

# **Appendix A**

## **Written Comments**

**COMMENT LETTERS REGARDING APRIL 20, 2005  
PATHOGENS IN TOMALES BAY WATERHSED  
TOTAL MAXIMUM DAILY LOAD (TMDL)  
PROPOSED BASIN PLAN AMENDMENT AND STAFF REPORT**

Sierra Club Marin Group, Gordon Bennett  
Blake's Landing Farms, Albert Straus  
Tomales Agricultural Group, Bob Giacomini and Sharon Doughty  
Marin Resource Conservation District, Hank Corda  
Marin Horse Council, Constance Berto  
Western United Dairymen, Paul Martin  
Marin Agriculture Land Trust, Anthony Nelson  
University of California Agriculture & Natural Resources, David Lewis  
Mike Gales (no affiliation)  
United States Environmental Protection Agency, David Smith  
National Park Service; Point Reyes National Seashore, Don Neubacher  
California Department of Health Services, Marc Commandatore  
State Water Resources Control Board, Ken Harris  
East Shore Planning Group, Paul Elmore  
County of Marin Environmental Health Services, Alex Hinds and Philip Smith  
Corey Goodman (no affiliation)  
John Hulls (no affiliation)  
Thomas Baty (no affiliation)



## SIERRA CLUB MARIN GROUP

COASTAL SECTION C/O GORDON BENNETT  
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April 20, 2005

California Regional Water Quality Control (RWQCB)  
San Francisco Bay Region  
1515 Clay Street, Suite 1400  
Oakland, California 94612  
Attn: Farhad Ghodrati (fghodrati@waterboards.ca.gov)  
Rebecca Tuden (btuden@waterboards.ca.gov)

Dear RWQCB:

On behalf of the Sierra Club's 7,000 Marin County members and our 750,000 national members, we are writing to support the Proposed Basin Plan Amendment re Pathogens in the Tomales Bay Watershed with the following four suggested additions and deletions:

A) The State Water Resources Control Board has determined that dedication of water to in-stream use is a beneficial use, therefore, please add the underlined phrase to the last sentence of the "Problem Statement" (pg 1): *"Pathogen pollution is adversely affecting existing beneficial uses, which include shellfish harvesting (i.e., sport and commercial oyster, clam, and mussel harvesting), water contact recreation (i.e., swimming, fishing) and non-contact water recreation (i.e., boating, kayaking) and wildlife habitat."*

B) The Clean Water Act does not define the background pathogens originating from wildlife as a "discharge;" likewise, the Basin Plan Tables 4-23 and 4-23 (pg 5-7) properly do not list wildlife as a "source," therefore please delete the struckthrough words in the "Source" paragraph (pg 1): *If not properly managed, the following Tomales Bay Watershed sources have the potential to discharge pathogens to surface waters: faulty on-site sewage disposal systems (OSDSs), small wastewater treatment facilities and sewage holding ponds, boat discharges, grazing lands, dairies, equestrian facilities, municipal runoff, and wildlife.*

C) The Sierra Club understands that the "Numerical Target" must be science-based and acceptable to the EPA, however, a fecal coliform target of >43 MPN/100L (Table 4-20) is so far from current levels (by orders of magnitude) that it sets a goal that not only may be unreachable without significant effort and investment, but it may also discourage that effort and investment. Furthermore, the RWQCB acknowledges that the key element in the Basin Plan is measurable and non-insignificant movement towards the goal, not the goal itself. We need to encourage responsible management of human-responsible pathogen discharges

Sierra Club 4/20/05 Letter to RWCB re Proposed Tomales Bay Basin Plan (pg 2)

through an appropriate combination of carrot/incentives and stick/regulations. In our opinion, there are clearly not enough carrots, however, we also believe that the <43 goal is too large a stick. We believe the maximum allowable level for recreational use (<200 MPN/100L) is a more appropriate goal for the first 5-year period of the Basin Plan. We further believe that all tributaries should have this as a goal regardless of the primary activity in the watershed. For example, even Walker Creek, which is primarily private grazing land, has public road crossings where the public could contact the water. Additionally in Walker Creek, fisheries monitoring for Fish and Game requires water contact and there are other private property owners (eg Audubon Canyon Ranch at the mouth) who engage in recreation or other endeavors that require water contact. Lastly, of course, Walker Creek is the major tributary to Tomales Bay, part of the Gulf of the Farallones National Marine Sanctuary and a major site for water contact recreation. Therefore, please strike "~~<43 MPN/100L~~" and substitute "<200 MPN/100L" throughout the document

D) It should be acknowledged that sub-watersheds in the basin with only wildlife impacts have significantly lower pathogen levels (by orders of magnitude) compared to sub-watersheds with significant human-related sources (primarily grazing). It should also be acknowledged that certain forward-thinking grazing operators in the basin have made significant progress in restoring riparian buffers and taking other measures that significantly reduce pathogen impacts on their downstream neighbors and the public. However, long-term monitoring in the Tomales Bay watershed appears to show essentially no basin-wide progress in reducing human-caused pathogen levels. Thus the Sierra Club is concerned about the possibility that currently publicized and accounted-for efforts by good operators to reduce grazing intensity and restore riparian buffers may be offset elsewhere by currently unpublicized and unaccounted-for increases in grazing intensity and degradation of riparian buffers by less responsible operators. Therefore under Table 4-23 (pg 6), please add the modifier wherever the following phrase occurs: "*Report site specific, sub-watershed specific and basin wide progress on implementation...*"

Thank you for the opportunity to comment and for your efforts in working towards improvement of the water quality in the Tomales Bay watershed.

Sincerely,

*(signature to follow on hard copy)*

Gordon Bennett  
Chair, Sierra Club Marin Group  
Executive Committee, SF Bay Chapter  
Agricultural Committee, Sierra Club California

## BLAKE'S LANDING FARMS

P.O. Box 848  
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April 19, 2005

John Muller  
San Francisco Bay Regional Water Quality Control Board  
1515 Clay St. Suite 1400  
Oakland, CA 94612

Thank you for the opportunity to comment on the proposed TMDL regulations for Tomales Bay. This proposal and the listing of Tomales Bay as an impaired watershed will have a great impact on our dairy on the shores of the bay.

The listing of Tomales Bay as impaired is not based on science. The conclusion that oysters were contaminated by the dairies or houses on the bay has no science behind it. To get to the real issues, I believe we need to use DNA tests which can identify the sources of fecal coliform as human, livestock and/or wildlife.

Let us make realistic goals that we can attain. The level of 43 MPN does not look like a realistic goal.

About five years ago, we started TBAG and started monitoring and testing dairies on the watershed. There were 18 dairies then. Today there are only 9 left. Has SFB-RWQCB measured a difference in the quality of the water? TBAG needs to have renewed funding to keep its monitoring and testing system in place to track the improvement in bay water quality.

Our dairy has taken many steps to prevent adverse impacts on the watershed. We have converted our manure ponds to an anaerobic and an aerobic pond that reduce the amount of fecal coliform by more than 99%. We also collect the methane gas from the ponds and use it to produce almost all the energy that is needed to operate the dairy. Some of our other practices include:

1. We don't use herbicides, pesticides or synthetic fertilizers and our dairy is certified organic.
2. All creeks are fenced off and no animals have been allowed in the creeks for the last 20 years.
3. We use no-till planting on 25% of our crops and minimum-tillage planting methods on the rest every year.
4. We compost our solid manure.
5. Most of the animals are housed during winter months.
6. We lay straw and plant cover crops in areas that could be problematic before winter.
7. We participate in TBAG and we are certified by CDQAP.

A cooperative approach rather than a legislative and regulatory approach will work better for dairies along Tomales Bay. Members of TBAG are committed to proactive management practices and to the quality of the bay watershed.

Thank you.

Albert Straus  
Owner,  
Blake's Landing Farms

## **TOMALES BAY AGRICULTURAL GROUP**

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April 14, 2005

John Muller, Chairman  
San Francisco Regional Water Quality Control Board  
1515 Clay St., Suite 1400  
Oakland, CA 94612

We want to thank you, the San Francisco Regional Water Quality Control Board (SFRWQCB) members and your staff, for this opportunity to provide comment on the "Pathogens in Tomales Bay Watershed - Proposed Basin Plan Amendment" referred to as the Pathogen Total Maximum Daily Load (TMDL). We have several concerns regarding this document and the policy for water quality regulation it will establish in the Tomales Bay Watershed.

When the first draft of this TMDL was reviewed, we provided verbal comment to staff that the coliform bacteria targets and density-based pollutant load allocations are unrealistic and unattainable. As participants on the SFRWQCB-directed Tomales Bay Shellfish Technical Advisory Committee, we cooperated on a watershed-wide coliform bacteria study in 1995 and 1996. This study has been used by the committee members to direct and prioritize implementation of water quality improving programs in those areas of the watershed that were identified to have the greatest loading. Interestingly, based upon study results for "control" or "comparison" tributary streams, there is not a stream in the Tomales Bay watershed that could meet the criteria and load allocations in the TMDL. Given that streams without agricultural and other sources of bacteria loading fail the TMDL goals or targets, how are agriculturists to meet those targets?

Repeatedly, SFRWQCB field staff have verbally assured us that "the numbers are not important" and that we will be considered in compliance by "doing everything we can" in actively carrying out the TMDL implementation plan. The fact that we are not secure in these assurances is the basis for our concern about the criteria and load allocation values. In all likelihood, the field staff we are currently working with will turn over, and as a result, any understandings and agreements on the intent of the TMDL will be lost. In addition, we do not believe that field staff or SFRWQCB have the ability or power to protect a source category member that has pursued all implementation measures but still cannot meet the criteria and load allocations. Imagine three years from now, after a producer has worked across 1,500 acres to install creek-side fencing, build vegetative buffers and sediment retention basins, improve pasture use, and improve manure management systems, all to protect and improve water quality. What role can or will SFRWQCB and its staff play if this producer receives a subpoena or notice of intent to sue by a "fourth party" because water quality in the nearby tributary stream is in violation of the TMDL? This is exactly the concern that is raising our blood pressure and keeping us up at night.

As alternatives to the current criteria and load allocations, we would suggest that they be based upon what can be achieved in the Bay and tributary streams. Producers will be encouraged to participate in a program and policy that has realistic and attainable goals. The current criteria and load allocations are a disincentive to participate with efforts to improve water quality and the TMDL. Clearly the results in the Tomales Bay Shellfish Technical Advisory Committee Report provide direction and data for setting those criteria and load allocations. And we are interested in other studies and approaches that determine these values. Determinations of the source category contributions, as well as the differing levels of risk to human health that each category presents

Tomales Bay Agricultural Group Response

Page Two

are needed. We encourage the board and its staff to conduct DNA fingerprinting type studies, as well as base policy upon actual pathogens as opposed to indicator bacteria.

Regarding the implementation plan, we welcome the flexibility that it provides to implement and document water quality improving measures. In many cases, producers already have ranch water quality management plans and have been certified through the California Dairy Quality Assurance Program. In addition, all of the dairies within the watershed have participated in SFRWQCB inspections to determine compliance with the SFRWQCB's Minimum Waste Discharge Guidelines. We are learning about other tools to meet the TMDL's implementation requirements including options for pasture management. We look forward to continued cooperation with the board and staff in determining ours and your respective roles and the timeline for carrying out the implementation plan.

In closing, we want the board and staff to know that our intent is constructive and proactive with regard to improving water quality and the environment in the Tomales Bay Watershed. And we will continue to work with the board, its staff, and our watershed community members toward that goal. This is why the Tomales Bay Agricultural Group was formed over five years ago. As part of that work, we are compelled to express that the proposed TMDL is not constructive toward that aim. Our members are interpreting it as an unattainable ultimatum of agriculture or water quality in the watershed. In this context, there is little incentive or motivation to participate and continue with efforts to meet the overall goal.

Sincerely,

Bob Giacomini, President, TBAG  
Giacomini Dairy

Sharon Doughty, TBAG Secretary  
Doughty Dairy

## MARIN RESOURCE CONSERVATION DISTRICT

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April 18, 2005

Mr. John Muller, Chair  
CA Regional Water Quality Control Board – San Francisco Region  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

RE: Tomales Bay Watershed – Proposed Basin Plan Amendment and Total Maximum Daily Load (TMDL)

Dear Chairman Muller:

For nearly 30 years, the Marin Resource Conservation District (Marin RCD) has invested a tremendous amount of time, effort, and funding to improve the habitat and water quality in the Tomales Bay watershed. During this period, many valuable lessons have been learned. We thank the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and its dedicated staff for the opportunity to share our concerns regarding the water quality regulations the plan will establish. Our years of experience have taught us the following:

- It is important to develop a trusting relationship between landowners, the Marin RCD, and other Local, State and Federal agencies.
- Implemented programs take time – perhaps as long as 20 years or more – to make significant improvements.
- Advances in science, technology, and creativity have vastly expanded the tools available to assist in the enhancement and improvement of the watershed.
- Local commitment to agricultural uses has been bolstered by a coalition of community organizations ranging from the Marin Agricultural Land Trust, the Point Reyes National Seashore, and the Farm Bureau, to the State of California/County of Marin regulated Williamson Act, to local advisory groups such as the Tomales Bay Agricultural Group – TBAG.
- We become extremely concerned when guidelines are imposed with strict numeric adherences that might be impossible to attain.
- While staff maintains, through verbal commitment, that “the numbers are not important” and that we will be in compliance by “doing everything we can”, it is a fact that, over time, personnel changes could bring a change in attitude. Then the numbers not achieved could be the cause for violation action. This does not give the landowners any level of comfort.

The Marin RCD would like to offer, as a consideration to the landowners in the District we represent, these comments for alternative discussion prior to implementation:

- The proposed standard of 14 and 43 in five years may be unattainable, in spite of stringent management practices and innovative programs.
- Potential sources of fecal bacteria are generally grouped into three major categories: human, livestock, or wildlife. Utilization of Bacterial Source Tracking (BST), a new methodology used to determine the source of fecal pathogens would possibly prevent errors in determining the point and non-point source of the bacteria.



