Missouri Department of Natural Resources

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

Fishpot Creek
WBID # 2186

St. Louis County, Mo.

Public Notice
June 29 – Aug. 13, 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 Fishpot Creek bacteria TMDL on a 45-day public notice and comment period from June 29, 2012 to Aug. 13, 2012. All original comments received during the Fishpot Creek public notice period are available online on the Department's website at dnr.mo.gov/env/wpp/tmdl/2186-fishpot-ck-record.htm. Comments were received from the following groups or individuals:

Boone County Commission
City of Ellisville
City of Florissant
City of Hazelwood
City of Independence
City of Manchester
City of Winchester
City of Woodson terrace
Home Builders Association of St. Louis & Eastern Missouri
Metropolitan St. Louis Sewer District

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 Fishpot Creek bacteria TMDL implementation plan to better facilitate citizen involvement and water quality improvement. The Fishpot Creek bacteria TMDL implementation plan is available on the department's website at http://dnr.mo.gov/env/wpp/tmdl/2186-fishpot-ck-record.htm.

RESPONSE TO COMMENTS
(Public comments in bold)

1. Comment: **Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the department should delay finalizing any St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed.**

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 Fishpot Creek. In addition to a 45-day public notice and comment period held from June 1, 2012 to July 16, 2012, 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 Fishpot 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 Fishpot Creek TMDL along with a new draft implementation plan is scheduled for 90 days, from May 23, 2014 to Aug. 21, 2014.

2. Comment: **All mandates and consent decrees established by legal action must be incorporated into TMDLs. It is irresponsible for DNR to set requirements for water quality improvements that are more stringent than federal consent decrees and to promulgate rules as if such consent decrees did not exist.**

2. Response: The Fishpot Creek TMDL is written to meet water quality standards per 40 CFR §130.7(c)(1). While the Fishpot 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 to comply with the six minimum control measures of municipal separate storm sewer system (MS4) permits are consistent with the types of practices needed to implement this TMDL towards achieving wasteload allocation targets. Continued monitoring and assessment of Fishpot 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.

3. Comment: **Use of EPA 1986 bacteria criteria document must be re-evaluated using studies on flowing water to assess the relative human health risks from exposure to *E. coli*. The Department should reconsider bacteria targets and adjust them as appropriate.**

3. 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. 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 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 *E. coli* is beyond the scope of the TMDL.

4. Comment: **Many urban streams are not used as whole body recreational areas. The Department should reconsider bacteria targets and adjust them as appropriate for these streams.**

4. Response: As noted in the response to Comment 2, TMDLs must be written to address current, EPA-approved water quality standards. Missouri's water quality standards consist of three components: designated uses, water quality criteria to protect those uses, and an antidegradation policy. In Missouri's water quality standards at 10 CSR 20-7.031 Table H, Fishpot Creek is assigned the whole body contact recreation category B use. Specific numeric *E. coli* criteria are given for the protection of whole body contact recreation at 10 CSR 20-7.031(5)(C). 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. For this reason, the target concentration used to develop the load duration curve was the state's category B recreational season geometric mean criterion of 206 *E. coli* counts / 100 mL of water, which was applied as a daily target.

5. 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 Fishpot Creek.**

A similar comment: **More detailed, local information must be 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.**

5. Response: All potential sources contributing to the impairment are considered in the Fishpot 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 Fishpot 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.

6. 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 Fishpot Creek is inconsistent with Missouri's recreational water quality criteria and TMDL guidance developed by the EPA.**

6. Response: For the Fishpot 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 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.

