



CITY OF STOCKTON

DEPARTMENT OF MUNICIPAL UTILITIES

2500 Navy Drive • Stockton, CA 95206-1191 • 209/937-8750 • Fax 209/937-8708
www.stocktongov.com

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Amanda Montgomery
Senior Environmental Scientist
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670

PUBLIC REVIEW DRAFT OF PATHOGEN TMDL FOR STOCKTON URBAN WATERWAYS

The City of Stockton appreciates the opportunity to work with the Central Valley Water Board in the development of the pathogen TMDL. We recognize the effort put forth by the Water Board to address the comments submitted for the Administrative Draft, and value the chance to provide further comments on the Public Review Staff Report and Draft TMDL. Our comment letter is organized to provide general comments followed by comments pertaining to specific points.

General Comments:

- 1. We suggest that the term “pathogen indicator bacteria” or “indicator bacteria” be substituted for “pathogen” in the Staff Report and TMDL.** Throughout the resolution and report, “pathogen” is often used interchangeably with “indicator bacteria.” A more careful distinction should be made between the two, as the TMDL is intended for indicator bacteria, and actual pathogens have not traditionally been measured during water sampling. Fecal indicator bacteria are not pathogens, but rather serve as surrogates for assessing health risks for human contact with water. The key studies which determined that fecal indicator bacteria were correlated with human health risks were performed during the early 1980s by the EPA, and more recent studies have shown a weak link between indicator bacteria and health risks in some waterbodies¹. Since pathogens and indicator bacteria have not previously been studied together in Stockton waterbodies, it is not appropriate to use the wording “pathogen” in the TMDL when indicator bacteria are actually measured. Specific instances include:
 - Resolution, Whereas statement 1
 - Resolution, Resolved statement 1
 - Staff Report, Executive summary (p. iii), and “TMDL Loading Capacity” (p. iv)
 - Staff Report, Problem statement (p. 5)
- 2. The wording in the Staff Report and TMDL should reflect the limitations of the microbial source tracking component of the Pathogen Plan to identify pathogen**

¹ Colford *et. al.* 2007. *Epidemiology* 18: 27-35.

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sources. The "Implementation" section of the Staff Report (p. iv) states that "By the end of the Pathogen Plan, all pathogen sources should be identified and BMPs should be in place to solve the impairment." The microbial source tracking method utilized (PCR-based detection of host-specific *Bacteroidales* DNA sequences) allows detection of total, human, dog, and cow/horse –specific bacteria, which should give an indication of the relative contribution from those specific animal hosts to the fecal bacteria load. However, this source tracking technology is relatively new and is rapidly evolving. Currently, only host sources with existing detection assays can be identified, and it is unlikely that "all pathogen sources" can be determined.

3. **The implementation plan should specify an iterative framework for evaluating the TMDL throughout the Pathogen Plan.** This comment is similar to comment #3 which we previously submitted on the administrative draft. We recognize that the comment was taken into consideration, as seen in the sentences at the end of "Implementation," and on p. 28 addressing additional controls and monitoring which can be undertaken upon completion of the Pathogen Plan by either the City of Stockton or the Central Valley Water Board.

However, those additional sentences do not adequately address our concerns about incorporating an adaptive implementation plan into the TMDL. Both the draft resolution and TMDL indicate that at the efficacy of the Pathogen Plan will be evaluated upon its completion. It is not clear whether the Central Valley Water Board intends to evaluate the TMDL based on results of the Pathogen Plan after the completion of each phase, or at the end of the entire plan. We suggest that the Staff Report and TMDL clarify the approach for evaluating the TMDL.

Specifically, we would like to see a more detailed timeline for evaluation incorporated into the TMDL, along with a detailed strategy for implementing alternative control measures should the Pathogen Plan not resolve water quality impairments. We recognize that this TMDL encompasses a more limited scope than that of a recent bacteria TMDL implemented in the Napa River; however, the Stockton pathogen TMDL could still implement a similar review process to evaluate its progress. The following issues should be addressed:

- Provide a timeline for evaluation. For example, the TMDL could be evaluated every 5 years, or at the end of each phase of the Pathogen Plan.
- Provide specific questions that will be addressed during evaluation of the TMDL, such as those developed in the adaptive implementation strategy for the Napa River bacteria TMDL.
- Investigate whether it might be appropriate for the TMDL to include an allowable number of exceedances based on background levels of bacteria present in un-impacted waterbodies. The Santa Monica Bay Beaches bacteria TMDL incorporated this approach.
- Provide a framework for reevaluating and adapting the TMDL based on findings from periodic review.

Specific comments:

1. **The modified Pathogen Work Plan schedule is not addressed in the report.** Subsequent to the April 2004 Work Plan, the City of Stockton requested that the

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schedule be modified to include more time for BMP implementation. The revised schedule requested the end date for Phase I to be extended to June, 2012, and the final end date revised to June, 2018. The "Source and Linkage Analysis" section (p. 23) refers to the original end dates of 2007 for Phase I and 2013 for Phase III. More recently the City received a 13267 letter from the Regional Board (dated 11/14/07) which requires the City to update the April 2004 Work Plan (including the 8/18/04 amendment). The revised Pathogen Plan is due to the Regional Board by June 6, 2008. It is the City's intent to request at that time an extended schedule for the completion of the Pathogen Plan.

2. **Identification of pathogen sources is still underway for Smith Canal and Mormon Slough.** The Staff Report states that "specific pathogen sources for . . . were identified;" however, phase I is still underway and while microbial source tracking is partially completed, the specific contributors to the total fecal bacterial load have not yet been determined.
3. **There is a potential for re-growth of indicator bacteria in the environment.** The "Margin of Safety" section (p. 27) states that pathogens cannot survive for long periods of time outside of the host body, and are thus expected to decrease in concentrations as they move away from the source. However, the indicator bacteria which are the basis for the TMDL do not necessarily exhibit the same survival characteristics as the pathogens they are supposed to represent. Recent studies have shown that *E. coli* and other bacteria with fecal origin can survive, grow, and establish populations in natural environments such as streams, and that their survival does not necessarily correlate with that of pathogens.² Because of this potential for re-growth, it would be appropriate to consider a TMDL similar to the Santa Monica Bay beaches bacteria TMDL, which takes into account background levels of indicator bacteria, and accordingly allows for a certain number of exceedances.

In closing, the City of Stockton appreciates the opportunity to provide comments on the Public Review Draft and looks forward to a positive collaboration in addressing the problem of elevated indicator bacteria in Stockton urban waterbodies.



MARK J. MADISON
DIRECTOR OF MUNICIPAL UTILITIES

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² Field and Samadpour. 2007. Water Research 41: 3517-3538.