



Missouri
Department of
Natural Resources

Draft Total Maximum Daily Load (TMDL)
SUMMARY OF COMMENTS AND RESPONSES

Creve Coeur Creek
WBID # 1703

St. Louis County, Mo.

Public Notice
June 22 – Aug. 6, 2012

Missouri Department of Natural Resources
Water Protection Program
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INTRODUCTION

U.S. Environmental Protection Agency (EPA) regulations require that total maximum daily loads (TMDLs) be subject to public review (40 CFR 130.7). The Missouri Department of Natural Resources placed the draft Creve Coeur Creek bacteria TMDL on a 45-day public notice and comment period from June 22, 2012 to Aug. 6, 2012. All original comments received during the Creve Coeur Creek public notice period are available online on the Department's website at dnr.mo.gov/env/wpp/tmdl/1703-creve-coeur-ck-record.htm. Comments were received from the following groups or individuals:

City of Bridgeton
City of Chesterfield
City of Florissant
City of Hazelwood
City of Independence
City of Springfield
City of Woodson Terrace
Home Builders Association of St. Louis & Eastern Missouri
Metropolitan St. Louis Sewer District
St. Louis County Office of the County Executive

This document summarizes and paraphrases the comments received, provides the department's responses to those comments, and notes any changes made to the final TMDL resulting from comments. The final TMDL document incorporates suggested edits and language changes provided as public comments where such comments provide additional clarification or correct inaccurate statements or incorrect information. Suggested changes to the document that conflict with Missouri's water quality standards, department style guidelines, or elements required for EPA approval were not incorporated. The implementation section and corresponding elements, such as load reduction calculations, were removed from the final TMDL and this information was used in developing the Creve Coeur Creek Bacteria TMDL Implementation Plan to better facilitate citizen involvement and water quality improvement. The Creve Coeur Creek Bacteria TMDL Implementation Plan is available on the department's website at <http://dnr.mo.gov/env/wpp/tmdl/1703-creve-coeur-ck-record.htm>.

RESPONSE TO COMMENTS

(Public comments in bold)

1. Comment: **The Department should delay finalizing St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed.**

A similar comment: **I strongly recommend that more stakeholders be involved in a process that involves more rigorous scientific methods and meaningful public input.**

A similar comment: **Provide a 14-day comment period to the permittee before any permit is issued, including TMDLs.**

A similar comment: **The potential cost, technical complexity, and stakeholder interest in the TMDL warrants additional public participation.**

1. Response: The department welcomes and appreciates stakeholder interest in the TMDL process and water quality issues related to Creve Coeur Creek. The draft Creve Coeur Creek TMDL was public noticed for 45-days from June 22, 2012 through Aug. 6, 2012 during which time the public could submit comments on the draft document. Potentially affected permit holders as well as other stakeholders were directly notified of the public comment period and the availability of the draft TMDL document. As stated in Section 14 of the TMDL, groups that directly received the public notice announcement were the Missouri Clean Water Commission, the Missouri Water Quality Coordinating Committee, the Missouri Department of Conservation, the St. Louis County Soil and Water Conservation District, the Metropolitan St. Louis Sewer District and its MS4 co-permittees, the St. Louis County Department of Health, St. Louis County Public Works, the St. Louis County council, the University of Missouri Extension, the Missouri Coalition for the Environment, 182 Stream Team volunteers living in or near the watershed, any affected permitted entities, and the nine state legislators representing areas within the watershed. The department also posted the notice, the water body TMDL information sheets and the draft TMDL document on the department's website, making them available to anyone with access to the Internet. Announcement of the public comment period for this TMDL was also issued as a press release. In addition to the 45-day public notice and comment period, the department also hosted a public meeting in St. Louis County on Sept. 12, 2012, at the Daniel Boone Branch of the St. Louis County Library. At the meeting, the draft Creve Coeur Creek TMDL and five other draft TMDLs for bacteria impaired streams in St. Louis County were discussed. Following revisions to the TMDL document, a second public comment period for the draft Creve Coeur Creek TMDL along with a new draft implementation plan is scheduled for 90 days, from May 23, 2014 to Aug. 21, 2014.