- The Environmental Protection Agency (EPA) has identified three molecular methods of "DNA Fingerprinting". Such testing may provide a more exact basis for determining the source of the bacteria from the three listed suspects. It would be a shame to hastily rush to judgment in five years only to find that perhaps the wrong source had been vilified.
- Non-molecular methods, relying on biochemical and chemical differentiation, have also been successful in helping to identify pathogenic sources, especially animal versus human.
- While the current methodology for the two previous alternative segregation methods is costly, continued scientific advances in the procedures could lower the monitoring costs. Here is where the time constraints of the current plan could have the most devastating effect.
- Given the level of strong, local community support for agriculture, a statement should be provided within the document realizing the importance of sustainable agriculture in the watershed.

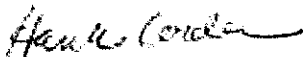
The Marin RCD certainly understands the dilemma facing all Regional Boards in the quest to satisfy requirements of the 303(d) mandate. However, it becomes increasingly difficult to convince landowners with livestock exposures that these are supposed to be cooperative efforts. Many hours have been spent by our organization researching US Department of Agriculture, EPA and other Government websites for additional answers. We know that this situation is not unique to the Tomales Bay watershed.

In our research, the following statement was found (paraphrased), "Our main goal is to identify the problem first, then create a program to rehabilitate the source of the problem. We must be certain of where the waste is originating before we begin to destroy our family farms that are located along the waterways. We've had a great success working with farmers and implementing voluntary, incentive based programs. Millions of dollars of public and private funding have been spent to insure that agricultural practices help protect the watershed. By identifying these sources through analytical means, we can target our testing to keep rivers and streams within acceptable, established limits and maintain farming in these same watersheds as well."

While we would like to take credit for the statement, West Virginia Commissioner of Agriculture, Gus R. Douglas, presented it. That such a statement can reverberate from East to West speaks to the enormity of the problem facing all waterways, rivers, tributaries, and watersheds in the quest to reach definable limits of the TMDL quest.

Again, we thank the SFBRWQCB and their staff for the tireless efforts they have been charged to administer. We appreciate that you have taken the materials and thoughts presented into consideration.

Respectfully,



Hark Corda, Chairman  
Marin RCD

c: Congresswoman Lynn Woolsey, US House of Representatives- CA District 6  
President Harold C. Brown, Jr., Marin County Board of Supervisors  
Supervisor Steve Kinsey, Marin County Board of Supervisors-District 4

**From:** "Constance Berto" <c.berto@earthlink.net>  
**To:** <fghodrati@waterboards.ca.gov>  
**Date:** 4/20/05 3:03PM  
**Subject:** Tomales Bay Plan

At its regular board of directors meeting last night, April 19, 2005, the Marin Horse Council, Inc., voted to send a letter of protest to the Calif. Regional Water Quality Control Board. The protest is based on the unrealistic standards set by the CRWQCB for water quality in Tomales Bay.

Despite the availability of low-cost DNA testing that will pinpoint sources of pollution, the RWQCB is continuing in its scatter-shot, one-blame-fits-all type of approach to the issue of water quality. Instead of partnering in tests to bring modern science to bear, the Board backs a plan which could cost up to \$73.5 million and not define, much less ensure solving, the problem.

The RWQCB has consistently refused to assess the contribution of wildlife to water quality issues. It keeps quoting the US-EPA as setting target numbers, yet the US EPA - Region 9 has stated that it does not set these numbers for water quality -- these are set by RWQCB.

The MHC believes that is not acceptable to attempt to manipulate the agricultural community to achieve unrealistic and non-science-based goals.

The equestrian community has research data on file to show that horse facilities have little to no impact on water quality. Equestrians are environmentalists because without a clean environment, we have no sport. We have voluntarily established and promoted Best Management Practices in the area for over five years, including all major Marin County and Sonoma County stables. The MHC protests the inclusion of equestrian facilities in the threat of economic sanctions.

It is the position of the Marin Horse Council that this Tomales Bay plan should be postponed and suspended until thorough DNA testing of Tomales Bay takes place. By no other means can the problems truly be identified and controlled.

Yours very truly, Connie Berto, 70 Crane Drive, San Anselmo CA 94960. Ph 415-454-2923.

**CC:** "steve kinsey" <skinsey@co.marin.ca.us>, "albion, linda" <albions2@comcast.net>, "berto, connie" <c.berto@earthlink.net>, "eichstaedt, robert" <re@well.com>, "englert, vicki" <vkenglert@hotmail.com>, "osgood, homer" <homerosgood@earthlink.net>, "stampfli-torme, lise" <lstampfli@earthlink.net>, "weems, robert" <rcweems@comcast.net>, "lewis, mike" <michallewis@earthlink.net>, "greenblatt, sandy" <sgreenblatt@comcast.net>, "putz, delos" <marincwby@comcast.net>, "lashbrook, jessica" <jalashbrook@comcast.net>, <btuden@waterboards.ca.gov>



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April 20, 2005

John Muller, Chairman  
San Francisco Regional Water Quality Control Board  
1515 Clay St., Suite 1400  
Oakland, CA 94612

Dear Mr. Muller:

Western United Dairymen has reviewed the proposed Basin Plan Amendment to accomplish the Tomales Bay Watershed Pathogen Total Maximum Daily Load (TMDL) and Implementation Plan. We appreciate the opportunity to provide the following comments.

Western United Dairymen is a statewide dairy farmer trade association representing 1,100 California dairy families. Our members produce 65% of the milk in California. All of the dairies in the Tomales Bay watershed are members of our association. We provided extensive written comments earlier in the TMDL process, dated April 12, 2004. While some of our requested changes have been accomplished, others have not yet been addressed.

We are particularly concerned that the baseline conditions of the watershed are not well understood. We note that the study results from the 1995 and 1996 indicate that even watersheds without dairy or other agricultural activities have been unable to meet the standards set by the basin plan amendment. We strongly caution the regional board that if requirements are set so strictly that producers feel they have no hope of complying, effectively there will be no incentive or reason to even try, either now or in the future. This is not what we or anyone else wants to happen. Dairy producers, just like others, need to know that they have at least a chance to be successful.

Wintertime storm flows can be quite severe, and it does not appear the proposed amendment gives full recognition to this fact. Contact recreation is highly unlikely during winter storms, and this should be considered when establishing beneficial uses for the tributaries to the bay. Temporal and spatial conditions must be evaluated to accurately determine beneficial uses. Considering this fact, the Most Probable Number standard presented for fecal coliforms of 43 is severely unrealistic, and should be reviewed with full consideration given to the study results mentioned above.

Lastly, we call to your attention a memo of March 23, 2005, sent to Art Baggett, Chairman of the State Water Resources Control Board (SWRCB) from Alan Lloyd, Secretary, Cal EPA. Secretary Lloyd requests that the SWRCB "assure the appropriate integration of science in decision making, including policies, regulations, basin plans, and permits." Western United Dairymen shares Dr. Lloyd's concern and encourages the regional board to pay close attention to the science to date, and further, to conduct additional site-specific research so that the Tomales Bay amendment to the Basin Plan is truly science-based, and reflective of a reasonable implementation program.

Our members in the Tomales Bay watershed have repeatedly indicated their willingness to engage in constructive resolution of community issues. We urge the regional board to direct staff to renew conversations with our Tomales Bay producers to accomplish resolution of the issues causing us concern.

Very truly yours,

Paul E. Martin  
Director of Environmental Services



## MARIN AGRICULTURAL LAND TRUST

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April 20, 2005

### BOARD OF DIRECTORS

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Rebecca Tuden  
San Francisco Bay Regional  
Water Quality Control Board  
1515 Clay St. Suite 1400  
Oakland, CA 94612

Dear Ms. Tuden,

Please accept the following comments in response to the proposed amendment to the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) which would establish a Total Maximum Daily Load (TMDL) and numeric targets for pathogens in Tomales Bay and its tributaries, and an implementation plan to achieve and support the Total Maximum Daily Load.

Robert Brown  
Executive Director

Executive Director  
Ellen Sauer &  
Phillip Cole

1. It has been stated by Water Board staff that there is little flexibility possible in the numeric targets for pathogens. However, there is significant doubt among source groups and water quality specialists as to whether the numeric targets are achievable, particularly given the extensive amount of wildlife in the watershed. While all of the source groups desire a clean and healthy watershed, this uncertainty of success is very discouraging to those expected to spend a great deal of money on implementing additional management practices. Further, it raises the specter that however much is done, ever more requirements and costs will be required in the future. The Basin Plan amendment should include greater discussion of probable responses by the Water Board, including the allowable modifications to targets and allocations alluded to, and likely further actions required, or not, of landowners that are in compliance if in fact the targets are not met within the original timelines indicated.

2. The proposed amendment reveals that the Tomales Bay Watershed TMDL is proceeding with significant gaps of knowledge in key areas such as pathogen ecology and relative source loading. It is reassuring that the TMDL, including targets and implementation plans, may be reviewed every five years for modification based on new information. However, with the exception of unspecified "monitoring" activities there is no commitment in the amendment to begin closing the gap between necessary and available knowledge. Given that the cost of implementation is high and the likelihood of meeting the targets appears low, it seems important that the Water Board, and hopefully the Environmental Protection Agency, begin addressing the significant questions raised in the basin plan. A proactive approach to gathering information would allow Water Board staff to make defensible decisions and give greater confidence to source groups that they won't be in the same quandary five years from now.

3. Requiring all implementation measures to be completed by January 2009 (3.5 years from now) is probably unrealistic, particularly for rural agricultural properties. The

amount of funding needed to implement some practices is significant and existing assistance programs likely can't help everyone that will need it within that time frame. Also, the number of specialists available to advise landowners on appropriate management measures is limited. Implementation schedules should be flexible to a landowner's means as long as progress is being made. At the least, the implementation schedule should be longer, perhaps doubled.

4. Because of the costs of implementation and the uncertainty of future requirements and limitations, the proposed Basin Plan amendment is perceived to be a threat to continued agricultural uses in the watershed. It would be reassuring to include in the amendment a discussion of the economic and cultural importance of agriculture in the county and the watershed, and a desire by the Water Board to see agriculture remain viable while they carry out requirements of the Clean Water Act.

5. The proposed Basin Plan amendment does not establish "monitoring necessary to implement the TMDL" as it indicates. Aside from two sentences in Tables 4-21 and 4-22 defining how targets are measured, the amendment states only that "dischargers, stakeholders, and Water Board staff will conduct water quality monitoring .." If a detailed monitoring plan exists elsewhere it should be included or referenced in the amendment and be made available for comment. A scientifically valid monitoring plan reviewed by specialists is vital when embarking on an expensive, target-based program.

Thank you for your consideration.

Sincerely,



Anthony R. Nelson  
Stewardship Coordinator



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April 18, 2005

John Muller, Chair  
San Francisco Bay Regional Water Quality Control Board  
1515 Clay St., Suite 1400  
Oakland, CA 94612

APR 21 2005

**Subject:** Pathogens in Tomales Bay Watershed: Proposed Basin Plan Amendment

Dear John Muller:

**Introduction**

Thank you and the staff of the San Francisco Bay Regional Water Quality Control Board (RWQCB) for the opportunity to provide comment on the *Pathogens in Tomales Bay Watershed – Proposed Basin Plan Amendment* referred to as the Pathogen Total Maximum Daily Load (TMDL). Since the release of this draft document, I have participated in several public meetings to discuss its purpose and content. Your staff is to be complimented on their efforts to explain the document's intent and content, listen to community member concerns, and search for solutions to those concerns. This effort, and the ability of the Board to direct revisions to the TMDL, will be instrumental in creating a policy that is supportive of a community based approach to improve water quality within the Tomales Bay Watershed. I offer the following comments toward that aim

**Implementation Plan**

The appropriate balance of flexibility and authority has been put forth in the TMDL Implementation Plan such that source category stakeholders know that compliance is mandatory through a number of self-selected options. Getting 100 % compliance with the implementation plan will require an inspection process similar to that already conducted by RWQCB staff on dairies for the RWQCB's Minimum Waste Discharge Guidelines. In the majority of cases, stakeholders have and are implementing practices to improve water quality with documentation of these efforts available through on-farm visits. In this way the stakeholders could have the option to be their own "third party" in a compliance inspection.

The TMDL contains a series of important and unanswered questions on page eight of the draft document. These questions speak to the uncertainty in this process regarding the proposed targets and allocations and the ability of the implementation plan to meet them. Only through monitoring of water quality and implementation activities can the RWQCB and the watershed community answer these questions and clear up this uncertainty. Therefore, it is critical that the RWQCB continue its monitoring program as described in the 2005 staff report

## Numeric Targets

The California Shellfish Protection Act of 1993 does not identify a shellfish harvesting area as threatened until it is closed more than 30 days a year. California Department of Health Services has designated the Tomales Bay shellfish harvesting areas as "conditionally approved" recognizing the seasonal nature of water quality conditions within the Bay. Through the Tomales Bay Shellfish Technical Advisory Committee (TBSTAC) and other watershed community based forums there has been public acknowledgement that a reduction in the number of closures days is the objective not "zero closures." Given the alignment of these policies and approaches within the watershed, the TMDL should strive to support the TBSTAC by aligning targets and allocations.

A TMDL is admittedly developed with minimal scientific information and in a relatively short period of time. Because of these limitations, the resulting numeric targets should be considered and presented with the greatest acknowledgement of the inherent uncertainty. Unfortunately in the case of this TMDL, even with this uncertainty acknowledged, it is difficult to ignore or feel comfortable with the targets and load allocations. They are the basis for determining compliance and pose a significant risk to source category members and RWQCB from litigation if they are not met.

The concern over the targets and allocations could be removed if they could be written in a way that recognizes that beneficial use of shellfish harvesting can not be met 365 days a year. Staff has given much attention to the question of what concentration of indicator bacteria within tributary streams will provide for the required standard of 14 mpn/100ml for shellfish harvesting areas in the Bay (Figure 1). This includes the development and application of a hydrodynamic model to answer this question as presented in the March 2005 staff report. This is a logical line of questioning to ascertain values for the targets and allocations, with the determined value of 43 MPN/100ml based on the model results.

