commentletters - RE: Comments on Pajaro River TMDL

From: "Darlene Din" <darlenedin@earthlink.net>
To: <commentletters@waterboards.ca.gov>, <paosmolovsky@waterboards.ca.gov>, "Michael Buckman" <MBuckman@waterboards.ca.gov>
Date: Thursday, February 18, 2010 11:33 AM
Subject: RE: Comments on Pajaro River TMDL
Attachments: TMDL Letter _revised_ 1 20 09.pdf

NOTICE OF OPPORTUNITY TO COMMENT

PROPOSED APPROVAL OF AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE CENTRAL COAST REGION (BASIN PLAN) to (1) ESTABLISH TOTAL MAXIMUM DAILY LOADS FOR FECAL COLIFORM IN THE PAJARO RIVER WATERSHED (INCLUDING PAJARO RIVER, SAN BENITO RIVER, LLAGAS CREEK, TEQUISQUITA SLOUGH, SAN JUAN CREEK, CARNADERO/UVAS CREEK, BIRD CREEK, PESCADERO CREEK, TRES PINOS CREEK, FURLONG (JONES) CREEK, SANTA ANA CREEK, AND PACHECHO CREEK); (2) ADD A DOMESTIC ANIMAL WASTE DISCHARGE PROHIBITION; AND (3) ADD A HUMAN FECAL MATERIAL DISCHARGE PROHIBITION

ATTN: Michael Buckman, Division of Water Quality,

I have attached the written comments that were supplied to the Regional Water Quality Control Board. It is my belief that those comments were not address completely by the Central Coast Regional Board Staff. I request that the State Board review the comments I have submitted and address my concerns. I further request that you delay the adoption of this TMDL until all of the concerns by all the stakeholders are addressed.

The Central Coast Regional Board Staff requested that the Coastal Cattlemen write a regional water quality protection plan that would answer the questions the Central Coast Regional Board Staff posed to the Coastal Cattlemen. The Central Coast NPS Grazing Approach document was completed in August, 2008 and submitted to Regional Board Staff for comment in early September, 2008. Regional Board staff never provided feedback to the Cattlemen.

There are many concerns that I addressed in the letter submitted to the regional board staff, two issues stand out in this prohibition as an example of the many flaws in the adoption of the PAJARO RIVER WATERSHED TMDL.

Two prohibitions are established as part of this amendment, the domestic animal waste discharge prohibition and the human fecal material discharge prohibition.

My comment - first point under discuss is the definition of domestic animal is too broad and the management practices of a commercial grazing operation and that of a rural residential are so different that the assumptions under the prohibitions are incorrect and must be addressed.

Domestic animals include cattle within grazing lands and farm animals such as horses, cattle, chickens, goats, dogs, and cats within rural residential areas of the watershed.

My comment – second point is the natural baseline exceeds standards of the non-point source of these TMDL's so the standards are not attainable ever.

This is a lose/lose for the rural and urban land uses under these TMDL.

As an agricultural land use consultant it concerns me that through the TMDL process, the approach that the Central Coast Regional Board Staff uses is inconsistent, focusing on the regulations verses improvement of water quality.

The purpose of the Clean Water Act is to improve water quality not to regulate appropriate land uses out of existence on the Central Coast.

My request is that you delay the adoption of this TMDL until all of the concerns by all the stakeholders are addressed.

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January 20, 2009

Central Coast Water Board
895 Aerovista Place, Suite 101
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Attention: Pete Osmolovsky
paosmolovsky@waterboards.ca.gov

Re: Comments on the Proposed Amendment of the Water Quality Control Plan for the Central Coast Basin to (1) Add Total Maximum Daily Loads for Fecal Coliform in Pajaro River Watershed Waters (including Pajaro River, San Benito River, Llagas Creek, Tequisquita Slough, San Juan Creek, Carnadero/Uvas Creek, Bird Creek, Pescadero Creek, Tres Pinos Creek, Furlong (Jones) Creek, Santa Ana Creek, and Pachecho Creek); (2) add a Domestic Animal Waste Discharge Prohibition; and (3) add a Human Fecal Material Discharge Prohibition (Proposed Resolution Number R3-2009-0008).

