State of Missouri

Regulatory Impact Report for Proposed Rule Amendment 10 CSR 20-7.031 Water Quality Standards

Missouri Department of Natural Resources
Water Protection and Soil Conservation Division
Water Protection Program

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Basic Rule Information

Program/Division: Water Protection Program, Division of Water Protection and Soil Conservation

Rule Number: 10 CSR 20-7.031 **Rule Title:** Water Quality Standards

Type of rule: Proposed Amendment Revision

Submitted by: Clean Water Commission

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Introduction

This Regulatory Impact Report (Report) was written to comply with Chapter 640.015 RSMo and is a means to provide to the public and interested parties the information on rule development within the Missouri Department of Natural Resources (the department). It is a summary of the information, discussion, input, and rationale used by the department in development of a draft rule. The goal of this Report is to ensure accountability, consistency, and transparency in the rulemaking process. The distribution of the Report makes this information readily available to a wide audience in a timely manner.

The Code of Federal Regulations at 40 CFR 131.20 requires a state to review its water quality standards at least once every three (3) years (Triennial Review). Missouri's Water Quality Standards (WQS) were last revised in 1994 and 1996. On September 8, 2000, the United States Environmental Protection Agency (EPA) officially disapproved some revisions made to the WQS in 1994 and 1996, saying that certain portions were inconsistent with the Federal Clean Water Act (CWA or Act).

The department responded by providing a three-phase schedule that outlines the order that it will address changes demanded by EPA as well as other issues. This proposed amendment is the first phase of this process. In 2001, the department held six stakeholder meetings to receive public input regarding potential changes to the WQS as part of the triennial review process. In addition, a stakeholder group of environmentalists, agriculturists, scientists, permittee representatives, and other interested groups discussed the whole body contact recreational use issue during the autumn of 2003. Further discussions on these revisions occurred during the drafting of this Report on January 18, January 27 and February 4, 2005. Minutes of these discussions are included as attachments to this report.

EPA may rectify these and other disapproved items by federal rulemaking if the state does not do so. In addition, the Missouri Coalition for the Environment has sued EPA to compel the state, through EPA, to promptly comply with many of the items explained in EPA's September 8, 2000, letter.

Regulatory Impact Report

1. **Does the rulemaking adopt rules from the US Environmental Protection Agency or rules from other applicable federal agencies without variance?**

   This rulemaking would establish new state standards for waters of the state that are functionally equivalent to the federal Clean Water Act, rules and/or guidance. Because the exact wording from the federal standards was not adopted in the department's draft rule in every instance, several revisions are not considered to be written "without variance" from federal rules. Consequently, the department does not believe this rulemaking qualifies for a complete exemption from the requirement to prepare a Regulatory Impact Report. The following paragraph provides an explanation of why this rulemaking was initiated and why, for the most part, the state adopted federal guidance as a basis for much of the draft rule.

   The Code of Federal Regulations at 40 CFR 131.20 requires a state to review its WQS at least once every 3 years. Missouri's WQS were last revised in 1994 and 1996. On September 8, 2000, the United States Environmental Protection Agency (EPA) officially disapproved some revisions made to Missouri's WQS in 1994 and 1996 that were inconsistent with the CWA. This rulemaking is an effort to resolve these disapprovals and inconsistencies so that the state's rules are functional equivalent to the CWA and federal rules. To achieve this equivalence, the state must either adopt federal rule or guidance, or develop alternate rules that are based on an equal level of structured scientific analysis applied to the development of the federal standards. Because the state does not have the resources to perform scientific research at that level, it has chosen to directly adopt federal standards as the new state standards. In doing so, it also adopts the science used by EPA experts in the development of the federal standards.

2. **Report on peer-reviewed scientific data used to commence the rulemaking process.**

   A list of the information used to develop the rule, including technical documents and data, as well as a statement on how this information was used, is included as **Appendix A**. Because the majority of the proposed rule was drafted in accordance with EPA guidance, the reader may wish to contact EPA (our visit their web site) for any available records that explain the science and peer reviews used by EPA in developing their guidance. To make this science easier to find, some of the references shown in **Appendix A** are specific to the section, page or portion of the federal guidance that applies to the new state standard.

   Federal guidance was not the only basis for the draft rule. The rule also follows the advice of the Clean Water Commission (CWC) provided during public meetings (**Appendix B)**. In addition, some of the language was chosen in response to public input. In 2001, the department held twelve (12) stakeholder meetings to receive public input regarding potential changes to the WQS due to of the triennial review process (Table 1). Minutes from these meetings and a list of attendees are attached as **Appendix C**.

Table 1. Stakeholder Involvement Meeting Schedule, 2001

Date	Location	Time	Topics of Discussion
April 3, 2001	Jefferson City	1:30 – 4:00 p.m.	Aquatic Life Metals Criteria; Hardness Ranges
April 17, 2001	Columbia	1:30 – 4:00 p.m.	Drinking Water Metals; Dissolved Oxygen
May 1, 2001	Jefferson City	9:30 – 11:30 a.m.	Whole Body Contact Use; High Flow Exemptions
May 14, 2001	Jefferson City	1:00 – 4:00 p.m.	Channel Modification; Sand/Gravel Excavation Guidelines
June 5, 2001	Jefferson City	9:30 – 11:30 a.m.	Outstanding National Resource Waters; Wetlands Criteria; Mitigation Guidelines
June 19, 2001	Columbia	1:30 – 3:30 p.m.	Water Quality Standards
October 24, 2003	Jefferson City	1:00 – 4:00 p.m.	Whole Body Contact Use Designation
November 4, 2003	Jefferson City	9:30 – 11:30 a.m.	Whole Body Contact Use Designation
January 18, 2005	Jefferson City	10:00 a.m. – 4:00 p.m.	Regulatory Impact Reports
January 27, 2005	Jefferson City	10:00 a.m.– 4:00 p.m.	Regulatory Impact Reports and Draft Rulemaking
February 4, 2005	Jefferson City	8:00 – 10:00 a.m.	CSO Workgroup
February 4, 2005	Jefferson City	9:30 – 11:30 a.m.	Regulatory Impact Reports and Draft Rulemaking

Meetings with the CWC members, stakeholders, EPA, and department staff resulted in the draft changes to Missouri's WQS. Stakeholders involved in this process included individuals from community associations, environmental consulting firms, academia, federal agencies, industrial groups, law firms, media groups, municipalities, environmental organizations, the public, and state agencies. A list of those individuals and organizations involved is included in the meeting minutes (**Appendices B & C**).

Listed below are other sources of information from the public, CWC members, department staff and EPA that helped to develop this rulemaking. This information consisted of letters, emails, phone conversations, meeting minutes, guidance documents, and other documents filed in the WQS file located within the Water Protection Program.

