Pearson Creek in Missouri
Draft Total Maximum Daily Load (TMDL)
SUMMARY OF COMMENTS AND RESPONSES
Prepared by the Environmental Protection Agency (EPA),
Region 7 Water, Wetlands and Pesticides Division
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INTRODUCTION

EPA public noticed a draft TMDL for Pearson Creek (water body identification MO_2373) from August 27, 2010 to September 30, 2010. EPA is establishing this TMDL to meet the obligations of the 2001 Consent Decree, *American Canoe Association, et al. v. EPA*, Consolidated Case No. 98-1195-CV-W-SOW, consolidated with 98-4282-CV-W-SOW, (Consent Decree). This document summarizes and paraphrases comments received, EPA's response to comments and changes made to the final TMDL where appropriate. Included is a list of all commentors.

RESPONSE TO COMMENTS (**EPA responses in bold**)

1. Comment: The commentor requested to review the TMDL before it was public noticed because they were named as a primary contributor of urban flow and because the implementation plan will be enforced through municipal separate storm sewers (MS4) permits.

Response: EPA agrees that there should be full and meaningful public participation in the TMDL development process from those impacted by the TMDL (40 Code of Federal Regulations (CFR) § 130.7(c)(1)(ii)) and 40 CFR § 130.7(d)(2).[1] The public notice period offers the opportunity for meaningful review. All comments received during public notice are considered and addressed in the final TMDL as is appropriate. Missouri Department of Natural Resources (MDNR) will work with permitted facilities identified in the TMDL as per EPA regulations, …*the state shall incorporate them [*the TMDLs*] into its current [*Water Quality Management*] WQM plan [*for implementation*] (40 CFR § 130.7(d)(2)). MDNR provided the implementation plan which EPA included in Appendix B as an informational tool for watershed stakeholders. The Pearson Creek TMDL is a phased and adaptive plan to restore water quality conditions in the Pearson Creek watershed.

2. Comment: Thirty days of public notice places a burden on agencies and citizens because of its short response time. The commentor felt that stakeholders were especially burdened by having two TMDLs on public notice at the same time that impacted their city and county.

Response: Per EPA regulations, public notice should follow the state's public review process as defined in the state's Continuing Planning Process (CPP) (40 CFR § 130.7(a), 40 CFR § 130.7(c)(1)(ii) and 40 CFR § 130.7(d)(2)). Missouri's most

[1] *Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992*, EPA, May 20, 2002

current CPP defines a 30 day public notice period distributed to all known stakeholders impacted by the TMDL. (Missouri's most current CPP is found at http://www.dnr.mo.gov/env/wpp/cpp/cpp_toc.htm.) To distribute the draft TMDL as widely as possible, EPA publishes the draft TMDL on its Website (http://www.epa.gov/region07/water/tmdl_public_notice.htm) and concurrently MDNR notifies stakeholders on its Website (http://www.dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm). When the draft TMDL is posted on the Websites, EPA and/or MDNR sends timely notice by mail and/or email to all identified point source facilities, non-point source entities, watershed stakeholders, community groups, elected representatives, cities, townships and counties that are part of the impaired watershed or have indicated previous interest in the impaired water's TMDL.

3. Comment: Due to deficiencies (mentioned in subsequent comments) the commentor believes the TMDL should have very limited applicability in the future without a significant amount of additional study and refinement.

A similar comment concerns water management in urban environments as an evolving science: the commentor asks that the Pearson TMDL be flexible enough to change course or adapt new water quality improvement ideas as they are tried and tested.

