on the USEPA 25th percentile approach, which therefore constitutes a uniform statistical reduction approach, the resultant level of implementation effort should be fairly uniform and equitable to all load contributions to the lower Reclamation Canal[13]; 4) these nutrient numeric targets for Natividad Creek and Gabilan Creek add an additional measure of confidence and assurance that load reductions necessary to mitigate biostimulation in the Reclamation Canal will be achievable; and 5) the nutrient numeric endpoint of 2.0 mg/L nitrate will be protective against the risk of biostimulation in Natividad Creek.

26. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

p. 19 contains a statement that violations of nitrate drinking water standards have doubled, but provides no citation so it is not possible to discern whether the increase in violations is due to recently elevated nitrate concentrations, or simply to an increase in monitoring and/or regulatory activity. This should be cited and clarified.

Staff response: The statement is from Acting Assistant Administrator Nancy K. Stoner of the U.S. Environmental Protection Agency, and the citation to her statements in this paragraph was provided by footnote on this page of the draft project report (Memorandum from Acting Assistant Administrator Nancy K. Stoner. March 16, 2011). However, staff will add additional narrative to make clear these statements are from USEPA Acting Administrator Stoner. These statements are not staff's assertions; staff did not research

[12] A typographical error found in the October draft project report has been corrected to correctly show that estimated dry season existing nitrate load in Natividad Creek at site 309NAD is 8,418 pounds.

Administrator Stoner's citations. Administrator Stoner's citations may be viewed in her memorandum.

http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/memo_nitrogen_framework.pdf

27. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

p. 19 also mentions impacts to the Elkhorn Slough watershed, but does not include any citations of literature on the topic. Citations should be added, and in particular the Draft Report should consider the documented impact of tidal flushing (or lack thereof) on low dissolved oxygen and eutrophic conditions in the Slough, which should in turn qualify any expectations set for improvements related to reduced nutrient loading from the Project area. Perhaps just including some of the citations used around p. 169, or referencing later sections of the report.

Staff response: Staff concurs with the comment about citation and will reference the relevant sections of the report on this page. The section of the project report on Elkhorn Slough and downstream impacts indeed reports on other factors that contribute to eutrophication, including residence time which is directly related to tidal flushing, as reported in the scientific literature. Also, in multiple areas throughout the project report, and the Resolution, staff reports that nutrient concentrations alone are not the sole contributory factor to biostimulation and staff have endeavored to set expectations for a holistic approach for water quality management to reduce the risk of biostimulation through the use of a range of metrics and water quality indicators that may be used to assess progress towards water quality improvements during TMDL implementation.

28. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

p. 20 contains an image of eutrophic conditions in the Pajaro River. This should be replaced with an image of eutrophic conditions observed in the Salinas River or Reclamation Canal basin (i.e. within the Project area relevant to this TMDL).

Staff response: Staff concur with the comment and have replaced this figure with a picture of biostimulation from a stream reach within the TMDL project area.

29. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

The maps containing sub-watershed delineations for the Project area are greatly appreciated. They should be used with caution at finer spatial scales however, as engineering can result in drainage directions at the level of individual parcels that run counter to the topographic data in the Digital Elevation Model.

Staff response: Staff added the clarifying language suggested by the commenter to the project report. Staff concurs that currently available spatial datasets or techniques may not always faithfully and accurately render local or real-time watershed conditions or drainage. It should also be noted that uncertainties and caveats in spatial data were indeed addressed in the October 2012 draft Project Report, and the relevant narrative is reproduced here for ease of reference:

A Note on Spatial Datasets Used in this TMDL Project

"Staff endeavored to use the best available spatial datasets from reputable scientific and public agency sources to render and assess physical, hydrologic, and biologic conditions in

the TMDL project area. Spatial data of these types are routinely used in TMDL development and watershed studies nationwide. Where appropriate, staff endeavored to clearly label spatial data and literature-derived values as estimates in this Project Report, and identify source data and any assumptions. It is important to recognize that the nature of public agency data and digital spatial data provide snapshots of conditions at the time the data was compiled, or are regionally-scaled and are not intended to always faithfully and accurately render all local, real-time, or site-specific conditions. When reviewing TMDLs, the U.S. Environmental Protection Agency will recognize these types of datasets as estimates, approximations, and scoping assessments. As appropriate, closer assessments of site specific conditions and higher resolution information about localized pollution problems are proposed to be conducted during TMDL implementation."

-Draft TMDL Project Report, October 8, 2012

30. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Several figures and supporting analyses reflect estimated or modeled data (for example, Figures 2-5, 2- 6, 2-7; Table 2-6). While these can provide insights and background information, they should be used only qualitatively in a regulatory setting due to the higher level of uncertainty associated with this type of information. For example, figure 2-6 channel classifications have not been ground-truthed; figure 2· 7 land area percentages with artificial drainage have not been ground-truthed; and Table 2·7 includes flow data for which some of the sources are not cited, but may contain data which show statistically significant changes in stream flows over the time period represented in the dataset (i.e. rendering "averages" unrepresentative of current conditions, except in terms of relative magnitude compared to nearby water bodies).

Staff response: Staff concurs that channel classifications have not been field checked and are subject to uncertainty. Indeed, note that staff included narrative in the October 2012 draft project report addressing this issue; the project report narrative is reproduced here for ease of reference:

"It should be noted that the NHDplus stream channel classifications carry no formal regulatory status, and have not necessarily been field-checked. In the NHDplus metadata these are described as "value-added" geospatial attributes created to supplement the NHDFlowline shapefiles."

-Draft TMDL Project Report, October 8, 2012

Staff concurs that estimates of land area percentages with artificial drainage have not been field checked and are subject to uncertainty. That said, the NRCS-NRI estimates are the best available spatial data on agricultural drainage currently available. Staff included narrative in the draft project report that characterizes these estimates as only plausible gross approximations; this narrative is reproduced below for ease of reference. Based on the comment, staff will also add narrative indicating this estimates are only for informational value. Also, as previously noted in Staff Response to Comment 29, staff indeed endeavored to provide multiple caveats in the TMDL project report regarding the limitations of spatial datasets used.

"Figure 2-7 illustrates the estimated percentage of land area that is subject to the practice of artificial drainage, such as ditches and tile drains. The estimations are from USGS NHDplus catchment attribute datasets, and are based on data derived by the National Resource Inventory conducted by the NRCS for the year 1992, and are presumed to represent a

plausible gross approximation of the current percentage of land area subject to artificial drainage practices.

-Draft TMDL Project Report, October 8, 2012

Regarding flow data, staff concurs that estimates of stream flow in the TMDL project area based on limited amounts of instantaneous flow data, or on NHDplus modeled data have significant uncertainties, and staff concurs that these flow estimates should be used only qualitatively in a regulatory setting. The lack of reliable and robust daily flow records for most TMDL project area stream reaches is one factor leading us to propose concentration-based receiving water load allocations (rather than flow-based mass load allocations) at this time. There is simply not enough flow data in most stream reaches to constitute a reliable daily flow record or an accurate and robust characterization of seasonal or annual mean flows. It is important to recognize that there is uncertainty associated with these mass load expressions, as they are in many cases based on limited amounts of instantaneous flow data, or NHDplus modeled flow data and as such reflect coarser temporal load representations (annual and seasonal loads). In the absence of reliable continuous, or daily flow data (i.e., USGS gages or hydrologic modeling), there could be a high degree of error associated with estimated daily flows from limited amounts of instantaneous flows[14]. According to USEPA, the potential for error is particularly pronounced in arid areas, areas with few USGS gages, and areas where flows are highly modified by human activities (e.g., impoundments, regulated flows, and irrigation return flows)[15]. Therefore, as noted previously, this TMDL and associated load allocation are based on instantaneous concentration-based loads – this satisfies the USEPA guidance to incorporate a daily time-step load. Also, concentration is generally a more direct linkage to the protection of aquatic habitat, than annual or seasonal mass loads.

31. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

The flow separation analysis in Figure 2-20 notes that the tool used can misinterpret artificial drainage flows ~s ambient baseflow. Given the substantial percentage of land area with artificial drainage depicted in Figure 2-7, this suggests that misinterpretations may occur throughout much of the Project area. This further supports the suggestion that modeled/estimated data be used only qualitatively.

Staff response: Staff concur that the base flow separation tool can misinterpret regulated flows as base flow. Based on the comment staff conducted a more concerted effort to remove regulated flows from the base flow separation presented in the October 2012 draft project report. Staff supplemented our baseflow separation analysis by using and calibrating to baseflow indices calculated by the U.S. Geological Survey[16] for the period of record at stream gages within the TMDL project area. The resultant base flow indices are marginally lower than in the October 2012 draft project report, comport with USGS calculated baseflow indices, and can reasonably be expected to reduce or mitigate the effect of regulated flows on the base flow separation. As noted by the commenter, these analyses have no regulatory consequences but are intended to inform that stream flow in surface water bodies are not universally the result of direct runoff, precipitation, and

[14] U*.S. Environmental Protection Agency, 2007. Options for Expression Daily Loads in TMDLs. June 22, 2007.*
[15] *Ibid.*
[16] *U.S. Geological Survey (2003), Flow characteristics at U.S. Geological Survey stream gages in the conterminous United States – USGS Open File Report 03-146.*

regulated flows – that, in fact, shallow groundwaters and surface waters are locally or temporally in hydraulic communication and are intimately connected to some degree.

32. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

The discussion of fish species and their historic utilization patterns throughout the Project area is appreciated, especially the citations and further clarifications for unconfirmed data.

Staff response: Staff thanks Ms. Lopez for the comment.

33. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Pages 81 and 82 include discussion of crediting irrigation source-water nitrogen towards applied fertilizer rates. While this is possible to an extent, there is not a 1:1 relationship (especially when irrigation water is not retained entirely within the cropped area), and the discussion should be qualified.

Staff response: The information provided by staff comes from citation to the peer-reviewed University of California Farm Water Quality Planning (FWQP) Reference Sheet no. 8066, and do not represent staff's assertions. However, staff concur with Ms. Lopez's comment and Staff will update the footnote citations with the clarifications provided by the commenter.

34. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

In analyzing nitrate monitoring data, the Draft Report reports "non-detect" values as the MDL. This practice may introduce a slight high bias into the dataset which is relatively unimportant in relation to the 10 mg/L as N objective, but may become more important relative to very low biostimulatory standards, especially when laboratory analytical methods have higher MDL's due to matrix effects or in less rigorous monitoring programs that use methods with a generally higher MDL.

Staff response: Staff concurs that setting non-detects equal to the MDL potentially introduces a negligibly small 'high" bias. To the extent this has any nominal effect at all on data analysis or on regulatory consequences, it would mathematically make the proposed biostimulatory numeric targets actually less stringent. This is because the numeric targets are based on the USEPA percentile based approach. In other words, in the USEPA 25th percentile approach, a population or subset of the data that is biased "high" would theoretically result in a nominally higher (less stringent or easier to achieve) 25th percentile endpoint. As a practical matter however, these differences occur at the scale of one to two decimal places / significant figures and have no practical impact on TMDL implementation or water quality targets. From the regulatory perspective, these nominal differences have no consequences, since the California Listing Policy uses a exceedance-frequency impairment analysis standard in which a sampling event is either counted as an exceedance, or as a non-exceedance with no other regard to the numerical value. Another common method of dealing with non-detects include setting them to ½ the MDL, which would also have no practical effect on data analysis or regulatory consequences for the same reasons mentioned above.

It is also noteworthy, that of the nitrate data available to staff, only about 2.7% were reported as censored data (non-detects) and that the majority of these sampling events were located in headwater tributary reaches and upper watershed reaches outside the

TMDL project area. As such, treatment of the censored data would have virtually no effect on TMDL project area analysis and development of nutrient water quality targets for the project area.

35. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Figure~ 3-4 through 3-6 and 3-16 discuss fertilizer sales data. Figure 3-16 states that manure sales data are not included, but other figures state that it is. Did the figures draw on different fertilizer sales datasets? If so, why were different datasets used within the Draft Report and how might the different data affect conclusions? Also, fertilizer dataset citations should be made more explicit to allow readers to locate the datasets for themselves.

Staff response: The data sets represent measures of different types of metrics and are not comparable. Figure 3-4 through 3-6 represent nitrogen and phosphorus inputs from fertilizer and manure. As cited in the draft project report, this data comes from the U.S. Geological Survey's national Spatially Referenced Regression on Watershed Attributes (SPARROW) model. Manure in the SPARROW model context are estimates of manure waste generated by livestock[17] within the watershed (based on U.S. Dept. of Agriculture livestock statistics); it does not represent manure applied to cropland as fertilizer. In contrast, Figure 3-16 represent nitrogen chemical fertilizer sales data available from the California Dept. of Food and Agriculture. With regard to the comment about the use of different types of datasets: different datasets were used in this project report to establish multiple, independent lines of evidence to assess, evaluate, and demonstrate the nature, scope, and extent of nutrient-related watershed and water quality impacts in the lower Salinas Valley. While it is generally understood and assumed that the lower Salinas Valley is a focal point for high rates of fertilizer and nutrient inputs, Staff endeavored to provide data, credible estimates, and evidence demonstrating this particular characteristic of the watershed.

With regard to citations, the citations to the sources of SPARROW datasets and Fertilizer Sales data are provided in draft project report via footnote or as annotated directly on the figures, but staff updated the citations for more clarity based on the commenter's suggestion.

36. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Figures 3-13 and 3-14 discuss trend analysis for a 30-40 year period, however it is not clear that the same monitoring sites were used at the beginning vs. end of the period. For example, early data do not include any nitrate concentrations typical of groundwater-influenced monitoring sites in more current programs. As written, the Draft Report implies that concentrations have increased over time, however the observed pattern could also be created by introducing sites with new and unique hydrology into the dataset. At a minimum, the figures should use different symbols/markers for different sites. Preferably, the trend analyses should rely on a consistent set of monitoring sites. A footnote states that staff "considered" this effect, but does not explain how, and also cites a corroborating MBARI dataset ... were the historic MBARI nitrate concentrations modeled/estimated, or directly measured?

[17] It should be noted that, according to the USGS SPARROW model estimates, manure generated by livestock and domestic animals in the Salinas River basin only accounts for about 6% of nitrogen inputs, while farm fertilizer accounts for over 90% of nitrogen inputs.

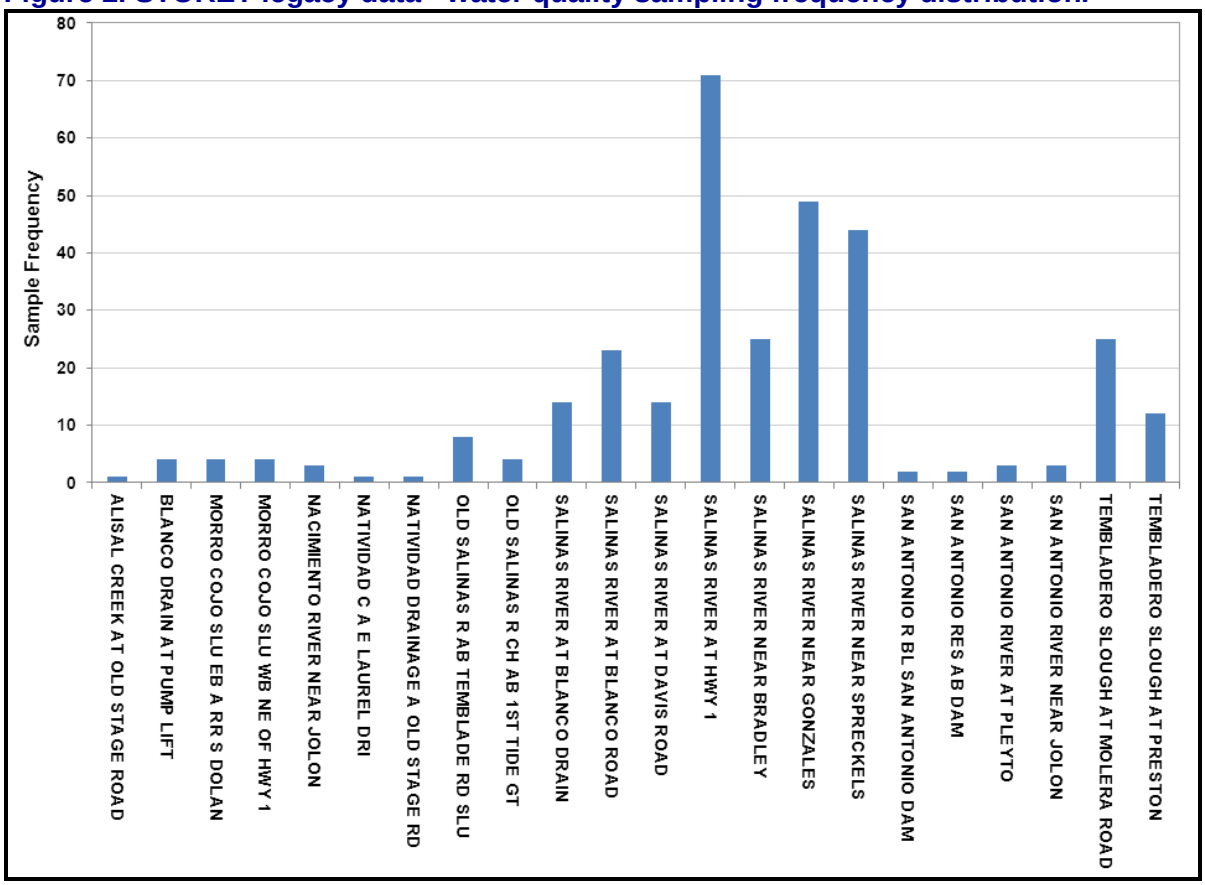
Staff response: Based on the comment provided by Ms. Lopez, the figure in the draft project report has been updated with a map showing location of monitoring sites used in these time series plots.

Regarding the questions and comments on nitrate trends: multiple lines of evidence, including aggregate nitrate data for the Salinas River basin; nitrate data from discrete reaches and monitoring sites near the downstream outlet of the TMDL project area; and nitrate data from different sources (grab sample data, and MBARI real time moored platform data) all consistently show trends of higher nitrate concentrations over the periods of record. Therefore, because of these multiple lines of evidence, staff had higher confidence that the trends on the aggregate dataset were not reflective of an undue bias introduced by spatial and temporal variations in monitoring. These conclusions are discussed in greater detail below. Also, as a practical matter, staff are unable to show different symbols for each monitoring site on the aggregate dataset for the Salinas River basin, as the sheer volume of monitoring sites would render such a display illegible. It should also be noted that aggregate datasets for a geographic area can and are used in statistical analysis of water quality data – for example, as noted in the draft project report, the U.S. Environmental Protection Agency uses aggregate datasets of spatial and temporal monitoring data from different sources which encompass entire ecoregions of the United States to derive nutrient criteria.

Monitoring sites from the beginning of the period of record have been routinely and consistently sampled throughout the period of record. The 1960s, 1970s, and 1980s-vintage STORET legacy data[18] is overwhelmingly from the Old Salinas River, Tembladero Slough, and the lower Salinas River downstream of Spreckels (see Figure 2). Indeed, these particular sites have been routinely sampled temporally throughout the period of record including and up to the most recent monitoring data. This provides a certain level of spatial consistency through time. STORET legacy data also has a nominal amount of data from the middle and upper Salinas River basin. Also, the STORET legacy monitoring sites overwhelmingly correspond to sites currently sampled by the CCAMP and CMP monitoring programs. As implied by Ms. Lopez however, over time, additional monitoring sites have been added in the Salinas Valley, through the CCAMP and CMP monitoring programs.

[18] The citation and webpage linkage to the USEPA STORET legacy data were provided in the draft TMDL project report.

Figure 2. STORET legacy data - water quality sampling frequency distribution.



Since the older vintage STORET data is largely from the lowermost Salinas Valley, staff do not concur with the comment that early data do not include groundwater-influenced monitoring sites. Indeed, at noted previously, most of the STORET legacy data are from the Old Salinas River, Tembladero Slough, the Salinas River downstream of Spreckels, and the Salinas River above the lagoon − these are lower alluvial basin floor and coastal confluence areas receiving substantial groundwater, tile drainage, and agricultural return flows. In other words, the older-vintage STORET legacy data is in fact heavily biased towards lower alluvial basin floor and coastal confluence areas that have historically been impacted by nutrients and agricultural drainage for many decades, and would be expected to have higher nutrient concentrations relative to upland ecosystems and upper watershed reaches.

Staff are aware that recent tributary monitoring of some agricultural ditches have introduced a smaller subset of high nitrate concentration waters into the aggregate basin dataset. However, even when looking at nitrate data from spatially discrete sites and reaches that have been monitored since the 1960s and 1970s (Tembladero Slough, Old Salinas River, Lower Salinas River) linear trends of nitrate concentrations in these discrete reaches are consistently higher over time. Figures illustrating these data were included in the October 2012 draft project report, and will be updated with additional time series figures in the final draft report.

Regarding the question on Monterey Bay Aquarium Research Institute (MBARI) data, these are real time data from moored platforms, and are not modeled or predicted data. Increasing nitrate concentration linear trends are reflected in real-time data from MBARI's

moored sensors in the Old Salinas River, and Elkhorn Slough main channel[19]. In other words, multiple lines of evidence, including aggregate nitrate data for the Salinas River basin; nitrate data from key discrete reaches and monitoring sites near the downstream outlet of the TMDL project area; and nitrate data from different sources (grab sample data, and MBARI real time moored platform data) all consistently show trends of higher nitrate concentrations over time.

37. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Also related to the trend analysis discussed in Figures 3-13 and 3-14, there is no discussion of a "change point" (i.e. date at which water quality change became statistically identifiable). To the naked eye, less change appears to have occurred in recent years than in earlier years.

Staff response: Staff did not perform change point analyses, however, staff will include Ms. Lopez's qualitative observation in the TMDL project report for its informational value and because it may serve to prompt future data assessments during the anticipated implementation phase of the proposed TMDL.

38. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Discussion on p. 119 attributes lower nitrate concentrations in very low flow conditions to dilution by shallow groundwater. Are shallow groundwater data available to support this? The small reductions in nitrate concentration are also on the order of reductions that might be expected due to denitrification or plant/algae uptake ... has this been considered? Finally, how do shallow groundwater nitrate concentrations that are low enough to have a diluting effect on in-stream concentrations mesh with concerns about elevated shallow groundwater nitrate concentrations due to contamination?