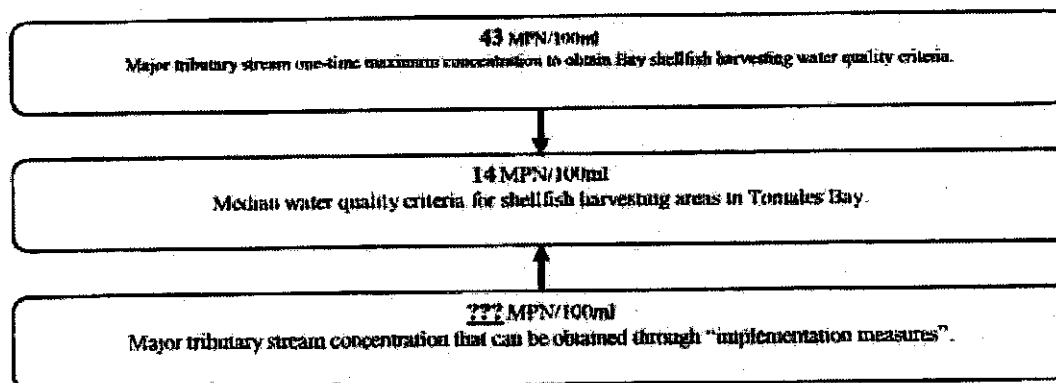


Figure 1: Framework for determining water quality targets and allocations for the Tomales Bay pathogen TMDL

This number is daunting, not because of its low value, but because it is unattainable based on existing water quality data. In 1995 and 1996 the Tomales Bay TBSTAC conducted an *Investigation of Pollution Sources Impacting Shellfish Growing Areas in Tomales Bay*. I have included a portion of the data from the TBTAC report that represents the fecal coliform

concentrations from three identified "control watersheds" (Table 1). Two of these are on the east shore of the bay: 1) Milepost 36.17 entering Marconni cove; and 2) Milepost 38.54 entering cove on which Hog Island Oyster Company sits. The third site is White Gulch on the west shore of the Bay. In each case, the concentrations of fecal coliform are consistently greater than targets and allocations of 43 MPN/100ml. If water quality conditions in these control watersheds are above the proposed allocations, then it seems unrealistic to expect that values in watersheds with identified source categories could meet them. It is useful to note that these results provide an indication of what background concentrations for fecal coliform could be within Bay tributaries.

**Table 1: Fecal concentration (MPN/100ml) results from the Tomales Bay Shellfish Technical Advisory Final Report of its 1995-1996 study.**

Date	Milepost 36.17	Milepost 38.54	White Gulch
9/12/95	511	78	170
12/4/95	2,200	1,663	
12/5/95	33	79	700
12/6/95	17	33	
12/9/95	230	11	46
1/16/96	3,300	490	
1/17/96	790	110	130
1/18/96	4,600	2,300	
1/31/96	330	110	
2/11/96	120	18	33
3/11/96	490	78	33
3/12/96	3,704	1,300	230
3/13/96	330	78	34
3/18/96	2,200	20	13
4/1/96	30,298	8,400	490
4/2/96	790	790	130
4/3/96	490	55	79
4/8/96	1,100	1,300	43
7/9/96	45	3,300	230

From 1999 to 2004, the University of California Cooperative Extension conducted water quality research on 11 dairy and ranch facilities within the Bay watershed. As part of this study, we sampled and analyzed water from the Milepost 36.17 site studied in the TBSTAC investigation. Because our study objective was to determine links between upland sources of fecal coliform and Bay conditions we conducted the majority of our sampling during storm events and stormflow conditions. We did, however, collect a number of samples between storms during baseflow conditions. Results from this five-year study indicate that baseflow fecal coliform concentrations are lower than stormflow values. Both, however, are consistently higher than the TMDL one-sample targets and allocations of 43 MPN/100ml (Figure 2). Additionally, these results document the direct relationship between stream discharge and fecal coliform concentration (Figure 3). Using the watershed above Milepost 36.17 and others like as controls



or comparisons, to watersheds with more intense land use, provides us with an indication of background fecal coliform levels that can be used to set achievable TMDL targets and allocations.

Both the SWRCB and RWQCB have at their disposition the latitude to conduct a Use Attainability Analysis or set a Site Specific Criteria for Tomales Bay. This or other methods of setting targets and load allocations, such as the loading approach, could be used to answer the question: what major tributary concentrations for indicator bacteria can be obtained in the watershed (Figure 1). Answering this question will assist in setting targets and allocations that are realistic and achievable. It will also help form realistic expectations for the number of shellfish harvesting closures days that will exist if these targets and allocations are achieved. It most definitely would mean more effort, time, and collaboration between the California Department of Health Services and representatives of the source category stakeholders. In the end, however, the targets and allocations would be goals that the community would be motivated to achieve because they would believe that they could and should.

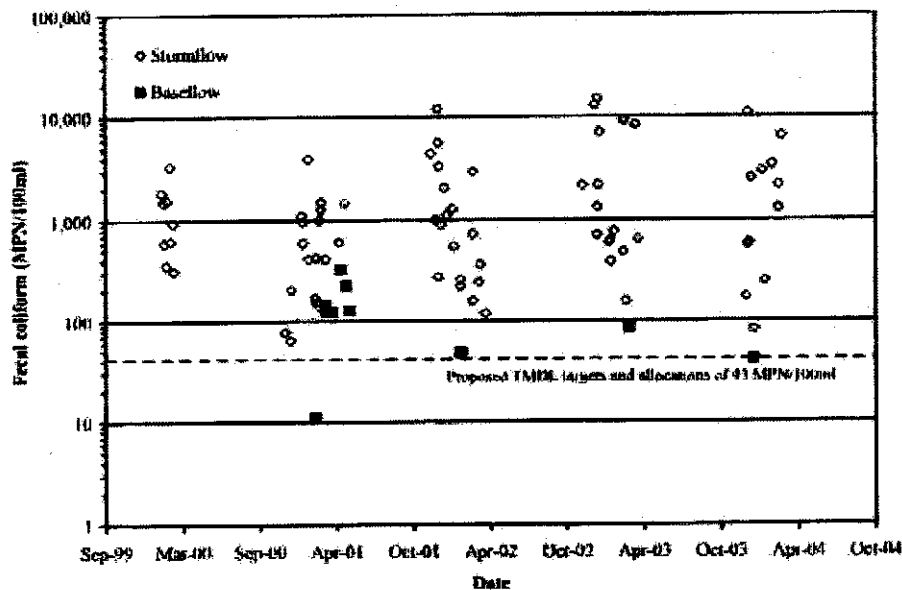
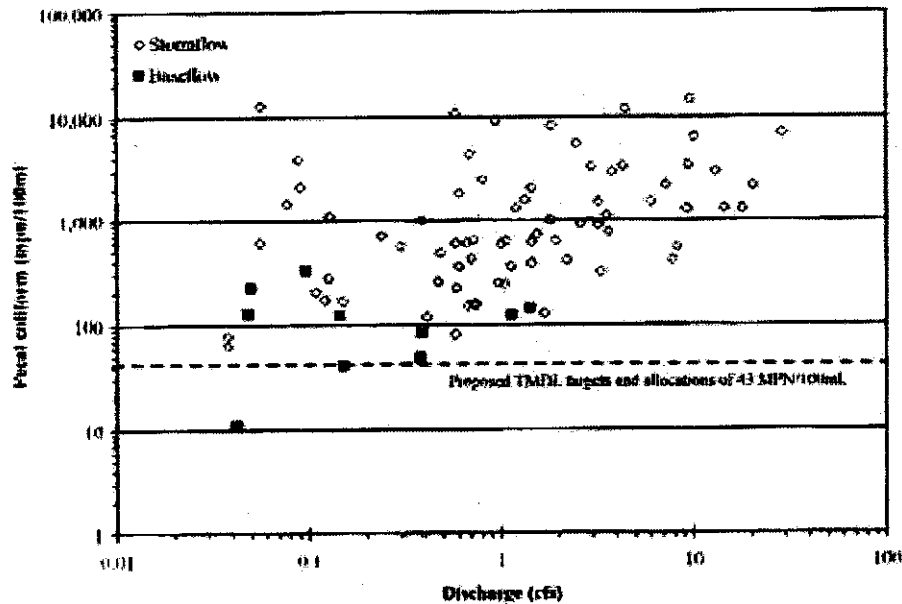


Figure 2: Fecal coliform concentrations from samples collected at Milepost 36.17 on the east shore of the Tomales Bay watershed from 1999 to 2004.



**Figure 3: Relationship between fecal coliform concentrations and stream discharge for samples collected at Milepost 36.17 on the east shore of the Tomales Bay watershed from 1999 to 2004.**

Thank you again for the opportunity to offer input on the draft basin plan amendment. Advisors from the University of California Cooperative Extension have partnered with RWQCB staff, the Natural Resources Conservation Service, and the Marin Resource Conservation District to develop and provide education on water quality improving practices and documentation methods. Additionally, we have directed research and facilitated group decisions toward the larger community goal of improving the Bay environment and community viability. We will continue to function in that collaborative role and look forward to working with the Board and its staff as you proceed with this TMDL.

Sincerely,

David J. Lewis  
Watershed Management Advisor

xc: Farhad Ghodrati  
Rebecca Fuden  
Dyan Whyte

WHITE GULL

## TESTIMONY OF MIKE GALE, RANCHER IN CHILENO VALLEY

Good Morning, and thank you for this opportunity to address the Board on the important issue of the Tomales Bay TMDL. My name is Mike Gale.

I have a particular interest in this issue as my wife Sally and I raise grass-fed beef in the Chileno Valley. Like us, our neighbors are in the business of animal agriculture.

Ours are not the mega-dairies and feed-lots of the Central Valley, nor are we the operators of huge factory farms, which spill and seep pollutants into public waterways. We share your concern with these polluters and feel they should be regulated to protect the public.

Rather, our ranches epitomize the bucolic settings featured in travel magazines. Our rolling verdant hills are dotted with cows, sheep and goats. For instance, our ranch is an average size, 600 acres, and we have 88 cows on all this space. It is not crowded and our animals lead the kind of life one would like for all animals in production agriculture. Similarly, there are few people in our neighborhood, with one house every half mile or so along our country road.

I come before you today because I feel threatened by the proposed TMDL. The target TMDL is far too low. I worry that our efforts to develop and sustain a profitable business will be threatened by closure if the target numbers are not met. I worry that our children will be discouraged from taking over our business because the threat of closure will always be over their heads. I worry that necessary improvements and repairs to infrastructure will be postponed because the uncertainty of the future will always be a concern.

I worry that our cows will have to meet what I see as unreasonable and unattainable target numbers. The dated MPN numbers in our Valley exceed the target MPNs by 100s, if not 1000s. There is no way we can meet these standards.

We are not even sure these standards were arrived at in a reasonable manner. They represent an indicator, rather than the presence of a real pathogen. They include fecal contributions from sources other than cows but in what proportions, we are not told. I am not sure that the local wildlife fecal coliform can meet your proposed standard. The standards are designed to protect people swimming in our streams, but there are no swimmers, nor is the water deep enough to swim in. And unlike illness from human pathogens, no cases exist in which a person has gotten sick from water borne pathogens originating from a cow.

My neighbors and I have many questions for you. We feel these questions need answers before we are able to undertake expensive practices. You are considering approving a new policy that could cost West Marin ranchers a great deal, and yet will not reach the proposed TMDL target. For many years we have been trying to improve water quality, because we want to and not because we have been forced to. These practices include fencing cows out of creeks and planting native trees, among other things. They are not modest efforts.

We feel a proper TMDL process would include answers to the following questions, in order to come up with a workable, understandable and achievable plan:

What is the definitive source of the pollutant of concern? Human, Livestock, or wildlife?

What is the natural background number of the pollutant of concern? What is the baseline from wildlife?

What is the likelihood, based on real conditions, of the pollutant of concern living outside of it's host, on the way to it's potential human victim?

What is the likelihood that this pollutant will reach its victim in the strength required for infection?

Page 2

What is the likelihood that potential human victims will be present in the creeks and the bay to receive the bacteria?

Are there any documented cases of anyone getting sick from bacteria from a cow upstream?

Why do we use indicator bacteria, rather than the bacteria or actual pathogen of concern?

If disease is likely from cows, why haven't our ranchers gotten sick?

What is the human cost of TMDL implementation? What will it mean to our way of life? Will West Marin cease to be an agricultural community? and will your TMDL standard forever change the character of our community, driving it away from productive agriculture?

At the point of implementation, what assurances will the Water Board give that the practices required by the Water Board, when implemented, will be the last word? What if the numbers don't go down? Surely we can't be expected to eliminate all of the local wildlife. Will this be a never-ending process, perhaps ending with the loss of all livestock?

What assurances can the Water Board give us that, if we follow all of their recommendations we will be safe from legal recriminations?

Admittedly, there are always more questions than answers. Please do not take your actions lightly. If you implement the proposed TMDL levels, you will change the character of West Marin. Wouldn't it be sadly ironic if it turns out that much of the actual fecal coliform comes from birds and other animals throughout the watershed? Do you feel comfortable permanently changing our community without having the facts to back up your decisions?

We ask the Water Board in all seriousness to initiate the research to answer these important questions. Our livelihood depends upon it.

Thank you for your time and consideration.

Submitted by

Mike Gale  
1505 Chileno Valley Road  
Petaluma, Ca. 94952  
707-765-6664



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION IX**  
**75 Hawthorne Street**  
**San Francisco, CA 94105-3901**

April 19, 2005

Mr. Farhad Ghodrati  
San Francisco Bay Regional Water Quality Control Board  
1515 Clay Street, Ste. 1400  
Oakland, CA 94612

Dear Mr Ghodrati:

Thank you for the opportunity to review and comment on the TMDLs for Tomales Bay watershed dated March 4, 2005. We reviewed the proposed TMDLs to determine whether they are consistent with applicable federal regulations concerning TMDLs. We have concluded that the TMDLs meet all federal requirements and will be approvable upon submission to EPA. Upon implementation, the TMDLs should effectively protect the important beneficial use of shellfish harvesting in Tomales Bay. We urge the Regional Board to approve the TMDLs at the June hearing. We commend you and Ms. Tuden for your excellent work in developing the TMDLs and are pleased to provide the following comments.

We wholly support the Board's proposed numeric targets for fecal coliform in Tomales Bay and in its tributaries to protect the important beneficial use of shellfish harvesting, as well as preserving the beneficial use of water contact recreation. We are particularly supportive of the use of the numeric target of a single-sample maximum of 43 (MPN/100 mL) for tributaries to ensure protection of shellfish harvesting in the Bay, and endorse the statement in your report that "In order to achieve the shellfish targets, fecal coliform concentrations in waters entering the bay must be at 43 MPN/100mL or less." Data cited clearly indicate that when the tributaries enter the bay at higher coliform concentrations, the median shellfish target is exceeded a significant amount of time. It is extremely important to ensure that the beneficial use of shellfish harvesting is protected in the Bay, not only because it is an applicable water quality standard, but also because human health is directly affected by it.

