West Fork Niangua River 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
December 2010

INTRODUCTION

EPA public noticed a draft TMDL for West Fork Niangua River (water body identification MO_1175) from October 13 to November 15, 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. 98-482-CV-W, (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 requests to see the Quality Assurance Project Plan that supports the sampling approach used to develop the dataset and TMDL.

1. Response: EPA thanks the commentor for their interest in the TMDL. The data used in the TMDL came from Missouri Department of Natural Resources (MDNR) and was generated by Midwest Environmental Consultants through a contract with MDNR. The data used in the modeling were the best available when writing the TMDL and met MDNR quality assurance requirements for data inclusion: represents instream conditions and meets the Quality Assurance/Quality Control levels of Missouri's Listing Methodology document (10 CSR 20-7.031 and 10 CSR 20-7.050).

To obtain MDNR data, the state's website offers some data online and a request system: http://www.dnr.mo.gov/env/wpp/waterquality/303d/2008/proposed-2008-303d-list-data.htm and http://www.dnr.mo.gov/env/wpp/tmdl/index.html. The commentor may also call MDNR's Water Quality Monitoring and Assessment Section who maintains information on the past and current quality of water in Missouri and makes the information available to other agencies and the general public (573-751-6623).

2. Comment: Because of data concerns, commentors request that the TMDL not be used to set NPDES WLA effluent limitations.

2. Response: National Pollutant Discharge Elimination System (NPDES)-regulated storm water discharges must be addressed by the wasteload allocation (WLA) component of a TMDL and cannot be removed from the TMDL, please refer to the Code of Federal Regulations at 40 CFR § 130.2(h). Per EPA regulations, it is the state that incorporates the TMDL into its current water quality management plan for implementation (40 CFR 130.7(d)(2)). The conversion of WLAs to permit limits is performed by the state (40 CFR

122.44), specifically MDNR's NPDES Permits and Engineering Section sets permit limits. 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.

Addressing the commentor's data concerns, West Fork Niangua River's TMDL includes an implicit margin of safety (MOS) which accounts for uncertainties from the data or other factors by using conservative assumptions as described in Section 10 of the TMDL and supported by (40 CFR § 130.7(c)(1)). The data used in the modeling were the best available when writing the TMDL and met MDNR requirements for data inclusion: represents instream conditions and meets the Quality Assurance/Quality Control levels of Missouri's Listing Methodology document (10 CSR 20-7.031 and 10 CSR 20-7.050).

3. Comment: The commentor believes that the nutrient wasteload should be removed from the TMDL because the listed impairment is low dissolved oxygen and EPA hasn't demonstrated that nutrient WLAs are necessary to achieve the statewide DO criterion.

A similar comment about the nutrient loads in the TMDL: Missouri is developing nutrient criteria that will potentially be in Missouri's 2012 Triennial Review. The Missouri Clean Water Commission has not approved total phosphorus [TP] or total nitrogen [TN] criteria for Missouri waters. The TMDL should provide the flexibility to incorporate state-developed nutrient criteria and implementation policies only when or where a quantitative and site-specific linkage is established. Absent a cause and effect relationship between these factors, the commentor requests that the nutrient criteria used in the TMDL be removed.

3. Response: EPA believes that the methodology linking the impairments as described in Appendix B, C & D of the TMDL is technically defensible. This is not a new methodology; the MDNR has used the methodology in developing several TMDLs that were subsequently approved by EPA.

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). It is true that Missouri does not have a numeric criterion for TN and TP in freshwater streams; therefore, targets and loading capacities (LCs) are based on EPA-recommended Level III Ecoregion 39 (Ozark/Osage Ecological Drainage Unit (EDU)) reference concentrations and water quality observations throughout the ecoregion where West Fork Niangua River is located. Percent reductions cannot be calculated for TP and TN because the permitted facilities do not have permit limits for these constituents. Please refer to Section 3.1 and Appendix D for a full explanation of how TN and TP are used as translator in this TMDL; refer to Sections 7 and 8 in the TMDL for full discussions about the WLA and LA for TP and TN.

4. Comment: In addition to total nitrogen and total phosphorus, EPA has also published ecoregional criteria guidance for sestonic and benthic algae. The periphyton criterion specified

for Ecoregion 39 is 32.5 mg Chl_a m^{-2} and is comparable to the 40 mg Chl_a m^{-2} value established by the Region 7 Regional Technical Assistance Group (RTAG). The QUAL2K allocation model simulates periphyton densities above these values, raising an independent applicability concern. As nutrient-algae relationships are uncalibrated and nutrient half-saturation values are well above suggested criteria, the commentor requests EPA to revise the TMDL, and allocation model, to reflect simulation of benthic algae at or below ecoregional targets.