This comment letter is submitted on behalf of myself working with many clients that are involved in agriculture and affected by the proposed action of the Central Coast Regional Water Quality Control Board (Central Coast Water Board) to amend the Water Quality Control Plan for the Central Coast Basin (Basin Plan) to include numerical fecal coliform total maximum daily load (TMDL) requirements to protect contact and non-contact recreational uses in the Pajaro River, San Benito River, Llagas Creek and other waters within the Pajaro River watershed. As discussed in more detail below, the proposed Basin Plan amendment does not comply with California Water Code Sections 13241 and 13000, would not reasonably protect recreational beneficial uses, and does not reflect a scientifically defensible characterization of pathogen loads in the Pajaro River watershed. Accordingly, I respectfully request that the Central Coast Water Board decline to adopt the proposed TMDL and implement alternative actions to properly identify and regulate pathogens that could impact recreational beneficial uses. This could establish a precedent for other water bodies that would affect agriculture, without proper science and without fact. In discussion with other interested Ag operations, I agree the points raised and submit for the record this letter and the information contained that has been included in other comment letters. There are currently programs such as the Leafy Green Marketing Agreement, the Ag Waiver program that included farm plans, Rangeland Short courses, rangeland management plans to name a few. These management practices will continue to address this TMDL there is not a need for additional action.

Our conclusions regarding the proposed amendment are based on the following facts:

- The fecal coliform TMDL relies on an outdated water quality objective developed in the 1940s and 1950s when wastewater was not treated to current standards and most fecal coliforms detected in surface water studies were from human sources.

- Fecal coliforms reasonably correlate with human illness risks only when human fecal coliforms are present in surface waters.

- The Central Coast Water Board's technical analyses demonstrate that human fecal coliforms are not present in significant quantities and that almost all fecal coliform detections are associated with avian or bovine sources in the Pajaro River watershed.

- The proposed TMDL would not reasonably protect recreational beneficial uses because it would not significantly control pathogens associated with human health risks.

- The proposed TMDL relies on inappropriate natural and baseline fecal coliform concentrations and does not adequately consider whether the water quality objective can be reasonably achieved as required by the Water Code.

- Costs associated with the proposed TMDL have not been properly considered because the analysis relies on inapplicable and incomplete information, assumes that only a select number of relatively low-cost actions will be necessary to achieve the proposed water quality objective, and does not analyze significant capital and operational expenses that may be required to detain and treat stormwater in the Pajaro River watershed.

- The proposed TMDL does not provide a sufficient basis for excluding agriculture, and regional farmers and growers could experience significant new costs and operational constraints if they are required to meet the fecal coliform discharge requirement in the future.

- The proposed TMDL does not comply with Water Code Sections 13241 or 13000, and similar legal issues have resulted in multi-year litigation and significant enforcement uncertainty in other water board jurisdictions.

Section I of this letter summarizes the requirements of Water Code Sections 13241 and 13000 that apply to the proposed action. Section II describes the primary technical concerns associated with the proposed TMDL. Section III summarizes the technical and legal issues that preclude adoption of the proposed TMDL and identifies alternative actions that would more effectively address potential pathogen risks in accordance with Water Code requirements.

I. The Proposed TMDL and Water Code Sections 13000 and 13241

All water quality objectives adopted by the Water Board, including TMDLs and Basin Plan objectives, must comply with the requirements of Water Code Sections 13000 and 13241.

Section 13000 states in relevant part that:

> [A]ctivities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

Section 13241 provides that:

> Each regional board shall establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:
>
> (a) Past, present, and probable future beneficial uses of water.
> (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
> (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
> (d) Economic considerations.
> (e) The need for developing housing within the region.
> (f) The need to develop and use recycled water.

Recent court cases have established that TMDLs and other water quality objectives that do not comply with Sections 13000 and 13241 are illegal and must be revised to comply with statutory requirements. In 2006, for example, 22 cities filed a lawsuit alleging that the stormwater objectives adopted by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) did not consider water quality conditions that could be reasonably achieved, the costs of the objectives, actual and probable beneficial uses of the regulated waters, and other factors described in Sections 13000 and 13241. After two years of litigation, the court invalidated the stormwater objectives, and the Los Angeles Water Board is currently required to revise and reassess its stormwater regulations to explicitly address all applicable Water Code requirements.[1]

[1] *Cities of Arcadia v. State Water Resources Control Board*, No. 06CC02974, (Cal. Super. filed Feb. 9, 2006).

As discussed more fully in Section II of this comment letter, the proposed TMDL utilizes an outdated indicator (fecal coliforms) that does not reasonably correlate with the protection of recreational beneficial uses. The TMDL also does not sufficiently consider existing environmental conditions, including natural and other non-human sources of fecal coliforms in the Pajaro River watershed, and potential costs and other economic considerations. As a result, the proposed TMDL cannot be adopted in compliance with Sections 13000 and 13241.

II. Technical Concerns with the Proposed TMDL

The Central Coast Water Board published a Project Report in support of the proposed fecal coliform TMDL in 2008. The Project Report recommended that the TMDL implement the following numeric target:

> Fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100mL, nor shall more than ten percent of total samples during any 30-day period exceed 400/100mL.

The Basin Plan water quality objective for waters designated for contact recreational (REC-1) beneficial uses is the same as the proposed TMDL. The Project Report did not precisely allocate fecal coliform loads to specific sources within the Pajaro River watershed. Instead, the proposed TMDL requires that any discharge to the Pajaro River watershed must meet or exceed the REC-1 fecal coliform standard.

