Missouri
Department of
Natural Resources

DRAFT GRAVOIS CREEK TMDL
PUBLIC COMMENTS

Public Notice
June 15 – July 30, 2012

Gravois Creek
WBID # 1712 and # 1713

St. Louis County, Mo.

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

EPA regulations require that total maximum daily loads (TMDLs) be subject to public review (40 CFR 130.7). The Missouri Department of Natural Resources placed the draft Gravois Creek bacteria TMDL on a 45-day public notice and comment period from June 15, 2012 to July 30, 2012. Comments were received from the following groups or individuals:

City of Crestwood
City of Florissant
City of Hazelwood
City of Independence
City of Springfield
City of Sunset Hills
City of Woodson Terrace
Home Builders Association of St. Louis
Metropolitan St. Louis Sewer District
St. Louis County Office of the County Executive

CITY OF CRESTWOOD

Jeff Schlink, Mayor

Office of the Mayor

July 18, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') study. With this letter, the City of Crestwood requests the Missouri Department of Natural Resources ('Department') revise the TMDL due to several technical and potential implementation issues.

The City of Crestwood appreciates the Department's efforts to protect Missouri's water resources. However, we are concerned about the potential impacts of the Gravois Creek TMDL as well as the several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. In addition to our public participation request, we are also providing the following list of technical concerns that if addressed would improve the TMDL:

- The majority of data used in the TMDL was collected outside the classified segment of Gravois Creek that is designated for whole body contact recreation.
- The long-term average for *E.coli* within the classified segment is very close to Missouri's standard so a TMDL may not be necessary or the target load reductions should be much less that those included in the TMDL.
- The TMDL approach does not distinguish well between bacteria sources within the watershed so we will not be confident that implementation efforts will achieve the water quality target.
- The TMDL could include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL should use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.
- The analysis of causes should meet rigorous scientific standards. Measurements of pollution should be done by trained professionals following rigorous protocols. The causes/sources of the pollution should be clearly related to the measurements in a statistically valid study. I do not

believe the creek studies noted above meet reasonable scientific methods, so the conclusions are suspect.

- The proposed solutions should address the sources. Few, if any MS4s are the cause of bacteria that negatively affects human health. Therefore the study should go beyond MS4/stormwater factors.
- If any MS4s are scientifically related, they should be ranked in order of importance, as should non-MS4 sources so that public funds can be appropriately aimed at the likely sources.
- The MS4s in the study have omitted MoDOT. This is worthy of more discussion and likely inclusion for remediation until better science is used overall to determine pollutants that are related to the bacteria.
- Sanitary Sewer Overflows (SSOs) may be linked to bacteria (along with other causes beyond the scope of MS4s). A massive new multi-BILLION dollar program is just being launched by MSD to reduce SSOs. It is premature to suggest remedies to bacteria without considering the elimination of SSOs. In addition, it could cost BILLIONS more to implement the response to bacteria as a result of the DNR studies focused on MS4s, so it is essential to "get it right". These two efforts (and others) should not be done in isolation. They need to be highly integrated to be environmentally effective and to be cost-effective.

We appreciate the opportunity to provide these comments. The City of Crestwood is committed to working with the Department to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, the City of Crestwood requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by the Department prior to finalizing the TMDL. Please contact James A. Eckrich at 314-729-4722 if you have any questions or would like to discuss these issues further.

Sincerely,

Jeff Schlink

Jeff Schlink
Mayor
CITY OF CRESTWOOD

Cc: Karl Kestler, Acting City Administrator
James A. Eckrich, Public Services Director

CITY OF FLORISSANT

Honorable Thomas P. Schneider, Mayor

July 27, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal. With this letter, the City of Florissant requests the Missouri Department of Natural Resources ('Department') rescind and/or revise the TMDL because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects.

The City of Florissant appreciates the Department's efforts to protect Missouri's water resources. However, we believe that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification ('WBID') 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. We are also concerned about the potential impacts of the currently proposed Gravois Creek TMDL and several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing any St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.

CITY HALL
955 Rue St. Francois
Florissant, MO 63031
314 / 921-5700
Fax: 314 / 921-7111
TDD: 314 / 839-5142

POLICE DEPARTMENT
1700 North Highway 67
Florissant, MO 63033
314 / 831-7000
Fax: 314 / 830-6045

PARKS DEPARTMENT
#1 James J. Eagan Drive
Florissant, MO 63033
314 / 921-4466
Fax: 314 / 839-7672

HEALTH DEPARTMENT
#1 St. Ferdinand Drive
Florissant, MO 63031
314 / 839-7654
Fax: 314 / 839-7656

MUNICIPAL COURT
1055 Rue St. Francois
Florissant, MO 63031
314 / 921-3322
Fax: 314 / 839-7663

www.florissantmo.com

- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.
- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.
- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

We appreciate the opportunity to provide these comments. The City of Florissant is committed to working with the Department to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, the City of Florissant requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by the Department to determine and justify the need for a TMDL and to further address the defects and concerns noted above, before any TMDL is finalized. Please contact Tim Barrett, P.E., City Engineer at 314-839-7643 if you have any questions or would like to discuss these issues further.

Sincerely,

Thomas P. Schneider
Mayor

Cc: Mr. Louis B. Jearls, Jr., P.E., Director of Public Works
Mr. Timothy J. Barrett, P.E., City Engineer

The City of Hazelwood

much more than you imagine

July 30 ,2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Submitted by email to: john.hoke@dnr.mo.gov

Subject: Public Comments for Total Maximum Daily Load for Watkins Creek, Creve Coeur Creek, Fishpot Creek, and Gravois Creek

Dear Mr. Hoke:

I may submit additional comments for the creeks other than Gravois Creek, but with the public comment deadline of 7-30-2012 for Gravois Creek I am submitting the following:

1. The efforts of DNR to improve our environment in general are always welcome.
2. The costs should largely be the responsibility of those who create the mandates with the exception of flagrant violations.
3. The analysis of causes should meet rigorous scientific standards. Measurements of pollution should be done by trained professionals following rigorous protocols. The causes/sources of the pollution should be clearly related to the measurements in a statistically valid study. I do not believe the creek studies noted above meet reasonable scientific methods, so the conclusions are suspect.
4. The proposed solutions should address the sources. Few, if any MS4s are the cause of bacteria that negatively affects human health. Therefore the study should go beyond MS4/stormwater factors.
5. If any MS4s are scientifically related, they should be ranked in order of importance, as should non-MS4 sources so the public funds can be appropriately aimed at the likely sources.
6. The MS4s in the study have omitted MoDOT. This is worthy of more discussion and likely inclusion for remediation until better science is used overall to determine pollutants that are related to the bacteria.
7. Sanitary Sewer Overflows (SSOs) may be linked to bacteria (along with other causes beyond the scope of MS4s). A massive new multi-BILLION dollar program is just being launched by MSD to reduce SSOs. It is premature to suggest remedies to bacteria without considering the elimination of SSOs. In addition, it could cost BILLIONS more to implement the response to bacteria as a result of the DNR studies focused on MS4s, so it is essential to "get it right". These two efforts (and others) should not be done in isolation. They need to be highly integrated to be environmentally effective and to be cost-effective.

Given these and other implications, I strongly recommend that more stakeholders be involved in a process that involves more rigorous scientific methods and meaningful public input.
We are ready, willing and able to work with DNR on new approaches to real solutions regarding creek issues and would encourage such partnerships.

Sincerely,

Earl Bradfield

Earl Bradfield, City Planner
City of Hazelwood

City Hall & Public Works
t: 314.839.3700
f: 314.839.0249
415 Elm Grove Lane

City Maintenance
t: 731.8701
f: 731.4240
115 Ford Lane

Fire Department
t: 731.3424
f: 731.1976
6800 Howdershell Road

Municipal Court
t: 839.2212
f: 838.5169
415 Elm Grove Lane

Parks & Recreation
t: 731.0980
f: 731.0989
1186 Teson Road

Police Department
t: 839.3700
f: 838.5169
415 Elm Grove Lane

Hazelwood, MO 63042

www.hazelwoodmo.org

City of Independence

WATER POLLUTION CONTROL DEPARTMENT

P.O. Box 1019 • INDEPENDENCE, MISSOURI 64051-0519 • (816) 325-7711 • FAX (816) 325-7722

AN EQUAL OPPORTUNITY EMPLOYER

July 27, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load (TMDL) proposal. With this letter, the City of Independence Water Pollution Control Department (WPC) requests that the Missouri Department of Natural Resources (Department) rescind and/or revise the TMDL because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects.

WPC appreciates the Department's efforts to protect Missouri's water resources. However, we believe that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification (WBID) 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. We are also concerned about the potential impacts of the currently proposed Gravois Creek TMDL and several other draft bacteria TMDLs for urban water bodies. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing any bacteria TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.
- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.

- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.
- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions for Municipal Separate Storm Sewer System (MS4) permits in the Clean Water Act and storm water regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

We appreciate the opportunity to provide these comments. WPC is committed to working with the Department to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, WPC requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by the Department to determine and justify the need for a TMDL and to further address the defects and concerns noted above, before any TMDL is finalized. Please contact Dorris Bender at dbender@indepmo.org or (816) 325-7711 if you have any questions or would like to discuss these issues further.

Sincerely,

Dorris L. Bender

Dorris L. Bender
Environmental Compliance Manager

c: Dick Champion, Jr.

CITY of SPRINGFIELD

July 30, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

The City of Springfield would like to offer a comment letter into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal.

Springfield not only wants to comment on this TMDL but also on the manner it was issued for public comment. Springfield commends the efforts of the Missouri Department of Natural Resource's (Department)to gain stakeholder input before permits are issued for public comment so both the Department and permittee can incorporate comments where both parties agree. This allows the Department to issue permit language that is acceptable to both parties in the most complete draft form that can be achieved. It is my understanding that this TMDL (and other TMDLs) are being issued without prior knowledge of the permittee. I don't believe this serves either the Department or the permitted at all.

Springfield requests that the Department:

- Provide a 14 day comment period to the permittee before any permit is issued, including TMDLs. This used to be a common practice by the Department.
- Revise the TMDL language because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects. If a 14 day comment period had been provided the permittee (before issuing for public comment) this important detail could have been addressed and potential changes in the TMDL could have been avoided.

I have learned from St. Louis Metropolitan Sewer District (MSD) that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification ('WBID') 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. Springfield is also concerned about the potential impact of the currently proposed Gravois Creek TMDL and several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing any St.

