Comment Response Document
Regarding the Total Maximum Daily Loads of Fecal Coliform for Restricted Shellfish Harvesting Areas in Magothy River, Tar Cove, and Forked Creek and a Water Quality Analysis of Fecal Coliform for Deep Creek for Restricted Shellfish Harvesting Areas in the Magothy River Basin in Anne Arundel County, Maryland

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads of Fecal Coliform for Restricted Shellfish Harvesting Areas in Magothy River, Tar Cove, and Forked Creek and a Water Quality Analysis of Fecal Coliform for Deep Creek for Restricted Shellfish Harvesting Areas in the Magothy River Basin. The public comment period was open from May 12, 2005 through June 28, 2005. MDE received two sets of comments during the comment period.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
Ted Connell	Magothy River Association	June 27, 2005	1
Mary Searing	Anne Arundel County Office of Environmental and Cultural Resources	June 29, 2005	2 through 11

1. The commentor states that his association has reviewed the document and has no comments at this time. In addition, the commentor states that the Magothy River Association strongly supports the work of MDE in this area and would like to receive any reports or other information as the work continues.

   Response: MDE thanks the Magothy River Association for their support. MDE will be sure to contact the Association should any additional information become available for this basin.

2. The commentor asked when the Bacteria Source Tracking data will be available and requested that MDE share the information when it becomes available.

   Response: MDE will share the BST results when they become available. The BST schedule is indicated in the following table:

Watershed	Station	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006	2006 - 2007	2007 - 2008	2008 - 2009	2009 - 2010
Patuxent River lower	26		MON	BST					
Potomac River L tidal	4			MON	BST				
St. Mary's River	7			MON	BST				
Breton Bay	2			MON	BST				
St. Clement Bay	6			MON	BST				
Wicomico River	2			MON	BST				
Honga River	1					MON	BST		
Little Choptank	1					MON	BST		
Lower Choptank	16					MON	BST		
Eastern Bay	2					MON	BST		
Miles River	3					MON	BST		
Wye River	7	BST							
Lower Chester River	1				MON	BST			
Corsica River	1				MON	BST			
Isle of Wight Bay	1				MON	BST			
Lower Pocomoke River	7				MON	BST			
Tangier Sound	2				MON	BST			
Manokin River	3				MON	BST			
Lower Wicomico River	5	MON	BST						
Monie Bay	1						MON	BST	
Nanticoke River	7	MON	BST						
Magothy River	10						MON	BST	
Severn River	9						MON	BST	
South River	11						MON	BST	
West River	4						MON	BST	
West Chesapeake Bay	2						MON	BST	
26	141								

Notes:

MON	= Monitoring year (Nov - Oct)
BST	= BST ARA anaysis results due (March)
STO	= Isolates stored for future analysis

3. The commentor states that the County is currently developing a Countywide land use coverage and that the information will be available in late summer. At that time, the commentor states that the County will compare the land use distribution from the draft report for the subject areas with the newly developed land use coverage.

   Response: MDE has requested that Anne Arundel County share the most updated land use information for the County with MDE when it is available. TMDL development of three restricted shellfish harvesting areas in Severn River basin will begin in October 2005 and MDE will use the most updated land use information for the TMDL development.

4. The commentor asks if sensitivity analysis was performed for the steady state tidal prism. The commentor states that the draft report indicates that the most sensitive parameter in the analysis is the decay rate and uses the conservative value of 0.7 from the range of 0.7 and 3.0 per day in salt water from literature sources. The commentor further asks if the decay rate values between 0.7 and 3.0 were tested to determine what value of the decay rate provides for water quality attainment. The commentor states that the County would be interested in knowing this value.

Response: A sensitivity analysis was conducted during development of the tidal prism methodology applied to the shellfish harvesting areas TMDLs (not for this specific area). The sensitivity analysis was performed by adjusting tidal prism model parameters (return ratio, boundary condition, decay rate, freshwater input and tidal range) by 20% and then calculating the corresponding change in estimated load and reduction. This analysis indicated that the decay rate was the most sensitive parameter for estimating the load. An environmentally conservative decay rate is used in the model thereby estimating a conservative TMDL. A value of 0.7 per day is on the lower end of the reported literature range for fecal coliform decay and estuary systems. Using this smaller value will allow for less bacteria loss in the system, thus estimating a lower watershed load that would meet water quality criteria. Due to the model framework (inverse solution), adjustment in the decay factor would not allow for attainment in water quality standards since the same decay rate is used in both the baseline and TMDL scenario. (Inverse solution is defined as assigning the required water quality criterion and estimating the upstream load).