Regarding discharge permits issued by the department to meet the requirements of the federal National Pollutant Discharge Elimination System (NPDES), the department currently provides permittees a 15-day review of draft permits prior to public notice. Following this 15-day review, draft permits are placed on public notice for 30 days for additional public comment. At this time, the department has no plans to deviate from this current practice.

2. Comment: **The TMDL approach does not adequately distinguish between bacteria sources within the watershed.**

A similar comment: **The analysis of causes should meet rigorous scientific standards.**

A similar comment: **The proposed solutions should address the sources.**

A similar comment: **The MS4s in the study have omitted MoDOT.**

A similar comment: **The TMDL does not adequately consider all sources of bacteria that may be impacting whole body contact recreation category B attainment in Creve Coeur creek.**

A similar comment: **More detailed, local information must be analyzed and used in assessing bacteria sources.**

A similar comment: **The Missouri Department of Transportation MS4 permit should be incorporated into the TMDL as a point source and must be included in the wasteload allocation.**

A similar comment: **It is arbitrary and unrealistic to assign permit holders a wasteload allocation equal to zero.**

A similar comment: **The wasteload allocation included in the TMDL is inaccurate given the technical defects with the load duration curve approach.**

2. Response: All potential sources contributing to the impairment are considered in the Creve Coeur Creek TMDL. Section 3 of the TMDL contains a detailed source inventory for point and nonpoint sources. Wasteload allocations for point sources can be found in Section 7 of the TMDL and load allocations for nonpoint sources can be found in Section 8. Although the Missouri Department of Transportation (MoDOT) MS4 area was not explicitly identified in the draft TMDL placed on public notice, the allowable point source loading remains entirely allocated to the MS4 wasteload allocation as presented in Table 7 of the TMDL. Section 3.1.3 and Table 5 of the TMDL have been amended to include the MoDOT MS4 permit. Because there are differences in the sources of bacteria originating from highway systems as opposed to urban residential areas or urban green spaces, the department does not have sufficient data to adequately disaggregate the MS4 wasteload allocation among the various permitted entities. If future monitoring data identifies specific source loading, the MS4 wasteload allocation may be disaggregated and distributed accordingly among the various MS4 sources. As stated in the TMDL regarding the other facilities listed in Table 5, the department assumes activities in the watershed will be conducted in compliance with all permit conditions, including monitoring and discharge limitations. For this reason, it is expected that compliance with these permits will result in bacterial loading at or below applicable targets. These facilities are not expected to cause or contribute to the bacteria impairment of Creve Coeur Creek and are therefore assigned a wasteload allocation of zero. If at any time the department determines that the water quality of streams in the watershed is not being adequately protected, then the department, per 10 CSR 20-

6.010(13)(C), may require the owner or operator of the permitted site to obtain a site-specific operating permit. This assumption and methodology is consistent with the approach applied in other TMDLs developed by the department and approved by EPA.

3. Comment: **The final TMDL must not include requirements that exceed the “maximum extent practicable” provision within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the phase II stormwater regulations.**

A similar comment: **The TMDL could result in stormwater management requirements that go beyond those already adopted for compliance with the MS4 permit and the federal consent decree.**

A similar comment: **The reference to MS4 stormwater management plans should be revised to state that these plans are to be developed to “reduce the discharge of pollutants from the MS4 system to the maximum extent practicable.”**