DEPARTMENT OF ENVIRONMENTAL SERVICES
840 Boonville Avenue, P.O. Box 8368 Springfield, Missouri 65801-8368
phone: (417) 864-1919 fax: (417) 864-1929
homepage: www.springfieldmo.gov e-mail: city@springfieldmo.gov

Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. If the Department continues to move forward finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.
- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.
- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.
- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

Springfield appreciates the opportunity to provide these comments on actions of the Department. Springfield is committed to working with the Department to ensure that Missouri's waters are protected, while addressing issues of concern in a smart and effective manner through application of good science and stakeholder input. In support of this approach, however, Springfield requests that the Department provide meaningful public participation with permittees to justify the need for a TMDL and to further address the defects and concerns in those TMDLs prior to finalization, to make it the best rule for the good of the environment. Please contact me at 417-864-1919 if you have any questions or would like to discuss these issues further.

Sincerely,

Steve Meyer

Stephen Meyer, P.E.
Director of Environmental Services
Springfield Missouri

CC: Law Department – Springfield Missouri
MSD – John Lodderhose
DNR – John Madras

Sunset Hills

3939 South Lindbergh Boulevard Sunset Hills, Missouri 63127
314.849.3400 314.849.8720 www.sunset-hills.com

July 30, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal. With this letter, the City of Sunset Hills requests the Missouri Department of Natural Resources ('Department') rescind and/or revise the TMDL because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects.

The City of Sunset Hills appreciates the Department's efforts to protect Missouri's water resources. However, we believe that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification ('WBID") 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. We are also concerned about the potential impacts of the currently proposed Gravois Creek TMDL and several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing any St. Louis area TMDLs until additional public participation activities (e.g. public meetings, workshops, etc.) are completed. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.

- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.
- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.
- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

We appreciate the opportunity to provide these comments. The City of Sunset Hills is committed to working with the Department to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, the City of Sunset Hills requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by the Department to determin and justify the need for a TMDL and to further address the defects and concerns noted above, before any TMDL is finalized. Please contact Anne Lamitola at 314-849-3400 if you have any questions or would like to discuss these issues further.

Sincerely,

Anne C. Lamitola, P.E.
City Engineer/Public Works Director

July 30, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal. With this letter, the City of Woodson Terrace requests the Missouri Department of Natural Resources ('Department') rescind and/or revise the TMDL because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects.

The City of Woodson Terrace appreciates the Department's efforts to protect Missouri's water resources. However, we believe that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification ('WBID') 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. We are also concerned about the potential impacts of the currently proposed Gravois Creek TMDL and several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the Department should delay finalizing any St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concernsmust be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.

- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.

- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.

- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.

- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

We appreciate the opportunity to provide these comments. The City of Woodson Terrace is committed to working with the Department to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, the City of Woodson Terrace requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by the Department to determine and justify the need for a TMDL and to further address the defects and concerns noted above, before any TMDL is finalized. Please contact Doug Zaiz, Director of Public Works at 314-427-2600 if you have any questions or would like to discuss these issues further.

Sincerely,

Doug Zaiz/Public Works Director

HOME BUILDERS ASSOCIATION OF ST. LOUIS & EASTERN MISSOURI
10[illegible] OLD OLIVE STREET
ST. LOUIS, MISSOURI 63141
314 997[illegible]
FAX 314 43[illegible]
WEB WWW.BIA[illegible]

July 30, 2012

John Hoke, Chief, Watershed Protection Section
Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176
Jefferson City, MO 65102

2012 AUG -1 PM 12:42
WATER PROTECTION PROG[illegible]

Public Comments for Total Maximum Daily Load for Gravois Creek, St. Louis County and City of St. Louis, Missouri

Dear Mr. Hoke:

On behalf of the Home Builders Association of St. Louis and Eastern Missouri (HBA) and its 600 member companies, I thank you for the opportunity to provide comments in response to the Missouri Department of Natural Resources' proposed Total Maximum Daily Load (TMDL) for Gravois Creek.

The HBA's membership consists of firms that participate in all levels of residential development and construction. Members live and work in the communities in which they build, and regularly plan and design projects to optimize environmental protection and resource conservation. The HBA supports the Missouri Department of Natural Resources in its consistent efforts to preserve the state's natural assets. However, the HBA respectfully requests that the proposed Gravois Creek TMDL be rescinded and/or revised because a substantial portion of Gravois Creek is not "impaired" and because it contains several technical and implementation defects.

The HBA finds concerns with draft TMDLs for waterbodies within the City of St. Louis and St. Louis County because these TMDLs can be detrimental to future development. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the HBA believes the Missouri Department of Natural Resources should delay finalizing area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) have been completed.

Specifically, for Gravois Creek, the HBA believes this TMDL is not needed for Gravois Creek Waterbody Identification (WBID) 1712 based on available water quality data. Additionally, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or to develop a TMDL. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.
- Correction of a data entry error for WBID 1712 shows water quality meets recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.
- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.

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- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

The HBA appreciates your willingness to consider comments from the home building industry. Like the Missouri Department of Natural Resources, the HBA believes Missouri waters should be protected through the application of sound science and stakeholder input. In support of this approach, the HBA requests meaningful public participation be sought and that at least one (or as many as needed) public meeting be hosted to determine and justify the need for a TMDL. Additionally, before any TMDL is finalized, the HBA believes the defects and concerns noted above must be addressed. Do not hesitate to contact me if you have any questions or would like to further discuss. I can be reached at 314.994.7700 ext. 116 or SchwartzeE@hbastl.com.

Regards,

Emily Schwartze Post

Emily Schwartze Post
Assistant Staff Vice President for Public Policy

cc: HBA Environmental Affairs Committee
HBA St. Louis County Board of Trustees
Pat Sullivan, Executive Vice President, HBA
Emily Wineland, Staff Vice President for Public Policy, HBA

WE BUILD NEIGHBORHOODS
HBA

Metropolitan
St. Louis Sewer
District

2350 Market Street
St. Louis, MO 63103-2555
(314) 768-6200

July 30, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for and Request for Public Meetings Regarding Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal. With this letter, the Metropolitan St. Louis Sewer District ('District') requests the Missouri Department of Natural Resources ('Department') withdraw or delay finalizing this TMDL until sufficient data are available to document a water quality standards impairment and, if a TMDL is needed, support development of its components. There are also several technical problems and defects with the proposed draft TMDL that should be addressed if the Department pursues a Gravois Creek TMDL in the future.

The District recognizes the significant technical challenges and complexities in developing accurate TMDLs in urban environments. Further, the District appreciates the ongoing dedication by Department professionals in protecting Missouri's water resources. The focus of this comment letter is to assist the Department's TMDL development process by providing additional information, analysis, and insights associated with the Gravois Creek watershed system. The District is concerned about the need for and the potential ramifications and implementation feasibility of the Gravois Creek TMDL as well as the several others recently public noticed for waterbodies within the MSD service area.

Due to the complexity of understanding water quality conditions within urban streams, the TMDL calculation process, and the potential major impacts to the District, local governments, private development, other businesses, and to residents, it was not possible (despite a substantial effort and expenditure of resources) to fully analyze and comment on the TMDL within the 45-day public comment period. Additional time is needed to conduct a thorough and complete review and have constructive dialogue with the Department. The analysis that has been completed, however, demonstrates that segment 1712 of Gravois Creek is not impaired and that the TMDL is unnecessary. Further, the analysis shows that there is insufficient data to develop a TMDL for segment 1713. Therefore, the TMDL is unnecessary and unsupported. The District also believes that the approach to developing the TMDL (use of a load duration curve with existing water quality data, source characterization methods, lack of appropriate implementation planning considerations, etc.) must be corrected and improved if the Department pursues a Gravois Creek TMDL in the future.

Some of our comments of significant concern are summarized by the District in this transmittal letter. Additional and more detailed comments are provided in Attachment A that, when addressed, will significantly improve the TMDL, if one is necessary.

1. **The TMDL dataset includes a critical error that, when corrected, demonstrates WBID 1712 is not impaired.** The TMDL acknowledges that in 2006 the Department 303(d) listed Gravois Creek (WBIDs 1712 and 1713) using data that do not meet the state's current listing methodology requirements (i.e., minimum of 5 samples during the recreational season). The TMDL indicates that five samples from any one of the last three years are not available from Gravois Creek and that, in the absence of additional data that shows good cause for delisting, the stream should remain listed as impaired and requires a TMDL. However, the District notes that correcting an error in the TMDL dataset results in sufficient data to delist Gravois Creek WBID 1712. Based on the District's data records, the sample listed as being collected on **2/28/2009** (30 col/100 mL) was actually collected during the recreational season on **9/29/2009**. Correcting the sampling date changes the number of recreational season samples available from four to five and results in a recreational season geometric mean of 177 col/100 mL, which is below the water quality criterion of 206 col/100 mL. These results show that WBID 1712 is supporting the beneficial use and must be taken off the impaired waters list. Further, the fact that the only segment on Gravois Creek with sufficient data to make impairment decisions (WBID 1712) is attaining its recreational use suggests that additional data are also necessary to appropriately evaluate WBID 1713. Therefore, Department should also delist or recategorize (integrated reporting category 3) WBID 1713 until sufficient data is available to correctly evaluate attainment status in that segment.

2. **The data are insufficient for developing a TMDL at this time.** Characterizing sources and calculating load reductions is significantly more data intensive than simply listing a water body as impaired. The current TMDL dataset is insufficient for conducting these analyses in both WBID segments. Furthermore, the District notes the TMDL dataset does not adequately characterize the water quality impacts associated with the 2009 CSO removal project. Given the complexities of understanding water quality conditions within urban streams and the TMDL calculation process, the Department should delay the TMDL until a valid, sufficiently robust and representative dataset is available.

3. **The TMDL does not adequately consider all sources of bacteria that may be impacting Whole Body Contact Recreation-Category B (WBCR-B) attainment in Gravois Creek.** The TMDL discounts bacteria contribution from other permitted stormwater discharges (46 other permitted discharges listed in Table 5). The Missouri Department of Transportation MS4, which was not considered, comprises a significant portion of the watershed (approximately 4%) and a likely higher percentage of the watershed's impervious area. There are also several nonpoint sources in need of further characterization (e.g., Grant's Farm). Finally, there are about 1,600 unsewered parcels within the watershed which are a significant source of bacteria and must not be ignored. The TMDL must consider all sources of bacteria rather than solely focus on the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit. In addition to the unsewered parcels and the MoDOT MS4, the District's GIS layer clearly shows Grant's Farm represents a significant portion of the watershed. Hundreds of free roaming exotic animals located at Grant's Farm potentially represent a significant source of bacteria loading. The failure to consider and address all these sources is arbitrary and legally and technically unsupportable.

4. **The TMDL components are inconsistent with Missouri's recreational use water quality criterion.** Missouri's WBCR Category B criterion (206 colonies/100 mL) is expressed as a recreational season (seven month) geometric mean. According to guidance issued by the U.S. Environmental Protection Agency (USEPA), loading capacity estimates using the Load Duration Curve approach should be developed using criteria with a daily averaging period. For those criteria not expressed as daily values (such as Missouri's bacteria criterion), the USEPA guidance offers multiple options to align averaging periods. The Department must revise the TMDL to employ the correct criterion averaging period if the load duration curve approach is retained.

