



Missouri  
Department of  
Natural Resources

DRAFT MARMATON RIVER TMDL  
PUBLIC COMMENTS

First Public Notice  
February 4, 2010 – April 2, 2010

**Marmaton River**  
**WBID # 1308**

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

**Hoke, John**

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**From:** Donald L. Schuster [dlschuster2@sbcglobal.net]  
**Sent:** Wednesday, March 10, 2010 10:06 PM  
**To:** Hoke, John  
**Cc:** Donald L. (H) Schuster; Bonnie McCord; Kennon Shaw; Danny L. Hahn; Randy Pike; McKenzie O'Neiell; Curtis, Mark; Wayne Prewitt  
**Subject:** DRAFT Marmaton River and Little Drywood Creek TMDL PUBLIC REVIEW

John,

Danny Hahn, President MMLO CWC, Bonnie McCord, Presiding Commissioner, Vernon County Commission and staff for the Vernon County SWCD are requesting an extension of the present PUBLIC NOTICE deadline from March 21, 2010 (Sunday) to COB on April 2, 2010 for the "*Marmaton R. & Little Drywood Creek TMDL*". The CWC and Vernon County Commission were finally able to conduct a public review session this past Tuesday due to many conflicting meetings and events. A total of 13 watershed citizens and professionals attended to learn more about the TMDL process and to comment on their concerns. A small group of individuals headed by Danny and Bonnie will compose a draft comment letter of this draft document review.

Vernon County SWCD staff was aware of the draft report but this Board will not meet again until March 25, 2010 to take formal action on the staffs review of the draft TMDL. The SWCD staff while cooperating with the CWC and Commissioners cannot officially make a statement until their Board authorizes such comments. When the Board does authorize it will take them a few days to a week to compile their thoughts and then capture the authorized signature.

The CWC upon request of the Vernon County Commissioners is preparing a a single response letter for all of those watershed residents in attendance this past Tuesday.

We hope that you have the flexibility to allow a 2 week extension so that we will be able to complete compilation of comments and have conduct a review of the written comments.

Thanks for your consideration.

Don Schuster  
CWC and Vernon County Commission Adviser

10/27/2010

**Whipps, Bill**

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**From:** Hoke, John  
**Sent:** Thursday, March 11, 2010 10:46 AM  
**To:** 'Donald L. Schuster'  
**Cc:** Bonnie McCord; Kennon Shaw; Danny L. Hahn; Randy Pike; McKenzie O'Neiell; Curtis, Mark; Wayne Prewitt; Whipps, Bill

**Subject:** RE: DRAFT Marmaton River and Little Drywood Creek TMDL PUBLIC REVIEW

Mr. Schuster,

Thank you for your e-mail regarding the Public Notice/Comment Period Extension for the Marmaton River and Little Drywood Creek TMDLs. The Department appreciates the interest and involvement of groups such as the CWC and Vernon County Commission and SWCD and welcomes any comments these organizations can provide.

As you are aware, the majority of TMDL development activities to date have been directed toward assisting the U.S. Environmental Protection Agency (EPA) in fulfillment of the requirements relating to the TMDL Consent Decree<sup>1</sup> and toward fulfilling the Memorandum of Understanding<sup>2</sup> (MOU) between EPA and the Department. The Marmaton River is one of the water body segments that is listed on the Consent Decree and must have TMDLs submitted to EPA as soon as possible in order to meet the Consent Decree deadline of December 31, 2010. Should the Department not fulfill its obligations under the Consent Decree and MOU, EPA will proceed with establishing and approving these TMDLs without the Department's input or assistance.

The Department believes a 45-day public notice period is sufficient time to review and provide informed comments on a TMDL. However, extensions may be granted provided the Department can accommodate the extension and still meet its obligations under the Consent Decree. In the case of the Marmaton River and Little Drywood Creek TMDLs, the Department can extend the public comment period until the requested COB April 2, 2010. This will give the CWC and Vernon County Commission and SWCD sufficient time to submit comments and allow the Department time to respond and submit these TMDLs to EPA.

The Department remains committed to working with the CWC and Vernon County toward implementing these TMDLs once they are approved by EPA. If you should have questions or need additional information, please let me know. Thank you again for your interest and involvement.

<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. <sup>2</sup> – Memorandum of Understanding (MOU) refers to the August 2000 MOU between EPA and the department to "memorialize all commitments relative to the determination of impaired waters and the development of total maximum daily loads."

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

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**From:** Donald L. Schuster [mailto:dlschuster2@sbcglobal.net]  
**Sent:** Wednesday, March 10, 2010 10:06 PM  
**To:** Hoke, John  
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Don Schuster  
CWC and Vernon County Commission Adviser

**Hoke, John**

---

**From:** TWallace@Geosyntec.com  
**Sent:** Thursday, March 11, 2010 11:12 AM  
**To:** Hoke, John  
**Cc:** jdkehrman@nevadamo.org; cerisman@amce.com  
**Subject:** Request for PN Extension for Marmaton-Little Drywood Draft TMDL

John,

On behalf of the City of Nevada and Allgeier Martin Consulting Engineers, we request an extension of the public notice (PN) period for the draft Marmaton River/Little Drywood Creek TMDL. This extension is requested to give sufficient time to review the extensive TMDL supporting information. The City is in the process of constructing a new wastewater treatment plant and will need additional time to coordinate comments and hopefully meet with you and your staff during the comment period. JD Ehrman has recently come on board as City Manager. I understand his transition occurred after the TMDL public notice began which created delays before the City's TMDL review team could commence. We greatly appreciate your consideration of the City's request on this very important issue. An extension of 30 days would be preferable to give sufficient time for review and discussions. Fifteen days would be considered the minimum time the City would need.

We greatly appreciate you and your staff's very timely response to forward the TMDL data files to us and we look forward to working together to address the City's comments. Please let me know if an extension can be granted and if we can provide anything else.

Thanks John, Tom

**Tom Wallace**  
Senior Project Manager

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10/27/2010

**Whipps, Bill**

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**From:** Hoke, John  
**Sent:** Thursday, March 11, 2010 11:42 AM  
**To:** 'TWallace@Geosyntec.com'  
**Cc:** jdkehrman@nevadamo.org; cerisman@amce.com; Whipps, Bill  
**Subject:** RE: Request for PN Extension for Marmaton-Little Drywood Draft TMDL

Tom,

The Department received a similar request yesterday evening from the Citizens Watershed Committee and Vernon County Commission and SWCD. I'll be forwarding my response to their request below for your information. We will be extending the public notice/comment period until close of business (COB) April 2, 2010. If you have questions or if I can be of additional assistance, 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

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**From:** TWallace@Geosyntec.com [mailto:TWallace@Geosyntec.com]  
**Sent:** Thursday, March 11, 2010 11:12 AM  
**To:** Hoke, John  
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Thanks John, Tom

**Tom Wallace**  
Senior Project Manager

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10/27/2010

April 2, 2010

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

RECEIVED  
2010 APR 12 PM 1:20  
WATER PROTECTION PROGRAM

RE: Draft Marmaton River and Little Dry Wood Creek Total Maximum Daily Load or TMDL, Vernon County, 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 Marmaton River and Little Drywood Creek", hydrologic unit code 10290104 and 10290104; water bodies identification # 1308 and 1325, Vernon County, Missouri released for public comment February 4, 2010 to March 21, 2010. The CWC requested an extension of time for local interested groups until the COB on April 2, 2010..

First, the committee believes the author(s) of this and other draft reports need to be placed prominently on the title page of the document or in the public notice of this document release so that the public may request document 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, a contractor, or a host email/phone number where the question may be posed and answered by an appointed responsible staff member.

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

- ❖ **SEC. 2.1 PARA. 3.** Agency writer expects all readers of this document to understand the agency terms "class P segments" If this term is to be used then have a definition section in the document or one for the program section that can be accessed.
- ❖ **SEC. 2.2 PARA. 1.** Agency is using two different sets of data collected from two different vintages that will not be consistent throughout the examination of issues in the watershed. Agency should use only one set of data and stick with it until better data is available. Do not mix data, it cannot be scientifically supported. Nobody can tell what data was used to evaluate the author's conclusions. Consequently the report in total is in question.
- ❖ **SEC. 2.2, PARA. 1.** Numbers of the population do not compute correctly. This and other census data needs to remain consistent or any assumption is brought into question bad or good.
- ❖ **SEC. 2.2, PARA. 2.** Ditto for population projections for Fort Scott, KS data. Select one and stick with it.
- ❖ **SEC. 2.3, PARA. 1.** Soil landscapes need to be correctly reported. Stream Bottoms are level whereas uplands adjacent to these streams are gentle sloping. Revise the description to accurately represent stream bottoms and include uplands in the proper context. There is no discussion as to the distance or how close these landscape features with steep sloping landscapes in relation to the streams and tributaries of these streams. The impacts derived from the relative distance and vegetal conditions will be a major contributor to soil erosion, sediment delivery, and organic matter to these streams.
- ❖ **SEC. 2.3, PARA. 4.** The premise of this entire paragraph is without foundation. First soil infiltration and soil permeability are two very distinct processes that are not interchangeable while at the same time are interrelated. Infiltration is surface waters, external, AND ABILITY to get into the soils surface. It is impacted by numerous factors including soil properties, vegetations, landscape, weather and seasonal changes. On the other hand permeability is entirely in soil waters ability to move internally within the soil profile. The example used in this paragraph of storms generating < .57 inches / hr is not correct. It is all dependent upon the timing of previous storms, seasonal changes, late summer versus late spring or winter, etc. Discussions with a prominent soil scientist will invalidate that claim. Weather data from the University of Missouri Weather Collection System will show cyclical events ranging from 20-25 yrs apart going from intense precipitation to drought conditions. USDA-FSA has for many years in each county maintaining daily precipitation records to help support these claims. If the authors of this document and the agency modelers are interchanging these properties the data will definitely present an erroneous computation not in favor of the resources.

RE: Draft Marmaton River and Little Drywood Creek Draft Total Maximum Daily Load or TMDL, Vernon County, Missouri  
Comments (Cont'd)

- ❖ **SEC. 2.4, TABLE 1,** The data provided by MoRAP is inconsistent with that provided in the MMLO Watershed Management Action Plans dated 2006 by which local natural resource agency staff completed an accurate analysis of the watershed land uses supported acreage figures from their agency records reported by landowners. CWC stands behind its report of 2006 found in this document.
- ❖ **SEC. 2.4, PARA. 2, Sentence 3 & Table 2;** The CWC is confused by the statement in regards to the urban land use component being the majority in Little Drywood Creek. If you look at your own map in this document depicting the two watersheds you will see the majority of City of Nevada actually lies within the Marmaton (about 75% ) and the growth in the city is going north and east not south (Table2). The percentage of wetlands is a debatable topic especially with the means at which the wetlands were interpreted by MoRAP and field verified.
- ❖ **SEC. 2.5, PARA. 2,** The statement about DO from 2001-2009 is a real stretch. Your own documents show that all of 2007-2009 do not have one reportable period of less than 5.0 mg/l DO. Also further evaluation of the DO data furnished will show you that as the yearly cycle of rainfall and seasonal drought occurs so does the lower DO occurs, namely from September thru October in the years 2001-2006. During this period of the season, water temperatures are starting to cool versus during the hot periods of May thru August. Consequently as the rainfall period within our regions typical 20-25 year cycle has diminished the water quality issue declines or disappears. Not knowing the results from 2010 and these should be good since the precipitation has been above normal. Thus the theory of drought and rainy cycles must have a direct bearing on this discussion, something that is not controlled by man. Another factor that must be addressed in this total water quality equation is the quantity of water available from the watershed runoff events. The number of public and private reservoirs built in the KS portion of this watershed is currently at 102 registered reservoirs ranging in size from 17 ac-ft to 8,092 ac-ft of stored water with a storage capacity for the normal reservoir pool at 27,110.4 ac-ft the average reservoir size at approximately 274ac-ft. This excludes the emergency storage pool derived from a 50-100 yr frequency storm event for these reservoirs. When the additional emergency storage is added approximately 41,913.4 ac-ft is stored in this emergency pool reservoir area with the average around 723 ac-ft. Each of these reservoirs hampers the streams ability to maintain constant flow to support aquatic life not only within these two streams but other streams entering Missouri from Kansas as well. When the initial rainfall runoff enters the streams feeding these reservoirs the Missouri watershed only gets that which leaves their fields to replenish their streams and wetlands. The majority of these reservoirs hold back 41, 913.4 ac-ft or 60.7% of the total structure holding capacities depriving Missouri of the much needed water. Stated another way the amount of water withheld from Missouri as a result of these reservoirs impounding the runoff from a storm event of this magnitude is 155,090,477,484 gallons of water. This is water that could be augmenting the streams flow for Missouri's healthy watersheds too. Instead much of this water is being used by others, especially domestic uses at the expense of maintaining a healthy watershed. These 102 reservoirs that are holding back large volumes of water 27,110.4 ac-ft for normal pool stages and 41,913.4 ac-ft at emergency pool stage, if released in a concerted low flow method would help augment stream flows and improve the overall health of these streams. Instead the State of Kansas continues to issue more and more watershed based permits to build more and more reservoirs to lock up more of the shared surface waters, deprive Missouri watershed residents of their fair share. While KS water laws are far more defining and controlling than MO the consequence for Missouri residents is that it will continue to get worse if allowed to persist. Currently the Missouri Department of Conservation Fisheries have openly stated that more than 60% of these two watersheds are already in retention mode, holding back vital water recharge important to the health of these streams. Additionally they are aware of more dams which are planned and designed for installation sometimes with conflicting water quality benefits by federal and KS state agencies. This topic was noted in the 2006 MMLO Watershed Management Plan of Actions from public input in 2005. Since US EPA through KDHE has the authority to determine the volume and quality of water released from these structures in both states and are required to assist states to maintain and oversee a streams health the CWC encourages MoDNR to pursue through appropriate channels reprieve from KS actions and arrive at a compromise that is beneficial to all watershed residents in both states
- ❖ **SEC. 2.5, PARA. 4,** In this paragraph the depiction is "maybe the result of such and such factor, yet leading up to this the writer was making very positive assertions. The bullets under this paragraph does not mention the normal rainfall patterns, drought cycles within any given year and the 20-25 year cycle. Also there no mention of how much of the watershed cropland, pasture and other land uses are already being treated in accordance with the best technology available, no-till, conservation tillage, rotational grazing, etc., etc. All those items listed within the MoDNR NPS Water Quality Plan initially put together early in 2000 and implemented by numerous state and federal agencies. The runoff as mentioned previously is misrepresented along with the slope and landscapes of these soils and vegetation covers.

RE: Draft Marmaton River and Little Drywood Creek Draft Total Maximum Daily Load or TMDL, Vernon County, Missouri  
Comments (Cont'd)

- ❖ **SEC. 3.1, PARA. 6.** The writer assumes that land applying wastewater does not contribute to low DO since there is no runoff, yet in the same breathe applying animal wastes (aka poultry litter) does. Also stormwater discharge from facilities with permits is not a contributor yet the number of inspections conducted by MoDNR on any one of these facilities is far from learning the truth of by-passes etc. Are the facilities other than Nevada following proper protocol for monitoring samples? That question applies to storm water facilities permitted also. Just because a facility is not permitted to discharge does not mean they don't bypass during any given storm in the watershed. What storm water discharges contribute to a stream can be in the form of lawn wastes (organic matter), parking lot debris rich in organics, etc. These organics are not microscopic in nature thus will settle on the banks and bottoms of streams to later decompose robbing the water of DO. Many manufacturing or resell facilities such as fertilizer mixing plants regularly have spills as the exit and enter the facilities. In a similar manner many homeowners have no idea how much lawn fertilizer they apply or when to properly apply these fertilizers. Commercial or public golf courses also are inclined to apply frequently fertilizer and pesticides to portray an appealing facility. Consequently these assumptions are far from conclusive. The CWC knows that a particular rural subdivision lagoon in the Drywood Creek proper has been leaking for nearly 15 years while attempts to obtain funding to correct has not reached the owners of the facility.
- ❖ **SEC. 3.1, PARA 8** MoDNR Water Pollution while they are not required to issue permits for livestock facilities classified as AFOs, they have for numerous years maintained those records upon reviewing them for the federal agency cost-sharing them. A map has been published for the state of MO that also depicts those facilities. Thus a check of Water Pollution files will show more than has been depicted. It also shows where the facilities spread their ag wastes in accordance with MoDNR rules. The very last sentence should be withdrawn since it is inflammatory without supporting information. If a facility small or large is violating the state water laws, they are required to become permitted regardless of size.
- ❖ **SEC. 3.1, PARA 9.** The reference to "illicit" straight pipes is again inflammatory and an inappropriate term used by the writer. These are not allowed now or ever before. At no time does MO DHSS or Vernon-Bates County Health Department define a malfunctioning system as illicit or a point source. Onsite Waste Water Treatment System (OWTS) are required for homes as of 1996 to follow as minimum state regulations unless the county enacts their own regulations that are more stringent. A lot of these OWTS that may be malfunctioning systems, were installed prior to 1996, did not require permits consequently no records of the placement or amenities. The writer compares these older systems to that of illicit connects to sewers. That is a legal term not suited to this type of facilities and is not a point source even according to US EPAs newest document on OWTS co-authored by Dr. Randall Miles, Professor Soil Science, University of Missouri, Columbia, MO.
- ❖ **SEC. 3.2, PARA 1** The 2d sentence contradicts just what claim the author was making in the previous paragraph under Sec. 3.1, par. 9 regarding OWTS. Also, the author is again stretching to make a statement that nonpoint sources of pollution are associated with riparian habitat. If the later is true why are natural resource agencies across the nation falling over each other to increase the number of acres of riparian habitat to benefit water quality.
- ❖ **SEC. 3.2.1, PARA 1-3.** The author does not take into account the acres of cropland, pasture, woodland, wildlife land, riparian, etc that is already adequately treated to conservation standards accepted by federal and state agencies. The standards not only treat the soil for protection but also the system is designed to help restore damage from potential years of mismanagement. Additionally the resources protected also have integrated benefits to the other major natural resources such as air, water, plants, and animals which is called "integrated resource management system". The discussion of "assimilative capacity" is not a term used by agronomists (plants and soils specialist). This misapplied term is really referred to the soils capacity to hold nutrients plus carbonates of calcium-magnesium that are held in reserve for plants and microscopic organisms living in the soil. That term is cation exchange capacity (CEC) relates not only to the soils texture, type of clay particle, bulk density, type of soil minerals, type of nutrients, and the soil pH to name just a few factors. Organic matter(OM) is another term most agronomists use to express the plant and animal life returned to the soil for recycling to plants and organisms. Rarely does the organic matter/plant residue leave a field except during a major uncontrolled flooding event (sudden downpour) or out-of-bank flooding near a major stream or a water body. Some OM arrives in small quantities from animal activities in an around the water body or gully erosion versus sheet and rill erosion. Throughout this paragraph and the next 2 there is allot of speculation or liberty in interpreting cause and effects without support data. Finger pointing without a foundation of basic facts is not good scientific proof that this was the culprit causing the low DO in these streams.
  - **PARAGRAPH 2** the author is using livestock (cattle operations) as similar between KS and MO. That is far from the fact. MO operations have ONLY winter feeding lot operations which start from Nov.-end of March, The remainder of this time they are in managed rotational pastures grazing the balance of the year. KS has more back grounding operations with feedlots concentrating the livestock wastes. MO cattle operations are consistently cow-calf operations versus back grounding operations. It should be noted that the disparity between the numbers of animals

computed for MO is related to how the author computes animals. Cattle as in hogs or horses is not based simply the number of animals. Instead it is computed on animal units with 1 Animal Unit (AU) equaling 1000#. Thus a cow-calf as a pair has a far different AU than young stock used in back grounding. When compared the number of AUs will compare. Also it should be noted that much of the wooded areas including the pecan and walnut groves grazed. This acreage should also be factored into the available grazing area. Likewise there are hay fields "cropland" that are baled 1 or 2 times a year then grazed late in fall that factor into the # of AUs.

- **PARAGRAPH 3** the author assumes again that the 1 poultry operation in these 2 watersheds is responsible for poultry litter being applied to pastures. The assumption is incorrect. Local resource staff will verify that until recently poultry litter applied was purchased and trucked at a premium which was applied to cropland, not pastures. Lastly this occurred during a period when N fertilizer became exceedingly expensive but declined thereafter. Thus the anecdotal information from an unsubstantiated claim is not fact. There is only one poultry operation in the entire watershed and it is a poult operation for which the nutrients are not high compared to layers, turkeys or broilers. The nutrient values are quite low for N-P-K. It should also be known that if litter were applied to grasslands, it has been in pecan and walnut groves which can be from time to time flash grazed. The litter is applied in bands close to the feeding roots of the trees and not broadcast as in cropland situations. The number of animals / square mile do not match up with the author's statement on p.16. If these were cow-calf pairs then the number per square mile should be approximately 100 animal units/sq mi and not 198 animals/sq mi. Secondly why is the author using data from Ohio EPA when the University of Missouri a widely accepted research institution for livestock grazing operations and provides training worldwide is not representative for a Missouri watershed. The grassland, livestock and soil specialist at University of Missouri Extension can surely provide more accurate information that is unbiased. If these facts are so accurate why is the data not used by all land grant universities? The author provides no data to substantiate the number for Missouri conditions and operations. Ohio is far more different in rainfall, grasses grown, length of growing season and other vital information to make this judgment call.

- ❖ **SEC. 3.2.1, PARA 6** Upon talking with the local SWCD staff most familiar with livestock operations within these watershed it became obvious to the CWC that the author again did not check the facts with either the SWCD, USDA-NRCS or UM-Extension staff that live and work in the watersheds on a daily basis and have landowner records to validate their claims. Nobody from MoDNR contacted these staff specialists to obtain accurate information however they will take anecdotal information from a MoDNR employee that observes a truck of litter going north and assumes based on a discussion with the trucker. The hauler of this litter must have records of where this litter is hauled or applied to the land when it is derived from a CAFO. By the permit requirements whether it is the MoDNR or the MoDOT permits the hauler must provide on a regular basis the location, quantity and type of litter hauled as a requirement of their permit. MoDNR Environmental Specialists are required to review this data for any permit renewals or reported violations. The author appears to not have collected this information and furnished this as evidence in the claims in this report. The CWC and natural resource staff would disagree with the assertions unless evidence is documented in this report. The numbers claimed the last 3 paragraphs is not consistent with known numbers by the local natural resource agency staff. The CWC disputes the numbers used from NASS and MoRAP since these are not the same terms utilized to arrive at animals versus animal units to justify the author's position regarding contributions from all these cattle and so few grassland acres. Previously we pointed out errors in the assumptions to derive this number. The very last paragraph of this section is grossly in error. There are no layer poultry in either of these two watersheds. This has been repeated by some source unknown to the CWC by previous authors of two previous Draft TMDL Reports in this area. There are no poultry layer operations in this area. Likewise the number of sheep reported are far beyond the comprehension of the local staff. Nobody knows of the exact number of sheep in the entire watershed for Missouri but nowhere near this number reported since wool prices are at a all time low and meat is not worth much either. Consequently any business minded farmer would raise sheep just to lose money. CWC also recommends that the author check with the local SWCD/NRCS offices and the USDA-FSA office to determine the actual crop rotations in the watershed. The local SWCD reports that 20-30% of the cropland is soybeans, 30-40% is corn; and 15-20% is winter wheat with some rotational hay mixed in also. When you take this average crop rotation compound it with conservation practices and conservation tillage methods adopted in the watersheds one would get a better appreciation for the soil saving and nutrient retention objectives already accomplished in these watersheds to protect the resources and water quality.