3. Response: The Clean Water Act provides that stormwater permits for MS4 discharges shall contain controls to reduce the discharge of pollutants to the “maximum extent practicable... and such other provisions as the Administrator or the State determines appropriate for control of such pollutants” (33 U.S.C. § 1342(p)(3)(B)(iii)). While the Creve Coeur Creek TMDL calculates a wasteload allocation for point source bacteria loading, the TMDL does not specify permitting requirements or effluent limits to achieve this load, nor does the TMDL require any specific implementation activities or best management practices (BMPs). BMPs and other pollution abatement activities completed as required by the consent decree established as part of the *United States of America and the State of Missouri, and Missouri Coalition for the Environment Foundation v. Metropolitan St. Louis Sewer District*, No. 4:07-CV-1120, and those completed to comply with an accepted stormwater management plan or the six minimum control measures of MS4 permits are consistent with the types of practices needed to implement this TMDL towards achieving wasteload allocation targets. Continued monitoring and assessment of Creve Coeur Creek will determine compliance with state water quality standards and the need for additional implementation activities. Voluntary BMP implementation by watershed groups or private citizens will also help achieve TMDL loading targets. Should you have questions regarding the determination of permit requirements, please contact Mr. Chris Wieberg, Chief, Operating Permit Section, at 573-526-5781 or via e-mail at chris.wieberg@dnr.mo.gov.

4. Comment: **The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.**

A similar comment: **The TMDL should include a phased or adaptive management component for implementation and future revisions due to the uncertainties and complexities with this study.**

A similar comment: **The TMDL should be re-written to be a phased TMDL that includes revision of the water quality target(s), collection of additional data and information, and adjustments to the wasteload and load allocations.**

4. Response: TMDLs are required to meet water quality standards (40 CFR 130.7(c)(1)), and this is done absent of cost considerations. However, all Missouri TMDLs are phased TMDLs and use an adaptive implementation approach that provides for an iterative process that makes progress toward achieving water quality goals, while using any new data and information to reduce uncertainty and adjust implementation activities. As noted in the response to Comment 3, the Creve Coeur Creek TMDL does not require any specific implementation activities or BMPs. This provides flexibility in how and where pollutant management is accomplished. The department expects implementation practices to occur over a period of time, but also within schedules identified in stormwater management plans, state operating permits, or as specified in the Metropolitan St. Louis Sewer District's consent decree. A Creve Coeur Creek bacteria TMDL implementation plan has been developed to help guide implementation activities and facilitate the adaptive implementation approach.

5. Comment: **The costs should largely be the responsibility of those who create the mandates with the exception of flagrant violations.**

A similar comment: **MS4s should be ranked in order of importance, as should non-MS4 sources so the public funds can be appropriately aimed at the likely sources.**

A similar comment: **Maximize grant funding to assist with TMDL implementation.**

5. Response: A variety of grants and loans may be available to assist watershed stakeholders with developing and implementing watershed plans, controls and practices to meet the required wasteload and load allocations in the TMDL. The Creve Coeur Creek bacteria TMDL implementation plan provides additional information for potential funding opportunities. For potential funding opportunities through the Missouri Department of Natural Resources, please visit the Wastewater Financial Assistance website at dnr.mo.gov/env/wpp/srf/wastewater-assistance.htm or the Section 319 Nonpoint Source Implementation Program website at dnr.mo.gov/env/wpp/nps/index.html.

6. Comment: **It is premature to suggest remedies to bacteria without considering the elimination of sanitary sewer overflows (SSOs).**

A similar comment: **The water quality improvements and load reduction by the District's upcoming elimination of constructed SSOs and other sanitary sewer improvements must be taken into account.**

A similar comment: **TMDL implementation should allow sanitary sewer improvements to proceed prior to other restoration activities.**

A similar comment: **The timing and necessity for TMDL issuance and implementation should take into account federal consent decree obligations and resource allocations.**

6. Response: The department recognizes and appreciates the work that has been done and that is being planned to improve water quality in the Metropolitan St. Louis Sewer District's service area. The TMDL references the district's consent decree and MS4 permitting requirements as evidence that improvements and management strategies consistent with those needed to implement the TMDL are being considered and conducted. These improvements and existing regulations will operate in concert with TMDL implementation and will be described in more detail in the Creve Coeur Creek Bacteria TMDL Implementation Plan.