1. September 8, 2000, letter from U.S. Environmental Protection Agency (EPA) that approved and disapproved parts of Missouri's WQS.
2. The department's response to EPA review of the Missouri's WQS.
3. Stakeholder meetings minutes as listed in Appendix C.

4. Commission Meeting Minutes as listed in Appendix B.
5. WQS draft changes file folders (2), which contain several versions of the draft changes.
6. Rulemaking documents file folder, which contains memos and letter associated with the rulemaking process of internal review and formal submittal.
7. EPA correspondence file folder, which contains emails and letters of correspondence between the department and EPA.
8. Missouri Coalition for the Environment Sunshine Request file folder, which contains the formal Sunshine Request and related document locations.
9. Sierra Club Petition to EPA file folder, which contains the formal petition and documents associated with it.
10. Missouri Coalition for the Environment Intent to Sue and Lawsuit file folder, contain the intent to sue, formal lawsuit, and related documents explaining the lawsuit.
11. Lawsuit Documents file folder, which contains the original department copy of documents used as part of the lawsuit's exhibit of evidence.
12. WQS Presentations file folder, which contains copies of notes and PowerPoint presentations used to explain the draft changes to the WQS.
13. Meetings pertaining to WQS file folder, which contains notes of department and public meetings related to the WQS.
14. WQS Stakeholder Address List file folder, which contains a list of individuals contacted in 2001 and 2003 to be part of the stakeholder process and others who wish to be notified of upcoming meetings and/or information dissemination.
15. Table A—Water Quality Criteria file folder, which contains the reason and documentation for the draft changes to the chemicals listed in Table A brought up by the department, CWC, other agencies, public, and EPA.
16. Table B—Ammonia file folder, which contains comparison of the criteria used in neighboring states, discussion of rulemaking language, and the recommended criteria from EPA.
17. *Ambient Water Quality Criteria for Ammonia—1984*, EPA 440/5-85-001, January 1985, which is an extra copy of the currently adopted ammonia water quality criteria to keep with the WQS files.
18. *1999 Update of Ambient Water Quality Criteria for Ammonia*, EPA 822-R-99-014, December 1999, which is an extra copy of the newly recommended ammonia water quality criteria to keep with the WQS files.
19. Table C—Cold Water Fisheries file folder, which contains the reason and documentation for the draft changes brought up by the department, CWC, other agencies, public, and EPA.
20. Table E—Outstanding State Resource Waters file folder, which contains the reason and documentation for the draft changes brought up by the department, CWC, other agencies, and public.
21. Table G—Lake Classifications and Use Designations file folder, which contains the reason and documentation for the draft changes brought up by the department, CWC, other agencies, public, and EPA.
22. Table H—Stream Classification and Use Designations file folder, which contains the reason and documentation for the draft changes brought up by the department, CWC, other agencies, public, and EPA.

23. Table I—Biocriteria Reference Locations file folder, which contains the reason and documentation for the draft changes brought up by the department.
24. Outstanding National Resource Waters file folder, which contains several versions of and information related to the draft rulemaking language.
25. Metals: drinking water supply file folder, which contains information related to the criteria change and cost.
26. Metals: protection of aquatic life file folder, which contains the recalculation worksheet, draft criteria equation and table, and correspondence with individuals about the subject.
27. Recreational Use Designation file folder, which contains several versions of potential rulemaking language, correspondence discussing draft changes, and other information related to the draft designation of WBCR.
28. Bacteria (*E. coli*) file folder, which contains reference material, discussion of potential revisions, and several versions of draft rulemaking language.
29. *Ambient Water Quality Criteria for Bacteria—1986*, EPA 440/5-84-002, January 1986, which is an extra copy of the recommended bacteria water quality criterion to keep with the Bacteria (*E. coli*) file folder.
30. Wetlands file folder, which contains several versions of draft rulemaking language, discussion of potential changes, and reference material.
31. Site-specific criteria file folder, which contains several versions of draft rulemaking language, comparisons of neighboring states' language, and reference material.
32. Chapter 3 and Appendix L *Water Quality Standards Handbook: Second Edition* that explains a methodology for conducting a site-specific criteria study.
33. High Flow Exemption file folder, which contains several versions of draft rulemaking language, discussion of potential changes, and reference material.
34. Fiscal Note file folder, which contains reference material and calculations of potential cost due to WQS and Effluent Regulations rulemaking.
35. *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, EPA 823-B-02-003, May 2002 Draft, which explains the current implementation of the 1986 bacteria criteria and is located in the library/reference bookshelf for WQS.
36. *Water Quality Standards Handbook: Second Edition*, EPA 823-B-94-005a & EPA 823-B94-005b, August 1994, which explains many aspects of the WQS as well as contains procedures for implementing the WQS.
37. *A Study of the Economic Value of Surface Waters of New Hampshire*, Phase I Report, August 1, 2001, By Dr. Lisa Shapiro and Ms. Heidi Kroll.
38. *Chlorine Compound Incidents 2005*, Hint Special Report, January, 2005 By ility Engineering (www.saunalahti.fi/ility/CCIncidents.htm)
39. *Fact Sheet: A Technical Overview – Chlorine Disinfection*, 1998, National Small Flows Clearinghouse (www.septic-info.com/doc/display/53.html)

3. Description of persons who will most likely be affected by the proposed rule, including persons that will bear the costs of the proposed rule and persons that will benefit from the proposed rule.

All Missouri citizens and persons associated with activities regulated or protected by WQS will be affected by this rulemaking, whether it is beneficially or adversely, direct or indirect. In preparing a response to this section of the Report, the department tried to

provide the best description of the entities and population groups most likely to experience an affect from the draft rule. An explanation is given where the possible effects are uncertain or indirect. For example, explanations were given where the effects such as increased sewer rates would be passed on by the wastewater treatment system owners who would initially face costs associated with treatment system upgrades.

Water use, and the generation of wastewater is associated with a vast number of human activities. The need to collect and treat industrial wastewater and human sewage is critical to all human activities. Also, the importance of controlling pollution's introduction into stormwater from construction sites and populated areas adds to the scope of the wastewater management effort. Therefore, when WQS are rewritten, the effects, as well as the benefits are often widespread.

Because Missouri's entire general population is tied in some way to wastewater collection and treatment, the effect (costs and benefits) of this rulemaking will be felt throughout the state. However, certain groups of the population will experience greater effects. The following portion of the Report tries to describe where those effects will be the greatest.