We support the Board's target of a zero discharge of human waste to waters of Tomales Bay and its tributaries. As you noted in your staff report, human waste can be a significant source of pathogenic organisms, including viruses, and attainment of fecal coliform objectives may not be sufficient to protect human health, since fecal coliforms are only indicator organisms. Since human waste is a direct source of pathogens, any discharge of it can be considered potentially deleterious to human health particularly given the sensitive beneficial uses of the Bay.

We support the Board's use of a concentration (density)-based approach to controlling sources of pathogens, rather than a load-based approach. Setting TMDLs for pathogens on a concentration basis is appropriate as the concentration of pathogens is generally of greater concern in the protection of shellfishing and recreation beneficial uses than mass loads of pathogens over time. This approach for pathogen TMDLs is consistent with our guidance (Protocol for Developing Pathogen TMDLs, U.S. EPA, 2001). This approach is also consistent with other pathogen TMDLs developed in other parts of California (including Newport Bay and Santa Monica Bay) and in other states. The use of concentration-based targets ensures that the TMDL will attain and maintain applicable water quality standards for pathogens (which are also concentration (density)-based) under different discharge and flow conditions.

On November 16, 2004, EPA promulgated a rule entitled, "Water Quality Standards for Coastal and Great Lakes Recreation Waters" (69 FR 67217 et seq.) and which can be found at 40 CFR part 131.41. This rule was effective December 16, 2004, and requires marine coastal waters (including estuarine waters) of California (except those covered by Regional Water Quality Control Board 4) to achieve certain bacteria standards. Our understanding is that this rule applies to Tomales Bay based on the designated body contact recreation beneficial uses in effect.

Designated Bathing Beach Waters must meet an enterococci concentration of no more than 35 / 100 mL (geometric mean, using analytical methods 1106.1 or 1600 or equivalent method) and a single sample maximum of no more than 104 / 100 mL (75% confidence level). These values explicitly apply to enterococci regardless of origin unless a sanitary survey shows that the source of the indicator bacteria are non-human and epidemiological study shows that the indicator densities are not indicative of human health risk.

We recognize that this TMDL does not specifically address these recently promulgated and applicable water quality standards. However, we believe that the current targets for fecal coliform to protect the beneficial uses of shellfish harvesting in the Bay and the target for tributaries will be sufficient to achieve these federal standards because the fecal coliform standards for shellfish protection are roughly an order of magnitude more stringent than the standards set to protect body contact recreation. We recommend that you provide a discussion in the final staff report or responsiveness summary of the applicable enterococci standards and the basis for concluding that the fecal coliform TMDLs are sufficiently stringent to result in attainment of the enterococci standards as well. We see no need to set a separate enterococci TMDL for Tomales Bay.

We further support the Board's use of the allocations in Table 4-22 of the proposed Basin Plan Amendment. Allocations are included for the following sources: Onsite sewage disposal systems, small wastewater treatment facilities, boat discharges (all direct sources of human waste and were assigned a zero allocation), grazing lands, dairies, equestrian facilities, municipal runoff, and wildlife. With respect to wildlife, EPA offers the following in support of the allocations. The Federal Register notice cited

above promulgating Water Quality Standards for Coastal and Great Lakes Recreation Waters addresses the issue of whether the standards should apply in cases where non-human sources discharge bacteria. EPA stated that its bacteriological standards apply irrespective of origin, unless a sanitary survey shows that sources of the indicator bacteria are non-human and an epidemiological study shows that the indicator densities are not indicative of human health risk. EPA investigated the issue and found that our scientific understanding of the human health risks associated with non-human sources of fecal contamination is still too incomplete to support a decision to exclude bacteria associated with wildlife sources from coverage under the bacteria standards. EPA cited several instances where studies have attributed disease outbreaks to non-human sources of fecal contamination, and that given the potential human health risk from non-human sources, EPA concludes that any other option would not be protective of human health at this point in time.

We note that the allocations are all referred to as load allocations. This may be appropriate as allocations are not being set for any current NPDES-regulated discharge sources. However, as some of the sources covered by load allocations may become subject to NPDES permitting requirements in the future, we recommend that you clarify in the allocation section and table 4-22 that the allocations for any sources subject to future regulation through the NPDES permit program are to be considered wasteload allocations as defined in 40 CFR 130.2(h).

We appreciate the opportunity to offer our unqualified support for the proposed TMDLs and look forward to receiving the TMDL submittal for our approval. If you have questions concerning this review, please call me at (415) 972-3416 or Diane Fleck at (415) 972-3480.

Sincerely,



David Smith  
TMDL Team Leader



## United States Department of the Interior

### NATIONAL PARK SERVICE

Point Reyes National Seashore  
Point Reyes, California 94956

IN REPLY REFER TO:

L7617

April 19, 2005

Mr. Bruce Wolfe  
San Francisco Bay Regional Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

Subject: Tomales Bay TMDL Rulemaking

Dear Mr. Wolfe:

Point Reyes National Seashore has reviewed the Tomales Bay Pathogen TMDL proposed rule released by the Board March 4, 2005. As you know, Point Reyes National Seashore located in west Marin County, is a significant stakeholder in the Tomales Bay watershed and the aquatic health of Tomales Bay. The Seashore has worked with Board staff throughout the development of the TMDL, and for the past two years we have conducted pathogen monitoring on Olema Creek in conjunction with the Board's pathogen TMDL monitoring efforts in other parts of the watershed.

The Seashore supports the Board's efforts and will work internally, and with our park leasees, to support the implementation process and ensure that progress is made toward achieving the TMDL goals. The primary reason for this listing was to protect existing beneficial uses including shellfish harvest, contact recreation, and non-contact recreation. However, we are concerned that the proposed TMDL will not be productive in meeting the desired conditions for the bay, namely the reduction in shellfish harvest closure days on the bay.

The use of density standards, as described in the TMDL, may be counter-productive to the goals of the Board. A general sense gathered from the community at a number of forums and public meetings is that the likelihood of achieving density based pathogen levels identified in the TMDL may be very difficult and may weaken community resolve, thereby decreasing the effectiveness of the TMDL in achieving water quality goals.

We have identified some alternatives that may better engage stakeholders towards achieving the TMDL. These ideas would also better relate TMDL goals to beneficial uses. The points summarized below are provided as suggestions to help make the TMDL

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more achievable, while still meeting the beneficial use goals. It may be these suggestions come too late in the process, but the Seashore encourages the Board to consider such approaches in the upcoming sediment TMDL, and to provide future options for this approach to be applied to the pathogen TMDL in the future.

- Establish threshold-based narrative goals which may be seasonally linked (rather than density based TMDL goals)
  - 1) Reduce shellfish harvest closure days to 10% (36 days per year)
    - a) This would result in a reduction of closure days from what currently is close to 100 days per year. The California Department of Health Services has developed a rainfall based closure which has proven effective with respect to shellfish harvest. TMDL goals using such thresholds could be used to link BMP prescription and implementation within the watershed to achieve reductions in shellfish closure.
    - b) Threshold based goals would support development and design of Best Management Practices to capture or control pollutant loading to the creeks.
  - 2) Use a seasonally-based goals for stream systems. For example, meet contact recreation standards (no violations) during the recreational use season (April-October). Acknowledging the seasonality of the watershed and potential pollutant delivery could strengthen the TMDL.
- Establish performance goals for BMP design, rather than just implementation

Performance standards for BMPs that link to narrative goals would result in more efficient investment of restoration funds. An example is linking a rainfall threshold (e.g. 1 inch) to on-the-ground performance goals. Watershed fate and transport models would also be valuable in helping provide a more strategic approach to restoration and BMPs, informing land managers of the best locations in the watershed to achieve control of problem pollutants. This information would be necessary for any watershed in which a pathogen TMDL is to be implemented.
- Address adaptive management associated with the sediment TMDL

The Adaptive Implementation section identifies five years as the timeline for reevaluating the TMDL. Because the Board will be embarking on a sediment TMDL prior to this it seems that the Pathogen TMDL should have some level of tie in. Sediment and pathogen fate and transport is somewhat linked, and information developed in the sediment TMDL planning process may be pertinent to the pathogen TMDL.

Point Reyes National Seashore is committed as a watershed stakeholder and land steward to work with the Board to reduce pollutant loading from operations on park lands, through structural controls, management actions, education, outreach and enforcement.

Sincerely,

A handwritten signature in cursive script, appearing to read "Don Neubacher". The signature is fluid and extends across the width of the text area.

Don L. Neubacher  
Superintendent



State of California—Health and Human Services Agency  
**Department of Health Services**



FG  
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ARNOLD SCHWARZENEGGER  
Governor

April 15, 2005

Mr. Farhad Ghodrati  
Regional Water Quality Control Board, San Francisco Bay Region  
1515 Clay St. Suite 1400  
1400 Oakland, CA 94612

Dear Mr. Ghodrati:

The Department of Health Services (DHS) appreciates the opportunity to comment on the proposed 'Tomales Bay Pathogen Total Maximum Daily Load (TMDL)', draft report dated March 12, 2004 (amended March 4, 2005) and 'The Proposed Basin Plan Amendment' dated March 4, 2005. DHS has been actively involved in water quality issues in Tomales Bay. DHS manages the only year-round water quality monitoring effort in the Bay and has been working with the San Francisco Bay Regional Water Quality Control Boards (SFBRWQCB) and the Tomales Bay Shellfish Technical Advisory Committee (TBSTAC) on several issues related Pathogens in Tomales Bay. A concentration-based approach may not be adequate to improve and protect water quality during the implementation phase of the TMDL. DHS is supportive of the SFBRWQCB efforts to reduce pathogen loads to the Bay and has comments on the proposed Pathogen TMDL.

Our comments are as follows:

1. A concentration based Pathogen TMDL may not adequately protect the beneficial uses of Tomales Bay. Therefore, DHS recommends that a load-based approach be incorporated into the implementation phase. As you are aware a concentration approach will not provide an adequate mechanism for evaluating implementation measures, setting priorities for load reductions, and may not be protective for shellfish during certain stream flows.
2. The TMDL should be supported by a detailed explanation of the modeling, testing, and analysis required for calculation of a TMDL.
3. The implementation procedures briefly outlined in the TMDL report and elaborated in the Implementation Plan should demonstrate that actual load reductions could be achieved.

Mr. Farhad Ghodrati  
April 15, 2005  
Page 2 of 8

The following discussion of these points provides an explanation of DHS' position.

1) Loading vs. Concentration:

It is the understanding of DHS that the agency establishing the TMDL has the discretion to use a concentration or a load based TMDL. A concentration based Pathogen TMDL may not adequately protect the beneficial uses of Tomales Bay. An explanation of the rationale for setting a concentration-based pathogen TMDL should be included in both the Basin Plan Amendment and the TMDL report. In addition, an explanation of how this approach will facilitate implementation measures should also be provided.

Loading calculations (Table 10a page 31) are presented but are not linked to the development of the TMDL. Concentration is discussed based on modeling conducted by Brannen and Stacey (2005). This information was not included in previous drafts. It would be helpful to understand the rationale to move from a loading-based TMDL to the concentration based approach proposed in the March 2005 Amendment. One example that the SFBRWQCB can use as a model would be the Nestucca Bay Bacteria TMDL (Oregon 2002). In addition there is no discussion on why salinity is significant to water quality. Perhaps its relationship to bacteria counts in Bay waters should be explained in the report.

An example of a load-based TMDL is provided by Stiles (2000). The State of Kansas has found that the single concentration concept for a "Bacteria TMDL" does not work well in bacteria impairments for five reasons:

- The resulting number has no real time translation to implementation.
- Allocations based on a single number are meaningless, particularly since treatment methods (i.e. Best Management Practices (BMP's)) are not so precise as to deliver a specific allocation from a given source. Concentrations and flows vary temporally. Only a load (i.e. the product of flow and concentration) can account for this variability.
- The emphasis on concentration or single loading requirements by sources diverts attention from the real issue of improved compliance with the standard.
- Different loading mechanisms dominate at different flow regimes.
- Load reflects the product of concentration and flow. A solitary load value based on a numeric criterion does not apply beyond the flow condition, used to derive the load value.

From the Kansas perspective, "The TMDL process reflects a continuum of adequate water quality across flow conditions, rather than at a single flow event, such as average flow."

A loading reduction value is needed to guide the stakeholder to the desired Pathogen TMDL. The concentration approach is problematic since there appears to be no basis for the stakeholders to determine whether or not they can measure a reduction in loading to tributaries of Tomales Bay and therefore meet their respective Pathogen TMDL. The potential for various fecal coliform (FC) concentrations to impact bay water quality is dependent on certain minimum stream flows to deliver contaminants to the Bay. DHS' review of other TMDL's developed in the United States has made it clear that a load-based TMDL facilitates the development of realistic, understandable implementation measures.

Therefore, DHS recommends a Loading TMDL or a concentration value based on modeling of loading values for a variety of flow regimes (high (14000 Cubic feet/second (CFS)), medium (1000CFS), low (100 CFS), and dry season/drought (<10 CFS)). For example when all flows are ranked for Walker creek from 1983-2005 you find that 34% of all flows are below 10 CFS. It is not clear from reading the TMDL whether or not Walker Creek is hydrologically linked to the Bay throughout the year, especially during low flows (<10 CFS) or seasonal drought conditions. It would be helpful if readers were informed as to what flow conditions the Bay is linked hydraulically to Walker Creek and other systems. This would help in management and implementation of the TMDL.

- 2) The TMDL should include a detailed explanation of the rigorous modeling, testing, and analysis required for calculation of a TMDL:

Based on existing data, including the fecal coliform loading results from the 1995-1996 Shellfish TAC study (TBSTAC 2000), it is clear that a significant portion of the fecal coliform load to Tomales Bay comes from the Upper Walker/Chileno watershed and Lagunitas Creek.