5. The commentor states that in Appendix A on page A3, the parameter of Qf as 0.69 cfs should be 873.1 (m^3/T). The commentor explains that the 3 and 7 are mistakenly inverted but the calculations are correct and the value of Qf is correct.

   Response: The number has been corrected.

6. The commentor states that on page 31 of the report, it is stated that a decay rate of 0.7 per day in salt water was used as a conservative estimate in the TMDL calculation. The commentor asks if the decay rate is for fecal coliform. The commentor states that if this is true then why in the case studies on pages A4 and A5 is a fecal coliform removal rate (k) of 0.36/T used. The commentors ask that the rates used in the calculations in the appendix and text be clarified.

   Response: Yes, the decay rate is for fecal coliform. The value of 0.36/T is per tidal cycle, which is 12.42hrs based on the lunar semi-diurnal (M_2) tide.

7. The commentors ask that the values of C and C_0 be clarified. The commentor states, that in the example on pages A4 and A5, the parameters C and C_0 have the same value as each other. The commentor further states that the definition on page A1, C is defined as fecal coliform concentration in the embayment and C_0 is defined as the fecal coliform concentration from outside the embayment.

   Response: When monitoring stations are not available directly outside the restricted shellfish area boundary, the boundary condition concentration is assigned the same value as the embayment concentration. This same procedure is applied when estimating both the current (baseline) load and the TMDL. This assumption is environmentally conservative for the TMDL since the transport from the embayment would typically dilute the embayment concentration.

8. The commentor states that Appendix C lists the data sources used in the assessment. The commentor states that Anne Arundel County is continuing to refine its existing databases and to develop new datasets. The commentor requests that MDE contacts the County for data that might be applicable to this TMDL as well as other State assessments or analyses.

   Response: MDE will contact Anne Arundel County for more information on the interested areas.

9. The commentor states that the TMDL does not account for source contribution from recreational vessels. The commentor asks if the State investigated other jurisdictions across the country to determine how this potential contribution has been addressed elsewhere. The commentor believes that it is not sufficient to state that the document will not attempt to quantify that source when other sources have largely been estimated themselves. The commentor further states that if the State has investigated this source then the document should provide examples of what documents were used to make the assumption to disquantify that source. The commentor states that she has briefly checked the Internet and have found that other jurisdictions considered this parameter and include it as part of the wasteload allocation.

   Response: The State considered methods to include sources from recreation activity but decided the information required for the analysis was limited and the calculation would be very uncertain. Recall from the report that the source analysis methodology presented in this document is to provide a relative ranking of probable sources in the watershed, assuming all sources are contributing.

   It is expected that the BST results will provide a more accurate estimate of bacteria sources within the embayment.

10. The commentor asks, "In calculating the septic loads as potential sources, was distance from the nearest stream investigated?" The commentor further states that areas on septic that are outside of 200 feet of a nearest waterbody may not be contributing to the wasteload.

    Response: Distance to the embayment was not considered in the calculation. Septic loads were estimated by first, determining the number of households on septics in the watershed (MDP data); second, estimating the percentage of septic systems that fail (based on MDE Shoreline Survey data); and third, assigning a daily load for each septic system.

    As previously stated, the report that the source analysis methodology presented in this document is to provide a relative ranking of probable sources in the watershed, assuming all sources are contributing. It is expected that the BST results will provide a more accurate estimate of bacteria sources within the embayment. The advantage of the BST results is that the uncertainty associated with modeling transport paths and kinetics will be removed because the source is estimated from the water sample.

11. The commentor asks, "Have best management practices (BMPs), such as stormwater management ponds, been taken into consideration to determine wasteloads?" The commentor

continues that BMPs such as stormwater detention ponds may allow for microbial processes to occur, thus reducing the potential wasteload from surface runoff such as might be evidenced through pet contributions.

Response: The TMDL load is an estimate of the assimilative capacity of the system based on the water quality standard. This load is calculated independently of BMP practices. The current load is based on the most recent five-year period of water quality data. Given the five-year time period, this should reduce the likelihood of including long term changes associated with watershed improvements and therefore account for the current watershed condition.

Studies from EPA[1] suggest that structural BMP effectiveness on reducing bacteria loads is highly variable. Implementation planning should consider the source estimates within the TMDL and appropriate BMPs to meet the estimated reduction required.

1. USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA-821-R-99-012. U.S. Environmental Protection Agency, Washington, DC.