5. **The District is very concerned that the TMDL could result in stormwater management requirements that go beyond those already adopted for compliance with the MS4 permit and the Federal Consent Decree.** The District's design requirements include capture and treatment of the 90th percentile daily storm depth in water quality best management practices (BMP) to meet the permit requirement of implementing BMPs to the maximum extent practicable (MEP). Additional TMDL requirements would exceed the MEP provisions of the District's MS4 permit and extend beyond the Phase II stormwater regulations. Further, the District has recently entered into the federal consent decree. To avoid arbitrary, duplicative and unnecessary costs and requirements, any TMDL implementation approach must incorporate and take into account the Federal Consent Decree requirements.

6. **The TMDL should include a phased or adaptive management component for implementation and future revisions due to the uncertainties and complexities with this study.** A phased or adaptive management approach is imperative given the issues outlined above and the complexity of urban hydrologic processes. The TMDL should prioritize future implementation activities based upon a recreational use risk analysis that considers limitations induced by high flow conditions and sources of bacteria. For example, human sources of bacteria occurring during baseflow conditions should be the first priority since these sources are of highest risk. Additionally, load reduction requirements should be contingent upon Gravois Creek not achieving its recreational water quality criterion. The TMDL proposed by the Department acknowledges an adaptive management approach by referring to a future implementation plan; however, this approach should be explicitly set forth within the TMDL. The District requests early involvement of all permitted entities, local governments, and other stakeholders in development of any implementation plan.

The District believes that the Gravois Creek TMDL approach must be improved (if the TMDL is necessary at all). The District requests that the Department either place Gravois Creek into integrated reporting category 3 or delay TMDL development and implementation process until sufficient, representative data is available to conduct a scientifically-defensible review of water quality in the watershed. Further, any revision of the TMDL must be conducted with more stakeholder coordination to ensure that an appropriate and legally compliant TMDL is established. This should include development of a phased TMDL, which would be consistent with USEPA's new Integrated Municipal Stormwater and Wastewater Planning Approach Framework.

We appreciate the opportunity to provide these comments. The District is committed to working with the Department to ensure that Missouri's waters are protected through application of good

science and stakeholder input. In support of this approach, the District requests a meeting with the Department to discuss these comments and identify a collaborative path forward prior to finalizing the TMDL. Please contact John Lodderhose, PE at 314-436-8714 if you have any questions and to discuss these issues further.

Sincerely,

Susan M. Myers

Susan M. Myers
General Counsel
Metropolitan St. Louis Sewer District

Pc John Lodderhose
Bruce Litzsinger
Bill Allen
Jay Hoskins
Kristol Whatley
Rich Unverferth

Attachments:

Technical Comments
Map

ATTACHMENT A

TECHNICAL COMMENTS ON TOTAL MAXIMUM DAILY LOAD (TMDL) FOR GRAVOIS CREEK ST. LOUIS COUNTY AND ST. LOUIS CITY, MISSOURI (PUBLIC NOTICE VERSION, JUNE 15 THROUGH JULY 30, 2012)

The Metropolitan St. Louis Sewer District (MSD or the District) has several technical and implementation concerns with the bacteria total maximum daily load (TMDL) to establish wasteload and load allocations to protect whole body contact recreation - category B (WBCR-B) in Gravois Creek[1]. The District is concerned about the potential ramifications of the Gravois Creek TMDL as well as the several others recently public noticed for waterbodies within the MSD service area. Due to the complexity of understanding water quality conditions within urban streams, the TMDL calculation process, and the potential major impacts to the District, local governments, private development, other businesses and to residents, it was not possible (despite a substantial effort and expenditure of resources) to fully analyze and comment on the TMDL within the 45-day public comment period. Additional time is needed to conduct a thorough review and have constructive dialogue with the Missouri Department of Natural Resources (MDNR or the Department).

The District's analysis that has been completed, however, demonstrates that segment 1712 of Gravois Creek is not impaired and the TMDL is not necessary. Further, the analysis shows that there are insufficient data to determine the attainment status of segment 1713, or to develop a TMDL for either 1712 or 1713. Therefore, the TMDL is unnecessary and unsupported at this time. The District also believes that the basic approach to developing the TMDL (use of a load duration curve with existing water quality data, source characterization methods, lack of appropriate implementation planning considerations, etc.) is not scientifically sound and must be improved. If a TMDL is ultimately required, the District requests revision of the TMDL with more stakeholder coordination to ensure that an appropriate TMDL is established based on sound, current, and defensible science. Any TMDL should also include development of a phased TMDL, which would be consistent with the U.S. Environmental Protection Agency's (USEPA) new Integrated Municipal Stormwater and Wastewater Planning Approach Framework (USEPA, 2012).

Furthermore, the District requests meeting with the Department to discuss the technical**,** implementation and other comments provided below with respect to not only the Gravois Creek TMDL but all other TMDLs for waters within the District. We believe resolution of the comments below will allow the Department to develop legally compliant, more appropriate TMDLs for urban streams.

[1] The draft TMDL is located at http://dnr.mo.gov/env/wpp/docs/1712-1713-gravois-ck-tmdl.pdf.

1. LAND USE AND WATERSHED INFORMATION

a. The TMDL land use and land cover information must be supplemented with more accurate, local data.

The land use statistics presented in Section 2.4 of the draft TMDL are based on data collected at 30-meter resolution obtained from Thematic Mapper imagery (MoRAP, 2005). At this resolution the data are insufficient for purposes of providing accurate land use statistics (e.g., impervious area). Additionally, the metadata file states the following:

- "Data only appropriate for regional scale assessments."
- "Data has not been subjected to accuracy assessment. No accuracy stated or implied."

Therefore, with these comments the District is providing the Department with more detailed GIS layer of land use data in the St. Louis area. The attached figure provides several key findings that may aid subsequent revisions to all TMDLs in the District's service area, which are discussed below.

First, this assessment demonstrates that nearly 1,600 parcels along Gravois Creek are not served by the District's sewer system. Therefore, wastewater generated at the developed portion of these parcels is likely managed with on-site systems (e.g., septic systems or lagoons). Obviously, these point or non-point sources could significantly impact the water quality of Gravois Creek. Second, the major highway corridors including I-44 and I-55 are significant portions of the watershed area (approximately 4%) and could be included in the TMDL as these are managed under the Missouri Department of Transportation (MoDOT) municipal separate storm sewer system (MS4) permit. In addition to the unsewered parcels and the MoDOT MS4, the District's GIS layer clearly shows Grant's Farm represents a significant portion of the watershed. Hundreds of free roaming exotic animals located at Grant's Farm potentially represent a significant source of bacteria loading.

These datasets can and must be considered, accounted for and used in the TMDL (and in revisions to the TMDL) and implementation plan, including for such purposes as source identification and characterization, load and wasteload allocation calculations, and prioritization of implementation actions.

2. DEFINING THE PROBLEM (WATER QUALITY DATA ANALYSIS)

a. Correction of an apparent data entry error in the TMDL report demonstrates that WBID 1712 is not impaired.

As mentioned in the TMDL, Gravois Creek was first included on the 2006 303(d) list as impaired by *E. coli*. In 2006, impairments were determined by evaluating the geometric mean of available recreational season data against the applicable criterion; there were no minimum sample number requirements. The current 303(d) listing methodology states that at least five samples per year, collected during the recreational season from any of the last three years, are needed to calculate the geometric mean and determine recreational use support. In the TMDL, MDNR indicates that five samples from any one of the last three years are not available from Gravois Creek and that, in the absence of additional data that shows good cause for delisting, the stream should remain listed as impaired and requires a TMDL.

The District notes that sufficient data are available to delist Gravois Creek. In Appendix A of the TMDL, the sample listed as being collected in WBID 1712 on **2/28/2009** was actually collected during the recreational season on **9/29/2009**. This appears to have been a data entry error in the Department's database[2] and changes the number of recreational season samples available from four to five. The geometric mean of the five correct samples (177 col/100 mL) is below the water quality criterion of 206 col/100 mL. These results show that WBID 1712 is supporting the beneficial use and must be taken off of the impaired waters list. Further, the fact that the only segment on Gravois Creek with sufficient data to make impairment decisions (WBID 1712) is attaining its recreational use suggests that additional data are also necessary to appropriately evaluate WBID 1713. Therefore, Department should also delist or recategorize (integrated reporting category 3) WBID 1713 until sufficient data is available to correctly evaluate attainment status in that segment.

b. It is inappropriate to apply the load duration curve approach given the limited number of samples available.

The implicit assumption of the load duration curve modeling approach is that sufficient data are available to characterize changes in water quality over a range of applicable flow conditions. In the TMDL, existing loading estimates for WBIDs 1712 and 1713 are based on a limited number of data points (12 and 23 samples, respectively) that were not collected across all flow conditions. For example, in WBID 1712 75% of samples were collected in the two highest flow categories and no data were collected in the mid and low range flow conditions. In WBID 1713, the highest number of samples were collected in the high (8 samples) and dry (7 samples) flow conditions while few samples (≤ 3) were available in the remaining categories. Therefore, the limited dataset is not representative of recreational season conditions in Gravois Creek and must be supplemented with additional data before the load duration curve approach can be scientifically justified, if representative data indicate a TMDL is needed.

c. The TMDL load duration curves do not account for the CSO removal.

The District is concerned the Department did not adequately consider removal of the combined sewer overflow (CSO) in developing the TMDL load duration curves. As discussed in the TMDL, one CSO was present in the Gravois Creek watershed, but was separated and removed in 2009. Although the TMDL suggests this CSO may have been contributing to the impairment of Gravois Creek, the load duration curve analysis was conducted using data collected largely before this date. Without additional data or analyses, the beneficial water quality impacts associated with the CSO removal are unknown. The Department must reevaluate the recommended load reductions to ensure they are not unduly influenced by data collected prior to the CSO's removal.

[2] MSD collects data at the sampling station on WBID 1712 and provides these data to MDNR for use in water quality assessments. The District confirmed the data entry error by comparing our data records to TMDL Appendix A as well as the 2012 proposed 303(d) list Excel data sheets provided on the Department's website. In the Department's Excel sheet, the 2/28/2009 sample is listed as being collected at 08:16 with an E. coli concentration of 30 col/100 mL. MSD does not have a record of any sample collected on 2/28/2009. However, MSD's database shows that 30 col/100 mL was measured at 08:16 on 9/29/2009. This is the correct sample information and it should be corrected in the Department's records.

d. The recreational season dataset for WBID 1712, while supportive of delisting, is not representative of average conditions because it is predominantly composed of wet-weather or runoff samples. These unrepresentative data skew the geometric mean upwards and should not be used to calculate TMDL components.