Response: Please refer to responses below that address each specific issue. EPA is sensitive to stakeholder concerns about implementation, and has identified the Pearson Creek TMDL to be both phased and adaptive in order to restore water quality conditions in the watershed. In a phased TMDL, EPA uses the best information available at the time to establish the TMDL at levels necessary to implement applicable Water Quality Standards (WQS) and to make the allocations to the pollution sources. However, the phased TMDL approach recognizes that additional data and information may be necessary to further validate the assumptions of the TMDL and to provide greater certainty that the TMDL will achieve the WQS. Using a phased TMDL approach does not include targeting Loading Capacities (LCs), Waste Load Allocations (WLAs) or Loading Allocations (LAs) less than WQS. There is one overarching requirement for all TMDLs, they must meet all applicable WQS (40 CFR § 130.7(c)(1)(ii)). A TMDL must be written and modeled to meet WQS. MDNR will incorporate the TMDL into Missouri's WQM plan for implementation and monitoring (40 CFR § 130.7(d)(2)). The phased TMDL process begins with monitoring and adaptive implementation, 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. Upon collection, the data and information would then be assessed and would form the basis for any appropriate future revision to the TMDLs, including any necessary adjustments to the load reductions or the allocation of the allowable load or both. Additionally, EPA recognizes that implementation of TMDLs will be iterative, as it uses any new data or information to reduce uncertainty and adjust the implementation activities accordingly. As new data becomes available as a

result of monitoring, at any time, MDNR may consider submitting a revised or modified TMDL for this water based on this or other data.

Development of a TMDL requires data collection and evaluation of implemented Best Management Practices (BMPs), or techniques to prevent pollution, to determine which and how pollutant sources can be controlled or eliminated to restore an impaired water body. This work can be adaptive; data gathered during the implementation process can be used to determine future actions. A TMDL can be revised or modified at any point; a decision to do so often depends on interim results, findings of ongoing studies or field data and the effectiveness of an implemented BMP.

The conversion of WLAs to permit limits is the purview of the MDNR's National Pollutant Discharge Elimination System (NPDES) Permits and Engineering Section. Should you have questions regarding the determination of permit effluent limits, please contact Mr. Refaat Mefrakis, Chief, NPDES Permits and Engineering Section, at (573) 526-2928 or via email refaat.mefrakis@dnr.mo.gov.

4. Comment:
The TMDL does not provide raw water quality, biological or flow data and does not present quantitative analyses of those data to support the TMDL's conclusions. The commentor requests that the TMDL present all biological and hydrological data as well as a quantitative analysis of the assumed relationship between the variables.

Response: The use of a surrogate parameter is permissible under the Clean Water Act (CWA) Section 303(d)(1)(C) (33 U.S.C. 1313(d)(1)(C)), which requires that the TMDL load "shall be established at a level necessary to implement the applicable WQS," but does not dictate the specific methodology for calculating or expressing the TMDL. EPA regulations state that TMDLs can be expressed in several ways, including in terms of toxicity which is a characteristic of one or more pollutants, or by some "other appropriate measure," per 40 CFR § 130.2(i). EPA regulations also state that TMDLs may be established using a biomonitoring approach as an alternative to the pollutant-by-pollutant approach 40 CFR § 130.7 (c)(1)(i). This flexibility in the expression of TMDLs support reliance on a surrogate where, as in this case, there is a reasonable rationale and the TMDL is designed to ensure attainment of applicable WQS. TMDLs are often complicated by multiple pollutants. In the case of Pearson Creek the pollutant causing the impairments may be listed as unknown on the 303(d) List; however, data indicates that toxicity from multiple pollutants carried by storm water is the cause of the impairment. The amount of storm water running into Pearson Creek has increased significantly due to an increase in impervious surfaces in the watershed. The increase in impervious surfaces is the result of development in the watershed. Therefore, using a surrogate that represents the toxic pollutant loadings to the stream, as well as the hydrologic conditions that are also found to be contributing to the impairment is appropriate and addresses both chemicals and habitat degradation.

The surrogate relationship between urban storm water runoff and the toxic mix of pollutants impairing Pearson's warm-water aquatic life designated beneficial use is explained in section 4.4 of the TMDL. Specifically, please refer to section 4.4.3 of the TMDL that outlines the four principle ways that storm water runoff from urban areas are linked to degradation of aquatic life in urban streams and how Pearson Creek's data links storm water to decreased aquatic life. The commentor is directed to Appendices C, D and E for data and further analyses. Data used in the TMDL's calculations that weren't in the draft TMDL is being placed into STORET (STOrage and RETrieval) Data Warehouse)) for better data sharing. The STORET Data Warehouse is EPA's repository of the water quality monitoring data collected by water resource management groups across the country. The new water quality exchange (WQX) makes uploading data to STORET easier so more groups are able to share data. Please access data for this TMDL at the following Website: http://www.epa.gov/STORET/dw_home.html. Assistance on using STORET is available at http://www.epa.gov/STORET/owners.html.