Effects are described as either a cost or benefit. Costs are considered as a need by a regulated entity (or group of entities), in response to this rule, to spend more resources on achieving compliance with the new standard. For the most part, the expenditure of resources will be related to designing, building and/or operating new treatment systems or implementing additional Best Management Practices (BMPs) specific to the pollutant(s) to which the new standard applies. Benefits are considered as any reduction in effort or cost that results from the draft rule. For example, a benefit may be less treatment or less BMPs needed to meet a standard, or less effort by the public to avoid (or recover from) the effects of a pollutant.

The following describes examples of the instances where additional resources (cost) may be incurred to ensure compliance with the draft rule. Following that list are examples of instances where the draft rule is expected to have no or negligible effect.

<u>Costs</u>

- Designating a Whole Body Contact Recreation (WBCR) use to all waters listed in Tables G and H may require up to nine hundred and eleven (911) permitted facilities to begin monitoring for bacteria and disinfecting the wastewater. These facilities may incur a new and substantial operating cost unless a Use Attainability Analysis (UAA) is conducted to show that WBCR is non-existing and unattainable, or unless it can be shown that the discharge will not violate the new standard. Even if a UAA shows the WBCR use designation is unnecessary, the costs to both the regulated entities and the state may be incurred to conduct either the UAAs or the water quality studies.
- Similar to the costs above, the members of the population associated with non-point sources of bacterial discharges, such as livestock producers, may experience some additional cost associated with managing animal wastes should it be determined that these wastes are the cause for significant levels of bacteria within classified waters.
- Changing the indicator bacteria from fecal coliform to *E. coli* could potentially increase the costs to treatment facilities due to initial equipment purchases if the facilities test for bacteria levels in effluent or in the receiving stream. Beyond the preliminary setup expenses, the actual bacteria tests cost about the same. Since

treatment technology is efficient at lowering bacterial concentrations in wastewater, the level of treatment for bacteria would not greatly change where such treatment is already being provided.
- Costs to the state may increase for assessing compliance on the increased number of entities now subject to new water quality standards.

Benefits

- This rule would tighten the limits on bacterial discharges, and may result in reduction in bacterial levels in some waters. While not well documented, the amount of illnesses and the medical treatment received for gastrointestinal, skin or other infections or diseases should drop due to less exposure to bacteria and pathogens in waters supporting a WBCR use.
- All permitted facilities that currently test drinking water supplies for metals using the dissolved method will likely spend slightly less on the total recoverable analytical method.

No or Negligible Effect

- Permitting in Outstanding Resource Waters would not be significantly changed by the proposed rule, as allowed discharges are presently required to conduct advanced treatment to meet the current Tier III antidegradation standard.
- The effects of metal toxicity is not expected to change because of the small amount of change in the standards themselves.

Of the costs discussed in this Report, the expanded designation of the WBCR use to all classified waters will be, by far, the greatest. The potential accumulative costs imposed by this rule may be above three hundred million dollars ($300,000,000). Nearly all of that cost, with the exception of a lesser figure within the tens of thousands of dollars, will be attributable to the WBCR use designations. For that reason, this Report places a special emphasis on the costs associated with the WBCR use designation. Most of the narrative and the tabulated costs in the following paragraphs offer estimates on that expanded standard alone. For the same reason, much of the narrative below regarding the benefits also focuses primarily on the same standard.

An estimate of the number of facilities potentially impacted by this proposed rule can be found in Tables 5, 7, and 12 through 16 of this document. Table 5 displays the number of facilities affected by the designation of WBCR. Based on a query to Water Quality Information System (WQIS) database, there were 2,522 permitted domestic facilities in the state, in October 2003. Of those, 1,055 facilities are currently required to monitor and are assumed to provide bacteria disinfection. The balance, 1,467 are currently not required to monitor for bacteria. The WQIS database contains information on bacteria monitoring but *not bacteria disinfection*. In order to make a reasonable query, it must be assumed that facilities that are not monitoring for bacteria most likely are not disinfecting bacteria.

Information about the 1,467 facilities *that don't monitor* was broken down even further. Staff, through mapping software, determined the number of facilities that discharge directly into or within two (2) miles of classified waters. There are 911 facilities that do not monitor for bacteria and are located within two miles of a classified water that is not currently designated for WBCR use.

The number of small businesses affected by the designation of whole body contact can be found in Table 7, which is a subset of Table 5. An explanation of how those numbers were determined can be found in section 4 under "Effect on Small Businesses."

Tables 12 through 16 display the number of facilities affected by other revisions to the WQS, namely the draft criteria changes to 10 CSR 20-7.031, Table A. These figures were taken from a query of WQIS, which showed the number of facilities monitoring for each particular pollutant.

4. Description of the environmental and economic costs and benefits of the proposed rule.

This section of the Report quantifies the costs and benefits of the likely effects described in the earlier section (Section 3.) All of the figures presented below are estimates and may be above or below the actual figures realized after promulgation of the rule.

The amount of quantification of the costs and benefits relates strongly to the amount of available data to support the estimates. Some of the costs and benefits are easier to determine. Where difficulty was encountered, the department offers the information that is available and explains the effort made to obtain the missing information.

Some of the economic costs represented below can be viewed as asset redistribution, as opposed to an economic loss. Monies spent on building new treatment go to the businesses that provide the building or operating services. Those businesses include engineering firms, building contractors, treatment system operators (if contracted), parts and equipment suppliers, chemical manufacturers and goods distributors. So a dollar is redistributed for every dollar spent on complying with the new standards. Some of the redistributed dollars may leave local jurisdictions depending on the services available in each area.

Environmental Costs and Benefits:

- Metals Criteria: The primary purpose of the revisions to the metals criteria is to bring state standards into strict equivalency to federal standards. While these criteria are aimed at increasing the protection to aquatic life and drinking water supplies from the effects of metal toxicity, the changes are so small that they will likely not pose the need for additional treatment for metals in wastewater. Also, there are no known effects from metals toxicity that would be corrected through this change. Therefore, this rule poses only a slight potential for environmental cost or benefit.

- Outstanding National and State Resource Waters (ONRWs and OSRWs) already receive the highest level of protection from degradation of water quality through the application of the Tier III antidegradation standards. The changes in this draft rule at 10 CSR 20-7.031(6) to eliminate the specific limitations on Publicly-Owned Treatment Works (POTWs) and mine dewatering water, does not change the

requirement that these discharges meet the Tier III antidegradation standard. In effect, the rule will cost entities associated with the specific discharges mentioned above only if they are not currently able to achieve the Tier III standard without providing additional treatment. To the best of the department's knowledge, all of the discharges currently within the watershed of the ONRWs and OSRWs comply with the Tier III standard or are under an enforceable plan to ensure their compliance. Consequently, there are no expected immediate costs or benefits to result from this change. However, the change does ensure strict equivalence of the state standard with the corresponding federal standard for protection of exceptionally high quality waters. Therefore, this rule amendment may affect future decisions on discharges within the watersheds of ONRWs and OSRWs, and consequently affect the future environmental costs and benefits.