The proposed TMDL is subject to several technical concerns, including the following.

1. *Fecal coliforms are not recommended as a water recreational health risk indicator.*

The proposed TMDL and the Basin Plan rely on measured concentrations of fecal coliforms as an indicator of pathogens in water that may impair designated beneficial uses. This approach is based on a 1968 report (National Technical Advisory Committee "Water Quality Criteria, a Report of the National Technical Advisory Committee to the Secretary of the Interior," Federal Water Pollution Control Administration (April 1968)) (the "NTAC Report") that relied on studies conducted during the late 1940s and early 1950s by the United States Public Health Service.[2] The NTAC Report was subject to significant criticism, including: (1) the limited amount of data used to establish the fecal coliform criteria; (2) reliance on only portions of collected data and exclusion of other information contrary to the report's conclusions; and (3) the lack of definition of "swimmers" in the study. A subsequent National Academy of Sciences study that considered the NTAC Report declined to recommend a recreational water quality

[2] The results of these studies are summarized in Stephenson, A.H. "Studies of Bathing Water Quality." American Journal of Public Health. 43 5:529 (1953).

criterion because of the paucity of epidemiological information available (National Academy of Sciences-National Academy of Engineering, Committee on Water Quality Criteria, "Water Quality Criteria," U.S. Environmental Protection Agency, EPA-R3-73-033, 1973).

In 1986, the U.S. Environmental Protection Agency (USEPA) recommended that E. coli and Enterococci bacteria be utilized in lieu of fecal coliforms to assess human health risks associated with recreational exposure to pathogens in marine and fresh water (United States Environmental Protection Agency, "Ambient Water Quality Criteria for Bacteria" EPA440/5-84-002, January 1986).[3] In 2004, the USEPA reevaluated and confirmed its 1986 recommendation that E. coli and Enterococci bacteria replace fecal coliforms as indicators of human health risks (USEPA, "Water Quality Standards for Coastal and Great Lakes Recreation Waters - Final Rule," Office of Water, November 2004).

The use of fecal coliforms as the pathogen and health risk indicator in the proposed TMDL and Basin Plan does not reflect the fact that the original study establishing the fecal coliform criterion was significantly flawed. Since 1986, the USEPA has specifically recommended that fecal coliforms not be used to establish bacterial water quality objectives. The Basin Plan should have been amended in prior review periods to incorporate a more accurate and reasonable health risk water quality objective consistent with USEPA and other relevant information.[4] If implemented, the proposed TMDL would unreasonably impose a water quality discharge requirement that incorporates an unreliable and inaccurate a fecal coliform indicator that the best available science has specifically *not* recommended for use to protect water recreation beneficial uses.

2. Fecal coliforms do not significantly correlate with infectious disease risks.

Studies completed since the NTAC Report have demonstrated that there is a poor correlation between fecal coliforms in a water body and pathogens that can cause human illness. A 2002 study concluded that fecal coliform measures do not protect public health because there is no clear relationship between the presence of pathogens and the concentration or presence of fecal coliforms (Schroeder et al., "Management of Pathogens Associated with Storm Drain Discharge Results of Investigations of the Presence of Human Pathogens in Urban Storm Drains," Center for Environmental and Water Resources Engineering Department of Civil & Environmental Engineering,

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[3] The USEPA analysis relied on McKee, "Development of Health Effects Criteria for Fresh Water Bathing Beaches by Use of Microbial Indicators." Ph.D. Dissertation. University of Oklahoma, Norman, Oklahoma (1980). McKee's results were further analyzed and confirmed in Dufour (1984) "Bacterial Indicators of Recreational Water Quality." Canadian Journal of Public Health Vol. 75, No. 1, p 49-56, January/February, 1984.

[4] In the *Arcadia* case, for example, the court found that did not reflect Water Code Section 13000 and Section 13241 requirements were legally invalid even though they had been incorporated into the basin plan for several years.

University of California, Davis, 2002). Fecal coliforms and virus concentrations have also been found to be poorly correlated in studies of nonpoint sources and water quality.[5]

A 2007 study of five bacterial indicators in the Los Angeles River (E. coli, Enterococcus, universal Bacteroidales, human Bacteroidales, and adenovirus) found that each indicator was poorly or at best moderately correlated to each another and that high rates of one indicator would often occur in areas with low concentrations of another indicator (Cleaner Rivers through Effective Stakeholder TMDLs (CREST), "Los Angeles River Bacteria Source Identification Study: Final Report," February 2007). The CREST study also found that adenoviruses often occurred at sites with relatively low concentrations of indicator bacteria such as fecal coliforms. As a result, reducing fecal coliform concentrations in receiving waters do not appear to be correlated with viral discharges that can cause human illness.