5. Comment: The aquatic invertebrate data that was used to place the stream on the 303(d) List should be included in an appendix to understand the degree of impairment. It would be beneficial if the water quality data in Appendix A were compared to WQS or benchmarks that would relate the levels to aquatic invertebrate health to determine if any specific pollutants are possibly contributing toward the toxicity.

Response: While the listing of this water body as impaired is beyond the scope of this specific TMDL public notice, all data used to list a water during any Missouri 303(d) listing cycle would be available on file with MDNR. Water quality monitoring has not revealed an exceedance of a specific numeric water quality criterion in Pearson Creek. However, all Missouri streams are protected by the general criteria contained in Missouri's WQS at 10 Code of State Regulations (CSR) 20-7.031(3). Please read Response 6 for a more detailed explanation of the relationship between aquatic invertebrate health and the toxicity in Pearson Creek. Data used in the TMDL's calculations that weren't in the draft TMDL is being placed into STORET for better data sharing. Please refer to Response 4 above for more STORET information.

6. Comment: There is a lack of a defined stressor-effect relationship because the draft TMDL does not establish causality between runoff and beneficial use attainment. The TMDL does not provide any assurance that benthic macroinvertebrate metrics or habitat will positively respond to decreased runoff. Page 26 of the TMDL provides too general a summary of biological and habitat data and it is difficult to determine whether the data support the TMDL's assumption that runoff results in a decrease in community health and stream habitat. Page 28 lacks the specific data and analysis to support that hydrological changes have degraded habitat. Although MDNR's habitat assessment is not designed as a stand-alone product to identify specific sources of habitat degradation, the TMDL uses MDNR's assessment to reach that conclusion.

A similar comment addresses the relationship between hydrology and the impact on aquatic invertebrate communities: The aquatic invertebrate indices of the reference streams should be provided. The TMDL assumes that the Flow Duration Curves must be matched to achieve acceptable water quality? Is this really true? Could the Flow Duration Curve of Pearson be improved to a lesser degree and still achieve water quality goals? More information needs to be provided in the TMDL so that the entities affected by the TMDL can more fully understand the level of flow control that is really necessary to achieve goals.

Response: National studies (Center for Watershed Protection (CWP), 2003; Water Environment Research Foundation, 2003) have documented the connection of increased impervious area in urban areas to increases in storm water runoff which contribute numerous pollutants and changes in hydrology with increased magnitude, duration and frequency of storm runoff. These resulting changes are known to negatively affect water quality and aquatic life.

As stated in the TMDL, the CWP study reviewed hundreds of research studies. The combined review and synthesis of information in these studies led CWP to conclude that impervious cover as low as 10 percent can be related to aquatic life impairments and worsens as more areas within the watershed are developed.

The TMDL data and local studies support the negative effects on water quality from urbanization within a watershed with decreasing trends and very low diversity of fish and aquatic invertebrates in Pearson Creek. In addition, they found low levels of pesticides, metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) in water and semi permeable membrane device (SPMD) samples in Pearson Creek and other urban streams near Springfield, Missouri. Elevated levels of nitrate + nitrite-N and low-level sediment toxicity in Jones Branch (a tributary to Pearson Creek) were also found. The TMDL also documents the storm water impacts to the hydrology as described in the literature with increased magnitude, frequency and duration of higher flows and lower low flows.

Reducing the frequency and magnitude of high flows will encourage infiltration so that the stream hydrology more closely matches pre-development hydrology as measured in the reference stream watersheds. In turn this will reduce the amount of pollutants carried by storm water into Pearson Creek. Based upon the analysis by national and local studies, it is reasonable that addressing these negative impacts will result in better habitat and protection of aquatic life and natural biological aquatic communities.