7. Comment: **It is my understanding that this TMDL and other TMDLs are being issued without prior knowledge of the permittee. I don't believe this serves either the department or the permittee at all.**

7. Response: As noted in sections 3.1.1 and 3.2.3 of the Creve Coeur Creek TMDL, the department was in communication with St. Louis County and the Metropolitan St. Louis Sewer District during the development of this TMDL and included information provided by these entities in the TMDL document. Additionally, EPA regulations require that all TMDLs be subject to public review (40 CFR 130.7). For this draft TMDL, a 45-day public notice and comment period was held from June 22, 2012 through Aug. 6, 2012. Potentially affected permit holders as well as other stakeholders were notified of the public comment period and the availability of the draft TMDL document. As stated in Section 14 of the TMDL, groups that directly received the public notice announcement were the Missouri Clean Water Commission, the Missouri Water Quality Coordinating Committee, the Missouri Department of Conservation, the St. Louis County Soil and Water Conservation District, the Metropolitan St. Louis Sewer District and its MS4 co-permittees, the St. Louis County Department of Health, St. Louis County Public Works, the St. Louis County council, the University of Missouri Extension, the Missouri Coalition for the Environment, 182 Stream Team volunteers living in or near the watershed, any affected permitted entities, and the nine state legislators representing areas within the watershed. The department also posted the notice, the water body TMDL information sheets and the draft TMDL document on the department website, making them available to anyone with access to the Internet. Announcement of the public comment period for this TMDL was also issued as a press release. Finally, the department hosted a public meeting in St. Louis County on Sept. 12, 2012, at the Daniel Boone Branch of the St. Louis County Library. At the meeting, the draft Creve Coeur Creek TMDL and five other draft TMDLs for bacteria impaired streams in St. Louis County were discussed. Stakeholders interested in the TMDL process are encouraged to subscribe to the department's TMDL email update service available by clicking the red envelope located on the TMDL webpage at <http://dnr.mo.gov/env/wpp/tmdl/index.html>.

In addition to the previously mentioned notifications, the TMDL webpage provides additional information pertaining to the scheduling of future TMDLs. Section 303(d) of the federal Clean Water Act and Chapter 40 of the Code of Federal Regulations Part 130 require states to develop TMDLs for waters not meeting designated beneficial uses. These waters for which TMDLs must be developed can be found on the state's current 303(d) List of impaired waters, which is

available online at dnr.mo.gov/env/wpp/waterquality/303d.htm. Schedules for TMDL development of these waters are maintained online at dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm. Should you have any questions regarding the TMDL development schedule, please contact John Hoke, Chief, Watershed Protection Section at 573-526-1446 or john.hoke@dnr.mo.gov.

8. Comment: The TMDL components are inconsistent with Missouri’s recreational use water quality criterion.

A similar comment: **The modeling approach and loading capacity calculated for Creve Coeur Creek is inconsistent with Missouri’s recreational water quality criteria and TMDL guidance developed by the EPA.**

8. Response: For the Creve Coeur Creek TMDL, the load duration curve approach was used. The load duration curve method allows for characterizing water quality concentrations (or water quality data) at different flow regimes and estimating load allocations and wasteload allocations for an impaired segment. The target concentration used to develop the load duration curve was the state’s recreation season geometric mean criterion of 206 *E. coli* counts / 100 mL of water, which was applied as a daily target and is consistent with the Anacostia Ruling (*Friends of the Earth, Inc., et al. v. EPA*, No 05-5010, April 25, 2006) and EPA guidance in response to this ruling. Missouri’s bacteria criteria for whole body contact recreation are applicable only during the defined recreational season. The recreational season is defined as being from April 1 to Oct. 31. Clarifying language was added to Section 10 of the TMDL to indicate that this is the period the TMDL addresses.

9. Comment: The TMDL land use and watershed information must be supplemented with more accurate, local data. This comment was supplemented with a parcel map of the watershed showing sewer and nonsewered areas.