RE: Draft Marmaton River and Little Drywood Creek Draft Total Maximum Daily Load or TMDL, Vernon County, Missouri  
Comments (Cont'd)

- ❖ **SEC. 3.2.2, PARA 1**, The author earlier stated that permitted storm water did not contribute to the low DO in the streams low volume of water but in this section the author does an about face on the topic. The CWC maintains it is equally responsible but in a much more concentrated manner than agriculture. Nevada along with at least a dozen or more facilities in or immediately adjacent to Nevada have permitted storm water facilities contributing to the watersheds sediment, organic debris, and heated runoff waters. These contributions the author admits contribute to low DO and the check list definitively lists those facilities that are most likely to contribute significantly to this low DO in these two tributaries. Again the CWC maintains that by the author ignoring these permitted storm water facilities debris, suspended sediment and organic solids will continue to contribute to the streams low DO. These facilities are a direct conduit to the DO degradation as well as the heat runoff pollution from hard surfaced areas. The organic materials deposited on the stream banks and stream bottoms is an endless reservoir of materials depleting the streams oxygen. This includes undecomposed leaves, grass clippings, commercial fertilizers spread on lawns, pet wastes, etc. Additionally the sediment deposited does reduce the streams capacity to hold more water thus making the flowing waters shallow and heated. Another assertion in this paragraph is the "illicit" sewer connections within Nevada. Illicit is a term implying knowingly doing something illegal to avoid compliance. The City of Nevada has never knowingly avoided having annexed homes to remain unhooked from their sewer system. If anything a home might have been annexed and through some administrative mix-up the home is still operating sufficiently with an OWTS. When identified, city staff informs the landowners and complete the hookups as required by their ordinance. We suggest the author contact the City's WWTP Superintendent, Roger Beach for more details in correcting this assumption.
- ❖ **SEC. 3.2.2, PARA 2**, Towards the end of the paragraph 2, the author is not clear as to what portion of the watershed is recipient of the City of Nevada's storm water runoff. When it comes to the modeling portion of this report it is imperative that the breakout for each watershed is properly addressed since the runoff is significantly different for each tributary. Approximately 25-35% of Nevada's storm water runoff enters the Little Drywood Creek Watershed. See the watershed map furnished with this draft report.
- ❖ **SEC. 3.2.3, PARA 1**, CWC consulted with a former MoDNR Soil Scientist still active interpreting soils and the local Environmental Health Specialist with Vernon County Health Department to understand the intent of this paragraph. Two terms are not used by the professionals, fail hydraulically (surface breakouts) or hydro-geologically (inadequate soil filtration). "Failing septic systems are sources of nutrients and oxygen-consuming substances that can reach nearby streams through both surface runoff and groundwater flows". The author in the explanation may not realize that the nutrients should they come to the surface are more likely to be filtered by grasses or ponds in the homeowners yard making it unhealthy for the family. In these situations the local health department is contacted and the system is then brought up to current standards. The number of systems failing are insignificant in relation the number of systems present in the watershed. Likewise the failure rate is minimal considering the number and age of these systems in the watershed. Contact Steve Dumell, Vernon County Health Department. The author also needs to be reminded that US EPA and MO DHSS uses the term On-Site Waste Water Treatment System (OWTS) since the only portion of the system that is "septic" is the tank itself. As for the authors assertion that failed OWTS get to streams via surface breakouts or via ground water. The later is highly unlikely in this watershed since he soils have a very tight clays layered below the 18-24" installation depth for any OWTS field drain lines. If a home waste water lagoon is utilized, the lagoon is compacted with a clay liner to prevent seepage and cross contamination with ground water. Author sites very slow permeability for the majority of the soils. The writer would want us to believe that the failed system when it does not surface travels to and through the groundwater. The soils present in the watershed is very tight, slow percolation (permeability) an unlikely situation to occur. There are very few homes built where bedrock occurs that would allow seepage through the bedrock. As per conversation with Steve Dumell he explained that state law requires a very extensive treatment package which is cost prohibitive to the average home builder/owner. Also installing an OWTS where bedrock might be an issue requires that the soil depth be at least 2-3 ft below the installed depth of facility apparatuses in addition to the 18-24" depth above the absorption field lines. Again this would not concern for pollution potential we're not sure where the author derived this information. A bigger issue not mentioned by the writer and should be of important when it comes to untreated household waste if fecal coli form bacteria (live). This presents a far greater health risk especially with a stream designated for whole body contact use.
- ❖ **SEC. 3.2.3, PARA 2-3**, The author goes to great lengths to mention the number of failed systems (OWTS) in the watershed yet the perspective is really reversed. With the number of people living in the two watersheds, minus those within the confines of the City of Nevada the average household is 2.4 persons per household, as per MoDNR and DHSS calculation. This means that for the population the writer wants us to use there is roughly 5,740 individual household OWTS in the two watersheds. Steve Dumell has stated before and does in this report that roughly 30 complaints are received annually for

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- ❖ Vernon County, not these watersheds. Taking this number for these two watersheds, assuming all complaints received is a failed system, and using the writers numbers of systems that would equate to 0.61% of the systems failing, less than 1 % of the total systems in these watersheds in any one year. Using the same analogy that 30 systems were installed annually since 1996, a 13 year period to redeem the situation this would 390 systems or 8.0% corrected. After reworking the numbers based on the two state agencies (2.4 persons/household), the number of systems increased to 5,740, an increase of 846 households. The annual replacement dropped to 0.53% and the 13 year replacement period would have been 6.8%. These numbers when checked with Steve Dumell confirmed our belief that this issue is relatively insignificant compared to other issues being presented throughout this report. The author sites an EPA study that claims a statewide failure rate for OWTS in (2002) at 30-50% failure rate. None of our sources can confirm this study or the numbers especially for this watershed. Use of such numbers without an exact number and the author's assumptions are inaccurate. Based on Vernon County Health Department's own admission the percentage does not nor has it come close to the number asserted by EPA or this author. CWC urges the author stick to the real facts as quoted by the Health Department. These numbers, replacements or repairs is normal for most systems around the country, even states with minimal soil limitations such as depth and water tables.
- ❖ **SEC. 3.2.4 PARA 1,** The author uses a word that is not used by biologists in defining the role of riparian habitat. The use of assimilation is once again used for nutrient and water uptake by grassy and woody vegetation. Likewise the use if infiltration and percolation of runoff waters reaching the riparian zone are not used in the context of its operation. Biologists, soil scientists and the like when reading this report may become confused by the author's intent when using such words. Recommend keeping the terminology as simple as possible. The stated goal of this TMDL is improve the DQ in the streams water quality profile; yet no where does the this become known in the introduction of this topic change. CWC encourages making the point and then proposing the modifications necessary to achieve that goal.
- ❖ **SEC. 3.2.4 PARA 2,** Author attributes the low DO to leaves falling from nearby trees in wooded areas, aquatic plants, drainage and organically rich areas like wetlands. The CWC during the past several years have argued this point to no avail with fisheries and water quality experts within , University of Missouri, Mo Department of Conservation Fisheries and MoDNR-NPS Unit, Stream Team. Their conclusion that the sum of all these mentioned items is quite insignificant to the "natural background low DO". Where does the authors assumptions arrive from when all research from these agencies state otherwise. These materials stated as contributors are essential to providing aquatic invertebrate food and habitat essential to the health of the stream. Also the perception that wetlands are rich in organics released to the stream is contrary to all biologists and water quality specialist around the country. These wetlands may have contributed enriched waters when they were initially drained during the white European settlers between the Civil War and early 1900's. However any organic matter in the soil after drained is fairly well consumed within 15-20 years after the initial drainage activity. Thereafter the organic matter remaining is stable and the influx would be created by plants growing currently in these areas. Again I do not see a relevance to the issue of low DO contributions and strongly urge the author to substantiate these claims if they are to remain in this report.
- ❖ **SEC. 3.2.4 PARA 3,** The CWC reviewers are confused by most of this paragraph. We cannot determine from the discussion presented in this last few sentences whether this is an acknowledgement of existing conditions and a wish for better conditions based on the authors own philosophical approach. Does the author have some factual evidence available for these watersheds that are attempting to convey? Will this help curb the situation and improve the low DO in these streams. Nothing is clearly stated or conveyed. Reading of the text there appears to be modification of the data to suit a need that is not clearly presented in the text. As it is written there appears to be no facts to support the perceived changes to improve low DO thus should be omitted from this document. The definition of wetlands as portrayed by the MoRAP leaves allot to interpretations. Most of this work was done from aerial photos and very little in the field verification. Many of the interpretations were conducted by a revolving door of students with little to no field experience in wetland identification. The numbers appear to be highly exaggerated and we would encourage this be evaluated in the field before setting these final in this publication.
- ❖ **SEC. 4.2 PARA 2,** Author in describing what impacts the low DO in a stream failed to mention the time of day, time of season " fall, winter, spring, summer", volume of water flowing, water recharge, and the shading impact from trees or other structures.
- ❖ **SEC. 4.2 PARA 3,** Author introduces the topic Sediment Oxygen Demand (SOD) a relatively new water quality test conduct in estuary sites such as in the Chesapeake Bay area and confluence locations with fresh water streams and the Gulf of Mexico, salt water. This test which has no known standard in fresh water bodies alone is being forced upon this TMDL with no supporting data to substantiate its accuracy or its validity in these conditions. There are no labs in the state that are

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equipped to conduct such singular tests and meet the Qa/Qc standards. CWC has discussed this test with state and federal water quality experts across the state only to determine it is not an acceptable test nor is it defensible as a water quality parameter to measure improved water quality in freshwater bodies. Where are the standards for Missouri that determines when this parameter can prove that water quality is impacted. If there are no standards adopted by the Clean Water Commission how you can force the standard on its citizen and watersheds residents. Without a firm basis, standard and direct benefit to water quality how can MoDNR impose this rule? Naturally occurring elements such as iron, manganese, and sulfur which the author states cause low DO is throughout these soils and would only prove these minerals exist. These minerals would not be managed or rectified due to the pervasive presence of these elements naturally. The depth of water which too is controlled by nature and the impacts of KS holding water back in their reservoirs would also prove unattainable. Temperature and stream velocity is in part controlled by the volume of water discharged from the watershed reservoirs in KS, a state with far different water laws than Missouri.

- ❖ **SEC. 4.2 PARA 4**, The last paragraph the author brings about the topic of phosphorous as a contributing pollutant yet this was not an issue in anything discussed to this point regarding low DO. Either present those facts or remove the subject entirely. Since it is not directly involved and there is no evidence presented in the water quality samples that this is a mute point and should be removed from discussion. Additionally, there is mention of algae consuming oxygen and the potential low DO, yet the numbers don't support that as an issue directly. Everything on this subject has been potential or indirect assumptions on the part of the author. Again unless it can be substantiated as a direct link we suggest it being removed until proven.
- ❖ **SEC. 4.3 PARA 2**, The author states a classification system without the supporting criteria that identifies each of these classes (Tiers). How is the TMDL reviewer, "John Q Citizen" going to find this data and where to determine if they are in agreement with the agencies determination? The public is not as versed in the topic as the author wishes them to be nor does the public care to be until it impacts them directly. Consequently it is suggested that the report contain the technical parameter ranges for the different levels of classifications. This was the shorts section but by far the most important to arrive at the conclusion that DO must be a priority for improvement in these two streams.
- ❖ **SEC. 5.2 PARA 2**, Why does the author conclude that this methodology described is the best method without offering the public the choice of 2-3 different methods deriving the streams potential reaeration potential? While the equation may be what is needed why is there not an explanation for the method chosen and the parameters used in the model to predict the streams reaeration potential. The discussion falls short of convincing the public and citizens of this watershed. The technical language throughout this section and report needs to be reconsidered so that the public can better understand the finer points of this serious topic impacting their lives and livelihood. Review of Tables 9 and 10 several things stood out at the presentation. Throughout the time columns the author or the tables author interspersed quasi-military times with civilian time. If you expect civilians to read and understand the report use civilian time recordings with the colon between the hour and minutes. Otherwise the military time does not have a colon in it. Also civilian time does not have any hour reported over 12:00 but has an extension of am and pm. It would make reading of the water quality parameters far easier and understand how time factors into the readings. Also the use of these tables means nothing unless you establish the benchmark or the range for what is acceptable and unacceptable. DO is > 5 mg/l is acceptable depending on the time of day and year.
- ❖ **SEC. 5.3, PARA 1**, Author needs to remove the scientific jargon and make it readable to the public at large. Many of the words used in this paragraph are not understood by undergraduates much less high school graduates composing the residents in the watershed. Writing of this document is expressly for watershed residents to understand what is happening to their watershed and how they can better manage the watershed. Terms like this will cause this document and others like it to be placed on the bottom of some of the largest paper collections in offices throughout the watershed. Understanding what needs to be done will fall to an all time low. The author assumes wrongly that his assumption is correct that nothing in the "historic prairie streams was modified by changes in land cover and channelization manipulation of these parameters does not address a pollutant and so is not the goal of a TMDL. Pollutants that result in oxygen concentrations below saturation are: fine particle size of bottom sediments; high nutrient levels (nitrogen and phosphorous); suspended particles of organic matter". First we have always been told that there is insufficient evidence to distinguish these type of streams in Missouri thus we magically now have data that was never before available. Secondly, the nature of these streams is that during any runoff event there is fine particle sized sediments throughout out the stream water profile, not just the bottom; nutrient levels identified have not been truly identified as the culprit (micrograms/liter); and the suspend particles of organic matter. While contributions from agriculture is not denied the quantities from other sources such as municipal WWTP needs to step forward being responsible. Additionally the topic is being side-stepped is the lack of consistent flow from our neighboring state which is entrapping large sums of water in the 102 reservoirs in KS in the upper watershed reaches of both streams. KS folks have anecdotally stated that their many reservoirs have benefitted by entrapping sediment and nutrients

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however if that were the case why does the Marmaton look the way it does in the summer months. MDC staff have stated that is simply not true regarding the entrapment of enriched sediments, nutrients, etc.

- ❖ **SEC. 5.3 PARA 3.** The last portion of this paragraph talks about a reference concentration of TP yet until now the topic of its importance was never discussed. Also TSS is now the target which until now has not been presented in the discussion as to cause and affects. This report appears to be slipping these "targets" in belatedly with hopes the sheer volume of this report will cause the topic to be ignored by the average reader. Volume of reading does not make for easier reading or understanding.
  - CWC recommends "Chlorophyll a" would be more appropriate measure of stream improvement since whatever limiting nutrient, NTN or TP is managed properly will see a dramatic reduction in the concentration thus proving the cause and effect. However, just focusing on nutrients alone, these parameters will change from season to season, crop year to crop year based on rotations, economy, livestock markets, farm programs, etc. Targeting chlorophyll makes more sense since it will also impact WWTP, Storm Water Management Facilities, and urban and commercial landowners and not just agriculture. The author mentions referencing a eco-region reference concentrations. Spell out the eco-region used to make sure that the regulatory agencies are comparing apples to apples which has not always been the case.
- ❖ **SEC. 5.3.2, PARA 1-3,** The author states in this section that the TMDL is a relationship with the Sediment Oxygen Demand (SOD) parameter and nutrient parameters to low DO however how does a water quality parameter untested and developed for freshwater-salt water interfaces become the standard parameter? This water quality parameter has no qualified laboratory in close proximity for timely and quality controlled analysis. There are no specific ranges established for fresh water bodies applicable to the prairie stream setting. The water body in question we have been informed is not a suitable site for this test and that the Clean Water Commission has not adopted rules imposing this parameter to measure water quality. Forcing citizens of a watershed to utilized and untested parameter to evaluate their watershed is uncalled for. Lastly, using the results of this test within the QUAL2K. The parameters within this model are based on the data supplied by the TMDL writers to be accurate and without random assumptions. The assumptions, on various inputs from various natural resources, human and animal throughout this watershed would make this current model run inappropriate; to conclude the needs for this TMDL and in particular the streams management demands. The CWC recommends that with all of the data found to be in error as pointed out during this review and noted; with the assumptions made by the TMDL staff inappropriately; and the inaccurate data collections from various years and units of measure; and from a multitude of sources with differing means of collecting the data used to compile this report. Much of what has been brought to your attention will create a significant change in the output of this model warranting the extra time to validate the all of the assumptions. The CWC maintains that use of the SOD as a parameter without any founded ranges for acceptance is totally unacceptable. Use of nutrients as a parameter must be spread across all load allocations in the watershed especially with urban and commercially permitted facilities, not just non-point sources from agriculture. The City of Nevada WWTP Superintendent mentioned in discussions with the CWC that their current \$6.7 million renovations of their WWTP will not meet the required reductions proposed in this draft TMDL and their temporary permit. They would have to make an additional \$2+ million investment with no assurance the modification would bring their WWTP into compliance. Their permit was to have been renewed but is on hold until the results from the renovated plant are back and acceptable. the WWTP folks will not be able to seek citizen approval for another investment with no assurances of making it meet the proposed standards in this TMDL. Their consultant has run the numbers and cannot find an equitable solution with today's technology. An evaluation of the TMDLs requirements for a 60% reduction is quite alarming with agricultural technologies, uncertainties of the economy and what the farmer receives for their commodities. Expectations are far greater than these enterprises will be able to afford and stay in the business of farming.
- SEC. 6, PARA 3,** The statement in this section refers to the critical period when DO in stream flows must be improved to maintain aquatic life is also during the peak period when KS watershed reservoirs are holding back large quantities of surface water runoff is being held behind these large reservoirs and augment release of these waters are not released for the benefit of all. The stream recharge is from runoff not groundwater recharge, as sometimes alluded to by the author throughout the text. The 102 reservoirs are holding back large volumes of water, 27,110.4 ac-ft for the normal pool stages and 41,913.4 acre-feet at emergency pool stage. if released in a concerted low flow, this would help to augment the flows and improve the health of the streams. Instead the State of Kansas continues to issue more and more watershed based permits to build more and more reservoirs to lock up more surface water, depriving Missouri watershed residents of their fair share. KS water laws are far more defining than MO consequently Missouri residents are suffering for it and will continue to

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get worse if this is allowed to persist. Currently the Missouri Department of Conservation Fisheries have openly stated that more than 60% of these watersheds are already in retention mode, holding back vital water recharge important to the health of these streams and others. Since US EPA through KDHE has the authority to determine the volume and quality of water released from these structures to maintain a streams health the CWC encourages MoDNR to pursue through appropriate channels reprieve from for such actions.

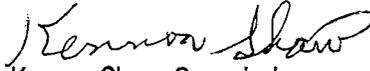
- ❖ **SEC. 8, PARA 5**, WWTP Superintendent informed the CWC that the waste load allocation determined for the WWTP point sources is not attainable with the current upgrades to the WWTP that has proven very costly to the community. With this additional waste load allocation (BOD) their consultant already has informed them that the current approved system will not meet the newest allocation and that all available technology that would be cost effective will not meet that demand. Lastly, the cost of the current improvement is \$6.7 million and the next level of treatment is between \$1-2 million additional with absolutely no assurance it will meet the load allocation projected. CWC cannot believe the waste load allocation is correctly run through the QUAL2K especially after we have pointed out errors in the potential input data utilized. This is another reason for requesting a rework of the model run using the latest data provided.
- ❖ **SEC. 10, PARA 1-3**, The author does a great job explaining the "Seasonal Variations" methodology however since there are two selections, it is not mentioned which method was selected for the modeling. Recommend naming the selected method to use based on the model runs conducted and the regional 20-25 year rainfall patterns.
- ❖ **SEC. 11, PARA 1-3**, Not knowing what the City of Nevada's monitoring plan is presently one have to read by the description of this document that only downstream monitoring is expected. Most monitoring protocols for point sources generally require the monitoring sites be selected from an upstream and a downstream location acceptable to the WWTP and MoDNR. In the situation where this facility can have influence from two tributaries, L. Drywood Creek and Marmaton River it would seem reasonable that the protocol would include a location on both stream, upstream from the WWTP. The last paragraph mentions aquatic habitat, fish communities, and in-stream invertebrates be sampled every 5-6 years on a rotational basis. CWC has been informed with budget constraints that all of these samplings will be done based on declining budgets and personnel available.
- ❖ **SEC. 12**, The CWC strongly urges the Clean Water Commission to review the water quality criteria for this prairie stream. Other streams under the guidance of the CWC are in the exact same position. One stream hopefully will provide water quality data to help support the review process and establish the new criteria beneficial to all.
- ❖ **SEC. 12.2, PARA 3- 4**, The author has done a very good job of following the MMLO Watershed Management Action Plans which includes these two tributaries. Currently the watershed is directed by the Citizens Watershed Committee (CWC) composed of 3 members from Bates and Vernon Counties, Commissioner and two landowners, and a member of the Osage Valley RC&D Council. The organization has directed its officers to start the process of becoming a 501 (c) (3) non-profit organization recognized by the Missouri Secretary of State and the US IRS. When addressing water quality practices in the watershed the committee has been active with a targeted Watershed Grant (TWG) with KS and a 319 Watershed Restoration Project in another portion of the Marais des Cygnes Watershed. The practices installed with the TWG include installation of OWTS replacing or correcting failed systems; riparian buffers; livestock management systems (non-traditional); forestry improvement practices and tree planting. The 319 project will include the same practices as well as Stream Bank Stabilization; field borders; nutrient management; rotational grazing; alternative watering systems; winter cattle feed and watering management; urban pet litter composting; urban organic composting and reuse and educational programs addressing water quality.
- ❖ **SEC. 12.2, PARA 7**, The CWC has already begun the process to initiate a watershed implementation strategy that will include at least 2 or 3 watersheds independent of the watershed restoration project already in motion. The CWC by applying for not-for-profit status, incorporating as such, and the hiring of key staff will be able to seek grant proposals for various watersheds including the Marmaton-Little Drywood Creek. Danny Hahn the re-elected President of the CWC along with the other officers will be attending training sessions on watershed management strategies; not-for-profit organizational management; and grant writing in the near future. The CWC has since 2005 developed a solid partnership with over 25 governmental and NGOs to execute their watershed management action plans. The organization also will be updating its watershed management plan on a regular basis to remain abreast of activities impacting the watershed from external and internal activities.

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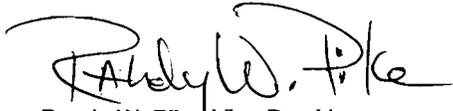
Sincerely,



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

## DEPARTMENT OF NATURAL RESOURCES

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

July 21, 2010

Mr. Danny Hahn, President  
Citizens Watershed Committee  
Route 2  
Box 415  
Adrian, MO 64720

RE: Response to Comments on the Draft Marmaton River-Little Drywood Creek Total Maximum Daily Load

Dear Mr. Hahn:

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 Marmaton River-Little Drywood Creek Total Maximum Daily Load (TMDL). Please note that, following discussions with the city of Nevada, Little Drywood Creek TMDL will be removed from this document. The Marmaton River TMDL is being revised accordingly, and new pollutant load allocations and implementation plans are being developed for the Marmaton River alone. This revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL for Little Drywood Creek will be completed at a later date.

This letter responds to comments received from the CWC on April 2, 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).

***Comment #1:*** *First, the committee believes the author(s) of this and other draft reports need to be placed prominently on the title page of the document or in the public notice of this document release so that the public may request document 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, a contractor, or a host email/phone number where the question may be posed and answered by an appointed responsible staff member.*

Contact information for submitting questions about a TMDL is provided in the public notice announcement that is posted on the Department's website and is distributed at the beginning of the public notice period. The telephone number for the Department is also available on the website, as

well as in the government listings section of phone books. Since the final TMDL is a static document, and Department personnel change over time, it is not practical to list an individual's name and phone number on the TMDL.

**Comment #2 (Sec. 2.1, Para. 3):** *Agency writer expects all readers of this document to understand the agency terms "class P segments." If this term is to be used then have a definition section in the document or one for the program section that can be accessed.*

Class P streams are defined in a footnote on the first page (ii) of the TMDL. This definition includes a reference describing where to find the definition in the Missouri Water Quality Standards, and also includes a link to the Secretary of State's website where the reader can find these standards within the Code of State Regulations.

**Comment #3 (Sec. 2.2, Para. 1):** *Agency is using two different sets of data collected from two different vintages that will not be consistent throughout the examination of issues in the watershed. Agency should use only one set of data and stick with it until better data is available. Do not mix data, it cannot be scientifically supported. Nobody can tell what data was used to evaluate the author's conclusions. Consequently the report in total is in question.*

The Department acknowledges that this paragraph contains two citations to the U.S. Census Bureau from two different years. However, a check of the references section of the TMDL confirms that, although the data was gathered from two different sources published in two different years, both sources utilize Census 2000 data.

**Comment #4 (Sec. 2.2, Para. 1):** *Numbers of the population do not compute correctly. This and other census data needs to remain consistent or any assumption is brought into question bad or good.*

When adding together the populations for the Missouri and Kansas portions of the watershed, the sum of populations for both states (35,867) differs slightly from the total population for the entire watershed (35,863). This difference of 0.0001 percent is due to rounding of numbers during calculations, and does not represent an inconsistency. The Department welcomes any additional population data or specific comments the Citizens Watershed Committee would like to share.

**Comment #5 (Sec. 2.2, Para. 2):** *Ditto for population projections for Fort Scott, KS data. Select one and stick with it.*

The Department makes no projections with regard to the population of Fort Scott, Kansas. Rather, the TMDL includes publicly available data from the U.S. Census Bureau's 2000 Census. The population of Fort Scott, as noted in the TMDL, was taken from the demographic profile available on the Census Bureau's website at <http://censtats.census.gov/data/KS/1602024000.pdf>.