Data for WBID 1712 were primarily collected during wet-weather conditions and therefore are not representative of average conditions in the watershed. The long term probability of a rain event greater than 0.25 inches within a three day time period is 31% (St. Louis Science Center weather station, 1996 to 2010). However, the majority of samples collected from site 1712/0.1 (8 of 12 or 67%) were collected within three days of a rain event in excess of 0.25 inches. This analysis shows that the dataset for WBID 1712 was skewed towards wet weather influenced conditions. The Department must reevaluate all data and demonstrate that wet weather events do not bias TMDL components.

e. Discrete bacteria samples are not representative of daily average *E. coli* levels in the Gravois Creek watershed.

It appears as though the Department applied daily average flows measured at USGS Station 07010180 (adjusted upwards using a watershed area-based adjustment factors) to the discrete bacteria samples to calculate existing loads. We are concerned that the discrete bacteria samples are not representative indicators of daily average bacteria levels in the watershed. As discussed in the previous comment, many of the bacteria samples appear to be skewed towards wet-weather events. Also, USGS sampling programs in the MSD service area targeted "first flush" storm events before 2009. Concentrations measured during these events likely represent the highest bacteria levels that would have occurred on the sampling date and therefore are not accurately reflect daily average bacteria concentrations in the stream. As a result, applying first flush sampling results as a daily average value overestimates existing loading in Gravois Creek. The Department should use an alternative modeling approach which appropriately translates discrete bacteria and instantaneous flow samples to daily or seasonal values that can be compared to the WBCR-B criterion.

f. The flow adjustment approach is inappropriate for urban watersheds and incorrectly characterizes bacteria loading in portions of Gravois Creek.

The Department apparently applied linear adjustment factors (1.2486 and 1.1547) to correct flow data measured from USGS station 07001980 for the drainage area of the two classified segments. These corrected flows were then applied to sample data to estimate existing loadings in Gravois Creek.

This flow correction approach is not appropriate due to non-linear hydrologic scaling relationships and non-uniform distribution of outfalls often found in urban watersheds. Furthermore, by not accounting for natural settling and decay processes, the Department mischaracterized bacteria loads in the watershed. MDNR must use appropriate methods to develop flow adjustment factors for the Gravois Creek watershed and account for bacteria fate and transport in the stream segments.

3. SOURCE INVENTORY AND ASSESSMENT

a. The TMDL should analyze, consider and take into account the importance of bacterial sources in the context of human health risks and this factor should be an important aspect of implementation planning.

Recent quantitative microbial risk assessments (QMRAs) conducted by USEPA contractors have shown that setting appropriate recreational indicator bacteria limits (i.e., corresponding to illness rates of 8-9 per 1,000 WBCR exposures) requires an understanding of bacteria sources (Schoen and Ashbolt, 2010 and Soller et al., 2010). These studies illustrate that some non-human sources of bacteria pose a lower risk than human sources of bacteria. These studies are discussed in more detail in Item 4.b below. Due to these new research findings, the Department must either defer TMDL adoption until after additional source identification studies can be conducted or adopt a phased TMDL. A phased TMDL should include source identification studies to be conducted prior to the implementation of load reduction activities and provide a mechanism to incorporate the findings of those studies into the TMDL and implementation approach.

b. The source assessment should distinguish between natural or background sources of bacteria versus anthropogenic sources.

Sources of bacteria indicator organisms, particularly *E. coli*, are complicated in urban environments. The Gravois Creek watershed has some areas of dense development but also large areas of forested or undeveloped land covers, particularly along the riparian corridor. These more naturalized environments support a significant amount of wildlife that could be significant sources of bacteria indicators. In addition, *E. coli* has been associated with soil, plants, and stream sediments, which complicates source assessment. Stream sediments have been viewed as a significant source of *E. coli* through regrowth and resuspension processes. These natural or background sources of bacteria are often uncontrollable and likely do not pose significant risk to human health. The Department must evaluate these sources and the lower risk to human health in the TMDL source inventory and assessment.

c. The USGS microbial source tracking study results are likely not representative of conditions in Gravois Creek.

The referenced USGS study was funded by the District in an effort to better understand the influence of sanitary sewer overflows (SSOs), combined sewer overflows (CSOs), and treated wastewater discharges on local receiving waters. The District opposes the use of the regression between bacteria concentrations and upstream SSOs since this relationship is only strong due to the inclusion of the Missouri and Mississippi Rivers in the dataset. These rivers, due to their watershed size and associated land uses, are not representative of receiving waters such as Gravois Creek that are influenced by SSOs and not CSOs. The District supports the potential use of microbial source tracking for future phases of the TMDL or implementation planning, particularly using new techniques that are more suitable for sanitary surveys.

d. More detailed, local information must be used in assessing bacteria sources.

The District and local governments have extensive data that can be mined to more accurately assess bacteria sources in the watershed. The District's data were discussed briefly under comments related to land use and watershed information. These data also include sanitary and storm sewer information that must be used to assess potential locations of on-site wastewater management system and stormwater outfalls. The District requests that the Department

incorporate these data in the TMDL source assessment. In addition, local information related to on-site wastewater management system inspections must be included in the TMDL rather than relying on national performance data.

e. The water quality improvements and load reduction by the District's upcoming elimination of constructed SSOs and other sanitary sewer improvements must be taken into account.

The TMDL source inventory and assessment suggests that SSO contributions to the potential water quality impairment are significant. The District has been aggressively implementing actions to reduce SSOs and improve sanitary sewer systems within its service area, including committing in a Federal Consent Decree to eliminate all constructed SSOs and to continue to develop and implement a Capacity, Management, Operations, and Maintenance (CMOM) program[3]. MDNR is a party to the Federal lawsuit and will receive copies of MSD's submittals under the Consent Decree. The water quality improvements and load reductions resulting from the District's efforts must be accounted for in estimating future load reduction requirements.

f. The language regarding "the presence of sewerage system infrastructure", "mismanagement", and "sewage discharge" on pages 13 and 14 and any subsequent references should be deleted.

This is broad-sweeping language that implies that simply the presence of a sewerage system will result in non-attainment of the WBCR-B designated uses. This statement is inaccurate and should be deleted.

g. The Missouri Department of Transportation (MoDOT) MS4 permit should be incorporated into the TMDL as a point source and should be included in the wasteload allocation.

MoDOT corridors, including highways I-55 and I-44, comprise a significant portion of the watershed (4%) and a likely higher percentage of the watershed's impervious area. These corridors should be controlled under the MoDOT MS4 permit. Pitt et al. (2004) demonstrates that highways significantly contribute to bacteria loading during wet weather conditions, with median fecal coliform densities ranging from 730 to 1,700 col/100 mL. Therefore, the MoDOT MS4 permit must be referenced as a point source in the TMDL and included within the wasteload allocation.

h. The reference to MS4 stormwater management plans should be revised.

The source assessment and inventory section pertaining to the MS4 permit held by the District and co-permitted local governments states that stormwater management plans are to be developed to "prevent the input of harmful pollutants" (page 16). The District requests that the Department revise the TMDL to state that these plans are to be developed to "reduce the discharge of pollutants from the MS4 system to the maximum extent practicable," consistent with state and USEPA regulations and guidance.

[3] The CMOM Program will include detailed performance goals for the prioritization, cleaning, inspection, and rehabilitation of the entire sewer system. Implementation of the Federal Consent Decree will also include continued implementation of the District's Fats, Oils, and Grease (FOG) Program, the development and implementation of a Private Inflow and Infiltration Reduction Program, a Building Backup Response Plan, and a Non-Capacity Related SSO Response Plan.

i. The District's Supplemental Environmental Project (SEP) to eliminate some septic systems should be put into proper perspective.

As referenced in the TMDL, the District committed to a SEP to eliminate some septic systems within our jurisdiction as part of the recent Federal Consent Decree. This project was undertaken in connection with the settlement of an efforcement action, United States, State of Missouri, and the Missouri Coalition for the Environment Foundation v. Metropolitan St. Louis Sewer District. The specified expenditure for this SEP is only $1.6 million to be used for low income homeowners. This money may also be used to repair defective private laterals. Therefore it is unlikely that the SEP will result in a significant reduction of bacteria within the Gravois Creek watershed. The District requests that the TMDL be revised to accurately describe the limitations of the SEP so that local landowners and stakeholders have a realistic expectation that additional actions will be needed to address failing septic systems.

j. The TMDL incorrectly dismisses bacteria loadings from Grant's Farm.

The Department did not adequately characterize Grant's Farm as a source of bacteria loading. The TMDL states that Grant's Farm is approximately 273 acres and houses approximately 423 animals, owned by the Anheuser-Busch company, many of which roam freely in the Deer Park section of the park. The impacts of animal waste to stream bacteria levels are well documented. However, the TMDL downplays the significance park animals may have on Gravois Creek, suggesting forested streamside conditions act as a buffer for pollutant detention, removal and assimilation. The TMDL also states that "[d]irect input of animal waste to Gravois Creek is not likely to occur, because the animals are excluded from the stream."

The TMDL does not sufficiently support the contention that animals at Grant's Farm are excluded from the stream. Neither the National Park Service (NPS) report or park website cited on page 17 of the TMDL indicate animals are excluded from the stream. Additionally, approximately 1.6 stream miles tributary to Gravois Creek are located in Grant's Farm based on 1:24,000 scale NHD (National Hydrography Dataset). The tributary stream miles are almost exclusively located in Deer Park where animals freely roam and use the stream as shown in the photo below. This suggests a very high likelihood of direct input of animal waste. Given this likelihood, and the large number exotic animals (e.g., bison, antelope, deer, and zebra) present at Deer Park, further characterization of animal impacts is needed.

Deer and Ducks at Grant's Farm Using Tributary to Gravois Creek.

4. APPLICABLE WATER QUALITY STANDARDS AND NUMERIC TARGET

a. The water quality condition targeted by the TMDL is not sufficiently linked with human health risk in the Gravois Creek watershed.

The TMDL targets a WBCR-B *E. coli* criterion of 206 col/100 mL as a recreational season (April 1 through October 31) geometric mean. This criterion is based on the USEPA 1986 bacteria criteria document ('1986 criteria'). While a geometric mean of 206 col/100 mL is the approved WBCR-B criterion, this criterion is not appropriate for several waterbodies within our jurisdiction because the underlying epidemiological studies are 1) poorly correlated with risk, 2) rooted in two unsupported assumptions, 3) not representative of inland flowing waters, and 4) largely focused on publicly-owned treatment work (POTW) impacted waters.

USEPA's 1986 criteria are based on a poor regression from relatively few epidemiologically studies. The epidemiological studies supporting this criterion were conducted on just two lakes over three years – i.e., Lake Erie and at Keystone Lake about 60 miles east of Tulsa, Oklahoma in 1979, 1980, and 1982. At the 95 percent confidence level, results from these studies indicate the corresponding mean *E. coli* density for the WBCR-B protection level (i.e., 10 illnesses per 1,000 swimmers or 1.0% risk) range anywhere from approximately 120 col/100 mL to 500 col/100 mL (USEPA, 1984).