4. Response: The TMDL's QUAL2K model was calibrated, based on July 12, 2000 for summer season and October 19, 2004 for fall season. After it was calibrated, the model was used to estimate the effluent pollutant load reduction needed to achieve the Dissolved Oxygen (DO) WQS criteria of a daily minimum of 5 milligrams per liter (mg/L). Based on the field water quality data, zero order growth modeling was used to depict benthic algae in the Niangua River, with maximum growth rate set to 100 mgA/m2/d (milligrams chlorophyll a per square meters per day).

A scenario was simulated where a major wastewater treatment plant would discharge its effluent with ecoregional nutrient levels to the river. The scenario revealed that under the current stream conditions, the portion of the Niangua River that's downstream from the treatment plant would meet the DO criterion and support its aquatic life designated use. The resulting wasteload model simulation was the aim of the TMDL.

As requested by the commentor, a model with the RTAG periphyton benchmark (32.5 mgA/m2, an average value for Ecoregion 39) was tested for the reference stream condition. This model shows that the DO condition in the river would also meet the DO criterion and this DO condition would be only slightly better than the DO condition predicted by the current model. This model would not result in any changes to load allocations in the TMDL.

5. Comment: Nutrient allocations are beyond the limits of tertiary wastewater treatment technology and would likely result in significant socioeconomic impact to the citizens of Marshfield. The commentor requests that the extent of DO benefits achieved through proposed nutrient removal requirements be demonstrated prior to issuance of the final TMDL.

5. Response: The Niangua TMDL was written with the best available data at the time and under the obligations of the Consent Decree. Based on that available data, the TMDL is written to meet WQS without regard to cost or available treatment technology (40 CFR 130.7(c)(1)(ii)). It is MDNR that will work with permitted facilities identified in the TMDL. Per EPA regulations the state incorporates the TMDL into its current water quality management plan for implementation (40 CFR 130.7(c)(1)).

Should WLAs result in effluent limitations that are beyond the limits of current treatment technology (including tertiary wastewater treatment technology), MDNR may develop a phased approach to implementation of effluent limitations through the use of the best available treatment technology. This approach can be implemented either within the operating permit or through a settlement agreement. The conversion of WLAs to permit limits is the purview of the MDNR's 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.

EPA understands that resources are limited and that communities are sometimes hard pressed to meet the demands of water and wastewater system improvements. EPA urges the commentor to work with MDNR's Financial Assistance Center to discuss grant, low-interest loans or other options that may be available to the city should wastewater system improvements be necessary. To reach MDNR's Financial Assistance Center, call (573) 751-1192 and ask for either Mr. Doug Garrett or Ms. Traci Newberry, or email Mr. Garrett at doug.garrett@dnr.mo.gov. You can also find them on the Web at http://www.dnr.mo.gov/env/wpp/srf/index.html.

6. Comment: Total suspended solids (TSS) concentrations simulated in the allocation model are greater than Table 12 values. WLAs for TSS listed in the draft QUAL2K model are greater than values listed in Table 12 of the draft TMDL. The commentor requests that if a TSS WLA is included in the TMDL, then it be appropriately included in the allocation model.

6. Response: The commenter is correct that the values in Table 12 differ from the TSS concentrations simulated in the allocation model and the WLAs for TSS listed in the draft QUAL2K model. However, both are correct. Table 12 is correct because it uses a monthly permit TSS value (15 mg/L). A weekly permit value (20 mg/L) was used in the model for WLA and LA which is also appropriate. The TMDL conversion between weekly and monthly values for TSS do not impact loading allocations because DO is the focus of the model.

7. Comment: It is not clear what basis supports the derivation and application of a TSS criterion because mechanistic processes linking volatile suspended solids (VSS), sediment oxygen demand (SOD), and dissolved oxygen are largely empirical as benthic demands are largely (>70%) prescribed in the model. It appears that high levels of prescribed SOD were used to fit available dissolved oxygen data. High proportions of prescribed SOD significantly diminish the process-based connection between VSS, SOD and dissolved oxygen; thereby reducing the certainty that reduction in TSS will have any effect on instream dissolved oxygen levels. Further, total SOD values used in the model are at the very upper end of values cited in literature. Environments typically hosting high levels of SOD feature channels composed of organic substrates and/or reduced velocity gradients (backwaters, sloughs, etc.). The commentor believes EPA should reconsider use of prescribed SOD in a revised model.

