

Missouri  
Department of  
Natural Resources

DRAFT LITTLE OSAGE RIVER TMDL  
PUBLIC COMMENTS

Public Notice  
November 13, 2009 – December 28, 2009

**Little Osage River**  
**WBID # 3652**

Vernon County, Mo.

Missouri Department of Natural Resources  
Water Protection Program  
PO Box 176  
Jefferson City, MO 65102-0176  
800-361-4827 / 573-751-1300



**I'd like to help!**  
**thriving-in-nevada** to: john.hoke

12/06/2009 08:25 AM

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History: This message has been forwarded.

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I'm a retired settled single nurse living in Nevada, Mo. I've grew up in this area & returned here. Maybe I can help somehow? While I'm not real active, perhaps I can help write, send emails etc. I want to be part of reversing the negative influences in Little Osage and areas. You can contact me via email, phone, or snail mail. Thanks.

Helen White  
623 South College Street  
Nevada, Missouri 64772  
417-667-8588



Jeremiah W. (Jay) Nixon, Governor • Mark N. Templeton, Director

## DEPARTMENT OF NATURAL RESOURCES

[www.dnr.mo.gov](http://www.dnr.mo.gov)

February 25, 2010

Ms. Helen White  
623 South College Street  
Nevada, MO 64772

RE: Response to Comments on the Little Osage River Total Maximum Daily Load

Dear Ms. White:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Little Osage River Total Maximum Daily Load (TMDL). Citizen participation and cooperation is crucial for successful watershed management and is the key to protecting our natural resources. For these reasons, the Department values your comments and willingness to get involved.

There are currently several organizations in your area dedicated to the protection of water quality and healthy watersheds. One of these groups is the Osage Valley Resource Conservation and Development Council, which has been involved in developing and implementing watershed plans for the Marais des Cygnes, Marmaton and Little Osage Rivers. They can be reached at:

Osage Valley Resource Conservation and Development Council  
1306 North 2<sup>nd</sup> Street, Suite E  
Clinton, MO 64735-1174  
(660) 885-5567, Ext. #6

You can also contact the Missouri Stream Team Program, which is a working partnership of citizen volunteers committed to education, stewardship and advocacy on behalf of Missouri streams. You can find more information, including how to contact them, on the Web at: <http://www.mostreamteam.org/index.asp>. You can also contact the Department's Stream Team coordinator, Priscilla Stotts, at (573) 526-3406 or [priscilla.stotts@dnr.mo.gov](mailto:priscilla.stotts@dnr.mo.gov), or by writing to:

Priscilla Stotts, Stream Team Coordinator  
Missouri Department of Natural Resources  
Water Protection Program  
P.O. Box 176  
Jefferson City, MO 65102-0176

Ms. Helen White  
Page Two

All comments pertaining to this TMDL will be reviewed and any needed changes will be made to the final TMDL document prior to its submittal to the U.S. Environmental Protection Agency for approval. Your comments, along with any others concerning the Little Osage River TMDL, will be included in the administrative record, which also includes the studies, data and calculations on which the TMDL is based.

Thank you again for your comments. If you should have any questions or would like additional information, please contact me at (573) 526-1446 or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

Sincerely,

WATER PROTECTION PROGRAM

A handwritten signature in black ink, appearing to read "John Hoke", written over the typed name below.

John Hoke, Chief  
TMDL Unit  
Water Quality Monitoring and Assessment Section

JH:bwl



**Fw: Little Osage TMDL**  
**John Hoke** to: Bill Whipps

12/12/2009 09:39 PM

History: This message has been replied to.

John Hoke

Environmental Specialist IV, TMDL Unit Chief  
Water Quality Monitoring & Assessment Section  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

----- Forwarded by John Hoke/WPCP/DEQ/MODNR on 12/12/2009 09:38 PM -----

From: "Tom Stiles" <tstiles@kdheks.gov>  
To: "john.hoke@dnr.mo.gov" <john.hoke@dnr.mo.gov>  
Date: 12/11/2009 05:15 PM  
Subject: Little Osage TMDL

John: I've reviewed the tmdl briefly and have a few comments for your consideration:

1. Table 2: you can expand the Kansas entry to 2009, now 6 samples below 5 mg/l out of 57 for a 10.5% percentage
2. Table 4: the four muni NPDES permits have been renewed to the same date in 2014; the Stewart Mfg permit expires 10/31/2010; make the mine a zero discharge since it's inactive
3. From Tables 7 & 8 and the modeled DO traces, it's apparent that Site 3 is the critical point, I'm not sure why because we haven't seen that drastic a deviation in DO levels at our site. From this, I'd make the reach from the stateline to Site 3 as your top priority for any implementation.
4. I'd give the Kansas dischargers a TSS WLA based on their design flows \* the 80 mg/l TSS limit, just to keep us in compliance, if you wanted to do an aggregate WLA by summing the design flows, that would be ok and that leaves it to us to distribute it among the WWTPs. We can keep the WLA for TN and TP indeterminate until we get a better idea of cause and effect and removal performance by the lagoon systems.
5. The load allocations are split 2/3 KS; 1/3 MO...that's ok for now, but if we get serious about implementation, we'll need to do some more assessment/modeling to pin down suspected hot spots with disproportionate contributions of TSS/TP/TN
6. An estimate of the entry loads can be made from the KDHE data and the usgs flow data, that could define existing loads entering your reaches of concern
7. Some estimate of existing loads might be good to derive load reductions using the basis of Tables 9-14, you might want to put in a table of tentative expected loads arriving from Kansas
8. Table 4 of Appendix C, you might want to note that certain values, such as those for ortho P are actually below detection limits, the value of which appears in the table
9. Make sure NFR by USGS is the same as TSS for us
10. It was indicated that notice of this TMDL was provided to KDHE, but I cant find a record of that. It's ok for this one, but when the Marmaton tmdl gets done, we definitely want to review that one.

That's all I've got. It's a tidy little study and I'm looking forward to the Marmaton TMDL soon.

Thanks for considering this

Happy Holidays if I don't speak with you before Xmas

Tom

Thomas C. Stiles, Chief  
Watershed Planning Section  
Bureau of Water, Division of Environment  
KS Dept. of Health & Environment  
1000 SW Jackson, Suite 420  
Topeka, KS 66612  
785-296-6170  
fax:785-291-3266  
tstiles@kdheks.gov



**Re: Little Osage TMDL** 

**John Hoke** to: Tom Stiles

Cc: Bill Whipps

Bcc: All Message Store

02/25/2010 12:44 PM

Tom,

The Missouri Department of Natural Resources (Department) appreciates the comments provided by the Kansas Department of Health and Environment (KDHE) on the draft Little Osage River TMDL. This e-mail responds to comments received from KDHE by e-mail on December 11, 2009 and includes the Department's response to each comment and the location of the revision (if applicable) within the final document as it will be submitted to EPA Region 7.

Thank you again for your comments and interest in this TMDL. The Department looks forward to working with KDHE to ensure water quality standards are met in the Little Osage River watershed. If you should have questions, please don't hesitate to contact me by phone, e-mail, or at Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

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**1. Table 2: you can expand the Kansas entry to 2009, now 6 samples below 5 mg/l out of 57 for a 10.5% percentage**

Thank you for the comment and for providing this additional data. Table 2 and Appendix A.1 have been updated to include Little Osage River water quality data recorded near Fulton, Kansas through 2009.

**2. Table 4: the four muni NPDES permits have been renewed to the same date in 2014; the Stewart Mfg permit expires 10/31/2010; make the mine a zero discharge since it's inactive**

The comment is appreciated. Table 4 of the TMDL document has been updated to reflect these changes.

**3. From Tables 7 & 8 and the modeled DO traces, it's apparent that Site 3 is the critical point, I'm not sure why because we haven't seen that drastic a deviation in DO levels at our site. From this, I'd make the reach from the state line to Site 3 as your top priority for any implementation.**

Additional language has been added to Sections 5.1 and 12.2 of the TMDL noting the lower DO measured between the Kansas-Missouri state line and Site 3. The TMDL implementation section of the document (Section 12.2) now contains language that recommends additional water quality monitoring and source identification of low dissolved oxygen conditions be conducted on this stretch of the river.

**4. I'd give the Kansas dischargers a TSS WLA based on their design flows \* the 80 mg/l TSS limit, just to keep us in compliance, if you wanted to do an aggregate WLA by summing the design flows, that would be ok and that leaves it to us to distribute it among the WWTPs. We can keep the WLA for TN and TP indeterminate until we get a better idea of cause and effect and removal performance by the lagoon systems.**

The Department appreciates KDHE's commitment to ensuring that TSS loads originating in Kansas are in compliance with water quality standards. Changing wasteload allocations in the TMDL, however, would require that the TMDL be opened for an additional public comment and review period. In order to meet our obligations under timelines established by the TMDL Consent Decree, the Department does not feel that it can afford the time it would take for this second public comment period. However, any future revision of the Little Osage River TMDL will afford the Department an opportunity to incorporate this comment. The Department looks forward to working with KDHE to

ensure that water quality standards are being met as the Little Osage River crosses the state line into Missouri.

- 5. The load allocations are split 2/3 KS; 1/3 MO...that's ok for now , but if we get serious about implementation , we'll need to do some more assessment /modeling to pin down suspected hot spots with disproportionate contributions of TSS /TP/TN.**

The Department agrees that additional assessment and modeling may be needed to refine source contributions of TSS, TP and TN for Kansas and Missouri. Once again, the Department looks forward to collaborating with KDHE to ensure that water quality standards are met in the Little Osage River .

- 6. An estimate of the entry loads can be made from the KDHE data and the USGS flow data , that could define existing loads entering your reaches of concern .**

The first phase of the Little Osage River TMDL modeled DO without consideration of whether or not water quality standards were being met at the Kansas-Missouri state line. In order to expedite submittal of the TMDL and meet our obligations under the Consent Decree, efforts to estimate entry loads of TSS, TN and TP originating in Kansas were not conducted.

- 7. Some estimate of existing loads might be good to derive load reductions using the basis of Tables 9-14, you might want to put in a table of tentative expected loads arriving from Kansas .**

The Department agrees that it may be beneficial to estimate existing loads contributed by Kansas in order to derive more effective pollutant load reductions. Future amendments to the TMDL may include entry loads of TSS, TN and TP originating from Kansas, and pollutant load reductions necessary to ensure that water quality standards are met at the state line. The Department looks forward to working with KDHE on this and other issues related to TMDL implementation .