**Comment #6 (Sec. 2.3, Para. 1):** *Soil landscapes need to be correctly reported. Stream Bottoms are level whereas uplands adjacent to these streams are gentle sloping. Revise the description to*

*accurately represent stream bottoms and include uplands in the proper context. There is no discussion as to the distance or how close these landscape features with steep sloping landscapes in relation to the streams and tributaries of these streams. The impacts derived from the relative distance and vegetal conditions will be a major contributor to soil erosion, sediment delivery, and organic matter to these streams.*

Description of stream bottoms and adjacent areas have been revised for clarification. The discussion of the landscape in the watershed is intended to provide general background information, and is not intended to support a detailed or quantitative analysis of erosion and sediment delivery potential.

***Comment #7 (Sec. 2.3, Para. 4):*** *The premise of this entire paragraph is without foundation. First soil infiltration and soil permeability are two very distinct processes that are not interchangeable while at the same time are interrelated. Infiltration is surface waters, external, AND ABILITY to get into the soils surface. It is impacted by numerous factors including soil properties, vegetations, landscape, weather and seasonal changes. On the other hand permeability is entirely in soil waters ability to move internally within the soil profile. The example used in this paragraph of storms generating < .57 inches / hr is not correct. It is all dependent upon the timing of previous storms, seasonal changes, late summer versus late spring or winter, etc. Discussions with a prominent soil scientist will invalidate that claim. Weather data from the University of Missouri Weather Collection System will show cyclical events ranging from 20-25 yrs apart going from intense precipitation to drought conditions. USDA-FSA has for many years in each county maintaining daily precipitation records to help support these claims. If the authors of this document and the agency modelers are interchanging these properties the data will definitely present an erroneous computation not in favor of the resources.*

The Department acknowledges that infiltration and permeability are two distinct, yet closely related terms. Infiltration was used to describe soils in the Missouri portion of the watershed, and permeability was used for the Kansas portion because these represent readily available information for each state. This information is intended to help provide a general idea of soil conditions in the watershed, and is not used for modeling purposes.

As noted in the TMDL, information regarding runoff potential in the Kansas portion of the watershed is based on data found in the NRCS State Soil Geographic database, and was taken from Kansas' EPA-approved low dissolved oxygen TMDL for the Marmaton River. Again, it is intended to reflect general conditions in the watershed, and is not used for modeling purposes.

***Comment #8 (Sec. 2.4, Table 1):*** *The data provided by MoRAP is inconsistent with that provided in the MMLO Watershed Management Action Plans dated 2006 by which local natural resource agency staff completed an accurate analysis of the watershed land uses supported acreage figures from their agency records reported by landowners. CWC stands behind its report of 2006 found in this document.*

The land use and land cover data used in the Marmaton River-Little Drywood Creek 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 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.

***Comment #9 (Sec. 2.4, Para. 2, Sentence 3 & Table 2):*** *The CWC is confused by the statement in regards to the urban land use component being the majority in Little Drywood Creek. If you look at your own map in this document depicting the two watersheds you will see the majority of City of Nevada actually lies within the Marmaton (about 75%) and the growth in the city is going north and east not south (Table2). The percentage of wetlands is a debatable topic especially with the means at which the wetlands were interpreted by MoRAP and field verified.*

Data presented in both Table 2 and paragraph 2 of Section 2.4 indicate that the major land uses in the Little Drywood Creek watershed are grassland, cropland and forest, and that urban land use comprises only 3.5 percent of the watershed. Where the Citizens Watershed Committee may be unclear is where the Department notes in Section 2.4 that urban land use comprises a proportionally larger area within the Little Drywood Creek watershed when compared with the Marmaton River watershed. The Department makes no claims in the TMDL about what proportion of the city of Nevada lies within each watershed.

The Department acknowledges that there is a certain degree of error inherent in the classification of all remotely sensed land cover data. For more information about the development and classification of MoRAP's 2005 land use and land cover data, please refer to the metadata available at [http://www.msdis.missouri.edu/datasearch/metadata/utm/mo\\_lulc05\\_utm.xml](http://www.msdis.missouri.edu/datasearch/metadata/utm/mo_lulc05_utm.xml).

***Comment #10 (Sec. 2.5, Para. 2):*** *The statement about DO from 2001-2009 is a real stretch. Your own documents show that all of 2007-2009 do not have one reportable period of less than 5.0 mg/L DO. Also further evaluation of the DO data furnished will show you that as the yearly cycle of rainfall and seasonal drought occurs so does the lower DO occurs, namely from September thru October in the years 2001-2006. During this period of the season, water temperatures are starting to cool versus during the hot periods of May thru August. Consequently as the rainfall period within our regions typical 20-25 year cycle has diminished the water quality issue declines or disappears. Not knowing the results from 2010 and these should be good since the precipitation has been above normal. Thus the theory of drought and rainy cycles must have a direct bearing on this discussion, something that is not controlled by man. Another factor that must be addressed in this total water quality equation is the quantity of water available from the watershed runoff events. 'The number of public and private reservoirs built in the KS portion of this watershed is currently at 102 registered reservoirs ranging in size from 17 ac-ft to 8,092 ac-ft of stored water with a storage capacity for the normal reservoir pool at 27,110.4 ac-ft the average reservoir size at approximately 274ac-ft. This excludes the emergency storage pool derived from a 50-100 yr frequency storm event for these reservoirs. When the additional emergency storage is added approximately 41,913.4 ac-ft is stored in this emergency pool reservoir area with the average around 723 ac-ft. Each of these reservoirs hampers the streams ability to maintain constant flow to support aquatic life not only within these*

*two streams but other streams entering Missouri from Kansas as well. When the initial rainfall runoff enters the streams feeding these reservoirs the Missouri watershed only gets that which leaves their fields to replenish their streams and wetlands. The majority of these reservoirs hold back 41, 913.4 ac-ft or 60.7% of the total structure holding capacities depriving Missouri of the much needed water. Stated another way the amount of water withheld from Missouri as a result of these reservoirs impounding the runoff from a storm event of this magnitude is 155,090,477,484 gallons of water. This is water that could be augmenting the streams flow for Missouri's healthy watersheds too. Instead much of this water is being used by others, especially domestic uses at the expense of maintaining a healthy watershed. These 102 reservoirs that are holding back large volumes of water 27,110.4 ac-ft for normal pool stages and 41,913.4 ac-ft at emergency pool stage, if released in a concerted low flow method would help augment stream flows and improve the overall health of these streams. Instead the State of Kansas continues to issue more and more watershed based permits to build more and more reservoirs to lock up more of the shared surface waters, deprive Missouri watershed residents of their fair share. While KS water laws are far more defining and controlling than MO the consequence for Missouri residents is that it will continue to get worse if allowed to persist. Currently the Missouri Department of Conservation Fisheries have openly stated that more than 60% of these two watersheds are already in retention mode, holding back vital water recharge important to the health of these streams. Additionally they are aware of more dams which are planned and designed for installation sometimes with conflicting water quality benefits by federal and KS state agencies. This topic was noted in the 2006 MMLO Watershed Management Plan of Actions from public input in 2005. Since US EPA through KDHE has the authority to determine the volume and quality of water released from these structures in both states and are required to assist states to maintain and oversee a streams health the CWC encourages MoDNR to pursue through appropriate channels reprieve from KS actions and arrive at a compromise that is beneficial to all watershed residents in both states.*

Section 2.5 has been revised, based on this comment and a similar comment submitted by the Kansas Department of Health and Environment, to reflect that no dissolved oxygen samples below 5 mg/L have been recorded since November 2006.

While the Department appreciates the importance of water quantity to both water quality and the quality of life of Missouri residents, neither water quantity nor the coordination of interstate water rights issues are the purview of this TMDL. For information and assistance addressing these matters, please contact the Department's Water Resources Center at (573) 751-1134, or go to <http://www.dnr.mo.gov/env/wrc/index.html>.

**Comment #11 (Sec. 2.5, Para. 4):** *In this paragraph the depiction is maybe the result of such and such factor, yet leading up to this the writer was making very positive assertions. The bullets under this paragraph does not mention the normal rainfall patterns, drought cycles within any given year and the 20-25 year cycle. Also there no mention of how much of the watershed cropland, pasture and other land uses are already being treated in accordance with the best technology available, no-till, conservation tillage, rotational grazing, etc., etc. All those items listed within the MoDNR NPS Water Quality Plan initially put together early in 2000 and implemented by numerous state and federal*

*agencies. The runoff as mentioned previously is misrepresented along with the slope and landscapes of these soils and vegetation covers.*

While the Department acknowledges that varying patterns of rainfall and drought may affect dissolved oxygen, these factors represent natural background conditions and are not the focus of this TMDL. The purpose of Section 2.5 is to outline potential factors that are contributing to the low dissolved oxygen impairment in the Marmaton River and Little Drywood Creek. Nonpoint source best management practices currently being utilized in the watershed are addressed in Section 12.2 of the document.

***Comment #12 (Sec. 3.1, Para. 6):*** *The writer assumes that land applying wastewater does not contribute to low DO since there is no runoff, yet in the same breathe applying animal wastes (aka poultry litter) does. Also storm water discharge from facilities with permits is not a contributor yet the number of inspections conducted by MoDNR on any one of these facilities is far from learning the truth of by-passes etc. Are the facilities other than Nevada following proper protocol for monitoring samples? That question applies to storm water facilities permitted also. Just because a facility is not permitted to discharge does not mean they don't bypass during any given storm in the watershed. What storm water discharges contribute to a stream can be in the form of lawn wastes (organic matter), parking lot debris rich in organics, etc. These organics are not microscopic in nature thus will settle on the banks and bottoms of streams to later decompose robbing the water of DO. Many manufacturing or resell facilities such as fertilizer mixing plants regularly have spills as the exit and enter the facilities. In a similar manner many homeowners have no idea how much lawn fertilizer they apply or when to properly apply these fertilizers. Commercial or public golf courses also are inclined to apply frequently fertilizer and pesticides to portray an appealing facility. Consequently these assumptions are far from conclusive. The CWC knows that a particular rural subdivision lagoon in the Drywood Creek proper has been leaking for nearly 15 years while attempts to obtain funding to correct has not reached the owners of the facility.*

Section 3.1 of the TMDL points out that land application of wastewater is subject to “no-discharge” general permit conditions that are designed to minimize the impacts to surface waters. Similarly, it is noted in Section 3.2.1 that land application of animal waste, when conducted properly, can be a beneficial agricultural soil amendment. The distinction between the two, and why animal waste is considered a more likely source of nutrients to the river, is that land application of animal waste is much more widespread, and most is not subject to permit conditions.

The Department acknowledges that spills, by-passes and storm-water discharge events do all occur and that more can be done to try to prevent these occurrences from taking place. However, unlike the application of animal waste and other fertilizers to agricultural land, these are designed to be rare events that occur only under extraordinary circumstances. All facilities with site-specific permits, like the Nevada WTP, are required to monitor their effluent and submit regular monitoring reports according to the terms of their permits. Although monitoring requirements vary among facilities with general and storm water permits, all such facilities are required to report discharges to the Department.

Urban nonpoint sources of pollutants are addressed in the TMDL in Section 3.2.2.

***Comment #13 (Sec. 3.1, Para. 8):*** *MoDNR Water Pollution while they are not required to issue permits for livestock facilities classified as AFOs, they have for numerous years maintained those records upon reviewing them for the federal agency cost-sharing them. A map has been published for the state of MO that also depicts those facilities. Thus a check of Water Pollution files will show more than has been depicted. It also shows where the facilities spread their ag wastes in accordance with MoDNR rules. The very last sentence should be withdrawn since it is inflammatory without supporting information. If a facility small or large is violating the state water laws, they are required to become permitted regardless of size.*

The map published by the Department that shows the locations of CAFOs and AFOs around the state is incomplete. It depicts only those AFO facilities that have either voluntarily obtained a permit or were required to obtain a permit due to a water quality violation. This map does not depict where these facilities land apply their animal waste. To the extent that the Department has information on the location and management plans of unregulated AFOs, this is information that has been voluntarily submitted. The AFOs for which the Department maintains records is a very small proportion of the total number that actually exist.

It is true that non-permitted AFOs that are known to violate state water quality laws are required to obtain a Missouri State Operating Permit and become, in effect, a “designated CAFO.” However, since these facilities are not inspected and are not required to report their discharges, it is likely that the majority of water quality violations go unreported and unnoticed. Consequently, the majority of these facilities continue to be unregulated. As the authors of this letter indicate in Comment #12 above, just because a facility is not permitted to discharge does not mean that it does not sometimes do so. The TMDL simply states that unregulated animal feeding operations that do not properly manage livestock, and the waste that they produce, may potentially be acting as point source contributors to the low dissolved oxygen impairment. The TMDL does not state, nor does the Department imply, that all unregulated operations improperly manage their facilities and contribute to water quality impairment.

***Comment #14 (Sec. 3.1, Para. 9):*** *The reference to “illicit” straight pipes is again inflammatory and an inappropriate term used by the writer. These are not allowed now or ever before. At no time does MO DHSS or Vernon-Bates County Health Department define a malfunctioning system as illicit or a point source. Onsite Waste Water Treatment System (OWTS) are required for homes as of 1996 to follow as minimum state regulations unless the county enacts their own regulations that are more stringent. A lot of these OWTS that may be malfunctioning systems, were installed prior to 1996, did not require permits consequently no records of the placement or amenities. The writer compares these older systems to that of illicit connects to sewers. That is a legal term not suited to this type of facilities and is not a point source even according to US EPAs newest document on OWTS co-authored by Dr. Randall Miles, Professor Soil Science, University of Missouri, Columbia, MO.*

The Department understands that illicit straight pipes are not allowed and, in fact, uses the term “illicit” in the TMDL precisely because it means “not legally permitted or authorized.” In the TMDL, the Department does not refer to failing onsite wastewater treatment systems as illicit point sources, or compare failing onsite wastewater treatment systems to illicit connections to sewers. Illicit straight pipe discharges of household waste are defined in the TMDL as point source discharges straight into streams or land areas that are different than illicitly connected sewers. Furthermore, failing onsite wastewater treatment systems are not referred to as point sources, but rather, are addressed in the nonpoint source section of the TMDL.

***Comment #15 (Sec. 3.2, Para. 1):*** *The 2d sentence contradicts just what claim the author was making in the previous paragraph under Sec. 3.1, par. 9 regarding OWTS. Also, the author is again stretching to make a statement that nonpoint sources of pollution are associated with riparian habitat. If the later is true why are natural resource agencies across the nation falling over each other to increase the number of acres of riparian habitat to benefit water quality.*

The Department fails to see the contradiction in the second sentence of Section 3.2. Once again, the TMDL does not refer to failing onsite wastewater treatment systems as point sources, and only refers to them as nonpoint sources.

Section 3.2.4 of the TMDL notes that riparian areas, including riparian wetlands, may act as a source of oxygen consuming materials that may affect dissolved oxygen in the river. This section also identifies the many benefits that riparian areas may have on water quality. Both conditions may exist in a riverine-riparian ecosystem and are not inconsistent with one another.

***Comment #16 (Sec. 3.2.1, Para. 1-3):*** *The author does not take into account the acres of cropland, pasture, woodland, wildlife land, riparian, etc that is already adequately treated to conservation standards accepted by federal and state agencies. The standards not only treat the soil for protection but also the system is designed to help restore damage from potential years of mismanagement. Additionally the resources protected also have integrated benefits to the other major natural resources such as air, water, plants, and animals which is called "integrated resource management system. The discussion of 'assimilative capacity' is not a term used by agronomists (plants and soils specialist). This misapplied term is really referred to the soils capacity to hold nutrients plus carbonates of calcium-magnesium that are held in reserve for plants and microscopic organisms living in the soil. That term is cation exchange capacity (CEC) relates not only to the soils texture, type of clay particle, bulk density, type of soil minerals, type of nutrients, and the soil pH to name just a few factors. Organic matter (OM) is another term most agronomists use to express the plant and animal life returned to the soil for recycling to plants and organisms. Rarely does the organic matter/plant residue leave a field except during a major uncontrolled flooding event (sudden downpour) or out-of-bank flooding near a major stream or a water body. Some OM arrives in small quantities from animal activities in an around the water body or gully erosion versus sheet and rill erosion. Throughout this paragraph and the next 2 there is allot of speculation or liberty in interpreting cause and effects without support data. Finger pointing without a foundation of basic facts is not good scientific proof that this was the culprit causing the low DO in these streams.*

Throughout the nonpoint source section of the TMDL, the Department presents what data is available to try to identify potential nonpoint sources of oxygen-consuming materials that may be contributing to the low dissolved oxygen impairment. These nonpoint sources are not singled out as being the only or primary cause of the impairment. Section 12 of the TMDL is careful to point out that the cause of the low dissolved oxygen impairment is likely a combination of various point and nonpoint sources, as well as natural background conditions.

*Para. 2: The author is using livestock (cattle operations) as similar between KS and MO. That is far from the fact. MO operations have ONLY winter feeding lot operations which start from Nov.-end of March, The remainder of this time they are in managed rotational pastures grazing the balance of the year. KS has more back grounding operations with feedlots concentrating the livestock wastes. MO cattle operations are consistently cow-calf operations versus back grounding operations. It should be noted that the disparity between the numbers of animals computed for MO is related to how the author computes animals. Cattle as in hogs or horses is not based simply the number of animals. Instead it is computed on animal units with 1 Animal Unit (AU) equaling 1000#. Thus a cow-calf as a pair has a far different AU than young stock used in back grounding. When compared the number of AUs will compare. Also it should be noted that much of the wooded areas including the pecan and walnut groves grazed. This acreage should also be factored into the available grazing area. Likewise there are hay fields "cropland" that are baled 1 or 2 times a year then grazed late in fall that factor into the # of AUs.*

Livestock specialists from Vernon and Barton counties have confirmed that cattle operations in Missouri are predominantly cow/calf operations, and language in Section 3.2.1 of the TMDL has been revised to clarify this fact. Also, as noted in Table 6 and Sections 3.1 and 3.2.1 of the TMDL, there are a number of certified or permitted animal feeding operations in the Kansas portion of the watershed, the presence of which may affect the livestock estimates in the watershed. Section 3.1 addresses these operations as point sources, rather than nonpoint sources.

Although Table 6 refers to the number of animals in feeding operations in Kansas in terms of animal units, all other estimates of livestock in the TMDL for both Kansas and Missouri are expressed as the number of individual animals, as reported in the 2007 Census of Agriculture published by the United State's Department of Agriculture's (USDA's) National Agricultural Statistics Service.

The Department has no data at this time to estimate the number of acres of pecan orchards in the watershed, consequently, these areas can not be factored into the available grazing area. However, Sections 3.2.1 and 3.2.4 of the TMDL have been revised to include a discussion of pecan farming in the area.

*Para. 3: The author assumes again that the 1 poultry operation in these 2 watersheds is responsible for poultry litter being applied to pastures. The assumption is incorrect. Local resource staff will verify that until recently poultry litter applied was purchased and trucked at a premium which was applied to cropland, not pastures. Lastly this occurred during a period when N fertilizer became exceedingly expensive but declined thereafter. Thus the anecdotal information from an*

*unsubstantiated claim is not fact. There is only one poultry operation in the entire watershed and it is a poult operation for which the nutrients are not high compared to layers, turkeys or broilers. The nutrient values are quite low for N-P-K. It should also be known that if litter were applied to grasslands, it has been in pecan and walnut groves which can be from time to time flash grazed. The litter is applied in bands close to the feeding roots of the trees and not broadcast as in cropland situations. The number of animals/square mile do not match up with the author's statement on p.16. If these were cow-calf pairs then the number per square mile should be approximately 100 animal units/sq mi and not 198 animals/sq mi. Secondly why is the author using data from Ohio EPA when the University of Missouri a widely accepted research institution for livestock grazing operations and provides training worldwide is not representative for a Missouri watershed. The grassland, livestock and soil specialist at University of Missouri Extension can surely provide more accurate information that is unbiased. If these facts are so accurate why is the data not used by all land grant universities? The author provides no data to substantiate the number for Missouri conditions and operations. Ohio is far more different in rainfall, grasses grown, length of growing season and other vital information to make this judgment call.*

The Department notes that paragraph 3 of Section 3.2.1 makes no mention of any poultry operation within the Marmaton River watershed being a source for litter being applied within the watershed. Instead, the TMDL addresses as a potential source of litter the large-scale poultry operations in the southwest region of the state.

Please note that this paragraph has been revised to include swine manure, and to address concerns about the source and destination of any poultry litter that may be land applied in this area. An additional reference citing application of this poultry litter as far north as Vernon County is also provided.

The Department agrees that references to cattle grazing densities from TMDLs that were developed in Ohio may be inaccurate and misleading when applied to southwest Missouri. In addition, a discussion with a University of Missouri Extension livestock specialist in the area suggests that the overall estimated density of cattle grazing in the watershed may be within general guidelines for stocking rates in this part of the state. As a result, this paragraph has been deleted from the TMDL.

**Comment #17 (Sec. 3.2.1, Para. 6):** *Upon talking with the local SWCD staff most familiar with livestock operations within these watershed it became obvious to the CWC that the author again did not check the facts with either the SWCD, USDA-NRCS or UM-Extension staff that live and work in the watersheds on a daily basis and have landowner records to validate their claims. Nobody from MoDNR contacted these staff specialists to obtain accurate information however they will take anecdotal information from a MoDNR employee that observes a truck of litter going north and assumes based on a discussion with the trucker. The hauler of this litter must have records of where this litter is hauled or applied to the land when it is derived from a CAFO. By the permit requirements whether it is the MoDNR or the MoDOT permits the hauler must provide on a regular basis the location, quantity and type of litter hauled as a requirement of their permit. MoDNR Environmental Specialists are required to review this data for any permit renewals or reported violations. The author appears to not have collected thus information and furnished this as evidence in the claims in this report. The CWC*

*and natural resource staff would disagree with the assertions unless evidence is documented in this report. The numbers claimed the last 3 paragraphs is not consistent with known numbers by the local natural resource agency staff. The CWC disputes the numbers used from NASS and MoRAP since these are not the same terms utilized to arrive at animals versus animal units to justify the author's position regarding contributions from all these cattle and so few grassland acres. Previously we pointed out errors in the assumptions to derive this number. The very last paragraph of this section is grossly in error. There are no layer poultry in either of these two watersheds. This has been repeated by some source unknown to the CWC by previous authors of two previous Draft TMDL Reports in this area. There are no poultry layer operations in this area. Likewise the number of sheep reported are far beyond the comprehension of the local staff. Nobody knows of the exact number of sheep in the entire watershed for Missouri but nowhere near this number reported since wool prices are at a all time low and meat is not worth much either. Consequently any business minded farmer would raise sheep just to lose money. CWC also recommends that the author check with the local SWCD/NRCS offices and the USDA-FSA office to determine the actual crop rotations in the watershed. The local SWCD reports that 20-30% of the cropland is soybeans, 30-40% is corn; and 15-20% is winter wheat with some rotational hay mixed in also. When you take this average crop rotation compound it with conservation practices and conservation tillage methods adopted in the watersheds one would get a better appreciation for the soil saving and nutrient retention objectives already accomplished in these watersheds to protect the resources and water quality.*

CAFO operators who apply animal waste from their own facility on to their own land must develop an approved nutrient management plan that identifies the rules and criteria that will be adhered to during application. In addition, operators who ship their waste off-site must keep records of how much waste is shipped and who received this waste. However, permit conditions do not require operators to keep records identifying where this waste is ultimately shipped, or where, when, or at what rates it is land applied. A review of the permits for the animal feeding operations in the watershed indicates that, in addition to spreading litter on their own land, two of the three operators have spreading agreements with other landowners. Additional language has been added to Section 3.2.1 to address this.

Data used to estimate the number of sheep, poultry and swine in the last paragraph of Section 3.2.1 is county level data that comes from the 2007 Census of Agriculture published by the USDA's National Agricultural Statistics Service. This is the most recent and comprehensive agricultural census that is available from USDA. As clearly noted in the TMDL, this data is for Barton and Vernon counties, and no data are available to estimate the number of these livestock that might actually be located in the Marmaton River watershed. These numbers are provided for general background information only, and are not used for modeling purposes.

Section 12.2 of the TMDL addresses agricultural conservation practices that are currently being utilized in the watershed. While this is not a comprehensive list detailing exactly where and to what extent these practices have been put into place, it is intended to give the reader a general idea of the type of work going on in the watershed and to provide a basis for considering what additional work may need to be done.