7. Comment: **The TMDL incorrectly included an unclassified losing stream segment which bypasses the required public participation process and for which no data is available to determine compliance with the water quality criterion or calculate the TMDL components.**

A similar comment: **The TMDL incorrectly included an unclassified losing stream segment of Fishpot Creek which must be removed from the TMDL.**

A similar comment: **The TMDL does not include data that demonstrates the unclassified losing stream segment of Fishpot Creek is impaired, which bypassed 303(d) listing public participation requirements and forces TMDL calculations based on assumptions.**

A similar comment: **The TMDL bypassed listing methodology and 303(d) public notice requirements.**

7. Response: The draft Fishpot Creek TMDL placed on public notice included loading capacity calculations for the losing stream segment of Fishpot Creek. Although not specifically listed on the state's 303(d) List of impaired waters, TMDL calculations for this segment were calculated to provide for a more holistic approach for addressing water quality concerns in the Fishpot Creek watershed. Although the Clean Water Act requires the development of TMDLs for impaired waters included on the 303(d) List, it does not prohibit the development of TMDLs for waters that are not listed. Calculations of allowable pollutant loads are a fundamental part of water quality management and are completed to prevent water quality degradation as well as to restore current impairments. An example of such calculations are the establishment of water quality based effluent limits in wastewater permits. Furthermore, the inclusion of a water body segment in a TMDL for a water body and pollutant not previously included on an approved 303(d) List is not unique to the draft Fishpot Creek TMDL and is an approach utilized by the department in other approved TMDLs (e.g., Pond Creek TMDL – Approved Dec. 23, 2010, Shibboleth Branch TMDL – Approved Dec. 23, 2010, Shoal Creek, Pogue Creek and Joyce Creek TMDL – Approved Nov. 21, 2007, and Goose Creek and Saline Creek TMDL – Approved Dec. 1, 1999). However, as noted by the commenter, the department lacks bacteria data specific to the losing segment of Fishpot Creek and, at this time, the department lacks sufficient evidence to adequately show a hydrologic connection between the losing and gaining segments. For these reasons, the department is removing TMDL calculations for the losing segment of Fishpot Creek from the TMDL document. Should adequate data showing impairment of the losing segment become available, the department may reopen and revise this TMDL.

8. Comment: **The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small MS4 permit, extending beyond the Phase II stormwater regulations.**

A similar comment: **The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions for MS4 permits in the Clean Water Act and 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."**

8. 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 Fishpot 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 BMPs. BMPs and other pollution abatement activities completed as required by the Metropolitan St. Louis Sewer District's consent decree 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. Continued monitoring and assessment of Fishpot 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 email at chris.wieberg@dnr.mo.gov.

9. 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, as well as the pre-existing legal requirements mentioned above.**

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.**

9. 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 8, the Fishpot 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 Fishpot Creek bacteria TMDL implementation plan has been developed to help guide implementation activities and facilitate the adaptive implementation approach.

10. 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.**

10. 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 Fishpot 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.

11. Comment: **It is premature to suggest remedies to bacteria without considering the elimination of sanitary sewer overflows.**

A similar comment: **The water quality improvements and load reduction by the District's upcoming elimination of constructed sanitary sewer overflows 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.**

11. 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 Fishpot Creek TMDL implementation plan.

12. 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 sewered and nonsewered areas.**

12. 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 sewered and nonsewered areas within the Fishpot Creek watershed. No changes to the calculated loading capacity or wasteload and load allocations occurred as a result of this revision.

13. 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 Fishpot Creek watershed.**

13. 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 Fishpot Creek have been removed from the final TMDL and can be found in the Fishpot 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.

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

14. Response: The flow adjustment approach used in the Fishpot 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 Fishpot Creek (9.58 square miles) and the drainage area of the entire watershed (10.73 square miles). Because the stream gage is located within the same watershed as Fishpot 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 Fishpot Creek have been removed from the final TMDL and can be found in the Fishpot Creek bacteria TMDL implementation plan.

15. 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 Fishpot Creek watershed.**

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

15. 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.

16. 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.**

16. Response: The department acknowledges that bacteria contributions to Fishpot 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 Fishpot 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.

17. Comment: **The TMDL should not use or reference the USGS microbial source tracking study because results are likely not representative of conditions in Fishpot Creek.**

17. 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 as well as several smaller watersheds with similar geology, climate, land use, and potential sources of bacteria as those found in the Fishpot Creek watershed. The USGS report also provides separate conclusions for the small basin 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 Fishpot Creek watershed, as well their close proximity to the Fishpot Creek watershed, the department believes it is appropriate to reference this study for identifying potential sources of bacteria to Fishpot Creek.