7. Response: EPA believes that the methodology linking the sources and listed cause of impairments as described in Appendix B, C & D of the TMDL is technically defensible. This is not a new methodology; MDNR has used the methodology in developing several TMDLs that were subsequently approved by EPA. The commentor is directed to Section 6 and Appendix C for a full discussion of the basis supporting the TSS criterion (also refer to Response 14 below). Appendix B of the TMDL describes in detail the modeling. Section B.3.2 of the TMDL discusses the Water Quality Calibration, including an in-depth

discussion about SOD conditions as they were prescribed for each reach of the West Fork Niangua River.

8. Comment: Losing stream hydrologic processes may be oversimplified. As mentioned in the draft TMDL, the WFNR [West Fork Niangua River] has been identified by MDNR hydrogeologists as a losing stream. To incorporate gaining and losing phenomena into the QUAL2K flow balance, diffuse abstractions and sources were used that specified concentrations of CBOD [Carbonaceous Biochemical Oxygen Demand], ammonia and dissolved oxygen of 1.5-2.5 mg/L, 100 ug/L and 6.5 mg/L, respectively. It is not clear what data support high DO concentrations from groundwater sources. Further, in the presence of presumed high DO, it is likely that ammonia and CBOD would oxidize. Hypothetically then, ammonia exported from losing reaches should have less ammonia than imported to the reach absent hydrolysis of organic compounds. Chemistries of diffuse sources and abstraction should be further evaluated within a revised model. Alternatively, we note that QUALKW, a model version authored by Greg Pelletier is better suited to losing stream environments and hyporheic exchange processes. Accuracy of solute transport in some reaches is limited by the simplified approach (see river kilometer 9.01 in 2004 conductivity calibration).

8. Response: In summary, the commentor discusses the gaining and losing phenomena inherent to losing stream hydrologic processes and how the QUAL2K model takes this phenomena into account. The commenter inquired about what high DO data was used in the TMDL's modeling. And finally, the commentor proposes an alternative model that would, in the commentor's best professional judgment, be a better model for a losing stream.

The QUAL2K water quality model was selected for the development of the Niangua TMDL because it is used extensively for TMDL development across the country, especially for issues related to DO concentrations. QUAL2K is discussed in detail in Response 15 below and in Appendix B of the TMDL.

The commentor is directed to the Appendices cited at relevant points in the body of the TMDL to find specific data and further analyses. The sources for all raw data used in the draft TMDL are listed in the References Section. Data used in the TMDL's calculations not in the draft TMDL is being placed into STORET 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.

EPA appreciates information on modeling alternatives. As previously indicated, QUAL2K was selected because of its extensive national use for DO streams, reliability and ability to simulate hydraulics and water quality conditions of small rivers and streams.

9. Comment: The commentor believes that EPA should collect additional data to quantify contributions of shallow groundwater and reaeration processes to the DO balance prior to implementing TMDL WLAs. As an example for why additional data should be collected for modeling purposes the commentor discusses how shallow groundwater and natural reaeration processes are likely contributing to critical dissolved oxygen deficits.

9. Response: EPA agrees that is always preferable to have as much data as possible. However in this instance, modeling appropriately supplemented the limited data. Data in the draft TMDL has been analyzed and presented consistent with the procedures included in Appendices A, B, C, D and E; 40 CFR 130.2(i) and 40 CFR 130.7(c)(1). Based on the model's calibration and validation, the model was well parameterized and adequately described the processes in West Fork Niangua River. Additionally, conservative assumptions and the MOS in the TMDL allow for variability as described by the commenter. The data used in the draft TMDL were the best available when writing the TMDL. Missouri may submit and EPA may approve a revised or modified TMDL for this water at any time. 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 incorporating new data and information to reduce uncertainty and adjust implementation activities.

10. Comment: The W. Fk. [West Fork] Niangua River should include adaptive management provisions. The commentor believes that a phased or adaptive management approach should be incorporated into the TMDL. Data cited in the TMDL indicate that dissolved oxygen regimes in the WFNR have not been synoptically measured since 2004.