- 8. Table 4 of Appendix C , you might want to note that certain values , such as those for ortho P are actually below detection limits , the value of which appears in the table .**

Table 4 of Appendix C has been corrected to reflect data that are below detection limits .

- 9. Make sure NFR by USGS is the same as TSS for us .**

TSS and NFR are synonymous for the purposes of this document. The NFR heading of Appendix A.2, which contains data used to develop reference targets for total suspended solids , has been changed to TSS to reflect the purpose of the data and for consistency within the TMDL document.

- 10. It was indicated that notice of this TMDL was provided to KDHE , but I cant find a record of that . It's ok for this one , but when the Marmaton TMDL gets done , we definitely want to review that one .**

As was discussed by Bill Whipps of my staff via e-mail, a public notice announcement was mailed to the Bureau of Water Director, Karl Mueldener notifying him of the public review and comment period for the Little Osage River TMDL. For future TMDLs involving the state of Kansas, the Department will also notify the chief of the Watershed Planning Section e-mail of the public comment period.

Tom, thank you again for your interest and involvement on this TMDL and others our states have in common. If you have questions, please let me know.

John Hoke  
Environmental Specialist IV, TMDL Unit Chief  
Water Quality Monitoring & Assessment Section  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

Courthouse  
100 W. Cherry Street  
Nevada, MO 64772  
417-448-2505  
417-448-2500  
Fax: 417-667-6035  
e-mail: [commission@vernoncountymmo.org](mailto:commission@vernoncountymmo.org)



**BONNIE M. McCORD**  
Presiding Commissioner

**NEAL F. GERSTER**  
Northern Commissioner

**KENNON R. SHAW**  
Southern Commissioner

**VERNON COUNTY COMMISSION**

**FAX COVER SHEET**

**TO:** John Hoke  
DNR

**FAX NO:** 573/526-5797

**FROM:** VERNON COUNTY COMMISSION

**FAX NO:** 417/667-6035

**PHONE NO:** 417/448-2505

**DATE:** December 22, 2009

**NUMBER OF PAGES:** 4

**This is in reference to Little Osage TMDL.**

December 20, 2009

John Hoke, Environmental Specialist, TMDL Unit Chief  
Mo Department of Natural Resources Water Pollution Program  
Water Quality Monitoring and Assessment Section  
Lewis and Clark State Office Building  
1101 Riverside Drive, P.O Box 176  
Jefferson City, MO 65102-0176

RE: Draft Little Osage River Total Maximum Daily Load or TMDL, Vernon and Bates Counties, Missouri Comments

Dear Mr. Hoke:

The Citizens Watershed Committee (CWC) for the Marais des Cygnes, Marmaton, and Little Osage River Watersheds are respectfully requesting your agencies reconsideration of this organization's concerns and issues in regards to the "Draft Total Maximum Daily Load (TMDL) for the Little Osage River", hydrologic unit code 10290103, water body identification # 3652, Vernon and Bates County, Missouri released for public comment November 13, 2009.

First, as an all volunteer committee from Bates and Vernon Counties comprised of numerous volunteer organizations requiring member consensus on issues of such importance as this report we recommend that the window of opportunity for public comment be a minimum of 45-60 days to allow for maximum participation. Also the author(s) of this and other draft reports need to be placed prominently on the title page of the document so that the public with follow-up questions can request such questions before commenting and drawing invalid conclusions. The name and contact phone or email address should be prominently displayed whether it is an agency staff person or a contractor. All other grants thru EPA or Missouri Department of Natural Resources-Water Quality Monitoring and Assessment Section (MoDNR) are so stipulated with those grants consequently Missouri Department of Natural Resources-Water Quality Monitoring and Assessment Section as a grant recipient should too.

Listed below are the Draft TMDL content the following issues or concerns were expressed by the CWCs partner membership:

- The CWC with and through the Osage Valley Resource Conservation and Development Council (OVRCD) has begun the slow process of securing funding for restoration of these watersheds as identified in **the "The Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan-2006"**. The **"Mound Branch Watershed Evaluation and Restoration Project-Bates County, Missouri, Section 319 Sub-grant G09-NPS04"** is one such project in its beginning phases. While funding has been secured (release of funds is pending) for the installation water quality practices, education, and monitoring as major components, it will take 1-2 years to get this project fully energized, correcting identified sources. The CWC has made it known that it is planning to initiate another watershed restoration proposal directed specifically at **Little Osage River Watershed**. It has become apparent to the CWC that from time of project idea is conceived until its inception actual funding may take upwards of 3-4 years. Based on this track record it might seem reasonable that the CWC could initiate a project regarding this watershed's issues and concerns about the time this TMDL would be scheduled for review. Also by that time the CWC along with MoDNR would potentially have 1-2 years of beneficial water quality data from Mound Branch to support future TMDL decisions for the impaired segment. A typical restoration project takes from 4-5 years to implement. Water quality experts know that there is a major lag period between when a practice is installed and the ability to document positive water quality benefits. For most non-point water quality benefits it ranges from 10-15 years. Monitoring data on this future project might be available within 3 years if restoration applications are put on a fast-track approval basis.
- MoDNR has offered in the draft TMDL report to pursue a new standard for dissolved oxygen (DO) levels before the TMDL is finalized. The watershed community / CWC thus far have not been asked to participate. It appears the regulators are not ready to pursue a revised standard at this time based on private conversations with various agency staff over the past few years. The CWC is ready and willing to assist in this endeavor.
- The proposal does not indicate when the TMDL will be reviewed and revised based upon water quality parameters monitored. A nearby watershed, Mound Branch, has a 3-year window to improve DO levels. We have stated in that TMDL document review that when properly installed practices will not begin to show improved water quality beneficial results for nearly 10-15 years following installation.

RE: Draft Little Osage River Total Maximum Daily Load or TMDL, Vernon and Bates Counties, Missouri Comments (Cont'd)

- The cited impairment in the Draft TMDL lists aquatic life for the Little Osage River, but the documents appear to vary from documentation regarding that impairment. The water quality evidence utilized in this draft TMDL assumes the impaired water use but has not been documented with the level of habitat loss. The first evidence that the local watershed residents knew of perceived water quality impairments when MoDNR-WPP and the Kansas City Regional Office staff met with the CWC to formulate options after the "***The Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan-2006***". The CWC has prioritized action as directed by its MoDNR partners to rectify the numerous issues and concerns, within the three watershed basins identified within before mentioned Management Action Plan. Thus Little Osage River as previously mentioned next in order to make application for a watershed restoration project.
- There are several questions regarding the livestock data and the validity of the number of livestock in the watershed nutrient contribution assumptions used. We believe the data is old and not representative of this watershed versus the balance of Bates and Vernon County. There appears to be more livestock per grassland acre when comparing MO versus KS. Does this number account for the difference in type of cattle operations and the acres being grazed in MO versus KS? Missouri operations are primarily cow-calf whereas we believe KS is back-grounding. Also, the comparison was not done by "animal units (AU)" but rather as "head". Additionally, there is considerable number of acres of pecan and walnut groves that are grazed in Missouri, a management strategy in nut trees organic. The authors have on occasions in the document checked with sources outside the agency to document facts and conditions (anecdotal) yet when it comes to the watershed area involved in this impaired water body they fail to utilize local resource staff for a more accurate depiction of the watershed involved. Agencies such as University of Missouri-Extension (Bates and Vernon Counties), Bates and Vernon County SWCDs, and USDA- NRCS, to name a few would have far more up-to-date data, that would make it more believable to local watershed residents and decision-makers because many of their local programs are directed by this information detailed.
- The draft TMDL report makes assumptions about pollutants to the impaired stream segment without documented evidence of the cause. It correctly assumes there are no issues with the municipal waste water systems (point source) since it outlets. These smaller communities may not be a major factor in the perception of the author(s) but pollutants derived from their lack of stormwater management should be factored into the waste load allocation. At the same time the author(s) discounts any contributions by the three (3) poultry operations near the outlet of Little Osage River and do not have real grip on the number of smaller operations within the MO portion of the watershed. These places may have stormwater permits yet there is no evidence of these being inspected for accidental spills or other handling methods. Since these operations are not CAFOs they are not required under Missouri law to have a permitted facility, yet if they have a AFO permitted facility they would have land application areas designated. Land applied litter from these three (3) operations are not restricted to grasslands as implied below the unimpaired stream segment. The locations of these establishments in the Little Osage River watershed while not conclusively contributors, should not be overlooked within the draft TMDL, report regardless of the fact they have only a stormwater permit. Also the agricultural producers purchasing litter from SW Missouri do not as a rule apply purchased litter only to grasslands. Rather the litter that is hauled by tractor-trailer loads is applied to croplands more so than grassland. The long hauls of purchased litter does not warrant economic sense to apply to grasslands.
- The draft Little Osage River TMDL lists poultry layer operations which community members are not aware of such operations. Since it is felt no layer operations exist in Bates and Vernon Counties the impact of poultry layer nutrient values and the application methods are diametrically different from broiler operations or turkey operations. The type of poultry, size of operations will make a difference in land area necessary for proper nutrient management by crop removal and allowance for soil buildup. The CWCs concern is how does the **QUAL2K Model** compute the potential waste load allocation with this discrepancy?
- The proposed reduction in the Sediment Oxygen Demand (SOD), by 82%, seems very unrealistic and a "pie-in-the-sky" wish. The CWC members feel it will very difficult to achieve in any 3-5 year timeframe based on what we know about the water quality measurement. The fluctuations of water within the Little Osage River, Marais des Cygnes River and the Marmaton Rivers is not only the result of runoff from storm events in their respective watersheds; rather it has been stated on numerous occasions that US Army Corps of Engineers operations of Truman Reservoir's flood-pool schemes greatly

influences the SOD in these three (3) streams. Anecdotal statements in public meetings bring and opinions of CWC members strongly believe that backwater flooding into these streams causes the drop-out of pollutant loads (sediment and nutrients) from upstream. These pollutant loads are not allowed to pass along in the normal stream "flushing" events as a result of slower water velocity attributed to the shortened stream grade. Backwater also impacts Mound Branch watershed as a result of Truman Reservoir.