7. Comment: Water quality data discussed in Appendix A and Section 4.4.2. are grouped from many monitoring sites on both Pearson Creek and Jones Spring Branch. Presenting the data in this manner precludes in-depth analysis of the data. The commentor requests that the raw data and their sources be included in the TMDL.

A similar comment is that Data in Appendix A appear to be missing critical metadata (detection limits, parameter codes, sampling locations, etc). The lack of metadata makes interpretation unclear and limits any useful analysis.

Response: Data in the draft TMDL has been analyzed consistent with the procedures included in Appendices A, C, D and E; 40 CFR § 130.2(i) and 40 CFR § 130.7(c)(1). The sources for all raw data used in the draft TMDL are listed in the References section. Additionally, all data used to list a water during any Missouri 303(d) listing cycle is on file with MDNR. Data used in the TMDL's calculations that weren't in the draft TMDL is being placed into STORET for better data sharing. Please refer to Response 4 above for more STORET information.

8. Comment: Several potential sources of toxic material in the watershed were not mentioned in the TMDL. In fact, increasing infiltration and subsurface flow in areas of soil contamination could worsen the problem. Other potential sources of toxicity from commentors include: long-time industrial uses along the U.S. 65, an old landfill northeast of U.S. 65 and Catalpa Street, the remnants of old lead mining operations, a mound of lead tailings just east of U.S. 65, United States Geological Service (USGS) water quality data at Highway D reveals an extremely high dissolved lead content on July 12, 2000 (the date of a major flood event in and east of Springfield), limited data available on the presence of PAHs in sediment, MDNR data on Jones Spring Branch shows levels of all 5 PAHs tested at a level approximately 10 times the Probably Effect Level, a livestock population estimated at 7,000 (compared to a human population of 8,160), and toxicity from industrial and agricultural spills or leaks into sinkholes that flow into Pearson Creek.

Response: EPA appreciates the commentor's information. If data is submitted, it should meet the minimum level that MDNR considers for use in determining TMDL targets and modeling. The data needs to be representative of instream conditions and meet the Quality Assurance/Quality Control levels of Missouri's Listing Methodology document (10 CSR 20-7.031 and 10 CSR 20-7.050). The data used in the draft TMDL were the best available when writing the TMDL. The margin of safety (MOS) in the TMDL accounts for any lack of knowledge concerning the relationship between effluent limitations and water quality, such as other potential sources of toxic material suggested by the commentor (40 CFR § 130.7(c)(1)). If the data provided by the commentor is found to meet MDNR's minimum level for data inclusion, MDNR may consider submitting a revised or modified TMDL for this water at any time based on this or other data.

9. Comment: The draft TMDL is very confusing in addressing the MS4 permits of the city of Springfield and Greene County. References throughout the document vary in how these permits are used and described. Nowhere is there any determination of the respective areas within both the city and county MS4 permit area nor has any attempt been made to estimate the approximate contribution of flow or pollution from the respective areas. (Specifically: on page 14 it states the Greene County MS4 covers the Springfield urban area but does not mention the Springfield MS4, and in Table 6 entitled

Permitted Facilities in the Pearson Creek Watershed, lists the Greene County small MS4 but does not list the Springfield large MS4.)

Response: EPA thanks the commentor. As is appropriate, changes have been made in the final TMDL that clarify which MS4 facility is being discussed at each point in the TMDL. In regards to the commentor's concern about approximating contribution of flow between the MS4s, EPA acknowledges the difficultly in discerning regulated from non regulated storm water discharges from Pearson Creek's sources. It may be reasonable to express allocations for NPDES-regulated storm water discharges from multiple point sources as a single categorical WLA when data and information are insufficient to assign each source or outfall individual WLAs 40 CFR § 130.2(i). All land area within the boundary of the Springfield Urban area is assumed to be regulated as part of the Greene County MS4, and all high intensity urban areas outside of the MS4 are assumed to be individually regulated storm water sources. Please refer to section 6 of the final TMDL for a more detailed discussion of how loads are assigned.