The 1986 criteria are also rooted in two unsupported assumptions (Wymer, 2007). This stems from the fact that USEPA set the 1986 *E. coli* criteria to have the same level of protection as the previously recommended fecal coliform criterion of 200 col/100 mL. The fecal coliform criterion was translated from a prior total coliform criterion, which was based on epidemiological studies dating back to 1948. In order to make this translation, in 1968 the National Technical Advisory Committee (NTAC) assumed fecal coliforms comprised about 18% of total coliforms in all waters (i.e., first unsupported assumption). Second, the NTAC arbitrarily halved the indicator density at which a detectable health effect occurred (i.e., from 400 to 200 col/100 mL in fecal coliform) assuming this would result in zero risk (i.e., second unsupported assumption).

The 1986 criteria have also been criticized as inapplicable for flowing waters, as they are based on studies from two lakes (i.e., Lake Erie and Keystone Lake) selected for the lack of nonpoint source pollution. Flowing waters (e.g., streams and rivers) present some unique challenges and characteristics that are not addressed by the 1986 criteria (USEPA, 2007a). Inland flowing waters are very diverse in terms of water flow, water volume, size, morphology of stream beds, land use, and anthropogenic impacts (WERF, 2009). Additionally, exposures in lakes and flowing waters differ. The 1986 criteria include no consideration for these differences such as providing allowances to reflect the differences in hydrologic regime (e.g., extreme high flows) (USEPA, 2007a).

In addition to the issues noted above, the lake studies supporting the 1986 criteria largely focused on POTW-impacted waters. However, the relative human health risks from exposure to recreational waters impacted by non-human sources or by poorly or untreated human fecal matter are not well understood (Soller et al., 2010; USEPA 2007b). A growing body of evidence suggests relative risks differ depending on the source (e.g., feces from fowl and some large

animals present substantially lower risk than from humans) (Soller et al., 2010). The 1986 criteria do not take these differences into account. Tools, such as quantitative microbial risk assessment (QMRA), could be employed to provide scientifically-defensible and valid criteria based upon actual human health risk. QMRA is a powerful tool for exploring the relative risks under different exposure scenarios (e.g., storm vs. non-storm event, *E. coli* from animal feces vs. POTW) (WERF, 2009). Given these considerations, the Department should reconsider bacteria targets in the future and adjust them as appropriate in subsequent TMDL revisions.

b. The TMDL target should consider the effects of bacteria source on human health risk.

Recent microbial risk assessments by USEPA contractors have shown that setting appropriate recreational indicator bacteria limits (i.e., corresponding to illness rates of 8-9 per 1,000 WBCR exposures) requires an understanding of bacteria sources (Schoen and Ashbolt 2010, Soller et al. 2010). As shown in Figure 4 from Schoen and Ashbolt (2010), when percent of bacteria from non-human sources (in this case gulls, as shown on the x-axis) is above roughly 80%, the cumulative illness risk (or the sum of the gull and human/sewage risk curves) is roughly half the USEPA's tolerable illness rate (as indicated by the "illness benchmark" horizontal line). Stated another way, when the percent of bacteria indicators from human fecal sources is low, default recreational criteria are overprotective and can be safely increased. Further supporting this understanding, as shown in Figure 3b from Soller et al. (2010), predicted illness risks associated with recreational contact with a variety of fecal sources all at uniform concentrations of 126 col/100ml *E. coli* indicate that illness rates (and therefore appropriate recreational limits) are very much a function of bacteria source. While some source tracking information is available within the USGS study, a phased TMDL approach would allow the collection of additional source data, which is essential given the very rough nature of the USGS source tracking methods.

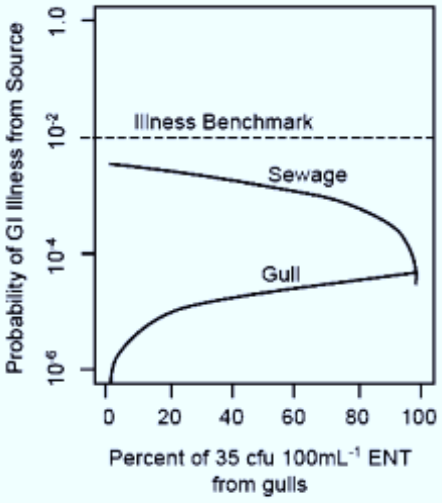


FIGURE 4. Comparison of median illness risk for adults when total ENT concentration (at 35 cfu 100 mL^{-1}) is attributed to a mixture of primary POTW effluent (sewage) and seagull feces (gulls).

Source: Schoen and Ashbolt (2010).

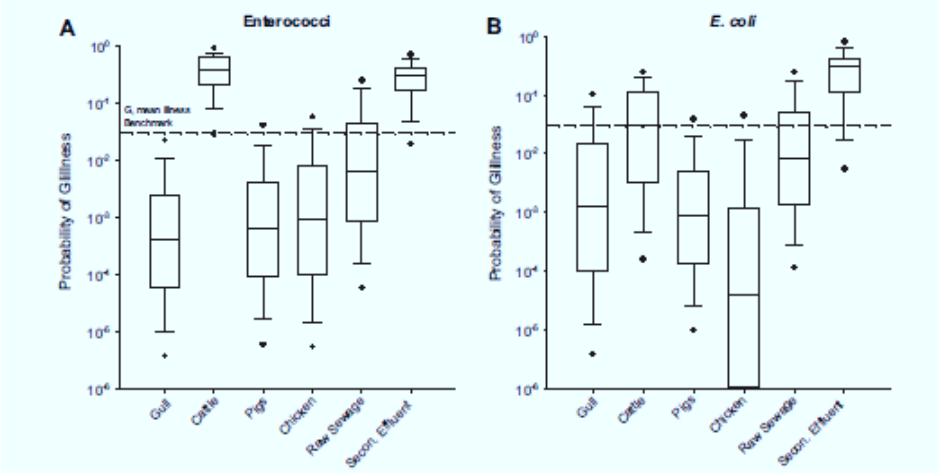


Fig. 3 – Run 2 probability of GI illness. Run 2 probability of GI illness from ingestion of water containing fresh faecal pollution at densities of 35 cfu 100 mL^{-1} ENT (3A) and 126 cfu 100 mL^{-1} *E. coli* (3B). Predicted risk (median, interquartile range, 10th and 90th percentiles, and 5th and 95th percentiles) for fresh gull, cattle and pig faeces, and chicken litter. Human impacts are presented for primary sewage (Human 1) and secondary disinfected effluent (Human 2). The illness benchmark represents a geometric mean probability of illness of 0.03.

Source: Soller et al. (2010)

In addition, we offer the following information regarding bacteria source and natural background contributions that substantiate selection of alternative water quality targets for TMDLs:

- California bacteria TMDLS that consider monitoring data from reference watersheds when setting criteria exceedance rates http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/bpa_78_R10-006_td.shtml).
- California Basin Plan Amendments that incorporate Natural Source Exclusion into Water Quality Standards http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/issue_7.shtml).

5. MODELING APPROACH, LOADING CAPACITY, LOAD AND WASTELOAD ALLOCATION, AND MARGIN OF SAFETY

a. The modeling approach and loading capacity calculated for Gravois Creek is inconsistent with Missouri's recreational water quality criteria and Total Maximum Daily Load guidance developed by the U.S. Environmental Protection Agency.

Missouri's MWBCR-B criterion (206 col/100 mL) is expressed as a recreational season geometric mean, with the stipulated recreation season spanning from April 1 to October 31 (10 CSR 20-7.031). Therefore, the bacteria criterion applicable to the currently classified segment of Gravois Creek has a seven-month averaging period.

Technical guidance developed by the USEPA (2007c) clearly indicates that development of the loading capacity curve should be calculated by multiplying the appropriate daily criterion by the average daily flow value. The Department apparently multiplied the seven-month criterion by a daily flow value to obtain the loading capacity for Gravois Creek.

In USEPA (2007c) guidance (see Appendix A), USEPA discusses approaches to convert non-daily criteria to daily values for use in the load duration curve approach. Included in Appendix B of USEPA (2007c) is a bacteria example calculation that converts a non-daily bacteria criterion to a daily value using statistical procedures outlined in USEPA (1986). Such an example is directly applicable to Gravois Creek.

While Missouri water quality standards do not include a short-term (e.g., daily) criterion for protection of WBCR-B, the process included in USEPA (2007c) should be used to develop a water quality target to evaluate loading capacity for a TMDL with the understanding that the recreational season geometric mean should be used to determine water quality standards compliance. The Department should recalculate the loading capacity (and TMDL components) for Gravois Creek based on an appropriate TMDL target that considers the correct averaging period. Such an approach should include development of a daily TMDL target based on statistical characteristics of bacteria datasets collected in Gravois Creek. An example of an alternative daily TMDL target analysis is provided in the next comment.

b. The load duration curve must be adjusted so that sample data and TMDL target have comparable averaging periods.

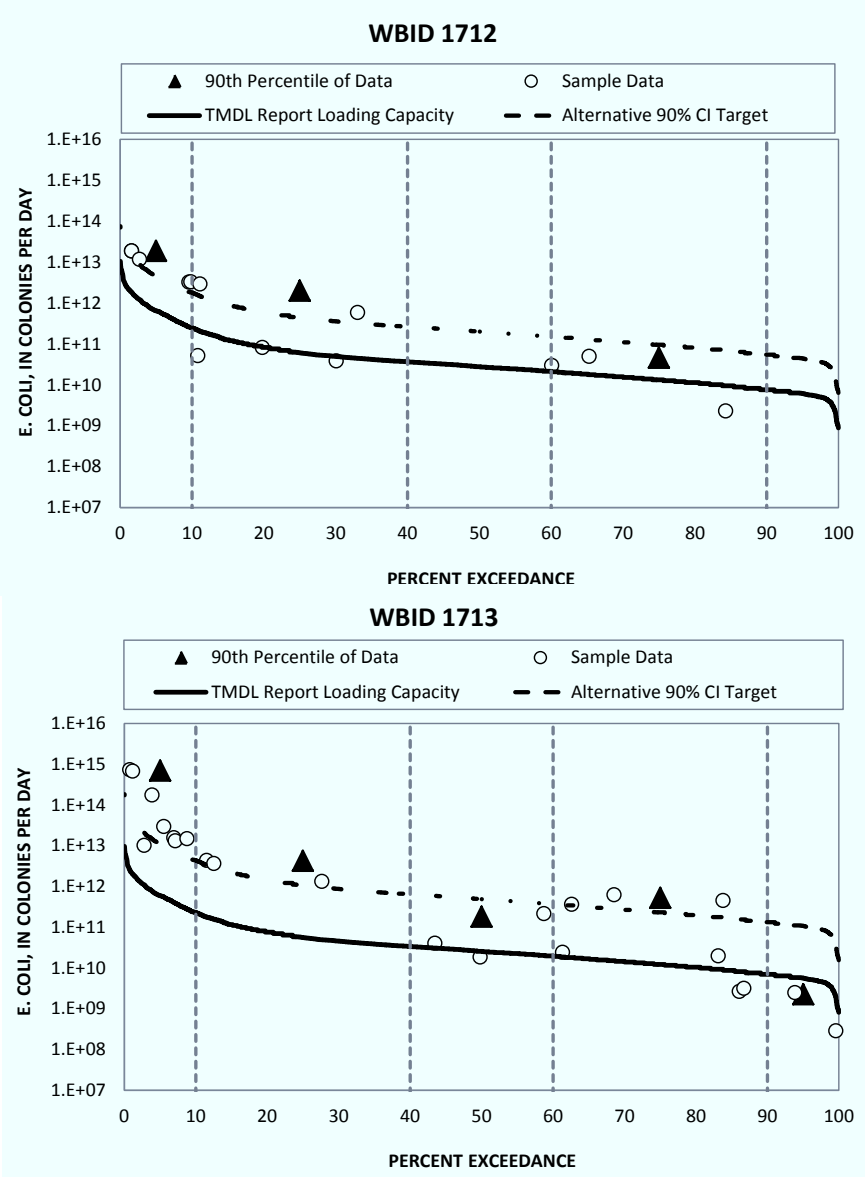
As discussed above, technical guidance developed by the USEPA (2007c) suggests that load duration curves should be calculated from data and criteria that have the same averaging period. Data used in the TMDL report did not have the same averaging period. In the TMDL, the Department multiplied the recreational season geometric mean criterion by a daily flow value to obtain the loading capacity for Gravois Creek. This loading capacity was then compared to daily bacteria measurements and geometric means of data from various daily flow exceedance intervals.