- What are the assumptions used for the waste load model, **QUAL2K Model** and sub-routines within this and other models? The model(s) and sub-routines may not be well known and commonly accepted. These model sources need to be made known to the public in this document and what version. An assumption by somebody far away from the source of the watershed is not accurate. A committee comprised of local watershed residents and users would add credibility to the process early in the development of a TMDL.
- The "Reference Streams", Ecological Drainage Units (EDUs) cited in the draft TMDL report to compare Little Osage River stream network is flawed. The similarity is not there in land form, land uses, watershed characteristics, etc. The draft TMDL cites the "Little Drywood Creek, Vernon County, Missouri" as the reference stream yet when comparing data uses other unrelated streams as references. It would appear that the author(s) are attempting to draw conclusions from other sources that are not even representative of Little Osage River Watershed characteristics. We urge the author(s) to visit website: "**Biological Criteria for Wadeable/Perennial Streams of Missouri**", Feb. 2002; Randy Sarver and Stuart Harlan, MoDNR ES Program; <http://www.dnr.mo.gov/enr/esp/docs/BiologicalCriteriaforWadeableStreamsOfMissouri.pdf> and the reports from 2001 and 2007 sponsored by MoDNR on this very topic. Incidentally the reports have not changed during these two periods. "**Ozark Stream Class Ecological Archives M077-010-A2**"; Scott P. Sowa, Gust Annis, Michael E. Morey, and David D. Diamond. 2007. A Gap analysis and comprehensive conservation strategy for riverine ecosystems of Missouri. **Ecological Monographs 77:301-334; Appendix B. Map showing the 17 Ecological Drainage Units (EDUs) of Missouri.** <http://esapubs.org/Archive/mono/M077/010/appendix-B.htm>. This draft TMDL did not use any of this streams data to support its claims for restoration. Why?

**Referenced streams listed in the document:**

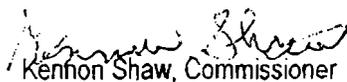
- South Grand River [Archie, MO and Freeman, MO] (Cass County) is a severely channelized muddy bottomed channel with row-crop up to its bank edges and a major flood plain diked;
- Muddy Creek Branches (Cass County) has major urbanization with at least 2 large impoundments across the stream in several locations;
- Big Creek (Cass, Johnson and Henry Counties) again is not typical of this watershed. It is channelized and diked for waterfowl hunting clubs;
- W. Tebo Creek (Henry County) is an abandoned strip mined watershed;
- Cedar Creek (Pleasant View, MO); Ozark Stream Class;
- Weaubleau Creek, (St. Clair County); Ozark Stream Class;
- Brushy Creek (St. Clair County)

Thanks you for allowing us to provide input in the draft Little Osage River TMDL. Also we want to thank you for extending the public review and comment period. If you have any questions about the concerns expressed by the Citizens Watershed Committee please do not hesitate to contact either of us.

Sincerely,



Danny Hahn, President  
Citizens Watershed Committee  
[816] 297-2747



Kennon Shaw, Commissioner  
Southern Vernon County  
[417] 448-2502



Randy W. Pike, Commissioner  
Northern Bates County  
[660] 679-8626

Mr. Pike;

I am working on drafting a response to the Little Osage River TMDL comment letter submitted via fax on December 22, 2009 on behalf of the Citizens Watershed Committee. There are several points in the letter that suggest that the department could have used better, more specific information in its analysis in the TMDL. If you or someone else in the CWC have such information that you would be willing to provide to us (or if you can direct us to someone else who can), we would appreciate the opportunity to consider including it in the TMDL. In order to complete the TMDL process in a timely manner, we would appreciate hearing back from you within five (5) business days (close of business on Jan. 27, 2010). At that time we will finalize our response to your comments and finalize the TMDL for submission to EPA. The comments in particular that I am referring to are:

► ***There are several questions regarding the livestock data and the validity of the number of livestock in the watershed nutrient contribution assumptions used. We believe the data is old and not representative of this watershed versus the balance of Bates and Vernon County... The authors have on occasions in the document checked with sources outside the agency to document facts and conditions (anecdotal); yet when it comes to the watershed area involved in this impaired water body they fail to utilize local resource staff for a more accurate depiction of the watershed involved. Agencies, such as University of Missouri-Extension (Bates and Vernon Counties), Bates and Vernon County SWCD, and USDA-NRCS, to name a few, would have far more up-to-date data that would make it more believable to the local watershed residents and decision makers because many of their local programs are directed by this information detailed.***

■ **Bill as stated in the comments found copied above, the named sources are underlined. We encourage you to contact Bates County Extension Agent, Al Decker Livestock Specialist, Vernon County Extension Agent, Wayne Prewitt Farm Management Specialist; Brad Powell, Bates County SWCD District Technician and Mark Curtis, Vernon County District Manager. These local experts are far more knowledgeable of the local conditions and are the experts the CWC contacts when developing proposals. They have detailed information specific to the areas of the watershed in the respective counties. The data is more specific and current than multi-year sampling process undertaken by USDA-AMS or MAMSS data.**

■ **In addition references made to land use can be obtained from the report "Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan", dated August 2006, where each watershed in the plan has been detailed. These local experts should be able to further refine the data in this report should you need more specifics. That information in the report was current through the date of report being reviewed, published and accepted by MoDNR-WPP-319 Section / EPA. Furthermore these same local experts, in particular the SWCD staff can make necessary adjustments in animal waste and commercial nutrients sources and application areas. Many of the AFOs referenced have facility plans developed through the SWCD/NRCS offices plus the nutrient management plans as part of the cost-share programs they administer. This data in the report was taken from the most current data collected locally and verified through Natural Resources Inventory (NRI) primary sampling units (PSUs) and the same individuals previously mentioned. Each of these folks live and reside as residents within the two counties. This data is available through the local USDA-NRCS office and the Bates County SWCD offices located in Butler and/or the Vernon County SWCD in Nevada. The values used in computing the potential nutrient runoff was based upon the latest known data acquired by the technical staff of USDA-NRCS, UM-Extension, and Bates & Vernon Counties SWCD (previously mentioned). If the data within this report is insufficient these individuals can collectively provide more up-to-date data that we feel it is more accurate.**

► ***If you have recent livestock data for the L. Osage watershed, or can give me the name of someone at MU-Extension, SWCD or NRCS who does, that would be very helpful.***

■ **Bill please understand that the above previously named agencies are agencies found in most counties throughout Missouri and the US. Each of these agencies have a website that is specific to the nation, state and each county. It provides the office managers and technical staff for the respective offices. In the reply above we did provide commonly accessible information that identifies the parties in each county. Also these same technical experts are still listed within above mentioned report under technical advisors.**

► ***At the same time the author(s) discount any contributions by the three poultry operations near the outlet of Little Osage River and do not have real grip on the number of smaller operations within the MO portion of the watershed.... Since these operations are not CAFOs they are not required under Missouri law to have a permitted facility, yet if they have an AFO permitted facility they would have land application areas designated. Land applied litter from these three operations are not restricted to grasslands as implied below the unimpaired stream segment. The locations of these establishments in the Little Osage River watershed...should not be overlooked within the draft TMDL report regardless of the fact that they have only a storm water permit. Also the agricultural producers purchasing litter from SW Missouri do not as a rule apply***

*purchased litter to grasslands. Rather the litter that is hauled by tractor loads is applied to croplands more so than grassland...*

**► The department does not have records regarding where litter from these facilities is land applied. Again, if you have this information or know who does, it would be very helpful if you could pass that along.**

■ I believe the MoDNR-WPP until recent years was the reviewer of AFOs and had maintained those plans in an archive. These locations do appear on some of the CAFO/AFO maps developed by MoDNR as recent as 2006/2007. While these AFOs are not “permitted facilities” as CAFOs, the applicants did have to have sufficient land designated for their land applications. Since MoDNR is no longer reviewing AFOs, the local SWCD/NRCS agencies make this requirement anytime they assist a landowner with development of an animal waste system. Keep in mind under MoDNR own water quality rules, any landowner regardless of the size of animal operation, when found to be a polluter of Missouri waters is required to resolve the pollution issue and get a permit from MoDNR-WPP the same as a CAFO. As for poultry litter being imported into this watershed, it was your MoDNR staff person that made the assertion that litter was being applied to grasslands of this watershed. We did not see data to support this information. What we do know is that anecdotal information we suggest is from the Bates and Vernon Counties agricultural agencies mentioned previously. Follow-up with them would be of assistance to you in determining whether the anecdotal information from either source is useful and can be supported. Did that poultry litter at its cost of purchase and transport actually reach this watershed or other adjoining watersheds? Furthermore, if poultry litter is transported from a facility in SW Missouri that possesses a CAFO Permit, regardless of where that litter is transported, a record must be kept and furnished upon request by one of your Environmental Specialists or EPA as part of their normal follow-up inspections. The litter transport records must list the rate of application, location, crop utilization rates, landowner, and applicator as a minimum.

***► The fluctuations of water within the Little Osage River, Marais des Cygnes River and the Marmaton Rivers is not only the result of runoff from storm events in their respective watershed; rather it has been stated on numerous occasions that US Army Corps of Engineers operations of Truman Reservoir’s flood-pool schemes greatly influences the SOD in these three streams. Anecdotal statements in public meetings bring and opinions of CWC members strongly believe that backwater flooding into these streams causes the drop-out of pollutant loads (sediment and nutrients) from upstream.***

***► The department does not have data on the influence of flood-pool waters from Truman Lake on SOD in the impaired segment of the Little Osage River. We would appreciate seeing any data you might have regarding this subject.***

■ The CWC would like to refer you to the report [“Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan”](#), dated August 2006, in which the plan has numerous detailed issues and concerns listed (pages 75-76-public meeting comments) collected for this approved report. There were 19 of the 81 total public participants’ who commented on this topic alone about flooding. It’s ranked as the 3<sup>rd</sup> highest priority (Water Quality & Water Quantity) along with many expressed concerns under this category (pages 77-90). The authors for this section include current technical experts from MoDNR, EPA, UM-Extension and SWCD agencies. Flooding source was identified as the backwaters of Truman Lake the “primary” concern. Flooding is also a “linked” concern to the other nine (9) prioritized categories identified in this report. The flooding specifically can be related to the day-to-day operations for each county in this watershed by local, county, and state road maintenance crews, county commissioners, municipalities and residents in the watershed that are shut-off from their primary residents as a result of extended road flooding.

■ Flooding data from this can be acquired through USGS stream gauging as well as the US Army COE lake water levels that are kept as required by operations permit. I would suggest contacting MoDNR-DGLS for records submitted. Many of these records are long-term and are kept for numerous studies, pre- and post-dam completion. I’d also suggest contacting the University of Missouri-Extension Water Quality unit and the University of Missouri-Lake Monitoring Program funded by MoDNR/EPA. All of this information is available to the public upon request.