- This draft rule proposes criteria for developing site-specific criteria for wetlands. The state will be required to develop site-specific numeric standards for the wetland following the receipt of an application for a discharge permit. The development of these site-specific criteria will improve the ability for the state to develop standards protective of the unique nature of wetlands. The state rarely receives requests to discharge to wetlands and the environmental benefit will be limited to the wetland areas that receive discharges.

- This draft rule proposes to make it a requirement that the department develop a policy for implementing the current antidegradation standard. All waters of the state will benefit from the development of the antidegradation policy implementation. The environmental benefit of requiring in rule that this is done may ensure that it will be completed more promptly.

- The chemical and biological integrity of Class C streams and streams with a seven day Q_{10} stream flow (7Q10) of 0.1 cubic feet per second (cfs) or less shall be protected more by the removal of the mixing zone allowance. Eliminating the mixing zone within streams of low flow will better protect these streams from damaging concentrations of pollutants. Most of the streams with 7Q10 flows of less than 0.1 cfs would be easily dominated by effluent. Removing the mixing zone eliminates the possibility of small streams being dominated by effluent where such domination would adversely affect an existing or designated use.

- This draft rule proposes to establish criteria for developing site-specific criteria for protection of aquatic life. While some permitted facilities could receive relief on their treatment requirements by requesting site-specific criteria, the relief would not equate to the degradation or impairment of aquatic life were the site-specific standards to be properly written. Site-specific criteria must provide full protection of the aquatic life use in the receiving stream.

- The addition of seven definitions (catastrophic storm event, early life stages, 30-day Q10, 1-day Q10, reference lakes or reservoirs, water effect ratio, and waters of the state) will better clarify the WQS. Language has been added to also clarify existing definitions (WBCR, boating & canoeing, and low-flow conditions). These clarifications should improve the accuracy of water quality reviews and consequently improve the choices for treatment and best management practices (BMPs).

- Language referencing modification of WQS for site-specific criteria can be found in Missouri's dissolved oxygen criteria, Tables A and B criteria, and sulfate and chloride criteria. Although federal guidance allows site-specific adjustment of water quality standards, EPA disapproved part of the language describing the application of site-specific criteria within these sections. In response, the site-specific criteria language in each of the listed paragraphs above will be removed and a new subsection added. The new subsection will describe the site-specific criteria development methods for all aquatic life WQS. These new criteria will provide an opportunity to develop criteria that closely matches the natural conditions of a stream, making the derivation of permit limitations more reflective of the stream's naturally diminished quality. These actions may result in achieving water quality standards with less costly treatment options.

- Missouri currently uses the dissolved metal analytical method, which differs from federal criteria, for the protection of surface waters serving as drinking water supplies. Therefore, the rule proposes that all metals attached to the drinking water supply designated use be analyzed using the total recoverable method. Converting to an analytical method that measures total recoverable metals is proposed primarily to ensure the state criteria are no less stringent than the federal standards. While the measurement of dissolved metals may better reflect the association of certain metals to a secondary drinking water use, such as laundry, the science has not yet been developed to support criteria for protecting those secondary uses. Because the criteria for primary use (drinking) is more stringent than secondary use, this change in the rule would not present any environmental costs or benefits.

- Metal criteria for aquatic life protection were recalculated using the most recent toxicity data sets and included the genus Ceriodaphnia. The metals affected by this recalculation include cadmium, trivalent chromium (Cr^{+3}), hexavalent chromium (Cr^{+6}), copper, lead, nickel, silver, and zinc. The results of these criteria recalculations are equation based and, with the exception of hexavalent chromium, are hardness dependent. Also, the values in the table will be revised and based on the lowest (most protective) hardness value. These changes will offer slightly greater protection to aquatic life. However, the changes are probably not great enough to effect the waters current ability to attain its designated use. Therefore, no change in current treatment or reduction in water pollutant levels are expected.

- New total ammonia nitrogen criteria for the protection of aquatic life was published in December 1999. Advances in research methods and increases in funding have allowed toxicologists to more accurately assess the toxicity of ammonia to aquatic life. The new ammonia criteria will be adopted to reflect improvements to the current (1984) criteria. Ammonia levels may increase in some waters because of this change. The 1999 criteria raise the allowable levels of ammonia under some conditions depending on stream temperature and the presence of early life stages in aquatic life. Therefore, these changes may result in less stringent future limitations for ammonia treatment at certain facilities.

- Missouri has been encouraged to adopt *EPA's Ambient Water Quality Criteria for Bacteria—1986* for WBCR. Therefore, *E. coli* will be adopted as the indicator

bacteria and the 1986 criteria will apply for water bodies with WBCR designations. This change in the indicator species will allow for identification that is more accurate and assessments of bacterial sources attributable to human activities. These improvements in assessments should help the department locate and address the regulated sources of bacteria.

- Missouri currently allows the bacterial standards to be exceeded during periods of storm water runoff (high flow exemption). As currently written, the current high flow exemption is broad and qualitative and might not ensure that WBCR is adequately protected. Therefore, the high flow exemption is being revised to better define the method for assessing when an exemption may be granted. The general premise is that if no use occurs during the time the high flow exemption is in effect, no environmental impact (cost) should exist.

- Several parameters in 10 CSR 20-7.031 Table A—Criteria for Designated Uses are currently inconsistent with federal criteria. The human health protection—fish consumption criteria affected include 2,4,6-trichlorophenol; n-nitrosopyrrolidene; 4-4'-DDE; 4-4'-DDD; and chloroform. The drinking water supply criteria affected include 2,3,7,8-TCDD (dioxin); trihalomethanes; dichlorobromomethane; methylene chloride. The criteria affected for the protection of both human health—fish consumption and drinking water supply include 1,2,4,5-tetrachlorobenzene; pentachlorobenzene; 4-4'-DDT; bis (chloromethyl) ether; bromoform; chlorodibromomethane; tetrachloroethylene; and 1,2-dichloropropane. All of the above criteria were changed to match federal criteria. These changes will offer slightly greater protection to aquatic life. However, the changes are probably not great enough to effect the waters current ability to attain its designated use. Therefore, no change in current treatment or reduction in water pollutant levels is expected.