The USEPA conducted a workshop in 2007[6] to identify technical issues associated with using fecal coliforms and other fecal indicator bacteria to measure and control infectious disease risks in a recreational waters. Issues identified during the workshop included the following:

(a) Pathogens are typically present in low concentrations in treated sewage, receiving waters, and recreational waters. As a result, high volumes of water need to be sampled to properly characterize health risks, a process that is time consuming, costly, and contributes to analytical variability.

(b) Pathogen presence in receiving waters is typically sporadic because waterborne diseases are usually transient or episodic and not related to a constant contaminant source that can be monitored and predictably controlled.

(c) Human fecal coliforms and other human indicator bacteria correlate with different health risks than are associated with fecal coliforms and other indicator bacteria arising from birds and animals.

Other studies have found that no single indicator can consistently predict illness in water recreational environments and that a suite of regulatory approaches is required for different applications and different geographies.[7]

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[5] See, e.g., Colford, et al., "Recreational Water Contact and Illness in Mission Bay, California," Southern California Coastal Water Research Project and the University of California, Berkeley School of Public Health (2005); Jiang et al., "Human Adenovirus and Coliphages in Urban Runoff-Impacted Coastal Waters of Southern California," Applied Environmental Microbiology, 67:179-184 (2001); Noble et al., "Enteroviruses Detected by Reverse Transcriptase Polymerase Chain Reaction from the Coastal Waters of Santa Monica Bay, California : Correlation to Bacterial Indicator Levels," Hydrobioligia 460:175-184 (2001).

[6] USEPA, "Report of the Experts Scientific Workshop on Critical Research Needs for the Development of New or Revised Recreational Water Quality Criteria," Office of Water, March 26-30, EPA 823-R-07-006 (2007).

[7] Wade et al., "Do U.S. Environmental Protection Agency Water Quality Guidelines for Recreational Water Prevent Gastrointestinal Illness? A Systematic Review and Meta-Analysis. Environmental

The best available scientific evidence shows that no single water quality indicator can sufficiently protect human health, and that specific analyses of particular watersheds are required to develop appropriate protective measures. The proposed TMDL unreasonably relies on only one indicator (fecal coliforms) that has not been demonstrated to correlate with human health risks related to water contact recreation. As discussed more fully below, the proposed TMDL also does not reflect a sufficient characterization of the Pajaro River watershed for purposes of protecting recreational beneficial uses.

3. *Fecal coliforms from birds and animals do not correlate with human health risks, and almost all Pajaro River fecal bacteria are contributed by birds and animals.*

Virtually all studies that have shown a correlation between waterborne human health risks and fecal coliforms were conducted at locations where human sewage was the predominant contamination source.[8] Fecal indicator bacteria and virus concentrations are poorly correlated when human fecal sources (e.g., septic tanks or untreated sewage) are not present or are a minor factor in a watershed.[9] Based on these results, contemporary research has questioned whether it is appropriate to extrapolate water quality objectives from waters subject to human fecal point source contamination to waters in which nonpoint bird and animal fecal coliforms predominate.[10]

The Central Coast Water Board relied on the results of studies conducted for the Watsonville Slough Pathogen TMDL (Central Coast Water Board, 2005) and the Morro Bay Pathogen TMDL (Central Coast Water Board, 2002) to develop the proposed TMDL. The Watsonville Slough TMDL study found that human sources accounted for a maximum of only 2% to 3% of all measured fecal coliforms and that non-human sources accounted for 99% (in dry weather) and 97% (in wet weather) of all measured fecal coliforms. The Morro Bay TMDL indicated that human sources were responsible for between 13% and 19% of the total fecal coliforms, but these results reflect the fact that the Los Osos community adjacent to Morro Bay does not have a centralized wastewater treatment plant and relies on individual septic systems. Human fecal contamination is known to exist in the Morro Bay watershed analyzed in the study. As discussed below, the Pajaro River watershed is not subject to similar forms of human fecal contamination and the Morro Bay results cannot be used to extrapolate conditions in the Pajaro River watershed.

Health Perspectives," 111: 1102-1109 (2003); National Research Council, "Indicators for Waterborne Pathogens," (2004).

[8] See Colford (2007) and Haile, et al., "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," Epidemiology. 10:355-363 (1999).

[9] See e.g., Lipp et al., "Assessment and Impact of Microbial Fecal Pollution and Human Enteric Pathogens in a Coastal Community," Marine Pollution Bulletin 42:286-293 (2001); Calderon et al., "Health Effects of Swimmers and Nonpoint Sources of Contaminated Water," International Journal of Environmental Health Research. 1:21-31 (1991).

[10] Colford (2007); USEPA (2007).