Staff response: Regarding the comment on groundwater, Staff's characterization in the project report is explicitly identified as a hypothesis only; not as a conclusion based on assessment and the weight of evidence. Staff's hypothesis is based on the fact that the U.S. Geological Survey's GWAVA modeled shallow groundwater nitrate concentrations are generally lower than one would expect in leachate or tailwater. However, Ms. Lopez presents a plausible alternative hypothesis, and consequently staff will include this alternative hypothesis in the relevant section of the project report.

Regarding the question on groundwaters and dilution, it is important to recognize that dilution in the context used by staff does not imply the attainment of water quality standards or criteria via the diluting process. Shallow groundwater may locally have relatively low concentrations of nitrate compared to agricultural return waters and tailwater that flow within surface water bodies. This does not imply however, that nitrate concentrations in shallow groundwater would be low enough to meet proposed biostimulatory numeric targets via dilution of surface waters. It simply means that during conditions when baseflow is the dominant hydrologic process in a given stream reach, the groundwater inputs (relatively lower predicted nitrate concentrations) might dilute-reduce the (likely) higher nitrate concentration inputs from return flows and tailwater.

[19] MBARI LOBO datasets: online linkage at http://www.mbari.org/lobo/

39. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

On p. 128 the Salinas River upstream of Spreckles is discussed as not being listed for nitrate impairment, but Figure 3-1 shows this as a reach "containing nitrate listings." Please clarify.

Staff response: This reflects the difference between two different things: 1) 303(d) listings, and 2) TMDL development. Namely, Figure 3-1 shows the California 2010 303(d) listings illustrating the reach of the Salinas River that was put on the 2010 303(d) list as impaired for nitrates. Accordingly the 2010 303(d) spatial dataset provided by the State Water Resources Control Board showed that this Salinas River listing extended upstream to Gonzalez. However, during TMDL assessment, Water Board staff typically engages in further spatial refinement of the extent of the listed impairments. The U.S. Environmental Protection Agency generally expects that TMDL development may further delineate and determine the extent of impairments identified during the 303(d) listing process. Based on available data, nitrate impairments in the lower Salinas River identified by staff during TMDL development only include reaches of the river downstream of Spreckels; i.e., MUN, AGR, aquatic habitat, and GWR designated beneficial uses are being supported on the basis of nitrate concentrations in the reach of the Salinas River upstream of Spreckels to Gonzalez. .

40. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Table 3-25 lists the Alisal Slough (downstream of the city, site ASB) as draining to the Salinas River. That hydrologic connection should be confirmed. Is there any connection to the Reclamation Canal as a downstream water body?

Staff response: This was a mistake-typo and staff appreciates Ms. Lopez bringing this to our attention. The cell in this table is re-written to state that the downstream impacts are to the Tembladero Slough. In fact, photo documentation and field reporting available to Water Board staff indicate that Alisal Slough drains to the Tembladero Slough (see Figure 3).

Figure 3. Confluence of Alisal Slough and Tembladero Slough.

41. Ms. Sarah Lopez, Technical Program Manager, Central Coast Water Quality Preservation, Inc.

Discussion on p. 180 states that numeric targets set in interpretation of narrative objectives do not require scientific certainty. A citation should be provided for this statement.

Staff response: The statement is a direct reflection of U.S. Environmental Protection Agency (USEPA) guidance; please note that the USEPA citation and guidance is cited within this section of the Project Report (USEPA, 2000a, Nutrient Criteria Guidance Manual). Based on the comment, staff will add an additional citation to the USEPA guidance. Also, to be clear, the statement staff wrote on page 180 is that "definitive and unequivocal scientific certainty" is not required; the relevant narrative from the draft project report is reproduced below.

> *"It is important to recognize that definitive and unequivocal scientific certainty is not necessary in a TMDL process with regard to development of nutrient water quality targets protective against biostimulation. Numeric targets should be scientifically defensible, but are not required to be definitive."*
>
> *Draft TMDL Project Report, October 2012*

To be sure, striving to reduce scientific uncertainty, and to increase scientific confidence, is a goal of nutrient criteria development. However, definitive unequivocal, or conclusive scientific certainty is not possible in the context of developing nutrient water quality criteria at this time. With regard to the request for citation, please note that in this section of the project report, Staff cited the U.S. Environmental Protection Agency's (USEPA) guidance on development of nutrient numeric criteria. The USEPA guidance provides for methodologies which USEPA explicitly states will result in nutrient numeric targets of "greater scientific validity"; therefore it is clearly recognized that scientific certainty is not a requirement for nutrient targets. In other words, USEPA recognizes that nutrient criteria development should strive for scientific validity and scientific defensibility. Scientific "validity" (or scientific defensibility) is, by definition, not the same as "definitive and unequivocal scientific certainty." It is important to recognize that in both scientific practice, and in standard English lexicon, validity and certainty do not mean the same thing. Therefore, staff endeavored to write narrative in this section of the Project Report that was consistent with USEPA guidance on nutrient criteria development.

Staff also cited in this section of the project report, guidance from the State Water Board Office of Chief Counsel and the U.S. Environmental Protection Agency, explicitly stating that narrative water quality objectives shall be implemented with a quantitative "interpretation" of the narrative objective. By definition, scientifically-based "interpretations", or scientifically "valid" criteria are not equivalent to − nor of similar stature as − definitive, unequivocal, and conclusive scientific certainty.

Finally, as noted periodically throughout the project report, nutrient concentrations contribute to biostimulation, however biostimulation is also a result of many other factors such as flow, temperature, substrate, and sunlight availability. Therefore, it is not possible to know at this time with a definitive and conclusive level of scientific certainty precisely what concentration of a nutrient is protective against biostimulation over all stream conditions, leading staff to propose a range of indicators, criteria, and methodologies to be used in assessing progress towards water quality improvements.

42. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Thank you for the opportunity for comment on the Lower Salinas draft Nutrient TMDL project report. Overall, RWQCB Staff should be commended for stating the problem clearly and thoroughly gathering information. This draft report is an important step towards clearly articulating impairments and potential mitigations.

Staff response: Staff appreciates the comment

43. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

As per the Nutrient TMDL: "There is limited hydrologic connection between the Reclamation Canal watershed and the lower Salinas River watershed". Not only is this a true statement, but, likewise, while both watersheds have crop production and nitrate and/or ammonia impairments, the two watersheds have little in common relative to physiography, hydromorphology, hydrogeology, topography, soil types or ecosystem levels functions. At a problem analysis level, the nutrient impairment indicators/stressors have very different responses as will be further discussed. For non-point sources, at the field level, implementation practices may be similar, however, at the watershed level, mitigation measures may vary tremendously. Should these two watersheds should be included in one TMDL? Might the probabilities of successfully addressing water quality be better achieved by separating these TMDLs?

Staff response: Staff concur that there are substantial differences, locally, between the Lower Salinas Watershed, the Reclamation Canal Watershed, and the Moro Cojo Slough subwatershed. This however, does not preclude TMDL project development that addresses nutrient pollution throughout this basin. Drainage from this basin is ultimately discharging to the same receiving water body and coastal confluence sites (Moss Landing Harbor-Elkhorn Slough); these discharges are having significant detrimental impacts on the ecologically-sensitive Elkhorn Slough and Salinas River Lagoon; and from a water quality management and implementation perspective it is therefore prudent to develop and implement a TMDL to address nutrient pollution in this basin.

With regard to the anticipation of a wide range implementation measures at the watershed or basin-scale, note that in accordance with Water Code § 13360, the Water Board cannot mandate specific management practices in recognition that site specific conditions may vary substantially throughout the basin. Landowners, local resource professionals and implementing parties are in the best position to identify effective management measures based on site specific or watershed-specific conditions, with the Water Board implementing its statutorily-required oversight role. TMDLs are not intended or required to comprehensively and conclusively assess and designate specific management practices tailored to physical and land use differences between subwatersheds or catchments. This proposed TMDL however, does estimate the degree, scope, and magnitude of nutrient pollutant loading at the various subwatershed and stream reach scales. It should also be noted that the Water Board has previously adopted TMDLs that collectively address the Lower Salinas River and Reclamation Canal basin.

44. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Staff states that the TMDL is consistent with CCRWQBC's highest priorities of protecting human health and addressing aquatic habitat as per July 2012. This is a true statement. In addition, the following were adopted in July 2012: preventing degradation of hydrologic processes, preventing/reversing seawater intrusion, preventing further degradation of groundwater basins from salts. Furthermore, the CCRWQCB Board members asked that the following be included:
• The importance of education, outreach, and collaboration in achieving results, and that these approaches should also be a priority. The Board also discussed the interests of other stakeholders.
• The ongoing controversy over the Ag Order and the need to communicate well with dischargers and the public to minimize controversy as much as possible.
• The need to prevent degradation of water resources and habitat before it occurs, rather than trying to restore degradation after it occurs, as defined by the CCRWQCB's mission and the law.

Staff response: Education, outreach, collaboration in achieving results, the need to communicate well with dischargers and the public, and the need to prevent degradation of water resources and habitat before it occurs are high priorities for us and we continue to include them in our work.

45. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Please note that **Figures 2-4 and Table 2.3** do not establish the timeframe for the data presented. **Table 2-4** would have been more useful if it had incorporated land use changes over time.

These data do not take rural residential land uses into account. This type of land use has expanded significantly in the TMDL project area in recent decades. There are a number of references regarding the impact of septic systems on nitrate groundwater loading. The 1988 SWRCB report (Anton et al., 1988) identified agricultural fertilization, animal operations (i.e. waste from dairy, feedlot, and poultry operations), and septic disposal systems as the three dominant sources of nitrate to impacted groundwater. Urban runoff and municipal waste treatment were cited as lesser sources. In 2001, the Natural Resources Defense Council highlighted nitrate contamination of groundwater in “California’s Contaminated Groundwater” (Helperin et al., 2001) and concluded that agriculture and septic systems are major sources of nitrate contamination.

Rural residential areas could be a significant cause of impairments by redirecting surface water flows, contributing to reduced land ethic and stewardship knowledge, and through increased nitrate groundwater loading. Omission of rural residential areas as a potential source of impairment could compromise loading estimates. Additionally, while the anomalous nature of this land use creates difficulties in regulation and enforcement, the exclusion of this land use could seriously impede future mitigation efforts.

We suggest that Staff include another set of data necessary for multi-variant analysis of impairments, bio-indicator assessments and development of meaningful implementation strategies. It is critical that historical land use changes be noted and included in any sort of multi-variant analysis. If fish habitat over-time and legacy nitrate and phosphorous loading over-time are significant when evaluating impairments and/or implementation plans, then land use over-time (e.g. the presence of dairies and land use conversions from ag or open space to urban and rural residential developments) is likely to be as critical a variable.

Staff response: With regard to the reference to a 1988 SWRCB report, and a 2001 Helperin report, newer vintage reporting (2012) by team of researchers from UC-Davis conducted pursuant Senate Bill SBX2[20] reported that agricultural fertilizer applications are by far the overwhelming contributor of nitrate to groundwater in the Salinas and Tulare basins. It is recognized that septics and animal waste can be problematic at localized scales. At the TMDL project scale, available information suggests that septics and animal waste are not major contributors to groundwater pollution inputs to surface waters at the project area scale.

Available evidence indicates that rural residential areas are not significant sources of nitrate to surface waters at the project area scale. Please refer to staff response to comment 61, Figure 14 and Figure 15 for additional relevant information.

Staff will add the suggestion for additional research as potential area that would benefit from further investigation in the "Optional Special Studies & Reconsideration of the TMDLs" section of the final draft TMDL project report. At this time, staff maintains there is sufficient information to adopt the TMDL and begin to investigate and implement water quality solutions.

46. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

It would be helpful if data cited in the report time frames during which the data were collected were dated. For example, what is the basis for estimating the mean annual discharge in Table 2.5? Other tables, charts and text that could benefit from more specific data include Table 2.7: Estimated percentage of land area subject to artificial drainage practices (ditches & drainage). These data are too old to be useful. There have been significant efforts made in the Monterey Bay area since 1992 to improve production and water quality management practices. Water use trends, as reported by Monterey County Water Resource Agency. These data and this report do not account for these changes to agricultural management practices that are already in place.

Staff response: As noted in Table 2-5 of the October 2012 project report, the USGS flow gages and hydrologic attributes reported by the National Hydrography Dataset (NHDplus) are the basis for mean annual flow estimates. Based on the comment, staff added the period of record for the USGS daily flow records. NHDplus are based on modeled data and NHDplus does not report time frames for hydrologic attributes associated with flow lines. Staff deferred to the expertise of federal scientists, university scientists, and private consultants who developed the NHDplus flow estimates.

Also, based on the comment, staff added footnote reference to this section of the project report; for ease of reference the project report footnote is reproduced below:

> ***USGS gages provide measured daily flow records (online linkage: http://ca.water.usgs.gov/). NHDplus provides modeled mean annual flow estimates; staff used values for the attribute "MAFlowU". MAFflowU are based on the Unit Runoff Method (UROM), which was developed for the National Water Pollution Control Assessment Model (NWPCAM) (Research Triangle Institute, 2001). Values in "MAFlowV" are based on methods from Vogel et al., 1999. NHDplus uses two flow estimation procedures, both developed by using the HydroClimatic Data Network (HCDN) of gages. These gages are usually not affected by human activities, such as major reservoirs, intakes, and irrigation withdrawals; thus, the mean annual flow estimates are most representative of "natural" flow conditions. These estimation methods used the HCDN gages because each method is developed for use at large scales; such as Hydrologic***

[20] *UC Davis Report for the SWRCB SBX2 Report to the Legislature. Online linkage: http://groundwaternitrate.ucdavis.edu/*

Regions. It was beyond the scope and capabilities of both methods to determine the human-induced effects at this scale.

With regard to the comment on estimates of lands subject to the practice of artificial drainage, staff will add the information provided by Ms. Taylor-Silva and Ms. Mercer pertaining to artificial drainage to the project report about water management changes since 1992. The NRCS-NRI estimates are the best available spatial data on the extent of agricultural drainage currently available. It should be noted that in the October 2011 report, staff characterized the U.S. Department of Agriculture artificial drainage estimates as "plausible gross approximations" of land areas subject to artificial drainage, in recognition of the 1992 vintage of the estimate provided by the U.S. Dept. of Agriculture. Also, note that staff endeavored to provide caveats about the nature and limitations of spatial data used in the TMDL project report; for ease of reference the relevant narrative from Section 2 of the October 2012 TMDL project report is reproduced below:

A Note on Spatial Datasets Used in this TMDL Project

"Staff endeavored to use the best available spatial datasets from reputable scientific and public agency sources to render and assess physical, hydrologic, and biologic conditions in the TMDL project area. Spatial data of these types are routinely used in TMDL development and watershed studies nationwide. Where appropriate, staff endeavored to clearly label spatial data and literature-derived values as estimates in this Project Report, and identify source data and any assumptions. It is important to recognize that the nature of public agency data and digital spatial data provide snapshots of conditions at the time the data was compiled, or are regionally-scaled and are not intended to always faithfully and accurately render all local, real-time, or site-specific conditions. When reviewing TMDLs, the U.S. Environmental Protection Agency will recognize these types of datasets as estimates, approximations, and scoping assessments. As appropriate, closer assessments of site specific conditions and higher resolution information about localized pollution problems are proposed to be conducted during TMDL implementation."

-Draft TMDL Project Report, October 8, 2012

47. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

For the purposes of addressing nutrient use by agricultural sources, the precipitation gradient present in the Salinas Valley is critical. Precipitation, along with fog, wind, temperature and solar radiation have a tremendous impact on the use of nutrient inputs (i.e. fertilizer use) in order to produce a consistent and quality end-product. The use of average annual precipitation corrected for orographic effects is confusing. What is the purpose of this information? From the perspective of agriculture, this statistic has little value.

Staff response: There is no intent for the precipitation estimates in the TMDL project report to inform agricultural management decisions, which presumably should be based on local and site specific conditions of crop, rainfall, runoff, etc. The purpose of developing the PRISM[21] regional estimate of rainfall is to have a scientifically-valid approximation of average, annual precipitation at the basin-scale so that the source analysis tool used in the TMDL project would have inputs to calculate credible estimates of runoff. Accounting for

[21] *The PRISM dataset was developed by researchers at Oregon State University, and uses point measurements of precipitation, temperature, and other climatic factors to produce continuous, digital grid estimates of climatic parameters. The dataset incorporates a digital elevation model, and expert knowledge of climatic variation, including rain shadows, coastal effects, and orographic effects. Online linkage: http://www.prism.oregonstate.edu/*

orographic effects via the PRISM precipitation dataset increases scientific confidence in estimating runoff volumes at the basin scale.

48. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

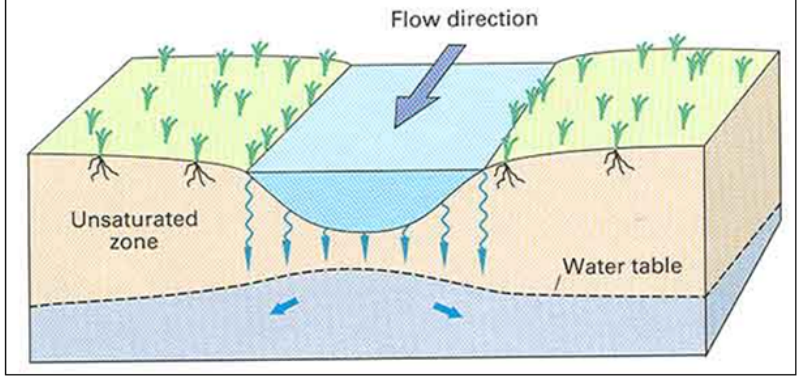
It is important to understand the inter-relationship between surface water leaching to groundwater quality and groundwater upwelling to surface water quality. It is important that this inter-relationship be modeled in an effort to improve implementation efforts and the CCRWQCB is encouraged to add this as a task to be performed by Staff as part of the TMDL Implementation Plan.
Figures 2-15 and 2-16
The comparison between agriculture, urban, and undeveloped land has been absent from previous analyses. It would have been helpful if ranges of measured nitrate concentrations were provided to compare to modeled nitrate concentrations. Is it assumed that predicted and estimated nitrate concentrations are the same factor? Also, please note that these figures as well as Figure 2-17 do not include a date or timeframe.

Staff response: Based on the comment Staff added the recommendation for further studies on the nexus between surface water quality and groundwater inputs as a potential area that would benefit from further investigation in the "Optional Special Studies & Reconsideration of the TMDLs" section of the final draft TMDL project report.

Staff concur that the nexus between groundwater and surface water is important to understand as it pertains to implementation and water quality protection and improvement projects. It is widely recognized by USGS, USEPA, and in the scientific literature that groundwaters and surface waters are really part of the same hydrologic cycle and should not be treated as closed systems that act independently from each other.

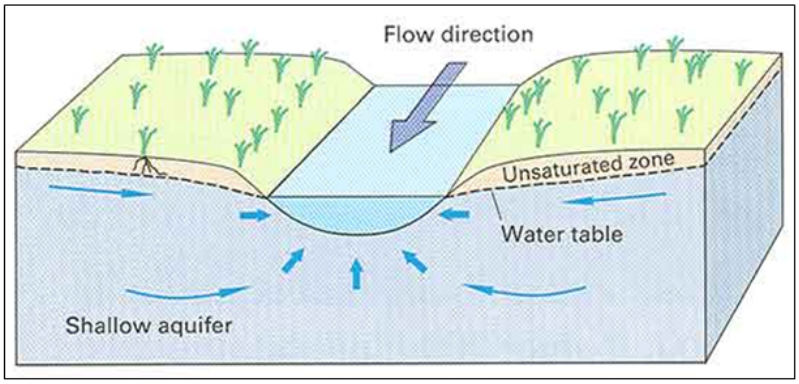
It should noted that some insights on groundwater interactions with streams can be deduced from field observation, and local knowledge of land and stream flow conditions. Gaining streams (those receiving groundwater inputs) would generally be expected to be located in lower reaches of alluvial basin floor areas where perennial flows are observed and local soil conditions and perched or shallow groundwater horizons are known or expected to exist. Headwater and upland reaches are sometimes expected to have gaining stream hydraulics as well. Losing streams (those which percolate to groundwater and do not receive substantial groundwater inputs, particularly in the dry season) would be expected to be associated with intermittent streams located on alluvial fan and alluvial plain geomorphic settings of the project area where high permeability soil and stream substrate conditions exist. These reaches would exhibit intermittent flows or dry stream beds in the absence of artificial return flows. Conceptually, the aforementioned information is illustrated in Figure 4.

Figure 4. Losing stream and gaining stream.



"Losing Stream"

Pollution of surface water can cause degradation of ground water.



"Gaining Stream"

Pollution of ground water can cause degradation of surface water.

Photo credits: University of Wyoming, Dept. of Geology and Geophysics
http://www.gg.uwyo.edu/content/laboratory/groundwater/gw-streams/intro.asp?callNumber=23165&SubcallNumber=0&color=873F8A&unit=

Regarding the comment on measure nitrate concentrations versus the U.S. Geological Survey GWAVA modeled concentrations, it should be recognized that the model simulates recently recharged, shallow groundwater (generally less than 15 meters below ground surface), and these shallow groundwaters typically do not have copious amounts of monitoring sites in the Salinas Valley and at spatial scales that would be representative of the entire project area[22]. Therefore, staff relied on UGSS GWAVA modeled data, which represents the best available predictive data for shallow, recently recharged groundwater. As a matter of resource efficiency, Staff deferred to the scientific analysis of USGS scientists, and did not re-investigate their data and methodologies to any significant extent. As noted in the project report, The GWAVA dataset represents predicted nitrate concentration in shallow, recently recharged groundwater in the conterminous United States, and was generated by a national nonlinear regression model based on 14 input parameters. Online linkage: http://water.usgs.gov/GIS/metadata/usgswrd/XML/gwava-s_out.xml.

Regarding the comment on adding timeframes for project report figures as mentioned, staff updated the figures with corresponding timeframes. Accordingly, note that the period of record for the USGS National Nutrients Synthesis Project if 1991-1998. The period of record for the environmental monitoring wells located in the City of Salinas is 2005-2012.