10. Comment: The commentor states that the TMDL's estimated percent of impervious cover is subject to error due to inconsistencies between aerial photos, Missouri Resource Assessment Partnership (MoRAP) data and application of the 10% rule of thumb for impervious cover.

Response: TMDLs are calculated to attain WQS with a MOS which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality, such as the inconsistencies listed in the comment (40 CFR § 130.7(c)(1)). This TMDL is established with an implicit MOS by using conservative assumptions during the development of the target flow duration curve. By meeting the conservative high flow targets defined in this TMDL, the physical impact of stream flow will be mitigated by reducing high flows and augmenting low flow periods, please refer to section 7 of the TMDL for a more detailed explanation.

11. Comment: The existence of impaired aquatic populations in a watershed that is in the beginning phases of urbanization would indicate that there are sources of pollution previous to MS4s.

Response: Early stages of development may be as likely to exhibit impairment based on runoff as more advanced stages of development. In the early stages of development there is a proportionally greater percentage of active construction with loadings of pollutants associated with those activities.

In the case of Pearson Creek the pollutant causing the impairments may be listed as unknown on the 303(d) List; however, data indicates that toxicity from multiple pollutants carried by storm water is the cause of the impairment. The amount of storm water running into Pearson Creek has increased significantly due to an increase in impervious surfaces in the watershed. The increase in impervious surfaces is the result of development in the watershed. Therefore, using a surrogate

that represents the toxic pollutant loadings to the stream, as well as the hydrologic conditions that are also found to be contributing to the impairment is appropriate and addresses both chemicals and habitat degradation.

12. Comment: There are readily available data from local agencies to better assess the number of on-site wastewater treatment systems. The failure rate of these systems is higher than estimated in the TMDL.

Response: All pollutants preventing or expected to prevent WQS attainment (and their sources) are listed in the TMDL, per 40 CFR § 130.7(c)(1)(ii). Referring to section 3.2.3 of the draft TMDL, little information was identified that would suggest failing onsite wastewater systems are a significant problem in the watershed. EPA is establishing this TMDL at this time to meet the requirements of the consent decree. If better data is made available, Missouri may submit, and EPA may approve, a revised or modified TMDL for this water at any time.

13. Comment: The draft TMDL shows an unfounded bias toward building a case for urbanization being the sole primary cause of impairment. The following examples were provided by commentors: Table 8 highlights urban sources as opposed to categorizing all significant sources including agriculture? Why are high peak flows attributed solely to urban sources and impervious area when only 10 percent or less of the watershed is impervious? Why are agricultural practices not mentioned as a potential source of toxic contaminants? Isn't it biased to say that impaired stream habitat is caused by "Increased urban runoff volume" as opposed to increased runoff? Showing "Riparian land cover alteration" as being related to impervious area is incorrect when 80 percent of the unforested area along the stream is agricultural in nature rather than urban. How can it be concluded that this condition is associated with impervious area?

Response: In the case of Pearson Creek, data indicates that toxicity from multiple pollutants carried by storm water is the cause of the impairment. The amount of storm water running into Pearson Creek has increased significantly due to an increase in impervious surfaces in the watershed. The increase in impervious surfaces is the result of development in the watershed. Therefore, using a surrogate that represents the toxic pollutant loadings to the stream, as well as the hydrologic conditions that are also found to be contributing to the impairment is appropriate and addresses both chemicals and habitat degradation.