The correct way to calculate the TMDL would be to either 1) convert the bacteria and flow data into recreational season geometric mean values and compare them to the geometric mean water quality criterion or 2) convert the recreational season water quality criterion to a daily value and compare it to the daily data. Either method would provide a more accurate representation of existing loading conditions relative to intended water quality criterion. The first method of converting the sample data to a recreational season geometric mean is complicated by the fact that limited data are available from most years to calculate a representative geometric mean value. However, the second method of converting the average water quality criterion into a daily value is a straightforward process. Appendix B of USEPA's (2007c) technical guidance includes an example bacteria calculation that converts a non-daily bacteria criterion to a daily value using statistical procedures outlined in USEPA (1986). This example is directly applicable to Gravois Creek and is illustrated in the following paragraphs.

The USEPA (1986) method used to develop the alternative daily statistical targets for *E. coli* is based on both the inherent variability in water quality data (as measured by the log standard deviation) and the assumed log-normal relationship between the geometric mean and statistical maximum value of bacteria data. Once calculated, this statistical maximum value can be interpreted as a daily target that is protective of the long-term average criterion, even when it is exceeded a certain percentage of the time. The USEPA approach therefore also provides a method for assigning a degree of caution based on the expected use intensity of the water. For example, USEPA's 1986 method included a high degree of caution (75% confidence) that can be assigned for heavily used waters while a lower degree of caution (95% confidence) can be assigned for waters with limited use.

We applied this alternative target approach to data (log SD = 0.67 and 1.0 for WBID 1712 and 1713, respectively) collected from the two waterbody segments of Gravois Creek. The alternative target was developed using the 90% confidence interval (CI) factor as this level likely corresponds to infrequent use of Gravois Creek ("lightly used full body contact" from USEPA 1986). We view this as a highly conservative exercise since the District is not aware of any WBCR uses that have occurred within Gravois Creek.

The result of applying a daily alternative target significantly changes the interpretation of TMDL conclusions regarding loading capacity and potential reductions in Gravois Creek (see Figure below). By using a more correct daily TMDL target, we estimate that loading reductions are generally lower than those listed in MDNR's report. Additional consideration is also required for load reductions calculated from sample data skewed towards high or low flow events within each flow condition category. For example, in MDNR's TMDL and the figure below, geometric means of the loading estimates for each flow condition are calculated from, and represented by, the median flow frequency in each category. However, sampling data within are not evenly distributed across flows in each category. Calculating existing loads from the median value of flows actually measured within each category, rather than the default median value, would change load reduction estimates. For example, in the 10-40% flow category for WBID 1713, the existing load estimate would shift horizontally from the 25th percentile to approximately the 13th percentile based on actual flows measured, thereby significantly lowering load reduction estimates. Given the small number of samples available for each WBID, this calculation approach would result in more representative load reduction estimates. In addition, because the criterion is a recreational season geometric mean and calculated over the range of flow conditions, a number of load reduction scenarios could be applied across the various flow conditions on the load duration curve.



Comparison between the MDNR-calculated TMDL and Alternative Statistical Maximum 90% Confidence Interval Target for WBID 1712 and 1713 in Gravois Creek.

Note 1: Alternative targets for WBID 1712 and 1713 based on log SD of 0.67 and 1.0, respectively.
Note 2: There were inconsequential differences between the distributions of recreational season and annual flow data. To maintain consistency with the TMDL report, watershed-adjusted flow data used by Department were used to calculate both loading capacity curves.

If the Department chooses to retain the load duration curve approach, the approach should be adjusted so that the sample data and water quality criterion are expressed with the same averaging periods. The method outlined above is the most appropriate way to express the data and criterion as daily values while still maintaining consistency with the recreational geometric mean water quality criterion.

c. Methods used to determine the loading capacity result in a Margin of Safety that is unrealistic, excessive, and significantly overestimates uncertainty.

As noted in an earlier comment, the loading capacity curve depicted in the TMDL is apparently based on use of the 206 col/100 mL geometric average. In other words, the 206 col/100 mL target could be considered a daily not-to-exceed target. By implementing the criterion as a daily value, the Department is protecting a geometric mean condition well below the WBCR-B criterion according to USEPA (1986) guidance. By using this approach, the implied geometric mean target is 6 and 1 col/100 mL, for WBID 1712 (0.67 log standard deviation) and 1713 (1.0 log standard deviation), respectively. Such an assumption is equivalent to an unrealistically large and scientifically unsupportable margin of safety between 34 and 206 times greater than intended by the current draft of the TMDL.

d. The load duration curve approach provides a very limited linkage between watershed processes and bacteria fate and transport mechanisms.

The load duration curve approach for TMDL development may be an expedient means to determine TMDL components. However, quantitatively evaluating improvements likely to result from implementing management scenarios (e.g., land use practices, structural Best Management Practices, sanitary sewer improvements, etc.) is precluded by this empirical approach. In comparison, a numerical watershed model (e.g., SWAT, HSPF, SWMM, etc.) provides a quantitative link between watershed improvements and calculated changes in bacteria densities. A watershed model offers several implementation advantages over a load duration curve approach including but not limited to: (1) a more accurate estimate of loading capacity during the recreational season, (2) identification of critical source areas, (3) consideration of fate and transport mechanisms, (4) a framework to assess data collected at different times/locations (i.e., Gravois Creek), (5) a framework to allocate loads to meaningful discharge categories, and (6) optimization and selection of management scenarios to help best achieve water quality standards with available resources.

Achieving the currently proposed TMDL load reductions in Gravois Creek would take decades (or longer), require significant investments, and would not allow resources to be targeted at restoring uses during the periods where the creek is most likely to be used for recreation (low flows). The TMDL should be based upon a meaningful tool that links in-stream criteria with the landscape processes that generate and transport bacteria. A more robust modeling tool is needed to deal with the complexities of bacteria fate and transport in an urban environment, and to avoid an arbitrary result and unnecessary and costly expenditures that would be unsupported by a meaningful reduction in risk or other benefits to human health or the environment.

e. The Gravois Creek TMDL should consider feasible management options and actual risk during wet weather conditions.

According to Cleland (2002) as cited by TCEQ (2007), the upper parts of the load duration curve may represent flow conditions that exceed feasible management. Specifically, the experts that TCEQ enlisted state in their report:

> "Exceedances occurring at the low flows may require regulatory actions to control point sources. At the mid range and high flows, management measures directed towards nonpoint sources could be developed. At some point in the flow frequency, control of pollutant sources becomes unfeasible. Pollutant loadings at these high flow events

typically exceed design specifications for control actions. For this reason, it may be reasonable to exclude data and loadings that occur at flooding conditions."

In addition, we note that high flows may also represent reduced illness risk because: (1) whole body contact recreation may be non-existent, and (2) velocities may exceed those considered safe for swimming by Hyra (1978). The Department should consider these factors that present lower risk during 0% to 10% exceedance interval when estimating load reduction needs. A revision should be implemented by selecting a higher confidence interval when identifying a daily TMDL target using USEPA (1986) bacteria criteria guidelines.

f. Wasteload allocations and TMDL targets must consider natural sources.

Pathogenic indicator bacteria, such as *E. coli,* are contributed to streams, rivers, and lakes by various sources including natural sources (e.g., deer, raccoons, waterfowl, soils, sediments, plants, and decaying organic matter, etc.). Natural or wildlife contributions should be considered when setting TMDL bacteria targets and developing wasteload allocations. The District submits that the Department must evaluate natural bacteria loads and the corresponding human health risks. Such evaluations must be used to make appropriate wasteload allocations for stormwater permittees.

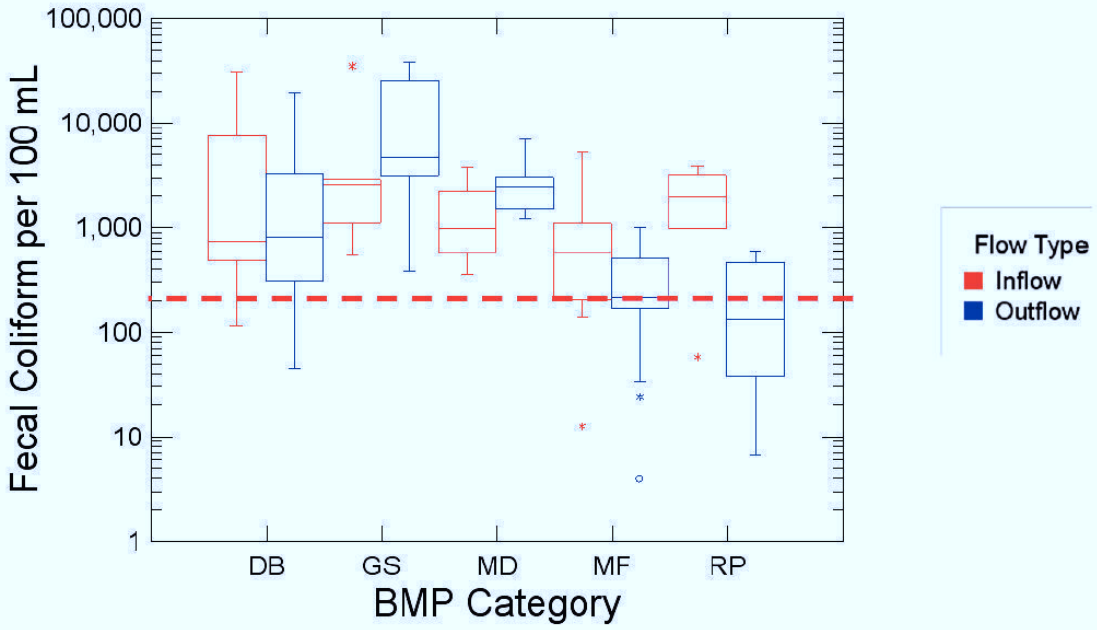
g. Wasteload allocation and implementation expectations must consider the limitations of treatment provided by structural and non-structural best management practices.