■ The dramatic economic impact on pecan and walnut growers is the result of the constant influx of prolonged backwater in these upstream tributaries. This prolonged backwater causes the soil profiles to be saturated in the pecan and walnut groves. Economic losses of trees dying and nut production loss is due to poor soil aeration. This “drowning phenomenon” is acknowledged by forestry experts, life-long growers, and local leaders. The US Army COE have not denied “drowning”, they only maintain these groves maybe within their flood plain easement.

■ Bill the CWC is being asked to provide data to MoDNR/EPA on the SOD parameter when neither MoDNR nor EPA has provided substantiated data for the use of this parameter in fresh-water scenarios. Our public requests to MoDNR, MDC, University of Missouri for such data is not available. In fact nobody even knew about this parameter until a web search was conducted. The parameter SOD as we researched along with the assistance of these water quality agencies found the application of such a parameter exclusive to coastal areas whereby fresh-water intermingles with tidal salt-waters. The parameter SOD was developed in particular for the estuary of Chesapeake Bay streams emptying into the bay where the influence is that of the mixing zone of upstream fresh-water with tidal salt-water. The parameter has been extended to 1-2 streams entering the Gulf of Mexico but nowhere else can we find an application in inland scenarios. Thus the parameter being proposed does not have time-tested data to support conclusions leading to an “etched in stone TMDL” plan which you are proposing. We find the untested and unsupported parameter for this area unjustified in the scientific community. While this maybe a future parameter neither this watershed nor any other currently impaired watershed should have this parameter included in its TMDL plan until such field tested data is developed for solely inland streams to lake fresh-waters scenarios.

Thanks again for taking the time to comment on the Little Osage River TMDL. The department appreciates your help in making this a better document. I will plan to follow this email with a phone call to make sure you received it. I look forward to speaking with you soon.

Best regards,

Bill Whipps  
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TMDL Unit/Water Quality Monitoring & Assessment Section  
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Jeremiah W. (Jay) Nixon, Governor • Mark N. Templeton, Director

## DEPARTMENT OF NATURAL RESOURCES

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February 25, 2010

Mr. Randy W. Pike  
Northern Bates County Commissioner  
Bates County Courthouse  
1 North Delaware Street  
Butler, MO 64730

RE: Response to Comments on the Little Osage River Total Maximum Daily Load

Dear County Commissioner Pike:

The Missouri Department of Natural Resources (Department) appreciates the comments provided by the Citizens Watershed Committee (CWC) for the Marais des Cygnes, Marmaton and Little Osage River Watersheds on the draft Little Osage River Total Maximum Daily Load (TMDL). This letter responds to comments (some paraphrased here in the interest of brevity) received from the CWC on both December 22, 2009 and January 21, 2010. Please find herein the Department's response to each comment and the location of the revision (if applicable) within the final document as it will be submitted to the U.S. Environmental Protection Agency (EPA).

### **Responses to December 22, 2009 Comment Letter:**

**Comment #1:** *We recommend that the window of opportunity for public comment be a minimum of 45-60 days to allow for maximum participation. Also the author(s) of this and other draft reports need to be placed prominently on the title page of the document so that the public with follow-up questions can request such questions before commenting and drawing invalid conclusions. The name and contact phone or email address should be prominently displayed whether it is an agency staff person or a contractor.*

At the request of the CWC, the Department extended the public comment period for the Little Osage River TMDL from 30 days to 45 days. The Department has also decided that all future public notice periods shall be for 45 days. Contact information for submitting questions about a TMDL is provided in the public notice announcement that is distributed at the beginning of the public notice period.

**Comment #2:** *The CWC with and through the Osage Valley Resource Conservation and Development Council (OVRCD) has begun the slow process of securing funding for restoration of these watersheds as identified in the "The Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan-2006". The "Mound Branch Watershed Evaluation and Restoration Project-Bates County, Missouri, Section 319 Sub-grant G09-NPS04" is one such project in its beginning phases. The CWC has made it known that it is planning to initiate another watershed restoration*

Mr. Randy W. Pike  
Page Two

*proposal directed specifically at **Little Osage River watershed**. It has become apparent to the CWC that from time of project idea is conceived until its inception actual funding may take upwards of 3-4 years. Based on this track record it might seem reasonable that the CWC could initiate a project regarding this watershed's issues and concerns about the time this TMDL would be scheduled for review. Water quality experts know that there is a major lag period between when a practice is installed and the ability to document positive water quality benefits.*

The Department congratulates the CWC and OVRCD on the achievement of developing the watershed management plan. The Department also appreciates the interest shown by the CWC and OVRCD in planning to secure a 319 grant to proceed with addressing the issues facing the Little Osage River watershed. The TMDL is being completed at this time to meet Consent Decree<sup>1</sup> requirements relating to Missouri's 303(d) List of impaired waters. The data being used are the best available at this time. As more data becomes available, this information will be considered and adjustments to the TMDL may be made, consistent with future findings.

As noted in Section 11 of the TMDL, post-TMDL monitoring will be scheduled and conducted approximately three years after the TMDL is approved, or "in a reasonable period of time following the implementation of nonpoint source best management practices (BMPs)." The Department has no plans to assess and evaluate the success of TMDL implementation before three years, and will only begin to collect data after post-TMDL implementation has had a chance to result in water quality improvements.

**Comment #3:** *MoDNR has offered in the draft TMDL report to pursue a new standard for dissolved oxygen (DO) levels before the TMDL is finalized. The watershed community/CWC thus far have not been asked to participate. It appears the regulators are not ready to pursue a revised standard at this time based on private conversations with various agency staff over the past few years. The CWC is ready and willing to assist in this endeavor.*

The final Little Osage River TMDL, which will be finalized in early 2010, is being revised to include amended implementation language acknowledging issues regarding low DO as a natural background condition in streams and rivers in this ecological region. The Department may develop revised DO criteria for Little Osage River and similar streams during a future Triennial Review of the Water Quality Standards in 2012 or 2015 if resources are available. Additional monitoring and analysis may determine whether the DO criterion of 5 mg/L is appropriate, or if a new site-specific DO criterion is required.

The Department appreciates the CWC's offer to be involved in and assist with developing revised DO criteria. At the present time, the Department is working with EPA to create a process on how to approach this issue. We will be sure to inform you when the Department is ready to engage stakeholders. Thank you for your willingness to be part of the process.

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<sup>1</sup> Consent Decree refers to the 2001 Consent Decree entered in the case of American Canoe Association, et al. v. Carol M. Browner, et al., No. 98-1195-CV-W in consolidation with No. 98-4282-CV-W, February 27, 2001.

Mr. Randy W. Pike  
Page Three

**Comment #4:** *The proposal does not indicate when the TMDL will be reviewed and revised based upon water quality parameters monitored. A nearby watershed, Mound Branch, has a 3 year window to improve DO levels. We have stated in that TMDL document review that when properly installed practices will not begin to show improved water quality beneficial results for nearly 10-15 years following installation.*

The Department agrees that improvement in water quality can be a slow process. It may take some time following implementation of nonpoint source BMPs before noticeable improvements in water quality are measured. The Department does not expect water quality impairments to be resolved within three years following completion of the TMDL. Rather, as noted above and as outlined in both the Little Osage River and Mound Branch TMDLs, it is the intent of the Department to wait at least three years after effective BMPs are installed before beginning post-implementation assessments of water quality.

**Comment #5:** *The cited impairment in the draft TMDL lists aquatic life for the Little Osage River, but the documents appear to vary from documentation regarding that impairment. The water quality evidence utilized in this draft TMDL assumes the impaired water use but has not been documented with the level of habitat loss. The first evidence that the local watershed residents knew of perceived water quality impairments when MoDNR-WPP and the Kansas City Regional Office staff met with the CWC to formulate options after the “**The Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan-2006**”. The CWC has prioritized action as directed by its MoDNR partners to rectify the numerous issues and concerns, within the three watershed basins identified within before mentioned Management Action Plan. Thus Little Osage River as previously mentioned next in order to make application for a watershed restoration project.*

The Little Osage River was first placed on Missouri’s 303(d) List of impaired waters in 1998 and, as noted in the “Marais des Cygnes, Marmaton and Little Osage River Watershed Management Action Plan”, has been identified since the 2002 303(d) List as impaired by low DO. The Little Osage River is also currently identified on Missouri’s EPA-approved 2004/2006 and 2008 303(d) Lists as impaired by low DO for the entire length of the Class C segment. Water from the Little Osage River was sampled and analyzed by both the Missouri Department of Natural Resources and the Kansas Department of Health and Environment to produce water quality data used to evaluate compliance with water quality standards, and to support TMDL development. While a greater than 10 percent frequency of exceedance of the minimum DO criterion of 5 mg/L indicates an impairment, combined data from both sources indicate an overall 85 percent frequency of exceedance.

Table A of Missouri’s Water Quality Standards (10 CSR 20-7.031), titled “Criteria for Designated Uses”, identifies DO as a criteria associated with the “Protection of Aquatic Life” use designation. Because low DO is the pollutant that has been identified as impairing the Little Osage River, the impaired designated use is listed as the “Protection of Aquatic Life”.

Once again, the Department commends the CWC for their efforts to develop a watershed restoration project for the Little Osage River.

**Comment #6:** *There are several questions regarding the livestock data and the validity of the number of livestock in the watershed nutrient contribution assumptions used. We believe the data is old and not representative of this watershed versus the balance of Bates and Vernon County. There appears to be more livestock per grassland acre when comparing MO versus KS. Does this number account for the difference in type of cattle operations and the acres being grazed in MO versus KS? Missouri operations are primarily cow-calf whereas we believe KS is back-grounding. Also, the comparison was not done by “animal units (AU)” but rather as “head”. Additionally, there is a considerable number of acres of pecan and walnut groves that are grazed in Missouri, a management strategy in nut trees organic. The authors have on occasions in the document checked with sources outside the agency to document facts and conditions (anecdotal) yet when it comes to the watershed area involved in this impaired water body they fail to utilize local resource staff for a more accurate depiction of the watershed involved. Agencies such as University of Missouri-Extension (Bates and Vernon Counties), Bates and Vernon County SWCDs, and USDA-NRCS, to name a few would have far more up-to-date data, that would make it more believable to local watershed residents and decision-makers because many of their local programs are directed by this information detailed.*

The livestock data used to estimate the level of cattle grazing in the Little Osage River watershed is county level data that comes from the 2007 Census of Agriculture published by the United States Department of Agriculture’s (USDA’s) National Agricultural Statistics Service. This is the most recent and comprehensive agricultural census that is available from USDA.