[22] *Groundwater exists in three dimensional space. Groundwater data from deeper aquifers are not relevant with respect to groundwater inputs to streams (which result from shallow or recently recharged groundwater) because groundwater in deeper aquifers do not contribute to stream flow. Also, groundwater chemistry in deeper aquifers can be substantially different than in shallow and recently recharged hydrogeologic horizons.*

49. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

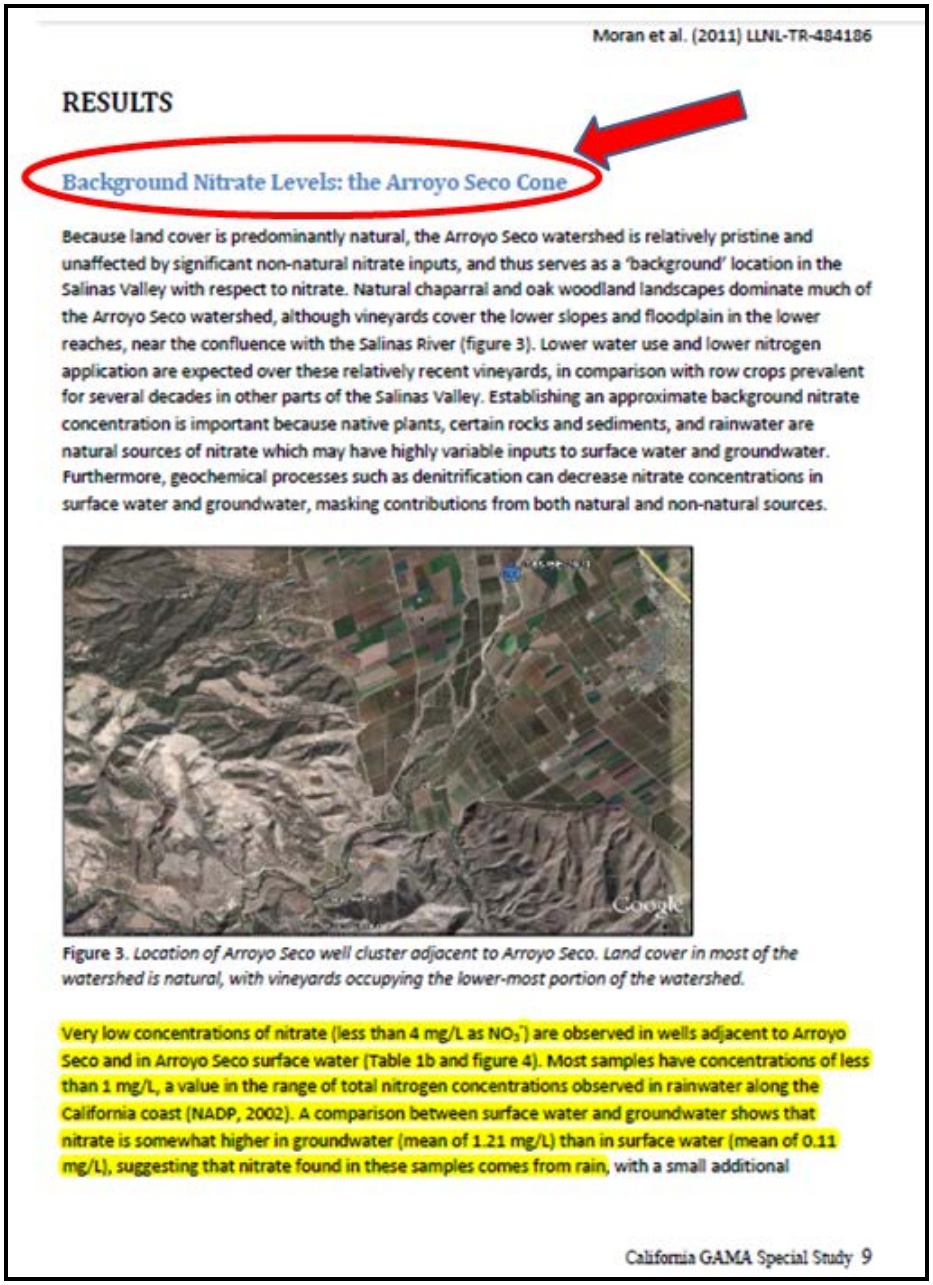
The TMDL draft Project report refers to a GAMA special study conducted by Moran et al (2011). Please find a direct quote from that report regarding groundwater nitrate concentration background levels: *(staff note: the public commenters provided a reproduction of narrative from the Moran et al. report as shown below):*

"A comparison between surface water and groundwater shows that nitrate is somewhat higher in groundwater (mean of 1.21 mg/L) than in surface water (mean of 0.11 mg/L), suggesting that nitrate found in these samples comes from rain, with a small additional contribution of nitrate from the soil zone in groundwater samples".

Staff response: To address the request regarding nitrate background reporting in the Moran et al. study, staff provides a screen-capture (please refer to Figure 5 below) of the section of the Moran et al. (2011) study which the authors entitled "Background Nitrate Levels: the Arroyo Seco Cone". This is the section of the Moran et al. (2011) study that reports average background nitrate concentrations in groundwater of 1.21 mg/L, for ground waters derived from rain water and have a rain water chemical signature as determined by isotopic analysis.

Since this section of the Moran et al. (2011) study is explicitly entitled by the authors "Background Nitrate Levels", and since rain water is by definition natural background water (water of meteoric-atmospheric origin − in contrast to percolated irrigation water, waste water, or urban effluent) − it is unequivocal that the authors reported 1.21 mg/L nitrate as an estimated average background concentration in unimpacted groundwaters for this area of the Salinas Valley.

Figure 5. Computer screen capture from Moran et al., 2011 study – "Background Nitrate Levels" section.



Moran et al. (2011) LLNL-TR-484186

RESULTS

Background Nitrate Levels: the Arroyo Seco Cone

Because land cover is predominantly natural, the Arroyo Seco watershed is relatively pristine and unaffected by significant non-natural nitrate inputs, and thus serves as a 'background' location in the Salinas Valley with respect to nitrate. Natural chaparral and oak woodland landscapes dominate much of the Arroyo Seco watershed, although vineyards cover the lower slopes and floodplain in the lower reaches, near the confluence with the Salinas River (figure 3). Lower water use and lower nitrogen application are expected over these relatively recent vineyards, in comparison with row crops prevalent for several decades in other parts of the Salinas Valley. Establishing an approximate background nitrate concentration is important because native plants, certain rocks and sediments, and rainwater are natural sources of nitrate which may have highly variable inputs to surface water and groundwater. Furthermore, geochemical processes such as denitrification can decrease nitrate concentrations in surface water and groundwater, masking contributions from both natural and non-natural sources.

Figure 3. *Location of Arroyo Seco well cluster adjacent to Arroyo Seco. Land cover in most of the watershed is natural, with vineyards occupying the lower-most portion of the watershed.*

Very low concentrations of nitrate (less than 4 mg/L as NO_3^-) are observed in wells adjacent to Arroyo Seco and in Arroyo Seco surface water (Table 1b and figure 4). Most samples have concentrations of less than 1 mg/L, a value in the range of total nitrogen concentrations observed in rainwater along the California coast (NADP, 2002). A comparison between surface water and groundwater shows that nitrate is somewhat higher in groundwater (mean of 1.21 mg/L) than in surface water (mean of 0.11 mg/L), suggesting that nitrate found in these samples comes from rain, with a small additional

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Very low nitrate concentrations are likewise observed in wells screened in the 400 Foot aquifer of the Pressure zone (only 38 out of 116 wells tested had nitrate concentrations >3 mg/L; MCWRA, 1997). Thus, an estimated background nitrate concentration of <4 mg/L is consistent between these [Arroyo Seco and Lower Salinas watersheds] which are unlikely to be affected by anthropogenic nitrate."

Furthermore, Moran reports in a separate 2011 GAMA report that the National Water-Quality Assessment (NAWQA) demonstrated that a large fraction of the nation's ground water supply is

impacted by anthropogenic nitrate contamination, where impact is defined as the presence of nitrate above a threshold value of 3-4 mg/L nitrate-N (Nolan et al., 2002; Nolan et al., 1997; Squillace et al., 2002).

There is a significant discrepancy in reported background levels between this TMDL project report and Dr. Moran's reports. If, indeed, background nitrate concentration levels are 3-4 mg/L, then, these reported background levels potentially exceed TMDL established dry season numeric targets in the Alluvial Valley River Flood Plain, Upper Alluvial Valley Tributaries, and Moro Cojo Slough. This discrepancy coupled with the fact that surface water/groundwater inter-relationships need further modeling should create enough doubt as to delay the adoption of this order until further groundwater modeling has been done.

In the absence of a delay in adoption, we not only encourage the Board to direct that a surface water/groundwater inter-relationship model be created by Staff as part of the implementation plan, but, also, that the completion of this model would trigger a review of the TMDL numeric targets in light of new data.

Staff response: Staff concur that estimates of natural, background nitrate-NO3 concentrations in groundwater should be on the order of about 3-4 mg/L. In fact, staff's estimate of background nitrate concentration in TMDL project area shallow groundwaters is marginally higher than that – our estimate is 5.3 mg/L nitrate as NO3 (i.e., 1.21 nitrate as N). In short, the estimated background nitrate concentration in shallow groundwater used by staff in the TMDL is entirely consistent with −and even marginally higher – than the suggested background values recommended by Ms. Taylor-Silva and Ms. Mercer (i.e., around 3 to 4 mg/L nitrate-NO3 based in part on MCWRA reporting). Thus, there is no discrepancy between staff's estimate, literature estimates, and the recommendations of Ms. Taylor-Silva and Ms. Mercer. It is prudent for staff to provide further clarification on this issue, as provided below.

The issue highlighted by this comment relates to the various analytical reporting conventions used for nitrate in water samples. Ms. Taylor-Siva and Ms. Mercer Nitrate refer to nitrate reporting from the Monterey County Water Resources Agency (MCWRA). It is important to recognize that MCWRA reports nitrate concentrations in water as NO3 (nitrate-NO3). Staff used a different reporting convention for nitrate in TMDL development: namely, nitrate as nitrogen (nitrate-N). Water quality data with different analytical reporting conventions can result in confusion, and even scientists and regulators have to practice diligence to avoid mixing-up and conflating nitrate concentrations reported in different conventions. In other words, mixing up these analytical nitrate reporting conventions can result in apples-to-oranges comparisons.

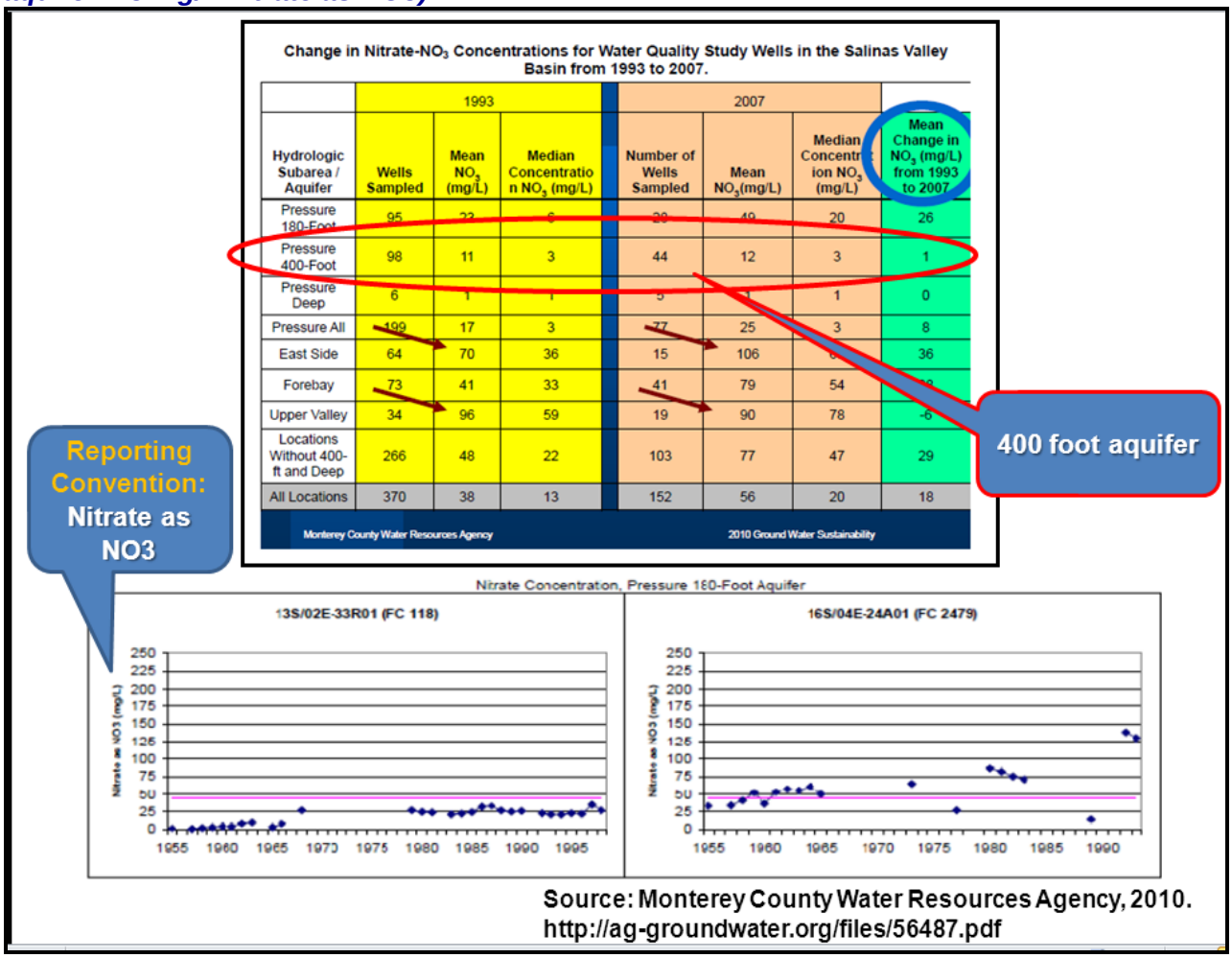
As noted in Section 3.7.1 if the October 2012 draft TMDL project report, the nitrate reporting convention used by staff in this TMDL is nitrate as nitrogen (i.e., nitrate-N). Unfortunately, California is unusual in comparison to national water quality standards conventions because the nitrate as NO3 reporting convention (i.e., nitrate-NO3) is often used here by public drinking water supply entities and local water resource agencies.

In contrast to California, national and USEPA water quality standards, water quality modeling tools, most scientific literature, and most TMDLs use the nitrate as nitrogen (nitrate-N) reporting convention. To illustrate the difference, note that the maximum contaminant level (MCL) in drinking water as nitrate-NO3 is 45 mg/l, whereas this MCL when reported as nitrate-N is 10 mg/l. While these two numeric values would appear to represent different concentrations, these numeric concentration values are in fact actually equivalent

to each other − the only difference being whether or not the molecular weight of the oxygen component of the nitrate molecule is included in the reporting.

Ms. Taylor-Siva and Ms. Mercer cite reporting from MCWRA and suggest that background concentrations of nitrate in groundwater are around 3 mg/L, based on observed nitrate concentrations in the 400 foot aquifer. Staff agrees with this comment, and that 3 mg/L nitrate-NO3 could indeed be considered a plausible background concentration in the 400 foot aquifer. However, it is important to reiterate and recognize that the 3 mg/L value reported by MCWRA is on the basis of the nitrate as NO3 convention (see Figure 6).

Figure 6. MCWRA nitrate water quality data in the 400 foot aquifer (median for 400 foot aquifer = 3 mg/L nitrate as NO3).



Note that this MCWRA reported 3 mg/L nitrate-NO3 value is equivalent to 0.7 mg/L nitrate when it is reported in the nitrate−nitrogen convention[23]. As noted previously, staff's estimate of shallow groundwater nitrate concentration is 1.21 mg/L nitrate as nitrogen – consequently, note that staff's estimate is actually substantially higher than the 0.7 mg/L nitrate as nitrogen reporting from MCWRA. This information is also graphically illustrated in Figure 7

[23] *It can also be confirmed that MCWRA reports nitrate groundwater concentrations in the "nitrate as NO3" convention from the MCWRA Water Resources Data Report, Water Years 1994-1995 – Chapter 6, Water Quality.*
http://www.mcwra.co.monterey.ca.us/Agency_data/Hydrogeologic%20Reports/WaterResourcesDataReport/WaterResourcesDataReport.htm

Figure 7. Illustration of EQUIVALENT nitrate concentrations using two different analytical reporting conventions.

Nitrate Reporting Convention used by MCWRA & Moran et al. (2011 GAMA study)		*Nitrate Reporting Convention used in TMDL (this convention is also used the USGS and USEPA)*
Nitrate as NO3 (mg/L)	*Reporting Equivalent as N >>>*	**Nitrate as N (mg/L)**
45	>>>	10
17.6	>>>	4
11	>>>	2.4
5.3	>>>	1.21
4.4	>>>	1.0
3.3	>>>	0.75
3.0	>>>	0.7

Water Board staff estimate of background nitrate concentration in shallow ground water of TMDL project area

Color shade legend
Nolan, 2002, USGS. Health Risk Threshold for non-Hodgkin's lymphoma
Groundwater background used in TMDL
U.S. Geological Survey groundwater "national background"
Maximum background nitrate reported by Moran et al. (2011) GAMA study
MCWRA "background": median value for 400 ft aquifer

Further, with regard to the comments on the Moran et al. (2011) report, an important fact to recognize is that Moran et al. (2011) actually reported background concentrations of nitrate in the context of the nitrate as NO3 reporting convention:

> *"Very low concentrations of **nitrate** (less than 4 mg/L **as NO3**) are observed in wells adjacent to Arroyo Seco and in Arroyo Seco surface water… nitrate is somewhat higher in groundwater (mean of 1.21 mg/L) than in surface water (mean of 0.11 mg/L)"*
>
> *From: California GAMA Special Study (Moran et al., 2011) – (emphasis added)*

Further, note that the range of natural background concentrations of nitrate in groundwater reported by Moran et al. (2011) were 0.5 mg/L (minimum) to 3.3 mg/L (maximum) nitrate as NO3 (see Table 1b. in Moran et al., 2011). This means that in the analytical reporting convention used by Water Board staff (nitrate as nitrogen), the Moran et al. (2011) background nitrate concentration ranges in groundwater are equivalent to 0.1 mg/L (minimum) to 0.75 mg/L (maximum) when reported as nitrate as nitrogen (nitrate-N). For graphical illustration, note that the maximum background value reported by Moran et al. (2011) = 3.3 mg/L N-NO3 is also annotated on Figure 7 which was presented above. However, staff chose to use the Moran et al. (2011) average concentration for background nitrate-NO3 (1.21 mg/L) as a nitrate as nitrogen value for the following reasons: (1) In staff's

judgment, and based on the body of scientific literature, it is plausible that any groundwater with concentrations less than about 5 mg/L nitrate-NO3 (e.g.., 1.21 mg/L nitrate-N) could be representative of ambient background conditions or conditions that have no significant human impacts (for example, refer back to Figure 7); and (2) staff endeavored to develop biostimulatory water quality targets that would not be infeasible to attain because of natural, background conditions.

Additionally, Ms. Taylor-Siva and Ms. Mercer cite nitrate studies by Nolan, and Nolan et al. at the U.S. Geological Survey (USGS) which Ms. Taylor-Silva and Ms. Mercer suggest indicate background nitrate in shallow groundwater should be around 4 mg/L. Regarding this comment, Mr. Nolan of the USGS has in fact confirmed to Water Board staff that the 4 mg/L nitrate-N screening value was used as a probabilistic numeric threshold based on the risk of health effects, but does not represent the U.S Geological Survey's estimate of natural, undisturbed background conditions for nitrate in groundwater[24]. The USGS generally considers national background nitrate-N in groundwater to be 1 mg/L (nitrate-N). As such, staff's estimate of background nitrate-N (1.21 mg/L) in groundwaters of the TMDL project area are in fact marginally higher than the USGS background estimate. The email exchange with Mr. Nolan of the USGS is re-produced below:

Water Board staff email exchange with Tom Nolan, U.S. Geological Survey – National Center

From: **Tom Nolan**, **U.S. Geological Survey** 12/19/2012
Sent: Tuesday, December 19, 2012 6:22 AM
Subject: Re: Question on the 2002 Nitrate Contamination Study

"Hi Pete, you are correct – as we state in the paper the 4 mg/L threshold is based on increased risk of non-Hodgkin's lymphoma based on an epidemiological study of users of community supply wells in Nebraska.* ***In general, we use 1 mg/L as a national background level**** *(see http://water.usgs.gov/nawqa/nutrients/pubs/circ1350/). Note that this is a nationally derived value and that regional background levels can vary. Hope this helps."*

− B.T. (Tom) Nolan, Hydrologist, U.S. Geological Survey-National Center, in an email received by Water Board staff on 12/19/2012

*******emphasis added by Water Board staff.*

>>

From: Osmolovsky, Pete, Central Coast Water Board staff
Sent: Tuesday, December 18, 2012 5:44 PM
To: Tom Nolan @ U.S. Geological Survey
Subject: Question on the 2002 Nitrate Contamination Study

Hello Mr. Nolan,

In your 2002 study entitled "Probability of Nitrate Contamination of Recently Recharged Groundwaters in the Conterminous United States" you used a threshold of 4 mg/L to indicate anthropogenic effects.

I was under the impression this threshold was a screening value to indicate a level or probability of risk.

[24] *Note that the U.S. Geological Survey uses the nitrate reported as nitrogen (nitrate-N) analytical convention. In other words, the USGS national background value of 1 mg/L nitrate-N is also equivalent to 4.4 mg/L nitrate as NO3.*

Some in our regulated community here, are asserting that your 4 mg/L nitrate threshold value is equivalent to natural, undisturbed, ambient background level for nitrate in groundwater -- and that our Water Board should consider 4 mg/L to be average, ambient nitrate background in groundwater.

Can you clarify, please? Thanks.

Pete Osmolovsky, California Central Coast Regional Water Quality Control Board

Based on the email exchange above, staff also confirmed that the scientific reference provided by Mr. Nolan of USGS via email, does indeed report that the U.S. Geological Survey (USGS) national estimate of natural background for nitrate in groundwater is 1 mg/L nitrate as N (or alternatively, equivalent to 4.4 mg/L nitrate as NO3) − please see Figure 8. This USGS 1 mg/L nitrate-N background value and the 4 mg/L nitrate-N health risk screening threshold are also graphically illustrated previously back on Figure 7

Figure 8. Screen capture of Table 4-1 in USGS NWQA Program report, Circular 1350 showing natural background concentrations for nitrate.