- During review of 10 CSR 20-7.031, Table C—Water Bodies Designated for Cold-Water Fisheries, six waters designated for cold water fisheries had reduced mileage or were removed during past revisions without adequate explanation. These waters have been restored to Table C. Bull Shoals Lake (Ozark County) and Indian Creek (Franklin and Washington Counties) were added to the table. In addition, this revision included corrections to Little Piney Creek (Phelps County), North Fork White River (Ozark County), South Indian Creek (Newton and McDonald Counties), and Spring Creek (Douglas and Ozark Counties). These changes will not likely have an immediate environmental impact (cost or benefit). However, any future decisions regarding discharges to these waters will be based on the more restrictive standards associated with the Cold-Water Fisheries use designation.

- Several changes were made to 10 CSR 20-7.031, Table I—Biocriteria Reference Locations due to water withdrawal for irrigation, accessibility limitations, and refinement of selection processes. These proposed changes reflect the loss of several waters as reliable indicators for natural background levels of pollutants and this change creates a void of reference streams for use in the southeast portion of the state. Because the loss of these waters as biocriteria reference streams was the result of land

use changes in the watershed and is not the result of the changes proposed by this rule, there is no environmental impact (cost or benefit) to report here.

- During the June 18, 2003 meeting, the Missouri Clean Water Commission directed staff to propose Bull Creek for Outstanding State Resource Water status. Bull Creek will be added for the mileage located within or adjacent to the Mark Twain National Forest in Christian County. This change would increase the level of protection to Bull Creek by eliminating the option that new dischargers could lower the water quality if they demonstrated a socio-economic need that out-weighs the environmental benefit from maintaining present water quality.

- Section 101(a)(2) of the CWA establishes as a national goal "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and … recreation in and on the water," wherever attainable. This national goal is commonly referred to as the "fishable/swimmable" goal. Missouri currently lists all classified waters for aquatic life, but lists only a few water bodies for WBCR. See Table 2 below. Therefore, all waters listed in 10 CSR 20-7.031 Tables G and H will be immediately designated and protected for WBCR. While not well documented, the amount of illnesses and the medical treatment received for gastrointestinal and other diseases contractible through swimming should drop due to less exposure to bacteria in waters supporting a WBCR use.

Table 2. Waters Listed for Whole Body Contact Recreation (WBCR).

Designated Use	Segments		Acres/Miles	
	Total	Percentage	Total	Percentage
All lakes	455		293,257.8 ac.	
WBCR lakes	147	32.3%	262,517.0 ac.	89.5%
Non-WBCR lakes	308	67.7%	30,740.8 ac.	10.5%
All streams	3751		22,217.8 mi.	
WBCR streams	285	7.6%	5,531.5 mi.	24.9%
Non-WBCR streams	3466	92.4%	16,686.3 mi.	75.1%
All in Tables G & H	4206			
WBCR waters	432	10.3%		
Waters needing UAA	3774	89.7%		

In an effort to quantify the number of illnesses currently related to swimming in classified waters, the department contacted the Center for Disease Control, EPA, Division of Tourism, the Department of Health and Senior Services, and the Department of Conservation. Very little information was available from these sources to quantity the extent of the human health problems resulting from exposure to bacteria from WBCR in Missouri's classified waters.

The DHSS is involved in the National Environmental Health Tracking Program in 2002. Data through that program is still too unreliable to determine illness trends, risks and related medical costs.

The association between various bacterial levels and illnesses was studied by EPA (see science references #29 and #35 under Section 2 of this Report). Studies show a correlation between bacterial levels in waters and the incidence of illness. EPA based federal guidance on an observed illness rate ranging between 8 and 14 illnesses per 1000 swimmers.

Although this study helps in understanding the risks associated with various bacterial levels in surface waters, estimating the *actual* number of bacteria-related illnesses requires knowledge of both the bacterial levels in the classified waters and the frequency of recreational use within these waters. While some information exists on the bacterial levels, the frequency of WBCR use within the classified waters throughout the state is far from being understood. Furthermore, insufficient information exists to separate the levels of bacteria originating from point sources from the non-point sources. Consequently, not enough information is available to make a reasonable estimate of the illnesses occurring because of human sources of bacteria in the state's classified waters. The department lacks the resources to undertake these studies. In conclusion, environmental and public health benefits are envisioned as a result of the WBCR use designation, however, the department is unable to provide in this Report a reasonable estimate (quantification) of those benefits.

Economic Costs and Benefits:

The paragraphs below restate the proposed revisions that are mentioned in the preceding section of this Report, but ends each discussion with a statement about the potential economic costs and benefits of each draft rule revision.

- The primary purpose of the revisions to the metals criteria is to bring state standards into strict equivalency to federal standards. While these criteria are aimed at increasing the protection to the surface water uses of aquatic life and public drinking water supplies from the effects of metal toxicity, the changes are so small that they will likely not pose the need for additional treatment for metals in wastewater. Also, there are no known effects from metals toxicity that would be corrected through this change. Therefore, this rule poses only a slight potential for economic cost or benefit.

- Outstanding National and State Resource Waters (ONRWs and OSRWs) already receive the highest level of protection from degradation of water quality through the application of the Tier III antidegradation standards. The changes in this draft rule at 10 CSR 20-7.031(6) to eliminate the specific limitations on Publicly-Owned Treatment Works (POTWs) and mine dewatering water, does not change the requirement that these discharges meet the Tier III antidegradation standard. In effect, the rule will cost entities associated with the specific discharges mentioned above only if they are not currently able to achieve the Tier III standard without providing additional treatment. To the best of the department's knowledge, all of the discharges currently within the watershed of the ONRWs and OSRWs comply with the Tier III standard or are under an enforceable plan to ensure their compliance. Consequently, there are no expected immediate economic costs or benefits to result from this change. However, the change does ensure strict equivalence of the state standard with the corresponding federal standard for protection of exceptionally high quality waters. Therefore, this rule amendment may affect future decisions on discharges within the watersheds of ONRWs and OSRWs, and consequently affect the future economic costs and benefits.

- This draft rule proposes criteria for developing site-specific criteria for wetlands. The state will be required to develop site-specific numeric standards for the wetland following the receipt of an application for a discharge permit. The development of these site-specific criteria will improve the ability for the state to develop standards protective of the unique nature of wetlands. The state rarely receives requests to discharge to wetlands. Therefore, this rule does not pose either a significant economic cost or benefit to the state, regulated community or the public.

- This draft rule proposes to make it a requirement that the department develop a policy for implementing the current antidegradation standard. All levels of protection to waters of the state will be clarified but not significantly changed from the development of the antidegradation implementation procedure. The economic benefit of requiring this be referenced in rule is that it may ensure prompter water quality reviews for permits.