The number of cattle per acre of grassland is calculated from the number of cattle estimated to be in the counties that contain the watershed, along with the number of acres of grassland in these counties. The proportion of cattle to acre of grassland is estimated to be higher in Vernon and Bates counties in Missouri than in the equivalent counties in Kansas. This estimate does not take into account the types of livestock operations in Missouri and Kansas. As noted in the TMDL, there are no permitted livestock operations in the Missouri side of the watershed but there are a number of permitted and certified livestock operations in the Kansas portion of the watershed. Also as noted in the TMDL, the locations of these facilities may affect the actual number of cattle in the watershed in Kansas. Please keep in mind that the livestock numbers reported in the TMDL are estimates and are intended to provide a general idea of the conditions and activities in the watershed. They are not intended to reflect a detailed accounting of the precise number of animals in the watershed and are not used for modeling purposes.

**Comment #7:** *The draft TMDL report makes assumptions about pollutants to the impaired stream without documented evidence of the cause. It correctly assumes there are no issues with the municipal waste water systems (point source) since it outlets. These smaller communities may not be a major factor in the perception of the author(s) but pollutants derived from their lack of storm water management should be factored into the waste load allocation. At the same time the author(s) discounts any contributions by the three (3) poultry operations near the outlet of Little Osage River and do not have real grip on the number of smaller operations within the MO portion of the watershed. These places may have storm water permits yet there is no evidence of these being inspected for accidental spills or other handling methods. Since these operations are not CAFOs they*

Mr. Randy W. Pike  
Page Five

*are not required under Missouri law to have a permitted facility, yet if they have a AFO permitted facility they would have land application areas designated. Land applied litter from these three (3) operations are not restricted to grasslands as implied below the unimpaired stream segment. The locations of these establishments in the Little Osage River watershed while not conclusively contributors, should not be overlooked within the draft TMDL report regardless of the fact they have only a storm water permit. Also the agricultural producers purchasing litter from SW Missouri do not as a rule apply purchased litter only to grasslands. Rather the litter that is hauled by tractor-trailer loads is applied to croplands more so than grassland.*

As noted in the TMDL, only 2.6 square miles (1.2 percent) of the land area in the Missouri portion of the Little Osage River watershed is classified as urban. The largest of the four towns in the watershed is downstream of the impaired segment, and the two towns that are situated on direct tributaries to the impaired segment each have a population under one hundred people. The Department believes that any contribution from these sources is insignificant when compared to other potential sources in the watershed. Furthermore, because these communities do not have permitted storm water management programs (point sources) they cannot be factored in the wasteload allocations in the TMDL.

The poultry operations located near the mouth of the Little Osage River are downstream of the impaired segment and would therefore not have a direct impact on the water quality impairment. While it is possible that waste generated from these facilities could be land applied upstream in a manner that impacts the impaired segment, the permits for these facilities do not designate where the waste is to be applied when it is applied off-site, and the Department cannot make assumptions within the TMDL about where it is applied. While we cannot pinpoint where waste from any particular facility may be distributed, the implementation section of the TMDL does address the issue of land application of animal waste to crop and pasture land from facilities both inside and outside of the watershed, and suggests ways to help minimize the impact of this practice on water quality in the Little Osage River.

**Comment #8:** *The draft Little Osage River TMDL lists poultry layer operations which community members are not aware of such operations. Since it is felt no layer operations exist in Bates and Vernon Counties the impact of poultry layer nutrient values and the application methods are diametrically different from broiler operations or turkey operations. The type of poultry, size of operations will make a difference in land area necessary for proper nutrient management by crop removal and allowance for soil buildup. The CWCs concern is how does the QUAL2K model compute the potential waste load allocation with this discrepancy?*

Data on poultry layers in Vernon and Bates counties comes from the 2007 Census of Agriculture published by the USDA's National Agricultural Statistics Service. This data is provided for informational purposes only, and the QUAL2K model does not take into consideration differing nutrient values associated with different types of poultry operations that may exist in the watershed.

**Comment #9:** *The proposed reduction in the Sediment Oxygen Demand (SOD), by 82%, seems very unrealistic and a “pie-in-the-sky” wish. The CWC members feel it will very difficult to achieve in any 3-5 year timeframe based on what we know about the water quality measurement. The fluctuations of water within the Little Osage River, Marais des Cygnes River and the Marmaton Rivers is not only the result of runoff from storm events in their respective watersheds; rather it has been stated on numerous occasions that US Army Corps of Engineers operations of Truman Reservoir’s flood-pool schemes greatly influences the SOD in these three (3) streams. Anecdotal statements in public meetings bring and opinions of CWC members strongly believe that backwater flooding into these streams causes the drop-out of pollutant loads (sediment and nutrients) from upstream. These pollutant loads are not allowed to pass along in the normal stream “flushing” events as a result of slower water velocity attributed to the shortened stream grade. Backwater also impacts Mound Branch watershed as a result of Truman Reservoir.*

The Department has no expectation that SOD will be reduced by 82% within 3–5 years. As previously noted, post-TMDL monitoring will be scheduled and conducted approximately three years after the TMDL is approved, or “in a reasonable period of time following the implementation of nonpoint source BMPs.” The Department has no plans to assess and evaluate the success of TMDL implementation before three years, and will only begin to collect data after post-TMDL implementation has had a chance to result in water quality improvements.

A conversation with personnel at the U.S. Army Corps of Engineers, Kansas City District, Water Management Division, which regulates Truman Dam and Truman Reservoir, indicates that backwater from Truman Reservoir may reach at least as far upstream as the stream gage at Horton, Missouri once every several years. Although this gage is approximately 2.4 miles downstream of the impaired segment, the Department acknowledges that it is possible that backwater from Truman Reservoir may occasionally impact the downstream end of the impaired segment of the Little Osage River. The Department does not have data at this time documenting SOD contributed by these flooding events, and this potential source of SOD was not incorporated into the QUAL2K model. Further assessment of potential sources of SOD, including possible backwater from Truman Reservoir and the effects these backwaters may have on water quality in the Little Osage River, may be warranted in future iterations of this TMDL.

**Comment #10:** *What are the assumptions used for the waste load model, QUAL2K Model and sub-routines within this and other models? The model(s) and sub-routines may not be well known and commonly accepted. These model sources need to be made know to the public in this document and what version. An assumption by somebody far away from the source of the watershed is not accurate. A committee comprised of local watershed residents and users would add credibility to the process early in the development of a TMDL.*

QUAL2K is an EPA supported water quality model that simulates the fate and transport of DO and oxygen demanding substances in rivers and streams. The load duration curves and QUAL2K models used in development of pollutant allocations are discussed in Section 5.3 of the TMDL. A further description of the QUAL2K modeling process is included in Appendix C of the TMDL. In addition, as noted in Section 15 of the TMDL, the Department has kept a complete administrative record of all data and modeling files,

including the QUAL2K input and output files. These files are available to the public at any time upon request.

**Comment #11:** *The “Reference Streams”, Ecological Drainage Units (EDUs) cited in the draft TMDL report to compare Little Osage River stream network is flawed. The similarity is not there in land form, land uses, watershed characteristics, etc. The draft TMDL cites the “Little Drywood Creek, Vernon County, Missouri” as the reference stream yet when comparing data uses other unrelated streams as references. It would appear that the author(s) are attempting to draw conclusions from other sources that are not even representative of Little Osage River Watershed characteristics. We urge the author(s) to visit website: “**Biological Criteria for Wadeable/Perennial Streams of Missouri**”, Feb. 2002: Randy Sarver and Stuart Harlan, MoDNR-ES Program: <http://www.dnr.mo.gov/env/esp/docs/BiologicalCriteriaforWadeableStreamsofMissouri.pdf> and the reports from 2001 and 2007 sponsored by MoDNR on this very topic. Incidentally the reports have not changed during these two periods, “**Ozark Stream Class Ecological Archives MO77-010-A2**”, Scott P. Sowa, Gust Annis, Michael E. Morey, and David D. Diamond, 2007. A Gap analysis and comprehensive conservation strategy for riverine ecosystems of Missouri “**Ecological Monographs 77:301-334; Appendix B. Map Showing the 17 Ecological Drainage Units (EDUs) of Missouri**; <http://esapubs.org/Archive?mono/MO77/010/appendix-B.htm>. This draft TMDL did not use any of this streams data to support its claims for restoration. Why?*

**Referenced streams listed in this document:**

- *South Grand River [Archie, MO and Freeman, MO] (Cass County) is a severely channelized muddy bottomed channel with row-crop up to its bank edges and a major flood plain diked;*
- *Muddy Creek Branches (Cass County) has major urbanization with at least 2 large impoundments across the stream in several locations;*
- *Big Creek (Cass, Johnson and Henry Counties) again is not typical of this watershed. It is channelized and diked for waterfowl hunting clubs;*
- *W. Tebo Creek (Henry County) is an abandoned strip mined watershed;*
- *Cedar Creek (Pleasant View, MO); Ozark Stream Class;*
- *Weaubleau Creek, (St. Clair County); Ozark Stream Class;*
- *Brushy Creek (St. Clair County)*

TMDL modeling was completed by EPA using the ecoregion reference concentration approach, rather than the reference stream approach. The total suspended solids targets were derived based on a reference approach that targeted the 25<sup>th</sup> percentile of total suspended solids measurements collected by the U.S. Geological Survey (USGS), as non-filterable residue in the geographic region in which the Little Osage River is located (see Appendix B of the TMDL for a more complete discussion of development of total suspended solids targets). To address nutrient levels of total nitrogen and total phosphorous, the EPA nutrient ecoregion reference concentrations were used (for more information on nutrient reference concentrations see “Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion IX”. U.S. Environmental Protection Agency, Washington DC. EPA 822-B-001-019 and “Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion X”. U.S. Environmental Protection Agency, Washington DC. EPA 822-B-001-016).

Mr. Randy W. Pike  
Page Eight

In regard to Little Drywood Creek, the Department is unable to find any mention of this water body being used as a reference stream in the draft TMDL.