National Background Conditions - Chapter 4, USGS Circular 1350, NWQA Program)

[mg/L, milligrams per liter; –, not applicable]

Data set	Ammonia		Nitrate		Total Nitrogen		Orthophosphate		Total Phosphorus	
	Sites or wells	Concen-tration (mg/L)	Sites or wells	Concen-tration (mg/L)	Sites or wells	Concen-tration (mg/L)	Sites or wells	Concen-tration (mg/L)	Sites or wells	Concen-tration (mg/L)
Streams	89	0.025	108	0.24	88	0.58	89	0.010	84	0.034
Groundwater	177	0.10	419	1.0	–	–	166	0.030	–	–

Also, can be reported as
4.4 mg/L nitrate as NO3

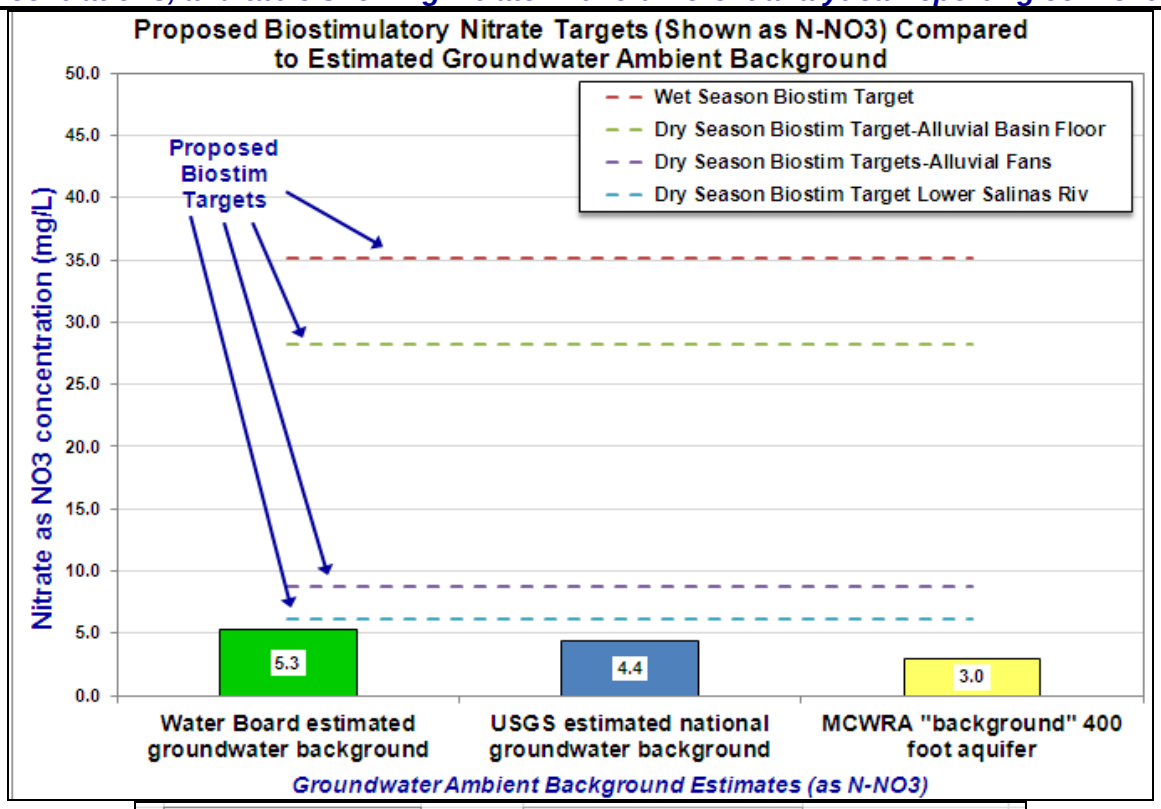
Source: reproduction of Table 4-1 in U.S. Geological Survey NWQA Program Report, Circular 1350 Chapter 4 – "Background Conditions"

It is worth noting again that staff's estimate of natural background concentration of nitrate in shallow groundwater of the TMDL project area (1.21 mg/L nitrate-n; or equivalent to 5.3 mg/L nitrate as NO3) is actually higher than the USGS national background estimate (1 mg/L nitrate-N); higher than the cited MCWRA's reporting of 3.0 mg/L nitrate-NO3 (i.e., equivalent to 0.7 mg/L nitrate-N); and also higher than the maximum background value reported by Moran et al. in 2011 (i.e., 3.3 mg/L nitrate-NO3; or equivalent to 0.75 nitrate-N) - please refer back to Figure 7 to view these relationships visually.

During. TMDL development, staff justified a marginally higher background concentration for nitrate in shallow ground waters of the alluvial floor areas on the basis that alluvial valley floor areas are regions with thick soil profiles, and that rainwater percolating through alluvial valley soil profiles could interact with soil nitrogen during infiltration and recharge. Further, staff was cognizant of developing biostimulatory targets that would not be infeasible to achieve because of plausible background conditions..

Finally, Ms. Taylor-Siva and Ms. Mercer suggest that natural, background nitrate concentrations in shallow groundwater (and expressed as stream baseflow) may by itself exceed the proposed dry season biostimulatory targets. Based on information provided by staff pursuant to this public comment, and based on information contained in the TMDL project report, estimated natural background concentrations of nitrate-N in shallow groundwater are expected to be well below the proposed water quality targets. As noted herein, Staff endeavored to estimate a concentration threshold for background nitrate in groundwater that could include all reasonably conceivable background concentrations (please refer again back to Figure 7 for visual illustration). Consequently, ambient, unimpacted groundwater is not plausibly anticipated to cause exceedances of the proposed targets in stream reaches – please refer to Figure 9 for graphical context.

Figure 9. Graph of biostimulatory targets compared to estimated groundwater background concentrations, and table showing nitrate in two different analytical reporting conventions.



Nitrate Reporting Convention used by MCWRA		*Nitrate Reporting Convention used in TMDL*	
Nitrate as NO3 (mg/L)	Reporting Equivalent as N >>>	Nitrate as N (mg/L)	
35.2	>>>	8	Wet Season Biostim Target
28.2	>>>	6.4	Dry Season Biostim Target-Alluvial Basin Floor
8.8	>>>	2.0	Dry Season Biostim Target-Alluvial Fans
6.2	>>>	1.4	Dry Season Biostim Target-Lower Salinas Riv
5.3	>>>	1.21	Groundwater Background Estimates
4.4	>>>	1.0	
3.0	>>>	0.7	
		Groundwater background used in TMDL	
		U.S. Geological Survey groundwater "national background"	
		MCWRA "background": median value for 466 ft aquifer	

51. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

We agree that it is important to consider the possibility of existing legacy pollution on shallow groundwater. This is particularly critical in light of the fact that dairies were prevalent on the Central Coast. Why wasn't legacy nitrate included as a part of the load estimates?

Staff response: Legacy nitrate pollutant loads are represented by the shallow groundwater contribution estimates to stream loading presented in the TMDL project report. As indicated in the TMDL project report, it is recognized that slow moving groundwater in shallow hydrogeologic horizons contributes nitrate loads to stream reaches, most particularly in the alluvial basin floor regions of the TMDL project area. As such, legacy loads are accounted for as a fraction (or a potentially large component) of the groundwater inputs estimated by staff. Staff defined legacy loads as being associated with land practices that occurred many years ago, and are not related to recent or current practices. As this time, there is not sufficient information to quantify the amount, percentage, or fraction of legacy loading to streams that are attributable to groundwater inputs. For example, some groundwater inputs to stream flow could come from recently recharged shallow groundwater, while other groundwater inputs to stream flow could result from baseflow that has long residence times in the subsurface prior to its expression as stream baseflow. Consequently as noted previously, the legacy pollutant component of current nitrate loading to streams is embedded within the groundwater inputs estimates.

With respect to the comment on nitrate associated with historic dairies, it should be noted that nitrate is a highly soluble and mobile compound. Soils and alluvium associated with historic, legacy dairies would not be expected to be a continuous reservoir of elevated nitrate levels at the soil horizon over a period of decades[25]. Based on available literature reviewed by staff, mineralization and net flux of inorganic nitrogen from organic nitrogen originating from manure would generally be expected to attenuate over a period of years, with the net flux of mineralized nitrogen ultimately becoming similar to that of native soil organic N (However, it should be noted that there is uncertainty with any estimate of nitrogen mineralization rates of organic materials based on local conditions).

Nitrate leaching from dairies, to the extent it historically occurred in decades past, would presumably be expected to currently be leached to groundwater as slow-moving a legacy pollutant. Note that during TMDL development, staff reviewed 1990s vintage spatial cropland data available from the California Dept. of Water Resources; there were two small dairies and a handful of confined livestock and poultry facilities at that time mapped in the TMDL project area. The collective total mapped areal extent of these vintage facilities was 168 acres, which amounts to only 0.06% of the areal extent of the TMDL project area. None of these facilities were located adjacent or near higher-order waterbodies having perennial or sustained flows, and these facilities were located a significant distance from any mapped lower-order ephemeral watebodies (greater than 800 feet to several thousand feet distance). It should also be noted that available isotopic data, as noted in the project report, suggest that nitrate in groundwaters and surface waters of the lower Salinas Valley have a geochemical signature consistent with chemical fertilizers but not animal waste. It should be noted that the isotopic data was limited in geographic scope and does not represent all subwatersheds and catchments in the TMDL project area. However, staff has not found, and is now aware, of any plausible evidence that historic dairies and confined animal facilities are causing or significantly contributing to nitrate pollution of surface waters in the project area.

[25] *It should also be noted that although the public comment referenced legacy nitrate, phosphorus (in contrast to nitrate) can preferentially fractionate into sediment and remain in sediment for long periods of time. In this TMDL project however, nitrogen has been identified as the priority pollutant (for reasons described in the project report) and that implementation efforts should focus priority efforts on nitrogen.*

52. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Historical land uses and conversions over time are critical factors when considering loss of fish habitat and potential mitigations that may be implemented. We do not believe that the collective implementations of management practices by individual landowners are sufficient to overcome chronic hydromodification of the Salinas River watershed over the past 100 years as it relates to healthy fish habitat and viable fish populations. While it is important for individual landowners to address excessive nitrate discharges and to improve watershed functions, within the bounds of what is agronomically sound, we believe it will require long-term, region-wide, conjunctive and collaborative efforts that have been thwarted by the regulatory process associated with the 2012 Agricultural Regulatory Program.

Staff response: Staff concur that the lower Salinas Valley has been substantially changed by hydromodification over the last century or more. A goal of this TMDL is to restore designated beneficial uses of existing surface waters in the TMDL project area and attainment of water quality standards consistent with state and federal law, which will result in improvements to viable fresh water habitat. As a practical matter, this means implementation of practices that ultimately result in reductions in nutrient loading, improvements in dissolved oxygen balance in local streams and reductions in excess algal biomass. While improving dissolved oxygen balance and reducing biomass and attainment of water quality standards should result in improvements to the quantity and quality of fresh water aquatic habitat in the lower Salinas valley, restoration of habitat and as it existed in historic times, a century or two centuries ago, is not contemplated by this TMDL.

53. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

There is some uncertainty about the legal status of numeric targets once they are adopted into the Basin Plan as part of the TMDL. Are these numeric targets elevated to the status of Water Quality Objectives so that subsequent regulatory actions must adopt them making them actionable and enforceable standards?

Staff response: The short answer is, no, the proposed TMDL biostimulatory substances numeric targets are not water quality standards or water quality objectives, even when incorporated into the Basin Plan. Proposed TMDL biostimulatory numeric targets are not enforceable numeric limitations, unless approved and adopted as numeric water quality effluent limitations in a Water Board-approved permit. Note that TMDLs are programs or strategies to implement existing water quality standards, but do not create new bases and authorities for direct enforcement apart from the existing permits and existing water quality standards.

The proposed TMDL numeric targets are not water quality standards themselves; they are a quantitative interpretation, a prediction, of the levels of pollutants necessary to implement and achieve an existing narrative water quality objective. It is important to recognize that under California law, a "water quality objective" has a very specific legal meaning. "Water quality objectives" are indeed regulatory thresholds/water quality limits. Water quality objectives can only be adopted through a specific legal and administrative process (often referred to as a "water quality standards action"), which exists independently and apart from the TMDL process. California Water Code §13241 establishes the requirements pertaining to the Regional Board's adoption of water quality objectives and require the Regional Boards to consider a number of factors when establishing water quality

objectives. Since TMDLs are not water quality objectives, the requirements for adopting such objectives do not apply to TMDLs or their numeric targets. Even when TMDL numeric targets are incorporated into the Basin Plan, they do not constitute new water quality objectives in and of themselves; they do not establish new bases for direct enforcement apart from existing water quality standards they translate; and the proposed biostimulatory water quality targets in this TMDL are not directly enforceable against dischargers.

Also noteworthy, state policy and federal regulation contemplate flexibility in translating allocations (e.g., TMDL numeric targets). Accordingly, the Regional Boards can determine that something other than a literal incorporation of allocations into permit conditions would be consistent with the assumptions and provisions of the TMDL allocations.

Central Coast Water Board staff are not recommending that the biostimulatory water quality targets be adopted as numeric, effluent water quality limitations. In fact, should the proposed basin plan amendment be adopted as written, the basin plan amendment would reflect the Central Coast Water Board's intent that compliance with proposed numeric targets and load allocations can be demonstrated in a variety of ways not limited simply to receiving water concentrations. The State Water Board Office of Chief Counsel has indeed written that permit conditions are not required to contain a literal incorporation of the TMDL numeric allocation (e.g., numeric target), and that the Regional Boards have discretion to implement the assumptions of a TMDL and its allocations through methodologies other than a direct translation of the receiving water numeric target/allocation. For reference, staff provides a reproduction of relevant information from the State Water I Board's Office of Chief Counsel that pertains to this public comment below:

SWRCB Office of Chief Counsel, Memo dated June 12, 2002
SUBJECT: THE DISTINCTION BETWEEN A TMDL'S NUMERIC TARGET AND WATER QUALITY STANDARDS

"Numeric Targets in a TMDL are not Directly Enforceable Against Dischargers"

The distinction between water quality standards and TMDLs is significant both for the manner in which they are adopted, and the manner in which they are enforced. *First, because* ***TMDLs are not water quality standards****, neither federal nor state law obligates the State and Regional Boards to establish and adopt TMDLs as water quality standards. Second, the provisions of a TMDL including its numeric targets, are not directly enforceable against dischargers by way of a citizen suit under the Clean Water Act. In general, section 505 permits such suits to directly enforce an effluent limit or standard. Because TMDLs are neither water quality standards nor a type of effluent limit addressed in section 505, TMDLs, including the respective waste load allocations, are not directly enforceable under the citizen suit provision of the Clean Water Act. The NPDES permits implementing the TMDL provide the vehicles for enforcement. The TMDL does not.*

The federal regulations reveal at least one obvious explanation for the exclusion of TMDLs from matters that can be directly enforced against dischargers. *Those regulations contemplate flexibility in translating waste load allocations into permit conditions. The NPDES permitting provisions require that water quality-based effluent limits must be "consistent with the assumptions and requirements of any available wasteload allocation." The provisions do not require the limit to be "identical to the wasteload allocation." This language leaves open the possibility that the Regional Board could determine that fact-specific circumstances render something other than literal incorporation of the waste load allocation to be consistent with its assumptions and requirements.37 The regulations thus contemplate the additional step of revising applicable NPDES permits to make them "consistent with the assumptions" of the TMDL*

Further, with regard to the concern about the use of proposed TMDL water quality targets being rendered as actionable and enforceable standards, it should be noted that the State Water Resources Control Board has found that the Central Coast Water Board will not take enforcement action against a discharger that is implementing and improving management practices to address discharges impacting water quality:

> *"While the Agricultural Petitioners are correct that the Agricultural Order contains no explicit compliance schedule for meeting water quality standards, the Central Coast Water Board has made it sufficiently clear in the Agricultural Order that it will not take enforcement action against a discharger that is implementing and improving management practices to address discharges impacting water quality."*
>
> *See* Agricultural Order, finding 10 and provision 12, and Attachment A, finding 2; Schroeter Testimony (Aug. 30, 2012); Thomas Testimony (Aug. 30, 2012).
>
> *From: State Water Resources Control Board Order WQ 2012-0013 In the Matter of the Petitions Of Ocean Mist Farms And Rc Farms; Grower-Shipper Association Of Central California, Grower-Shipper Association Of Santa Barbara And San Luis Obispo Counties, And Western Growers For Review of Conditional Waiver of Waste Discharge Requirements Order No. R3-2012-0011 Discharges from Irrigated Lands (emphasis added by Water Board staff)*

54. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The discussion in this section was very helpful in better understanding beneficial use designations. More information about what type of information is necessary to change beneficial uses during the Triennial Bain Plan review process would be helpful. We request that Staff clearly post such information on the CCRWQCB TMDL web-site to determine the feasibility of taking advantage of such options.

Staff response: The comment is acknowledged and staff have notified TMDL management and our Basin Planning unit of this request.

55. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

A TMDL is the maximum amount of a pollutant that a waterbody can assimilate while still meeting water quality standards. (SWRCB S.B. 469 TMDL Guidance, A Process for Addressing Impaired Waters in California, 2005) However, what if the assimilative capacity of the river to support certain uses is below the background levels found naturally in the watershed? This is a valid question considering reported background levels appear to be lower than several proposed numeric targets. Conversely, what happens if the numeric targets are so low that a beneficial use cannot be supported? There is a strong potential this may be the case for the production of cool season vegetables. The ground on which they are grown is considered the best economic use of that soil. The nitrate water quality objectives/standards/numeric targets are much lower than the soil nitrate levels needed to grow vegetables (4-5 mg/L NO3-N in soil solution or 20-25 mg/L NO3-N in an acre foot of soil). Would it not follow, then, that the agricultural beneficial use couldn't be supported? The overarching question here is: "What if beneficial uses cannot be attained/retained in this watershed?"

Staff response: Regarding the comment that background levels may exceed water quality standards and proposed biostimulatory targets, staff do not concur. Please refer back to staff response to comment 52, in which background concentrations and this topic are discussed in detail. Based on available data, undisturbed, background nitrate concentrations in shallow groundwater are well below all water quality standards and proposed numeric targets. Additionally, background nitrate concentrations that could reasonably be expected in runoff from undisturbed or lightly-disturbed lands are also well

below all proposed biostimulatory numeric water quality targets (please refer forward to Figure 11 and Figure 12 embedded within staff response to comment 58 for graphical context pertaining to this issue)

Regarding the comment on agricultural beneficial uses, it is important to recognize that "beneficial uses", in a Clean Water Act legal context, refer to legally protected current, potential, and future uses of the stream water. This Clean Water Act legal framework does not apply to economic uses of the landscape. However, State and Federal law provides the Water Board has several options to address situations where beneficial uses are not supported, cannot be supported, or are inappropriate for a given stream reach. These options are conceptually identified in the proposed Resolution-Basin Plan Amendment and are reproduced below for ease of reference:

> Based on relevant future information, data, and research, the Central Coast Water Board has the discretion to conduct a water quality standards review which may potentially include one or more of the following: (1) The Water Board may designate critical low-flow conditions below which numerical water quality criteria do not apply, as consistent with federal regulations and policy; (2) The Water Board may authorize lowering of water quality to some degree if and where appropriate, if the Water Board finds water quality lowering to be necessary to accommodate important economic or social development. In authorizing water quality lowering the Water Board shall make any such authorizations consistent with the provisions and requirements of federal and state anti-degradation policies; (3) The Water Board may authorize revision of water quality standards, if appropriate and consistent with federal and state regulations, to remove a designated beneficial use, establishing subcategories of uses, establishing site specific water quality objectives, or other modification of the water quality standard. When a standards action is deemed appropriate, the Water Board shall follow all applicable requirements, including but not limited to those set forth in part 131 of Title 40 of the Code of Federal Regulations and Article 3 of Division 7, Chapter 4 of the California Water Code.

56. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

"If the water quality standards are not being achieved because the applicable standards are not appropriate, an appropriate regulatory response may be to correct the standards through mechanisms such as use attainability analysis (UAA), a site-specific objective (SSO) or other modification of the water quality standards. In addition an antidegradation finding may authorize the lowering of water quality to some degree, which may address the impairment. This should not be construed as implying that standards may be changed as a convenient means of "restoring' waterbodies. To the contrary, federal and state law contains numerous detailed requirements that in many cases would prevent modification of the standards especially if it would result in less stringent control. Modification of standards may be appropriate however, to make uses more specific, to manage conflicting uses, to address site-specific conditions, and for other such reasons." (SWRCB S.B. 469 TMDL Guidance, A Process for Addressing Impaired Waters in California, 2005)

The regulations at 40 CFR 131.10(g) specify six factors that may provide a legal basis for changing or removing a designated use:

1. Naturally occurring pollutant concentrations prevent the attainment of the use.
2. Natural, ephemeral, intermittent, or low-flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met.

3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.
4. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use.
5. Physical conditions related to the natural features of the waterbody (e.g. the lack of a proper substrate, cover, flow, depth), unless these conditions may be compensated, unrelated to water quality preclude attainment of aquatic life protection uses.
6. Controls more stringent than those required by Sections 301(b)(1)(A) and (B) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

There is some concern that factors 1, 2, 3, 4, and 6 may apply to this TMDL. Factor 1 has been previously discussed. Relative to Factors 2 and 3, there have been numerous stakeholder discussions about the cumulative impacts from decreased irrigation water flows and associated increased nitrate concentrations and increased water temperatures. Further, efforts to curtail sediment could result in increased light penetration. Collectively, these could be conducive to *increased,* rather than decreased, algal blooms.

Factor 4 may apply if using aquatic life as a biological nutrient-response indicator when one considers the extensive hydrologic, and subsequent, habitat modifications that have occurred throughout the 20th century in the Salinas River Watershed. And finally, there is concern regarding the unintended consequences of this TMDL, and its associated permit, on land values, the resiliency of individual farms to be self-sustaining, industry viability and impacts to labor. Consequently, we recommend that TMDL adoption be delayed until further discussion, stakeholder input, and impact assessment may occur relative to the factors enumerated above.