9. Response: The department appreciates the additional data and recognizes the usefulness of this information in regards to implementation of the TMDL. The land use data included in the TMDL provides a general description of watershed conditions in order to characterize the watershed’s land use characteristics. The TMDL loading capacity, as well as wasteload and load allocations calculated in the TMDL, were derived independently of land use data and no additional land use data is needed at this time. However, as previously mentioned, more accurate and localized data will be useful in identifying critical areas and targeting implementation activities. Section 3.2.3 of the TMDL has therefore been expanded to include additional discussion of sewer and nonsewered areas within the Creve Coeur Creek watershed. No changes to the calculated loading capacity or wasteload and load allocations occurred as a result of this revision.

10. Comment: **Recreational season datasets that are skewed, predominantly composed of wet-weather samples, or are greater than seven years old are not representative and therefore should not be used to calculate TMDL components.**

A similar comment: **Discrete bacteria samples are not representative of daily average *E. coli* loads in the Creve Coeur Creek watershed.**

10. Response: Calculations of loading capacity were based strictly on the applicable whole body contact recreation category B criterion concentration and calculated stream flow occurrence frequency values. Observed bacteria measurements were used solely for estimating current bacteria loading from the various sources within the watershed and to estimate reductions to aid in targeting implementation activities to meet TMDL goals. Observed bacteria data were not used for calculating overall loading capacity or wasteload and load allocations. As previously noted, information pertaining to estimates of existing loads and load reductions to Creve Coeur Creek have been removed from the final TMDL and can be found in the Creve Coeur Creek bacteria TMDL implementation plan. To reduce uncertainty that the available data is representative of current conditions, only the last five years of available bacteria data were used to calculate existing loads in the implementation plan.

11. Comment: **The flow adjustment approach over-estimates current bacteria loads within the classified segment of Creve Coeur Creek.**

11. Response: The flow adjustment approach used in the Creve Couer Creek TMDL to develop the load duration curve is based on an area ratio calculated from the drainage area of a stream gage located on Creve Coeur Creek (22 square miles) and the drainage area of the entire watershed (27.65 square miles). Because the stream gage is located within the same watershed as Creve Coeur Creek as well as on the stream itself, the assumptions associated with this approach, such as similarity of land use, rainfall, and soil characteristics are reasonable. This estimation technique is an established methodology for TMDL load duration curve development and is supported by EPA guidance. As previously noted, information pertaining to estimates of existing loads and load reduction to Creve Coeur Creek have been removed from the final TMDL and can be found in the Creve Coeur Creek bacteria TMDL implementation plan.

12. Comment: **Additional justification regarding the application of censored data is needed to determine representativeness. Specifically, the commenter requests the Department's rational pertaining to "greater than" values as there is a concern that the doubling of these values will result in overestimating bacteria loads.**

12. Response: No data were recorded as greater-than values and references to such values in the draft Creve Coeur Creek TMDL were in error. All references to data recorded as greater-than values have been removed from the TMDL. Appendix A of the TMDL was revised to show values recorded as less-than values rather than the halved value used for calculation purposes.

13. Comment: **The effect of data transcription or site identification discrepancies must be considered in any future TMDL. The commenter provided five *E. coli* values from Appendix A of the TMDL, which differ from U.S. Geological Survey (USGS) records. The data in question were collected on Feb. 10, 1999, April 15, 1999, June 16, 1999, Aug. 2, 1999, and Oct. 2, 2006.**

13. Response: The department appreciates the submittal of corrected data. The department reviewed the data in question and determined that four of the five discrepancies cited by the commenter were due to fecal coliform values being entered into its database instead of the correct *E. coli* values. The corrected data values are presented in the table below. This data has been corrected in the department's database and appropriate revisions were made to the TMDL. These corrections and modifications to the TMDL document did not result in changes to the calculated loading capacity or wasteload and load allocations. The fifth discrepancy cited by the commenter was for bacteria data collected on Oct. 2, 2006. In this case, the USGS collected duplicate samples with *E. coli* values of 75 and 83. The department used the average of these two values, which is 79.