The Pathogen TMDL report data, collected in 2001 by the San Francisco Bay Regional water Quality Control Board, estimates loading in the Walker/Chileno watershed at  $9.2 \times 10^{13}$  FC /Day (Table 10a Page 31). Walker Creek discharge (Q) was 27 CFS according to records from the U.S. Geological Survey (USGS) gauging station. The Walker/Chileno system has historically experienced Q as high as 14000 CFS (USGS) at Walker Creek Ranch. The January 11, 2001 loadings are therefore not maximum values for this watershed but are comparable to loading reported in the 1995-1996 TBSTAC study for January 31, 1996 which produced a load of  $1.8 \times 10^{13}$  FC /Day at flows of 435 CFS.

Table 1. Examples of loading variability in the Walker Creek drainage.

Date	FC Value at Flow	Loading	(Q) Creek Discharge (CFS)	(Q) % Of Max Discharge	(Q) % Of Occurrence (Rank)
January 31, 1996	1700	$1.8 \times 10^{13}$ FC /Day	435	3 %	2.5%
January 4, 1982	28000	$9.5 \times 10^{15}$ FC /Day	14000	100%	.01%
January 10, 1992	33	$9.6 \times 10^9$ FC /Day	12	.08%	33%

The January 4, 1982 flows in Table 1 are calculated with the highest fecal coliform values and the resulting loadings are of  $9.5 \times 10^{15}$  FC /Day. This is above the entire "5-day Total" for lower Walker Creek in Table 10a page 31 of the TMDL. If you take this further to include the TMDL of 43 FC/100mL in the Walker Creek system you will get the following loadings for flows at 27 CFS  $2.8 \times 10^{10}$  FC /Day, at 435 CFS  $4.6 \times 10^{11}$  FC /Day, and at 14000 CFS  $1.5 \times 10^{13}$  FC /Day. The mean of 80 DHS samples for the Walker Creek site is 228 FC/100mL with a maximum value of 28000 FC/100mL.

One method for testing the TMDL would be to check any model with the in-stream value of 43 FC/100mL to determine if the test values can meet the in-bay TMDL at the nearest shellfish growing area (14 Fecal Coliform MPN (Most Probable Number) /100mL) at a range of flows described earlier. Any TMDL should include a margin of safety for the predicted in-bay values as recommended by USEPA.

The following mass balance equation was used by DHS to evaluate the earlier, and most recent, TMDL:

$$V_1 C_1 = V_2 C_2$$

- $V_1$  = the volume of receiving water. In this example it is the volume of Walker/Keyes Creek below the highway bridge sampling station plus the volume of the bay (Walker Creek delta) up to the nearest shellfish growing area lease in Tomales Bay.
- $C_1$  = 14 FC/100 mL. Note that 14 FC/100 mL is the maximum allowable concentration at the nearest growing area in the Bay by the TMDL. The geometric mean for all certified shellfish growing areas in Tomales Bay range from 2 to 6 MPN FC 100/mL during open harvest conditions.
- $V_2$  = the volume of water entering the bay from the Walker Creek watershed.
- $C_2$  = the concentration of fecal coliform in the Walker Creek drainage entering the Tomales Bay at the nearest growing area.

- This assumes the volume of the bay (receiving water, V1) is constant throughout the day (based on the average depth assumed 5ft.) and that the volume of water from the Walker Creek watershed (V2) is for 1 day (24 hours). This also assumes that the receiving water (Bay) has no coliforms (Via Keys or other sources Ocean Roar) below the Hwy 1 Bridge. This does not account for overland decay nor does it account for in-stream decay.

The original proposed TMDL of 200 FC/100ML was demonstrated not to be protective of bay water quality at flows greater than 40 CFS.

It should be noted that the proposed TMDL of 43 FC/100ml was not met when testing to see if in-bay values were below 14 MPN. DHS evaluated the revised draft TMDL of 43 FC/100ml and determined that Bay water quality would be impaired at flows of 40 CFS or greater using in-stream values of 43 MPN.

This data was shared with SFBRWQCB staff in October 2004 and is consistent with the scientific peer review comments. These examples demonstrate the importance of considering both fecal coliform concentration and stream flow when determining a suitable TMDL target. An understanding of loading will also be critical for evaluating the success of implementation measures.

The TMDL report should show details of the model runs used to develop the proposed 43 MPN in-stream TMDL. This will show the stakeholders how the TMDL will impact the beneficial uses (i.e. shellfish growing areas). This can be accomplished by using the Nestucca Bay Oregon TMDL (Oregon 2002) as an example as to how to present the model information to the reader.

### 3) Development and Implementation of the TMDL

The SFBRWQCB should consider the following in development and implementation of the TMDL:

- With dilution models using a range of flow values, determine if the in-stream TMDL can be met for each land use and provide the appropriate loading reductions required. This will aid in the future development of Waste Discharge Requirements (WDR's) for each property.
- Use dilution models to determine (using a range of flow values 14000 CFS – 5 CFS) if the Tomales Bay Pathogen TMDL can be met under a variety of flows for each tributary and provide the appropriate loading reductions required to achieve improvement in Bay water quality.
- If the current dilution model can be validated, determine the relationship between different load reductions in the watershed and projected

improvements to Bay water quality. This will be a critical step for evaluating the potential to modify existing rainfall-related shellfish harvest closures.

- Develop a number of decision criteria, weighted according to impact on water quality, and use the highest reduction targets for each impaired water body to create a priority ranking where resources should be first invested.
- Begin implementation of the BMPs first at priority sites of the most problematic tributaries, tributary, or sub-tributary. Monitoring of fecal coliform loads should follow wherever BMPs are implemented.
- Basic BMPs such as fencing and riparian buffer zones to keep cattle out of the stream should be required throughout the watershed.
- The TMDL implementation should include a plan for addressing failing on-site sewage treatment systems (Page 45) within the watershed. The proximity of failing on-site sewage treatment systems to commercial shellfish leases make these failing systems a concern to DHS relative to the risk of illness outbreaks. DHS has requested but has not been provided the location of known failing on-site sewage treatment systems by SFBRWQCB staff.

After the TMDL has been approved, water quality management plans should be updated and control measures implemented. NPDES Permits or WDR limits based on TMDLs should be issued for any significant sources of bacteria.

Implementation plans should provide a reasonable assurance that the non-point source controls will be implemented and maintained, examining the hydrologic links to water quality and effective monitoring programs develop to evaluate the magnitude of reductions achieved.

Evaluating TMDL Implementation should include the following:

- Monitor pollutant loadings, not just stream concentrations.
- Track implementation and effectiveness of controls.
- Identify streamlet breaks and hydrologic links in riparian BMPs.
- Assess water quality trends in the watershed and Bay receiving waters.
- Reevaluate TMDL for attainment of water quality standards.

One goal of the Pathogen TMDL could be to reduce fecal coliform loading enough to shorten shellfish rainfall closures by at least 24-Hours. It is a realistic goal for the



Mr. Farhad Ghodrati  
April 15, 2005  
Page 7 of 8

watershed since the most conservative beneficial use besides drinking water in the watershed is the consumption of shellfish. Significant improvement in Bay water quality will result in increased public health protection. The key would be in finding the approximate fecal coliforms reductions required to meet such a goal. A long-term goal could be to reduce the amount of closure days to less than 30-days per year and thus removing Tomales Bay from the requirements of the Shellfish Protection Act (Porter-Cologne Water Quality Act Chapter 24, WATER CODE SECTION 14950-14958). The Act requires that if a commercial shellfish growing area is subjected to harvest closure for more than 30 days per calendar year during the previous three years that the formation of a technical advisory committee will occur with certain duties and responsibility to investigate the pollution sources causing the closures. Tomales Bay averages 65 to 72 days of shellfish closures annually since 2000.

DHS would like to have this letter placed in the comments sections of the proposed 'Tomales Bay Pathogen Total Maximum Daily Load', draft report dated March 12, 2004 (amended March 4, 2005) and 'The Proposed Basin Plan Amendment' dated March 4, 2005. DHS will continue to work with the SFBRWQCB on efforts to improve water quality in Tomales Bay shellfish growing areas. Thank you for the opportunity to comment on the TMDL. If you have any questions or comments please contact me at (510) 412-4631 or [mcommand@dhs.ca.gov](mailto:mcommand@dhs.ca.gov).

Sincerely,



A. Marc Commandatore  
Environmental Scientist  
Environmental Management Branch  
Preharvest Shellfish Unit

References:

Brennan, M. and Stacey, M. 2005. Modeling the Fate and Transport of Tracer Concentration of Walker Creek Discharge into Tomales Bay. University of California, Berkeley. Department of Civil and Environmental Engineering.

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Mr. Farhad Ghodrati  
April 15, 2005  
Page 8 of 8

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USGS [http://nwis.waterdata.usgs.gov/nwis/peak/?site\\_no=11460750](http://nwis.waterdata.usgs.gov/nwis/peak/?site_no=11460750)

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**From:** Ken Harris  
**To:** Dyan Whyte; Ghodrati, Farhad; Mumley, Thomas  
**Date:** 4/21/05 10:55AM  
**Subject:** Tomales Bay TMDL comments

These are a day late because I forgot they were due on Wednesday.

Thank you for the opportunity to review the Draft TMDL. We think this draft has been strengthened by the application of the 43 MPN/100mL to the tributaries. However, there are sections that still need to be strengthened, primarily in the implementation plan. To be approved TMDLs need an enforceable implementation plan, and the necessity of each regulatory provision must be specified. DAL is adamant on this point, and they are the final authority on what is regulatory and what isn't. There are also a couple of areas where clarity needs to be improved. Our comments are in the attached document.

These comments were prepared by Planning, Standards and Implementation staff after consultation with Rik and I. Both Rik and I have reviewed and agree with the comments. We ask that you seriously consider them. It is our opinion that addressing the comments and suggestions will strengthen the TMDL and make it more likely that State Board staff will be able to recommend approval. Our goal is to avoid another tabled item. We are available to discuss them with you.

Ken Harris, Chief  
TMDL Section  
SWRCB  
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Sacramento, CA 95814

P.O. Box 100  
Sacramento, CA 95812-0100

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e-mail: [KHarris@waterboards.ca.gov](mailto:KHarris@waterboards.ca.gov)

costs, see our Web-site at [www.calepa.ca.gov](http://www.calepa.ca.gov)."

**CC:** Cox, Joanne, Rasmussen, Rik

Region 2 - Fecal coliform (pathogens) TMDL for Tomales Bay watershed

1. Support the revision of the target in the tributaries from 200 MPN/100mL to 43 MPN/100mL. The lower target should result in attainment of the water quality objective in Tomales Bay.
2. The Source Identification paragraph of the amendment does not actually identify the sources affecting water quality. Therefore we must assume that the contributing sources have not been positively identified, and the various sources' contribution quantified.
3. Maximum concentrations of fecal coliform allowed year-round, including during high flows.
4. Load Allocations:
  - a. The TMDL requires: "Based on a minimum of no less than five samples equally spaced over a 30-day period." (which translates to: every 6 days) which equals year-round monitoring. Unless these are perennial streams, recommend decreasing monitoring frequency in dry season and increasing it in wet season.
  - b. The Load Allocations and Implementation Program for the small wastewater treatment facilities needs to be clarified by listing the names of these existing facilities, by stating that they discharge to land, and by stating whether or not any new facilities would be allowed and if so, under what conditions.
  - c. The staff report needs to explain why all of the small wastewater treatment facilities are not required to disinfect their effluent before discharging to ponds or the ground. Disinfection of ponded wastewater seems to be a logical requirement for control of fecal coliform from pond overflows or berm breaches.
  - d. Municipal runoff needs to be addressed through the Marin County stormwater permit.
  - e. Must clarify: for discharges to the bay, the TMDL lists a "Maximum" allocation is 43 mpn/100 mL, but there is also a footnote to the "Maximum" which states that up to 10% of the total samples in any 30-day period may exceed the 43 MPN. The allocation is *either* a Maximum or a 90 percentile limit, it cannot be both. (If "Maximum" chosen, it would be a conservative interpretation of the objective, off-setting the lack of a margin of safety.
5. Monitoring See 4., a., above. No monitoring program is included in the amendment. Section 9.2 of the staff report needs to be added to the amendment in order for the Regional Water Board to be able to implement the monitoring program envisioned.
6. Margin of Safety - The first paragraph of this section is true if all sources are known and quantified, however according to the amendment they are not (see number 2, above); and if worst case conditions were known and accounted for in the staff report (e.g., minus tides, high runoff from a series of warm storms, and a dairy pond overflows/breaks), but they are not. See number 2, above; number 9, below; and also the (confusing) statement on pg. 37 of staff rpt: "tributary waters receive very little to no dilution in the southern section of the Bay." This statement in conjunction with the statement that Lagunitas/Olema subwatershed has the highest or second highest loadings (staff report pg. 24) (ranking is not clear in the discussion) indicates a need for an explicit margin of safety.
7. The first paragraph of the Implementation program should state the applicability of the existing Prohibition of Discharge to all the identified discharge sources. As the prohibition is the basis for the implementation program, that basis should be firmly stated, rather than left as presumptive.
8. The Regional Board Attorney needs to include in the Administrative Record an interpretation of the current Prohibition of Discharge stating why any allocations may be allowed under the prohibition.
9. The Implementation Plan needs to be clarified and strengthened. As written in the amendment, the implementation program is not an enforceable program and is not acceptable. It consists of a series of

task which identified implementing parties are presumed to complete without any oversight, and the first progress report is due on the same date as full compliance, January 2009. It does not make sense to have a progressive series of tasks due on the same date. Specific examples are given in the following two paragraphs, and in the edited Table 4-23, below. The implementation plan would be substantially improved if the implementation program laid out in the staff report was incorporated into the amendment along with compliance dates.

Septic systems implementation measures listed on Table 4-23, Trackable Implementation Measures, need task completion dates, and a requirement that the identified necessary repairs/upgrades be made. Table 4-24, Regulatory Framework" indicates that septic systems will be under a waiver. The amendment language need to state when the RB will act to adopt such a waiver, and what the requirements will include (e.g., require compliance with the TMDL). Similar clarifications need to be made for the other sources. Recommendations on the types of changes needed are shown in "Track Changes" on Table 4-23, below.

One of the implementation measures for boat discharges includes recommendations for mooring exclusion zones, and enforcement procedures to ensure compliance with mooring exclusion areas. The staff report needs to address why mooring exclusion areas are necessary (to show that this is not an arbitrary requirement). Table 4-23 lists seven implementing parties to bring boats into compliance with the prohibition of discharge (Table 4-24), however boat owners, who are directly responsible for complying with the prohibition are not listed as an implementing party. It is not clear from Table 4-24 against whom the prohibition of discharge would be enforced.