**Comment #18 (Sec. 3.2.2, Para. 1):** *The author earlier stated that permitted storm water did not contribute to the low DO in the streams low volume of water but in this section the author does an about face on the topic. The CWC maintains it is equally responsible but in a much more concentrated manner than agriculture. Nevada along with at least a dozen or more facilities in or immediately adjacent to Nevada have permitted storm water facilities contributing to the watersheds sediment, organic debris, and heated runoff waters. These contributions the author admits contribute to low DO and the check list definitively lists those facilities that are most likely to contribute significantly to this low DO in these two tributaries. Again the CWC maintains that by the author ignoring these permitted storm water facilities debris, suspended sediment and organic solids will continue to contribute to the streams low DO. These facilities are a direct conduit to the DO degradation as well as the heat runoff pollution from hard surfaced areas. The organic materials deposited on the stream banks and stream bottoms is an endless reservoir of materials depleting the streams oxygen. This includes undecomposed leaves, grass clippings, commercial fertilizers spread on lawns, pet wastes, etc. Additionally the sediment deposited does reduce the streams capacity to hold more water thus making the flowing waters shallow and heated. Another assertion in this paragraph is the "illicit" sewer connections within Nevada. Illicit is a term implying knowingly doing something illegal to avoid compliance. The City of Nevada has never knowingly avoided having annexed homes to remain unhooked from their sewer system. If anything a home might have been annexed and through some administrative mix-up the home is still operating sufficiently with an OWTS. When identified, city staff informs the landowners and complete the hookups as required by their ordinance. We suggest the author contact the City's WWTP Superintendent, Roger Beach for more details in correcting this assumption.*

Earlier references to storm water discharges in Section 3.1 of the TMDL refer to permitted point source discharges that result from extraordinarily high rainfall events. The discussion of storm water in Section 3.2.2 refers specifically to non-permitted nonpoint source urban storm water runoff. The Department agrees that urban storm water runoff in the watershed may contribute to low dissolved oxygen conditions in the Marmaton River and Little Drywood Creek, and this is addressed in Section 3.2.2 of the TMDL.

The Department understands the term "illicit" to simply mean "not legally permitted or authorized", and makes no assumptions about the intent of anyone's actions. The TMDL does not state or imply that the city of Nevada, either knowingly or unknowingly, avoids connecting annexed homes or businesses to their municipal sewer system. Illicit connections to municipal sewer systems are a widely recognized problem, and have been identified by the U.S. Environmental Protection Agency as a potential source for contaminated wastewater to enter surface waters before receiving treatment from a wastewater treatment plant. For more information, please go to: <http://www.epa.gov/nps/ordinance/discharges.htm>.

**Comment #19 (Sec. 3.2.2, Para. 2):** *Towards the end of the paragraph 2, the author is not clear as to what portion of the watershed is recipient of the City of Nevada's storm water runoff. When it comes to the modeling portion of this report it is imperative that the breakout for each watershed is properly addressed since the runoff is significantly different for each tributary. Approximately 25-*

*35% of Nevada's storm water runoff enters the Little Drywood Creek Watershed. See the watershed map furnished with this draft report.*

The discussion of the relative contribution from the cities of Fort Scott and Nevada to the Marmaton River and Little Drywood Creek in Section 3.2.2 is for informational purposes only, and is not intended as a quantitative assessment of flow or discharge used for modeling purposes. Section 5 and Appendix C of the TMDL discuss subbasin and stream reach characteristics associated with the QUAL2K water quality model. As noted in Section 15, the Department has maintained 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 #20 (Sec. 3.2.3, Para. 1):** *CWC consulted with a former MoDNR Soil Scientist still active interpreting soils and the local Environmental Health Specialist with Vernon County Health Department to understand the intent of this paragraph. Two terms are not used by the professionals, fail hydraulically (surface breakouts) or hydro-geologically (inadequate soil filtration). 'Failing septic systems are sources of nutrients and oxygen-consuming substances that can reach nearby streams through both surface runoff and groundwater flows.' The author in the explanation may not realize that the nutrients should they come to the surface are more likely to be filtered by grasses or ponds in the homeowners yard making it unhealthy for the family. In these situations the local health department is contacted and the system is then brought up to current standards. The number of systems failing are insignificant in relation the number of systems present in the watershed. Likewise the failure rate is minimal considering the number and age of these systems in the watershed. Contact Steve Durnell, Vernon County Health Department. The author also needs to be reminded that US EPA and MO DHSS uses the term On-Site Waste Water Treatment System (OWTS) since the only portion of the system that is 'septic' is the tank itself. As for the authors assertion that failed OWTS get to streams via surface breakouts or via ground water. The later is highly unlike in this watershed since he soils have a very tight clays layered below the 18-24" installation depth for any OWTS field drain lines. If a home waste water lagoon is utilized, the lagoon is compacted with a clay liner to prevent seepage and cross contamination with ground water. Author sites very slow permeability for the majority of the soils. The writer would want us to believe that the failed system when it does not surface travels to and through the groundwater. The soils present in the watershed is very tight, slow percolation (permeability) an unlikely situation to occur. There are very few homes built where bedrock occurs that would allow seepage through the bedrock. As per conversation with Steve Durnell he explained that state law requires a very extensive treatment package which is cost prohibitive to the average home builder/owner. Also installing an OWTS where bedrock might be an issue requires that the soil depth be at least 2-3 ft below the installed depth of facility apparatuses in addition to the 18-24" depth above the absorption field lines Again this would not concern for pollution potential we're not sure where the author derived this information. A bigger issue not mentioned by the writer and should be of important when it comes to untreated household waste if fecal coli form bacteria (live). This presents a far greater health risk especially with a stream designated for whole body contact use.*

The Department stands by its use of terminology and its assessment of the potential impacts of failing onsite wastewater treatment systems to surface and groundwater.

The Department acknowledges that bacterial contamination of surface and groundwater is a significant problem associated with failing onsite wastewater treatment systems within Missouri, and throughout the nation. However, as noted in many places throughout the TMDL, this document is being developed to address an impairment to the protection of the warm water aquatic life designated use caused by low dissolved oxygen, and is not being developed to address an impairment to the whole body contact recreation designated use caused by bacterial contamination.

*Comment #21 (Sec. 3.2.3, Para. 2-3): The author goes to great lengths to mention the number of failed systems (OWTS) in the watershed yet the perspective is really reversed. With the number of people living in the two watersheds, minus those within the confines of the City of Nevada the average household is 2.4 persons per household, as per MoDNR and DHSS calculation. This means that for the population the writer wants us to use there is roughly 5,740 individual household OWTS in the two watersheds. Steve Durnell has stated before and does in this report that roughly 30 complaints are received annually for Vernon County, not these watersheds. Taking this number for these two watersheds, assuming all complaints received is a failed system, and using the writers numbers of systems that would equate to 0.61% of the systems failing, less than 1 % of the total systems in these watersheds in any one year. Using the same analogy that 30 systems were installed annually since 1996, a 13 year period to redeem the situation this would 390 systems or 8.0% corrected. After reworking the numbers based on the two state agencies (2.4 persons/household), the number of systems increased to 5,740, an increase of 846 households. The annual replacement dropped to 0.53% and the 13 year replacement period would have been 6.8%. These numbers when checked with Steve Durnell confirmed our belief that this issue is relatively insignificant compared to other issues being presented throughout this report. The author sites an EPA study that claims a statewide failure rate for OWTS in (2002) at 30-50% failure rate. None of our sources can confirm this study or the numbers especially for this watershed. Use of such numbers without an exact number and the author's assumptions are inaccurate. Based on Vernon County Health Department's own admission the percentage does not nor has it come close to the number asserted by EPA or this author. CWC urges the author stick to the real facts as quoted by the Health Department. These numbers, replacements or repairs is normal for most systems around the country, even states with minimal soil limitations such as depth and water tables.*

Several county health department inspectors from across the state have indicated in conversations with the Department that the only mechanism they have for being made aware of failing onsite wastewater treatment systems is by citizen complaints. They have also indicated that they believe that the number of complaints they receive represents a very small proportion of the actual number of failing systems. The Department therefore believes that it is inaccurate to assume that the number of complaints reported by the Vernon County Health Department represents the maximum number of failing systems there could potentially be in the county.

This section of the TMDL is intended to present information identifying failing onsite wastewater treatment systems as one possible source of pollutants. Because of the lack of comprehensive and accurate information available specifically for this watershed, it is not possible to know exactly what impact these systems are having on the Marmaton River and Little Drywood Creek, and the Department makes no such claims in the TMDL. Regardless, in general terms, the impacts of such system failures on surface and groundwater resources is well documented by EPA and others. The EPA document that reports the failure rate in Missouri is cited in the reference section of the TMDL, and is also available at [http://www.epa.gov/owm/septic/pubs/septic\\_2002\\_osdm\\_all.pdf](http://www.epa.gov/owm/septic/pubs/septic_2002_osdm_all.pdf).

*Comment #22 (Sec. 3.2.4, Para. 1): The author uses a word that is not used by biologists in defining the role of riparian habit. The use of assimilation is once again used for nutrient and water uptake by grassy and woody vegetation. Likewise the use of infiltration and percolation of runoff waters reaching the riparian zone are not used in the context of its operation. Biologists, soil scientists and the like when reading this report may become confused by the author's intent when using such words. Recommend keeping the terminology as simple as possible. The stated goal of this TMDL is improve the DO in the streams water quality profile; yet no where does this become known in the introduction of this topic change. CWC encourages making the point and then proposing the modifications necessary to achieve that goal.*

The Department believes the terminology and usage within the TMDL document is appropriate. We appreciate the CWC's comments and will take these into consideration when developing future TMDLs.

*Comment #23 (Sec. 3.2.4, Para. 2): Author attributes the low DO to leaves falling from nearby trees in wooded areas, aquatic plants, drainage and organically rich areas like wetlands. The CWC during the past several years have argued this point to no avail with fisheries and water quality experts within, University of Missouri, Mo Department of Conservation Fisheries and MoDNR-NPS Unit, Stream Team. Their conclusion that the sum of all these mentioned items is quite insignificant to the 'natural background low DO.' Where does the authors assumptions arrive from when all research from these agencies state otherwise. These materials stated as contributors are essential to providing aquatic invertebrate food and habitat essential to the health of the stream. Also the perception that wetlands are rich in organics released to the stream is contrary to all biologists and water quality specialist around the country. These wetlands may have contributed enriched waters when they were initially drained during the white European settlers between the Civil War and early 1900's. However any organic matter in the soil after drained is fairly well consumed within 15-20 years after the initial drainage activity. Thereafter the organic matter remaining is stable and the influx would be created by plants growing currently in these areas. Again I do not see a relevance to the issue of low DO contributions and strongly urge the author to substantiate these claims if they are to remain in this report.*

Section 3.2.4 of the TMDL notes that riparian areas, including riparian wetlands, may act as a source of oxygen consuming materials that may affect dissolved oxygen in the river. This section also identifies the many benefits that riparian areas may have on water quality. As noted earlier in the

response to Comment #15, both conditions may exist in the riverine-riparian ecosystem and are not inconsistent with one another.

The Department appreciates the CWC's comments, and has revised this section for clarity as well as to include a supporting reference.

***Comment #24 (Sec. 3.2.4, Para. 3):*** *The CWC reviewers are confused by most of this paragraph. We cannot determine from the discussion presented in this last few sentences whether this is an acknowledgement of existing conditions and a wish for better conditions based on the authors own philosophical approach. Does the author have some factual evidence available for these watersheds that are attempting to convey? Will this help curb the situation and improve the low DO in these streams. Nothing is clearly stated or conveyed. Reading of the text there appears to be modification of the data to suit a need that is not clearly presented in the text. As it is written there appears to be no facts to support the perceived changes to improve low DO thus should be omitted from this document. The definition of wetlands as portrayed by the MoRAP leaves a lot to interpretations. Most of this work was done from aerial photos and very little in the field verification. Many of the interpretations were conducted by a revolving door of students with little to no field experience in wetland identification. The numbers appear to be highly exaggerated and we would encourage this be evaluated in the field before setting these final in this publication.*

As noted in the responses to other comments, this section is being presented to provide background information about conditions within the watershed. The information presented is not intended as a prescription for solving the low dissolved oxygen impairment, and no data has undergone modification to support a Department need. For more information concerning TMDL implementation, please refer to Section 12 of the TMDL document. As noted in the response to Comment #23, Section 3.2.4 of the TMDL has been revised.

As also previously noted, the Department acknowledges there is a certain degree of error inherent in the classification of all remotely sensed land cover data. The land use and land cover data used in the Marmaton River-Little Drywood Creek 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 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. For more information about the development and classification of MoRAP's 2005 land use and land cover data, please refer to the metadata available at [http://www.msdis.missouri.edu/datasearch/metadata/utm/mo\\_lulc05\\_utm.xml](http://www.msdis.missouri.edu/datasearch/metadata/utm/mo_lulc05_utm.xml).

***Comment #25 (Sec. 4.2, Para. 2):*** *Author in describing what impacts the low DO in a stream failed to mention the time of day, time of season "fall, winter, spring, summer," volume of water flowing, water recharge, and the shading impact from trees or other structures.*

Paragraph 3 of Section 4.2 has been revised to include stream flow as a factor affecting dissolved oxygen. Time of day, season, and shading are all implicitly acknowledged in this paragraph by citing parameters such as stream flow, water temperature, amount of decaying organic matter, and level of photosynthesis occurring. Please note, however, that Missouri's 5 mg/L minimum dissolved oxygen criterion is in effect statewide at all times and does not vary by season or time of day.

***Comment #26 (Sec. 4.2, Para. 3):** Author introduces the topic Sediment Oxygen Demand (SOD) a relatively new water quality test conduct in estuary sites such as in the Chesapeake Bay area and confluence locations with fresh water streams and the Gulf of Mexico, salt water. This test which has no known standard in fresh water bodies alone is being forced upon this TMDL with no supporting data to substantiate its accuracy or its validity in these conditions. There are no labs in the state that are equipped to conduct such singular tests and meet the Qa/Qc standards. CWC has discussed this test with state and federal water quality experts across the state only to determine it is not an acceptable test nor is it defensible as a water quality parameter to measure improved water quality in freshwater bodies. Where are the standards for Missouri that determines when this parameter can prove that water quality is impacted. If there are no standards adopted by the Clean Water Commission how you can force the standard on its citizen and watersheds residents. Without a firm basis, standard and direct benefit to water quality how can MoDNR impose this rule? Naturally occurring elements such as iron, manganese, and sulfur which the author states cause low DO is throughout these soils and would only prove these minerals exist. These minerals would not be managed or rectified due to the pervasive presence of these elements naturally. The depth of water which too is controlled by nature and the impacts of KS holding water back in their reservoirs would also prove unattainable. Temperature and stream velocity is in part controlled by the volume of water discharged from the watershed reservoirs in KS, a state with far different water laws than Missouri.*

The rate of sediment oxygen demand (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>1</sup>. Understanding of oxygen depletion in rivers associated with deposition of organic matter in bottom sediments dates back to the late 19th 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>2</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

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<sup>1</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>2</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

agricultural landscapes, as is the case with the Marmaton River and Little Drywood Creek. As noted in the “Model Calibration” section of Appendix C of the TMDL, an analysis of continuous DO measurements in the Marmaton 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>.

The Department acknowledges that SOD is not a pollutant identified in Missouri’s Water Quality Standards. However, SOD is associated with dissolved oxygen which is a water quality criterion found in Missouri’s Water Quality Standards. Nowhere in the TMDL does the Department attempt to impose restrictions on SOD, and no pollutant load allocations are developed for SOD. Section 5.3.2 states that QUAL2K modeling conducted for this TMDL indicates that an average reduction in sediment oxygen demand of 60 percent is required to meet the dissolved oxygen criterion of 5 mg/L throughout the Missouri portion of the Marmaton River and Little Drywood Creek. Sections 7 and 8 of the TMDL then go on to address the TMDL allocations needed to achieve this 60 percent goal, including allocations for nutrients, total suspended solids, and biochemical oxygen demand.

***Comment #27 (Sec. 4.2, Para. 4):** The last paragraph the author brings about the topic of phosphorous as a contributing pollutant yet this was not an issue in anything discussed to this point regarding low DO. Either present those facts or remove the subject entirely. Since it is not directly involved and there is no evidence presented in the water quality samples that this is a mute point and should be removed from discussion. Additionally, there is mention of algae consuming oxygen and the potential low DO, yet the numbers don't support that as an issue directly. Everything on this subject has been potential or indirect assumptions on the part of the author. Again unless it can be substantiated as a direct link we suggest it being removed until proven.*

Phosphorus is addressed in the TMDL as a potential contributing pollutant in Sections 2.5, 3.2.1, 3.2.2, 4.2, 5.3 and 5.3.1. In addition, the QUAL2K model used for the Marmaton River-Little Drywood Creek TMDL recognizes that both total nitrogen and total phosphorus can cause or contribute to low DO issues through algal growth, respiration and decomposition. Point and nonpoint source allocations for total phosphorus are outlined in Sections 7 and 8.

It is recognized by EPA in their National Nutrient Strategy<sup>3</sup> and their Nutrient Criteria Technical Guidance Manual for Rivers and Streams<sup>4</sup>, and widely understood in general, that excess nutrients, including phosphorus, in a water body can lead to potentially harmful algal blooms. The algal blooms can in turn contribute to low dissolved oxygen conditions. A reference has been added to

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<sup>3</sup> National Strategy for the Development of Regional Nutrient Criteria (June 1998). EPA 822-R-98-002.

<sup>4</sup> Nutrient Criteria Technical Guidance Manual: Rivers and Streams (July 2000). EPA 822-B00-002.

Section 4.2 of the TMDL to support the statement that phosphorus can contribute to algal growth in streams.

It is within the authority of the Department to set wasteload allocations for pollutants that cause or contribute to the impairment of a water body. According to 40 CFR 122.44(d)(1)(i), "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." For this reason, WLAs for total nitrogen and total phosphorous have been developed for the Marmaton River-Little Drywood Creek TMDL.

***Comment #28 (Sec. 4.3, Para. 2):** The author states a classification system without the supporting criteria that identifies each of these classes (Tiers). How is the TMDL reviewer, "John Q Citizen" going to find this data and where to determine if they are in agreement with the agencies determination? The public is not as versed in the topic as the author wishes them to be nor does the public care to be until it impacts them directly. Consequently it is suggested that the report contain the technical parameter ranges for the different levels of classifications. This was the shorts section but by far the most important to arrive at the conclusion that DO must be a priority for improvement in these two streams.*

Detailing the technical parameters of the Department's antidegradation policy is not the purview of this TMDL. As noted in Section 4.3 of the TMDL, the antidegradation section of Missouri's Water Quality Standards can be found at 10 CSR 20-7.031(2). In addition, the references section of the TMDL provides a link to these standards on the Missouri Secretary of State's website at the following link: <http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-7.pdf>. For readers requiring additional information about antidegradation implementation, the antidegradation implementation policy in the water quality standards cites the "Missouri Antidegradation Rule and Implementation Procedure," which is also available on the Department's website at <http://www.dnr.mo.gov/env/wpp/docs/aip-cwc-appr-050708.pdf>.

***Comment #29 (Sec. 5.2, Para. 2):** Why does the author conclude that this methodology described is the best method without offering the public the choice of 2-3 different methods deriving the streams potential reaeration potential? While the equation may be what is needed why is there not an explanation for the method chosen and the parameters used in the model to predict the streams reaeration potential. The discussion falls short of convincing the public and citizens of this watershed. The technical language throughout this section and report needs to be reconsidered so that the public can better understand the finer points of this serious topic impacting their lives and livelihood. Review of Tables 9 and 10 several things stood out at the presentation. Throughout the time columns the author or the tables author interspersed quasi-military times with civilian time. If you expect civilians to read and understand the report use civilian time recordings with the colon between the hour and minutes. Otherwise the military time does not have a colon in it. Also civilian time does not have any hour reported over 12:00 but has an extension of am and pm. It would make reading of the water quality parameters far easier and understand how time factors into the readings.*

*Also the use of these tables means nothing unless you establish the benchmark or the range for what is acceptable and unacceptable. DO is > 5 mg/l is acceptable depending on the time of day and year.*

As noted in Section 5.2 of the TMDL, the O' Connor and Dobbins reaeration equation is considered an appropriate means of determining estimates of stream reaeration based upon the estimated depths and velocities of the Marmaton River observed during the sampling events of summer 2008. Methods used in the determination of reaeration, respiration and net productivity are well referenced in this section. In addition, while the Department has attempted to simplify the modeling and analysis discussion to the greatest extent practicable, as noted in Section 15 of the TMDL the Department maintains 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, and the Department welcomes input and questions related to the model and its parameters.

Thank you for your comment regarding the "Time" column of Tables 9 and 10. The colon has been removed in order to more accurately represent military time.

Missouri's 5 mg/L minimum dissolved oxygen criterion is noted repeatedly throughout the TMDL, beginning in Section 2.5. This minimum criterion is in effect statewide at all times and does not vary by season or time of day. As for the other parameters in the table, the Department welcomes the suggestion that a benchmark or range of acceptable values for each parameter be included with the table, and will take this into consideration when developing future TMDLs.

***Comment #30 (Sec. 5.3, Para. 1):*** *Author needs to remove the scientific jargon and make it readable to the public at large. Many of the words used in this paragraph are not understood by undergraduates much less high school graduates composing the residents in the watershed. Writing of this document is expressly for watershed residents to understand what is happening to their watershed and how they can better manage the watershed. Terms like this will cause this document and others like it to be placed on the bottom of some of the largest paper collections in offices throughout the watershed. Understanding what needs to be done will fall to an all time low. The author assumes wrongly that his assumption is correct that nothing in the "historic prairie streams was modified by changes in land cover and channelization manipulation of these parameters does not address a pollutant and so is not the goal of a TMDL. Pollutants that result in oxygen concentrations below saturation are: fine particle size of bottom sediments; high nutrient levels (nitrogen and phosphorous); suspended particles of organic matter". First we have always been told that there is insufficient evidence to distinguish these type of streams in Missouri thus we magically now have data that was never before available. Secondly, the nature of these streams is that during any runoff event there is fine particle sized sediments throughout out the stream water profile, not just the bottom; nutrient levels identified have not been truly identified as the culprit (micrograms/liter); and the suspend particles of organic matter. While contributions from agriculture is not denied the quantities from other sources such as municipal WWTP needs to step forward being responsible. Additionally the topic is being side-stepped is the lack of consistent flow from our neighboring state which is entrapping large sums of water in the 102 reservoirs in KS in the upper watershed reaches of both streams. KS folks have anecdotally stated that their many reservoirs have benefitted by*

*entrapping sediment and nutrients however if that were the case why does the Marmaton look the way it does in the summer months. MDC staff have stated that is simply not true regarding the entrapment of enriched sediments, nutrients, etc.*

The TMDL document has been simplified to the greatest extent practicable, with the intent of being as meaningful as possible to as wide an audience as possible, while still adhering to EPA guidelines and requirements. All TMDLs are subject to public review and the Department welcomes questions and comments from citizens of the watershed.

The Department does not assume that “nothing in the ‘historic prairie streams was modified by changes in land cover and channelization,’” and nowhere is this claimed in the document. Rather, the TMDL states that although the hydrologic regime of historic prairie streams was modified by changes in land cover and channelization, manipulation of these parameters does not address a pollutant and so is not the goal of a TMDL. Human-induced physical alterations to the landscape represent *pollution* and not a *pollutant* (see 10 CSR 20-2.010, <http://www.sos.mo.gov/adrules/csr/current/10csr/10c20-2.pdf>). TMDLs are not designed to address pollution, including physical changes to the landscape or stream channel, and must address a pollutant, where applicable.

As noted in the TMDL, the Marmaton River and Little Drywood Creek are located in the Cherokee Plains ecoregion<sup>5</sup>. These water bodies are referred to as prairie streams because both the Cherokee Plains ecoregion and the soils that dominate the Marmaton River watershed (see Section 2.3 of the TMDL) are characterized as having a potential natural vegetation of tall prairie grasses and are indicative of a prairie ecosystem.

The Department agrees that the problem in the Marmaton River and Little Drywood Creek is partly a result of suspended solids along with fine bottom sediment, which is why Section 5.3 of the TMDL addresses both issues. Again, it is recognized by EPA in their National Nutrient Strategy and their Nutrient Criteria Technical Guidance Manual for Rivers and Streams, and widely understood in general, that excessive nutrients in a water body can lead to potentially harmful algal blooms which can in turn contribute to low dissolved oxygen conditions. Because phosphorous transport is often associated with sediment, TMDLs for phosphorous and total suspended solids is an appropriate means to address the low dissolved oxygen impairment.