Corrected *E. coli* (counts/100mL) Data

<i>Date (mo/dy/yr)</i>	<i>Previous Value</i>	<i>Correct Value</i>
02/10/1999	750	280
04/15/1999	4,000	4,600
06/16/1999	1,400	1,300
08/2/1999	230	130

14. Comment: **The TMDL should analyze, consider, and take into account the importance of bacterial sources in the context of human health risks and this factor should be an important aspect of TMDL development and implementation planning.**

A similar comment: **The water quality condition targeted by the TMDL is not sufficiently linked with human health risk in the Creve Coeur Creek watershed.**

A similar comment: **The TMDL target should consider the effects of bacteria source on human health risk.**

14. Response: *E. coli* bacteria are used as indicators of the risk of waterborne disease from pathogenic bacteria or viruses. High counts of *E. coli* are an indication of fecal contamination and an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat, and skin diseases. To address these health risks, this TMDL targets instream bacteria levels using *E. coli* as the primary measurement parameter. TMDLs must be written to address current, EPA-approved water quality standards. In Missouri's water quality standards at 10 CSR 20-7.031(5)(C), specific numeric bacteria criteria are given for the protection of the whole body contact recreation use. For category B waters, *E. coli* counts, measured as a geometric mean, shall not exceed 206 counts/100 mL of water during the recreational season. An evaluation of the

specific risks associated with various sources of *E. coli* is beyond the scope of the TMDL. Implementation activities should be consistent with reducing pollutants from the sources identified in the TMDL, but such risk factors could be considered when identifying critical areas.

15. Comment: **The source assessment should distinguish between natural or background sources of bacteria versus anthropogenic sources.**

A similar comment: **Wasteload allocations and TMDL targets must consider natural sources.**

15. Response: The department acknowledges that bacteria contributions to Creve Coeur Creek may occur from wildlife (background) as well human-caused sources. Section 3 of the TMDL discusses such background sources as components of urban stormwater runoff. Because the entire Creve Coeur Creek watershed is regulated through MS4 permitting, loading from these sources are included in the MS4 wasteload allocation as opposed to being allocated to the nonpoint source load allocation. Individuals or groups conducting implementation activities in the watershed may consider contributions from background sources to aid in identifying critical areas and selecting appropriate BMPs.

16. Comment: **The TMDL should not use the USGS microbial source tracking study to relate bacteria concentrations to presence of upstream sanitary sewer overflows.**

16. Response: The USGS microbial source tracking study referenced by the TMDL is *Occurrence and Sources of Escherichia coli in Metropolitan St. Louis Streams, October 2004 through September 2007*. The purpose of the report as described in the introduction of the document, is to “characterize the occurrence, distribution, and sources of *E. coli* in metropolitan St. Louis streams.” The study included portions of the Missouri and Mississippi rivers, the Creve Coeur Creek watershed, and other watersheds of similar size, geology, climate, and land use to the Creve Coeur Creek watershed. The USGS report also provides separate conclusions for the small watershed areas and the larger Missouri and Mississippi rivers sites. The USGS study concludes, “...average instream *E. coli* densities were correlated strongly with the percent of upstream impervious cover and at small basin sites, the combined number of upstream CSOs and SSOs.” Due to this study being completed in watersheds with similar characteristics as the Creve Coeur Creek watershed as well as in the Creve Coeur Creek watershed itself, the department believes it is appropriate to reference this study for identifying potential sources of bacteria in the Creve Coeur Creek watershed.

17. Comment: **The language regarding “the presence of sewerage system infrastructure,” “mismanagement,” and “sewage discharge” on page 12 and any subsequent references should be deleted. This is broad-sweeping language that implies that simply the presence of a sewerage system will result in non-attainment of the whole body contact recreation designated uses.**

17. Response: The language in question was intended to show why the sewerage system present in the Creve Coeur Creek watershed is a potential source for bacteria contributions to Creve Coeur Creek. It is not the department’s belief that the mere presence of a sewerage system equates to non-attainment, only that the potential for bacteria contributions from these types of systems exists due to potential sanitary sewer overflows that may result for a variety of reasons. The language in the TMDL has been redrafted to better illustrate this point and to refer to sewerage systems in a more general sense.