10. The Basin Plan contains a prohibition of discharge of "wastewater which has particular characteristics of concern to beneficial uses" (page 4-67, Table 4-1, item number 5). The amendment should specifically reference the prohibition (Table 4-1), and indicate what immediate enforcement action will be taken against boat owners, septic system owners and small wastewater treatment facilities for violations of this prohibition.
11. This amendment includes an agricultural water quality control program. The costs of the program and an identification of potential sources of financing must be included in the amendment in accordance with Water Coded Section 13141. The costs of lost shellfish harvest days should be included in the costs estimate.

Table 4-23

Trackable Implementation Measures for the Tomales Bay Watershed Pathogens Total Maximum Daily Load Implementing Party

Source Category	Action	Implementing Party	Completion Dates
On-Site Sewage Disposal Systems (OSDSs)	<p>Submit to the Executive Officer for approval a plan to document Tomales Bay watershed OSDS compliance with the prohibition of discharge</p> <p>Establish and implement the (above) approved watershed-wide management program that documents and assess performance of OSDSs.</p> <p>Implement the above approved management plan for meeting repair standards for all OSDSs that fail to pass inspection.</p> <p>Report progress on implementation of OSDS assessment and repair program.</p> <p>Document compliance with Waste Discharge requirements (WDRs).</p>	<p>Marin County, Community Development Agency</p> <p>Marin County, Community Development Agency</p> <p>Marin County, Community Development Agency</p> <p>Marin County, Community Development Agency</p>	<p>a specific date or "insert date of x no. of months after EPA approval"</p> <p>Date or as above</p> <p>Date or as above</p> <p>Every x months</p> <p>a specific date, or "insert date of x no. of months after EPA approval"</p> <p>Need dates for those too.</p>
Small Wastewater Treatment Facilities	<p>Inspect and evaluate all permitted WDR facilities and update WDRs as warranted</p> <p>Report progress on inspection and evaluation of WDR facilities.</p>	<p>Water Board staff</p>	<p>Need dates for those too.</p>
Boat Discharges	<p>Submit to the Executive Officer for approval a plan to document/ Evaluate the adequacy of on-shore restroom facilities and boater disposal/pump out facilities and develop and implement a plan to ensure adequate facilities are provided in Tomales Bay. Implement the approved Plan</p> <p>Submit to the Executive Officer for approval a boating management plan for Tomales Bay that includes: recommendations? for mooring exclusion zones; permitting procedures for mooring; and enforcement procedures to ensure compliance with mooring exclusion areas and no sewage discharge from boats. Implement the approved plan</p> <p>Report progress on implementing waste facilities and boating management plan.</p>	<p>Water Board staff Point Reyes National Seashore, California Coastal Commission, California State Lands Commission, California State Parks, County of Marin, Regional Water Board, Gulf of the Farallones National Marine Sanctuary individually or jointly? - needs clarification: who is the responsible party?</p> <p>Point Reyes National Seashore, California Coastal Commission, California State Lands Commission, California State Parks, County of Marin, Regional Water Board, Gulf of the Farallones National Marine Sanctuary same question as above</p>	<p>a specific date, or "insert date of x no. of months after EPA approval"</p> <p>Date or as above</p> <p>Date or as above</p> <p>Every x months</p>
Grazing Lands (Ranchland and Riparian Pastureland)	<p>Submit to the EO for approval identification of necessary site-specific grazing management measures that will reduce fecal coliform runoff. (Make consistent with monitoring requirement - monitoring is for fecal coliform not pathogens)</p> <p>Comply with state's Nonpoint-Source-Guidelines-for-rangelands. ???</p>	<p>Dairies and ranchers (landowners and leases) Individually or could they do this jointly?</p> <p>Regional Bd adoption of WDRs, Waiver etc</p>	<p>a specific date, or "insert date of x no. of months after EPA approval"</p> <p>as above</p>

Table 4-23  
**Trackable Implementation Measures for the Tomales Bay Watershed Pathogens Total Maximum Daily Load<sup>1</sup>**  
 Implementing Party

Source Category	Action	Completion Dates
	Compliance with the Guidelines is through WDRs, Waiver or prohibition. These are the only choices. Which will the RB adopt to implement this TMDL?	Dairies and ranchers (landowners and leasees)
	Implement grazing management measures that reduce fecal coliform runoff. In accordance with the TS in the WDR/waiver	Dairies and ranchers (landowners and leasees)
	Report progress on implementation of grazing management measures that reduce pathogens runoff.	Every x months
Dairies	Comply with animal waste guidelines (Specify exactly what guidelines: Title and date/and dairy waiver provisions. In existing waiver? If so, clarify, if provisions to be added to an existing waiver, clarify. Submit RWD. RB adopt WDRs. Waiver or prohibition of discharge. The WDRs, Waiver, will require Completion of watershed-wide assessment of equestrian facilities and identification of management measures necessary to reduce fecal coliform runoff.	a specific date, or "insert date of x no. of months after EPA approval"
Equestrian Facilities	Implement management measures that reduce pathogens runoff. In accordance with TS in the WDR/waiver RB revise Marin Co. stormwater permits to include provisions to implement TMDL by addressing: (a) ...; (b) ...; (c) ... [revise following as needed for compatibility with the permit revision]	a specific date, or "insert date of x no. of months after EPA approval"
Municipal Runoff	Report progress on implementation of management measures to reduce fecal coliform runoff.	Equestrian facilities, Marin County, and Marin County Stormwater Pollution Prevention Program
	Implement stormwater management plan.	Stormwater Pollution Prevention Program
	Update/amend stormwater management plan to include specific measures to reduce pathogen loading for Tomales Bay watershed.	RB revise stormwater permit for: Equestrian facilities, Marin County, and Marin County Stormwater Pollution Prevention Program
	Report progress on implementation of pathogens reduction measures.	Marin County, Stormwater Pollution Prevention Program

<sup>1</sup>All actions are to be implemented by January 2009

April 19<sup>th</sup>, 2005

To: San Francisco Regional Water Quality Control Board  
From: East Shore Planning Group  
PO Box 827, Marshall, CA 94940  
Re: Draft TMDL Tomales Bay

The East Shore Planning Group submits the following comments:

As you know, The East Shore Planning Group is very committed to water quality in Tomales Bay. This commitment has been well demonstrated by our Community's current voluntary efforts to improve our septic systems in partnership with the County of Marin. However, we have serious concerns regarding the Draft TMDL for Tomales Bay.

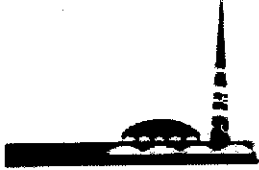
We believe the specific targets (as indicated in table 18) are unattainable particularly as they apply to our East Shore agricultural community. Furthermore, we believe that these unattainable targets are based on incomplete scientific data. If the sources of specific pollution were identified by more thorough scientific measures such as DNA testing, specific solutions could be achieved relative to the actual source.

Let us not forget: the preservation of this magnificent watershed is largely due to the stewardship of our ranchers on the East Shore of Tomales Bay. As it stands, the unattainable goals as set forth in the Draft TMDL may, in fact, destroy our valued agricultural community while unidentified sources of pollution remain a threat to the water quality of Tomales Bay.

Thank you for considering our concerns.

Paul Elmore /s/  
President ESPG





COUNTY OF MARIN  
ENVIRONMENTAL HEALTH SERVICES

Community Development Agency

3501 Civic Center Drive, Rm 236  
San Rafael, CA 94903  
(415) 499-6907 FAX (415) 507-4120  
[www.co.marina.ca.us/ehs](http://www.co.marina.ca.us/ehs)

APR 26 2005

April 19, 2005

Mr. Farhad Ghodrati  
S.F. Bay Regional Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

RE: Comments on the *Pathogens in Tomales Bay Watershed Total Maximum Daily Load (TMDL) and Proposed Basin Plan Amendment* (March 4, 2005)

Dear Mr. Ghodrati:

Thank you for the opportunity to provide comment on the *Pathogens in Tomales Bay Watershed Total Maximum Daily Load (TMDL) and Proposed Basin Plan Amendment*. We believe Tomales Bay is an important natural resource and are appreciative of efforts to reduce pollution in Tomales Bay. However, while we are highly supportive of efforts to improve the water quality of Tomales Bay, we are concerned that the TMDL contains some requirements that are currently unachievable. In addition, we would like to suggest specific language for the County's implementation actions for on-site wastewater disposal systems. These comments are discussed more fully below.

County of Marin, Environmental Health Services (EHS) is in the process of developing a comprehensive management program for Marin County's on-site disposal (septic) systems. This program includes homeowner education, technical assistance, and improvements to our inventory of systems. We also received a grant from the State Water Resources Control Board to support repairs and upgrades to at least twenty septic systems in the Marshall community along the shoreline of Tomales Bay. Since a maintenance and management District will be formed as part of this project, we look upon this undertaking as forming a prototype for developing a community-wide management program for septic systems.

We are strongly committed to improving water quality in Marin County and will continue to work toward eliminating pathogen sources from leaky or faulty septic systems. However, we are concerned that the timeframe of 2009 to establish management districts and repair programs for the entire watershed is unrealistic. As we are seeing from the Marshall pilot project, the formation of management districts and septic system repairs requires extensive community dialogue, acquisition of grant funds, and ultimately, a vote of approval by the property owners.

We are also concerned that Assembly Bill (AB) 885 is expected to include specific requirements for water bodies impaired by septic systems. In the interest of good planning, we would like to assess and incorporate these requirements into our Codes, regulations and policies before finalizing a septic management and repair program for Tomales Bay.

We suggest that you not require the full program to be in place until 2015, as we consider this to be a realistic timeframe for instigating a county-wide program, and will also allow us time to incorporate requirements from the anticipated AB885 onsite wastewater system regulations into our monitoring and maintenance program.

Therefore, we recommend that the implementation action in the TMDL be modified to state that "reasonable progress toward establishment of management districts and repair of septic systems" be demonstrated by 2009, and the effort assessed again in 2012.

Lastly, we are concerned that the revised water quality target of 43 MPN/100 ml in the tributaries is unduly stringent and, according to our understanding of the data, not currently being achieved in the watersheds that have no human or agricultural pathogen sources. Consequently, we recommend that there be an accurate calculation of the natural or background pathogen sources being contributed by wildlife in the watershed, before establishing target levels below the recreational water contact standards.

We offer the suggestion that some type of microbial source tracking be used to determine the sources and numbers of pathogens that are naturally occurring in the watershed. Once this background contribution is determined, then we can support setting the targets for the agricultural and human sources at some level comparable to those background targets. We do not advocate applying the revised target of 43 MPN/100ml until the background sources have been more accurately identified. Accordingly we recommend that the target for the tributaries be kept at 200 MPN/100ml (the current water quality objective for recreational use) at least until background concentrations are accurately characterized.

We look forward to working with you on improving the water quality in Tomales Bay. Please contact Philip Smith (415-499-7338 or [psmith@marin.co.ca.us](mailto:psmith@marin.co.ca.us)) if you have any further questions about these comments.

Sincerely,



Alex Hinds, Director  
Community Development Agency



Philip D. Smith, Chief  
Environmental Health Services

**Renovis**  
*renew restore repair*

Corey S. Goodman, Ph.D.  
President and CEO

April 17, 2005

APR 19 2005

From: Corey S. Goodman, Ph.D.  
Mailing address: 5610 Golden Gate Avenue  
Oakland, CA 94618  
510 652-9792  
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Marshall residence: 19845 State Highway #1  
Marshall, CA

To: John Muller, Chairman  
California Regional Water Quality Control Board  
San Francisco Bay Region  
1515 Clay St., Suite 1400  
Oakland, CA 94612  
(510) 622-2300

Re: written public testimony for April 20, 2005 public hearing  
on draft Water Quality Control Plan for Tomales Bay

Dear members of the San Francisco Bay Region RWQCB:

I apologize that due to a scheduling conflict I will not be able to attend your meeting on April 20 to read this letter into the public record and respond to questions. Nevertheless, I hope you will read my letter into the public record, and that you will provide a written response.

I write as a long-time Marshall resident, more recently a Marshall rancher, and as a scientist, U.C. Berkeley Professor, and member of the National Academy of Sciences. My message is simple and comes with a deep knowledge of the science: I strongly encourage the Regional Water Quality Control Board to apply Microbial Source Tracking (MST; also known as Bacterial Source Tracking or BST) technologies to uncover the source of fecal coliform in Tomales Bay. It is essential to identify the source of the fecal coliform in Tomales Bay before one can assign purity standards and design a solution to meet them.

Tomales Bay has been declared to be "impaired" due to fecal coliform levels, the RWQCB is considering a stringent Total Maximum Daily Load (TMDL) for coliform levels in the bay, and has proposed a series of measures that will cost many tens of millions of dollars to meet that TMDL requirement. But this project

is being undertaken without knowledge of the source of the coliform in the bay, when there are comparatively inexpensive and well-proven tests available to make that determination. The source of the coliform is crucial to both understanding the state of the bay and to determining how to clean it up.

First, as concluded by a 2004 National Research Council report, "Indicators for Waterborne Pathogens," waters contaminated by fecal coliform from animals represent a lower risk to human health than when the coliform source is human, and so if the contamination is from animals and not humans, a less stringent TMDL would be adequate to ensure public safety.

Second, effective measures to lower the coliform count cannot be designed unless the major source of coliform is known. Tens of millions of dollars may be spent, and when all is finished, the bay will still not meet TMDL requirements if the proper source has not been addressed. Birds and seals have been found to be major sources of fecal coliform in other similar bays and at similar beaches, some in nearby locations. If our bay is like many other waterways around the country, then simply guessing at the source of contamination without doing good science to determine the truth can lead one to erroneous assumptions and faulty solutions. And if a significant fraction of the fecal coliform in our bay does indeed come from birds, seals, and other wildlife, then the bay may not be as "impaired" as previously claimed, and it may be impossible to meet your proposed stringent TMDL levels without eliminating the wildlife. Cleaning up broken septic systems and establishing community sewage systems are fine goals that I fully support, but they are likely to have little impact on the measured TMDL.