10. Response: The TMDL is being written at this time to satisfy the requirements of the Consent Decree. The data used in the draft TMDL were the best available when writing the TMDL. Missouri may submit and EPA may approve a revised or modified TMDL for this water at any time. Should more data be made available, MDNR may then consider submitting a revised or modified TMDL for this water based on the newly obtained data. TMDLs are written to meet current surface WQS (40 CFR § 130.7(c)(1)(ii)). EPA appreciates the commentor's information about the need for future measurements that may improve conditions in West Fork Niangua River. 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 water quality management plan for implementation (40 CFR § 130.7(c)(1)). Missouri has the authority to monitor and access state waters to ensure protection of the designated beneficial uses.

11. Comment: The commentor invested over 5 million dollars in 2001 to design and construct a tertiary filtration WWTF to meet effluent regulations during the previous renewal process. We note the most recent dataset (2004) was collected after construction of the new Marshfield WWTF in 2001 and does not include DO concentrations below the statewide criterion. It is possible that DO regimes in the WFNR have improved, due in part, to enhanced effluent quality

from the new Marshfield WWTF. In addition, the TMDL model is not well supported by available data. For these reasons, the commentor requests that TMDL implementation include an adaptive management approach and reopener provisions to respecify, or remove, allocations pending results of additional in-stream monitoring or changes to Missouri's water quality standards.

11. Response: EPA applauds the commentor for steps already taken to improve its watershed. The Niangua TMDL was written with the best available data at the time that the TMDL was written. The TMDL is being written at this time to meet the obligations of the Consent Decree. TMDLs are designed to meet WQS without regard to cost or available treatment technology (40 CFR 130.7(c)(1)(ii)). However, EPA understands that resources are limited and that communities are sometimes hard pressed to meet the demands of water and wastewater system improvements. It is MDNR that will work with permitted facilities identified in the TMDL as per EPA because it is the state that incorporates the TMDL into its current water quality management plan for implementation (40 CFR §130.7(d)(2)). It is through MDNR that the commentor may find assistance in implementation. Resources are given below to help the commentor.

Should WLAs result in effluent limitations that are beyond the limits of current treatment technology, MDNR may develop a phased approach to implementation of effluent limitations through the use of the best available treatment technology. This approach can be implemented either within the operating permit or through a settlement agreement. The conversion of WLAs to permit limits is the purview of the MDNR's 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.

EPA urges the commentor to work with MDNR's Financial Assistance Center to discuss grant and low-interest loan options that may be available to the city should wastewater system improvements be necessary. To reach MDNR's Financial Assistance Center, call (573) 751-1192 and ask for either Mr. Doug Garrett or Ms. Traci Newberry, or email Mr. Garrett at doug.garrett@dnr.mo.gov. You can also find them on the Web at http://www.dnr.mo.gov/env/wpp/srf/index.html.

12. Comment: Commentor is a Missouri Stream Team Volunteer from the New Hope Team who reviewed the draft TMDL and supports the TMDL for West Fork Niangua River.

12. Response: Thank you. EPA appreciates support from groups working to improve their watersheds.

13. Comment: Commentor opposes any expansion of the Marshfield WWTP and also supports the TMDL's WLA.

13. Response: EPA thanks the commentor for their support of the TMDL. EPA also encourages the commentor to work with volunteer groups already active in their watershed.

14. Comment: The Missouri Clean Water Commission has not adopted an in stream water quality criterion for total suspended solids so what is the technical and regulatory basis for total suspended solids allocations in the TMDL.

A similar comment on the technical and regulatory basis for TSS in the TMDL: Since documentation of narrative criteria concerns were not included in the TMDL the technical and regulatory basis for total suspended solids allocations is unclear.

14. Response: 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). Additionally, narrative criteria are discussed in Section 4.2 of the TMDL.

From the TMDL: The narrative criteria not being met in the West Fork Niangua River are (3)(A),(C), (D) and (G), as follows:

- **Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.**

- **Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.**

- **Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.**

- **Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.**

In the absence of Missouri numeric criteria for nutrients in freshwater streams, ambient water quality criteria recommendations provided by EPA are used to quantify TN and TP LCs in Ecoregion 39 and West Fork Niangua River. For this TMDL, recommended TN and TP criteria are used directly in developing LCs for TN and TP. There are many quantitative indicators of sediment, such as TSS, turbidity and bedload sediment, which are appropriate to describe sediment in rivers and streams. A concentration of TSS was selected to represent the numeric target for this TMDL because it enables the use of the highest quality available data and is included in monitoring data.

Additional discussion on watershed-specific targets used to develop LCs for TSS, TN, TP and DO is provided in Section 5.1 and 5.2 of this TMDL.