The Central Coast Water Board also completed a study in support of the Soquel Creek Pathogen TMDL (Central Coast Water Board 2007) that was not referenced in the background materials for the proposed TMDL. The Soquel Creek TMDL showed that humans contributed between 4% and 6% of the measured fecal coliforms and that non-human sources constituted the remainder of the measured fecal coliforms. These results are consistent with the findings reported in the Watsonville Slough study.

The extent to which fecal coliforms from human sources occur in the Pajaro River watershed is almost certainly comparable to, if not lower than, the results reported by the Central Coast Regional Board in the Watsonville Slough and Soquel Creek TMDL studies. Unlike Morro Bay, there are no significant sources of untreated (i.e., septic tank) or treated wastewater discharges to surface waters in the Pajaro River watershed. The five primary wastewater treatment facilities in the Pajaro River watershed are summarized below. None discharge directly to surface waters, and the proposed TMDL Project Report concludes that permitted wastewater treatment facilities are not a source of fecal coliform water quality impairment of the Pajaro River.

1. Hollister Domestic Wastewater Treatment Facility (MRR R3-2008-0069) Secondary Treatment with percolation ponds and no permitted discharge to surface water.

2. Sunnyslope County Water District (WDR R3-2004-0065) Pond system with percolation and no permitted discharge to surface water.

3. San Juan Bautista Wastewater Treatment Facility (WDR R3-2003-0087) Pond system with ultraviolet disinfection prior to discharge to drainage channel, about two miles north of where it joins San Juan Creek and the Pajaro River.

4. South County Regional Wastewater Authority – Gilroy/Morgan Hill (WDR R3-2004-0099) Secondary treatment with ponds and percolation plus a portion is tertiary-treated recycled water for crop irrigation.

5. City of Watsonville Wastewater Treatment Facility (WDR R3-2003-0040) Secondary treated wastewater discharged directly to the Pacific Ocean.

The bacteria source identification studies completed by the Central Coast Water Board indicate that the human fecal coliform concentrations are very low in the Pajaro River watershed. Almost all of the measured fecal coliforms in the watershed are generated by birds or animals. Epidemiological data shows that bacterial indicator concentrations do not correlate with human health risks in the absence of significant amounts of human fecal coliforms. The proposed TMDL exclusively utilizes an inappropriate fecal coliform concentration measure that does not reasonably correlate with the protection of recreational beneficial uses.

4. *Insufficient consideration of existing background fecal coliform concentrations.*

Water Code Section 13241 (d) requires that a water quality objective consider

> "[e]nvironmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto."

Section 13241 (c) requires that the proposed objective consider

> "[w]ater quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area."

To comply with these provisions, the proposed TMDL must accurately describe the natural, baseline occurrence of fecal coliforms in the Pajaro River watershed and explain how the proposed regulation can be achieved if background and naturally-occurring conditions would result in exceedances irrespective of fecal coliform concentrations in regulated discharges.

The Project Report focuses on data derived from Waddell Creek, a stream located in Big Basin State Park in the Santa Cruz Mountains. The Project Report suggests that since the Waddell Creek data generally exhibited fecal coliform concentrations from background sources that were below the proposed water quality objective, natural background conditions in the Pajaro River watershed must also be below the proposed objective. Based on this assumption, the Project Report concludes that the proposed TMDL water quality objective can be achieved by controlling fecal coliforms in regulated discharges.

This analysis fails to conform with Water Code requirements for several reasons, including the following:

(a) Average annual rainfall in Big Basin State Park is approximately 48 inches per year, significantly higher than in the Pajaro River watershed. Average annual rainfall is approximately 13 inches per year in Hollister, for example, and 21 inches per year in Gilroy, communities that are located in the Pajaro River watershed. Data from Waddell Creek is not indicative of background conditions in the Pajaro River watershed because the more significant rainfall affecting Waddell Creek substantially dilutes the concentration of fecal coliforms in the creek's stormwater compared with flows in the Pajaro River watershed.

(b) The analysis does not consider the Central Coast Water Board's studies of the Watsonville Slough (Central Coast Water Board, 2005) and Soquel Creek (Central Coast Water Board, 2007) which indicate that naturally occurring fecal coliforms attributed to birds and animals are sufficient to generate exceedances of the proposed fecal coliform TMDL water quality objective.

(c) The analysis is not consistent with several recent studies that have shown that naturally occurring background fecal coliform levels frequently exceed the

proposed TMDL water quality objective in surface water. A study of the Ballona Creek watershed in Los Angeles County, for example, found that fecal indicator bacteria concentrations were as high at the head of the watershed where no human, anthropogenic contributions occurred as at the creek's downstream discharge point after traversing through a heavily urbanized area. Based on this result, the study observed that almost all flows in the watershed, including areas not subject to significant human influence, would require secondary treatment.[11] Median E. coli and Enterococcus concentrations in wet weather flows from natural, non-anthropogenic catchments have also been shown to exceed water quality objectives.[12] These studies indicate that the Waddell Creek data is not representative of background fecal coliform and other bacterial conditions in the Pajaro River watershed.