There is evidence for this in an earlier study of our own Tomales Bay. In the 1995-1996 Tomales Bay Shellfish Technical Advisory Committee study sponsored by DHS and the state and regional water boards, a fresh-water tributary to White Gulch, an inlet on the west shore of Tomales Bay surrounded by National Seashore, was used as a "control site". There are no homes and no ranches around White Gulch; the area surrounding it is populated only with wildlife. The designers of the study chose it as a "good representative site for determining the amount of coliform present from wildlife and other natural sources in the watershed." Yet multiple fecal coliform samples from this control site ranged from 100-1000 MPN (most probable number, a measure of coliform) for fecal coliform (and over 10,000 for total coliform). These numbers are considerably higher than the TMDL fecal coliform standard proposed by the RWQCB of less than 14 MPN for Tomales Bay and less than 43 MPN for its tributaries. If these numbers obtained at White Gulch represent (as the study suggested) the fecal coliform contributed by wildlife alone, how can one expect the number to get down to 14 or 43 without eliminating these animals from the National Seashore?

There have been numerous examples from around the country that wildlife are a common source of high fecal coliform levels. In one famous example from the early 1990s, shellfish beds in Chesapeake Bay had to be closed due to fecal

coliform contamination. Local regulatory agencies assumed, incorrectly, that the source of the contamination was an unknown leaking septic system. They called in Prof. George Simmons from Virginia Tech, who performed a DNA fingerprint analysis that showed the fecal coliform was coming from raccoons and deer. In the winter of 1993 they removed the raccoons and deer from neighboring properties and found by spring of 1994 that the fecal coliform count at the shellfish beds had decreased by 1 to 2 orders of magnitude.

There was a similar case in our own back yard. In 2003, MST was used successfully to determine the source of fecal coliform in Campbell's Cove in Bodega Bay. The primary source was shown to be seagulls, and the secondary source marine mammals such as sea lions and harbor seals.

Your mandate to protect the public health and the quality of our water requires, in my opinion, that you use the best available technology, and our governor, the citizens of our state, and the citizens of our county surely want to see their tax dollars spent in the wisest fashion. We all want clean water, and we all turn to you to use the best technology available to fulfill your mandate. And the examples above demonstrate that it is essential to know the source of fecal coliform before one can decide whether the observed levels are problematic, and if so, how to lower them.

The report prepared by RWQCB staff suggests that that MST has shortcomings, uncertainties, and is costly and unproven. This view of the technology is based on a 3-year old study that is now outdated, but that even at the time, was more positive about the technology than your report suggests. And in the past three years the technology has become well validated. The scientific record on this is clear.

I am very familiar with both studies to which the RWQCB staff refers in its report, the 2002 comparison study of MST methods commissioned by Southern California Coastal Water Research Project and the Environmental Protection Agency and the 2003 study of the technology commissioned by the EPA and US Geological Survey. The RWQCB staff analysis paints an inaccurate picture of these studies. The 2002 study concludes that "Workshop participants were enthusiastic about the rapid advances in source tracking techniques that had been made in the last several years," and adds that they "recognize that the field will continue to advance rapidly over the next several years." This conclusion is a clear indication that they expected their 2002 analysis to be quickly outdated, and indeed they called for future workshops every few years to follow the progress of the technology.

Indeed, in May of 2002, after the EPA-sponsored study that staff misquotes as being quite negative on MST (BST) methods, the EPA wrote in their own report:

"Many BST techniques are undergoing intensive research that leads to rapid change in existing methods and the creation of new methods. BST

technologies are quickly becoming proven and should be used by federal and state regulatory agencies to address sources of fecal bacterial pollution in water. Although they are still experimental, BST methods represent the best tools available to determine pathogen TMDL load allocations and TMDL implementation plan development."

That was in 2002. These methodologies have advanced considerably in the past 3 years. That is why the EPA and other federal agencies are so enthusiastic about the methods today. In recent years there have been many dozens of success stories from across the country in which MST was used to identify coliform sources. In some cases it pointed to human sources, in others to livestock, and in many others to wildlife. There are also numerous examples in which regulatory agencies such as yours initially did not use MST, spent large amounts of money, and found that they had not solved the problem. Once the true source of the fecal coliform was identified using MST, the final solution was often simpler, less costly, and more effective.

In addition to the Chesapeake Bay and Bodega Bay samples I mentioned above, another recent example from the City of San Diego points to the clarity provided by MST technology. Although human waste was erroneously suspected as being the culprit, the studies showed that in certain bays and lagoons, the source of fecal coliform was bird droppings. Some of these "impaired" bodies of water are home to 1,500 birds in the winter; in wintertime our bay is home to more than 25,000 birds.

Indeed, MST (BST) methods today are the clear technology of choice around the country and world for determining the source of fecal coliform. At least half of the states in our country have reported successful use of these methods. The European Union and Canada have adopted these methods. In the U.S., the EPA, USGS, US Department of Agriculture, Department of Interior, and the majority of state departments of health all recommend using these methods.

In the face of this trend, I urge you to look at the current technology in 2005, and to look to the future. Genotyping methods have vastly improved since the comparison study in 2002. In addition, the use of DNA databases derived from fecal samples of species found in the local area being investigated has greatly improved the technology. Of the variety of MST technologies available, certain ones have emerged as the best. Most experts are recommending a combination approach that uses one method for preliminary identification and a second method for confirmation. With this approach one can now make extremely reliable determinations of whether fecal coliform comes from humans, livestock or wildlife. And it is even possible with reasonable certainty to determine which species of livestock or wildlife is the major contributor. Most molecular biologists in the scientific community are convinced that improving reliability simply requires better local databases and automation, and that technology is rapidly improving to bring down costs and increase efficiency. Just as with computers or

any other modern technology, price comes down and accuracy and capacity goes up.

As a member of the National Academy of Sciences, I have had the honor to serve as Chair of the Board on Life Sciences, the committee of the National Research Council (NRC) that does most of the environmental studies and reports for the federal government. In collaboration with the NRC's Board on Water Science and Technology, this committee was commissioned several years ago by the EPA to bring together the nation's very best scientists for a workshop and report on water quality. Their report (on which I had no personal input), entitled "Indicators for Waterborne Pathogens", was published in 2004 based on a September 2002 workshop and a report written largely in 2003. The 2004 NRC report concluded:

"When a public health risk or water quality impairment is identified through measurement-based systems, the next step is often to conduct investigations to identify the source of contamination. There are two primary purposes of source identification. The first is to decide whether a health warning should be issued because a recreational water body closure is typically issued only after determining that a human fecal source is associated with the high bacterial indicator levels. The second is to identify the most promising approach for fixing the problem. For example, should a local agency be looking for a leaking sewer pipe or for a flock of birds as the source of the problem? From a regulatory point of view, source tracking also feeds directly into the TMDL requirement of the Clean Water Act for problem characterization in impaired waters."

The committee went on to conclude:

"Public health risk from exposure to fecally contaminated water is likely to vary depending on whether high indicator concentrations resulted from animal or human sources, and microbial source tracking tools will allow public health managers to incorporate that distinction into their decision making"

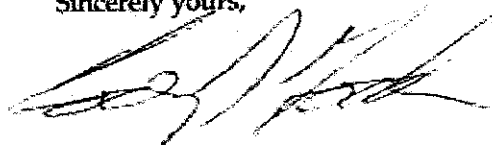
This report gives several clear reasons to use MST to determine the source of the coliform in Tomales Bay. Without this information, you can neither estimate the health risk, nor the appropriate TMDL level, nor can you devise a clean up plan that addresses the actual source of the contamination.

In summary, my recommendation is that you do as the NRC report recommended to the EPA, and as the EPA endorsed, namely, that you use the best technology available - MST (BST) - and that you get the very best scientists to help you implement this plan. As a member of the National Academy of Sciences, I would be glad to help you select the appropriate scientists and methods, and to make sure that the study of Tomales Bay is the very best in the world in terms of reliability and accuracy. I am a strong advocate of genotypic methods using DNA databases derived from local species. I would be happy to

work with your staff to set up an advisory panel of world-class scientists. The cost of a few hundred thousand dollars is modest compared to the tens of millions of dollars envisioned for bay cleanup. What's more, this cost could be completely covered by a grant. MST studies routinely are funded by grants from the EPA, the USGS, and the USDA. Additional potential funding sources locally include the Buck Fund and the Moore Foundation. The time for doing such a study will be minimal compared to the potential for money and time that could be wasted on misguided approaches.

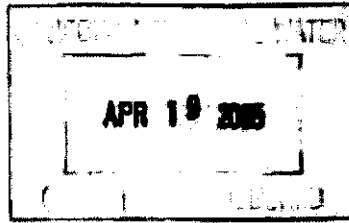
On behalf of all of us who care deeply about the quality of the water in Tomales Bay, I urge you to use the best technology available to identify the source of fecal coliform, and thus solve the problem most efficiently to best serve our community. Don't be afraid of the truth. Truth is knowledge and knowledge empowers solutions. We all have the same goal — clean water. Let's get the job done in the most cost-effective and time-efficient fashion.

Sincerely yours,



Corey S. Goodman, Ph.D.





John Hulls  
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Chairman  
SF Bay Region Water Quality Control Board  
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CA 94612

Re: Public Comments on Tomales Bay Pathogen TMDL, "Pathogens in Tomales Bay Watershed - Proposed Basin Plan Amendment"

18 April 2005

The EPA has provided guidelines by which they evaluate TMDL's. They made it clear that they are not advisory in nature, and defined the intent of the words "must" and "should" in the document. They further noted their use of the checklist on page 7 of the document. (*Guidelines for reviewing TMDL's under Existing Regulations issued in 1992, dated May 20, 2002*)

Obviously, the submittal letter comes at a later stage, but the draft document can be evaluated based on the items on the checklist.

- 1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking** On the first checklist item, the nonpoint sources are inadequately described. The ecology of the bay and the national parks have been extensively studied, yet the draft fails to note the potential for identifiable contributions from the large herds of elk and deer that populate watersheds that feed directly into Tomales Bay. Also, the existence of one of the larger populations of harbor seals in California, and the presence of large flocks of migratory birds represent discreet, identifiable potential sources of significance in the natural background. Item 1 is quite clear, stating that "This information is necessary for the EPA's review of the load and wasteload allocations which are required by regulation." (emphasis added). The draft report is also not clear on several of the other items mentioned
- 2. Applicable Water Quality Standards & Numeric Targets** The report is vague in this area, and this confusion is apparent in recent discussions between the local RCD and RWQCB staff, where the standards and targets seem to be very flexible. See 14 April Pt. Reyes Light, wherein RCD's Dyan White is quoted as saying that standards can be changed from an MPN of 43 to a MPN of 200. Item 2 is deficient as it apparently applies an arbitrary standard required of shellfish beds to the entire watershed. Nowhere does the report show why this standard is necessary for the entire watershed. Quoting from the guidelines, "The TMDL

expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target".

3. **Loading Capacity** Loading Capacity This section perhaps causes the most concern, as the report is essentially silent on any data that would allow a statistically valid link between the identified pollution sources and the target number. The report is silent on the volume or % contribution of septic tanks, boaters, ag runoff and other sources. Quoting the guidelines, "The TMDL must identify the loading capacity of a waterbody for the applicant pollutant" and that "The TMDL submittal should describe the method used to establish the link between cause-and-effect relationship between the numeric target and the pollution source." The report also is deficient on the remaining two sections, especially documenting supporting the TMDL analysis and EPA's statement that "TMDL's must take into account critical conditions." (see UC Cooperative Extension objections at last RCD meeting)
4. **Load Allocations (LAs)** The guideline states, "EPA regulations require that a TMDL include LA's (Load Allocations) which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. (emphasis added)" The report is deficient in this area.
5. **Wasteload Allocations (WLAs)** While the report does not seem to address future point sources, WLA's are a miniscule portion of the overall load and therefore not a critical item.
6. **Margin of Safety (MOS)** The report fails to meaningfully address both the statutory and regulatory margin of safety (MOS) required "to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality". In cases such as Tomales Bay, with the presence of such large quantities of contributory wildlife, it is clearly impossible to comply with this requirement without complying with the requirements of item 4, Load Allocations.
7. **Seasonal Variation** The effects of seasonal variations are inadequately explored. Certain events such as the herring runs bringing about the influx of large numbers of harbor seals, migratory bird populations, large herds of elk sheltering from storms on the lee (Tomales bay) side of Pierce Point by are all ignored, nor are they correlated with the limited number of actual test performed. It appears that the presence of e-coli in sediment is a little known phenomena, and the report is silent on the possibility that disturbance of stream sediment by increased velocity after rains may be a significant.
8. **Reasonable Assurances** As there is no load allocations (LA's) to the various identified non-source pollutants, it is simply a matter of logic that RWQCB cannot possibly represent to EPA that there is reasonable assurance that source reductions imposed by RWQCB on the various sources of pollution will result in

attainment of the target standards. Once again, without LA's, it is logically impossible to comply with this section.

9. While this section states that the EPA is not required to and does not approve implementation plans and is not on the checklist, it does not provide any exemption from regulations
10. **Public Participation** It is clear that many of the ranchers and other stakeholders were unaware of the existence of these referenced EPA guidelines. It is hard to see how there can have been meaningful public participation when the public is not aware of the basis by which the TMDL's will be evaluated. It is noted that the EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or EPA
11. Items 12 is not relevant at this time.
12. Item 13 is relevant at this time to the extent of the inadequacies noted in the individual sections previously cited.

Comments: While it is easy to blame the individual investigators for the glaring deficiencies in the Draft TMDL report, the overall responsibility rests with the management of RWQCB. It is obviously very difficult for a staff person charged with preparing a TMDL to go to management and report that the previously budgeted testing procedure is inadequate to meet the EPA requirements, as is clearly the case in the instance of the Tomales Bay e-coli TMDL's. The literature from sources such as EPA itself, West Virginia Department of Agriculture and the City of San Diego show that where there is an extensive wildlife population that is not properly accounted for in the TMDL, the risk of serious error and fruitless expenditure of millions of dollars is extremely high. (All these instances have been referenced in articles in the Pt. Reyes Light with appropriate source contacts)

It seems only appropriate at this stage that the RWQCB delay the acceptance of this plan, and revise where necessary until consensus is reached amongst the stakeholders that the scientific accuracy and procedures of all EPA regulations and guidelines and requirements for submission have been met.