18. Comment: **The District’s supplemental environmental project to eliminate some septic systems should be put into proper perspective.**

18. Response: The department appreciates the additional information regarding this portion of the Metropolitan St. Louis Sewer District’s consent decree. The language in the TMDL has been revised to better characterize the role that the supplemental environmental project may play in regards to TMDL implementation.

19. Comment: **The load duration curve must be adjusted so that sample data and TMDL target have comparable averaging periods. Load duration curves should be calculated from data and criteria that have the same averaging period.**

19. Response: The target bacteria concentration used to develop the TMDL load duration curve was applied as a daily target. This method provides the same averaging period for both the observed data and the TMDL targets, as shown in Figure 9 of the TMDL. As noted in response to Comment 10, calculations of loading capacity were based strictly on the whole body contact recreation category B criterion concentration and calculated stream flow occurrence frequency values. Observed bacteria data were not used for calculating the overall loading capacity or wasteload and load allocations.

20. Comment: **Methods used to determine the loading capacity result in a margin of safety that is unrealistic, excessive, and significantly overestimates uncertainty.**

20. Response: A margin of safety is required in TMDL calculations to account for uncertainties in scientific and technical understanding of water quality in natural systems. For the Creve Coeur Creek TMDL, the margin of safety was expressed as an explicit 10 percent portion of the loading capacity the magnitude of which varies with flow. Additionally, the fact that bacteria decay or die off was not accounted for in the TMDL serves as a conservative assumption that provides an additional, although likely minor, implicit margin of safety. As noted in response to Comment 8,

the target concentration used to develop the TMDL load duration curve was the state's whole body contact recreation category B criterion applied as a daily target. This method provides a level of protection that will support whole body contact recreation. Assessment of Creve Coeur Creek for compliance with water quality standards will be consistent with the department's water quality assessment protocols and 303(d) listing methodology.

21. Comment: **An explicit margin of safety is not needed as bacteria are treated as a conservative parameter in the load duration curve modeling approach. Treating bacteria as a conservative parameter represents an implicit margin of safety and renders additional explicit safety factors unnecessary.**

21. Response: Although bacteria are treated as a conservative pollutant and the TMDL notes that this may serve as an additional implicit margin of safety, due to the lack of available data specific to bacteria die off rates, time of travel, and sediment bacteria resuspension in the Creve Coeur Creek watershed (or other comparable reference watersheds) there is insufficient evidence to adequately account for any modeling uncertainties through the sole use of an implicit margin of safety.

22. Comment: **If the load duration curve approach is retained, the Department should calculate separate load duration curves for each monitoring site in the watershed.**

22. Response: Calculations of loading capacity were based strictly on the approved whole body contact recreation category B criterion and calculated stream flow occurrence frequency values. This provides TMDL targets that attain water quality standards at the outlet of the watershed throughout the recreational season. Observed data were not used for calculating overall loading capacity or wasteload and load allocations. Observed bacteria data were used solely for estimating existing bacteria loading and reduction goals to meet TMDL targets. Information pertaining to estimates of existing loads and load reductions to Creve Coeur Creek have been removed from the final TMDL and can be found in the Creve Coeur Creek bacteria TMDL implementation plan.

23. Comment: **The Creve Coeur Creek TMDL should consider feasible management options and actual risk during wet weather conditions. The commenter asks the Department to incorporate risk factors associated with whole body contact recreation that present lower risk, such as unsafe flow velocities and lack of recreational activities during the 0 to 10 percent flow exceedance intervals, when estimating load reduction needs.**

A similar comment: **The TMDL should be revised to exclude extremely high flow events.**

23. Response: Risks associated with whole body contact recreation during wet weather conditions, are beyond the scope of the TMDL process. However, the relationship between flows and recreational activities may be a valuable consideration when selecting or locating BMPs during implementation of the TMDL to maximize human health protections. For TMDL

purposes, the TMDL target concentration is set at the state's whole body contact recreation category B criterion at all flows. The state's water quality standards do not provide separate criteria for higher flows, nor is there an EPA-approved flow exception for the applicability of recreational uses. Since TMDLs are required to be written to achieve water quality standards, it would not be appropriate to include allocations that do not achieve the whole body contact recreation criterion at all flows.