- This draft rule proposed the removal of a mixing zone allowance on streams with a 7Q10 of 0.1 cfs or less. Eliminating the mixing zone within low-flow streams will require less time and cost for the state. The state may more promptly develop water quality based effluent limits on these discharges because the discharge limits would automatically default to the numeric standards for aquatic life. This default may pose more stringent effluent limits (and additional cost for treatment) on any person presently discharging into a low-flow stream where water quality based effluent limits are needed to protect the aquatic life use. The 479 facilities that currently discharge to a Class C stream or a classified stream with a 7Q10of 0.1 cfs or less can be found in Table 14 within Section 9 of this Report.

- This draft rule proposes to establish criteria for developing site-specific criteria for protection of aquatic life. Some permitted facilities could receive a cost relief on their treatment requirements by requesting site-specific criteria.

- The addition of seven definitions (catastrophic storm event, early life stages, 30-day Q10, 1-day Q10, reference lakes or reservoirs, water effect ratio, and waters of the state) will better clarify the WQS. Language has been added to also clarify existing definitions (WBCR, boating & canoeing, and low-flow conditions). These clarifications should improve the accuracy of water quality reviews and consequently improve the choices for treatment and BMPs. The clarifications may also facilitate decision-making and reduce costs to the state and the regulated community through more timely feedback on permit applications.

- This draft rule proposes criteria for developing site-specific criteria for aquatic life. The development of these site-specific criteria will improve the ability for the state to develop standards protective of the unique natural conditions in some waters. The state is receiving an increasing number of requests for site-specific criteria. Therefore, this rule offers an economic benefit to those dischargers that will see as a result of this rule less stringent criteria for the waters receiving their discharge.

- Missouri currently uses the dissolved metal analytical method, which differs from federal criteria, for the protection of surface waters serving as drinking water supplies. Therefore, the proposed rule will require that all metals attached to the

drinking water supply designated use be analyzed using the total recoverable method. Converting to an analytical method that measures total recoverable metals is proposed primarily to ensure the state criteria are no less stringent than the federal standards. While the measurement of dissolved metals may better reflect the association of certain metals to a secondary drinking water use, such as laundry, the science has not yet been presented for developing the criteria for protecting those secondary uses. Because the analytical costs are not significantly different between the methods, this change in the rule would not present any economic costs or benefits. As shown in Table 12 in Section 9 of this Report, a total of 79 facilities monitor and report on one or more of the drinking water supply metals.

- Metal criteria for aquatic life protection were recalculated using the most recent toxicity data sets and included the results from tests performed on aquatic organisms in the genus Ceriodaphnia. The metals affected by this recalculation include cadmium, trivalent chromium (Cr^{+3}), hexavalent chromium (Cr^{+6}), copper, lead, nickel, silver, and zinc. The results of these criteria recalculations are equation based and, with the exception of hexavalent chromium, are hardness dependent. Also, the values in the table will be revised and based on the lowest (most protective) hardness value. These changes will offer some additional protection to aquatic life, however, the changes are not great enough to result in an assessment that some waters do not now meet water quality standards. Therefore, no change (therefore, no new cost) for current treatment is expected. As shown in Table 13 in Section 9 of this Report, a total of 246 facilities monitor and report one or more of these metals.

- New total ammonia nitrogen criteria for the protection of aquatic life was published in December 1999. Advances in research methods and increases in funding have allowed toxicologists to more accurately assess the toxicity of ammonia to aquatic life. The new ammonia criteria will be adopted to reflect improvements to the current (1984) criteria. Because the 1999 criteria are less stringent in some cases (depending on water temperature and pH), future limits on ammonia may increase in some permits because of this change. The actual number of permitted facilities monitoring for ammonia (and therefore potentially affected by this draft rule) can be seen in Table 14 within Section 9 of this Report.

- Missouri has been encouraged to adopt *EPA's Ambient Water Quality Criteria for Bacteria—1986* for WBCR. Therefore, *E. coli* will be adopted as the indicator bacteria and the 1986 criteria will apply for water bodies with WBCR designations. This change in the indicator species will allow for identification that is more accurate and assessments of bacterial sources attributable to human activities. These improvements in assessments should help the department locate and address the regulated sources of bacteria. Because of the increased efficiency in addressing bacterial discharges, some cost savings could be seen by the state.

- Missouri currently allows the bacteria limits to be exceeded during periods of storm water runoff (high flow exemption). As currently written, the current high flow exemption is broad and qualitative and might not ensure that WBCR is adequately protected. Therefore, the high flow exemption is being revised to better define the

method for assessing when an exemption may be granted. Better definition of the exemption period may help dischargers better design treatment plans to avoid unnecessary costs.

- Several parameters in 10 CSR 20-7.031 Table A—Criteria for Designated Uses are currently inconsistent with federal criteria. The human health protection—fish consumption criteria affected include 2,4,6-trichlorophenol; n-nitrosopyrrolidene; 4-4'-DDE; 4-4'-DDD; and chloroform. The drinking water supply criteria affected include 2,3,7,8-TCDD (dioxin); trihalomethanes; dichlorobromomethane; methylene chloride. The criteria affected for the protection of both human health—fish consumption and drinking water supply include 1,2,4,5-tetrachlorobenzene; pentachlorobenzene; 4-4'-DDT; bis (chloromethyl) ether; bromoform; chlorodibromomethane; tetrachloroethylene; and 1,2-dichloropropane. All of the above criteria were changed to match federal criteria. The changes are not considered great enough to result in an assessment that some waters do not now meet water quality standards. Therefore, no change in current treatment (therefore, no new costs) are expected.

- During review of 10 CSR 20-7.031, Table C—Water Bodies Designated for Cold-Water Fisheries, six waters designated for cold water fisheries had reduced mileage or were removed during past revisions without adequate explanation. These waters have been restored to Table C. Bull Shoals Lake (Ozark County) and Indian Creek (Franklin and Washington Counties) were added to the table. In addition, this revision included corrections to Little Piney Creek (Phelps County), North Fork White River (Ozark County), South Indian Creek (Newton and McDonald Counties), and Spring Creek (Douglas and Ozark Counties). These changes will not likely have an immediate environmental impact (cost or benefit). However, any future decisions regarding discharges to these waters will be based on the more restrictive standards associated with the Cold-Water Fisheries use designation.

- Several changes were made to 10 CSR 20-7.031, Table I—Biocriteria Reference Locations due to water withdrawal for irrigation, accessibility limitations, and refinement of selection processes. These proposed changes reflect the loss of several waters as reliable indicators for natural background levels of pollutants and this change creates a void of reference streams for use in the southeast portion of the state. Because the loss of these waters as biocriteria reference streams is not the result of this rule, there is no economic impact (cost or benefit) to report here.