Urban areas are more likely to contain impairing pollutants as anthropogenic sources are concentrated in these areas (EPA 1983. Results of the Nationwide Urban Runoff Program. PB84-185552). EPA's regulations state that TMDLs can be expressed in several ways, including in terms of toxicity, which is a characteristic of one or more pollutants, or by some other appropriate measure (40 CFR § 130.2(i)). They also state that TMDLs may be established using a biomonitoring approach as an alternative to the pollutant by pollutant approach (40 CFR § 130.7(c)(1)(i)). While urban areas are expected to be the major contributors to storm water (and pollutant) loadings, non-urban and agricultural sources are also discussed in the

TMDL. It cannot be over-emphasized that developed/urbanized areas contribute greater surface runoff per unit area basis compared to undeveloped/agricultural areas. Differences in runoff generating mechanism explain the disproportionate difference between higher peak flows and larger flow volumes from urbanized areas as compared to non-urbanized areas (see Appendix E for more detailed discussion). The TMDL addressed the entire flow regime from the watershed. Compared to the flow duration of bio-reference streams, the Pearson Creek watershed has higher flows in the lower durations which are usually associated with storm runoff

14. Comment: Under section 4.4.3, item 4, none of the stressors listed exist along Pearson Creek to any significant degree, or as a result of urbanization.

Response: The stressors identified in the first half of section 4.4.3 (four principal ways runoff from urbanized areas negatively impact aquatic life in streams) are defined in scientific literature and are not meant to be specific to Pearson Creek. The second half of section 4.4.3 (Figures 9 through 11) show the flow duration curve for data specific to Pearson Creek and demonstrate that a majority of the storm water impacts described in the literature are also present in Pearson Creek.

15. Comment: On Figures 9 and 10, the label of the x axis should be clarified. Percent exceedence is often calculated as annual exceedence but in this case it would appear the data was daily average and, therefore, the label should be Percent Daily Exceedence.

Response: Thank you for your comment, the x-axis labels on Figures 9 and 10 on page 29, have been corrected in the final TMDL.

16. Comment: Apparent typos in Appendix B include reference to Wilsons Creek rather than Pearson and reference to Christian County rather than Greene.

Response: Thank you for your comment. References to Wilson Creek on page 48 and Christian County on page 49 of Appendix B have been corrected in the final TMDL.

17. Comment: The draft TMDL relies on reference stream watersheds that have a significantly different size and land use composition than Pearson Creek. *The rationale supporting selection of these streams is not clear*. Scientific literature suggests that appropriate reference streams should have a watershed area that is within an order of magnitude of the test stream (Hughes et al. 1986). Plotting the Flow Duration Curves on a log scale gives the impression that the unit flows in the reference streams are very similar to each other when in fact they are not. For instance, at 5 percent exceedence, Bryant is approximately 2, North Fork is approximately 3 and Bull is approximately 4 cfs/square mile. The recommended flow for Pearson in the proposed TMDL, the average of the three, is approximately 3 cfs/square mile. Therefore, the TMDL is stating that at this point of the Flow Duration Curve, Pearson must have a flow of 3 cfs, 25 percent lower (better or less flashy) than Bull Creek, a pristine creek with a mostly forested watershed.

Response: The reference streams used in the TMDL are from the same ecological drainage unit (EDU) as Pearson Creek and follow MDNR's selection criteria for reference streams, per MDNR's Biological Criteria for Wadeable/Perennial Streams of Missouri, found online at http://www.dnr.mo.gov/env/esp/docs/BiologicalCriteriaforWadeableStreamsofMissouri.pdf. Reference streams from the same EDU were chosen to insure reference locations were similar to the impaired stream by virtue of what defines a collection of watersheds in one EDU: common zoogeographical history, physiography and climatic characteristics. The result of these shared characteristics is that watersheds in one EDU share similar distributions of animals, freshwater assemblages, habitats, weather and precipitation. To estimate the reference conditions of Pearson Creek, the synthetic (or representative) flow from the reference streams was derived from the average values of all the individual log transformed flow values (or median of the individual reference streams). Prior to the synthetic flow being derived from the average, all of the flows are normalized based on their respective watershed sizes. Please refer to section 4.5 which discusses reference watersheds in greater depth and provides reference to additional scientific literature. Furthermore, section 4.5.2 discusses the choice of the reference streams according to MDNR's reference stream criteria and applicable WQS (40 CFR § 131).