15. Comment: The WFNR is a riffle-pool system near the WWTF, predominated with cobble, gravel, and coarse sand substrates. The QUAL2K model assumes a high proportion of organic,

oxygen consuming, substrate. Absent in-situ respirometry to the contrary, visual observation suggests that organic substrates compose much less than 75% of the streambed.

15. Response: EPA believes that West Fork Niangua's QUAL2K modeling is scientifically defensible and dynamically models the in-situ respirometry of West Fork Niangua River.

A more detailed discussion of why QUAL2K is a scientifically defensible choice to model West Fork Niangua: The QUAL2K water quality model was selected for the development of the Niangua TMDL because it is used extensively for TMDL development in point source permitting issues across the country, especially for issues related to DO concentrations. The QUAL2K model is suitable for simulating hydraulics and water quality conditions of small rivers and streams (including the conditions the commentor references). It is a one-dimensional uniform flow model with the assumption of a completely mixed system for each computational cell. QUAL2K assumes that the major pollutant transport mechanisms, advection and dispersion, are significant only along the longitudinal direction of flow. The model allows for multiple waste discharges, water withdrawals, nonpoint source loading, tributary flows and incremental inflows and outflows. The processes employed in QUAL2K addresses nutrient cycles, algal growth, particulate settling, Sediment Oxygen Demand (SOD) and DO dynamics. See Appendix B for a detailed explanation of how the QUAL2K modeling in the Niangua TMDL is performed.

The data used in the modeling were the best available when writing the TMDL. If the commentor provides new data indicating that organic substrates compose much less than 75% of the streambed, it must also meet MDNR requirements for data inclusion: represents instream conditions and meets the Quality Assurance/Quality Control levels of Missouri's Listing Methodology document (10 CSR 20-7.031 and 10 CSR 20-7.050). MDNR may submit and EPA may approve a revised or modified TMDL for this water at any time based on newly obtained data that meets MDNR's requirements for data inclusion.

LIST OF COMMENTORS

1. Jami Gay, Missouri Stream Team Volunteer, Missouri
2. Anonymous, Citizen
3. Chris Zell, Geosyntec Consultants for the city of Marshfield, Missouri

END SUMMARY OF COMMENTS AND RESPONSES

MO. proposed TMDL for West Fork Niangua River

Daniel Gay to: R7TMDL 10/31/2010 12:38 PM

Follow Up: Normal Priority.

History: This message has been replied to.

I am a MO. Stream Team trained/certified member (#3957 - New Hope Team) for monitoring local streams.
I am Jami Gay and sample Panther Creek a small stream in Webster County routinely to gather data on the environmental quality of that stream.

I have examined info on the proposed TMDL standard for the West Fork of the Niangua River. I would
support adoption of this standard to protect the Niangua River.

Thank you.

To: anonymous
Cc:
Bcc:
Subject: Re: Marshfield wwtp/Ms Debby White
From: R7TMDL - Monday 11/01/2010 04:09 PM
Sent by: Debby White/R7/USEPA/US

requests anonymity! Does not want name released to public. DBW

Dear Commenter:

This email confirms receipt of your comment. When the comment period closes, all comments will be considered and the TMDL will be edited as is appropriate.

After the public notice for this TMDL closes, you may see how your comment was addressed by going to the following website:
http://www.epa.gov/region07/water/apprtmdl.htm

Thank you for your support.

Please direct further comments (before public notice closes) to:

Ms. Debby White
Environmental Protection Agency, Region 7
Total Maximum Daily Load Program
Mail Code 3121A/WWPD/WQMB
901 North 5th Street
Kansas City, Kansas 66101

FAX: 913-551-9886
Public Notice Email: R7TMDL@epa.gov

Ms White . Thank you for taking the time to read... 11/01/2010 01:21:50 PM

From: anonymous
To: R7TMDL@EPA
Date: 11/01/2010 01:21 PM
Subject: Marshfield wwtp/Ms Debby White

Ms White . Thank you for taking the time to read my comment concerning the wwtp facility of Marshfield Mo. I understand that storm water run off is presenting problems for this community as well as others . I believe Marshfield will use these new regulations as an excuse to build a new treatment facility that basically improves one extended family's property and pollutes the Pomme De Terre river .Marshfield will no doubt still need to improve the existing plant on the west fork of the Niangua so it should be mandated by your agency that they expand ,update and improve this existing

facility instead of multiplying the mismanagement of local utilities by two . Do not allow Marshfield to pollute a second pristine river (which by the way I believe to be habitat of the protected Hellbender). This is clearly a politically motivated attempt to use tax dollars to improve two related primary landowners (more that 600 acres)Foglesong and Foster . Do not allow Marshfield to proceed with building a new facility that discharges into the Pomme De Terre . They have already bought 15 acres from Foster for this purpose . A former Alderman tells me they paid Foster $300k for a property that a local R.Estate broker has an appraisal for $90k and agreed to build 1/2 mile road to it . I don't believe they followed sunshine law to purchase this property . Just an example of how things are done here . Watch them closely. Please omit my name from any public release of comments I will however be willing to talk to any agency needed to stop this politically motivated discharge into the Pomm De Terre . Thank You