(d) The analysis does not consider studies demonstrating that water body sediments sustain and breed fecal coliforms that contribute to chronic water quality objective exceedances. Fecal coliforms have been shown to reproduce and compete in warm soils, to be normal members of a microbial community, and to have survival rates lower than certain waterborne pathogens.[13] Sediments can function as reservoirs for E. coli and Enterococcus and can facilitate bacteria growth after discharge in the water column. E. coli concentrations in bottom sediments have been observed at levels 760 times greater than in overlying waters and can be re-suspended after rainstorm events.[14]

The proposed TMDL has not properly considered the existing environmental conditions within the Pajaro River watershed. As a result, the TMDL cannot reasonably ascertain whether it is possible to achieve the water quality objective given naturally occurring fecal coliform levels and sources in the watershed.

5. Unsupported exclusion of agriculture from fecal coliform load allocations.

The Project Report asserts that irrigated agricultural operations are not a source of fecal coliforms that may contribute to exceedances of the water quality objective. As a

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[11] Noble et al., "Multitiered Approach Using Quantitative PCR to Track Sources of Fecal Pollution Affecting Santa Monica Bay, California," Applied Environmental Microbiology 72(2): 1604–1612 (2006).

[12] Stein et al., "Technical Report 500 - Assessment of Water Quality Concentrations and Loads from Natural Landscapes," Southern California Coastal Water Research Project (2007).

[13] See Schroeder, 2002.

[14] See Byappanahalli, M. and Fujioka, R., "Indigenous soil bacteria and low moisture may limit but allow fecal bacteria to multiply and become a minor population in tropical soils," Water and Science Technology 50(1): 27-32 (2004); Desmarais et al., "Influence of Soil on Fecal Indicator Organisms in a Tidally Influenced Subtropical Environment," Appl. Environ. Microbiol. 68: 1165-1172 (2002); Davies et al., "Survival of Fecal Microorganisms in Marine and Freshwater Sediments," Applied Environmental Microbiology; 61:1888-1896 (1995); Stephenson et al., "Bottom Sediment: A Reservoir of Escherichia coli in Rangeland Streams," Journal of Range Management, 35:119-123 (1982).

result, the Project Report assumes that regional farmers and growers will not be required to meet the fecal coliform discharge requirement. The conclusion that agriculture is not a significant source of fecal coliforms, however, is not supported with sufficient evidence, and it is possible that farmers and growers in the Pajaro River watershed will be required to meet the TMDL discharge requirement in the future. The costs and operational constraints potentially associated with TMDL compliance, such as the detention and treatment of potential farmland stormwater to remove fecal coliforms, could severely impact regional agriculture.

The Project Report concedes that the Central Coast Ambient Monitoring Program (CCAMP) and other Central Coast Water Board sampling efforts were not able to identify the relative fecal coliform loads associated with any specific land use, including agriculture. The 2004 TMDL project plan anticipated that a "Region-Wide Bacteria Source Analysis in Irrigated Agricultural Areas" study would be completed to support the proposed TMDL. This study was never completed, and the Project Report appears to utilize at most limited anecdotal information, such as statements from certain farmers that manure was not typically used for fertilizer, to conclude that agriculture would not be regulated under the proposed TMDL.

The Project Report also cites a United States Department of Agriculture (USDA) 2002 census[15] to indicate that approximately 11 of 326 irrigated farms in San Benito County applied manure during irrigated agricultural operations. Assuming this information is accurate; the USDA census does not provide information regarding the location and size of the farms that use manure and that could generate fecal coliforms from fertilizer application. The Project Report conclusions are also contradicted by studies indicating that irrigated agricultural operations can mobilize animal, bird or fertilizer-related fecal coliforms during irrigation, soil management and other activities.[16]

These results suggest that, if implemented, the proposed TMDL could apply to agricultural operations in the Pajaro River watershed in the future. As discussed in this comment letter, the proposed TMDL would not reasonably protect beneficial uses despite the imposition of significant costs on the affected community. The extension of the proposed TMDL to agricultural operations could substantially and adversely affect organic and other high-value crop activities in the region without generating significant public health or other water quality benefits.

6. Insufficient consideration of costs and other potential economic impacts.

The Project Report estimates the costs associated with the proposed TMDL by calculating the average annual household expenses reported for recently-approved federal Clean Water Act (CWA) Phase II Stormwater Management Plans (SWMPs) in the Central Coast region. The reported annual SWMP costs ranged from $21 in Seaside to

[15] United States Department of Agriculture. 2002 Census of Agriculture, California. Volume 1, Geographic Area Series, Part 05, National Agricultural Statistics Service, USDA, Washington, D.C.
[16] Tyrrel et al., "Overland Flow Transport of Pathogens from Agricultural Land Receiving Faecal Wastes. The Society for Applied Microbiology. 94:87S-97S (2003).