18. Comment: Appendix A should compare the data in the data summary table to WQS limits or levels believed to impact aquatic life so that specific toxins can be identified as the most likely cause of toxicity. This would be necessary for proper design of controls to minimize the impacts of that particular pollutant. For instance, if specific sources such as sediment from construction sites or PAHs from parking lot sealants were identified as probable causes of toxicity due to high levels in stream samples, relatively cheap actions could first be taken to begin to address those particular pollutants of concern rather than spending many millions of dollars that would be necessary to reduce runoff volume and change the Flow Duration Curve as described in the proposed TMDL and implementation plan.

Response: Water quality monitoring has not revealed an exceedance of a specific numeric water quality criterion. However, all Missouri streams are protected by the general criteria contained in Missouri's WQS at 10 CSR 20-7.031(3). In the case of Pearson Creek, data indicates that toxicity from multiple pollutants carried by storm water is the cause of the impairment. The amount of storm water running into Pearson Creek has increased significantly due to an increase in impervious surfaces in the watershed. The increase in impervious surfaces is the result of development in the watershed. Therefore, using a surrogate that represents the toxic pollutant loadings to the stream, as well as the hydrologic conditions that are also found to be contributing to the impairment is appropriate and addresses both chemicals and habitat degradation.

The surrogate relationship between urban storm water runoff and the toxic mix of pollutants impairing Pearson's warm-water aquatic life designated beneficial use is

explained in section 4.4 of the TMDL. The commentor is also directed to Response 6 above, where there is a broader discussion about the many sources, in addition to PAHs, that were identified by the TMDL and in local studies. Data used in the TMDL's calculations that wasn't in the draft TMDL is being placed into the water quality exchange and would be available to the public. Should more data be made available, MDNR may then consider submitting a revised or modified TMDL for this water at any time based on the newly obtained data.

19. Comment: The commentor suggests that since all streams in urban sections of Missouri have been impaired by loss of biodiversity for decades, returning Pearson Creek to an unimpaired state within 20 years is unlikely. Therefore, the short term goal should be to restore only a portion of the stream.

Response: Designated beneficial uses and any associated water criteria for each water body are determined by the state (40 CFR § 131.10(a) and 131.11(a)(1)). TMDLs shall be established for all pollutants preventing or expected to prevent attainment of WQS for the water body's use (40 CFR § 130.7(c)(1)(ii)). The state of Missouri has determined there is an impairment to the warm-water aquatic life designated beneficial use for an 8 mile length of Pearson Creek, that is identified as segment MO_2373 (10 CSR 20-7.031(1)(C) and Table H), on the EPA-approved 2008 Missouri 303(d) List. The draft TMDL was written to attain WQS for the entire watershed of Pearson Creek segment MO_2373.

20. Comment: The Karst topography needs more consideration in the TMDL. There are numerous concerns related to the proposed approach of massive, widespread runoff volume reduction in an urbanized area underlain with Karst geology. One of the primary concerns is pollution of groundwater and private drinking water wells. Also, the TMDL has not considered the effects that increased infiltration would have on accelerating the formation of sinkholes and collapses in the area's Karst geology. It is requested that these potential unintended consequences be clearly stated in the report so all costs and risks can be assessed. It is requested that a variety of BMPs be encouraged using site specific selection criteria that could rule out volume reduction as a feasible solution where particular potential risks are identified.

Response: TMDLs are written to meet surface WQS (40 CFR § 130.7(c)(1)(ii)). One of the hallmarks of the TMDL process is adaptive management or implementation. Adaptive implementation is 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. MDNR will work with permitted facilities identified in the TMDL as per EPA regulations, the state incorporates the TMDL into its current WQM plan for implementation (40 CFR § 130.7(d)(2)). Missouri has the authority to monitor and access state waters to ensure protection of the designated beneficial uses. Missouri may submit, and EPA may approve, a revised or modified TMDL for this water at any time.