Please note that Section 3.1 of the TMDL addresses potential point sources of pollutants to the Marmaton River and Little Drywood Creek, including municipal WWTPs. As previously noted in this response letter, while the Department understands the importance of water quantity to both water quality and the quality of life of Missouri residents, neither water quantity nor the coordination of interstate water rights issues are the purview of this TMDL. For concerns regarding water quantity issues, please contact the Department’s Water Resources Center at (573) 751-1134, or go to their web site at the following link: <http://www.dnr.mo.gov/env/wrc/index.html>.

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<sup>5</sup> Chapman, S.S., Omernik, J.M., Griffith, G.E., Schroeder, W.A., Nigh, T.A., and Wilton, T.F., 2002, Ecoregions of Iowa and Missouri (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,800,000).

**Comment #31 (Sec. 5.3, Para. 3):** *The last portion of this paragraph talks about a reference concentration of TP yet until now the topic of its importance was never discussed. Also TSS is now the target which until now has not been presented in the discussion as to cause and affects. This report appears to be slipping these "targets" in belatedly with hopes the sheer volume of this report will cause the topic to be ignored by the average reader. Volume of reading does not make for easier reading or understanding.*

*CWC recommends "Chlorophyll a" would be more appropriate measure of stream improvement since whatever limiting nutrient, NTN or TP is managed properly will see a dramatic reduction in the concentration thus proving the cause and effect. However, just focusing on nutrients alone, these parameters will change from season to season, crop year to crop year based on rotations, economy, livestock markets, farm programs, etc. Targeting chlorophyll makes more sense since it will also impact WWTP, Storm Water Management Facilities, and urban and commercial landowners and not just agriculture. The author mentions referencing a eco-region reference concentrations. Spell out the eco-region used to make sure that the regulatory agencies are comparing apples to apples which has not always been the case.*

As noted in the response to Comment #27, phosphorus is addressed in the TMDL as a potential contributing pollutant in Sections 2.5, 3.2.1, 3.2.2, 4.2, 5.3 and 5.3.1. In addition, the QUAL2K model used for the Marmaton River and Little Drywood Creek recognizes that both total nitrogen and total phosphorus can cause or contribute to low DO issues in the streams through algal growth, respiration and decomposition. Point and nonpoint source allocations for phosphorus are outlined in Sections 7 and 8. It is recognized by EPA in their National Nutrient Strategy and their Nutrient Criteria Technical Guidance Manual for Rivers and Streams, and widely understood in general, that excessive nutrients (including phosphorus) in a water body can lead to potentially harmful algal blooms which can in turn contribute to low dissolved oxygen conditions. Section 4.2 of the TMDL already includes language addressing this point, and a supporting reference has been added.

Sediment is discussed in Section 4.2 in the context of sediment oxygen demand, and is addressed again in the first paragraph of Section 5.3 along with suspended solids. The last paragraph of Section 5.3 introduces the link between fine particle sized sediment and suspended solids and notes that, in order to address the problem of sediment oxygen demand caused by an accumulation of fine organic bottom sediments, the TMDL will have total suspended solids (TSS) as one of its allocations. Additionally, because phosphorous transport is often associated with sediment, TMDLs for phosphorous and total suspended solids are an appropriate means to address the low dissolved oxygen impairment.

**Comment #32 (Sec. 5.3.2, Para. 1-3):** *The author states in this section that the TMDL is a relationship with the Sediment Oxygen Demand (SOD) parameter and nutrient parameters to low DO however how does a water quality parameter untested and developed for freshwater-salt water interfaces become the standard parameter? This water quality parameter has no qualified laboratory in close proximity for timely and quality controlled analysis. There are no specific ranges established for fresh water bodies applicable to the prairie stream setting. The water body in question we have*

*been informed is not a suitable site for this test and that the Clean Water Commission has not adopted rules imposing this parameter to measure water quality. Forcing citizens of a watershed to utilize and untested parameter to evaluate their watershed is uncalled for. Lastly, using the results of this test within the QUAL2K. The parameters within this model are based on the data supplied by the TMDL writers to be accurate and without random assumptions. The assumptions, on various inputs from various natural resources, human and animal throughout this watershed would make this current model run inappropriate; to conclude the needs for this TMDL and in particular the streams management demands. The CWC recommends that with all of the data found to be in error as pointed out during this review and noted; with the assumptions made by the TMDL staff inappropriately; and the inaccurate data collections from various years and units of measure; and from a multitude of sources with differing means of collecting the data used to compile this report. Much of what has been brought to your attention will create a significant change in the output of this model warranting the extra time to validate the all of the assumptions. The CWC maintains that use of the SOD as a parameter without any founded ranges for acceptance is totally unacceptable. Use of nutrients as a parameter must be spread across all load allocations in the watershed especially with urban and commercially permitted facilities, not just non-point sources from agriculture. The City of Nevada WWTP Superintendent mentioned in discussions with the CWC that their current \$6.7 million renovations of their WWTP will not meet the required reductions proposed in this draft TMDL and their temporary permit. They would have to make an additional \$2+ million investment with no assurance the modification would bring their WWTP into compliance. Their permit was to have been renewed but is on hold until the results from the renovated plant are back and acceptable. the WWTP folks will not be able to seek citizen approval for another investment with no assurances of making it meet the proposed standards in this TMDL. Their consultant has run the numbers and cannot find an equitable solution with today's technology. An evaluation of the TMDLs requirements for a 60% reduction is quite alarming with agricultural technologies, uncertainties of the economy and what the farmer receives for their commodities. Expectations are far greater than these enterprises will be able to afford and stay in the business of farming.*

As stated in the response to Comment #26, 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”. SOD is not confined to freshwater-saltwater interfaces and understanding of oxygen depletion in streams and rivers associated with deposition of organic matter in bottom sediments is not a new concept. Studies to quantify and understand the effects of SOD have been ongoing since the 1930's and include former prairie streams such as the Illinois River. The US EPA and other research agencies and institutions recognize the importance of SOD to aquatic environments. To this end, SOD is a parameter included in the QUAL2K water quality model upon which the Marmaton River TMDL based. Appropriate ranges and values for SOD can be found in literature and EPA guidance. The department maintains the data and assumptions used for SOD, and all other data, parameters, and assumptions used in the Marmaton River TMDL, are appropriate and based upon the best science available.

Section 3 of the TMDL identifies both point and nonpoint sources of pollutants in the watershed, and Sections 7 and 8 identify pollutant allocations for both point and nonpoint sources. Development of

TMDL pollutant allocations must ensure attainment and compliance with applicable water quality standards per 40 CFR 130.7(c). As a result, TMDL allocation development is conducted without consideration of wastewater treatment technology or cost. However, following discussions with the city of Nevada, the Department has agreed to remove TMDLs for Little Drywood Creek from the TMDL document. The Marmaton River TMDL has been revised accordingly, and new pollutant load allocations and implementation plans have been developed for the Marmaton River alone. This revised TMDL is currently available for public comment, and relevant stakeholders and other interested parties, including the CWC, have been notified. The Department encourages the CWC to review the new TMDL. A Little Drywood Creek TMDL will be developed at a later date.

**Comment #33 (Sec. 6, Para. 3):** *The statement in this section refers to the critical period when DO in stream flows must be improved to maintain aquatic life is also during the peak period when KS watershed reservoirs are holding back large quantities of surface water runoff is being held behind these large reservoirs and augment release of these waters are not released for the benefit of all. The stream recharge is from runoff not groundwater recharge, as sometimes alluded to by the author throughout the text. The 102 reservoirs are holding back large volumes of water, 27,110.4 ac-ft for the normal pool stages and 41,913.4 acre-feet at emergency pool stage, if released in a concerted low flow, this would help to augment the flows and improve the health of the streams. Instead the State of Kansas continues to issue more and more watershed based permits to build more and more reservoirs to lock up more surface water, depriving Missouri watershed residents of their fair share. KS water laws are far more defining than MO consequently Missouri residents are suffering for it and will continue to get worse if this is allowed to persist. Currently the Missouri Department of Conservation Fisheries have openly stated that more than 60% of these watersheds are already in retention mode, holding back vital water recharge important to the health of these streams and others. Since US EPA through KDHE has the authority to determine the volume and quality of water released from these structures to maintain a streams health the CWC encourages MoDNR to pursue through appropriate channels reprieve from for such actions.*

As noted in the response to Comment #10, while stream flow may be a factor affecting the dissolved oxygen conditions of a river, this parameter in and of itself does not represent a pollutant and consequently was not a goal of this TMDL. While the Department appreciates the importance of water quantity to both water quality and the quality of life of Missouri residents, neither water quantity nor the coordination of interstate water rights are the purview of this TMDL. For information and assistance in addressing these matters, please contact the Department's Water Resources Center at (573) 751-1134, or go to their web site at the following link:  
<http://www.dnr.mo.gov/env/wrc/index.html>.

**Comment #34 (Sec. 8, Para. 5):** *WWTP Superintendent informed the CWC that the waste load allocation determined for the WWTP point sources is not attainable with the current upgrades to the WWTP that has proven very costly to the community. With this additional waste load allocation (BOD) their consultant already has informed them that the current approved system will not meet the newest allocation and that all available technology that would be cost effective will not meet that demand. Lastly, the cost of the current improvement is \$6.7 million and the next level of treatment is*

*between \$1-2 million additional with absolutely no assurance it will meet the load allocation projected. CWC cannot believe the waste load allocation is correctly run through the QUAL2K especially after we have pointed out errors in the potential input data utilized. This is another reason for requesting a rework of the model run using the latest data provided.*

As previously noted, development of TMDL pollutant allocations must ensure attainment and compliance with applicable water quality standards per 40 CFR 130.7(c). As a result, TMDL allocation development is conducted without consideration of wastewater treatment technology or cost. However, as also previously noted in response to Comment #32, the Department has agreed to remove TMDLs for Little Drywood Creek from the TMDL document. The Marmaton River TMDL has been revised accordingly, and new pollutant load allocations and implementation plans have been developed for the Marmaton River alone. This revised TMDL is currently available for public comment, and relevant stakeholders and other interested parties, including the CWC, have been notified. The Department encourages the CWC to review the new TMDL. A Little Drywood Creek TMDL will be developed at a later date.

As previously noted and documented within both the TMDL and this response letter, the data and assumptions used to develop the Marmaton River TMDL are based upon the best science available. The Department maintains the accuracy and quality of these data are appropriate for TMDL development and do not contain significant errors. However, as additional water quality data are generated or gathered, these data can be considered during future iterations of the Marmaton River and/or Little Drywood Creek TMDLs.

***Comment #35 (Sec. 10, Para. 1-2):*** *The author does a great job explaining the "Seasonal Variations" methodology however since there are two selections, it is not mentioned which method was selected for the modeling. Recommend naming the selected method to use based on the model runs conducted and the regional 20-25 year rainfall patterns.*

When considering seasonal variation in applicable standards, a loading capacity for carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>) that is protective of the critical low flow period sampled in August 2008 was identified. In order to meet this loading during periods of critical low flow, when CBOD is most likely to impact dissolved oxygen in the stream, allocations were also set for total nitrogen, total phosphorus and total suspended solids (TSS). As noted in Section 5 of the TMDL, TSS allocations were derived based on a method using reference ecological drainage units (see Appendix B of the TMDL for more information) and nutrient allocations were based on EPA nutrient ecoregion reference concentrations. Because reference concentrations for TSS and nutrients were not derived based on low flow conditions, the Department has the flexibility through the load duration curve approach to set pollutant allocations for a variety of flow conditions across all seasons.

***Comment #36 (Sec. 11, Para. 1-3):*** *Not knowing what the City of Nevada's monitoring plan is presently one have to read by the description of this document that only downstream monitoring is expected. Most monitoring protocols for point sources generally require the monitoring sites be selected from an upstream and a downstream location acceptable to the WWTP and MoDNR . In the*

*situation where this facility can have influence from two tributaries, L. Drywood Creek and Marmaton River it would seem reasonable that the protocol would include a location on both stream, upstream from the WWTP. The last paragraph mentions aquatic habitat, fish communities, and in-stream invertebrates be sampled every 5-6 years on a rotational basis. CWC has been informed with budget constraints that all of these samplings will be done based on declining budgets and personnel available.*

Section 12.1 of the TMDL document has been revised to indicate that new permit conditions for the Nevada WWTP will require in-stream monitoring of several water quality parameters both upstream and downstream of the facility. These data will assist the facility and Department with determining the impact the WWTF is having on the receiving stream.

The CWC is correct in stating that any water quality monitoring to be conducted by the Department is subject to resource availability. For this reason, and as noted in the TMDL, the Department will also utilize data collected by other state or federal agencies.

***Comment #37 (Sec. 12):*** *The CWC strongly urges the Clean Water Commission to review the water quality criteria for this prairie stream. Other streams under the guidance of the CWC are in the exact same position. One stream hopefully will provide water quality data to help support the review process and establish the new criteria beneficial to all.*

As noted in Section 12 of the TMDL, it is the intention of the Department that prior to implementation of wasteload allocations, either the Department or the city will determine whether the dissolved oxygen criterion of 5 mg/L found in 10 CSR 20-7.031, Table A is appropriate or if a site-specific dissolved oxygen criterion is required. This determination will likely coincide with the Department's next triennial review of the Water Quality Standards, scheduled for 2012, when new dissolved oxygen criteria may be promulgated. For more information about rulemaking efforts and to receive updates about upcoming meetings, agendas and discussion topics, please refer to the Missouri Water Protection Forum at <http://www.dnr.mo.gov/env/wpp/cwforum/>.

Any change to the Water Quality Standards will require approval by both the Missouri Clean Water Commission and US EPA. More information about the Missouri Clean Water Commission, including information about scheduled meetings, can be found at <http://www.dnr.mo.gov/env/wpp/cwc/index.html>.

***Comment #38 (Sec. 12.2, Para. 3- 4):*** *The author has done a very good job of following the MMLO Watershed Management Action Plans which includes these two tributaries. Currently the watershed is directed by the Citizens Watershed Committee (CWC) composed of 3 members from Bates and Vernon Counties, Commissioner and two landowners, and a member of the Osage Valley RC&D Council. The organization has directed its officers to start the process of becoming a 501 (c) (3) non-profit organization recognized by the Missouri Secretary of State and the US IRS. When addressing water quality practices in the watershed the committee has been active with a targeted Watershed Grant (TWG) with KS and a 319 Watershed Restoration Project in another portion of the Marais des*

*Cygnés Watershed. The practices installed with the TWG include installation of OWTS replacing or connecting failed systems; riparian buffers; livestock management systems (non-traditional); forestry improvement practices and tree planting. The 319 project will include the same practices as well as Stream Bank Stabilization; field borders; nutrient management; rotational grazing; alternative watering systems; winter cattle feed and watering management; urban pet litter composting; urban organic composting and reuse and educational programs addressing water quality.*

The Department congratulates the CWC on its achievements and appreciates all of the efforts directed at improving water quality in the Marais des Cygnes, Marmaton and Little Osage River watersheds.

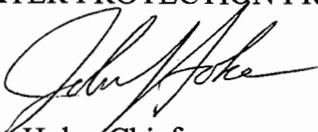
**Comment #39 (Sec. 12.2, Para. 7):** *The CWC has already begun the process to initiate a watershed implementation strategy that will include at least 2 or 3 watersheds independent of the watershed restoration project already in motion. The CWC by applying for not for-profit status, incorporating as such, and the hiring of key staff will be able to seek grant proposals for various watersheds including the Marmaton-Little Drywood Creek. Danny Hahn the re-elected President of the CWC along with the other officers will be attending training sessions on watershed management strategies; not-for-profit organizational management; and grant writing in the near future. The CWC has since 2005 developed a solid partnership with over 25 governmental and NGOs to execute their watershed management action plans. The organization also will be updating its watershed management plan on a regular basis to remain abreast of activities impacting the watershed from external and internal activities.*

Once again, the Department congratulates the CWC on its achievements and appreciates all of the efforts directed at improving water quality in the Marais des Cygnes, Marmaton and Little Osage River watersheds. As you are undoubtedly aware, citizen action and involvement is crucial for successful watershed management and is the key to protecting our natural resources. For these reasons, the Department values the interest and participation of the CWC in the TMDL and watershed management process.

Thank you again for your comments. If you should have questions or would like to discuss this TMDL further, please feel free to contact me at (573) 526-1446, by e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) 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



John Hoke, Chief  
TMDL Unit  
Watershed Protection Section

JH:bwd

April 2, 2010

Mr. John Hoke  
Missouri Department of Natural Resources  
Water Protection Program  
Water Quality Monitoring and Assessment Section  
P.O. Box 176  
Jefferson City, MO 65102

**Subject: Draft Marmaton River and Little Drywood Creek Total Maximum Daily Load Report**

Dear Mr. Hoke:

On behalf of the City of Nevada and Allgeier Martin Consulting Engineers, Geosyntec Consultants (Geosyntec) appreciates the opportunity to submit this comment letter addressing the City's concerns regarding development of the draft Marmaton River and Little Drywood Creek Total Maximum Daily Load (TMDL) report and its impacts on the City of Nevada (City) Wastewater Treatment Facility (WWTF). The TMDL seeks to place extremely stringent limits on the Nevada WWTF using an unverified model despite recognition that Little Drywood Creek upstream of the WWTF outfall does not attain the dissolved oxygen (DO) criterion targeted by the TMDL. The City is concerned that wasteload allocations stipulated by the TMDL are significantly lower than wasteload allocations issued to other WWTPs in Missouri that discharge to low DO streams.

The primary observations, concerns and objections regarding the TMDL are listed as follows:

- The water quality data collected through the TMDL process indicates that the Nevada WWTP is not the cause of low DO in Marmaton River or Little Drywood Creek.
- DO measurements in Little Drywood Creek upstream of the Nevada WWTP were either as low as or at times lower than DO measurements downstream from the Nevada WWTP discharge.
- DO in Little Drywood Creek is naturally below the 5.0 mg/L DO criterion in summer, low-flow conditions.
- The need for alternative dissolved oxygen criteria and/or designated uses is apparent.

- The TMDL does not demonstrate that the immense cost of a Nevada WWTP upgrade required to meet the TMDL wasteload allocations would result in a significant DO increase in Marmaton River or Little Drywood Creek.
- The Nevada WWTP already has water quality-based effluent limits based on a site-specific DO criterion of 3 mg/L and a verified model.
- The wasteload allocations proposed in the TMDL are unprecedented and likely cannot be consistently achieved with any technology used to treat domestic wastewater.
- Wasteload allocations for nutrients are not supported by water quality criteria approved by the Missouri Clean Water Commission.
- The QUAL2K model used to develop the wasteload allocations appears to be unverified and there are other aspects of the model such as ammonia and prescribed sediment oxygen demand values that should be reevaluated.
- The City requests the Department develop separate TMDLs for Little Drywood Creek and Marmaton River.

We request the Department of Natural Resources ('MDNR' or the 'Department') consider the following specific comments before formulating the final TMDL for Marmaton River and Little Drywood Creek.

1. **Nevada WWTP wasteload allocations are likely unachievable and unmerited** (*Page 30, Section 8, Waste Load Allocations*).

Several of the wastewater treatment plant wasteload allocations may be unachievable, particularly after conversion to permit limitations. Installation of tertiary filtration or membrane filtration may not meet the BOD and total suspended solids reduction requirements. In addition, the nutrient limitations are beyond the state of the practice.

The draft TMDL does not conclusively demonstrate that nutrient limits, if achieved, will meet a DO concentration of 5 mg/L. Data collected during the 2008 stream survey and from previous studies on Little Drywood Creek at locations upstream of the Nevada WWTP feature nutrient and BOD concentrations comparable to wasteload allocations yet support DO concentrations less than 5 mg/L.

Marmaton River and Little Drywood Creek are listed for a low DO impairment, not excessive nutrients. Given the considerable capital outlay represented by proposed nutrient wasteload allocations the City believes the Department should remove proposed nutrient removal requirements from the TMDL.

**2. Wasteload allocations for nutrients are not supported by water quality criteria approved by the Missouri Clean Water Commission** (*Pages 34-35, Tables 18-19, Section 8, Waste Load Allocations*).

Included within Tables 18 and 19 of the draft TMDL are wasteload allocations of 13.46 lbs/day (0.8 mg/L) for total nitrogen and 1.46 lbs/day (87 ug/L) for total phosphorus, respectively. It is not clear what regulatory basis supports the prescribed nutrient wasteload allocations. The TMDL qualitatively ties nutrients to the DO impairment; however, limited quantitative analysis was provided to demonstrate that nutrient wasteload allocations are needed to address the DO impairment. We note that Marmaton River and Little Drywood Creek are not identified by the Department as being impaired by unacceptably high nutrient concentrations, and that the State of Missouri has not adopted numeric (304(a)) nutrient criteria for flowing waters. The nutrient wasteload allocations are beyond the limits of conventional wastewater treatment technology and represent an unachievable target for wastewater utilities. It is not clear what affordable technologies are available that can meet the prescribed nutrient wasteload allocations.

In addition, the load duration curve method for identifying nutrient allocations does not provide a linkage between nutrients and DO or the aquatic life beneficial use. Therefore, the applicability of this technique is questionable and should be reconsidered.

**3. The City supports the development of alternative criteria and/or designated uses.**

Throughout the TMDL, the Department mentions plans to possibly pursue development of alternative dissolved oxygen criteria for Marmaton River and Little Drywood Creek. The City resoundingly supports this effort. Even with advanced treatment, achieving proposed wasteload allocations listed below may not be technically possible or affordable. Furthermore, the City is aware of significant data collection efforts already recently undertaken in Little Drywood Creek, which are supportive of site-specific criteria.

Dissolved oxygen concentrations well below 5 mg/L have been documented by the Department and contractors within Little Drywood Creek upstream of the Nevada WWTP, which is a biocriteria reference stream. Defined within 10 CSR 20-7.031, reference streams are “stream reaches determined by the department to be the best available representatives of ecoregion waters in a natural condition, with respect to habitat, *water quality*, biological integrity and diversity, watershed land use and riparian conditions [emphasis added].”

Monitoring locations located within Little Drywood Creek feature BOD, nitrogen, phosphorus, and suspended solids concentrations comparable to, or less than, concentrations prescribed as wasteload allocations in the draft Marmaton River and Little Drywood Creek TMDL. Upstream reference stream monitoring locations also feature DO concentrations less than 5 mg/L. Even if wasteload allocations proposed in the draft Marmaton River and Little Drywood Creek TMDL could technologically be achieved, there is a significant compilation of data suggesting that the statewide DO criteria of 5 mg/L would not be attained.

The City therefore requests the Department pursue alternative DO criteria and/or designated uses based on readily available data. Until such time that they are developed, the City additionally requests that the Department abstain from issuing wasteload allocations prescribed in the TMDL.

#### **4. The water quality model used to develop wasteload allocations does not follow Department guidance.**

The Qual2K model used to demonstrate that proposed wasteload allocations will meet water quality standards appears to be calibrated to a single 24-hour survey conducted on August 27, 2008. While the calibrated model appears reasonable and accurate, current Department guidance<sup>1</sup> specifies two (2) 48-hour surveys be conducted to calibrate and verify a receiving stream model if the waterbody is impaired for dissolved oxygen. Additionally, the 24-hour survey appears to have only included a single downstream monitoring station. Department guidance<sup>2</sup> recommends at least three downstream stations.

The City also notes the Department calculated current permit limits for the Nevada WWTP using discharge observations and data collected during two wasteload allocation studies in

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<sup>1</sup> MDNR. 2009. Memorandum to Leanne Tippet regarding DO Modeling & BOD Effluent Limit Development Administrative Guidance for the Purpose of Conducting Water Quality Assistance Reviews. December 30, 2009. Water Protection Program. Jefferson City, MO.

<sup>2</sup> MDNR. Undated guidance document entitled “Water Quality Monitoring in Support of Missouri’s Antidegradation Rule.” Water Protection Program, Jefferson City, MO.

contrast to the single 24-hour survey conducted for the TMDL. Given the significant capital investment associated with attempting to meet proposed wasteload allocations, the City requests an explanation as to why the Department is recommending significantly more stringent limits based on an unverified model given that a verified model already exists. The City believes the Department should verify the TMDL model based on two (2) 48-hour surveys with a minimum of three downstream monitoring stations.

**5. The Department and USEPA have already acknowledged the need for site-specific criterion through its application in developing current permit limits.**

Although the draft TMDL makes reference to developing a site-specific DO criterion, the City notes the current permit for the Nevada WWTP was already developed using a site-specific criterion of 3.0 mg/L. We understand this criterion has not yet been officially adopted in Missouri regulations, but the City notes that significant capital investments have already been made in response to the Department's and USEPA's approval of the Nevada WWTP permit. Therefore, the City requests that the Department delay application of TMDL-based wasteload allocations until Missouri formally adopts site-specific DO criteria for Little Drywood Creek.