Staff response: Please refer to staff response to comment 55, which includes a discussion of various water quality standards actions the Board could potentially consider and implement in the future if and where appropriate. The TMDL process is not designed to evaluate water quality standards appropriateness, but to create a strategy to attain those water quality standards that have already been established[26]. Modification of standards is an option through the basin planning and triennial review process where appropriate, but according to the SWRCB, modification of standards should not be viewed as an "easy fix" to avoid a TMDL.[27]

Regarding the assertion about naturally occurring pollutant concentrations prevent the attainment of the use please refer to staff response to comment 50 and 55 .

Regarding the comment about natural, ephemeral, intermittent, or low-flow conditions or water levels preventing the attainment of the use, please refer to comment 55 and 7 for relevant information on this topic.

Regarding the comment stating that efforts to curtail sediment could result in increased light penetration and that this could result in increased, rather than decreased, algal blooms, it is important to recognize that staff developed numeric targets, in part, on the basis of relatively undisturbed turbidity conditions for various stream grouping categories. This issue is discussed in detail in Appendix D of the October 2012 draft project report. In fact, the USEPA-recognized statistical approach staff employed is intended to establish

[26] *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options. SWRCB adopted by Resolution 2005-0050.*
[27] *Ibid*

nutrient endpoint targets under conditions closely approximating maximum sunlight penetration the would routinely be feasible in a given stream reach. Practically speaking, this means that proposed biostimulatory targets are linked to the "lowest reasonably feasible" turbidity conditions and highest sunlight availability conditions that would be expected for that stream category. Consequently implementing parties would not be expected to achieve turbidity conditions consistently that are much better than the low-end turbidity values used in the derivation of biostimulatory numeric targets. As noted previously, in the proposed TMDL staff endeavored to develop credible numeric targets that would not be more stringent than natural background, and would not be expected to worsen biostimulatory conditions on the basis of future sedimentation control efforts.

Regarding the economic concerns of growers regarding this TMDL, note that the implementation mechanism for the TMDL is the Agricultural Order. The TMDL does not establish any new requirements above and beyond what enrolled growers are already required to do under the existing order.

Finally, staff is not recommending delaying the TMDL. Please refer to staff response to comment 1 and 3 for relevant information on this topic. Regarding stakeholder input, staff maintain there was a significant amount of stakeholder input into this TMDL project over the last two and a half years; please refer staff response to 69 for information on this topic; also please note that Section 8.2 of the October 2012 draft TMDL project report outlined the scope and nature of stakeholder contributions to this TMDL. Additionally, some of the methodologies, flexibilities, and metrics staff are proposing to evaluate TMDL implementation and water quality progress resulted from the direct input and participation of agricultural stakeholders in another recently Water Board-adopted nitrate TMDL.

57. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Data qualifications and trend analysis presented by Central Coast Water Quality Preservation, Inc. should be considered in this TMDL. Please find data analysis from the following documents: 2010 Final Follow-up Water quality Monitoring Report: Continuous Monitoring of Flows, and 2010 and the Central Coast Water Quality Preservation, Inc. Draft Cooperative Monitoring Program Five-Year Evaluation Report: Monitoring Program Effectiveness and Efficiency, 2010:

Ms. Taylor-Silva and Ms. Mecer provided the following Narrative from:

Central Coast Water Quality Preservation, Inc. 2010. 5 Year Evaluation Report: Monitoring Program Effectiveness and Efficiency.

"The presence [of nitrate and ammonia are directly relevant to beneficial uses such as municipal and domestic water supply, agricultural water supply, and freshwater habitat and aquatic life. Although these parameters are clearly related to potential agricultural sources, there are also other significant sources for each of these parameters that complicate evaluation of agricultural impacts. Specifically, irrigation supply water, natural geological sources, urban runoff, treated municipal wastewater, and septic systems are all potentially significant sources of some of these parameters. Nitrate, total ammonia, and unionized ammonia all have clear numeric objectives that provide unambiguous regulatory interpretation of water quality status relative to support of specific Beneficial Uses. However, orthophosphate and chlorophyll-a do not have numeric objectives that support straightforward interpretation of their status related to Beneficial Uses. Chlorophylla is particularly problematic because it cannot be directly related to agricultural influences due to the many other environmental factors that influence ambient algae growth and species composition. Chlorophyll-a is intended to be an indicator of primary productivity and potential impairment from eutrophication, but there are no objective measures of "ideal" or "impaired" conditions. Additionally, trends in chlorophyll-a concentrations cannot be simply interpreted as protective or detrimental for Beneficial Uses. So, although chlorphyll-a is relatively inexpensive to monitor as a field parameter, it is not necessarily cost-effective because it provides little value in interpreting Beneficial Use support, agricultural influence, or progress towards CMP objectives. An additional consideration is that chlorophyll-a generally indicates only the presence of phytoplankton

suspended in the water column and does not address the benthic/attached algaes that are generally more important in flowing streams, which represent the majority of CMP sites."

Dissolved oxygen and pH are field-measured parameters. Both are most directly relevant to support of aquatic life Beneficial Uses and have numeric objectives in the Basin Plan. However, interpretation of Beneficial Use support related to these parameters is not always straightforward and determining the relative contribution of agriculture is difficult. There is often a high level of natural variability, and local geology can impact pH. A significant challenge with both parameters is considering the role of relatively high seasonal and diurnal variation due to temperature and algal and other microbiological respiratory processes. In spite of this, these parameters are essential to assessing aquatic life support, and can be measured in the field with conductivity at very little additional cost.

Water temperature and flow are most directly related to aquatic life Beneficial Uses. They can be directly influenced by agricultural practices, including irrigation management, and hydrological and habitat modifications. There are also many other natural and anthropogenic, non-agricultural factors that influence these parameters, which complicates interpretation by adding "noise" not related to agricultural influences. Substantial natural variability in these parameters occurs at multi-year, annual, seasonal and daily time scales and is more extreme in smaller water bodies. The high natural variation makes it difficult to characterize the status of these parameters relative to Beneficial Use support and to determine an appropriate management objective. The non- perennial nature and extreme hydromodification of most CMP water bodies also make it difficult to assess the relevance of agricultural discharges. Identification of real long- term trends in flows and the influence of agriculture are also very challenging. In spite of these limitations, monitoring of both of these parameters is essential for interpretation of other indicators. Water temperature is essential for interpreting dissolved oxygen data, and flow data are needed to evaluate loads of parameters such as nitrate. They are reliably, accurately, and cost-effectively quantified by the CMP, and there are no reasonable alternative parameters. The primary value of air temperature is in interpreting other water quality indicators such as water temperature and dissolved oxygen.

The highest number of trends was observed for flow and chlorophyll-a. The decreasing trend in flow was more often significant for dry season events, but was also observed for wet season events. Trends in flow were similar in both regions [Northern and Southern parts of the Central Coast]. In contrast, chlorophyll-a exhibited only decreasing trends at [Northern] sites, and only increasing trends at [Southern] sites. Most of the increasing trends at [Southern] sites were observed for dry season events. Several trends in air temperature and water temperature were identified, with many more decreasing trends than increasing trends. There were few trends in ammonia and nitrate. In the [Northern] sites there were more increasing trends (10) than decreasing trends (2) for these two parameters, and they were evenly split between wet and dry seasons. In the [Southern] sites the numbers of decreasing (8) and increasing (6) trends were similar, with nearly all decreasing trends observed during the dry season. There were few trends in dissolved oxygen and pH. Of those that were significant, there were more increasing trends in both parameters for [Northern] sites, and more decreasing trends for [Southern] sites.

The most frequently observed flows on Quail Creek during the study period were between 0 and 0.4 cfs. Flows above 2 cubic feet per second (cfs) were rare (Figure 7). Flows on Quail Creek had the highest coefficient of variation of any site in the project, and also dropped to 0 cfs on a greater number of days than any other site, on 35% of days in the study period. Flows were generally higher during June, July and August than in other months. Periods of more constant and somewhat higher flows occurred over three- to five-day stints throughout the study period, as did a few periods of a week or more when flows showed high daily fluctuations but never dropped to 0 cfs. Quail Creek also showed a strong pattern of nighttime peak flows. There were some daytime peak flows as well, however, the highest flows during most 24-hour periods appeared to occur predominantly between the hours of 9 p.m. and 3 a.m.

Flows on Chualar Creek were reported as follows: The most frequently observed flows on Chualar Creek during this study were around 1.0 cfs, and flows were rarely below 0.5 cfs or above 2.5 cfs. On a weekly or monthly basis, flows in Chualar Creek did not fluctuate much except to increase slightly from July to August, and to decline somewhat after October. Variability was higher on a daily basis, with peak and low flows evident during most 24-hour periods. Daily peak flows occurred at all times of day, but appeared to occur more frequently in the middle of the day. This pattern was somewhat different than in nearby Quail Creek. The magnitude of daily changes in flow appeared to decline after October.

In summary, if discussed in semi-quantitative or qualitative terms, monthly "grab sampling" of flows over a period of several years has provided a useful characterization of stream flows at the monitoring sites. In more quantitative terms, single monthly monitoring events do not provide the same information as monitoring which captures flows on a sub-daily basis. Thus, it may be inaccurate to extrapolate "grab sampled" flow data beyond the parameters under which they were collected. Perhaps more importantly, chemical water quality

parameters may exhibit the same kinds of fluctuation and variability as stream flows. If that is the case, then while monthly grab sampling may provide a useful characterization of water quality in general, it may be inaccurate to extrapolate results beyond the conditions under which they were collected without significant additional research.

The magnitude of flow rates in tributary streams is important when considering regional hydrology and loading to downstream water bodies. Whether or not these tributary streams are important sources of constituent loads to downstream waters depends on the interaction of stream flow with concentration-based water quality. When flows are negligible or non-existent, loads to downstream waters may be small (or zero). On the other hand, small flows may contain very high concentrations of nutrients, sediment, or toxicants that can contribute significant loads (i.e. cause impairments to cleaner downstream water bodies with higher flows). Though very low, flows at study sites for this project rarely dropped to 0 cfs, even during the driest part of the year. The major exception to this was Quail Creek, where 0 cfs occurred on a regular basis (0 cfs calculations for San Juan are not supported by field observations). Flows at all study sites exhibited somewhat regular daily patterns, with obvious peak- and low-flows in most 24-hour periods. Peak flows often (though not exclusively) occurred at night. The size of the drainage contributing flow to an individual monitoring site can impact water quantity and hydrological patterns. Under natural conditions, smaller drainages and tributaries tend to have greater variability of flows and are more influenced by short-term climatic variation. However, this typical pattern is less applicable or apparent in systems with a high degree of flow manipulation or management, as is the case for many of the water bodies monitored for the CMP. This is most apparent for the Salinas and Santa Maria regions. These two watersheds are the largest of the six hydrologic units and have main stem river monitoring sites with large contributing drainage areas. However, the hydrology of water bodies at the bottom of these two watersheds are highly influenced by diversions and drainage and supply management, and do not reflect natural flow patterns.

Staff response: Staff thanks you for providing narrative from the CCWQP report. Staff used substantial amounts of data collected by Central Coast Water Quality Preservation, Inc. Growers and the central coast agricultural community should be commended for supporting a robust and high quality monitoring program. Based on the comment, staff also added a reference and citation in the TMDL project report to the 2010 Central Coast Water Quality Preservation, Inc. report.

With regard to the reproduction of the report narrative published by Central Coast Water Quality Preservation, Inc. staff are aware that the use of any one stand-alone metric, such as chlorophyll concentrations or nutrient concentrations, are problematic for assessing biostimulatory impairments. This is because of the well-established fact that biostimulation is known to be the result of a combination of physical, chemical, and biologic factors. As noted repeatedly in the TMDL project report, a weight-of-evidence approach in data assessment regarding biostimulation, and measuring progress towards achievement of water quality goals is needed. As such, staff are proposing a wide range of metrics, including nutrient concentrations and nutrient load reductions in conjunction with monitoring and assessment of nutrient response indicators such as dissolved oxygen, chlorophyll, and microcystins on the basis of credible numeric water quality targets to assess water quality and progress towards attainment of water quality standards.

Also, as articulated in the project report, Staff are aware that not all water quality problems associated with pH and dissolved oxygen are necessarily related to biostimulation or to agricultural practices. Staff identified other factors which can effect pH or dissolved oxygen; this highlights the necessity of a weight-of-evidence approach towards addressing biostimulatory problems. In recognition of uncertainties regarding biostimulation, staff endeavored to provide maximum flexibility for implementing parties to demonstrate progress towards attainment of water quality goals and allocations. Staff also provided for a TMDL re-opener in ten years in which water quality numeric targets, implementation timelines, and implementation strategies could be re-assessed or revised on the basis of new research and information.

Consistent with the reporting by CCWQP, staff indeed assessed seasonal, flow-based, and temporal variations in nutrients and nutrient response indicators. Staff's source analysis regarding irrigated agriculture, urban, animal agriculture, septic systems, and natural background are consistent with previous studies published by researchers and staff's predicted source load comports quite well with observed source loads obtained from water quality monitoring data. Staff evaluated natural background sources such as geologic sources, atmospheric deposition, and natural ambient loads in runoff and shallow groundwater and concludes on the basis of the available data that it is implausible that these natural sources could be contributing substantially to the incredibly high loads and concentrations of nitrogen compounds observed in project area surface water bodies.

58. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

As discussed previously, there are serious concerns in the agricultural community about the ability to achieve proposed numeric targets and simultaneously produce cool season vegetables. There is also concern that proposed targets may exceed background standards in some watersheds.

Staff response: As noted in the October 2012 draft project report, staff emphasized uncertainties relating to the efficacy of meeting proposed biostimulatory substances water quality targets in an agricultural watershed dominated by irrigated row crop and vegetable. Staff proposed that TMDL implementation incorporate interim milestones and an iterative process that includes Water Board re-consideration of the TMDL of the proposed water quality targets, and of the proposed implementation timelines, based on implementation progress, new research, and additional studies.

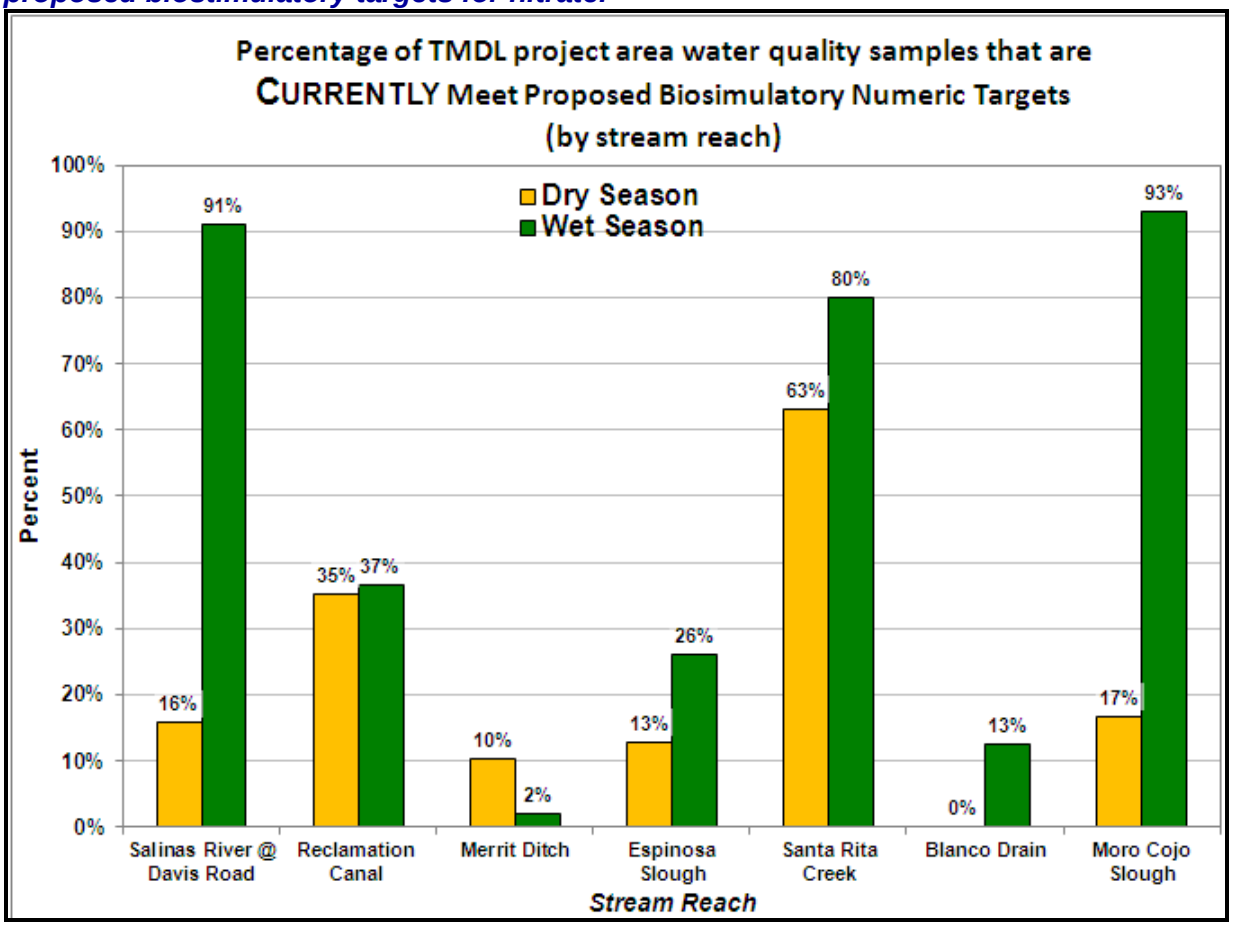
At this time, staff maintains there is sufficient information to begin to reduce and mitigate nutrient impacts to water quality in the lower Salinas Valley. According to the literature staff has surveyed, reputable resource professional and pilot field-scale studies and vegetative treatment systems demonstration projects show that substantial reductions in nitrogen losses from cropland possible with existing mitigation strategies, and an ecologically intensive approach that integrates complex crop rotations, cover crops, and perennials could reduce nitrogen losses by as much as 70-90%[28].

Also, it is important to note that the approaches staff used in biostimulatory water quality target development were based, in part, on USEPA-recognized statistical methods. Accordingly, the approach staff employed was intended to facilitate numeric target development appropriate to local scales, and local conditions. Since staff approach included the 25th percentile approach applied at the project-area scale, as a practical matter this means that one out of every four (25%) water quality samples (monitoring years 1999-2010) on average are in fact already meeting the proposed biostimulatory targets. In other words, it is not accurate to suggest the targets are infeasible and cannot be achieved − they are already being achieved, episodically in many stream reaches of the TMDL project area. It should be noted achieving that the targets in some stream reaches, like Blanco Drain, and Tembladero Slough will indeed be challenging, either because upstream sources are contributing to the observed in-stream degradation (Tembladero Slough), or because control of shallow groundwater, tile drainage, and water management in a vegetable

[28] *Davidson, E.A., Mark B. David, James N. Galloway, Christine L. Goodale, Richard Haeuber, John A. Harrison, Robert W. Howarth, Dan B. Jaynes, R. Richard Lowrance, B. Thomas Nolan, Jennifer L. Peel, Robert W. Pinder, Ellen Porter, Clifford S. Snyder, Alan R. Townsend, and Mary H. Ward. 2012. Excess Nitrogen in the U.S. Environment: Trends, Risks, and Solutions. Issues in Ecology, Number 15. Winter 2012.*

cropland setting present challenging technical issues locally. Figure 10 presents a graphical illustration of the frequency with which current and recent water quality samples already meet the proposed biostimulatory numeric water quality targets.

Figure 10. Percentage of water quality samples (1999-2010) that are CURRENTLY meeting proposed biostimulatory targets for nitrate.



Finally, staff do not concur that background levels exceed the proposed numeric water quality targets. Please also refer back to staff response to Comment 50 for relevant information. Staff have not received any evidence and data which indicate natural background levels would exceed the proposed water quality targets in any systematic or routine way (background nitrate concentrations in groundwater is addressed in detail in staff response to Comment 50). Indeed, based on available evidence and data, background concentrations of nitrate in both runoff[29] and in shallow groundwater are expected to be well below the proposed nitrate receiving water quality targets (please refer to Figure 11 and Figure 12 for relevant graphical context).

[29] *Source: U.S. Department of Agriculture's national MANAGE database. To estimate natural and lightly-disturbed background conditions staff used the native grasslands, ungrazed to lightly-grazed pasture, forest, and dryland grain farming land use categories, and excluded land management that included burned woodland, fertilized landscapes, and moderately to heavily grazed landscapes.*

Figure 11. Nitrate concentrations in runoff from natural or lightly-disturbed grassland, forested, and dryland farmed grain crop landscapes in various ecoregions of the U.S. and nitrate concentration in unimpacted groundwater (Salinas Valley), compared to proposed nitrate biostimulatory targets [Sources: US Dept. Agriculture MANAGE national database and Moran et al. (2011)].