24. Comment: Wasteload allocation and implementation expectations must consider the limitations of treatment provided by structural and non-structural BMPs.

24. Response: The Creve Coeur Creek TMDL is written to meet water quality standards per 40 CFR §130.7(c)(1). Cost considerations and available treatment technologies cannot be considered in TMDL development. Potential sources contributing to the bacteria impairment of Creve Coeur Creek are discussed in Section 3 of the TMDL and include both point and nonpoint sources. BMPs and other pollution abatement activities completed as required by the Metropolitan St. Louis Sewer District's consent decree and those completed in accordance with an accepted stormwater management plan or to comply with the six minimum control measures of MS4 permits are consistent with the types of practices needed to implement this TMDL. Voluntary BMP implementation by watershed groups or private citizens will also help achieve TMDL loading targets. All Missouri TMDLs are phased TMDLs and use an adaptive implementation approach that provides for an iterative process that makes progress toward achieving water quality goals, while using any new data and information to reduce uncertainty and adjust implementation activities. Continued monitoring throughout the implementation process will assist in identifying critical areas and be useful when selecting the appropriate BMPs.

25. Comment: It is not clear if sanitary sewer overflows are included in the wasteload allocation.

25. Response: Sanitary sewer overflows, although not permitted or authorized under the Clean Water Act, are considered point sources of bacteria. TMDL allocations to point sources are included in the wasteload allocation. The Creve Coeur Creek TMDL assigns a wasteload allocation of zero to sanitary sewer overflows. Any potentially contradictory language in the TMDL regarding this wasteload allocation has been removed.

26. Comment: The TMDL implementation plan should include the opportunity to develop site-specific recreational use criteria.

26. Response: TMDLs are written to address current, EPA-approved water quality standards. However, the department will, through the triennial review process, continue to review and modify or adopt water quality standards, where appropriate. Suggestions for revised recreational uses or criteria can be submitted to the department for review during the next triennial water quality standards review. Should the state modify the whole body contact category B criterion,

promulgate new single sample maximum criteria, or change the designated uses assigned to Creve Coeur Creek, the department may reopen and modify the TMDL.

27. Comment: **The implementation plan should target water quality criteria, rather than specific load reductions, as its ultimate goal.**

27. Response: The department agrees that the ultimate goal of the TMDL is to restore Creve Coeur Creek to the point where water quality standards are achieved and water quality sampling shows compliance with the appropriate whole body contact recreation use criterion. Load reductions are included in the Creve Coeur Creek bacteria TMDL implementation plan to provide interim and final goals for BMP and TMDL implementation activities, particularly those using Section 319 funds. Assessment of Creve Coeur Creek for compliance with water quality standards will be consistent with the department's water quality assessment protocols and 303(d) listing methodology.

28. Comment: **The TMDL should include other District actions planned for the watershed in the discussion about reasonable assurance.**

28. Response: Additional language pertaining to the Metropolitan St. Louis Sewer District's consent decree obligations has been added to Section 12 (formerly Section 13) of the TMDL to provide additional reasonable assurance that TMDL loading targets will be met.

29. Comment: **The TMDL should rely on the maximum extent practicable standard for reasonable assurance in stormwater permits.**

29. Response: Section 12 of the TMDL provides reasonable assurance of permitted point source reductions through discussion of the National Pollutant Discharge Elimination System (NPDES) permitting program, of which stormwater permits are a part. Additional language from Section 402(p)(3)(B)(iii) of the Clean Water Act, which is specific to MS4 permits, has been added.

END SUMMARY OF COMMENTS AND RESPONSES