18. 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 category B designated use.**

18. Response: The language in question was intended to show why the sewerage system present in the Fishpot Creek watershed is a potential source for bacteria contributions to Fishpot 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.

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

19. 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.

20. Comment: **Two beneficial uses identified in the TMDL are not listed in Missouri's water quality standards. The beneficial uses listed on page ii of the TMDL including "Protection of warm water aquatic life" and "Metropolitan no-discharge stream" are not consistent with the beneficial uses in 10 CSR 20-7.031(1)(C).**

20. Response: Designated uses are described in Missouri's water quality standards at 10 CSR 20-7.031(1)(C) and Tables G and H. As noted in 10 CSR 20-7.031 Table H, Fishpot Creek is assigned the protection of warm water aquatic life use. Revisions to the state's water quality standards at 7.031(1)(C), which became effective on Feb. 28, 2014, more appropriately defines this use as the protection of Warm Water Habitat. The TMDL document was updated to reference this change. As the commenter correctly notes, metropolitan no-discharge stream is not a defined designated use in 10 CSR 20-7.031(1)(C). Instead, designations of metropolitan no-discharge streams are found in 10 CSR 20-7.031, Table F. The TMDL has been revised to accurately reflect this information.

21. Comment: **The TMDL does not include or reference sufficient scientific and regulatory basis for the losing stream *E. coli* criterion.**

21. Response: The Fishpot Creek TMDL is written to meet water quality standards per 40 CFR§130.7(c)(1). It is beyond the scope of the TMDL to evaluate the appropriateness of a specific water quality criterion. Missouri's water quality standards at 10 CSR 20-7.031(5)(C) state that a losing stream shall not exceed 126 *E. coli* counts / 100 mL of water at any time. For these reasons, a TMDL targeting 126 counts/100mL was calculated for the losing segment of Fishpot Creek. However, as noted in the response to Comment 7, the department currently lacks bacteria data specific to the losing segment of Fishpot Creek. Additionally, there is insufficient evidence to adequately show a hydrologic connection between the losing and gaining segments. For these reasons, the department is removing TMDL calculations for the losing segment of Fishpot Creek from the TMDL document. Should adequate data showing impairment of the losing segment become available, the department may reopen and revise this TMDL.

22. Comment: **The load duration curve must be adjusted so that sample data and TMDL target have comparable averaging periods.**

22. 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 11 of the TMDL. As noted in response to Comment 13, 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.

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

23. 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 Fishpot 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 6, 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 Fishpot Creek for compliance with water quality standards will be consistent with the department's water quality assessment protocols and 303(d) listing methodology.

24. 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.**

A similar comment: T**he load duration curve approach provides a very limited linkage between watershed processes and bacteria fate and transport mechanisms.**

24. 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 small size of the watershed (10.7 square miles) bacterial decay rates are likely low and insufficient to adequately serve as the sole margin of safety. Additionally, there is a lack of available data specific to bacteria die off rates, time of travel, and sediment bacteria resupsension in the Fishpot Creek watershed (or other comparable reference watersheds) to adequately account for any modeling uncertainties through the sole use of the implicit margin of safety.

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

25. 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 Fishpot Creek have been removed from the final TMDL and can be found in the Fishpot Creek bacteria TMDL implementation plan.

26. Comment: **The Fishpot Creek TMDL should consider feasible management options and actual risk during wet weather conditions.**

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

26. 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.

27. Comment: **Wasteload allocation and implementation expectations must consider the limitations of treatment provided by structural and non-structural best management practices.**

27. Response: The Fishpot 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. 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.

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

28. 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 Fishpot 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.

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

29. 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 Fishpot Creek, the department may reopen and modify the TMDL.

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

30. Response: The department agrees that the ultimate goal of the TMDL is to restore Fishpot 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 Fishpot 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 Fishpot Creek for compliance with water quality standards will be consistent with the department's 305(b) and 303(d) assessment protocols and listing methodologies.

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

31. 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.

32. Comment: T**he TMDL should rely on the maximum extent practicable standard for reasonable assurance in stormwater permits.**

32. 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