**6. The Little Drywood Creek TMDL should be developed separately from the Marmaton River TMDL.**

As discussed in our meeting, the City understands that USEPA is operating under a consent decree to issue the Marmaton River TMDL by December 31, 2010. Furthermore, it is our understanding that Little Drywood Creek is not a "consent decree" water. Given the significant issues discussed at our meeting and presented in this letter, the City requests the Department develop the Little Drywood Creek TMDL separate from the Marmaton River TMDL to be issued at a later date. For purposes of developing the Marmaton River TMDL, per our discussion, the City understands that wasteload allocations developed for the Nevada WWTP will be based on meeting an instream dissolved oxygen criterion of 5 mg/L at the confluence with Marmaton River. In other words, modeling efforts in support of the Marmaton TMDL need not demonstrate compliance with water quality standards within Little Drywood Creek. Protection of water quality standards within Little Drywood Creek will be addressed in the Nevada WWTP permit and in a separate TMDL developed for Little Drywood Creek.

**7. Wasteload allocations for CBOD<sub>5</sub> appear to be mislabeled as BOD<sub>5</sub> (Page 30, Section 8, Waste Load Allocations; Page 69, Appendix C; Page 79, Appendix D).**

The draft TMDL determined that the “BOD<sub>5</sub>” wasteload allocation for the Nevada WWTP must be reduced to 3.25 mg/L (pages 30, 69, and 79). We note that this wasteload allocation value appears to be based on a ‘Fast-CBOD’ model input value of 8.03 mg/L and an assumed ultimate to 5-day ratio of 2.47. This suggests that the wasteload allocation should be in terms of carbonaceous BOD (CBOD). There is a significant difference between BOD and CBOD. We request “BOD<sub>5</sub>” wasteload allocations in the draft TMDL be revised to “CBOD<sub>5</sub>”.

**8. Quantitative link between proposed wasteload allocations and reduction in prescribed sediment oxygen demand is not clear.**

In order to attain a minimum DO criterion of 5 mg/L in Little Drywood Creek, the prescribed sediment oxygen demand (SOD) was reduced to zero in the Qual2K model without adequate justification. The TMDL did not quantitatively link the draft wasteload allocations to the required reduction in SOD. Without such a quantitative link significant uncertainty remains whether the minimum DO criterion of 5 mg/L can in fact be obtained. We request that the Department quantitatively address how the draft wasteload allocations result in the required reduction in SOD. Furthermore, we note the additional uncertainty introduced by the reduction in SOD necessitates an adaptive management approach.

**9. Quantitative linkage between TSS and DO is not clear** (*Pages 30, 33, and 36, Section 8, Waste Load Allocations*).

Section 8 does not to provide a clear and quantitative linkage between the listed cause of impairment (dissolved oxygen), the beneficial use, suspended particles of organic sediment, and total suspended solids. We request the approach for determining the TSS criterion and wasteload allocations be removed from the TMDL as no quantitative linkage between TSS, dissolved oxygen, beneficial use, or narrative criteria violation has been demonstrated.

**10. The water quality model used for Little Drywood Creek assumed an unachievable ammonia wasteload allocation for the Nevada WWTP.**

The Little Drywood Creek Qual2K model assumed an ammonia wasteload allocation for the Nevada WWTP of 0.085 mg/L. It is unrealistic to expect any technology used to treat domestic wastewater can consistently achieve ammonia concentrations at this level.

**11. Adaptive management strategies should be used** (*Pages 38-39, Section 12.1, Implementation Plans/Point Sources*)

As discussed, there are substantive uncertainties associated with the draft TMDL and load capacity estimates. These issues coupled with the likely unachievable wasteload allocations justify the use of adaptive management for TMDL implementation. Additional water quality data and modeling efforts are needed to set technically defensible wasteload allocation targets. In addition, the Department is considering revisions to the DO criteria within the next few years. Therefore, we recommend that the implementation plan within the TMDL includes an adaptive management approach and reopener provisions so that the load and wasteload allocations are reevaluated within the near-term. Requested revisions to Section 12.1 are included below, which include edits addressing the removal of Little Drywood Creek from the TMDL (deletions are in strikethrough and additions are in bold):

This TMDL will be implemented partially through permit action. The permit for the city of Nevada's wastewater treatment plant expired Aug. 5, 2009, with renewal pending the completion of ongoing plant upgrades to add four clarifiers, two aeration basins, two aerobic digesters and ultraviolet disinfection. Pending effluent limits in the draft permit are 28 mg/L daily maximum and 20 mg/L monthly average for both biochemical oxygen demand and total suspended solids. **Wasteload allocations developed in support of the TMDL will not immediately apply subsequent to the first permit renewal following completion of plant upgrades.**

Wasteload allocations developed for this TMDL ~~will~~ **may** be used to derive new limits for biochemical oxygen demand and total suspended solids that are protective of the dissolved oxygen criterion and aquatic life use in ~~both the Marmaton River and Little Drywood Creek. However,~~ **It** is the intention of the department that prior to implementation of these wasteload allocations, either the department or the city will determine whether the dissolved oxygen criterion of 5 mg/L found in 10 CSR 20-7.031, Table A is appropriate or if a site-specific dissolved oxygen criterion is required. This will likely coincide with the department's next Triennial Review of the Water Quality Standards, scheduled for 2012, when new dissolved oxygen criteria may be promulgated. **Revised dissolved oxygen criteria may better reflect natural stream reaeration conditions to assure that treatment plant effluent limits are based on meeting dissolved oxygen criteria that are naturally attainable and realistic.** Further, it is recommended that additional sampling, including biological sampling, be conducted in the affected segments of the Marmaton River ~~and Little Drywood Creek~~ prior to implementation of the wasteload allocations in order to assess the water bodies'

attainment of designated beneficial uses. These sampling events should occur prior to the end of the calendar year 2012 and continue as necessary.

If it is determined at that time that the current water quality criterion for dissolved oxygen is appropriate, the wasteload allocations from the TMDL will be implemented **using a phased, adaptive management approach. The Nevada Wastewater Treatment Plant permit may incorporate TMDL-based BOD and TSS limits possibly under a negotiated schedule of compliance to be issued in a subsequent permit renewal. Instream monitoring downstream of the wastewater treatment plant should be conducted in order to provide additional data with which to assess the impact of the revised permit limits on Little Drywood Creek and the Marmaton River. Should post-TMDL monitoring indicate initial reductions to BOD and TSS limits result in attainment of numeric and narrative water quality standards, TMDL-based total nitrogen and total phosphorus limits will not be required.**

If **the current water quality criterion for dissolved oxygen** it is determined not to be appropriate, and a new dissolved oxygen criterion is promulgated, then new wasteload allocations will be calculated and implemented **and the TMDL will be revised accordingly.** Along with implementation of any new wasteload allocations, effluent monitoring for nutrient species and instream monitoring for dissolved oxygen, temperature, pH, ammonia and chlorophyll *a* will be required on the Nevada Wastewater Treatment Plant operating permit.

12. **Monitoring plan section should be revised to account for potential WLA revisions** (*Page 37, Section 11, Monitoring Plan for TMDLs Developed under Phased Approach, paragraph 1*)

We request the following revisions to this paragraph (deletions are in strikethrough and additions are in bold):

“Post-TMDL monitoring will be scheduled and conducted by the department approximately three years after the TMDL is approved, or in a reasonable period of time following ~~the~~ **any** compliance schedule outlined in the permit **prompted by the TMDL** and the application of any new effluent limits. The Missouri State Operating Permit for the city of Nevada’s wastewater treatment plant expired August 5, 2009 and renewal of the permit is pending completion of these TMDLs, as well as completion of facility upgrades currently underway. The permit ~~will~~ **may** be renewed with revised effluent limits based on the wasteload allocations developed in these TMDLs.”

These modifications are requested to make certain there is not an incorrect inference that the TMDL wasteload allocations will automatically be used to develop effluent limits for the Nevada WWTP.

**13. Instream monitoring requirements better suited for Section 12** (*Page 37, Section 11, Monitoring Plan for TMDLs Developed under Phased Approach, paragraph 2*)

We request the second paragraph in Section 11 on page 37 regarding instream monitoring requirements be stricken. Discussion of instream monitoring requirements should be moved to Section 12.1 where we believe it is better suited.

**14. Point source section should be revised to account for potential WLA revisions** (*Page 41, Section 13, Reasonable Assurances, paragraph 1, sentence 2*)

We request the following revisions to the second sentence of the first paragraph (deletions are in bold):

“For TMDLs that address point sources of pollution, **the authority to include** effluent limits determined from the TMDL wasteload allocations incorporated into a state permit, along with effluent monitoring reported to the department, should provide a reasonable assurance that instream water quality standards will be met.”

This modification is requested to make certain there is not an incorrect inference that the TMDL wasteload allocations will automatically be used to develop effluent limits for the Nevada WWTP.

We greatly appreciate the opportunity to discuss the Marmaton River and Little Drywood Creek draft TMDL and the Department’s sensitivity to the City of Nevada’s concerns. The Department’s willingness to develop a site-specific DO criterion and build in flexibility to the TMDL is also greatly appreciated. Please let us know of any questions or additional information you may need and thanks again for your continued efforts and cooperation.

John Hoke  
April 2, 2010  
Page 10

Sincerely,

A handwritten signature in black ink that reads "Tom Wallace". The signature is written in a cursive style with a large, stylized 'T' and 'W'.

Tom Wallace  
Senior Project Manager

cc: JD Kehrmann, City of Nevada  
Chris Erisman, P.E., Allgeier Martin Consulting Engineers  
Dean Willis, P.E., Allgeier Martin Consulting Engineers



STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

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

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

July 23, 2010

Mr. Tom Wallace  
Senior Project Manager  
Geosyntec Consultants  
1123 Wilkes Blvd., Suite 400  
Columbia, MO 65201

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

Dear Mr. Wallace:

The Missouri Department of Natural Resources (Department) appreciates the comments provided by Geosyntec Consultants (Geosyntec) on behalf of the city of Nevada and Allgeier Martin Consulting Engineers on the draft Marmaton River-Little Drywood Creek Total Maximum Daily Load (TMDL). This letter responds to comments received from Geosyntec during the first public notice period for this TMDL. Please find herein the Department's response to each comment and the location of the revision (if applicable) within the document as revised and placed on public notice July 8, 2010 until August 22, 2010.

Concerning the primary observations, concerns and objections raised by Geosyntec in its April 2, 2010, letter on the draft TMDL, the Department acknowledges that water quality data collected through the TMDL process indicates that the Nevada Wastewater Treatment Plant (WWTP) is not the sole cause of low dissolved oxygen (DO) in Marmaton River or Little Drywood Creek. DO measurements in Little Drywood Creek upstream of the Nevada WWTP indicate that nonpoint sources of pollutants are also contributing to low DO within these watersheds. As required by the TMDL process, allocations and reductions for both point and nonpoint sources of nutrients and oxygen demanding substances are included in the TMDL.

Responses to concerns and objections regarding alternative DO criteria, technical and financial feasibility of implementing TMDL wasteload allocations (WLAs), regulatory and technical justification for nutrient WLAs, the QUAL2K model, and separation of the Marmaton River and Little Drywood Creek TMDLs can be found in the responses to comments that follow.

***Comment #1: Nevada WWTP wasteload allocations are likely unachievable and unmerited (Page 30, Section 8, Waste Load Allocations).***

*Several of the wastewater treatment plant wasteload allocations may be unachievable, particularly after conversion to permit limitations. Installation of tertiary filtration or membrane filtration may not meet the BOD and total suspended solids reduction requirements. In addition, the nutrient limitations are beyond the state of the practice.*

*The draft TMDL does not conclusively demonstrate that nutrient limits, if achieved, will meet a DO concentration of 5 mg/L. Data collected during the 2008 stream survey and from previous studies on Little Drywood Creek at locations upstream of the Nevada WWTP feature nutrient and BOD concentrations comparable to wasteload allocations yet support DO concentrations less than 5 mg/L.*

*Marmaton River and Little Drywood Creek are listed for a low DO impairment, not excessive nutrients. Given the considerable capital outlay represented by proposed nutrient wasteload allocations the City believes the Department should remove proposed nutrient removal requirements from the TMDL.*

It is recognized by the U.S. Environmental Protection Agency (EPA) in their National Nutrient Strategy<sup>1</sup>, and widely understood in general, that excessive nutrients in a water body can lead to potentially harmful algal blooms which can in turn contribute to low DO conditions. The QUAL2K model used for the Marmaton River and Little Drywood Creek TMDL recognizes that total nitrogen and total phosphorus can cause or contribute to low DO issues in the stream through algal growth, respiration, and decomposition. Because total nitrogen and total phosphorous are addressed in the model, WLAs are required for the city of Nevada wastewater treatment plant. WLAs for nutrients and oxygen demanding substances from the QUAL2K model that result in compliance with the 5 mg/L minimum DO criterion should ensure compliance with applicable water quality standards.

Development of TMDL WLAs must ensure attainment and compliance with applicable water quality standards per 40 CFR 130.7(c). As a result, TMDL WLA development is conducted without consideration of wastewater treatment technology or cost. However, the implementation section of the TMDL outlines a phased implementation approach to pollutant reduction. This phased approach stipulates that WLAs for carbonaceous biochemical oxygen demand (CBOD) and total suspended solids (TSS) will not immediately apply subsequent to the first permit renewal following completion of facility upgrades. It is the intention of the Department that prior to implementation of these WLAs, either the Department or the city will determine whether the DO criterion of 5 mg/L found in 10 CSR 20-7.031, Table A, is appropriate or if site-specific DO criteria are required for Little Drywood Creek. Whether site-specific criteria are developed or not, initial reductions to effluent limits for CBOD and TSS should result in attainment of

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<sup>1</sup> National Strategy for the Development of Regional Nutrient Criteria (June 1998). EPA 822-R-98-002.

numeric and narrative water quality criteria. In the event that post-TMDL monitoring indicates that reductions in CBOD and TSS from the wastewater treatment plant are not achieving the desired improvements to water quality, additional conditions, including effluent limits for nutrients, may be placed in the operating permit for the Nevada WWTP. The Department typically waits at least three years from the end of a permit compliance schedule or facility upgrade before assessing the impact of facility improvements on instream water quality. The implementation of nutrient WLAs as effluent limitations will follow nutrient implementation guidance developed by the Department's Water Protection Program.

***Comment #2: Wasteload allocations for nutrients are not supported by water quality criteria approved by the Missouri Clean Water Commission (Pages 34-35, Tables 18-19, Section 8, Waste Load Allocations).***

*Included within Tables 18 and 19 of the draft TMDL are wasteload allocations of 13.46 lbs/day (0.8 mg/L) for total nitrogen and 1.46 lbs/day (87 ug/L) for total phosphorus, respectively. It is not clear what regulatory basis supports the prescribed nutrient wasteload allocations. The TMDL qualitatively ties nutrients to the DO impairment; however, limited quantitative analysis was provided to demonstrate that nutrient wasteload allocations are needed to address the DO impairment. We note that Marmaton River and Little Drywood Creek are not identified by the Department as being impaired by unacceptably high nutrient concentrations, and that the State of Missouri has not adopted numeric (304(a)) nutrient criteria for flowing waters. The nutrient wasteload allocations are beyond the limits of conventional wastewater treatment technology and represent an unachievable target for wastewater utilities. It is not clear what affordable technologies are available that can meet the prescribed nutrient wasteload allocations.*

It is within the authority of the Department to set WLAs for pollutants that cause or contribute to the impairment of a water body. According to 40 CFR 122.44(d)(1)(i), "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Furthermore, this TMDL was developed to comply with Sections 303(d) and 302(a) of the Clean Water Act which dictates that when technology-based effluent limitations result in impaired water quality and non-attainment of designated uses, water quality-based effluent limitations shall be established. Domestic wastewater treatment facility effluent contains nutrient concentrations at levels that can cause or contribute to algal growth, respiration, and decomposition in the receiving stream. These conditions in turn can cause or contribute to violations of the state minimum water quality criterion for DO.

As noted in the response to Comment #1, TMDL WLA development is conducted without consideration of wastewater treatment technology or cost. Additionally, the implementation

section of the TMDL outlines a phased implementation approach which may or may not result in the need to implement nutrient limitations in the future.

*In addition, the load duration curve method for identifying nutrient allocations does not provide a linkage between nutrients and DO or the aquatic life beneficial use. Therefore, the applicability of this technique is questionable and should be reconsidered.*

Nutrient allocations are derived from load duration curves that are based on EPA ecoregion nutrient reference concentration values. As noted in Section 5.3 of the TMDL, for the Central Irregular Plains Level III Ecoregion, the nutrient values are 0.855 mg/l for total nitrogen and 0.092 mg/l for total phosphorus. The reference population of streams used to determine nutrient values was chosen by EPA since these are the most likely to be associated with minimally impacted conditions and to be protective of designated uses<sup>2</sup>. The load duration curves do not need to establish a linkage between nutrients and low DO. This linkage has already been established by the QUAL2K model. The load duration curves provide a mechanism to establish nutrient loadings to water bodies at higher flows not simulated by the QUAL2K model. The effect of pollutant reductions at all flows should be nutrient concentrations in-stream that do not cause or contribute to the low DO impairments.

***Comment #3: The City supports the development of alternative criteria and/or designated uses.***

*Throughout the TMDL, the Department mentions plans to possibly pursue development of alternative dissolved oxygen criteria for Marmaton River and Little Drywood Creek. The City resoundingly supports this effort. Even with advanced treatment, achieving proposed wasteload allocations listed below may not be technically possible or affordable. Furthermore, the City is aware of significant data collection efforts already recently undertaken in Little Drywood Creek, which are supportive of site-specific criteria.*

*Dissolved oxygen concentrations well below 5 mg/L have been documented by the Department and contractors within Little Drywood Creek upstream of the Nevada WWTP, which is a biocriteria reference stream. Defined within 10 CSR 20-7.031, reference streams are “stream reaches determined by the department to be the best available representatives of ecoregion waters in a natural condition, with respect to habitat, **water quality**, biological integrity and diversity, watershed land use and riparian conditions [emphasis added].”*

*Monitoring locations located within Little Drywood Creek feature BOD, nitrogen, phosphorus, and suspended solids concentrations comparable to, or less than, concentrations prescribed as wasteload allocations in the draft Marmaton River and Little Drywood Creek TMDL. Upstream*

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<sup>2</sup> U.S. EPA. 2001a. Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion IX. U.S. Environmental Protection Agency, Washington DC. EPA 822-B-001-019.

*reference stream monitoring locations also feature DO concentrations less than 5 mg/L. Even if wasteload allocations proposed in the draft Marmaton River and Little Drywood Creek TMDL could technologically be achieved, there is a significant compilation of data suggesting that the statewide DO criteria of 5 mg/L would not be attained.*

*The City therefore requests the Department pursue alternative DO criteria and/or designated uses based on readily available data. Until such time that they are developed, the City additionally requests that the Department abstain from issuing wasteload allocations prescribed in the TMDL.*

The Department acknowledges in Section 12 of the TMDL that low DO is an issue in the Marmaton River both upstream and downstream of the confluence with Little Drywood Creek, and is an issue in Little Drywood Creek both upstream and downstream of the Nevada WWTP. Language in the TMDL also acknowledges issues regarding low DO as a natural background condition in prairie streams in this ecological region. Section 12.1 of the TMDL states that allocations of pollutant loading will be implemented only partially through permit action, acknowledging the potential importance of nonpoint source controls in addressing nutrients and oxygen demanding substances in the Marmaton River and Little Drywood Creek. In addition, as referenced previously, the TMDL recommends a phased and iterative approach to implementation of the WLAs.

Because Little Drywood Creek is not a TMDL Consent Decree<sup>3</sup> water and does not need to be completed this year, it will be removed from this TMDL and will be addressed in a separate TMDL in the future. A revised version of this TMDL has been developed for the Marmaton River alone and is currently on public notice until August 22, 2010. Relevant stakeholders and other interested parties, including Geosyntec and the City of Nevada, have been notified of this second public comment period. Comments on the second public notice draft of the TMDL are welcome.

Also as noted in the TMDL document, it is the intention of the Department that prior to implementation of WLAs found in the TMDL, either the Department or the city will determine whether the DO criterion of 5 mg/L found in 10 CSR 20-7.031, Table A, is appropriate or if a site-specific DO criterion is required. This determination will likely coincide with the Department's next triennial review of the Water Quality Standards, scheduled for 2012, when new DO criteria may be promulgated. The Department acknowledges that, should revised criteria be developed, a revised Marmaton River and Little Drywood Creek TMDL may be necessary. It also acknowledges that the revised criteria may result in no difference for Marmaton River and Little Drywood Creek and that new loading calculations may not differ or offer relief from what is currently contained in this TMDL.

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<sup>3</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.

***Comment #4: The water quality model used to develop wasteload allocations does not follow Department guidance.***

*The Qual2K model used to demonstrate that proposed wasteload allocations will meet water quality standards appears to be calibrated to a single 24-hour survey conducted on August 27, 2008. While the calibrated model appears reasonable and accurate, current Department guidance<sup>4</sup> specifies two (2) 48-hour surveys be conducted to calibrate and verify a receiving stream model if the waterbody is impaired for dissolved oxygen. Additionally, the 24-hour survey appears to have only included a single downstream monitoring station. Department guidance<sup>5</sup> recommends at least three downstream stations.*

*The City also notes the Department calculated current permit limits for the Nevada WWTP using discharge observations and data collected during two wasteload allocation studies in contrast to the single 24-hour survey conducted for the TMDL. Given the significant capital investment associated with attempting to meet proposed wasteload allocations, the City requests an explanation as to why the Department is recommending significantly more stringent limits based on an unverified model given that a verified model already exists. The City believes the Department should verify the TMDL model based on two (2) 48-hour surveys with a minimum of three downstream monitoring stations.*

The Department believes the water quality data collected for the Marmaton River TMDL is of sufficient quality and quantity to develop appropriate WLAs. Department stream sampling and survey guidance documents were used and resulted in representative data being collected for TMDL WLA development.

The model used to calculate current permit limits for the Nevada WWTP is a QUAL2E model developed in 1992 using effluent and water quality data that is no longer representative of current conditions. The current QUAL2K model was developed using more recent water quality data, and improvements in this version of the model allow for more sophisticated modeling of nutrient species and oxygen demand. The Department believes the QUAL2K model developed for this TMDL is an accurate and appropriate tool for developing WLAs for the Nevada WWTP.

***Comment #5: The Department and USEPA have already acknowledged the need for site-specific criterion through its application in developing current permit limits.***

*Although the draft TMDL makes reference to developing a site-specific DO criterion, the City notes the current permit for the Nevada WWTP was developed using a site-specific criterion of*

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<sup>4</sup> MDNR. 2009. Memorandum to Leanne Tippet regarding DO Modeling & BOD Effluent Limit Development Administrative Guidance for the Purpose of Conducting Water Quality Assistance Reviews. December 30, 2009. Water Protection Program. Jefferson City, MO.

<sup>5</sup> MDNR. Undated guidance document entitled "Water Quality Monitoring in Support of Missouri's Antidegradation Rule." Water Protection Program, Jefferson City, MO.

*3.0 mg/L. We understand this criterion has not yet been officially adopted in Missouri regulations, but the City notes that significant capital investments have already been made in response to the Department's and U.S. EPA's approval of the Nevada WWTP permit. Therefore, the City requests the Department delay application of TMDL-based wasteload allocations until Missouri formally adopts site-specific DO criteria for Little Drywood Creek.*

As noted in the response to Comment #3, the applicability of revised DO criteria for Little Drywood Creek will likely be investigated during the next triennial review of the Water Quality Standards. Because Little Drywood Creek is not a TMDL Consent Decree water and a TMDL does not need to be completed at this time, it will be removed from this TMDL, and will be addressed in a separate TMDL in the future. Also as noted in the TMDL, it is recommended that additional sampling be conducted in the affected segments of the Marmaton River and Little Drywood Creek prior to implementation of the WLAs in order to assess the water bodies' attainment of designated beneficial uses.

The Department concurs that implementation of TMDL-based WLAs in the state operating permit for the Nevada WWTP should be delayed until such time as either: 1) site-specific DO criteria for Little Drywood Creek are developed and approved by EPA in Missouri's Water Quality Standards or 2) until such time as it is determined that site-specific criteria are not appropriate or needed to protect designated beneficial uses in Little Drywood Creek. See response to Comment #11 below, and Section 12.1 of the revised TMDL, for additional information and details.