The District believes that technical feasibility must be considered when implementing any TMDL provisions into MS4 permits. Such a position is supported by the Maximum Extent Practicable (MEP) standard and minimum control measures approach embodied in the Clean Water Act. The reality of the MEP standard is supported by results generated by the International Stormwater Best Management Practice (BMP) Database (BMP DB). The BMP DB is a warehouse for performance data of various urban stormwater BMPs. Recently, data from the BMP DB were used to evaluate the performance of various structural BMPs in treating bacteria (see below for figure, with permission). Results from this analysis suggest that typical flow-through and passive control BMPs may not be capable of consistently achieving WBCR criteria, depending upon the expressed average period or duration. The ability of other BMPs, such as infiltration or capture/reuse systems, are constrained by soil infiltration conditions, available open space, land availability, reuse opportunities, and infrastructure or utility conflicts. The MEP standard must be employed in implementing MS4 controls, including the development and implementation of the Gravois Creek TMDL.

Please note that the entire BMP DB report on Fecal Indicator Bacteria can be found at:

http://www.bmpdatabase.org/Docs/BMP%20Database%20Bacteria%20Paper%20Dec%202010.pdf

Figure 11. Box Plots of BMP Study Geometric Means for Fecal Coliform by Selected BMP Category



Notes: **DB** = Detention Basin; **GS** = Grass Strip/Swale; **MD** = Manufactured Device; **MF** = Media Filter; **RP** = Retention Pond

h. The TMDL should be revised to exclude extremely high flow events.

During high stream flows (which occur less than 10% of the time), high stream velocities (greater than 2 feet per second or fps) will exceed those necessary for safe recreation (Whole Body Contact Recreation) in segments of Gravois Creek. It is arbitrary and unreasonable to require the highest bacteria percent reduction (Table 9) when it may be unsafe for recreation. The Missouri Effluent Regulations (20 CSR 10-7.015) recognize this situation by allowing a "temporary suspension of accountability for bacteria standards" during periods of wet weather. With this comment, the District notes the 90th percentile flow in WBID 1712 (49.9 cubic feet per second, or cfs) will likely yield average velocities of approximately 3.5 fps, respectively, and that peak velocities (i.e., kurtotic urban hydrograph) will be even higher.

The District is very concerned that the TMDL could result in stormwater management requirements that go beyond those already adopted for compliance with the MS4 permit (e.g., requiring capture and treatment of volumes greater than 90th percentile daily storm depth). Such additional requirements exceed the MEP provisions of the District's MS4 permit and extend beyond the intent of the Phase II stormwater regulations. Thus, the draft TMDL may create stormwater performance objectives that are arbitrary, and are not required by law, not enforceable, and not even necessary to protect recreational uses. The Department should reevaluate the load reduction targets for flows that are generated by precipitation events greater than the 90th percentile storm.

i. It is not clear if sanitary sewer overflows (SSOs) are included in the wasteload allocation.

On page 26 (second paragraph), the draft TMDL indicates that wasteload allocations for SSOs are considered zero. In the following sentence, the Department states that SSOs are included in

the wasteload allocation. These two sentences appear to be contradictory and should be clarified.

j. It is arbitrary and unrealistic to assign permit holders a wasteload allocation equal to zero.

Section 7 suggests that permit holders listed in Table 5 are to be prescribed a wasteload allocation of zero. No scientifically supportable TMDL allocation scheme or technical basis supports a wasteload allocation of zero. The District notes unavoidable natural background loads, the limits of treatment achievable through implementation of structural BMPs, and the need for a watershed model to distribute wasteload allocations to spatially explicit locations or discharge categories. All permitted entities, including the Missouri Department of Transportation, must be assigned wasteload allocations. In addition, the municipal MS4 co-permittees should also be included in the wasteload allocations.

k. The wasteload allocation included in the TMDL is inaccurate given the technical concerns with the load duration curve approach.

The wasteload allocation assigned to the District's MS4 permit was based upon the load duration curve approach. As described earlier, the District has significant concerns over these calculations and asserts that all wasteload allocations should be reevaluated accordingly.

6. IMPLEMENTATION PLAN

a. Maximize grant funding to assist with TMDL implementation.

The District understands that Section 319 grant funding guidance requires that grant awards be directed at addressing nonpoint source pollution concerns and watershed restoration activities. The TMDL indicates the watershed does not include any nonpoint source discharges, but this does not mean that Section 319 funding is not available to help with TMDL implementation activities. Section 319 grant guidance published by EPA (see 68 FR 205) specifically states:

> "Section 319 funds may be used to fund any urban stormwater activities that are not specifically required by a draft or final NPDES permit."

The section also describes other urban runoff management activities that could be eligible for Section 319 funding, including technical assistance to local stormwater programs, monitoring needed to design and evaluate the effectiveness of implementation strategies, best management practices for pollution prevention and runoff control except those required by a draft or final permit, information and education programs, technology transfer and training, and development and implementation of policies, regulations, and local ordinances to address stormwater runoff. The Department should more explicitly state what 319 funding will be sought and how that funding could be used to assist in TMDL implementation efforts.

b. TMDL implementation should allow sanitary sewer improvements to proceed prior to other restoration activities.

The District strongly urges the Department to postpone TMDL implementation to allow sanitary sewer improvement efforts to be completed. The District, USEPA, the Department, and with some input from the Missouri Coalition for the Environment (as well as the District stakeholders) spent several years determining the best approach to developing and implementing sanitary sewer improvements. This approach, as well as a post-construction monitoring plan, is

embodied in a Federal Consent Decree. After all SSO projects have been completed, the CMOM Program has been fully developed and implemented, and in-stream water quality has been assessed for at least two years, the Department should evaluate whether the creek is impaired and delist the creek if appropriate, to the extent it is not already delisted after correction of the data and other errors noted above**.** If the creek is impaired, then the TMDL should be revisited and the requirement to move forward with load reduction efforts may be appropriate via the addition of enhanced MS4 program implementation and BMPs. This could include more focused illicit discharge detection and elimination, conducting sanitary surveys, addressing septic system failures, and other bacteria-focused BMPs.

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

The District believes that it is possible to develop a more accurate, site-specific water quality target for the TMDL that is protective of human health for Gravois Creek and allows the District and other stakeholders to more efficiently target limited financial resources across all of MSD's watersheds. This can be accomplished through the use of state-of-the-art quantitative polymerase chain reaction (qPCR) detection methods, human-specific indicator or marker species measurements, pathogen measurements (if needed), quantitative microbial risk assessment and the latest microbial source tracking techniques. This is also discussed in item 4.a above. The Department should include at least a two to three year period in the implementation schedule to allow this to be completed.

d. The TMDL should be re-written to be a phased TMDL that includes revision of the water quality target(s), collection of additional data and information, and adjustments to the wasteload and load allocations.

The Gravois Creek TMDL and all subsequent TMDLs that the Department develops for waterbodies within the District's service area will impose requirements on the District and other stakeholders to reduce pollutant loads. The Department should recognize that in most instances, the District's ratepayers will bear a disproportionate burden for implementing the TMDL. USEPA's new integrated municipal stormwater and wastewater planning approach (USEPA 2012) is intended to help states and communities

> "assist municipalities on their critical paths to achieving the human health and water quality objectives of the Clean Water Act by identifying efficiencies in implementing requirements that arise from distinct wastewater and stormwater programs, including how to best prioritize capital investments."

The TMDL does not fully integrate, and may not be sufficiently consistent with, the Federal Consent Decree that binds the District along with USEPA and the Coalition. This decree addresses mitigation of sanitary sewer overflows and post-construction monitoring which will help ensure that any recreational use impairments in Gravois Creek are addressed. The implementation plan for the TMDL should also consider the additional requirements for stormwater sources that will be imposed through the District's MS4 program. The implementation plan must also include further source characterization, monitoring, assess beneficial use attainment, sanitary sewer improvements and CMOM efforts, and evaluation of on-site wastewater systems. Because of the disproportionate cost that the District's ratepayers are bearing, additional stormwater controls should only be pursued if needed and appropriate and after "lower hanging fruit" controls have been identified.

Given USEPA's new framework, it appears that the Department has added flexibility to integrate the Gravois Creek TMDL and other urban stream TMDLs within the District's service area into a more comprehensive facility planning approach for the District. Under USEPA's framework, there are many options that could be considered. The District recommends that the Department conduct a stakeholder meeting(s) on these options to evaluate how best to consider this new approach with respect to restoring urban streams within the District's service area.

e. The timing and necessity for TMDL issuance and implementation must **take into account Consent Decree obligations and resource allocations.**

The District is presently implementing water quality improvements prescribed by a Federal Consent Decree. These improvements will further reduce bacteria concentrations in Gravois Creek. Issuance and implementation of the TMDL prior to completing the referenced improvement arbitrarily creates the potential for resource allocation conflicts. These conflicts arise from the coarse TMDL source and allocation analysis dictated by the load duration curve method. In other words, the TMDL does not thoroughly quantify the relative contributions from various source categories, permittees, or critical subwatersheds. Attempting to implement a TMDL without a meaningful source analysis has the potential to divert resources away from areas or sources most in need of improvement. Therefore, any TMDL implementation plan must incorporate and include Consent Decree requirements and improvements, CMOM activity, and monitoring of the resulting stream water quality prior to any additional efforts to improve wet weather conditions.

f. The potential cost, technical complexity, and stakeholder interest in the TMDL warrants additional public participation.

The District notes that Missouri's Public Participation Plan stipulates that public meetings be held when appropriate. Further, because the Department is developing a standard, a public hearing opportunity is required under RSMo Section 644.036. Moreover, the District believes that public meetings are appropriate due to the potentially significant infrastructure planning and capital costs associated with implementing the TMDL. For the purposes of rough estimation, we estimate that installing stormwater treatment retrofits to the MEP could cost from $10,000 to $30,000 per developed urban acre. This estimate was based upon rough local cost calculations and costs gathered from other MS4 programs that have TMDL drivers. Since the Gravois Creek watershed is composed of approximately 11,700 urban acres, the District is concerned that the cost of stormwater implementation could range from $117 million to $351 million. Therefore, public meetings are certainly warranted and appropriate prior to finalizing the TMDL. The District requests to move forward in a collaborative manner with the Department in developing TMDLs for waters within or intersected by District boundaries.

g. The implementation plan should target the water quality criterion, rather than specific load reductions, as its ultimate goal.