**Responses to January 21, 2010 Comment Letter:**

**Comment #1:** *We encourage you to contact Bates County Extension Agent, Al Decker Livestock Specialist, Vernon County Extension Agent, Wayne Prewitt Farm Management Specialist; Brad Powell, Bates County SWCD District Technician and Mark Curtis, Vernon County District Manager. These local experts are far more knowledgeable of the local conditions and are the experts the CWC contacts when developing proposals. They have detailed information specific to the areas of the watershed in the respective counties. The data is more specific and current than multi-year sampling process undertaken by USDA-AMS or MAMSS data.*

As recommended, the Department contacted personnel at the University of Missouri Extension Service in Bates and Vernon Counties. The specialist we spoke with assessed the livestock estimates contained in the draft TMDL and said that he thought they were a reasonable estimate of the number of livestock in the watershed, and that he could find no reason to fault them or use any data other than the USDA's Agricultural Census data. For this reason, as well as reasons outlined in the response to Comment #6 above, the Department will retain the livestock estimates contained in the draft Little Osage River TMDL.

**Comment #2:** *In addition references made to land use can be obtained from the report "Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan", dated August 2006, where each watershed in the plan has been detailed. These local experts should be able to further refine the data in this report should you need more specifics. That information in the report was current through the date of report being reviewed, published and accepted by MoDNR-WPP-319 Section / EPA. Furthermore these same local experts, in particular the SWCD staff can make necessary adjustments in animal waste and commercial nutrients sources and application areas. Many of the AFOs referenced have facility plans developed through the SWCD/NRCS offices plus the nutrient management plans as part of the cost-share programs they administer. This data in the report was taken from the most current data collected locally and verified through Natural Resources Inventory (NRI) primary sampling units (PSUs) and the same individuals previously mentioned. Each of these folks live and reside as residents within the two counties. This data is available through the local USDA-NRCS office and the Bates County SWCD offices located in Butler and/or the Vernon County SWCD in Nevada. The values used in computing the potential nutrient runoff was based upon the latest known data acquired by the technical staff of USDA-NRCS, UM-Extension, and Bates & Vernon Counties SWCD (previously mentioned). If the data within this report is insufficient these individuals can collectively provide more up-to-date data that we feel it is more accurate.*

The land use and land cover data used in the Little Osage River TMDL were developed by the Missouri Resource Assessment Partnership (MoRAP), an interagency partnership that includes the USGS' Columbia Environmental Research Center and the University of Missouri-Columbia. This 30-meter land cover classification was published in 2005 based

Mr. Randy W. Pike  
Page Nine

on 2000–2004 satellite imagery and the Department believes it is the most accurate and up-to-date land classification available for the State of Missouri.

A review of the “Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan” could find no reference to calculations of nutrient runoff potential related to land use practices. Also, the Natural Resources Conservation Service (NRCS) and Extension Service livestock specialists in the area have indicated that they are not immediately aware of any livestock animal feeding operations in the watershed, and so were not able to provide facility plans or nutrient management plans related to such facilities.

While potential nutrient loading inputs into the Little Osage River watershed have already been developed as part of the QUAL2K model based on measured water quality data, the Department acknowledges that the technical expertise of local agriculture and land use professionals is an invaluable asset. It is the Department’s hope that such individuals will continue to play a key role in the development and implementation of BMPs that address pollutant loading in the watershed.

**Comment #3:** *I believe the MoDNR-WPP until recent years was the reviewer of AFOs and had maintained those plans in an archive. These locations do appear on some of the CAFO/AFO maps developed by MoDNR as recent as 2006/2007. While these AFOs are not “permitted facilities” as CAFOs, the applicants did have to have sufficient land designated for their land applications. Since MoDNR is no longer reviewing AFOs, the local SWCD/NRCS agencies make this requirement anytime they assist a landowner with development of an animal waste system. Keep in mind under MoDNR own water quality rules, any landowner regardless of the size of animal operation, when found to be a polluter of Missouri waters is required to resolve the pollution issue and get a permit from MoDNR-WPP the same as a CAFO. As for poultry litter being imported into this watershed, it was your MoDNR staff person that made the assertion that litter was being applied to grasslands of this watershed. We did not see data to support this information. What we do know is that anecdotal information we suggest is from the Bates and Vernon Counties agricultural agencies mentioned previously. Follow-up with them would be of assistance to you in determining whether the anecdotal information from either source is useful and can be supported. Did that poultry litter at its cost of purchase and transport actually reach this watershed or other adjoining watersheds? Furthermore, if poultry litter is transported from a facility in SW Missouri that possesses a CAFO Permit, regardless of where that litter is transported, a record must be kept and furnished upon request by one of your Environmental Specialists or EPA as part of their normal follow-up inspections. The litter transport records must list the rate of application, location, crop utilization rates, landowner, and applicator as a minimum.*

As recommended, the Department contacted personnel at both the Bates and Vernon County NRCS offices. The representative from the Bates County office said that he was not aware of poultry litter being shipped into Bates County from poultry facilities in the southwest part of the state. He also confirmed that there is very little, if any, poultry litter being land applied in southern Bates County. He also confirmed that cattle operations in the area are primarily cow/calf grazing operations, with no concentrated feeding operations, and that he knows of no land application of cattle manure.

Mr. Randy W. Pike  
Page Ten

At the same time, the manager we spoke with in Vernon County did confirm that poultry litter is being hauled north into Vernon County from the poultry operations in the southwest part of the state, and that it is being land applied on both crop and pasture land in the county. Although he could not specifically say that poultry litter is generally land applied within the Little Osage River watershed, he did know of at least one landowner who has applied it in the area around Metz, Missouri (which is within the watershed). He was not aware of there being any smaller, non-permitted poultry operations in the Little Osage River watershed, or in the general area around the watershed.

A review of the permits for both of the permitted poultry operations in the Little Osage River watershed (downstream of the impaired segment) does indicate that, in addition to spreading litter on their own land, both operators have spreading agreements with other landowners. While these spreading agreements may be for land within the watershed, permit conditions do not require these operators to submit records revealing where, when, or at what rates this litter is being applied.

The TMDL has been updated with this additional reference confirming that poultry litter is spread as fertilizer in Vernon County, including within the Little Osage River watershed.

**Comment #4:** *The CWC would like to refer you to the report “Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan”, dated August 2006, in which the plan has numerous detailed issues and concerns listed (pages 75-76-public meeting comments) collected for this approved report. There were 19 of the 81 total public participants’ who commented on this topic alone about flooding. It’s ranked as the 3<sup>rd</sup> highest priority (Water Quality & Water Quantity) along with many expressed concerns under this category (pages 77-90). The authors for this section include current technical experts from MoDNR, EPA, UM-Extension and SWCD agencies. Flooding source was identified as the backwaters of Truman Lake the “primary” concern. Flooding is also a “linked” concern to the other nine (9) prioritized categories identified in this report. The flooding specifically can be related to the day-to-day operations for each county in this watershed by local, county, and state road maintenance crews, county commissioners, municipalities and residents in the watershed that are shut-off from their primary residents as a result of extended road flooding.*

*Flooding data from this can be acquired through USGS stream gauging as well as the US Army COE lake water levels that are kept as required by operations permit. I would suggest contacting MoDNR-DGLS for records submitted. Many of these records are long-term and are kept for numerous studies, pre- and post-dam completion. I’d also suggest contacting the University of Missouri-Extension Water Quality unit and the University of Missouri-Lake Monitoring Program funded by MoDNR/EPA. All of this information is available to the public upon request.*

*The dramatic economic impact on pecan and walnut growers is the result of the constant influx of prolonged backwater in these upstream tributaries. This prolonged backwater causes the soil profiles to be saturated in the pecan and walnut groves. Economic losses of trees dying and nut production loss is due to poor soil aeration. This “drowning phenomenon” is acknowledged by forestry experts, life-long growers, and local leaders.*

Mr. Randy W. Pike  
Page Eleven

*The US Army COE have not denied “drowning”; they only maintain these groves maybe within their flood plain easement.*

The Department acknowledges that flooding is a serious issue of concern for some area residents and farmers in the Little Osage River watershed. A review of “The Marais des Cygnes, Marmaton, and Little Osage River Watershed Management Action Plan” found two public comments about flooding impacts to roads and bridges attributable to Truman Reservoir (page 86), and a brief discussion of impacts to agriculture and forests caused by changes in hydrology associated with the reservoir (page 44). The Water Quality and Quantity section of the report (pages 24-29) refers briefly to flooding insofar as it is caused by excessive precipitation and the construction of levees. Although “storm water” is listed as one of the current threats to water quality in the watershed, flooding associated with backwater from Truman Reservoir is not identified as a threat.

As noted in the response to Comment #9 above, the Department acknowledges that it is possible that backwater from Truman Reservoir may occasionally impact the downstream end of the impaired segment of the Little Osage River. However, the Department does not have data at this time documenting SOD contributed by any such flooding events, and this potential source of SOD was not incorporated into the QUAL2K model. It should be further noted that water quality data collected in Missouri to assess impairment of the Little Osage River was collected at Highway V near Stotesbury, Missouri. While the maximum mean surface elevation ever recorded on Truman Reservoir was 739.6 feet (in 1986), the elevation of the river at Highway V is greater than 750 feet. Thus, while backwater from Truman Reservoir may impact the lower reaches of the Little Osage River, it does not appear likely to be contributing to the assessed impairment.

Once again, the Department appreciates the CWC bringing this issue to our attention and agrees that further assessment of flood water in the Little Osage River watershed may be warranted in future iterations of this TMDL.

**Comment #5:** *The CWC is being asked to provide data to MoDNR/EPA on the SOD parameter when neither MoDNR nor EPA has provided substantiated data for the use of this parameter in fresh-water scenarios. Our public requests to MoDNR, MDC, University of Missouri for such data is not available. In fact nobody even knew about this parameter until a web search was conducted. The parameter SOD as we researched along with the assistance of these water quality agencies found the application of such a parameter exclusive to coastal areas whereby fresh-water intermingles with tidal salt-waters. The parameter SOD was developed in particular for the estuary of Chesapeake Bay streams emptying into the bay where the influence is that of the mixing zone of upstream fresh-water with tidal salt-water. The parameter has been extended to 1-2 streams entering the Gulf of Mexico but nowhere else can we find an application in inland scenarios. Thus the parameter being proposed does not have time-tested data to support conclusions leading to an “etched in stone TMDL” plan which you are proposing. We find the untested and unsupported parameter for this area unjustified in the scientific community. While this maybe a future parameter neither this watershed nor any other currently impaired watershed should have this parameter included in its TMDL plan until such field tested data is developed for solely inland streams to lake fresh-waters scenarios.*

The rate of SOD has been defined as “the rate that dissolved oxygen is removed from the water column in lakes, rivers and estuaries due to the decomposition of organic material in the bottom sediments”<sup>2</sup>. Understanding of oxygen depletion in rivers associated with deposition of organic matter in bottom sediments dates back to the late 19<sup>th</sup> century, and quantification of SOD as a component of total oxygen demand first took place in studies of the Ohio and Illinois Rivers in the 1930’s<sup>3</sup>.