Hoke, John

From: CZell@Geosyntec.com
Sent: Saturday, November 13, 2010 10:54 AM
To: White.Debby@epa.gov; R7TMDL@EPA.GOV
Cc: johncooper@marshfieldmo.gov; reedre@missouri.edu; Hoke, John; Adkins.Tabatha@epamail.epa.gov
Subject: W. Fk. Niangua River TMDL Public Notice Comments
Attachments: W Fk Niangua Draft TMDL Public Notice Comment Letter_FINAL.pdf

Good Morning Ms. White,

On behalf of the City of Marshfield, Missouri please find attached public notice comments regarding the draft Total Maximum Daily Load developed for the West Fork Niangua River. We look forward to working with you and your staff in addressing the City's concerns. We will providing these comments by fax on Monday November 15th, 2010 as well.

Thank you for your time and consideration.

Sincerely,

Chris Zell
Project Scientist

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November 13, 2010

Ms. Debby White
U.S. Environmental Protection Agency – Region 7
Water, Wetlands and Pesticides Division
901 North 5th St.
Kansas City, KS 66101

Subject: Public Notice Comments on W. Fk. Niangua River Total Maximum Daily Load Report

Dear Ms. White:

On behalf of the City of Marshfield, MO ('City'), Geosyntec Consultants (Geosyntec) appreciates this opportunity to comment on the draft of the West Fork Niangua River (WFNR) Total Maximum Daily Load (TMDL) placed on public notice October 12th, 2010. We appreciate the continued dedication by EPA to maintain and protect our aquatic resources through various regulatory programs, including TMDL requirements set forth in 40 CFR 130.2. However, the WFNR TMDL includes wasteload allocations (WLAs) for the Marshfield wastewater treatment facility (WWTF) that cannot be achieved with municipal wastewater treatment technology. Underpinning these WLAs is a complex mechanistic dissolved oxygen (DO) model (QUAL2K) calibrated to a sparse and questionably representative dataset. Proposed TMDL requirements and allocations would place a significant financial burden on the City and are clearly disproportionate to the level of data rigor thus far invested in receiving stream analyses. Therefore, the City requests the TMDL be adaptive and specifically include provisions that WLAs be modified, or removed, pending updates to available datasets, modeling approaches, or applicable water quality standards.

We respectfully request that your staff consider the following comments before formulating the final TMDL for the West Fork of the Niangua River.

General Comment #1
Data cited in the TMDL do not support application of a complex mechanistic model.

Data requirements for DO TMDLs are well documented and supported within a Standard Operating Procedure titled "Project Procedure for Wasteload Allocation/Special Stream Studies" developed by the Missouri Department of Natural Resources (MDNR). Briefly, this SOP dictates a minimum of two intensive surveys be conducted during warm-weather low-flow conditions. Each survey generates n=4 data points per site for several parameters; 2 in the early morning, 2 in the afternoon. Data provided in Appendices of the draft TMDL do not appear to follow MDNR's recommended sampling design as:

- ✓ October 2004 data were not collected during warm-weather low-flow conditions;
- ✓ Information provided in the draft TMDL suggests that less than n=4 data points were collected per monitoring site per sampling event; and
- ✓ Algae and dissolved inorganic phosphorus data, critical model inputs for diel DO and eutrophication modeling, appear absent from model calibration datasets included in the TMDL.

While useful information is provided in the TMDL, data do not appear to be of sufficient quantity (n<4 data points per site per event) or quality (key parameters missing, seasonal representativeness) to support application of a complex mechanistic model. Given the paucity of data, uncertainty in model predictions and associated TMDL conclusions are significant. Therefore, the City requests the TMDL not be issued until data concerns described in this letter have been satisfactorily addressed by EPA. The City offers two specific requests to EPA in regards to data adequacy:

1. <u>The City requests EPA provide the City a copy of the Quality Assurance Project Plan (QAPP) that supports the sampling approach used to develop the WFNR dataset and TMDL.</u>

2. <u>If the City's data concerns are not satisfactorily addressed before the final TMDL is issued, the City requests that EPA include within Appendix F (Implementation) that WLA's in the draft TMDL will not be used to derive NPDES permit effluent limits until the WLA's are confirmed with a more robust monitoring and modeling effort of the WFNR.</u>

General Comment #2
Wasteload allocations for nutrients are questionable and should be reconsidered.