Section 12 of the TMDL report indicates that the TMDL is considered to be successfully implemented when loading reductions listed in Table 9 are achieved. The District understands that the purpose of the TMDL process is to identify loading levels needed to meet water quality standards, and that achieving the estimated reductions should result in standards being attained. However, given the technical issues and uncertainties associated with the MDNR's TMDL development approach, water quality standards likely will be achieved well before all loading reductions in Table 9 are met**.** As noted above, they are already achieved for WBID

1712. The District requests that the Section 12 should be modified to state that the TMDL is considered to be successfully implemented when water quality standards, rather than the estimated loading reductions, are achieved.

7. REASONABLE ASSURANCE

a. The TMDL should include other District actions planned for the watershed in the discussion about reasonable assurance.

The TMDL does not address the actions that MSD is required to take in the Gravois Creek watershed (and other watersheds) under the above referenced Federal Consent Decree that must count towards reasonable assurance that the TMDL will be implemented. These actions include sewer lining, supplemental environmental projects, sanitary sewer improvements, continued development and implementation of a CMOM Program, as well as other actions. TMDL requirements must be integrated with the Federal Consent Decree obligations to avoid conflicting obligations, unnecessary expenditures, and other arbitrary and/or duplicative requirements.

b. The TMDL should rely on the maximum extent practicable (MEP) standard for reasonable assurance in stormwater permits.

The District is very concerned about the mention of *effluent limits* in stormwater permits in the discussion of reasonable assurance. In 1987, Congress amended the Clean Water Act (CWA) to expand the National Pollutant Discharge Elimination System (NPDES) permitting program to include pollutants discharged in certain types of stormwater runoff. Section 402(p) was added, which states, in part:

> ***§ 402(p) Municipal and Industrial Storm Water Discharges. (3) Permit Requirements.***
>
> ***(A) Industrial Discharges.*** *Permits for discharges associated with industrial activity shall meet all applicable provisions of this section and section 301 [Related to effluent Limitations].*
> ***(B) Municipal Discharge.*** *Permits for discharges from municipal storm sewers (i) may be issued on a system- or jurisdiction-wide basis; (ii) shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers; and (iii)* ***shall require controls to reduce the discharge of pollutants to the maximum extent practicable****, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants [emphasis added].*

The stormwater permitting program defined in the statute explicitly incorporated the phrase "*reduce the discharge of pollutants to the maximum extent practicable*" (known as the MEP standard) into the regulations and the resulting permits. The District believes that the CWA only imposes the MEP standard on MS4 permit holders and that the imposition of effluent limitations in municipal stormwater permits is not authorized. Section 402(p)(A) regarding discharges associated with industrial activities clearly references the Section 301 effluent standards (rather than the MEP standard), whereas Section 403(p)(B) regarding discharges from municipal storm sewers employs the MEP standard (rather than the 301 effluent standards). The imposition of effluent limits on MS4 permit holders would not comply with Section 402(p), and will exceed the Department's jurisdiction and authority.

Based on the applicability of the MEP standard, the District urges the Department to include reference to the MS4 being revised to include the implementation of appropriate and incremental BMPs to reduce the discharge of pollutants from the municipal storm sewer system to the maximum extent practicable, but only if, after sanitary sewer improvements and other required efforts are complete, water quality does not meet applicable water quality standards.

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Non-Sewered Property within Gravois Creek Watershed, June 2012

Category	Parcel Count	Percent of Parcels	Acres	Percent of Acreage
Confirmed Non-Sewered	207	1%	461.71	4%
MODOT R.O.W.	18	0%	538.98	4%
Sewered	28,885	95%	11,006.21	84%
Unconfirmed Non-Sewered	1,366	4%	1,112.18	8%
	30,476		13,119.07	

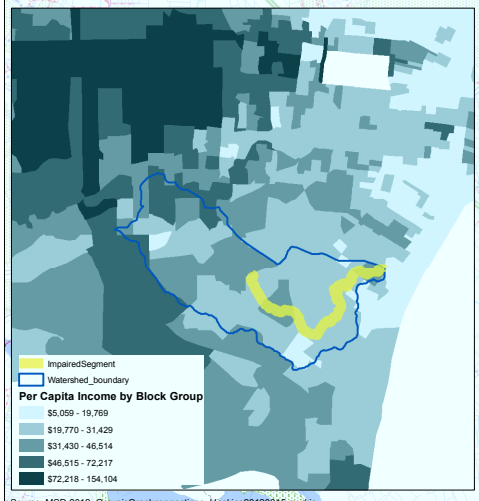
Gravois watershed total impervious = 35.6%

Legend

- Constructed SSO
- Watershed_boundary
- Sanitary sewer, Active
- Storm sewer, Active
- Improved Channel
- Unimproved Channel
- Other BMP
- Bioretention/Raingarden
- Permeable Pavement
- ImpairedSegment
- Openspace
- Structures
- Open Water

Watershed Parcels

- Confirmed Non-Sewered
- Unconfirmed Non-Sewered
- MODOT R.O.W.
- Sewered



Source: MSD 2012, GravoisCreekconnections_Hoskins20120615.mxd jc

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0 1,150 2,300 4,600 6,900 9,200 Feet

HOME BUILDERS ASSOCIATION OF ST. LOUIS & EASTERN MISSOURI

10104 OLD OLIVE STREET ROAD

ST. LOUIS, MISSOURI 63141-5908

314 994 7700

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July 30, 2012

John Hoke, Chief, Watershed Protection Section
Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176
Jefferson City, MO 65102

Public Comments for Total Maximum Daily Load for Gravois Creek, St. Louis County and City of St. Louis, Missouri

Dear Mr. Hoke:

On behalf of the Home Builders Association of St. Louis and Eastern Missouri (HBA) and its 600 member companies, I thank you for the opportunity to provide comments in response to the Missouri Department of Natural Resources' proposed Total Maximum Daily Load (TMDL) for Gravois Creek.

The HBA's membership consists of firms that participate in all levels of residential development and construction. Members live and work in the communities in which they build, and regularly plan and design projects to optimize environmental protection and resource conservation. The HBA supports the Missouri Department of Natural Resources in its consistent efforts to preserve the state's natural assets. However, the HBA respectfully requests that the proposed Gravois Creek TMDL be rescinded and/or revised because a substantial portion of Gravois Creek is not "impaired" and because it contains several technical and implementation defects.

The HBA finds concerns with draft TMDLs for waterbodies within the City of St. Louis and St. Louis County because these TMDLs can be detrimental to future development. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, the HBA believes the Missouri Department of Natural Resources should delay finalizing area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) have been completed.

Specifically, for Gravois Creek, the HBA believes this TMDL is not needed for Gravois Creek Waterbody Identification (WBID) 1712 based on available water quality data. Additionally, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or to develop a TMDL. If the Department continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.
- Correction of a data entry error for WBID 1712 shows water quality meets recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.
- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.

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- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

The HBA appreciates your willingness to consider comments from the home building industry. Like the Missouri Department of Natural Resources, the HBA believes Missouri waters should be protected through the application of sound science and stakeholder input. In support of this approach, the HBA requests meaningful public participation be sought and that at least one (or as many as needed) public meeting be hosted to determine and justify the need for a TMDL. Additionally, before any TMDL is finalized, the HBA believes the defects and concerns noted above must be addressed. Do not hesitate to contact me if you have any questions or would like to further discuss. I can be reached at 314.994.7700 ext. 116 or SchwartzeE@hbastl.com.

Regards,

Emily Schwartze Post

Emily Schwartze Post
Assistant Staff Vice President for Public Policy

cc: HBA Environmental Affairs Committee
HBA St. Louis County Board of Trustees
Pat Sullivan, Executive Vice President, HBA
Emily Wineland, Staff Vice President for Public Policy, HBA

WE BUILD NEIGHBORHOODS
HBA

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July 30, 2012

Mr. John Hoke
Chief, Watershed Protection Section
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Subject: Public Comments for Total Maximum Daily Load for Gravois Creek located in St. Louis County and St. Louis City, Missouri

Dear Mr. Hoke:

This comment letter is offered into the administrative record during the public notice period associated with the Gravois Creek Total Maximum Daily Load ('TMDL') proposal. With this letter, St. Louis County requests the Missouri Department of Natural Resources rescind and/or revise the TMDL because a substantial portion of Gravois Creek is not "impaired" and because the proposed TMDL contains several technical and implementation defects.

St. Louis County appreciates MoDNR's efforts to protect Missouri's water resources. However, we believe that the Gravois Creek TMDL is not needed for Gravois Creek Waterbody Identification ('WBID') 1712 based on available water quality data. In addition, insufficient data are available for the remaining classified segment (WBID 1713) to determine use attainment or develop a TMDL. We are also concerned about the potential impacts of the currently proposed Gravois Creek TMDL and several other draft TMDLs for waterbodies within St. Louis City and County. Given the complexity and potential cost of implementing bacteria TMDLs in urban areas, MoDNR should delay finalizing any St. Louis area TMDLs until additional public participation activities (e.g., public meetings, workshops, etc.) are completed. If MoDNR continues to insist on finalizing a Gravois Creek TMDL, the following list of technical defects and concerns must be addressed:

- The limited data available from Gravois Creek do not adequately characterize bacteria sources or account for water quality changes associated with the 2009 CSO removal project and are insufficient for calculating scientifically defensible TMDL components.
- Correction of a data entry error for WBID 1712 shows water quality meets the recreational use criterion; the WBID 1712 segment of Gravois Creek in the proposed TMDL therefore supports its beneficial use and should be taken off the impaired waters list.

- The TMDL approach does not adequately distinguish between bacteria sources within the watershed. Distinguishing between such sources is necessary to ensure that implementation efforts will achieve the water quality target.
- The final TMDL must not include requirements that exceed the "maximum extent practicable" provisions within the St. Louis Metropolitan Small Municipal Separate Storm Sewer System (MS4) permit, extending beyond the Phase II stormwater regulations.
- The TMDL must use an adaptive management approach that includes implementation activities based upon achieving the highest water quality improvements at the lowest cost.

We appreciate the opportunity to provide these comments. St. Louis County is committed to working with MoDNR to ensure that Missouri's waters are protected through application of good science and stakeholder input. In support of this approach, St. Louis County requests meaningful public participation be sought and that at least one (or as many as may be needed) public meeting be hosted by MoDNR to determine and justify the need for a TMDL and to further address the defects and concerns noted above, before any TMDL is finalized. Please contact Glenn Powers at 314.615.2515 if you have any questions or would like to discuss these issues further.

Sincerely,

Charlie A. Dooley
County Executive

Cc: Garry E. Earls
Sheryl Hodges D.E., P.E., L.P.G
Glenn Powers
Gail Choate
Ray Gawlik