The Department acknowledges that there may be some stream and river systems where the use of SOD as a measure of oxygen demand is not warranted. However, SOD is widely accepted by EPA and others in the scientific and regulatory community as an appropriate parameter for measuring water quality and establishing pollutant load allocations in rivers and streams that, because of their physical and hydrologic characteristics, experience pronounced decomposition of organic material in bottom sediments. This is particularly true of former prairie streams that now drain predominantly agricultural landscapes, as is the case with the Little Osage River. As noted in the “Model Calibration” section of Appendix C of the TMDL, an analysis of continuous DO measurements in the Little Osage River indicated that benthic processes may contribute significantly to the fluctuation of DO observed under critical low flow conditions.

For additional discussion of the use of SOD as a parameter for assessing the oxygen balance of streams and rivers, see EPA’s “Technical Guidance Manual for Performing Wasteload Allocations, Book II: Rivers and Streams”, at the following link: <http://www.epa.gov/waterscience/standards/tmdl/guidance.pdf>.

Please understand that, while TMDL modeling does indicate that a significant reduction in SOD is needed to meet the DO standard of 5 mg/L throughout the Missouri portion of the Little Osage River, there are no “etched in stone” plans nor strict time lines for achieving this goal. As noted in the implementation section of the TMDL, because of the lack of permitted facilities contributing to the low DO impairment, no wasteload allocations have been established and no portion of the TMDL will be implemented through permit action at this time. Rather, pollutant reductions will need to be achieved through voluntary BMPs directed at nonpoint sources. Far from being a Department directive, pollutant reduction through the establishment of BMPs should be a flexible and open process that is driven by the initiative and creativity of local residents and officials in and around the watershed.

The Little Osage River is a TMDL Consent Decree water that was due to have a TMDL submitted to EPA by December 31, 2009. Since this date has passed, the TMDL must be finalized and submitted to EPA at the earliest possible opportunity. Please know, however, that the Department is committed to working with the CWC and the Vernon

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<sup>2</sup> Hatcher, Kathleen J., “Introduction to Part 1: Sediment Oxygen Demand Processes,” in *Sediment Oxygen Demand: Processes, Modeling and Measurement* (Institute of Natural Resources, University of Georgia, 1986), 3–8

<sup>3</sup> Davis, Wayne S. and Lathrop-Davis, Joyce E., “Brief History of Sediment Oxygen Demand Investigations,” in *Sediment Oxygen Demand: Processes, Modeling and Measurement* (Institute of Natural Resources, University of Georgia, 1986), 9–21

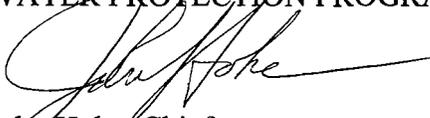
Mr. Randy W. Pike  
Page Thirteen

County and Bates County Commissions toward implementing this TMDL once it is approved by EPA.

Thank you again for your comments. If you should have questions or would like to discuss this TMDL further, please contact me at (573) 526-1446 or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

Sincerely,

~~WATER PROTECTION PROGRAM~~

A handwritten signature in black ink, appearing to read "John Hoke", written over the text "WATER PROTECTION PROGRAM".

John Hoke, Chief  
TMDL Unit  
Water Quality Monitoring and Assessment Section

JH:bwl

## Whipps, Bill

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**From:** Hoke, John  
**Sent:** Friday, April 02, 2010 3:37 PM  
**To:** Whipps, Bill  
**Subject:** FW: Comments on Little Osage River

John Hoke  
Env. Specialist IV, TMDL Unit Chief  
Water Quality Monitoring & Assessment  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920  
From: Adkins.Tabatha@epamail.epa.gov [Adkins.Tabatha@epamail.epa.gov]  
Sent: Friday, April 02, 2010 3:26 PM  
To: Hoke, John  
Subject: Comments on Little Osage River

John,

Listed are EPA comments for Little Osage River. Thanks.

TJ

Need a copy of the January 21, 2010 comment letter from Vernon County Commissions.

- TMDL states WB length as 23.6 miles in Missouri's new Table H (not EPA approved?), but does acknowledge in footnote that the 2008 303(d) list has it listed for 16.0 miles.

We need clarifications:

- 1) acknowledgement that the Table H effective for MDNR October 2009 has not been approved by EPA,
- 2) some statement indicating that the new 23.6 miles encompasses the entirety of the 16.0 miles listed in 2008, and
- 3) if wanting to write this for the 23.6 miles, that the location information is the same or provide the updated information.

Pages 4-5, Landuse percentage discussion does not match Table 1. (ie, grassland is 52% where the Table has MO % = to 42%). Unclear in the

TMDL: "The primary land uses/land covers for the entire watershed are....." clarify if this means including KS or MO only.

- Land use and land cover

Calculating from Table 1, different landuse/land cover percentages are found for the entire watershed than what is cited in the text. Values are the same for grassland 52%, and 0.75% for urban. Those that differ are cropland 26%, forest and woodland 15%, and open water 1.2%. Please recheck the values and/ or calculations of these values.

- Table 1 Land use/ land cover

Found slightly different totals than what is given. Our calculations are 138561 acres in Missouri and 234375 acres in Kansas. Please recheck values and/ or calculations.

Explain implicit MOS. Need to elaborate on what those conservative assumptions/targets were.

Antidegradation Tier 2 - Phrase should be "economical and social development" rather than "or".

- 2008 303(d) list problem. The official list says the impaired use is Whole Body Contact Recreation (swimming). Know that's not right with a DO pollutant. This needs to be explained in the TMDL with probably a statement that it will be fixed on a future 303(d) list.

Page 8, first paragraph: "The other three facilities, a meat processing plant and two poultry concentrated animal feeding operations, are downstream of the impaired segment and are not contributing to the low dissolved oxygen impairment." Need to clarify why these three are not contributing. Language for other two were unlikely w/ an explanation.

Page 23, section 7: "Therefore, no portion of the TMDL load capacity will be allocated to point sources and wasteload allocations for Kansas and Missouri are set at zero." Need to remove Kansas from this wording.

Per Tom's comment letter, an indication can be made on what the Kansas permits might be contributing based on the

standard and design flow.

This could go in Table 4. This would not need to be re-public noticed.

You are only showing (and explaining) sourcing and what current conditions could be at the worst coming in from Kansas.

Page 9, Table 4 and Table 5: It would help the reader if the Kansas permits had the NPDES Federal number (KS00XXXX). This allows for easier review in PCS.

Page 7, indicates there are two CAFOs in the watershed for the Missouri portion. These permit numbers need to be included in the TMDL or the language needs to be clarified that they are in the greater watershed but not part of the impaired segment watershed or clarify if these are the same two poultry facilities. Confusing.

- Listing of potential NPS: Vernon County produces more pecans in Missouri than any other county according to the USDA's Agricultural census data. The extent of nut growing acres is further substantiated by the Vernon County Commission's letter stating, "...there is considerable number of acres of pecan and walnut groves that are grazed in Missouri, a management strategy in nut trees organic." While neither estimates the acres involved, pecans are grown in the alluvial floodplain and are regularly flooded. In addition, standard growing practices for nut tree groves includes fertilization of the trees, mowing ground cover and/or seasonal grazing. This is a source of nutrients that should be included in context with livestock grazing, forested areas, and riparian areas.

The letter from Vernon County Commission and MDNR's response also indicate that poultry litter may be land applied in the LO watershed from the two facilities downstream. The discussion of poultry litter application only mentions SW Missouri sources. MDNR should also acknowledge in the text that poultry litter could originate from local operations, e.g., those immediately downstream.

- Defining the Problem.

Please provide the citation for the referenced 2007 biological assessment conducted by MDNR.

- Point Sources

Table 3 lists MO-G490983 while Figure 2 show MOG409083. Please clarify this discrepancy whether it be two facilities or one.

- Point Sources

Table 4 and Figure 2 list the municipal WWTP with different numbering systems. The letters and numbers are the same but the figure shows additional hyphens. For clarification, please confirm these are the same facilities.

- Numeric Criteria

The last sentence refers to Table 8 which discusses productivity and respiration rates of the Little Osage. Please confirm this is the correct table reference.

- Data Collection

I only count 12 sampling events in Appendix A.1 for Little Osage River at Highway V. Please confirm if there are 12 or 13 sample points.

- Diurnal DO Analysis

Please provide reference information for Huggins and Anderson (2003).

Also confirm if Wilcock is 1984 (text) or 1988 (reference section).

Please provide more detail on why the O'Connor and Dobbins equation is an appropriate means of estimating stream reaeration.

- Tables 7 and 8

Please provide more information on at least the lesser used abbreviations used in this table, e.g., SS, gO<sub>2</sub>/m<sup>2</sup>/day.

- QUAL2K

Please provide the reference information for Chapra, et al. (2007).

- LA

Please clarify why the flows are different between the tables for the entire watershed and the watershed in Missouri. It is also confusing whether the LC/ LA for each pollutant in the entire watershed was simply reduced by 66%. Many values calculate correctly from the tables, but many others do not. For example, the first three values for TP. The total watershed gives a LC of 3.8 lbs/d at 95%, 6.3 lbs/d at 90%, and 17.9 lbs/d at 70%. Multiplying these each by 0.33 (33%) gives 1.254 lbs/d, 2.079 lbs/d, and 5.907 lbs/d. The Missouri watershed table lists 1.27 lbs/d, 2.06 lbs/d, and 5.89 lbs/d.