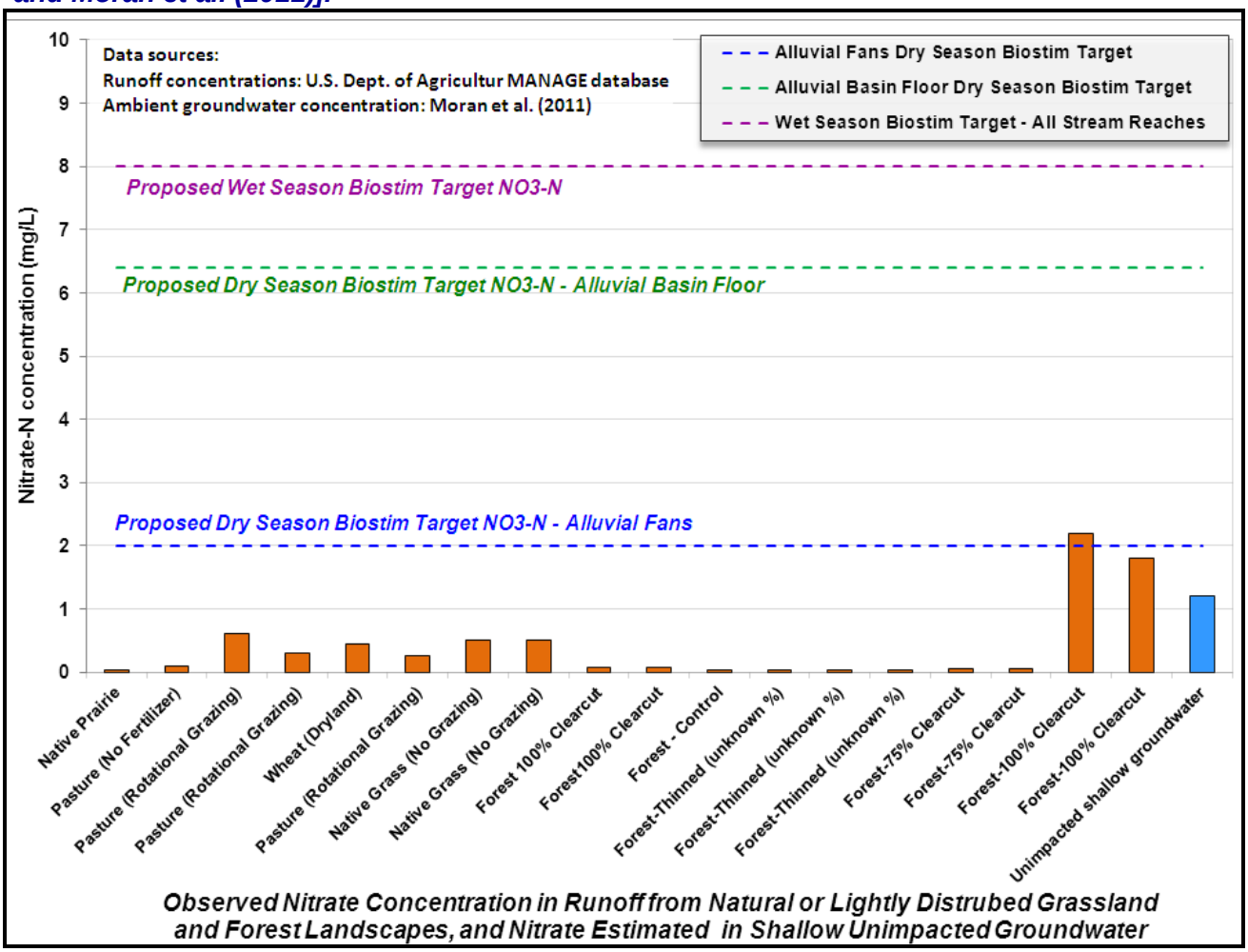
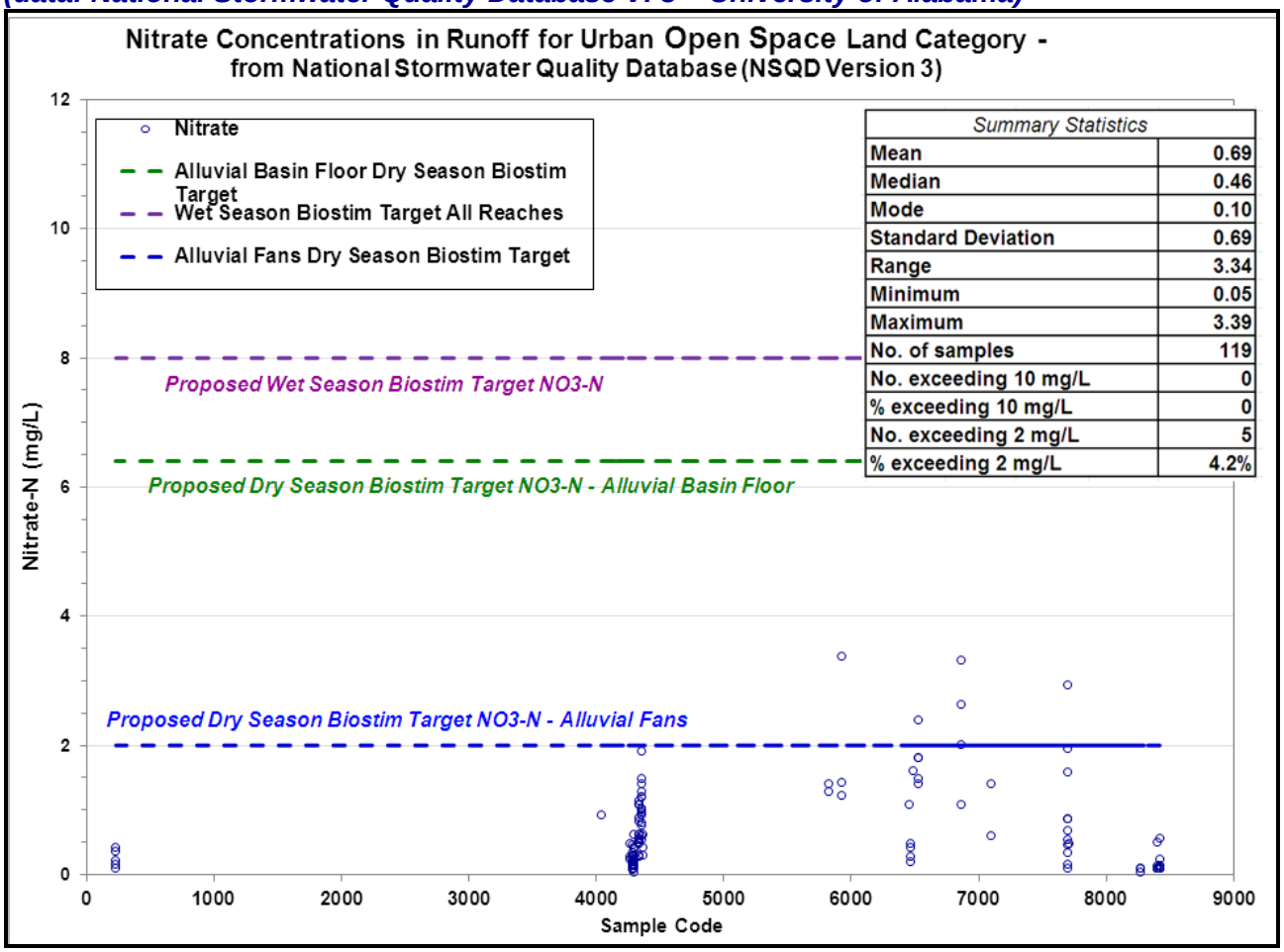


Figure 12. Nitrate concentrations in runoff from urban Open Space land cover category (data: National Stormwater Quality Database V. 3 – University of Alabama)



59. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

One concern that arises is the appropriateness of using the SWRCB draft Statewide Nutrient Policy recommendations to craft numeric targets in this TMDL. Until this policy is adopted, it is not the controlling guidance, and we recommend that Staff constrain the TMDL to currently adopted policies, procedures, and regulations. Another concern that exists is the use of surrogates for reference stream populations when those surrogates are derived from nutrient ecoregions significantly different from the Salinas Valley. The use of data from Minnesota lakes and Tennessee streams are not appropriate surrogates. We suggest the development of alternative surrogates using locally pertinent data or the abandonment of the use of the 25th percentile surrogates as proposed by the EPA.

Staff response: The proposed policy for nutrients for inland surface waters of the State of California does not require that regional boards delay or defer development of nutrient TMDLs on the basis of possible future promulgation of a statewide nutrient policy. Further, state water board staff informs us that the draft SWRCB nutrient policy is currently "on the shelf", is still being internally deliberated, and there was no indication if or when this policy will be promulgated. The approaches staff employed in TMDL nutrient target development are consistent with the nutrient criteria development framework under consideration by the state. As noted in the draft TMDL project report, if and when a statewide nutrient policy is

adopted in the future, nutrient criteria or monitoring requirements in this TMDL project may sunset and be superseded by revisions consistent with a possible future statewide policy as appropriate.

Regarding the comment on use of data, staff did not use data from Minnesota Lakes and Tennessee streams. Reference to Minnesota and Tennessee in the October 2012 draft project report was historical references and backdrop pertaining to USEPA's nutrient criteria guidance document. As documented in the October 2012 draft Project Report Appendix D – Nutrient Target development, Staff only used local and TMDL project-area specific data in the derivation of proposed nutrient water quality targets. For ease of reference, a screen capture from Project Report−Appendix D is shown in Figure 13 and provides an example of the monitoring sites, stream and landscape criteria, and water quality statistics for the alluvial valley basin floor stream category staff developed to support nutrient target development.

Figure 13. Computer screen-capture from October 2012 draft TMDL Project Report−Appendix D: An example of monitoring sites, stream and landscape criteria, and water quality statistics used in derivation of proposed nutrient targets in the alluvial valley basin floor stream category.

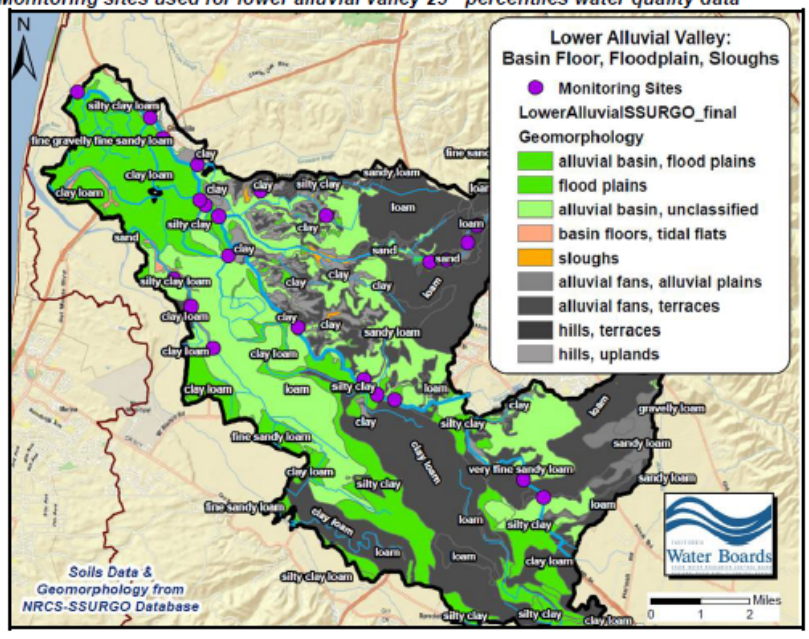
D.5 Lower Alluvial Valley - Basin Floor Stream Reaches

D.5.1 Lower Alluvial Valley Basin Floor Streams and Sloughs 25th Percentile Targets

Stream Conditions

- Geomorphic description: Alluvial basin floor; floodplain, sloughs. Low gradient, slopes less than 1 degree (source: NRCS-SSURGO)
- Waterbodies: Alisal Slough, Blanco Drain, Espinosa Slough, Merritt Ditch, Reclamation Canal, Santa Rita Creek, Tembladero Slough
- Estimated riparian tree canopy: close to 0% (source: NLCD, 2001 canopy raster, field observation)
- Substrate-soils: Dominantly fine-grained: clays, clay loams, silty clays (source: NRCS-SSURGO)
- Turbidity conditions: 35 NTU (25th percentile-year round); 53 NTU (geomean-dry season, May-Oct.); 56 NTU (median-dry season, May-Oct)

Monitoring sites used for lower alluvial valley 25th percentiles water quality data



Agricultural Alluvial Valley Inland Streams:
Basin floor, sloughs, and flood plain: Statistical Summary

Reclamation Canal, Tembladero Slough, Alisal Slough, Santa Rita Creek, Blanco Drain
Stream Geomorphic Description: Agricultural Valley Inland Streams - Basin Floor, Slough, and Floodplains
Statistical Summary of Nitrate-N

Temporal Representation	Nov. 1971 – Dec. 2009
Mean	22.70226313
Standard Error	0.939154872
Median	15.417
Mode	0.036
Standard Deviation	26.62963663
Range	439.975
Minimum	0.025
Maximum	440
No. of Samples	804
25th percentile	6.4

Reclamation Canal, Tembladero Slough, Alisal Slough, Santa Rita Creek, Blanco Drain
Stream Geomorphic Description: Agricultural Valley Inland Streams - Basin Floor, Slough, and Floodplains
Statistical Summary of Orthophosphate-P

Temporal Representation	Nov. 1971 – Mar. 2010
Mean	0.593975919
Standard Error	0.031233157
Median	0.34525
Mode	0.0075
Standard Deviation	1.330986993
Range	29.7925
Minimum	0.0075
Maximum	29.8
No. of Samples	1816
25th percentile	0.125

60. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

A final concern regarding numeric targets is the insertion of Microcystins as a target for all watersheds in the TMDL project area when they have not been routinely sampled and analyzed and no watersheds are listed for this nutrient response indicator. We see the value in this parameter as a direct measure of potential human health effects. We recommend that it be further developed and incorporated as "new data" upon the proposed review of this TMDL project.

Staff response: Staff intends to recommend this parameter as a useful nutrient response water quality indicator. There are currently a sufficient number of microcystin sampling events in the TMDL project area to assess impairment status consistent with guidance and methodologies promulgated in the California 303(d) Listing Policy. Microcystins are a primary biological response indicator to nutrient loading and an indicator of health risks and public nuisances. As noted in the project report, we are not recommending that implementing parties be required to collect microcystin data (they could choose to do so voluntarily); therefore our proposal does not add to the burden of monitoring placed on implementing parties.

61. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

We would like to express a similar concern regarding the use of local data in the STEPL modeling approach. If the data or models have not been generated in the similar nutrient eco-regions, we question the scientific applicability. Furthermore, we also question the uses of the following sources of data in the STEPL calculations: the use of Santa Maria Weather Station data, the lack of rural residential land cover estimates, the use of estimated national median N values from the GWLF User's Manual instead of local and measured estimates, and the use of nutrient concentration runoff data generated by the Southern California Coast Water Research Project.

Staff response: As documented in the draft TMDL project report, the source model staff used for predicted nutrient source loads comported quite well with observed existing nutrient loading in the water column of streams discharging from the TMDL project area. Staff's source analysis findings also comported quite well with studies and conclusions independently published by previous scientific researchers. Additionally, staff's source analysis as well as the TMDL project more broadly has been independently peer reviewed by reputable scientists who have expertise in nutrient pollution. As such, staff maintains that the source analysis presented in the TMDL project report is sufficient to meet the legal and scientific requirement of the federal Clean Water Act and State of California requirements pertaining to the scientific validity of proposed plans and policies. Staff also emphasized that additional research and studies would be useful to address uncertainties in this TMDL project, and that the Water Board would reconsider the TMDL on the basis of new studies and research.

Regarding, the Santa Maria weather station: the STEPL model inputs only allows for a finite number of weather stations used for rainfall correction factors in California (Santa Maria, San Francisco, Eureka, Sacramento, Fresno, Bakersfield, Los Angeles, San Diego, and Yosemite). The STEPL model does not provide a Salinas Valley weather station for correction factors. The Santa Maria weather station was the best choice climatologically and geographically to provide for climate correction factors in Monterey County. Further the numerical differences in rainfall correction factors between the Santa Maria, San Francisco, Fresno, and Sacramento weather stations are very small and result in negligible and insignificant variations in source load calculations.

Regarding residential land cover, the Farmland Mapping and Monitoring program metadata defines the urban and built up land use category as:

> ***"Urban and built-up land is occupied by structures with a building density of at least one unit to 1.5 acres*, or approximately 6 structures to a 10-acre parcel".***
>
> ***(*this is equivalent to one housing unit per 7,260 square meters, or one house on a square-shaped land parcel measuring 312 feet on a side)***

As such, this land use category includes both densely populated municipal areas, as well as unincorporated, less densely developed residential areas throughout the county. With regard to rural residential, and lightly populated areas, staff is unaware of any data in the central coast region suggesting nitrate pollution and impairment of surface waters is associated with areas where housing density is lower than 1 unit per 1.5 acres and the surrounding land use is not associated with fertilized cropland or treatment plant effluent discharges.

Also, available data indicates that in areas of the central coast region that have rural residential − but do not have substantial amounts of irrigated agricultural production − nitrate-N concentrations in surface waters are very low – generally well below 1 mg/L nitrate-N. At this time, staff cannot reasonably conclude that rural residential areas are exceeding proposed load allocations. It should be noted that information developed in this project report does not conclusively demonstrate that all domestic animal operations are currently meeting load allocations; there are potentially unpermitted confined animal facilities, equestrian facilities, or grazing animal operations that do not meet load allocations. More information will be obtained, if merited, during the implementation phase of the TMDL to further assess the level of nutrient contribution from these source categories, and to identify any actions if necessary to reduce loading.

Figure 14. Nitrate-N concentrations in surface waters associated w/ rural residential areas - Carmel Valley area and vicinity.

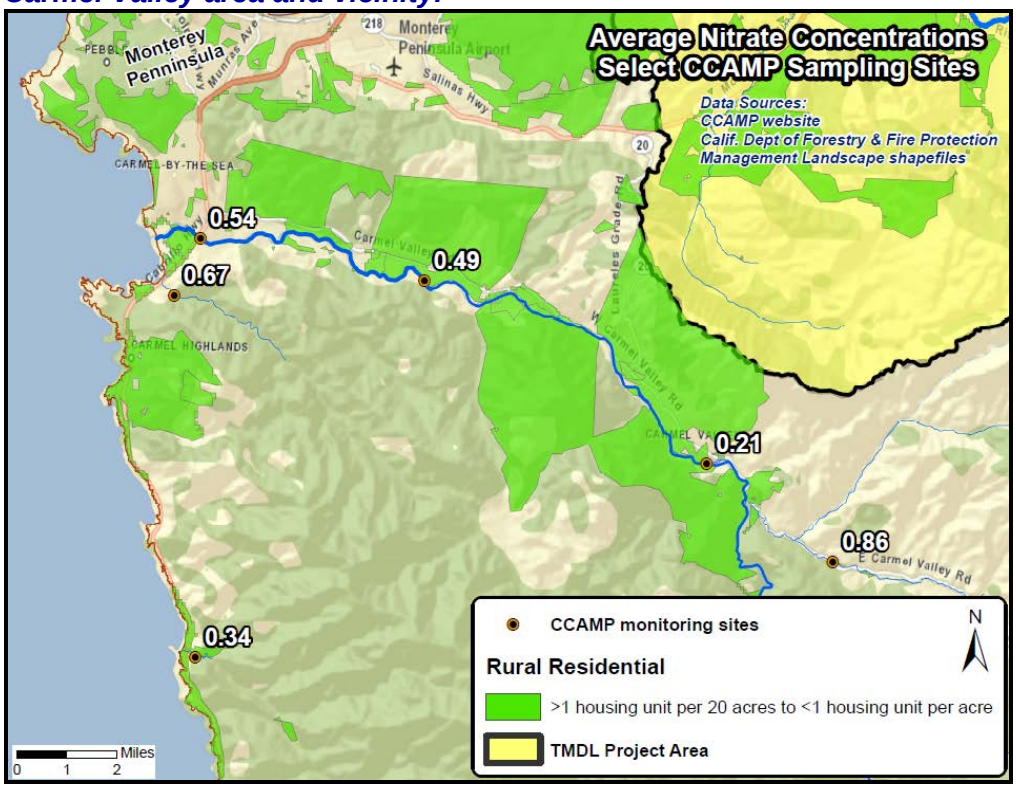
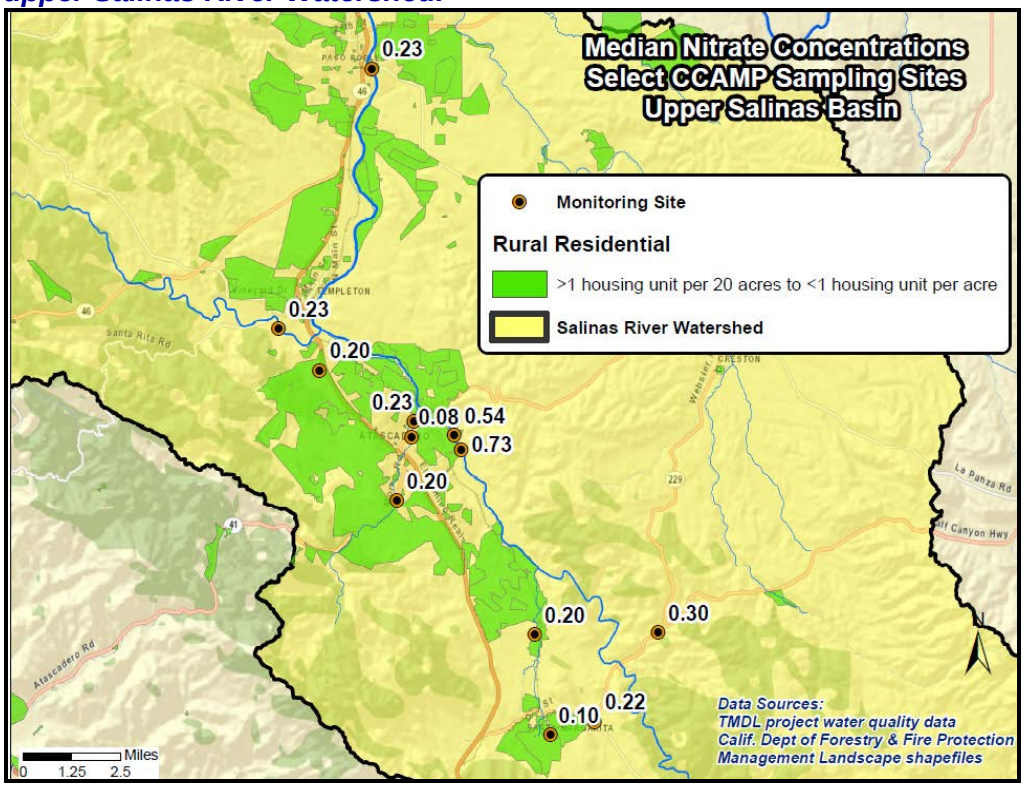


Figure 15. Nitrate-N concentrations in surface waters associated w/ rural residential areas – upper Salinas River Watershed.



Regarding the national median estimate of soil nitrogen, staff was unable to locate a credible regional estimate of average soil nitrogen in the Salinas Valley. When local data are not available, it is common practice in TMDL development to use literature values or national estimates.

Regarding the Southern California Coast Water Research Project estimate of runoff data, these were regional estimates for California's central coast and staff considers them reasonable to use for a central coast TMDL. Average runoff concentration that would be representative of the lower Salinas Valley was not available to staff. . When local data are not available, it is common practice in TMDL development to use literature values or regional estimates.

62. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Furthermore, several potential sources of nitrate are not incorporated into these source estimates. As previously stated, rural residential properties and legacy loading calculations are not integrated. Mineralization also has not been included and could lead to nitrate pulses during the warmer seasons resulting in anomalies examined in a vacuum that could be enormously misleading when determining source attributions or calculating loads.

Staff response: Please refer to staff response to comment 61 for information on the topic of rural residential properties.

Please refer to staff response to comment 51 and comment 2 for information on the topic of legacy loads.

Please refer to staff response to comment 51 for information on the topic of mineralization.

63. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Here, it should be reiterated that in section 3.7.3 Staff emphasized there were no statistically significant associations between fertilizer sales and water column nitrate concentrations: "Undoubtedly, there are many other confounding factors besides the magnitude of fertilizer sales that impacts average water column nitrate concentrations, including, but not limited to, substantial interannual variability in runoff and precipitation and water and irrigation management."

Staff response: The comment is acknowledged. Staff indeed concluded that temporal trends of average nitrate concentrations in surface waters are the result of many factors, not simply limited to annual fluctuations in fertilizer sales.

64. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Staff has done a commendable job of parsing data. However, we would recommend that Staff review the draft report with the following questions in mind:

Does this proposed TMDL actually address when, where, what, why and how much impairment exists in this Watershed? We contend that Staff has focused on why and how much but could improve analysis of the other factors.

Does this TMDL explain how the current levels of nutrient impairments evolved and how they can be addressed within a historical context? In order to "fix" the problem, the problem must first be understood. The TMDL project report does not consider the following:
• Historical flood control efforts (e.g. reservoir impoundments, creek channelization)(See discussion below)
• Historical groundwater recharge efforts to offset impacts of drought (e.g. year round reservoir releases
• Efforts to create aquatic life habitat (e.g. year-round water releases)
• Increased land conversion (e.g. from crop or grazing lands to rural residential and/or urban land uses)
• Degraded riparian habitat resulting from past watershed management efforts
• Excessive and unmanaged riparian habitat resulting from curtailed management Efforts

Staff response: Thank you for the comment. The draft TMDL project identifies the locations, scope, sources, and magnitude of impairments on the basis of available data. Indeed, there are uncertainties which could be the topic of future studies. Based on stakeholder comments, staff has added ideas for additional areas of studies and research that may be contemplated to reduce uncertainty during TMDL development over the coming decades. While science is a cornerstone of the TMDL program, a search for full scientific certainty and a resolution of all uncertainties is not contemplated or required in TMDLs adopted in accordance with the Clean Water Act, and USEPA and federal guidance. Staff endeavored to identify uncertainties in the TMDL, and reduce uncertainties where possible on the basis of available data. It should be recognized that from the water quality risk management perspective, scientific certainty is balanced by decision makers against the necessities of addressing risk management[30]. Conceptually, this issue is highlighted below:

> *"**Scientific uncertainty is a reality within all water quality programs, including the TMDL program, that cannot be entirely eliminated.** The states and EPA should move forward with decision-making and implementation of the TMDL program in the face of this uncertainty while making substantial efforts to reduce uncertainty. Securing designated uses is limited not only by a focus on administrative rather than water quality outcomes in the TMDL process, but also by unreasonable expectations for predictive certainty among regulators, affected sources, and stakeholders…. Although science should be one cornerstone of the program, an unwarranted search for scientific certainty is detrimental to the water quality management needs of the nation. Recognition of uncertainty and creative ways to make decisions under such uncertainty should be built into water quality management policy,"*
>
> *National Academy of Sciences – National Research Council (2001)*
>
> *Report issued pursuant to a request from the U.S. Congress to assess the scientific basis of the TMDL program: National Research Council, 2001. "Assessing the TMDL Approach to Water Quality Management – Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction, Water Science and Technology Board"*
>
> *(Emphasis not added – emphasis as published in the original National Research Council report)*

Over the past two and a half years, in public meetings and through informal communications, staff also invited interested parties to informally submit their comments, ideas, and data to support TMDL development (see staff response to comment 69).

[30] *U.S. National Research Council − National Academies of Science, 2001. Assessing the TMDL Approach to Water Quality Management − Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction Water Science and Technology Board*

Staff will include the suggestions provided regarding uncertainties that could benefit from more study in the "Optional Studies" section of the TMDL project report. USEPA guidance states that TMDLs and implementation of water quality controls should not delayed on the basis of uncertainties; this particularly holds true for diffuse source of nonpoint source pollution and where there are credible threats of serious or irreversible environmental damage. Staff maintains that this TMDL complies with all federal Clean Water Act Requirements and there is sufficient evidence to begin to implement the TMDL. Indeed, the project report notes that many nutrient pollution strategies are currently underway in the project area, in recognition of the widespread nature of the problem. Further, the Water Board cannot mandate the specific types of management measures at the local scale to protect or improve water quality, and comply with state water quality standards.

65. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

As is the case in most of the developed world, land uses and river hydrology has been highly modified in the Central Coast of California. The agricultural development and activity is not unique in this respect. Nor it is unique that the water quality has been affected. The bizarre comment from the scientific review claims that the standards are not over or under protective does not spur confidence that meeting these numeric targets will improve water quality to meet beneficial uses, thus delist the river and tributaries. It is not clear that the scientific review actually evaluated the models used to determine the numeric objectives (in terms of validity of assumptions, appropriate use of data, and interpretation). What is of most concern is the capacity of agricultural land uses to ever meet these numeric objectives, thus never be able to delist the water body. Furthermore, we foresee that the use of the agricultural waiver, which has limited capacity to address these impairments (with a significantly flawed risk assessment) is touted as the implementation tool. Given the rather aggressive timetable, the Regional Board will be compelled to further disenfranchise growers in the next agricultural waiver to meet a new set of statutory requirements (i.e. meeting TMDL goals).

Staff response: Regarding the concern about the scientific peer review comments of Dr. Marc Beutel, it is important to recognize that the reviewer was not requested or required to evaluate the California NNE model, or the USEPA published statistical approaches. Both of these methodologies were developed over the course of many years, with the input, contributions and external review of reputable university, government, and private consulting scientists[31,32]. It is not necessary for the Water Board's peer reviewer to re-visit and re-evaluate recognized methods and models that have already gone through substantial review processes − indeed that would amount to an inefficient, redundant, and poor use of state resources. It is also noteworthy that the aforementioned USEPA recommended statistical approaches staff employed have been used routinely throughout the nation in USEPA-approved nutrient TMDLs.

With that said the appropriate role for the Water Board's scientific peer reviewer was to evaluate the appropriateness of staff's application and use of these established and recognized methodologies. For reference, the relevant narrative from the Dec. 8, 2011 Water Board request for scientific peer review of this TMDL is presented below:

[31] *For information on the development of California's NNE approach, and information about the scientists and technical advisory groups involved in developing the NNE approach, please visit: http://rd.tetratech.com/epa/*

[32] *For information on the development of USEPA statistical nutrient endpoint approaches, and information about the scientists and contributors involved in developing USEPA statistical endpoint approaches, please visit: http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/rivers/index.cfm,*

Staff recommendation for focused peer on NUTRIENT TARGETS

Primary Scientific Issue: Use of USEPA-recommended statistical approaches in conjunction with California Nutrient Numeric Endpoints Approach to derive numerical water quality criteria to implement the Central Coast Basin Plan's Biostimulatory Substances Narrative Water Quality Objective for Inland Surface Waters

From: Central Coast Water Board Letter, dated Dec. 8, 2011: Request for Scientific Peer Review of Proposed Basin Plan Amendment to Adopt Total Maximum Daily Loads for Nitrate, Unionized Ammonia, and Orthophosphate in the Lower Salinas River and Salinas Reclamation Canal Basin, and the Moro Cojo Slough Subwatershed

Based on the peer review comments we received, it is quite apparent that the reviewer familiarized himself with the conceptual approach staff took (which is graphically represented in Figure 7 of Project Report Appendix D-Nutrient Target Development in the October 2012 project report documentation), as well as pursuant to the technical comments he provided on turbidity input values, numeric endpoints, and the appropriateness of proposed numeric endpoints for specific stream reach categories, on the basis of technical information contained in draft Project Report Appendix D-Nutrient Target Development . As noted in the peer review comments, Dr. Beutel reported that on balance, he considered the proposed targets a "reasonable starting point", which in his opinion strike a reasonable balance between being over-protective and under-protective.

With regard to the comment on agricultural lands never being able to meet these objectives, please refer to staff response to comments 55, 58, and 1.

With regard to the statement about aggressive TMDL implementation timelines, staff is proposing these timelines on the basis of best available information. it should be noted here that while agricultural stakeholders have recommend longer timeline milestones than staff proposes, a scientific peer reviewer of this TMDL project (Dr. Marc Buetel, Washington State University) and federal fisheries biologists (NOAA-NMFS) have recommended shorter timelines than proposed by staff. Please refer to staff response to comment 8 for relevant information. Staff is also proposing the TMDL implementation timelines and criteria be re-evaluated on an interim basis to take into account new information, data and research.

With regard to the comments on the agricultural order being inadequate to implement the TMDL, that is will result in additional statutory requirements and will disenfranchise growers please refer to staff response to comments 19 and 16 for relevant information on these topics.

66. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Furthermore, while commendable efforts were made by Staff to differentiate numeric targets per variable geomorphology or stream characteristics site, it appears that all other aspects of the TMDL are broadly applied. Difficulty arises because of the unique watershed characteristics of the sub-tributaries and the unique nutrient responses within each sub-tributary. For example, in spite of elevated nitrate levels found in the eastside watersheds, no biostimulation response factors were graphed in the TMDL draft project report.

Staff response: Thank you for the comment. Regarding the comment on unique watershed characteristics and unique nutrient responses within each tributary, no further or additional information is provided in the public comment that would allow staff to further evaluate or address this comment. Staff concur that there is substantial variation in the TMDL project area. The scientific basis for estimated nitrate source loading from each individual subwatershed in the project area is presented in the project report. As a matter of

implementation, water quality protection, and water quality improvement, the TMDL contemplates that that landowners and local resource professionals are in the best position to locally assess and determine appropriate water quality protection and water quality improvement strategies. Staff endeavored to provide as much flexibility as possible for implementing parties to demonstrate water quality protection, improvement, and progress towards attainment of state water quality standards. With regard to the comment on the eastside creeks, some of these creeks are contributing to downstream biostimulatory impacts based on available data and as documented in the draft TMDL documentation.

67. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

We understand that there is considerable pressure on the SWRCB and the Water Boards to develop, implement and finalize TMDL programs. However, we are somewhat puzzled as to the proposed deadline for adoption of the Lower Salinas Nutrient TMDL in light of numerous state and regional pending decisions and initiatives. It would appear prudent to postpone further decisions until 1) SWRCB makes recommendations to the California legislation regarding nitrate management as per SBX2 1, 2) SWRCB finalizes decisions regarding petitions of the 2012 Region 3 adopted Agricultural Regulatory Program, 3) work to better incorporate findings and recommended actions that result from the SWRCB Salinas Valley Salt and Nutrient Basin Planning process. For the Water Boards to move forward in a vacuum without regard for these pending initiatives seems precipitous.

Staff response: SBX2 1 resulted in the addition of Water Code Section 83002.5, which is "To improve understanding of the causes of groundwater contamination, identify potential remediation solutions and funding sources to recover costs expended by the state for the purposes of this section to clean up or treat groundwater, and ensure the provision fo safe drinking water to all communities…" (emphasis added). Water Code Section 83001.5 does not preclude the Water Board from implementing actions or developing plans (such as TMDLs) to achieve existing water quality standards, including in surface water quality standards applicable to the Salinas Valley. Furthermore, staff do not anticipate, nor is it likely, that the outcome of pending petitions against the Ag Order will result in removal of the surface water quality standards used to develop this TMDL, nor will the final Ag Order, even if modified from its present requirements, remove requirements to progress towards achieving those surface water quality standards. Finally, similar to the responses regarding SBX2 1 and the petitions against the Ag Order, salt and nutrient management planning will not result in the removal of nutrient-related surface water quality objectives used to develop this TMDL, and when salt and nutrient management planning does commence, that effort can utilize the information provided in this TMDL. Staff is not recommending delay or deferral of the TMDL. Staff is required to develop TMDLs in accordance with the federal Clean Water Act, and in a timely manner on the basis of available data. The proposed TMDL does not impose additional requirements on agricultural stakeholders above and beyond what they are already required to do pursuant to existing regulatory programs, or future revisions of the Agricultural Order. TMDLs are strategies, or plans to assist the state implementing existing water quality standards and do not create new bases for enforcement apart from the existing standards they implement. Relevant information on the Ag Order or possible pending revisions to the Ag Order can also be found in staff response to comment 16. Staff does not typically consider the existence of ongoing research, programs, and planning processes to be the basis for deferring a TMDL, nor have we been informed by management or by USEPA to delay TMDLs on the basis of on-going planning and research. Ongoing planning, and research can be incorporated into − or be considered consistent with − TMDL implementation. Note that the proposed TMDL implementation does not contemplate immediate or prompt compliance with state water quality standards; indeed

this TMDL contemplates that compliance with state water quality standards may not be achievable for up to 20 and 30 years. Also, please refer to staff response to comment 64 for further information on this topic.

68. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The intent of the TMDL Process is designed to allow stakeholders in a watershed to address water quality using a flexible approach. Namely, to estimate load and to assign load reduction for various sources and use types. Using this framework, stakeholders should have the flexibility to address nutrient impairments by reducing loads, or to provide incentives by developing pollutant trading programs to address overall load reductions. However, the proposed TMDL is focused on concentration based-criteria and spends only a token amount of attention to on alternatives.

Staff response: In recognition of the need to provide flexibility, Staff are proposing a range of methodologies and criteria in allowing implementing parties to demonstrate water quality protection, water quality and management improvements, and progress towards attainment of relevant state water quality objectives. Please see staff response to comment 7 which contains relevant information pertaining to this topic.

69. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The release of draft documents in excess of 500 pages of technical writing does not provide a good foundation for a process. We suggest that the Regional Board develop a collaborative process, where stakeholders are continually engaged in the process from “fact finding”, goal setting and implementation planning. The region is desperate for this type of approach and GSA has worked hard to develop the foundation for that process to build upon.

Staff response: Staff will inform our program management of this suggestion. With regard to the voluminous nature of the TMDL project documents, it should be noted that a preliminary draft of the TMDL project report was made available to the public in March 2012, 7 months before the formal written public comment period commenced. Further, the fundamental elements of the TMDL project and implementation plan are not substantially changed since that March 2012 preliminary draft web posting. Staff have endeavored to encourage informal feedback, ideas, and input from stakeholders throughout the TMDL process. Section 8 of the October 2012 draft TMDL project report outlines a number of key contributions stakeholders contributed to TMDL development either on the basis of formal workshops, or through informal contact with Water Board staff.

Water Board staff held four public workshops on this TMDL between the summer of 2010 and fall of 2012. At each workshop, we endeavored to diligently take notes about stakeholder ideas and concerns, and if appropriate endeavored to incorporate or address these ideas and concerns in the TMDL project. In public meetings and in informal discussions we also informed stakeholders they could share data, studies, and research with us that would be relevant to TMDL development, if they chose to do so. Indeed, staff utilized information, data, studies, etc. that were provided to us by interested parties whom chose to interface with us. Staff web-posted and mailed Fact Sheets for the TMDL project, in which we encouraged interested persons to contact us and offer their contributions to TMDL development

We received quite a number of letters, emails, and phone calls throughout the TMDL development process from stakeholders who chose to interface with us, and attempted to incorporate or address issues, data, and ideas presented to us through these contacts.

Also noteworthy, is the fact that some of the TMDL's implementation plan ideas (including metrics for measuring implementation progress and methodologies for implementing parties to demonstrate compliance with allocations) were developed with the direct input and participation of agricultural stakeholders in a previous, recently approved Water Board nitrate TMDL.

With that said, staff will endeavor to continue to seek ways to improve stakeholder outreach and participation in TMDL development as feasible and consistent with our statutory and policy obligations.

70. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

We also find it necessary to provide comments on the proposed implementation program for irrigated agriculture. While the TMDL Draft Report indicates that implementation will be achieved through compliance with the Conditional Waiver for Irrigated Agriculture, we are concerned that the more detailed information in the Project Report suggests that the TMDL Implementation Requirements would be imposed regardless of the status of the Conditional Waiver for Irrigated Agriculture. (See Project Report, p. 250, "Implementing Parties will comply with the Agricultural Order, and … owners/operators of irrigated lands in the project area will implement management measures as identified in Table 7-2.")

Staff response: The draft Project Report implementation plan does not suggest that TMDL implementation requirements will be imposed regardless of the status of the status of the Conditional Waiver for Irrigated Agriculture (Ag Order). It should be noted that the full narrative from this section of the October 2012 draft TMDL project report states:

> ***"Implementing parties will comply with the Agricultural Order, and if/where appropriate and as consistent with the current Agricultural Order or renewals of the Agricultural Order, owners/operators of irrigated lands in the project area will implement management measures as identified inTable 7-2"***
>
> ***(emphasis not added, emphasis is in the October 2012 draft Project Report)***

Also noteworthy, is that TMDL project reports have no legal authority or legal standing; they are staff technical reports. As such the implementation plans contained within them are not by themselves self-executing or self-implementing. In the proposed TMDL project report implementation plan, staff endeavored to list the conditions of the Ag Order that were not stayed by SWRCB (September 2012) and which pertained to aquatic habitat protection, nutrient management, and irrigation management. These are the practices that would be most relevant in implementing the proposed TMDL. Also note that the narrative staff repeatedly wrote in the proposed implementation plan is that these conditions will be applied if and where appropriate and as consistent with the Ag Order or revisions of the Ag order.

TMDL staff's intent in tabulating the existing conditions found in order Ag Order (as of Sept. 2012) pertaining to aquatic habitat protection and nutrient/irrigation management is so that we comply with our statutory obligations and public responsibilities. These obligations can be summarized as follows:

- ***Staff are required to craft implementation plans in a TMDL to ensure all waters meet applicable standards as soon as is practicable[33]. Further, in accordance with California Water Code §13242, a program of implementation for achieving water quality objectives shall include, but are not limited to, a description of the nature of actions which are necessary to achieve the objectives, and a time schedule for actions to be taken[34].***
- ***Staff endeavored to make sure the interested general public, State Water Board and USEPA are duly informed as to some of the expected or potential conditions of the Ag Order that could implement the TMDL. Most of the general public, State Water Board staff and USEPA are not expected to be familiar with the specifics of the Ag Order. Consequently staff considered it appropriate to inform the interested general and relevant public agencies of the required, expected, or potential regulatory practices that could implement the TMDL. Recall that the State Water Board and the USEPA are the agencies responsible for reviewing and approving TMDLs subsequent to any Central Coast Water Board approval.***

71. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

As the CCRWQCB is well aware, the Conditional Waiver for Irrigated Agriculture is currently under review by the State Water Board, and that certain nutrient-related provisions of the Conditional Waiver have been stayed pending that review. Many of the provisions subject to the stay, and subject to review, are specific implementation provisions identified in the Project Report. Specifically, Table 7-2 (Implementation Actions for Irrigated Lands) includes measures that are subject to the stay and/or review by the State Board. Such measures include, for example, the determination of crop nitrogen uptake, development and implementation of an Irrigation and Nutrient Management Plan, calculation of nitrate loading risk levels, and progress towards meeting nutrient balance ratio targets. It would be highly inappropriate if CCRWQCB were to use the TMDL Implementation Program to undermine the SWRCB's stay, and its review of the pending petitions. Thus, the independent applicability of these measures outside of the Conditional Waiver must be removed.

Staff response: Please see staff response to comment 70.

72. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Overall, our concern is that while arguably the TMDL process may be sufficient for addressing nutrient-related water quality, it is insufficient for assessing watershed health with the context of a healthy community, economy and environment. There's too much uncertainty about how to mitigate nutrients across crop types, different areas within the same watershed, and what appropriate and productive response factors might be when challenged with a multitude of variables and a lack of tools to manage post-season residual nitrate. Uncertainty about management effectiveness and availability is prevalent, despite research, because it has not been sufficiently modeled against these challenges.

Staff response: Please see staff response to comments 1, 3, and 68 for relevant information on this topic.

[33] *State Water Resources Control Board, Water Quality Control Policy for Addressing Impaired Waters, adopted by Resolution 2005-0050.*
[34] *C.W.C § 13242(a) and (b)*

73. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

This draft TMDL also lacks comprehensive risk assessments, which could lead to adverse unintended consequences. By requiring the promulgation of riparian habitat without conducting adequate modeling of human health risks, one can expect increased risk of: habitat for human illness vectors, human pathogen vectors, and flooding of agricultural fields and homes.

Staff response: Note that the TMDL does not require the promulgation of riparian habitat (canopy cover). In recognition of spatial variability in ecosystems, land use, the need for flood control management, and other reasons, the TMDL recommends, that where and as appropriate, increased riparian canopy shading can help reduce the risk of biostimulation. In addition to increased tree canopy, the TMDL project report tabulates and identifies a plethora of known and published management practices that could potentially achieve a similar performance result. Local resource professionals and local stakeholders are in the best position to assess and ultimately find an appropriate mix of tools, practices, and strategies that provide for progress towards and attainment of state water quality standards over time, with the Water Board playing its statutorily-mandated oversight role.

74. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

What is intriguing is that the TMDL program emphasizes the need for adequate assessment, but, then limits the types of assessments to singularly address water quality objectives (standards) are being achieved. There are no simple provisions for assessing historical watershed modifications and whether these modifications impact attainability.

Staff response: It is important to recognize that TMDLs are not the appropriate administrative venue to review the appropriateness and attainability of water quality standards. The Water Board's Basin Planning Process and the Triennial Review intended to review the appropriateness and feasibility of attainment of water quality standards. As stated in the SWRCB's Impaired Waters Policy, the TMDL process is not designed to evaluate water quality standards appropriateness, but is to create a strategy to attain those water quality standards that have already been legally established[35].