$130 in the City of Monterey, and the average cost per household was calculated at $77. To estimate the expenses associated with the proposed TMDL, the average household cost was increased by 2 to 15 percent to reflect additional expenses reported in Marin County for a pathogen reduction program.

This methodology fails to comply with applicable Water Code requirements for several reasons:

(a) The only factor used to estimate the proposed TMDL compliance costs is a "2 to 15 percent" increase in SWMP program expenses that was reportedly experienced in Marin County. This factor was derived from a "personal communication" with sources in Marin County and relates to a pathogen program comprised of "signage, education, and pet waste reduction measures."[17] In contrast, the pathogen-specific recommendations in the proposed TMDL include a significantly greater range of measures, including pet waste and dumpster leachate management, control of bird, rodent, and other wildlife waste, control of pathogen loading from private laterals, public education, and development and implementation of low-impact development principles. There is no evidence that the anecdotal "2 to 15 percent" SWMP program increase reportedly experienced in Marin County is reasonably representative of the potential costs associated with the more extensive measures included in the proposed TMDL.

(2) The assessment appears to ignore significantly higher SWMP compliance costs that have been reported in the Central Coast region. A recent Central Coast Water Board staff report stated that "the annual cost per house [to implement the SWMP] for the Monterey Regional Group ranged from $20 to $655 (Seaside $20, Monterey County $119, City of Monterey $130, Sand City $650)."[18] These values would increase the baseline costs used to analyze proposed TMDL household expenses by approximately 300% to 400%.

(3) There is no evidence that the measures reportedly implemented in Marin County or the more extensive measures identified in the proposed TMDL will achieve the fecal coliform water quality objective. In other jurisdictions, pathogen control objectives have been found to require or to potentially involve the design, construction and long-term operation and management (O&M) of stormwater diversion, storage, and secondary treatment facilities. An economic analysis prepared for the Santa Ana River watershed, for example, showed that stormwater detention and disinfection capital costs (i.e., excluding long-term O&M expenses) could

[17] San Francisco Regional Water Quality Control Board, "Pathogens in the Napa River Watershed Total Maximum Daily Load (TMDL) Staff Report," (August 2006).
[18] Central Coast Water Board, "Staff Report for Regular Meeting of September 7-8, 2006, Item 13" (August 18, 2006).

range from $131 to $3,993 per household.[19] To comply with the Water Code, the proposed TMDL analysis must provide evidence that the proposed control measures will achieve the water quality objective. If such evidence cannot be reasonably provided, then the analysis must identify capital and O&M costs that could be associated with additional measures, such as stormwater capture, treatment, and disinfection or other fecal coliform reduction technologies.

(4) The analysis does not sufficiently consider other factors identified in Section 13241, such as "developing housing within the region" and the need to "develop and use recycled water." Housing can result in the more efficient transmission of animal or bird fecal matter from roads, roofs or other constructed surfaces to receiving waters. Increased recycled water use could mobilize animal or bird wastes that might contribute to water quality objective exceedances. To comply with the Water Code, the proposed TMDL must consider how regional housing and recycled water programs could be affected if additional controls, including runoff detention and treatment facilities, are required to achieve the proposed TMDL's objective.

III. Conclusion

The proposed TMDL uses a fecal coliform measure that is outdated and not recommended by the USEPA as an appropriate water quality indicator for the protection of recreational beneficial uses. Recent studies show that fecal coliform concentrations only associate with human health risks when human fecal matter is present in significant quantities. The best available evidence developed by the Central Coast Water Board demonstrates that human fecal matter is not a significant contributor to surface water pathogen impairment in the Pajaro River watershed. Background fecal coliform concentrations in the Pajaro River watershed have not been properly characterized. Costs associated with achieving the proposed TMDL, including potential impacts to agriculture, housing and recycled water, and the potential need for secondary treatment facilities, have not been sufficiently considered.

As a result, the proposed TMDL cannot be adopted in compliance with applicable Water Code requirements. The proposed TMDL would primarily regulate fecal coliforms that do not correlate with health risks, and it is not possible to conclude that the water quality objective would reasonably protect recreational beneficial uses. The proposed TMDL cannot consider whether the water quality objective can reasonably be achieved In the absence of sufficient information regarding existing and background environmental conditions in the Pajaro River watershed. Potential compliance costs and regional economic impacts have not been sufficiently identified and the reasonableness of these expenses cannot be properly considered. As discussed above, similar concerns in

[19] CDM, "Economic Analysis of Compliance Alternatives," Memorandum to the Stormwater Quality Standards Study Task Force (June 2006).

other jurisdictions generated lengthy litigation that invalidated water quality objectives and substantially disrupted water quality protection programs.