- During the June 18, 2003 meeting, the Missouri Clean Water Commission directed staff to propose Bull Creek for Outstanding State Resource Water status. Bull Creek will be added for the mileage located within or adjacent to the Mark Twain National Forest in Christian County. This change would increase the level of protection to Bull Creek by eliminating the option that new dischargers could lower the water quality if they demonstrated a socio-economic need that out-weighs the environmental benefit from maintaining present water quality. This change may result in the need for advanced (more costly) treatment on future discharges to Bull Creek.

- The draft rule proposes to designate a WBCR use to all classified waters. This portion of the draft rule has the potential for imposing the greatest amount of new costs on the state, the regulated community and the public. Therefore, the several pages that follow are devoted to explaining these potential costs.

Economic Costs Associated with WBCR Use Designation: The proposed amendment to designate a WBCR use on all classified waters is being written in conjunction with proposed changes to 10 CSR 20-7.015, Effluent Regulations. Because both rules would be administered jointly, the department has determined potential costs as an aggregate for both rulemakings. The rulemakings together will cost private and public entities (permitted facilities) an estimated three hundred four million, eight hundred sixty-six thousand dollars ($304,866,000) in the aggregate. The cost and figures are included in the documentation for both rules, although the cost will only be incurred once. Since the Effluent Regulations are tied so closely to the WQS, the cost cannot be distinguished as part of one rule or the other. Therefore, the basis for the cost estimation and assumptions are also described in the Regulatory Impact Report for Effluent Regulations and fiscal notes for both the WQS and Effluent Regulations. The basis for the cost estimation and assumptions are described below.

Estimated costs to the state to implement this rule revision are explained in Section 5 of this Report. The following information estimates the cost to the owners of regulated (point-source) facilities. A discussion of potential costs to small businesses, non-point sources and to the general public can be found at the end of this section.

Effect on Municipal and Private Domestic Wastewater Treatment Plants:

The current number of domestic wastewater treatment facilities (WWTFs or facilities) without bacteria monitoring that would be affected by this rule were taken from the department's Water Quality Information System database (WQIS). All cost estimates have been adjusted to reflect the cost of equipment, installation, and operation and maintenance of disinfection systems for the year 2004 using the Engineering News Record Construction Cost Index (CCI). The costs do not include the cost of borrowing money to finance upgrades. Additional costs to municipalities may include the expense of administering sewer rates increases or enacting new ordinances related to sewer connections and pretreatment requirements. Communities where Combined Sewer Overflows (CSOs) might cause the bacteria standards to be exceeded face another unknown (and potentially significant) cost in addressing these events. Furthermore, substantial costs may also come from the need to increase monitoring of discharges or the receiving stream for compliance. The estimates provided in this Report for the 911 facilities identified in Table 5 and **Appendix G** do not identify the facilities having more than one effluent outfall. Some facilities may need to provide disinfection for multiple outfalls. Records show that an additional 255 outfalls may require disinfection at these facilities. For purposes of understanding the potential variations in cost due to the selection of a disinfection method, **Appendix F** of this Report provides three cost scenarios representing the expected costs depending on the type of disinfection system

selected. It should also be noted that certain types of facilities, particularly lagoons, may not be able to adapt a disinfection system to the treatment process and may be required to upgrade to an entirely different system to ensure compliance.

The Little Blue Valley Sewer District (LBVSD) estimated a total cost of $25 million for achieving disinfection of the 52 million gallons per day of effluent discharged from their facilities. This figure suggests a cost of $480,000 per million gallons to install disinfection. That rate is higher than the department's estimate. The department estimated that in order to achieve disinfection on discharges across the state (totaling of about 860 million gallons of effluent per day), an estimated $250 million expenditure is needed (860 / 250 = .29 or $290,000 per million gallons). The costs for installing disinfection increase substantially above 1.0 million gallons per day (mgd). Most of the 911 potentially affected facilities discharge less than 1 mgd which could explain why the department's estimated average cost for the all facilities is less than that calculated by the LBVSD.

According to National Small Flows Clearinghouse (see document reference #39 in Section 2 of this Report), the cost of chlorine disinfection systems is dependent on the manufacturer, the site, the capacity of the plant, and the characteristics of the wastewater to be disinfected. The total cost of chlorination will be increased by approximately 30 to 50% with the addition of dechlorination. In 1995, a study was conducted by the Water Environment Research Federation for secondary effluents from disinfection facilities at average dry weather flow rates of 1, 10, and 100 mgd (2.25, 20, and 175 mgd peak wet weather flow, respectively). Cost estimates ranged from $410,000 to $445,000 for systems treating 1 mgd. The annual operation and maintenance (O&M) costs for chlorine disinfection include power consumption, chemicals and supplies, miscellaneous equipment repairs, and personnel costs. The study also states that requirements associated with the Uniform Fire Code can add more than $200,000 to chlorination costs.

To make the cost estimations for equipment, installation, and O&M more manageable, the department categorized facilities into similar groups by design flow. The use of either chlorination or an ultraviolet disinfection system was determined according to the size of a facility's design flow in million gallons per day (MGD). The determination of the appropriate equipment needed for each category was based on peak flow. Peak flows were calculated from the average flow using standard engineering factors. (See **Appendix D**)

These calculations assume all wastewater facilities that are not currently disinfecting, and located within two (2) miles of a classified water body, will be required to disinfect their effluent. In addition, it was assumed that those facilities currently monitoring bacteria levels are in fact disinfecting their effluent. These calculations do not take into account the cost to future facilities that do not presently have an operating permit. Additionally, the cost estimate calculations assume that most mechanical WWTFs will use ultraviolet disinfection while lagoon systems will use chlorination. Therefore, it was also assumed that mechanical WWTFs would not need additional filtration since their effluent would be of high quality. The cost of dechlorination was calculated for facilities that were anticipated to add chlorine disinfection.

The department is proposing an implementation schedule for permitted facilities to comply with the new rules. Such a schedule will allow impacted facilities time to: 1) install necessary equipment, 2) conduct a scientific study to determine if disinfection is required to protect WBCR, or 3) conduct a UAA to determine if a water body does not support WBCR. The effect such a schedule would have on costs is discussed the Regulatory Impact Report prepared for the proposed amendments to the Effluent Rule (10 CSR 20-7.015).

The tables below show the estimated cost to facilities for each of the four size ranges and two types of disinfection systems. Table 3 displays installation costs, Table 4 the O&M costs, and Table 5 the number of facilities in each category of flow and type of disinfection system. Unit rate assumptions, as well as additional information on the calculations, are in **Appendix D**.

Table 3. Total Installation Cost for All Facilities.