Included within Table 12 of the draft TMDL are wasteload allocations of 0.007 mg/L and 0.289 mg/L for total phosphorus and total nitrogen, respectively. It is not clear why nutrient wasteload allocations are included within the TMDL as the listed impairment for W. Fk. Niangua River is low dissolved oxygen. The TMDL infers that DO is impacted by excessive algae, both through respiration and/or contribution to the detritus pool and sediment oxygen demand. While this general relationship certainly exists, the quantitative response of algae to dissolved nutrients, and ultimately to the DO balance, is well understood to be site-specific. Nutrient, algae, and DO relationships in the QUAL2K model that supports TMDL allocations appear uncalibrated as neither algae, macrophyte, nor dissolved inorganic phosphorus data are referenced in the TMDL. In a fundamental sense, the City believes EPA has not demonstrated that nutrient WLAs are necessary to achieve the statewide DO criterion. Therefore, the City believes that EPA should remove nutrient wasteload allocations from the TMDL. In addition, the City offers the following specific comments related to nutrient criteria and wasteload allocations within the TMDL:

1. It is not clear why EPA is choosing to preempt development of nutrient criteria by the State of Missouri. Scientists at MDNR are in the process of developing stream nutrient criteria for potential inclusion within Missouri's 2012 Triennial Review. Currently however, the Missouri Clean Water Commission has not approved total phosphorus or total nitrogen criteria for Missouri streams and rivers. The City believes the TMDL should provide the flexibility to incorporate state-developed nutrient criteria and implementation policies only when or where a quantitative and site-specific linkage between DO and nutrients is established for W. Fk. Nianagua River.

2. Ecoregional nutrient criteria are not grounded in cause and effect. Recent recommendations by the EPA Science Advisory Board (04/27/2010) encourage EPA to recognize the importance of quantifying stressor- response, cause-effect, and weight-of-evidence in establishing nutrient criteria. Ecoregional criteria used in the draft TMDL are based on quantile analyses of ecoregional nutrient data and do not quantify the relationship of derived criteria to designated use attainment or effects to aquatic biota. Absent a cause-effect demonstration in this general sense, or in a site-specific sense (see comment 2.1), the City believes nutrient criteria used in the WFNR TMDL are not well supported and should be removed.

3. In addition to total nitrogen and total phosphorus, EPA has also published ecoregional criteria guidance for sestonic and benthic algae. The periphyton criterion specified for Ecoregion 39 is 32.5 mg Chl_a m^{-2} and is comparable to the 40 mg Chl_a m^{-2} value established by the Region 7 Regional Technical Assistance Group (RTAG). The QUAL2K allocation model simulates periphyton densities above these values, raising an independent applicability concern. As nutrient-algae relationships are uncalibrated and nutrient half-saturation values are well above suggested criteria, the City requests EPA to revise the TMDL, and allocation model, to reflect simulation of benthic algae at or below ecoregional targets.

4. Nutrient allocations are beyond the limits of tertiary wastewater treatment technology and would likely result in significant socioeconomic impact to the citizens of Marshfield. The City requests that the extent of DO benefits achieved through proposed nutrient removal requirements should clearly be demonstrated prior to issuance of the final TMDL.

5. Total suspended solids (TSS) concentrations simulated in the allocation model are greater than Table 12 values. Wasteload allocations for TSS listed in the draft QUAL2K model are greater than values listed in Table 12 of the draft TMDL. The City requests that if a TSS wasteload allocation is included in the TMDL, then it be appropriately included in the allocation model.

General Comment #4
The technical and regulatory basis for total suspended solids allocations is unclear.
WFNR has been listed for low dissolved oxygen, not TSS. It is not clear what basis supports the derivation and application of a TSS criterion as:

- ✓ The Missouri Clean Water Commission has not adopted an in-stream water quality criterion for total suspended solids;
- ✓ Documentation of narrative criteria concerns were not included in the TMDL; and
- ✓ Mechanistic processes linking volatile suspended solids (VSS), sediment oxygen demand (SOD), and dissolved oxygen are largely empirical as benthic demands are largely (>70%) prescribed in the model.