***Comment #6: The Little Drywood Creek TMDL should be developed separately from the Marmaton River TMDL.***

*As discussed in our meeting, the City understands that USEPA is operating under a consent decree to issue the Marmaton River TMDL by December 31, 2010. Furthermore, it is our understanding that Little Drywood Creek is not a "consent decree" water. Given the significant issues discussed at our meeting and presented in this letter, the City requests the Department develop the Little Drywood Creek TMDL separate from the Marmaton River TMDL to be issued at a later date. For purposes of developing the Marmaton River TMDL, per our discussion, the City understands that wasteload allocations developed for the Nevada WWTP will be based on meeting instream dissolved oxygen criterion of 5 mg/L at the confluence with Marmaton River. In other words, modeling efforts in support of the Marmaton TMDL need not demonstrate compliance with water quality standards within Little Drywood Creek. Protection of water quality standards within Little Drywood Creek will be addressed in the Nevada WWTP permit and in a separate TMDL developed for Little Drywood Creek.*

As noted in the responses to comments above, TMDLs for Little Drywood Creek have been removed from the Marmaton River TMDL document and will be completed separately at a later date. A revised version of the Marmaton River TMDL has been developed for the Marmaton

River alone and is currently on public notice until August 22, 2010. Although Little Drywood Creek must still meet water quality standards and remains on the 303(d) List of impaired waters, modeling efforts in support of the Marmaton River TMDL need not demonstrate compliance with water quality standards within Little Drywood Creek. Protection of water quality standards within Little Drywood Creek will be addressed through the terms and conditions contained within the Nevada WWTP operating permit.

***Comment #7: Wasteload allocations for CBOD<sub>5</sub> appear to be mislabeled as BOD<sub>5</sub> (Page 30, Section 8, Waste Load Allocations; Page 69, Appendix C; Page 79, Appendix D).***

*The draft TMDL determined that the “BOD<sub>5</sub>” wasteload allocation for the Nevada WWTP must be reduced to 3.25 mg/L (pages 30, 69, and 79). We note that this wasteload allocation value appears to be based on a ‘Fast-CBOD’ model input value of 8.03 mg/L and an assumed ultimate to 5-day ratio of 2.47. This suggests that the wasteload allocation should be in terms of carbonaceous BOD (CBOD). There is a significant difference between BOD and CBOD. We request “BOD<sub>5</sub>” wasteload allocations in the draft TMDL be revised to “CBOD<sub>5</sub>”.*

The WLA for BOD in the document should be identified as CBOD<sub>5</sub>, which represents a 5-day CBOD. The TMDL has been revised to reflect this change.

***Comment #8: Quantitative link between proposed wasteload allocations and reduction in prescribed sediment oxygen demand is not clear.***

*In order to attain a minimum DO criterion of 5 mg/L in Little Drywood Creek, the prescribed sediment oxygen demand (SOD) was reduced to zero in the Qual2K model without adequate justification. The TMDL did not quantitatively link the draft wasteload allocations to the required reduction in SOD. Without such a quantitative link significant uncertainty remains whether the minimum DO criterion of 5 mg/L can in fact be obtained. We request that the Department quantitatively address how the draft wasteload allocations result in the required reduction in SOD. Furthermore, we note the additional uncertainty introduced by the reduction in SOD necessitates an adaptive management approach.*

The purpose of the TMDL model allocation run is to establish WLAs for CBOD and nutrients that will result in attainment of water quality standards downstream of the Nevada WWTP. The model allocation run discounts the effects of SOD, hence a minimal SOD flux was prescribed. However, if the WLA results are desired to be more conservative, mechanistically modeling the SOD would likely result in more stringent CBOD limits, lower than what is indicated in the TMDL.

EPA ecoregion nutrient values were used for the nutrient loadings of the model run. For the Central Irregular Plains Level III Ecoregion, the nutrient values are 0.855 mg/l for total nitrogen, 0.092 mg/l for total phosphorus, and 2.8 ug/l for Chlorophyll-A. At the upstream model

boundary, recent water quality data (summer period) from the monitoring station (SC208) near Fort Scott, Kansas, were used.

Using the ecoregion nutrient loadings, simulation results show an average SOD reduction of 60% is required in Marmaton River in order to meet the DO water quality standard. The simulated longitudinal profile of DO corresponding to 60% SOD reduction shows that beginning from the KS-MO state line (about 56 km) up to the downstream boundary, the simulated minimum DO is equal to or greater than 5 mg/L.

As noted in the response to Comment #1, the implementation section of the TMDL (Section 12) outlines a phased implementation approach to pollutant reduction. This phased approach stipulates that, pending the determination of whether or not site-specific dissolved oxygen criteria are appropriate, WLAs for CBOD and TSS will not immediately apply subsequent to the first permit renewal following completion of the Nevada WWTP facility upgrades. Initial reductions to effluent limits for CBOD and TSS should result in attainment of numeric and narrative water quality criteria. In the event that post-TMDL monitoring indicates that reductions in CBOD and TSS from the wastewater treatment plant are not achieving the desired improvements to water quality, additional conditions, including effluent limits for nutrients, may be placed in the operating permit for the Nevada WWTP. The Department typically waits at least three years from the end of a permit compliance schedule or facility upgrade before assessing the impact of facility improvements on in-stream water quality. The implementation of nutrient WLAs as effluent limitations will follow nutrient implementation guidance developed by the Water Protection Program.

***Comment # 9: Quantitative linkage between TSS and DO is not clear (Pages 30, 33, and 36, Section 8, Waste Load Allocations).***

*Section 8 does not provide a clear and quantitative linkage between the listed cause of impairment (dissolved oxygen), the beneficial use, suspended particles of organic sediment, and total suspended solids. We request the approach for determining the TSS criterion and wasteload allocations be removed from the TMDL as no quantitative linkage between TSS, dissolved oxygen, beneficial use, or narrative criteria violation has been demonstrated.*

TSS are composed of organic sediment and inorganic sediment. Although Missouri's water quality standards do not include applicable numeric criteria to address organic sediment, the general, or narrative, criteria that apply can be found in the standards at 10 CSR 20-7.031(3)(A) and (C). Wastewater treatment plants have the potential to discharge high levels of organic sediment into the receiving stream. Organic sediment can settle onto the bottom of a stream and smother natural substrates, aquatic invertebrate animals and fish eggs. High amounts of organic sediment may also contribute to sludge on the stream bottom, which may be unsightly and have an offensive odor. In addition, organic solids entering the river can cause or contribute to BOD and SOD, which can affect DO conditions.

Any reduction in TSS from the facility discharge will result in a reduction of organic sediment loading to the receiving stream, which should improve both DO and benthic habitat.

***Comment #10: The water quality model used for Little Drywood Creek assumed an unachievable ammonia wasteload allocation for the Nevada WWTP.***

*The Little Drywood Creek Qual2K model assumed an ammonia wasteload allocation for the Nevada WWTP of 0.085 mg/L. It is unrealistic to expect any technology used to treat domestic wastewater can consistently achieve ammonia concentrations at this level.*

As noted in the response to Comment #1, development of TMDL WLAs must ensure attainment and compliance with applicable water quality standards per 40 CFR 130.7(c). As a result, TMDL WLA development is conducted without consideration of wastewater treatment technology or cost.

Should the city request a higher wasteload allocation for ammonia, the QUAL2K water quality model can be rerun using alternative assumptions. However, reductions in other nitrogen containing pollutants would need to be realized in order to meet CBOD allocations.

***Comment #11: Adaptive management strategies should be used (Pages 38-39, Section 12.1, Implementation Plans/Point Sources).***

*As discussed, there are substantive uncertainties associated with the draft TMDL and load capacity estimates. These issues coupled with the likely unachievable wasteload allocations justify the use of adaptive management for TMDL implementation. Additional water quality data and modeling efforts are needed to set technically defensible wasteload allocation targets. In addition, the Department is considering revisions to the DO criteria within the next few years. Therefore, we recommend that the implementation plan within the TMDL includes an adaptive management approach and reopener provisions so that the load and wasteload allocations are reevaluated within the near-term. Requested revisions to Section 12.1 are included below, which include edits addressing the removal of Little Drywood Creek from the TMDL (deletions are in strikethrough and additions are in bold):*

*This TMDL will be implemented partially through permit action. The permit for the city of Nevada's wastewater treatment plant expired Aug. 5, 2009, with renewal pending the completion of ongoing plant upgrades to add four clarifiers, two aeration basins, two aerobic digesters and ultraviolet disinfection. Pending effluent limits in the draft permit are 28 mg/L daily maximum and 20 mg/L monthly average for both biochemical oxygen demand and total suspended solids. **Wasteload allocations developed in support of the TMDL will not immediately apply subsequent to the first permit renewal following completion of plant upgrades.***

*Wasteload allocations developed for this TMDL ~~will~~ **may** be used to derive new limits for biochemical oxygen demand and total suspended solids that are protective of the dissolved oxygen criterion and aquatic life use in ~~both the Marmaton River and Little Drywood Creek.~~ ~~However,~~ **It is the intention of the department that prior to implementation of these wasteload allocations, either the department or the city will determine whether the dissolved oxygen criterion of 5 mg/L found in 10 CSR 20-7.031, Table A is appropriate or if a site-specific dissolved oxygen criterion is required. This will likely coincide with the department's next Triennial Review of the Water Quality Standards, scheduled for 2012, when new dissolved oxygen criteria may be promulgated. Revised dissolved oxygen criteria may better reflect natural stream reaeration conditions to assure that treatment plant effluent limits are based on meeting dissolved oxygen criteria that are naturally attainable and realistic.** Further, it is recommended that additional sampling, including biological sampling, be conducted in the affected segments of the Marmaton River ~~and Little Drywood Creek~~ prior to implementation of the wasteload allocations in order to assess the water bodies' attainment of designated beneficial uses. These sampling events should occur prior to the end of the calendar year 2012 and continue as necessary.*

*If it is determined at that time that the current water quality criterion for dissolved oxygen is appropriate, the wasteload allocations from the TMDL will be implemented **using a phased, adaptive management approach.** The Nevada Wastewater Treatment Plant permit may incorporate TMDL-based BOD and TSS limits possibly under a negotiated schedule of compliance to be issued in a subsequent permit renewal. Instream monitoring downstream of the wastewater treatment plant should be conducted in order to provide additional data with which to assess the impact of the revised permit limits on Little Drywood Creek and the Marmaton River. Should post-TMDL monitoring indicate initial reductions to BOD and TSS limits result in attainment of numeric and narrative water quality standards, TMDL-based total nitrogen and total phosphorus limits will not be required.*

*If the current water quality criterion for dissolved oxygen ~~it~~ is determined not to be appropriate, and a new dissolved oxygen criterion is promulgated, then new wasteload allocations will be calculated and implemented **and the TMDL will be revised accordingly.** Along with implementation of any new wasteload allocations, effluent monitoring for nutrient species and instream monitoring for dissolved oxygen, temperature, pH, ammonia and chlorophyll a will be required on the Nevada Wastewater Treatment Plant operating permit.*

The Marmaton River TMDL currently recommends a phased approach to the implementation of pollutant reductions that delay any potential implementation of nutrient effluent limits. The Department welcomes the opportunity to further clarify this point, and the TMDL implementation section has been modified based upon the suggested language above.

**Comment #12: Monitoring plan section should be revised to account for potential WLA revisions (Page 37, Section 11, Monitoring Plan for TMDLs Developed under Phased Approach, paragraph 1)**

*We request the following revisions to this paragraph (deletions are in strikethrough and additions are in bold):*

*“Post-TMDL monitoring will be scheduled and conducted by the department approximately three years after the TMDL is approved, or in a reasonable period of time following ~~the any~~ compliance schedule outlined in the permit **prompted by the TMDL** and the application of any new effluent limits. The Missouri State Operating Permit for the city of Nevada’s wastewater treatment plant expired August 5, 2009 and renewal of the permit is pending completion of these TMDLs, as well as completion of facility upgrades currently underway. The permit ~~will~~ **may** be renewed with revised effluent limits based on the wasteload allocations developed in these TMDLs.”*

*These modifications are requested to make certain there is not an incorrect inference that the TMDL wasteload allocations will automatically be used to develop effluent limits for the Nevada WWTP.*

The Department appreciates the comment and suggested language regarding the monitoring section of the document. TMDL monitoring language has been modified based upon the language provided.

**Comment #13: In-stream monitoring requirements better suited for Section 12 (Page 37, Section 11, Monitoring Plan for TMDLs Developed under Phased Approach, paragraph 2)**

*We request the second paragraph in Section 11 on page 37 regarding instream monitoring requirements be stricken. Discussion of instream monitoring requirements should be moved to Section 12.1 where we believe it is better suited.*

The Department agrees the second paragraph of Section 11 describing in-stream monitoring requirements is better suited for Section 12.1. This language has been removed from Section 11 and added to Section 12.1.

**Comment #14: Point source section should be revised to account for potential WLA revisions (Page 41, Section 13, Reasonable Assurances, paragraph 1, sentence 2)**

*We request the following revisions to the second sentence of the first paragraph (deletions are in bold):*

Mr. Tom Wallace  
Page 13

*“For TMDLs that address point sources of pollution, **the authority to include** effluent limits determined from the TMDL wasteload allocations incorporated into a state permit, along with effluent monitoring reported to the department, should provide a reasonable assurance that instream water quality standards will be met.”*

*This modification is requested to make certain there is not an incorrect inference that the TMDL wasteload allocations will automatically be used to develop effluent limits for the Nevada WWTP.*

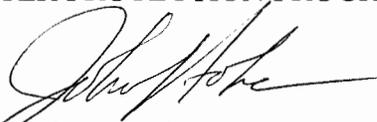
This sentence has been modified to read:

For TMDLs that address point sources of pollutants, **any** effluent limits determined from TMDL wasteload allocations **which may be** incorporated into a state permit, along with effluent monitoring reported to the Department, should provide a reasonable assurance that instream water quality standards will be met.

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, [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) or by mail at Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

Sincerely,

WATER PROTECTION PROGRAM



John Hoke, Chief  
TMDL Unit  
Watershed Protection Section

JH:bwd

c: J.D. Kehrmann, City Manager, City of Nevada  
(110 South Ash, Nevada, MO 64772)

**Whipps, Bill**

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**From:** Hoke, John  
**Sent:** Thursday, April 01, 2010 10:51 AM  
**To:** Whipps, Bill  
**Subject:** FW: Voicemail Message

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

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**From:** Mebruer, Linda  
**Sent:** Thursday, April 01, 2010 10:36 AM  
**To:** Hoke, John  
**Cc:** Buford, Candace  
**Subject:** FW: Voicemail Message

FYI

Linda Mebruer  
Administrative Office Support Assistant  
Water Quality Monitoring and Assessment Section  
Water Protection Program  
P.O. Box 176  
Jefferson City, MO 65102  
phone: (573) 751-6623  
fax: (573) 522-9920  
linda.mebruer@dnr.mo.gov

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**From:** Buford, Candace  
**Sent:** Thursday, April 01, 2010 10:32 AM  
**To:** Mebruer, Linda  
**Subject:** FW: Voicemail Message

Can you make sure that this gets to the right place. I am not sure who would need to see it.

~~~~~  
*Candace Buford*  
Senior Office Support Assistant  
Missouri Department of Natural Resources  
Water Protection Program  
Fiscal Management Section

P.O. Box 176  
1101 Riverside Drive  
Jefferson City, MO 65102  
Phone: (573) 751-1300  
Fax: (573) 526-1146  
Email: [candace.buford@dnr.mo.gov](mailto:candace.buford@dnr.mo.gov)

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**From:** Gibson, Alisha  
**Sent:** Thursday, April 01, 2010 9:22 AM  
**To:** Buford, Candace  
**Subject:** Voicemail Message

*Kate Blanchard left a message on our voicemail. She is from Barton county, and has been doing some research on the Little Drywood Creek. She wanted to let us know that she fully endorses cleaning the water. (she did not leave a phone number)*

*Thanks!*

*Alisha Gibson  
Office of Communications  
573-751-3443*

NO CONTACT INFORMATION PROVIDED. NO RESPONSE DRAFTED.

Bill Whipps  
Environmental Specialist  
TMDL Unit/Watershed Protection Section  
Missouri Department of Natural Resources  
Phone: (573) 526-1503 Fax: (573) 522-9920  
bill.whipps@dnr.mo.gov

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**From:** Hoke, John  
**Sent:** Thursday, April 01, 2010 10:51 AM  
**To:** Whipps, Bill  
**Subject:** FW: Voicemail Message

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

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**From:** Mebruer, Linda  
**Sent:** Thursday, April 01, 2010 10:36 AM  
**To:** Hoke, John  
**Cc:** Buford, Candace  
**Subject:** FW: Voicemail Message

FYI

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Administrative Office Support Assistant  
Water Quality Monitoring and Assessment Section  
Water Protection Program  
P.O. Box 176  
Jefferson City, MO 65102  
phone: (573) 751-6623  
fax: (573) 522-9920  
linda.mebruer@dnr.mo.gov

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**From:** Buford, Candace  
**Sent:** Thursday, April 01, 2010 10:32 AM  
**To:** Mebruer, Linda  
**Subject:** FW: Voicemail Message

Can you make sure that this gets to the right place. I am not sure who would need to see it.

~~~~~

*Candace Buford*  
Senior Office Support Assistant  
Missouri Department of Natural Resources  
Water Protection Program  
Fiscal Management Section  
P.O. Box 176  
1101 Riverside Drive  
Jefferson City, MO 65102  
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Fax: (573) 526-1146  
Email: [candace.buford@dnr.mo.gov](mailto:candace.buford@dnr.mo.gov)

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**From:** Gibson, Alisha  
**Sent:** Thursday, April 01, 2010 9:22 AM  
**To:** Buford, Candace  
**Subject:** Voicemail Message

*Kate Blanchard left a message on out voicemail. She is from Barton county, and has been doing some research on the Little Drywood Creek. She wanted to let us know that she fully endorses cleaning the water. (she did not leave a phone number)  
Thanks!*

*Alisha Gibson  
Office of Communications  
573-751-3443*

**Hoke, John**

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**From:** chuck.webb@sbcglobal.net  
**Sent:** Thursday, April 01, 2010 8:16 AM  
**To:** Hoke, John  
**Subject:** little drywood creek Barton co.

I have lived very near the head waters of Little Drywood creek for 20+ years. When i first moved there the stream was alive with snails,crawfish,mussels,and several varieties of fish. We caught and released many bluegill,crappie and bass. The water was clear and clean for a stream in this part of the state. Now, there is comparitively nothing. From my observations,the decline in the stream started when the state allowed a huge landfill to be built at Hwy. 71 and DD in Barton co. This is the very beginning of Drywood!! I have nothing against landfills in particular,but if the DNR was really on the ball then why was this location approved? Seems like common sense would dictate this would be a problem for this stream. The water is now a different color at times than before this was allowed. It appears that sediment runoff from the huge mountains of dirt wash into the creek during rainy times. They have built holding ponds, but they only hold so much. I am not a water quality expert, so this is based on my personal observations over the past.

**Hoke, John**

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**From:** Hoke, John  
**Sent:** Friday, July 09, 2010 11:14 AM  
**To:** 'chuck.webb@sbcglobal.net'  
**Cc:** Whipps, Bill  
**Subject:** RE: little drywood creek Barton co.

Dear Mr. Webb:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Marmaton River-Little Drywood Creek 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 interest in the TMDL process and your comments regarding water quality in Little Drywood Creek.

As noted in the TMDL, the Department considers all waters that flow into the Marmaton River and Little Drywood Creek during the TMDL development process, including those in the very headwaters of these streams. The process includes an inventory of all "point" sources of pollutants in the watershed, such as those regulated under the Missouri State Operating Permit system, as well as all "nonpoint" sources of pollutants which, most notably, can include runoff from agricultural and urban areas. All permitted facilities are inspected at regular intervals, and those that are permitted to discharge wastewater into streams and rivers are required to monitor their discharge and submit monitoring reports to the Department on a regular basis. This can help ensure that the discharge does not exceed pollutant limits specified in their permit.

In your comments, you observed that water quality and aquatic life in the headwaters of Little Drywood Creek appear to have been diminished by the construction of a large landfill near highways 71 and DD in Barton County. The source inventory in Section 3.1 of the TMDL identifies the landfill at this location as the Prairie View Regional Waste Facility. This facility has been inspected by the Department on a several occasions in the past couple of years and, as a result, continues to make improvements to their operations that should help ensure that any pollutants discharged from the site are within limits established in the facility's operating permit. Based on your observations, however, the Department is planning to schedule an additional inspection, along with water quality sampling, in order to investigate whether there continues to be ongoing problems at the facility that may be causing or contributing to the impairment of Little Drywood Creek. Any facility, including this one, found to be violating the terms of their permit will be required to correct the problem and, depending on the nature and extent of the problem, may also face additional enforcement actions.

Please note that TMDL calculations for Little Drywood Creek are being removed from the draft TMDL, and that the Marmaton River TMDL document is being revised accordingly. New pollutant load allocations and implementation plans are being developed for the Marmaton River alone. However, since Little Drywood Creek flows in to the Marmaton River, pollutant sources and controls in Little Drywood Creek will still be addressed in the revised TMDL. The revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL specifically to address the low dissolved oxygen impairment in Little Drywood Creek will be completed at a later date.

All comments pertaining to the Marmaton River 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 Marmaton River-Little Drywood Creek 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 bringing your observations regarding water quality in Little Drywood Creek to our attention. If you should have questions or would like to discuss this TMDL further, please contact me at (573) 526-1446, via e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) 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

John Hoke  
Env. Specialist IV, TMDL Unit Chief  
Watershed Protection Section  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

7/9/2010

---

**From:** chuck.webb@sbcglobal.net [mailto:chuck.webb@sbcglobal.net]  
**Sent:** Thursday, April 01, 2010 8:16 AM  
**To:** Hoke, John  
**Subject:** little drywood creek Barton co.

I have lived very near the head waters of Little Drywood creek for 20+ years. When i first moved there the stream was alive with snails,crawfish,mussels,and several varieties of fish. We caught and released many bluegill,crappie and bass. The water was clear and clean for a stream in this part of the state. Now, there is comparitively nothing. From my observations,the decline in the stream started when the state allowed a huge landfill to be built at Hwy. 71 and DD in Barton co. This is the very beginning of Drywood!! I have nothing against landfills in particular,but if the DNR was really on the ball then why was this location approved? Seems like common sense would dictate this would be a problem for this stream. The water is now a different color at times than before this was allowed. It appears that sediment runoff from the huge mountains of dirt wash into the creek during rainy times. They have built holding ponds, but they only hold so much. I am not a water quality expert, so this is based on my personal observations over the past.

**Hoke, John**

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**From:** chuck.webb@sbcglobal.net  
**Sent:** Friday, July 09, 2010 11:30 AM  
**To:** Hoke, John  
**Subject:** Re: little drywood creek Barton co.

Thanks for the response. I will tell you that since my email of April 1, The water quality has indeed improved (according to me, an untrained observer). We seem to be getting the crustaceans back and a minnow population. This is the first time I have found these in a while. Thanks for your reply and for following up with some action. I am not against the landfill, just concerned about the water quality of our Missouri streams. Thank you. Original Message -----

**From:** [Hoke, John](#)  
**To:** '[chuck.webb@sbcglobal.net](mailto:chuck.webb@sbcglobal.net)'  
**Cc:** [Whipps, Bill](#)  
**Sent:** Friday, July 09, 2010 11:14 AM  
**Subject:** RE: little drywood creek Barton co.

Dear Mr. Webb:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Marmaton River-Little Drywood Creek 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 interest in the TMDL process and your comments regarding water quality in Little Drywood Creek.

As noted in the TMDL, the Department considers all waters that flow into the Marmaton River and Little Drywood Creek during the TMDL development process, including those in the very headwaters of these streams. The process includes an inventory of all "point" sources of pollutants in the watershed, such as those regulated under the Missouri State Operating Permit system, as well as all "nonpoint" sources of pollutants which, most notably, can include runoff from agricultural and urban areas. All permitted facilities are inspected at regular intervals, and those that are permitted to discharge wastewater into streams and rivers are required to monitor their discharge and submit monitoring reports to the Department on a regular basis. This can help ensure that the discharge does not exceed pollutant limits specified in their permit.