To be notified of opportunities to submit data and participate in the Basin Plan Triennial Review, stakeholders, interested parties, and the general public may elect to be included on the Water Board's Basin Planning Triennial Review email subscription list at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg3_subscribe.shtml

75. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

Also, TMDL programs do not assess the economic costs of attaining standards, nor the consequences of being solely focused on one class of constituents (i.e. ignoring interrelationships with other constituents), nor the impacts of loading variability over time periods (past or future, short or long duration), nor the assessments of the consequences of cumulative (and potentially negative) environmental impacts of regulations, nor other, as yet, un-assessed consequences. Best Management Practice implementation costs, achievability and field data variability are not

[35] *State Water Resources Control Board: Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options. Adopted by Resolution 32005-0050.*

taken into account. For example, there's an inexplicable degree of variability of nitrate concentrations in both soil and groundwater found through routine field monitoring.

Staff response: The comment is acknowledged. Also, please refer to staff response to comment 64.

76. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The TMDL process also lacks provisions when implementation fails to achieve water quality standards. Adaptive management, the application of the scientific method to decision-making, is a critical missing step. This process of taking actions of limited scope, commensurate with available data and information to continuously improve our understanding of the problem and its solutions, while at the same time making progress toward attaining water quality standards, is an essential missing element.

Staff response: Please refer to staff response to comment 55 ; please refer to staff response to comment 56; please refer to staff response to comment 1 and 3, and also please refer to staff response to comment 64.

77. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

According to the SWRCB, because an implementation plan will often identify actions that have unknown or uncertain efficiencies, it is important that it be flexible to the need for change over time. If monitoring and surveillance during the implementation process indicate that the interim milestones are not being achieved, 3 options are possible: 1) the implementation can continue, 2) the implementation practices can be adjusted or new practices initiated and 3) the regulatory actions can be revised by revisiting phases 1-7 (State of California, A process for Addressing Impaired Waters in California, S.B. 469 Guidance, June 2005).

Staff response: The comment is acknowledged.

78. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The SWRCB Policy for Implementation and Enforcement of NPS Pollution Control Program states four key elements, the last of which is critical to this TMDL: 4) feedback mechanisms must be designed to track and evaluate progress. If a TMDL or other regulatory acting is being adopted with sufficient information to develop a complete implementation plan the implementation plan can be developed consistent with an adaptive approach that outlines the various stages of implementation that are expects and a the process for fully realizing the regulatory actions. The implementation plan may adopt initial stages such as a study program or may contain a commitment by the RWQB to reconsider the implementation play a specified time. However, RWQCB shall require itself to produce a full implementation plan (SWRCB, Implementation and Enforcement of the Nonpoint Source Pollution Control Program, May 20, 2004).

According to the same SWRCB Policy, steps in designing an implementation plan should include identifying current activities, identifying common interests and overlapping objectives, engaging stakeholders, identifying opportunities for management practices and considering alternatives and costs. In our opinion, the following processes have not been fully addressed when designing this TMDL: SBX21; the Agriculture Alternative Ag Waiver Proposal, the Salt and Nutrient Basin Planning Process and Monterey County Water Resources Agency's nitrate management activities. There should also be actions taken to resolve key uncertainties and verify assumptions.

Staff response: Please refer to staff response to comment 67; and staff responses to comments 17, 56, and 69.

79. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The SWRCB Guidance also provides that technical considerations should be made to consider sources and load delivery mechanisms, linkages of management needs to the sources, and availability of appropriate techniques, management measures and individual practices for the impairment and source categories. This has not been sufficiently addressed, as stated previously in this letter.

Staff response: Please see staff response to comments 61 and 64.

80. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

The SWRCB Guidance (State of California, A process for Addressing Impaired Waters in California, S.B. 469 Guidance, June 2005) considers these three triggers for consideration of economics or cost in basin planning: Before implementing any agricultural water quality control program (i.e. before adopting any agricultural related Basin Plan amendments); In establishing WQOs that ensure the reasonable protection of beneficial uses; Analyze reasonable foreseeable methods of compliance with proposed performance standards and treatment requirements. This must include economic factors (enumerating potential funding sources does not constitute a cost estimate). Additionally, collective impacts and unintended consequences of crop loss, yield loss, quality loss, business failure, the election of growers to discontinue their businesses, and the costs of exacerbated environmental negative impacts must be included.

Staff response: The guidance document referenced by the commenter states: "Under state law, there are three specific triggers for RWQCB consideration of economics or costs in basin planning: -The RWQCBs must estimate costs and identify potential financing sources in the Basin Plan before implementing any agricultural water quality control program. – The RWQCBs must consider economics in establishing WQOs that ensure the reasonable protection of beneficial uses. –The RWQCBs must comply with the California Environmental Quality Control Act (CEQA,…) when they amend their Basin Plans. CEQA requires that the RWQCBs analyze the reasonably foreseeable methods of compliance with proposed performance standards and treatment requirements. This analysis must include economic factors." The guidance goes on to reference relevant legal memos regarding the consideration of cost; pertinent language from legal memos is provided in staff's response below.

Consistent with requirements pertaining to economics, Staff identified estimated incremental TMDL implementation costs and funding sources in the March 2012 draft basin plan amendment documents. Staff is only required to consider incremental costs associated with the TMDL. Compliance with the existing Agricultural Order (or revisions of the Order) is the implementation mechanism for the TMDL. As such, Staff is not required to estimate the costs of compliance with an approved order or permit that exists apart and separate from the TMDL.

With regard to the comment on economic analysis−economic impact of water quality objectives (WQOs), please note staff are not establishing any water quality objectives in the TMDL. Under the provisions of the Clean Water Act, TMDLs are intended by to create a

strategy to attain those water quality standards that have already been legally established (refer back to footnote 35). This issue regarding economic analysis raised by Ms. Abby-Silva and Ms. Mercer was addressed in Section 7.14.1 of the October 2012 draft TMDL project report; for ease of reference the relevant narrative from that section is presented below:

> *Note that in the case of this TMDL, impairments due to exceedances of existing State water quality objectives are being addressed. Although the State must consider a variety of factors in establishing the different elements of a TMDL, considering the economic impact of the required level of water quality is not among them. The SWRCB Office of Chief Counsel notes that the economic impact was already previously determined when the water quality standard was adopted[36] consistent with Water Code Section 13241 and pursuant to the basin planning process. The statutory directive under the federal Clean Water Act to adopt TMDLs to "implement the applicable water quality standards" is not qualified by the predicate "so long as it is economically desirable to do so." This conclusion is not altered when a TMDL is established to implement a narrative water quality objective (SWRCB, Office of Chief Counsel, 2002). Therefore, not only would an in-depth economic analysis be redundant, it would be inconsistent with federal law (SWRCB, Office of Chief Counsel, 2002). Further, the SWRCB Office of Chief Counsel states that under the Porter-Cologne Water Quality Control Act §13141 (i.e., implementation of agricultural water quality control programs), the Regional Boards "are not required to do a formal cost-benefit analysis" under the statute. This statute focuses only on costs and financing sources (SWRCB, Office of Chief Counsel, 1997).*
> *October 2012 Draft TMDL Project Report, Section 7.14.1*

81. Ms. Abby Taylor-Silva, Grower Shipper Associations of Central California, and Ms. Kay Mercer, KMI

We're asking that this process be given more time, and created in a way that will allow for a phased approach that brings science, BMP modeling, adaptive management and a strong implementation plan, in line with the SWRCB's Policy for Implementation and Enforcement of NPS Pollution Control Program (May 20, 2004) and supports future state and regional initiatives. We are committed to water quality improvements in the Salinas Valley and dedicated to remaining active in this effort to encourage a TMDL that will substantively improve water quality.

Staff response: Water Board staff appreciates and commends your commitment to helping to protect and improve water quality in the lower Salinas Valley. With regard to the comment on more time for TMDL development, please refer to staff response to comment 67.

82. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay

I have spent several hours reviewing the proposed Nutrient Salinas River TMDL and am writing to provide a few comments. Although the scientific "validity" of the TMDL science in general is problematic with various weaknesses, the Staff have clearly put a great deal of effort to use a diverse set of tools, e.g. models, and data available to address the nutrient impairment issues in the watershed. Nevertheless, I feel the approach does not capture key aspects for the successful a process to delist impaired water bodies.

Wet-season versus Dry Season: The establishment of wet and dry season numeric goals distinctions is admirable. However, the fix date approach is misguided because the precipitation mechanism for the fate and transport of runoff is probabilistic, which undermines the validity of a

[36] State Water Resources Control Board, Office of Chief Counsel, memo June 12, 2002: *"The Distinction Between a TMDL's Numeric Targets and Water Quality Standards"*

range of the TMDL components, e.g. flow calculations, value of monitoring stations, load reduction goals, margin of safety calculations, etc. Rainfall in May , June, and October is not common, but neither is it rare. In fact, based on data collected in other central coast watersheds, the early rainfall generated runoff that contribute to nitrate spikes may be due to atmospheric deposition and non-agricultural field soil mineralization processes instead of agriculturally derived nutrients. Regardless of the source, seasonally early or late storms may generate non-dry season runoff events and TMDL exceendances. This has more to do with our mild Mediterranean Climate and how it interacts with the various land uses in the region. I suggest the regional board develop a more probabilistic approach to the modeling of numeric objectives to capture this source of variability instead of relying on the wet/dry dichotomy. NOTE: This would also address the scientific review comment on the limitations of the margin of safety approach.

Staff response: Thank you for the comments. Staff concur that there are some uncertainty about the nexus between proposed numeric targets and seasonal conditions, including inter-annual and intra-seasonal variability precipitation and runoff, and mineralization. Nutrient pollution and nutrient flux studies and research in Mediterranean-like climates are fairly rare in the scientific literature, in contrast to studies conducted in the the more common and widespread temperate climatic ecosystems of the eastern half of the United States and much of Europe. Mediterranean-like climates may be characterized by high interannual variability in nutrient flux due to our rather unusual climatic and precipitation conditions. At this time, staff does not have the data or scientific studies to capture or address these issues in a scientifically-adequate way. Staff will add these topics as potential additional areas of research to the "Optional Studies" section of the final draft project report, constituting an area of uncertainty which could be addressed prior to the proposed Water Board reconsideration of the TMDL in ten years.

Regarding the comment on nitrate spikes related to early rainfall and associated runoff, in the October 2012 draft project report staff performed flow duration and load duration analyses, and other types of analyses to assess flow-related variance in nitrate loads and concentrations. Based on available data and our analyses, there does not appear to be any systematic evidence that precipitation events and associated high flow runoff events contribute to nitrate spikes. Nitrate exceedance frequency of water quality targets − and the magnitude of those exceedances − are overwhelmingly associated with low and low-moderate flow conditions. Also note that the state listing and de-listing policy endeavors to discount episodic conditions and ephemeral natural or temporal variation by use of a binomial exceedance-frequency distribution methodology. This however does not preclude that further investigation and study into precipitation events and runoff conditions may be merited in the future.

83. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay

Background P (and N) Concentrations: Developing a robust understanding of background sources of nutrients is tough and in general, the area has been fraught with misunderstandings. While I found the TMDLs discussion of background contribution of P from rock materials a good start, the issue needs a regional board contract to characterize these concentrations. For example, the TMDL numeric goals for P range from 0.07 to 0.3 mg/L as P, while two upstream rivers have mean concentrations of 0.13 mg P/L and 0.06 mg P/L (San Antonio and Nacamiento rivers, respectively). For various reasons, these means are probably do not describe stream processes in the lower Salinas well, but suggest that the background levels are substantial relative to the goals. I suggest that a more sophisticated analysis of the geology, headwaters and sediment geochemistry, spatial and temporal analysis be done to better characterize P dynamics in the watersheds. Phosphorous concentrations in the water column can at best be thought of in terms of being in equilibrium, with inputs and outputs, uptake and release from water column and benthic taxa, and

adsorption/desorption at the water-sediment interface. I suggest that the Board Staff develop a more sophisticated evaluation of these processes, because these exchanges have the potential to mask loading or exaggerate loading estimates, thus handicap the ability to meet water quality goals. In the meantime, I suggest that the P targets should be put in context of uncertainty to avoid the perception that they have regulatory standing like a MCL. These arguments can also be made for nitrogen, and I suggest that a similar approach be taken for that constituent.

Staff response: Staff will add these suggestions to the "Optional Studies" of the final draft project report, constituting an area of uncertainty which could be addressed prior to the proposed Water Board reconsideration of the TMDL in ten years. At this time, as noted in the draft TMDL project documentation, control of nitrogen is a much higher priority than for phosphorus for reasons documented in the TMDL project report.

With regard to the comment on the regulatory standing of proposed phosphorus TMDL targets, indeed these targets are not water quality standards in the regulatory context. Please see staff response to comment 53 for further information on this topic.

84. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay

Geographic Foci are not useful: The surface water quality in the Salinas is the result of patterns of crop types and geomorphological and soil characteristics. The TMDL does not adequately recognize these patterns to help stakeholders address water quality because they are not explicitly linked to sampling sites and load allocation and water quality improvement capacity. The capacity to demonstrate TMDL success relies on the linkage between monitoring locations and mechanisms of impairment. I suggest that the Board Staff address load reductions where monitoring locations exist. This will allow the success adaptive management approach in the TMDL to be gauged in spatially explicit ways.

Staff response: It should be noted that proposed nutrient targets are not based on geography per se, but are based on stream grouping categories having similarities in geomorphology, soils, turbidity, substrates, and riparian canopy conditions, as consistent with USEPA nutrient criteria development guidance[37]. This grouping system, of course, does end up constituting a spatial geographic distribution when presented in map view.

With that said staff concur that meaningful metrics to facilitate implementation can be appropriate and necessary. Indeed, existing mass loading and estimated necessary load reductions to attain water quality standards at discrete monitoring sites at the subwatershed-scale were in fact presented in Section 6.2 of the October 2012 draft TMDL project report, and were intended to facilitate implementation.

However, for the sake of clarity and to elevate the importance of mass-load alternative load expression metrics, staff modified both the proposed Basin Plan Amendment and the Project Report, to clearly provide for the use of mass load expressions as implementation-related assumptions of the TMDL and to facilitate practical implementation of the water quality standards. Please see staff response to comment 7 for more information on this topic.

85. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay

Feasibility of Reductions: It is easy to discount the "regulated" stakeholders claim that they cannot economically meet the environmental quality regulations. Unfortunately, this argument requires a

[37] *The documentation, development, and justifications for these stream groupings were detailed in the October 2012 draft project report – Appendix D.*

significant burden of proof by the regulated community and to date, that burden has been difficult to meet. Nevertheless, I do not believe that the timelines and targets are feasible in the region; the cost estimates are inappropriately extrapolated from questionable sources and underestimate the economic costs; and I am not convinced that these targets will improve water quality as defined by the staff due to background concentrations. However, to maintain targets is important to gauge progress. But I think the targets are too coarsely defined, both spatially and temporally, to be useful, in part because of the concentration focus. For example, I might suggest that load estimates in the CMP be looked at more carefully and evaluated for trends and used to project out in time, based on various watershed characteristics and potential to implement BMPs. Although this is a modeling exercise, with commitment to include stakeholder in the process, it might be possible to set feasible goals at the same time as improving stakeholder ownership.

I am not convinced that the concentration-based approach is useful. While I remain sympathetic to concentration based targets, I believe they are inappropriate for this TMDL context. Using loads as a planning approach allow stakeholders to address water quality with some flexibility. The flexibility allowed by the regulatory framework is lost with a concentration-based approach.

Staff response: Regarding the comment of feasibility of timelines please refer to staff response to comments 8 and 65.

Regarding the comment of feasibility of water quality targets please refer to staff response to comment 58.

Regarding the comment on cost estimates please refer to staff response to comment 6.

Regarding the comment on background conditions please refer to staff response to comments 50 and 58. Regarding the comment on background conditions please refer to staff response to comments 50 and 58. Also, staff utilized the USEPA-recommended 75th percentile approach as applied to Salinas River Basin headwater and lightly-disturbed tributary streams to try to ensure that proposed targets are not more stringent than would be expected in natural or lightly disturbed areas of the basin.

With regard the comment on the concentration-based approach and mass based loads, please see staff response to comments 84 and 7 for more information on this topic.

86. Dr. Marc Los Huertos, Associate Professor, Calf. State University Monterey Bay

How to work with stakeholders: I believe water quality goals can best be met when stakeholders have participated in a collaborative process and take ownership of the goals. The TMDL process was defined as a planning process. When Staff develop long-technical reports with questionable cost estimates and aggressive and problematic targets that do not appear feasible, the stakeholder process is not collaborative. Public meetings are not a surrogate for a collaborative process. I suggest that the Regional Board work with stakeholders to “reset” the clock to develop an effective stakeholder process to avoid entrenched conflicts distract our attention from the work to improve water quality.

Staff response: With regard to the comments on stakeholder involvement and the stakeholder process please refer to staff response to comment 69.

With regard to the assertions about cost estimates, problematic and infeasible targets, please refer to staff response to comments 7 and 58.

87. Ms. Jennifer Biringer, Central Coast Project Director – The Nature Conservancy, and Ms. Sarah Newkirk, Coastal Project Director – The Nature Conservancy

The Nature Conservancy (TNC) appreciates the opportunity to provide comments on the proposed Total Maximum Daily Load (TMDL) for nitrogen compounds and orthophosphate in the Lower Salinas River and Reclamation Canal Basin, and Moro Cojo Slough sub-watershed. The purpose of this comment letter is to bring your attention to work we are beginning to conduct in the project area that may aid in the implementation of the TMDL.

TNC has a long history of working in the vicinity of the project area, beginning in the early 1960s, focused primarily on land acquisition in coastal areas within Elkhorn Slough. In 1999 the Conservancy conducted a regional analysis of conservation priorities and completed the Monterey Operations Plan, identifying 12 portfolio areas including Salinas River and its main tributary, Arroyo Seco River. In 2001 the Conservancy opened the Central Coast Regional Office on the Monterey peninsula and initiated the Monterey Project. Priority goals for the initial 10 years of operation included protection of core habitat in the Carmel Valley, Arroyo Seco, and Gabilan range portfolios, providing science and planning support for land use policy including the Monterey County General Plan update, and strengthening partnerships to leverage our capacity. An additional priority identified in the Monterey Operations Plan was to conduct additional conservation analyses and planning for the Salinas River. Between 2007 and 2010 the Conservancy conducted a series of analyses including an initial biological assessment, a historical ecology reconnaissance for the lower Salinas River, and an in-depth report on conflicts between food safety practices and ecological health.

More recently, however, TNC has transferred most of its lands in the project area to other conservation partners, and turned its attention toward achieving conservation – including water quality improvement – primarily through partnering with industry in the collaborative planning, demonstration and implementation of a suite of spatially-targeted management practices. Specifically, we hope that by working with the users of the lands and waters of the project area – particularly growers – we can identify the natural functions and services that these stakeholders rely on, what the value of these functions and services are, and how they are impaired by land use practices or other changes to the landscape. Then, by visualizing these values, use constraints, and management practices using GIS-based decision-support tools, we can work with decision-makers and stakeholders to explore management and restoration scenarios and test strategies in discrete locations where they have a high likelihood of success. Finally, by acting as an honest broker in resolving the trade-offs involved in abating these threats, we can collaborate with stakeholders to develop and implement policy and management practices that will improve water quality, protect and restore riparian and estuarine habitat, and provide a demonstration of the use of decision-support tools to enhance the conservation stewardship capacity of the agriculture industry.

TNC has a successful track record of partnership-driven planning and conservation. Specifically, we have worked closely with central coast fishing industry partners on reform of the groundfish fishery to address regulatory and environmental issues. In addition, TNC provided technical expertise to support California's statewide marine protected area planning effort under the Marine Life Protection Act. Further, we have substantial experience in using spatially-explicit decision-support tools to integrate science into these partnerships (*see* coastalresilience.org, ecatch.org, and marinemap.org). We believe that the implementation of this TMDL is an opportunity to demonstrate the efficacy of tools like these in the context of collaborative water quality management.

According to the Staff Report:
TMDL implementation and load allocations for owners/operators of irrigated lands will be implemented and achieved by complying with the conditions and requirements of the Conditional

Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Agricultural Order) and any renewals or revisions thereof. Owners and operators are required to comply with the requirements outlined in the Agricultural Order, and subsequent revisions of the Order. Water Board staff will prioritize implementation efforts in the TMDL Project area aimed at addressing discharges of nutrients as described in the TMDL Final Project Report (Attachment 2).

Staff report at 9. TNC did not participate in the development of the Agricultural Order, but recognizes the challenges that growers face in its implementation. We have been exploring the needs and opportunities for engagement with growers on this issue, and believe that – although strict compliance with the terms of the Agricultural Order may not be consistent with economically-viable agricultural production in the region – we can develop tools that may be able to help growers significantly reduce their contributions to the water quality impairments that are targeted by the Order and by this TMDL. The TMDL recognizes that achievement of the water quality objectives laid out therein will require time; benchmarks of 12 years, 25 years, and 30 years are established for the municipal drinking water, wet-season biostimulatory, and dry-season biostimulatory nitrate standards, respectively. We hope to use the interim time to work with growers during this period to test, target and implement a mix of management practices that can reduce nutrient inputs to receiving waters in the project area, enable continued profitable agricultural production, and protect important ecological assets in the bargain.

Our purpose in bringing this project to your attention is to highlight our expertise in the collaborative use of science to develop and use decision-support tools to achieve conservation – as well as social and economic – objectives. We would be interested in offering this expertise to willing industry partners to assist in the development of economically viable efforts to improve water quality. However, this project's success is predicated – to some extent – on growers receiving credit, in the context of the Agricultural Order and this TMDL, for their efforts in working with TNC toward meaningful reduction in surface water nutrient loading. We wish to work with interested growers and the Regional Board to ensure that there is an appropriate framework for assuring this credit.

Once again, thank you for the opportunity to provide these comments, and please contact us if you have any questions.

Staff response: Thank you for your comments. The Central Coast Water Board appreciates your contributions and commitment to partnership and conservation efforts in collaboration with growers and other stakeholders in the lower Salinas Valley to improve water quality and aquatic habitat. Water Board staff supports and commends your efforts to "collaborate with stakeholders to develop and implement policy and management practices that will improve water quality, protect and restore riparian and estuarine habitat, and provide a demonstration of the use of decision-support tools to enhance the conservation stewardship capacity of the agriculture industry". If appropriate, please keep in mind grant funding opportunities that we anticipate the Central Coast Water Board will prioritize and make available in the coming years to support nutrient TMDL implementation and improvement of water quality protection in the lower Salinas Valley.