It appears that high levels of prescribed sediment oxygen demand were used to fit available dissolved oxygen data. High proportions of prescribed SOD significantly diminish the process-based connection between VSS, SOD, and dissolved oxygen; thereby reducing the certainty that reduction in TSS will have any effect on in-stream dissolved oxygen levels. Further, total SOD values used in the model are at the very upper end of values cited in literature.

Environments typically hosting high levels of SOD feature channels composed of organic substrates and/or reduced velocity gradients (backwaters, sloughs etc.). The City believes EPA should reconsider use of prescribed SOD in a revised model.

Further, the City notes that the WFNR is a riffle-pool system near the WWTF, predominated with cobble, gravel, and coarse sand substrates (see below for 2004 image). The QUAL2K model assumes a high proportion of organic, oxygen consuming, substrate (~ 75% bottom coverage). Absent in-situ respirometry to the contrary, visual observation suggests that organic substrates compose much less than 75% of the streambed.

W. Fk. Niangua River Approximately 3,000 feet downstream of Marshfield WWTF - 19 October 2004

General Comment #5
Losing stream hydrologic processes may be oversimplified.
As mentioned in the draft TMDL, the WFNR has been identified by MDNR hydrogeologists as a losing stream. To incorporate gaining and losing phenomena into the QUAL2K flow balance, diffuse abstractions and sources were used that specified concentrations of CBOD, ammonia, and dissolved oxygen of 1.5-2.5 mg/L, 100 ug/L, and 6.5 mg/L, respectively. It is not clear what data support high DO concentrations from groundwater sources. Further, in the presence of presumed high DO, it is likely that ammonia and CBOD would oxidize. Hypothetically then, ammonia exported from losing reaches should have less ammonia than imported to the reach absent hydrolysis of organic compounds. Chemistries of diffuse sources and abstraction should be further evaluated within a revised model. Alternatively, we note that QUALKW, a model version authored by Greg Pelletier is better suited to losing stream environments and hyporheic exchange processes. Accuracy of solute transport in some reaches is limited by the simplified approach (see river kilometer 9.01 in 2004 conductivity calibration).

General Comment #6
Shallow groundwater and natural reaeration processes are likely contributing to critical dissolved oxygen deficits.
Recently ($\leq$10 years) collected data in the WFNR listed in Appendix A poorly support the argument that the Marshfield WWTF is responsible for DO concentrations below 5 mg/L. Of the n=2 DO values below the statewide criterion of 5 mg/L, contemporaneous data for CBOD and ammonia are non-detect at these monitoring locations. Inferences of algae causing DO<5 mg/L is questionable as algae data (AFDW or Chl_a) were apparently not collected to support calibration and validation.

Flow is reported as '0 cfs' for one location (losing reach) in the July 2000 dataset. Absent velocity to drive turbulent mixing, DO mass transfer is primarily dependent on episodic wind shear. It is quite possible that reaeration levels depicted in the QUAL2K calibration are greater than true values (overestimated) in losing reaches where longitudinal velocity gradients become negligible. The City believes that EPA should collect additional data to quantify contributions of shallow groundwater and reaeration processes to the DO balance prior to implementing TMDL wasteload allocations.

General Comment #7
The W. Fk. Niangua River should include adaptive management provisions.
The City believes that a phased or adaptive management approach should be incorporated into the TMDL. Data cited in the TMDL indicate that dissolved oxygen regimes in the WFNR have not been synoptically measured since 2004.

The City invested over 5 million dollars in 2001 to design and construct a tertiary filtration WWTF to meet effluent regulations during the previous renewal process. We note the most recent dataset (2004) was collected after construction of the new Marshfield WWTF in 2001 and does not include DO concentrations below the statewide criterion. It is possible that DO regimes in the WFNR have improved, due in part, to enhanced effluent quality from the new Marshfield WWTF. In addition, the TMDL model is not well supported by available data. For these reasons, the City requests that TMDL implementation include an adaptive management approach and reopener provisions to respecify, or remove, allocations pending results of additional in-stream monitoring or changes to Missouri's water quality standards.

We greatly appreciate this opportunity to provide comments regarding the WFNR TMDL. The City is interested and willing to meet with your staff to discuss these comments, and identify implementation approaches associated with upcoming permit renewal processes. If you have any questions or require additional information, please contact me at czell@geosyntec.com or by phone at 574-443-4100.

Sincerely,

Chris Zell
Project Manager

cc: John Cooper, City of Marshfield, Missouri
Robert Reed P.E., PhD, University of Missouri
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