In your comments, you observed that water quality and aquatic life in the headwaters of Little Drywood Creek appear to have been diminished by the construction of a large landfill near highways 71 and DD in Barton County. The source inventory in Section 3.1 of the TMDL identifies the landfill at this location as the Prairie View Regional Waste Facility. This facility has been inspected by the Department on several occasions in the past couple of years and, as a result, continues to make improvements to their operations that should help ensure that any pollutants discharged from the site are within limits established in the facility's operating permit. Based on your observations, however, the Department is planning to schedule an additional inspection, along with water quality sampling, in order to investigate whether there continues to be ongoing problems at the facility that may be causing or contributing to the impairment of Little Drywood Creek. Any facility, including this one, found to be violating the terms of their permit will be required to correct the problem and, depending on the nature and extent of the problem, may also face additional enforcement actions.

Please note that TMDL calculations for Little Drywood Creek are being removed from the draft TMDL, and that the Marmaton River TMDL document is being revised accordingly. New pollutant load allocations and implementation plans are being developed for the Marmaton River alone. However, since Little Drywood Creek flows in to the Marmaton River, pollutant sources and controls in Little Drywood Creek will still be addressed in the revised TMDL. The revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL specifically to address the low dissolved oxygen impairment in Little Drywood Creek will be completed at a later date.

All comments pertaining to the Marmaton River 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 Marmaton River-Little Drywood Creek 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 bringing your observations regarding water quality in Little Drywood Creek to our attention. If you should have questions or would like to discuss this TMDL further, please contact me at (573) 526-1446, via e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102.

Sincerely,

7/9/2010

## WATER PROTECTION PROGRAM

John Hoke  
Env. Specialist IV, TMDL Unit Chief  
Watershed Protection Section  
Missouri Department of Natural Resources  
Phone: (573) 526-1446 Fax: (573) 522-9920

---

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**Sent:** Thursday, April 01, 2010 8:16 AM  
**To:** Hoke, John  
**Subject:** little drywood creek Barton co.

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**Hoke, John**

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**From:** Eric Poythress [ericpoythress@gmail.com]

**Sent:** Wednesday, March 10, 2010 1:08 PM

**To:** Hoke, John

Mr. Hoke,

I am a Nevada, Mo resident. I was curious with your investigation with Marmaton River contamination. Will you back track to all the waters that dump into the river? If so, will you be giving out fines to people who have pollution spilling into the water? Thank you very much for your time.

-Eric Poythress  
220 A S. Main St.  
Nevada, Mo 64772  
(573) 587-0226

3/10/2010



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

## DEPARTMENT OF NATURAL RESOURCES

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

July 8, 2010

Mr. Eric Poythress  
220 A South Main Street  
Nevada, MO 64772

RE: Response to Comments on the Marmaton River-Little Drywood Creek  
Total Maximum Daily Load

Dear Mr. Poythress:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Marmaton River-Little Drywood Creek 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 interest in the TMDL process.

In answer to your question regarding the scope and extent of the TMDL investigation, the Department considers all waters that flow into the Marmaton River during the TMDL development process, including those in the very headwaters of the Marmaton River watershed. The process also includes an inventory of all "point" sources of pollutants, such as those regulated under the Missouri State Operating Permit system, as well as all "nonpoint" sources of pollution which, most notably, can include runoff from agricultural and urban areas.

In your comment, you also asked whether or not the Department will give out fines to people found to "have pollution spilling into the water". All permitted facilities are inspected at regular intervals, and those that are permitted to discharge wastewater into streams and rivers are required to monitor their discharge and submit monitoring reports to the Department on a regular basis. This can help ensure that the discharge does not exceed pollutant limits specified in their permit. Any facilities found to be violating the terms of their permit will be required to correct the problem and, depending on the nature and extent of the problem, may also face additional enforcement actions such as fines or suspension of their permit. In addition, non-permitted point source facilities found to be polluting are also subject to enforcement action by the Department, and may be required to obtain a state operating permit that allows the Department to monitor and limit their discharge. Finally, while the Department does not have the authority to regulate nonpoint source runoff, the TMDL document does describe voluntary efforts to control nonpoint sources of pollutants currently underway in the watershed, and also addresses the Department's role in assisting in these and any possible future nonpoint source control efforts.



Recycled Paper

Mr. Eric Poythress  
Page Two

Please note that TMDL calculations for Little Drywood Creek are being removed from the draft TMDL, and that the Marmaton River TMDL document is being revised accordingly. New pollutant load allocations and implementation plans are being developed for the Marmaton River alone. However, since Little Drywood Creek flows in to the Marmaton River, pollutant sources and controls in Little Drywood Creek will still be addressed in the revised TMDL. The revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL specifically to address the low dissolved oxygen impairment in Little Drywood Creek will be completed at a later date.

All comments pertaining to the Marmaton River 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 Marmaton River-Little Drywood Creek 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 questions or would like to discuss this TMDL further, please contact me at (573) 526-1446, via e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) 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~~



John Hoke, Chief  
TMDL Unit  
Watershed Protection Section

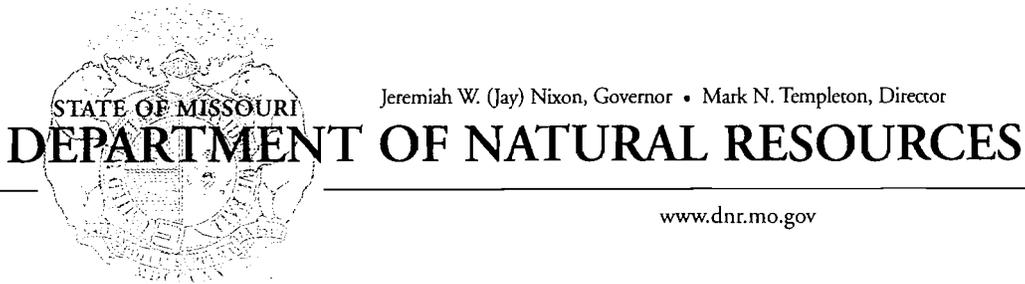
JH:bwl

## Hoke, John

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**From:** hsbogart@centurytel.net  
**Sent:** Sunday, March 28, 2010 1:50 PM  
**To:** Hoke, John  
**Subject:** Little Drywood Creek

Does this proposed plan to improve water quality in the Little Drywood Creek change the water level? We live in southern Vernon County and a branch off of Little Drywood Creek runs across a low water bridge in our driveway. Our concern is that the water level in the creek can take the run off from the rain to let the water down in the driveway. Thank you in advance for your time to answer this question. Saundra Bogart, 13004 East Hwy, N, Bronaugh, MO 64728. Phone number 417-922-3500 or work number 417-922-3211.



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

## DEPARTMENT OF NATURAL RESOURCES

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

July 8, 2010

Ms. Sandra Bogart  
13004 East Highway N  
Bronaugh, MO 64728

RE: Response to Comments on the Marmaton River-Little Drywood Creek  
Total Maximum Daily Load

Dear Ms. Bogart:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Marmaton River-Little Drywood Creek 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 interest in the TMDL process.

To address your concerns regarding water levels in Little Drywood Creek, the TMDL document does not suggest altering water levels in any way in either the Marmaton River or Little Drywood Creek in order to improve water quality. Implementation plans within the TMDL address control of "point" sources of pollutants through use of the Missouri State Operating Permit system, and control of "nonpoint" sources of pollutants, including runoff from agricultural and urban areas, through the use of voluntary best management practices.

Please note that TMDL calculations for Little Drywood Creek are being removed from the draft TMDL, and that the Marmaton River TMDL document is being revised accordingly. New pollutant load allocations and implementation plans are being developed for the Marmaton River alone. However, since Little Drywood Creek flows in to the Marmaton River, pollutant sources and controls in Little Drywood Creek will still be addressed in the revised TMDL. The revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL specifically to address the low dissolved oxygen impairment in Little Drywood Creek will be completed at a later date.

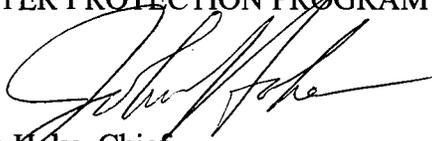
Ms. Sandra Bogart  
Page Two

All comments pertaining to the Marmaton River 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 Marmaton River-Little Drywood Creek 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 questions or would like to discuss this TMDL further, please contact me at (573) 526-1446, via e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) 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 printed name below.

John Hoke, Chief  
TMDL Unit  
Watershed Protection Section

JH:bwl

**Hoke, John**

---

**From:** SBrown6930@aol.com  
**Sent:** Saturday, March 27, 2010 8:10 PM  
**To:** Hoke, John  
**Subject:** Marmaton River - Little Drywood creek

I was writing to see what your plans are to fix the problem of poor water quality on the marmaton and Little Drywood creek? I read the reports that talk about the problems, but I am not clear as to the plans to solve this problem. It seems that maybe Nevada should treat their waste water better before it is released in the water sources.

I look forward to hearing from you.

Sincerely Yours,

Sherry Brown

**Hoke, John**

---

**From:** Hoke, John  
**Sent:** Friday, July 02, 2010 4:24 PM  
**To:** 'SBrown6930@aol.com'  
**Cc:** Whipps, Bill  
**Subject:** RE: Marmaton River - Little Drywood creek

Dear Ms. Brown:

The Missouri Department of Natural Resources (Department) appreciates your comments and interest in the draft Marmaton River-Little Drywood Creek 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 interest in the TMDL process.

In your comment, you asked what the Department's plans are to improve water quality in the Marmaton River and Little Drywood Creek, and you suggested that the city of Nevada should improve their wastewater treatment process. Section 12.1 of the TMDL document includes implementation plans that address control of "point" sources of pollutants through use of the Missouri State Operating Permit system. Please be aware that, while this TMDL does include new pollutant loads for the Nevada Wastewater Treatment Plant, this facility is also currently undergoing an upgrade utilizing emerging treatment technology that should help the city fulfill its regulatory obligations. Section 12.2 of the TMDL outlines plans for the control of "nonpoint" sources of pollutants, including runoff from agricultural and urban areas, through the use of voluntary best management practices.

Please note that TMDL calculations for Little Drywood Creek are being removed from the draft TMDL, and that the Marmaton River TMDL document is being revised accordingly. New pollutant load allocations and implementation plans are being developed for the Marmaton River alone. However, since Little Drywood Creek flows in to the Marmaton River, pollutant sources and controls in Little Drywood Creek will still be addressed in the revised TMDL. The revised TMDL will be made available for public comment for 45 days, and relevant stakeholders and other interested parties will be notified at that time. A TMDL specifically to address the low dissolved oxygen impairment in Little Drywood Creek will be completed at a later date.

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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, via e-mail at [john.hoke@dnr.mo.gov](mailto:john.hoke@dnr.mo.gov) 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

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:** SBrown6930@aol.com [mailto:SBrown6930@aol.com]

**Sent:** Saturday, March 27, 2010 8:10 PM

**To:** Hoke, John

**Subject:** Marmaton River - Little Drywood creek

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I look forward to hearing from you.

Sincerely Yours,

Sherry Brown

## Whipps, Bill

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**From:** Hoke, John  
**Sent:** Friday, March 19, 2010 9:01 PM  
**To:** Whipps, Bill  
**Subject:** FW: marmaton tmdl

---

From: Tom Stiles [tstiles@kdheks.gov]  
Sent: Friday, March 19, 2010 4:38 PM  
To: Hoke, John  
Subject: marmaton tmdl

John: I've reviewed the Marmaton DO TMDL; had a just a few comments for you consideration

1. Info Sheet: We've three TMDLs on the Marmaton: DO for the lower reach below Ft. Scott; DO for the upper reach above Ft Scott and a biology impairment that we linked in 2001 to phosphorus, but more likely reflects the early wastewater ammonia discharges from Ft Scott that approached acute levels; there are no other impairments identified on the river, the ammonia and bacteria indeterminate (Category 3) impairments of 2008 are now cited as resolved (Category 2); we may still have a nps bacteria issue on the lower river at high flows. We are planning to update and revise the DO and Bio TMDLs in 2012, incorporating your TMDL analysis. Btw, we also have a DO TMDL on the West Fork Drywood Creek, approved in 2008.

2. 1. Intro: there is text implicating Ft Scott as cause of the impairment of the 2 mile reach below the stateline; this may have been true in the past, but recent upgrades in treatment at Ft Scott may have resolved this linkage (more to follow on this).

3. 2.5: it's really more accurate to say that 12 of 34 samples between 2001 and 2006 were deficient in DO; it's 15 out of 46 between 2000 and 2006; there have been no samples below 5 mg/l from Nov 2006 to Jan 2010 (19 samples) 4. 3.1, page 13 – Fort Scott; there have been significant upgrades in treatment at Ft Scott; the original aerated lagoons now serve in concert with an activated sludge plant with UV disinfection, the combined design flow is 3.0 MGD on average and 20 MGD peak; average flows from the lagoon system were 0.84 MGD since 2008; 2.47 MGD from the mechanical plant and 3.45 MGD as measured at the combined outfall. Plus, an average of 0.2 MGD of treated wastewater was piped from Ft. Scott to the bio-diesel plant in Eve, MO (indications are the bio-D plant has suspended operations as of Feb 2010).

1. BOD from 2006-Jan 2010 averaged 2.7 – 2.9 mg/l with 90% of samples under 3.6 – 4.6 mg/l 2. TSS averaged 9 – 16 mg/l with 90% of samples under 15 – 24 mg/l 3. 45 of 70 samples were below TP detection limits from 2004 – 2009 (d.l. = 0.5 mg/l 2004-sept 07; 0.1 mg/l oct 07-jan 10); 14 of 30 samples < 0.1 mg/l); TN average 3.7 – 5.5 mg/l (range is defined by samples taken from steady flow of mechanical plant or combined outfall, monitored since April 2009).

1. 5.3: the effects of temperature and physical aspects of the stream itself were discounted. On the Marmaton, low flow and warm temperatures appear to be major factors in the DO condition of the stream. Three of four samples with deficient DO below Ft Scott also showed deficient DO in concurrent samples taken at the upstream station. Plotting ambient TP vs DO at temps above and below 20 deg C shows that a similar range of TP will yield different DO patterns depending upon the temperature

[rtfimage://]

I agree that SOD is the primary culprit and excessive nutrients can contribute to organic matter comprising SOD, but some additional allowance should be recognized for the seasonality of the relationships. Similarly, flows during summer near the stateline become more reflective of what Ft.Scott is discharging, with little gain in flow between Ft Scott and Richards, a typical low flow condition which is the backdrop for the TMDL modeling.

[rtfimage://]

1. Table 6. City of Ft Scott WTP is now an inactive NPDES permit, they may be disposing of sedimentation deposits from the raw water through land application.

2. The modeling seems to indicate the most pressing issue is the DO sags that occur between Marmaton 3 and Marmaton 2; Site 2 has the lowest DO values, the deepest sags and greatest benefit from SOD reduction. That reach should be your primary target for implementation.

3. Be cautious with using the ecoregion reference concentrations as end of pipe expectations for the point sources; Ft Scott appears to be satisfying that expectation for TP, but remains an order of magnitude off from the TN reference concentration. While it appears that the implementation plan defers the imposition of any nutrient permit limits, some expression of how to view the reference values (not to exceed, average, median, some percentile) will be necessary so as to direct the appropriate management efforts in permitting and assessment.

4. We will encourage the Marmaton Watershed Restoration and Protection Strategy group to consider achieving reductions in nutrient and sediment loads that work toward attaining the endpoints of the Missouri TMDL as they develop their 9-element watershed plan.

5. And again, we'll be examining our TMDLs in 2012 and make adjustments based on the MO TMDL, latest stream and DMR data and work accomplished by our WRAPS watershed group. We'll coordinate with you on Missouri expectations in the early years of the post-TMDL period between now and then.

6. A key step will be to get biological monitoring done to see the relative health of the aquatic community as well as their ability to rebound from the episodic "stress" of DO falling between 4 and 5 mg/l. All things considered, the sags weren't as dramatic as what I think we've seen in the past. We still need to reduce oxygen demand, particularly if it emanates from bed deposits that might be imposing greater stress on the stream benthos than the biota in the water column.

Hope this helps puts some tighter focus on the outcome of the TMDL. Let me know if you have questions or need me to clarify something I've mentioned here.

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

**Hoke, John**

---

**From:** Hoke, John  
**Sent:** Wednesday, July 21, 2010 12:14 PM  
**To:** 'Tom Stiles'  
**Cc:** Whipps, Bill  
**Subject:** RE: marmaton tmdl

Tom,

Thank you for providing comments on the draft Marmaton River TMDL. This e-mail responds to comments received from KDHE during the first public notice period for the TMDL. Please find herein the Department's response to each comment and the location of the revision (if applicable) within the document as revised and placed on second public notice July 8, 2010 until August 22, 2010. If you should have questions or require additional information or details, please let me know. I appreciate your continued support and assistance on this TMDL. Thanks

- John

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

MDNR responses to KDHE Comments on the first public notice of the Marmaton River TMDL. Responses are numbered according to the comment order found in the March 19, 2010 e-mail titled "marmaton tmdl", found below.

1. Thank you for the clarifications. Section 1 (Introduction) of the TMDL and the information sheet have been updated to reflect this information.
2. The most recently approved Missouri 303(d) List (2008) identifies the Ft. Scott WWTP as the source of the low dissolved oxygen impairment for 2 miles downstream of the state line. Until more recent data become available to revise the source of the impairment, this language must be retained in the TMDL. However, a clarifying statement has been added to this section to indicate that improvements have been made to the Ft. Scott WWTP and that future assessments will determine whether this facility is still the source of the low DO impairment.
3. Section 2.5 of the document has been updated to reflect this information.
4. The Ft. Scott WWTP is now described in a bit more detail in this section, and the facility design flow has been corrected in the table of Kansas facilities. The Department appreciates the additional effluent data and information for the Ft. Scott WWTP. These data and information will be added to the Marmaton River TMDL file and administrative record.
5. Additional language has been added to Section 5.3 acknowledging that temperature and flow are factors affecting DO in Marmaton River. Regarding sediment oxygen demand, although SOD itself is not addressed seasonally in the TMDL, the factors affecting SOD – nutrient and TSS inputs – are addressed seasonally through load duration curves.
6. Thank you for the update. The table of Kansas permitted facilities has been revised to reflect this new information.
7. The Department appreciates the comment and agrees the reach in question merits future monitoring, source assessment and TMDL implementation efforts.
8. The ecoregion reference concentrations were developed by EPA and can be found in the document *Ambient Water Quality Criteria Recommendations: Rivers and Streams in Ecoregion IX* (EPA 822-B-001-019). In developing numeric criteria or narrative translators, EPA encourages states and tribes to identify appropriate periods of magnitude, duration, and frequency of occurrence. EPA goes on to discourage identifying nutrient concentrations that must be met at all times, and instead recommends concentrations based on a period of seasonal or annual averaging. The Department will soon be developing appropriate assessment and compliance guidance for use with the ecoregion nutrient concentrations. Effluent limits for nutrients in Missouri State Operating permits will be consistent with nutrient WLA implementation guidance that is currently being developed by the Water Protection Program's Permits and Engineering Section.
9. The Department appreciates the support and cooperation of KDHE and the Marmaton Watershed Restoration and Protection

7/21/2010

Strategy group in attaining the goals of the Marmaton River TMDL.

10. Thank you again for your support and cooperation. The Department looks forward to working with KDHE and Kansas stakeholders on TMDL development and implementation for the Marmaton River and other interstate waters Kansas and Missouri have in common.

11. The Department is encouraged that DO sags in the Marmaton River are not as dramatic as previously seen. This is likely due to improvements in wastewater treatment and nonpoint source implementation efforts within the watershed. The Department agrees that biological monitoring will play an important role in determining water quality trends and improvement in the Marmaton River. Additional biological and chemical monitoring will be scheduled by the Department in the future as resources allow and any data collected will be shared with KDHE when available.

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**From:** Tom Stiles [mailto:tstiles@kdheks.gov]

**Sent:** Friday, March 19, 2010 4:38 PM

**To:** Hoke, John

**Subject:** marmaton tmdl

John: I've reviewed the Marmaton DO TMDL; had a just a few comments for you consideration

1. Info Sheet: We've three TMDLs on the Marmaton: DO for the lower reach below Ft. Scott; DO for the upper reach above Ft Scott and a biology impairment that we linked in 2001 to phosphorus, but more likely reflects the early wastewater ammonia discharges from Ft Scott that approached acute levels; there are no other impairments identified on the river, the ammonia and bacteria indeterminate (Category 3) impairments of 2008 are now cited as resolved (Category 2); we may still have a nps bacteria issue on the lower river at high flows. We are planning to update and revise the DO and Bio TMDLs in 2012, incorporating your TMDL analysis. Btw, we also have a DO TMDL on the West Fork Drywood Creek, approved in 2008.
2. 1. Intro: there is text implicating Ft Scott as cause of the impairment of the 2 mile reach below the stateline; this may have been true in the past, but recent upgrades in treatment at Ft Scott may have resolved this linkage (more to follow on this).
3. 2.5: it's really more accurate to say that 12 of 34 samples between 2001 and 2006 were deficient in DO; it's 15 out of 46 between 2000 and 2006; there have been no samples below 5 mg/l from Nov 2006 to Jan 2010 (19 samples)
4. 3.1, page 13 – Fort Scott; there have been significant upgrades in treatment at Ft Scott; the original aerated lagoons now serve in concert with an activated sludge plant with UV disinfection, the combined design flow is 3.0 MGD on average and 20 MGD peak; average flows from the lagoon system were 0.84 MGD since 2008; 2.47 MGD from the mechanical plant and 3.45 MGD as measured at the combined outfall. Plus, an average of 0.2 MGD of treated wastewater was piped from Ft. Scott to the bio-diesel plant in Eve, MO (indications are the bio-D plant has suspended operations as of Feb 2010).
  - a. BOD from 2006-Jan 2010 averaged 2.7 – 2.9 mg/l with 90% of samples under 3.6 – 4.6 mg/l
  - b. TSS averaged 9 – 16 mg/l with 90% of samples under 15 – 24 mg/l
  - c. 45 of 70 samples were below TP detection limits from 2004 – 2009 (d.l. = 0.5 mg/l 2004-sept 07; 0.1 mg/l oct 07-jan 10); 14 of 30 samples < 0.1 mg/l); TN average 3.7 – 5.5 mg/l (range is defined by samples taken from steady flow of mechanical plant or combined outfall, monitored since April 2009).
5. 5.3: *the effects of temperature and physical aspects of the stream itself were discounted.* On the Marmaton, low flow and warm temperatures appear to be major factors in the DO condition of the stream. Three of four samples with deficient DO below Ft Scott also showed deficient DO in concurrent samples taken at the upstream station. Plotting ambient TP vs DO at temps above and below 20 deg C shows that a similar range of TP will yield different DO patterns depending upon the temperature



I agree that SOD is the primary culprit and excessive nutrients can contribute to organic matter comprising SOD, but some additional allowance should be recognized for the seasonality of the relationships. Similarly, flows during summer near the stateline become more reflective of what Ft.Scott is discharging, with little gain in flow between Ft Scott and Richards, a typical low flow condition which is the backdrop for the TMDL modeling.



6. Table 6. City of Ft Scott WTP is now an inactive NPDES permit, they may be disposing of sedimentation deposits from the raw water through land application.
7. The modeling seems to indicate the most pressing issue is the DO sags that occur between Marmaton 3 and Marmaton 2; Site 2 has the lowest DO values, the deepest sags and greatest benefit from SOD reduction. That reach should be your primary target for implementation.
8. Be cautious with using the ecoregion reference concentrations as end of pipe expectations for the point sources; Ft Scott appears to be satisfying that expectation for TP, but remains an order of magnitude off from the TN reference concentration. While it appears that the implementation plan defers the imposition of any nutrient permit limits, some expression of how to view the reference values (not to exceed, average, median, some percentile) will be necessary so as to direct the appropriate management efforts in permitting and assessment.
9. We will encourage the Marmaton Watershed Restoration and Protection Strategy group to consider achieving reductions in nutrient and sediment loads that work toward attaining the endpoints of the Missouri TMDL as they develop their 9-element watershed plan.
10. And again, we'll be examining our TMDLs in 2012 and make adjustments based on the MO TMDL, latest stream and DMR data and work accomplished by our WRAPS watershed group. We'll coordinate with you on Missouri expectations in the early years of the post-TMDL period between now and then.
11. A key step will be to get biological monitoring done to see the relative health of the aquatic community as well as their ability to rebound from the episodic "stress" of DO falling between 4 and 5 mg/l. All things considered, the sags weren't as dramatic as what I think we've seen in the past. We still need to reduce oxygen demand,

particularly if it emanates from bed deposits that might be imposing greater stress on the stream benthos than the biota in the water column.

Hope this helps puts some tighter focus on the outcome of the TMDL. Let me know if you have questions or need me to clarify something I've mentioned here.

Tom

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