21. Comment: In the TMDL, Jones Branch and Jones Spring are mentioned as possible significant sources of pollution based on water quality data taken above and below the Jones Branch tributary. Yet no information is provided regarding the recharge area of Jones Spring in the TMDL and it is not shown on the map or included in drainage area and runoff calculations. The Jones Spring Complex (a recharge area) was modified to accept higher volumes of storm flow providing base-flow to Pearson Creek which would otherwise be dry much of the year. The recharge area of Jones Spring has been well-documented through dye tracing and has been identified primarily as an internally drained area west of U.S. 65, at least two square miles in size, making it a significant part of the watershed that has been overlooked in this study. Without the recharge area for the Jones Spring added to the total Pearson watershed area, the unit runoff calculations and other related calculations are in error.

Response: TMDLs are calculated to attain WQS with a MOS which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality (40 CFR § 130.7(c)(1)). The high number of springs located in the Pearson Creek drainage area creates a potential for error when quantifying the unit runoff calculations, as discussed in the comment. This potential source of error is addressed by Pearson Creek's MOS. This TMDL is established with an implicit MOS by using conservative assumptions during the development of the target flow duration curve. The TMDL specifically targets reducing storm water runoff at the higher flows. Slowing and retaining storm water promotes infiltration, which aids ground water recharge. Groundwater recharge results in increasing base flows. Please refer to section 7 of the TMDL.

22. Comment: Returning Pearson Creek to a pristine condition is unrealistic given that we cannot infiltrate a large enough portion of the urban runoff flow in Karst to achieve restoration for both surface flow conditions and high surface/groundwater quality. A better goal is targeting basic watershed functions (including moderate recovery of stream life) through "soft techniques" like natural drop structures and bioengineered bank stabilization that would accommodate urban stream flow characteristics while at the same time improving stream water quality and aquatic habitat.

Response: TMDLs must be written to meet WQS and address impairment to a water body's designated beneficial use (40 CFR § 130.7(c)(1)(ii)), rather than targeting watershed functions. TMDLs are calculations that set the maximum amount of pollutants a water body can assimilate and meet WQS. The commentor suggests BMPs that would be part of implementation. While EPA doesn't establish implementation plans in TMDLs, EPA does agree that BMPs may have a strong influence on instream water quality and habitat. MDNR may work with the Natural Resources Conservation District to encourage area land owners to implement BMPs.

23. Comment: The city of Springfield is currently researching the effects of PAHs on local aquatic environments. Although there isn't any current state or federal restrictions on PAHs, the potential for bans or restrictions on these sorts of chemicals is possible.

The TMDL needs to be flexible enough to recognize that practices may need to be added or modified in the future, but not specifically mandated in case further research determines the problem is not significant.

A similar comment concerning possible future developments in Pearson Creek: The commentor suggests that TMDLs are the process whereby water quality is intended to be improved and watershed functions restored. Many water resource organizations in the Springfield area share these goals and have submitted a CWA Section 319 project which will implement new urban storm water management techniques. However, the draft TMDL forces regulatory fixes on our community before the new techniques can be tested to see if they solve the problems.

Response: EPA appreciates the interest shown by water resource organizations in the Springfield area by planning a 319 project to address the issues facing the watershed. TMDLs must be written to meet WQS and address impairment to a water body's designated beneficial use (40 CFR § 130.7(c)(1)(ii)). TMDLs are not written to target watershed functions or future developments in streams or watersheds. However, MDNR may submit and EPA may approve a revised or modified TMDL at any time based on new research, restrictions or data that may impact the existing TMDL.

24. Comment: The commentor is concerned that attainment requirements described in the TMDL are more stringent than those described by MDNR in the 2010 303(d) listing procedures and requests clarification regarding this requirement.

Response: TMDLs are written to meet surface WQS (40 CFR § 130.7(c)(1)(ii)). The listing and designated uses of this water body are beyond the scope of this specific TMDL public notice. Table A of Missouri's WQS (10 CSR 20-7.031), entitled "Criteria for Designated Uses" identifies the criteria associated with the "Protection of Aquatic Life" use designation.

LIST OF COMMENTORS

1. Todd G. Wagner, Stormwater Services Division, City of Springfield, Missouri.
2. Loring Bullard, Watershed Committee of the Ozarks, Inc., Springfield, Missouri.

END SUMMARY OF COMMENT AND RESPONSES