Tabatha Adkins, TMDL Coordinator

Water Quality Management Branch-WWPD,  
USEPA Region 7  
901 North 5th Street  
Kansas City, KS 66101  
913.551.7128  
adkins.tabatha@epa.gov

## Whipps, Bill

---

**From:** Hoke, John  
**Sent:** Monday, April 05, 2010 4:42 PM  
**To:** Whipps, Bill  
**Subject:** FW: little Osage

John Hoke  
Env. Specialist IV, TMDL Unit Chief  
Water Quality Monitoring & Assessment  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

-----Original Message-----

From: Adkins.Tabatha@epamail.epa.gov [mailto:Adkins.Tabatha@epamail.epa.gov]  
Sent: Monday, April 05, 2010 4:21 PM  
To: Hoke, John  
Subject: little Osage

John,

Sorry but we have a few additional comments on Little Osage. Thanks.

TJ

CAFO's near Blue Mound, KS: Lloyd Mitchell & Terry L. Broyles  
A-MCBB-L008  
A-MCBB-L007

Clarify in Table 5 of the TMDL that referring to Kansas animal units, not federal.

Tabatha Adkins, TMDL Coordinator  
Water Quality Management Branch-WWPD,  
USEPA Region 7  
901 North 5th Street  
Kansas City, KS 66101  
913.551.7128  
adkins.tabatha@epa.gov

## Whipps, Bill

---

**From:** Hoke, John  
**Sent:** Monday, May 03, 2010 11:10 AM  
**To:** 'Adkins.Tabatha@epamail.epa.gov'  
**Cc:** Whipps, Bill  
**Subject:** RE: Comments on Little Osage River

TJ,

Please see the Department's responses to EPA's comments on the Little Osage River TMDL in [blue](#) below. I've also placed the draft final TMDL on the Department's FTP site in the Outgoing\TMDL folder at the link below. If you have questions or need additional information, please let me know. Thanks!

John Hoke  
Env. Specialist IV, TMDL Unit Chief  
Water Quality Monitoring & Assessment  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

-----Original Message-----

From: Adkins.Tabatha@epamail.epa.gov [<mailto:Adkins.Tabatha@epamail.epa.gov>]  
Sent: Friday, April 02, 2010 3:27 PM  
To: Hoke, John  
Subject: Comments on Little Osage River

John,

Listed are EPA comments for Little Osage River. Thanks.

TJ

Need a copy of the January 21, 2010 comment letter from Vernon County Commissions.

- TMDL states WB length as 23.6 miles in Missouri's new Table H (not EPA approved?), but does acknowledge in footnote that the 2008 303(d) list has it listed for 16.0 miles.

We need clarifications:

- 1) acknowledgement that the Table H effective for MDNR October 2009 has not been approved by EPA,
- 2) some statement indicating that the new 23.6 miles encompasses the entirety of the 16.0 miles listed in 2008, and
- 3) if wanting to write this for the 23.6 miles, that the location information is the same or provide the updated information.

[Clarifying language added to footnote on page ii.](#)

Pages 4-5, Landuse percentage discussion does not match Table 1. (ie, grassland is 52% where the Table has MO % = to 42%). Unclear in the

TMDL: "The primary land uses/land covers for the entire watershed are....." clarify if this means including KS or MO only.

[Clarifying language added to Section 2.4. Percentages corrected and new Table 1 added that includes land use percentages for the whole watershed.](#)

- Land use and land cover

Calculating from Table 1, different landuse/land cover percentages are found for the entire watershed than what is cited in the text. Values are the same for grassland 52%, and 0.75% for urban. Those that differ are cropland 26%, forest and woodland 15%, and open water 1.2%. Please recheck the values and/ or calculations of these values.

[Percentages corrected.](#)

- Table 1 Land use/ land cover

Found slightly different totals than what is given. Our calculations are 138561 acres in Missouri and 234375 acres in Kansas. Please recheck values and/ or calculations.

[Calculations in Table 1 checked and corrected.](#)

Explain implicit MOS. Need to elaborate on what those conservative assumptions/targets were.

[Language added to Section 9.](#)

Antidegradation Tier 2 - Phrase should be "economical and social development" rather than "or".

[Language in Section 4.3 corrected.](#)

- 2008 303(d) list problem. The official list says the impaired use is Whole Body Contact Recreation (swimming). Know that's not right with a DO pollutant. This needs to be explained in the TMDL with probably a statement that it will be fixed on a future 303(d) list.

[Explanatory footnote added to page ii.](#)

Page 8, first paragraph: "The other three facilities, a meat processing plant and two poultry concentrated animal feeding operations, are downstream of the impaired segment and are not contributing to the low dissolved oxygen impairment." Need to clarify why these three are not contributing. Language for other two were unlikely w/ an explanation.

[Clarifying language added to Section 3.1.](#)

Page 23, section 7: "Therefore, no portion of the TMDL load capacity will be allocated to point sources and wasteload allocations for Kansas and Missouri are set at zero." Need to remove Kansas from this wording.

[Section 7 corrected](#)

Per Tom's comment letter, an indication can be made on what the Kansas permits might be contributing based on the standard and design flow.

This could go in Table 4. This would not need to be re-public noticed. You are only showing (and explaining) sourcing and what current conditions could be at the worst coming in from Kansas.

[Potential pollutant contribution based on design flow from Kansas WWTPs added to Table 4.](#)

Page 9, Table 4 and Table 5: It would help the reader if the Kansas permits had the NPDES Federal number (KS00XXXX). This allows for easier review in PCS.

[Table 4 has been revised to include NPDES ID number. Livestock facilities in Table 5 do not have federal permits](#)

Page 7, indicates there are two CAFOs in the watershed for the Missouri portion. These permit numbers need to be included in the TMDL or the language needs to be clarified that they are in the greater watershed but not part of the impaired segment watershed or clarify if these are the same two poultry facilities. Confusing.

[Revised language added to Section 3.1.](#)

- Listing of potential NPS: Vernon County produces more pecans in Missouri than any other county according to the USDA's Agricultural census data. The extent of nut growing acres is further substantiated by the Vernon County Commission's letter stating, "...there is considerable number of acres of pecan and walnut groves that are grazed in Missouri, a management strategy in nut trees organic." While neither estimates the acres involved, pecans are grown in the alluvial floodplain and are regularly flooded. In addition, standard growing practices for nut tree groves includes fertilization of the trees, mowing ground cover and/or seasonal grazing. This is a source of nutrients that should be included in context with livestock grazing, forested areas, and riparian areas.

[Language added to Sections 3.2.1 and 3.2.4.](#)

The letter from Vernon County Commission and MDNR's response also indicate that poultry litter may be land applied in the LO watershed from the two facilities downstream. The discussion of poultry litter application only mentions SW Missouri sources. MDNR should also acknowledge in the text that poultry litter could originate from local operations, e.g., those immediately downstream.

[Language added to Section 3.2.1.](#)

- Defining the Problem.

Please provide the citation for the referenced 2007 biological assessment conducted by MDNR.

Reference added to Section 2.5 and citation added to the References section.

- Point Sources

Table 3 lists MO-G490983 while Figure 2 show MOG409083. Please clarify this discrepancy whether it be two facilities or one.

Figure 3 has been corrected with the permit number MO-G490983

- Point Sources

Table 4 and Figure 2 list the municipal WWTP with different numbering systems. The letters and numbers are the same but the figure shows additional hyphens. For clarification, please confirm these are the same facilities.

Figure 3 has been corrected to include hyphens in the permit numbers.

- Numeric Criteria

The last sentence refers to Table 8 which discusses productivity and respiration rates of the Little Osage. Please confirm this is the correct table reference.

The reference to Table 8 had been incorrect, it should have referred to Table 7. However, I have since added a new Table 7 (see below) which makes what had been Table 7 now Table 8. So the reference to Table 8 in the text is now correct.

- Data Collection

I only count 12 sampling events in Appendix A.1 for Little Osage River at Highway V. Please confirm if there are 12 or 13 sample points.

Last sentence of section 5.1 corrected to reflect 12 sample points.

- Diurnal DO Analysis

Please provide reference information for Huggins and Anderson (2003).

The citation is already there in the References section, however it is listed as Anderson and Huggins. The reference in the text (Section 5.2) has been corrected to read (Anderson and Huggins 2003).

Also confirm if Wilcock is 1984 (text) or 1988 (reference section).

The Wilcock reference in the text has been corrected to read (Wilcock 1988).

Please provide more detail on why the O'Connor and Dobbins equation is an appropriate means of estimating stream reaeration.

A new Table 7 and additional references added to Section 5.2, as per guidance from Glenn Fernandez.

- Tables 7 and 8

Please provide more information on at least the lesser used abbreviations used in this table, e.g., SS, gO<sub>2</sub>/m<sup>2</sup>/day.

Clarifications added below Tables 8 and 9 (formerly Tables 7 and 8)

- QUAL2K

Please provide the reference information for Chapra, et al. (2007).

Citation added in the references section.

- LA

Please clarify why the flows are different between the tables for the entire watershed and the watershed in Missouri.

The flows in the two tables represent the flow from the entire watershed, and the contribution of flow from only the Missouri portion of the watershed (as indicated in the table headings). This is how these tables were developed by EPA. This is appropriate because the pollutant loading is based on flow, and the allocations table for the Missouri portion of the watershed takes into account only flow contribution from Missouri, and does not take into account flow contributed from upstream in Kansas.

It is also confusing whether the LC/ LA for each pollutant in the entire watershed was simply reduced by 66%. Many

values calculate correctly from the tables, but many others do not. For example, the first three values for TP. The total watershed gives a LC of 3.8 lbs/d at 95%, 6.3 lbs/d at 90%, and 17.9 lbs/d at 70%. Multiplying these each by 0.33 (33%) gives 1.254 lbs/d, 2.079 lbs/d, and 5.907 lbs/d. The Missouri watershed table lists 1.27 lbs/d, 2.06 lbs/d, and 5.89 lbs/d.

The minor discrepancies noted are due to the fact that the calculations that proportionally reduce the LC/LA for the Missouri portion of the watershed are done using the full value (to 4 decimal places) from the LDC spreadsheet, whereas the numbers displayed in the tables are rounded.

CAFO's near Blue Mound, KS: Lloyd Mitchell & Terry L. Broyles

A-MCBB-L008

A-MCBB-L007

Table 5 updated to include these livestock permits.

Clarify in Table 5 of the TMDL that referring to Kansas animal units, not federal.

Clarified in a footnote to Table 5.

Tabatha Adkins, TMDL Coordinator  
Water Quality Management Branch-WWPD,  
USEPA Region 7  
901 North 5th Street  
Kansas City, KS 66101  
913.551.7128  
adkins.tabatha@epa.gov