  
John Hallis

Enc: excerpts from Pt. Reyes Light 28 Aug 2003 & 14 April 2005 with comments relevant to submission criteria marked in red.

# Guest Column

AUG 28  
2003

## No science for sewer in Marshall

NOTE: THIS IS GOODMAN ON NIRC BY COREY MARSHALL

By Corey Goodman  
Marshall

On Saturday afternoon, Aug. 24, I joined my friends and neighbors from the east shore of Tomales Bay at the Marconi Center to discuss what has become our favorite community pastime — septic systems. Our community has been under attack for five years by every agency and environmental group with an interest in water quality, all claiming as fact that our homes are the source of significant viral and bacterial contamination. The only problem with their rush to judgment is that they have never had any water-quality measurements to support these claims.

### Proud of community

I'm proud of the way my shoreline community and its leadership have pulled together to do their part to try to improve water quality, and I'm equally proud of the way ranchers have spent considerable money and time to improve water quality in and around the bay.

At our Saturday meeting, thoughtful community leaders and engineers presented various scenarios to us for how to build community septic systems that could cost as much as \$5 million — at a cost to each homeowner of \$50,000 or more, something that scares many of my neighbors living on fixed or limited incomes. But why are we being forced into this? Are we really the source of the bacteria that the state is requiring the County to eliminate?

I am a scientist, and so I tend to be data-driven. As any scientist knows, one needs to read beyond the summaries of reports and examine the data, since summaries often do not reflect reality. This is particularly true with the Tomales Bay Shellfish technical advisory committee report on water quality.

The simple fact is that, contrary to how the executive summary and recommendations are often quoted as suggesting that the shoreline homes are a major source of contamination, there has never been a single measurement of water quality that has shown any contamination coming from our homes.

And there was never a shred of evidence to suggest that the Norwalk virus came from our homes in May of 1998 (it almost certainly came from a butter, and most probably an oyster worker). For those people who might feel compelled to attack me for these comments, I ask you first to look at the data in the various reports and then tell me what table or graph of water-quality measurements implicates the shoreline homes.

### Various kinds of bacteria

Many measurements of water quality taken from around the bay have revealed (not surprisingly) various kinds of bacteria (the open ocean has them as well), but even though modern molecular biology could easily solve the mystery of "why-does-it" at least that would be a pittance compared to the community septic systems being planned and the costs being incurred by ranchers, we still don't know (as *The Point Reyes Light* has steadfastly continued to remind us) whether the bacteria come from cattle, birds, seals, or other water or land critters.

One thing we can be pretty certain of — the measured levels of bacteria in the bay are not coming from the shoreline homes. Water measurements taken in the waters directly off those homes have never detected one iota of contamination above the baseline measured throughout the bay. There simply has never been a single measurement of water quality that has pointed to the homes being the culprits for the measurable bacteria in the bay.

The San Francisco Regional Water Quality Control Board has ordered Marin County to lower bacteria in the bay 30 percent by 2005 and 75 percent by 2007.

Under relentless pressure from state agencies, the county

must do something to be presumed failing septic systems of the shoreline homes. Some of this pressure has been passed onto our community, which, under the leadership of the East Shore Planning Group, has worked with the county to take steps that will likely lead to the spending of \$5 million dollars to build some beautiful eco-designed community septic systems.

Nevertheless, it is likely that this huge expenditure and effort will produce no change in the kinds of water-quality measurements that drove this issue in the first place. Since we have no indication that any of that measured bacteria comes from the homes, how can we get an outcome measure on whether the \$5 million was well spent? Why are we doing this without data? What is the starting value upon which we will measure success or failure?

In contrast to the lack of water-quality measurements implicating the shoreline homes, it is no surprise that some failing shoreline septic systems were found. By all means, let's get them fixed. But will that significantly impact the mandated water quality improvements? Unlikely. Neither theoretical calculations nor empirical water quality measurements would suggest that these failed systems are a significant source of the bacteria that the regional water quality control board wants the county to reduce.

### Same goal

All of us have the same goal: high quality water — and thus no one should pollute, failed systems should be fixed, and every system should be periodically tested. Everyone living or doing business around the bay can probably do better, and the shoreline homes are no exception.

But while both the shoreline and ranching communities have responded with appropriate actions, the state agencies who are imposing their will upon us have never done the much less costly job of doing the right experiments —

performing the right kind of water tests and DNA analysis to determine whether in fact anything harmful is actually coming from our homes or cattle.

*The Point Reyes Light* has continued to ask those agencies to at the very least do what scientists have done at Morro Bay. I made the very same request four years ago when I met with staff of the regional quality control board and California's department of health services at the water board's Oakland office.

When I asked them to conduct better tests using modern technology, in light of their striking lack of data supporting their recommendations on the shoreline homes, the department of health services staff told me that they knew how to do better tests to look for human pathogens seeping out of the shoreline septic systems into the bay, and that they planned on making such measurements.

I presume that either they never conducted these tests or nothing was detected, because I have found no record of such a study. Is there something wrong with trying to find out the truth? It would be nice to do the right experiments before jumping to conclusions.

I don't write this column naively imagining that I or anyone else can stop the process. I acknowledge that the train has left the station and there is no stopping it — some sort of community septic systems will be built along the east shore of the bay.

### Centralized systems come with cost

The east shore community and county are working together quite effectively on this endeavor. Improving the septic systems is a fine goal, although I and others worry that we may create large centralized systems that will undoubtedly fail someday in the future and lead to a catastrophic sewage spill.

An engineer at our community meeting said that such a failure might "only" dump hundreds of gallons of human sewage into the bay before the pumps were turned off, an event most of us would consider to be an environmental catastrophe. Centralized systems come at a cost — potential failures of a much larger scale.

But it is not that that the septic tank is being destroyed by politics and not science, and as a result, that it is highly unlikely to lead to any measurable change in water quality. Wouldn't it be a shame to spend millions of dollars on community septic systems, and drive many ranchers out of business (and thus permanently change the character of our community), and in the end find out that nothing has changed and it was all in vain because we had never done the right experiments to find out where the bacteria were coming from?

I encourage everyone involved to focus on a united goal — working towards the highest water quality, but in harmony with the long-term maintenance of the agricultural character of our community.

We have limited resources. Time is of the essence. We need to make sure we distinguish science from politics, and fact from fiction. But let's not delude ourselves into thinking that the \$5 million systems being proposed will have any effect on the mandated lowering of bacteria in the bay. If there is a problem, this step won't solve it. And given the lack of good science, I am still wondering whether the problem is as serious as state agencies make it out to be. Some good science to sort this out would be refreshing.

*Curry Goodman has had a home in Marshall for 10 years. He is Professor of Molecular and Cell Biology at UC Berkeley, a member of the National Academy of Sciences, and chair of the National Research Council's Board on Life Sciences, which oversees many biological and environmental studies for the federal government. He is currently on leave of absence from UC Berkeley at a biotechnology company. He and his wife own a local beef cattle ranch that is within the Marm Agricultural Land Trust.*

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THOMAS G. BATY

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April 20, 2005

COMMENTS TO THE SFRWQCB ON THE TOMALES BAY PATHOGEN TMDL

My name is Tom Baty and I have lived 46 of my 48 years next to Tomales Bay. The bay is a huge part of my life: I fish its waters, clam its shoreline, swim its beaches, do volunteer research for various scientific studies, organize an annual shoreline cleanup effort, and basically spend an awful lot of time trying to protect and improve the health of the bay.

May I express my strong support of the Pathogen TMDL for Tomales Bay and its tributaries. This effort represents our best "next-step" to improve water quality, providing the significant means to categorically address the key sources of one of the primary pollutants in this bay. It's been twenty-eight years since the Clean Water Act mandated the creation and application of the total maximum daily load concept for addressing water pollution and we still have a very long way to go.

This TMDL is not without some shortcomings. I am concerned that the implementation mechanisms may lack the teeth to affect the desired changes in behaviors that will be necessary to reduce pathogen levels in the bay. The effectiveness of the implementation plan depends on how regulatory staff chooses to interpret and enforce the "trackable implementation measures." I frankly have a hard time figuring how much of the implementation plan is enforceable at all. The TMDL fails to adequately address the role of wildlife as a source of pathogens, listing wildlife as a discharger of pollutants and failing to frame the debate in a way that clearly acknowledges that background levels of pathogens are not in fact a problem. The TMDL is also quite anthropocentric in its purpose and how it states the problem in the Basin Plan Amendment. It ignores how the human and animal waste responsible for pathogen loading can significantly impact the health of the natural ecosystem.

I would ask that the Board consider the following three issues, one of which call for ~~ai~~correction in the Basin Plan Amendment and two that offer ~~small~~ additions that will make this a stronger program.

1) A PROBLEM STATEMENT THAT ARTICULATES THE NON-HUMAN BENEFICIAL USES OF TOMALES BAY. Tomales Bay and its main tributaries are absolutely critical pieces of increasingly-rare coastal habitat: the relatively healthy and functional estuarine system. The pathogen loading addressed in the TMDL is the result of animal and human waste coming in contact with the tributaries

and the bay itself. Pathogens themselves need to be recognized as an indicator of all the other harmful constituents that may be present in the waste and can adversely affect the biotic health of the ecosystem. For example, growth hormones and other pharmaceuticals used in agriculture are known to disrupt natural growth and reproductive cycles in the aquatic environment downstream. Similarly, pet waste associated with municipal runoff has been linked to viral problems for marine mammals in affected waters. While there has been no documentation (nor to my knowledge has much research been done in these waters) of these concerns, the linkage between our waste and the bay and its tributaries has been made and the inherent risk to the natural resources needs to be identified.

PROPOSED CHANGE: In the Problem Statement on page 1, include a sentence at the end of the paragraph: "Elevated pathogen levels should also be seen as indicative of significant risk to those listed beneficial uses protecting the natural resources (Cold Freshwater Habitat, Estuarine Habitat, Marine Habitat, Preserving Rare and Endangered Species, Fish Spawning, Wildlife, etc.)."

2) THE CONSIDERATION OF WILDLIFE AS A SOURCE OF PATHOGENS. The TMDL report and subsequent Basin Plan Amendment identify wildlife as a recognized source of pathogens in listed waters. The TMDL is conceptually clouded by the failure to adequately separate wildlife from the other sources or user-groups and to clearly acknowledge that background levels of pathogens are not a legally recognized pollutant. The Clean Water Act is fairly straightforward in defining pollutants as those harmful constituents that have been directly produced by man or are the results of man's effects on the environment. Some critics of the TMDL continue attempting to blame wildlife for elevated pathogen levels, incorrectly calling for management measures on wildlife when this is neither a defensible legal option nor particularly justified in light of the current data on how and when pathogens enter the bay and tributaries. The TMDL has failed to adequately articulate how background levels of pathogens are a recognized, yet expected and generally exempted source by regulatory standards.

PROPOSED CHANGE: Under Sources on page 1, strike wildlife from the list of sources to be "properly managed" and add the

following sentences: "While acknowledged as a source of pathogens, a naturally occurring background level from wildlife is not considered a form of pollution under the Clean Water Act. Furthermore, current data on control (ie: non-human use) subwatersheds and non-runoff sampling throughout the watershed strongly suggests that wildlife is not a significant source of pathogen loading." In Table 4-22 the final category of Wildlife should be removed because it is neither a "discharger" nor a recognized "pollutant." Another option to correct this table would be to leave the Wildlife category in place and void out the associated loading allocations with a simple "not applicable--N/A." Changes to the loading values and the associated footnote would read:

"Wildlife"	N/A	N/A	N/A
Footnote (c)	Although wildlife is recognized as a source of pathogens, naturally occurring background levels are not considered a form of pollution. Current data suggests that wildlife is not a significant source of pathogens."		

3) THE LACK OF A SEPTIC TREATMENT FACILITY. With all the effort going into improving the septic system maintenance and functionality around Tomales Bay, it seems absurd that West Marin is without a facility that actually treats our septic waste. Borello's is an antiquated series of sludge ponds. Without a prescribed residence time for either effluents or solids nor any sort of monitoring of pathogen levels, the material from these receiving ponds is simply spread on the surrounding hillsides. Depending on the time of year, this morning's received waste can be dumped on the ground this afternoon. An aggressive and often recalcitrant operator has stymied Board staff into an almost complete lack of oversight. For example, a 1997 Cleanup and Abatement Order (97-080) has stalled out, with little or no compliance to its directives. Over the years various citizens, the Tomales Bay Association, the Inverness Association, The Environmental Action Committee of West Marin, the County of Marin, the California Department of Health Services, and the board's own Tomales Bay Shellfish Technical Advisory Committee have all expressed concern and often dissatisfaction with how this facility is operated and regulated. The WDP for this facility limits the irrigation of effluent from April through



November, so every winter this facility is shut down for lack of freeboard in the ponds. The fallback solution in the San Rafael municipal treatment plant, but it has been turning away West Marin septage, claiming their own system is overburdened in the wet season as well.

As the septic component of the Pathogen TMDL gathers momentum, there will be a greater need for a facility to receive and treat an increasing volume of septage. The TMDL directs Regional staff to review WDRs for treatment facilities. I hope the Board can recognize that we do not have a true wastewater treatment facility that is available for our septic waste and will direct staff to evaluate the options and act to rectify the situation. Here in the 21st century the practice of spreading untreated human waste on the hills is unconscionable.

PROPOSED CHANGE: Include the following action items under the heading of Small Wastewater Treatment Facilities in Table 4-23:

"Evaluate the options for septage receiving facilities and develop alternatives to the current choices that are not seasonally limited and that provide adequate treatment.

Upgrade existing WDRs to include a measurable degree of treatment before effluents and solids can be released from a facility."

In conclusion, I would ask that the RWQCB makes the necessary commitment of resources to carry this program forward in a robust manner. Ongoing monitoring will be a crucial component in gauging the effectiveness of the implementation plan and is absolutely essential in assessing progress towards reducing pathogens in the bay and tributaries. Enforcement will also be a critical piece of the puzzle, for although many stakeholders have and will continue to work toward improving water quality, we all know there are a significant number of players that have made no effort and could do with a demonstration of the consequences of non-compliance. Conversely, those individuals and communities that are making a true effort to reduce their share of pathogens deserve the full regulatory, technical, and (if possible) financial support of the RWQCB and other jurisdictional agencies.



Thomas G Baty