Given these significant legal and technical concerns, we respectfully request that the Central Coast Water Board decline to adopt the proposed TMDL. We recognize that protecting recreational beneficial uses in the Pajaro River watershed is an important objective. We respectfully request that the Water Board consider implementing the following measures in support of this goal:

(a) *Revise the indicators used to protect recreational beneficial uses.* As discussed above, fecal coliforms poorly correlate with and are not recommended for the protection of recreational beneficial uses. Newer, more representative pathogen indicators should be identified for regulated waters and incorporated into the Basin Plan and TMDLs as may be required to protect beneficial uses.

(b) *Incorporate natural, reference watershed information in the water quality objective.* Due to the technical concerns described in this comment letter, other jurisdictions, including the Los Angeles Water Board, Ventura County and San Diego County, have developed pathogen water quality objectives that incorporate an allowable number of exceedances based on an appropriate, natural reference watershed rather than a single maximum concentration.[20] This approach more defensibly and reasonably accounts for natural conditions and more effectively focuses regulatory attention on controllable anthropogenic sources.

(c) *Characterize existing conditions and sources in the Pajaro River watershed.* As discussed above, a more comprehensive analysis of the sources of bacteria and pathogens in the Pajaro River watershed is required to assess: (i) the extent of human health risks related to recreational beneficial uses; (ii) the most appropriate water quality objective indicators that would reasonably protect these beneficial uses; and (iii) the relative contribution of the appropriate water quality objective indicators attributable to various land uses within the watershed. This approach has been implemented in other jurisdictions[21] and would generate information that facilitates a more comprehensive understanding of the source contributions and assimilative capacity of the Pajaro River watershed. In turn, regulatory controls can be more reasonably and effectively focused on the sources that are determined to generate the most significant water quality impacts to recreational beneficial uses.

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[20] Los Angeles Regional Water Quality Control Board, "Harbor Beaches of Ventura County (Kiddies Beach and Hobie Beach) Bacteria Total Maximum Daily Load," (October 12, 2007); San Diego Regional Water Quality Control Board, "Total Maximum Daily Loads for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region - Final Technical Report," (December 12, 2007).

[21] Los Angeles Regional Water Quality Control Board ((October 12, 2007); San Diego Regional Water Quality Control Board (December 12, 2007).

(d) *Analyze potential seasonal variations affecting the water quality objective.* Pajaro River water quality data should be further analyzed to determine whether seasonal water quality objectives are more appropriate than a single criterion that applies in all conditions. Pathogen TMDLs developed in the Los Angeles and San Diego regions, for example, incorporate measures for wet and dry weather conditions.[22] This approach can provide a more defensible and reasonable method for protecting recreational beneficial uses.

(e) *Comprehensively consider potential costs and economic impacts.* As discussed above, the proposed TMDL cannot comply with Water Code requirements until potential compliance costs and economic impacts are properly characterized and the reasonableness of these expenses is explicitly considered. The analysis should obtain studies and information from other jurisdictions, such as Los Angeles City or Encinitas, that have comprehensively analyzed the potential costs associated with pathogen TMDL compliance.[23]

(f) *Revise the Basin Plan and reconsider TMDL development.* The information developed in the preceding sections should be utilized to revise the Basin Plan and applicable TMDLs as required to address recreational beneficial uses in the Pajaro River and other regulated watersheds. This process can be conducted in conjunction with the regular triennial review of the Basin Plan and would be consistent with court mandates in other jurisdictions regarding regulations that do not comply with applicable Water Code requirements.[24]

Please do not hesitate to contact me at 831-682-0734 should you have any questions regarding this comment letter.

Very truly yours,

Darlene Din

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[22] [22]Los Angeles Regional Water Quality Control Board ((October 12, 2007); San Diego Regional Water Quality Control Board (December 12, 2007).

[23] City of Encinitas, "Moonlight Beach Urban Runoff Treatment Facility Final Report." City of Encinitas Clean Water Program, (February 2006); City of Los Angeles Stormwater Program, "Bacteria TMDLs," http://www.lastormwater.org/Siteorg/program/TMDLs/bacteria.htm (Accessed January 2009).

[24] In the *Arcadia* litigation (see footnote 1, above) the court's initial ruling was interpreted to preclude any new enrollment in or enforcement of stormwater programs by the Los Angeles Water Board. The court subsequently modified the ruling to allow for interim enforcement of the invalidated regulations until the Water Board could complete the required Water Code analysis and review in conjunction with the next triennial review of the Basin Plan (see, e.g., Office of the Chief Counsel, State Water Resources Control Board, Memorandum of July 26, 2008 and Memorandum of August 1, 2008).