Design Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	$1,425,000	$2,118,163	$4,000,000	$8,472,650	$16,015,813
Flow between 0.05 & 1.0 MGD	$2,817,500	$9,222,098	$301,875	$731,913	$13,073,385
Flow between 1.0 & 20.0 MGD	$13,362,368	$38,880,000	$4,454,123	$2,430,000	$59,126,490
Flow greater than 20.0 MGD	$0	$162,540,009	$0	$0	$162,540,009
Total	$17,604,868	$212,760,269	$8,755,998	$11,634,563	$250,755,696

Table 4. Operating & Maintenance Cost Per Year for All Facilities.

Design Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	$3,135,000	$89,688	$8,800,000	$358,750	$12,383,438
Flow between 0.05 & 1.0 MGD	$23,244,725	$390,285	$2,490,506	$30,975	$26,156,491
Flow between 1.0 & 20.0 MGD	$1,020,150	$2,623,520	$340,050	$163,970	$4,147,690
Flow greater than 20.0 MGD	$0	$10,967,793	$0	$0	$10,967,793
Total	$27,399,875	$14,071,285	$11,630,556	$553,695	$53,655,411

Table 5. Facility Numbers.

Design Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	114	41	320	164	639
Flow between 0.05 & 1.0 MGD	140	63	15	5	223
Flow between 1.0 & 20.0 MGD	6	32	2	2	42
Flow greater than 20.0 MGD	0	7	0	0	7
Total	260	143	337	171	911

Analytical bacteria testing costs were estimated by averaging the cost of fecal coliform and total residual chlorine testing from ten (10) laboratories in Missouri and neighboring states that service Missouri facilities. The number of samples per year per facility was

derived from the monitoring frequency requirement of the current permit for each facility and tracked in WQIS. Table 6 shows the cost of analytical testing of fecal coliform (FC) and total residual chlorine (TRC) facility type and size.

Table 6. Average Analytical Testing Cost per Year.

Design Flow (MGD)	Public		Private		Total
	TRC	FC	TRC	FC	
Flow less than 0.05 MGD	$18,904	$36,802	$39,491	$95,066	$190,263
Flow between 0.05 & 1.0 MGD	$29,006	$78,989	$1,350	$9,847	$119,192
Flow between 1.0 & 20.0 MGD	$9,952	$78,329	$217	$10,296	$98,794
Flow greater than 20.0 MGD	$0	$46,042	$0	$0	$46,042
Total	$57,862	$240,161	$41,058	$115,210	$454,290

The frequency for analytical testing of facilities is specific to each permit that would be affected by the WBCR designation. It is assumed that facilities of similar size and type will most likely require similar monitoring frequency.

Facilities will not be required to test for both fecal coliform and *E. coli*. The draft regulations state that either can be monitored for a period of three years. After that time, entities will be required to monitor only *E. coli*. The transition phase was developed to allow entities and the laboratories time to make the conversion to *E. coli*. Since *E. coli* requires a slightly different method of analysis, additional equipment may need to be acquired. The cost of analysis for fecal coliform and *E. coli* is essentially the same beyond the initial equipment. In addition, since only fecal coliform is presently required, few labs have established costs for effluent *E. coli* testing. Therefore, only the cost of analyzing fecal coliform was used in the calculations.

This rule may add extra implementation costs beyond what is already required by the department or other agencies that currently carry out the WQS. For example, a slight change in a water quality criterion would not affect the process of calculating a water quality based effluent limit, but would require a recalculation, which in turn takes time. Additionally, when requests for use re-designation are received, significant amounts of staff time and department resources could be needed to conduct surveys and/or review of data submitted. The estimated cost to the department is explained in Section 5 of this report.

Further impacts due to the WBCR use designation may include the potential listing of additional waters on the 303(d) list, which results in the need to prepare Total Maximum Daily Loads (TMDLs). The cost of preparing TMDLs cannot be measured at this time since the number of waters potentially falling into this category is unknown.

Effect on Small Business: Small business affected by this rulemaking would include for-profit wastewater treatment facilities with less than fifty (50) full- or part-time employees. The data the department used to determine the number of small businesses impacted by this rulemaking mainly consisted of the type of facility. If the WWTF was a publicly owned treatment works (POTW) or categorized as a municipal plant under the department's fee assessment, then it was assumed those facilities were not-for-profit. All

others, generally non-municipals, were considered for-profit and used in this calculation. Due to this categorization, some churches, schools, and sewer districts were included as for-profit, which may or may not be accurate. Therefore, this calculation may over-estimate the impact to small businesses.

The primary change to affect small businesses is the designation of WBCR for waters classified in Tables G and H of the WQS. These costs are also included in the fiscal note for both private and public entities. The same assumptions used in the fiscal note calculation apply to this calculation. The number of small businesses assessed to be impacted by this rulemaking can be found in Table 7. The total installation cost for facilities is in Table 8, while the annual operating and maintenance costs is in Table 9.

Table7. Affected Small Business Facility Numbers

Flow (MGD)	Disinfection System		Total
	UV	Chlorination	
Flow less than 0.05 MGD	164	317	481
Flow between 0.05 & 1.0 MGD	5	15	20
Flow between 1.0 & 20.0 MGD	1	2	3
Flow greater than 20.0 MGD	0	0	0
Total	170	334	504

Table 8. Total Installation Cost for First Year

Flow (MGD)	Disinfection System		Total
	UV	Chlorination	
Flow less than 0.05 MGD	$8,472,650	$3,962,500	$12,435,150
Flow between 0.05 & 1.0 MGD	$731,913	$301,875	$1,033,788
Flow between 1.0 & 20.0 MGD	$1,215,000	$4,454,123	$5,669,123
Total	$10,419,563	$8,718,498	$19,138,060

Table 9. Total O & M Cost per Year

Flow (MGD)	Disinfection System		Total
	UV	Chlorination	
Flow less than 0.05 MGD	$358,750	$8,717,500	$9,076,250
Flow between 0.05 & 1.0 MGD	$30,975	$2,490,506	$2,521,481
Flow between 1.0 & 20.0 MGD	$81,985	$340,050	$422,035
Total	$471,710	$11,548,056	$12,019,766

Small businesses, along with other stakeholders, were provided an opportunity to participate in meetings held in 2001 and 2003 on several issues related to changes in the WQS. All stakeholders will be asked to provide comments during the public comment period and public hearing after the proposed rule is published in the *Missouri Register*.

The department has considered different levels of implementation for small businesses, but none were used in developing the proposed amendment to the effluent rule. Due to

the nature of this rule, the application of different implementation levels based on business size were considered either not practical or were inconsistent with statute. This rule adopts comparable federal standards for several criteria, such as *E. coli* and total ammonia nitrogen.

Costs Non-Point Sources:

The amount of bacterial loads attributable to non-point sources is not well known. Data from the United States Geological Survey (USGS) and fixed station monitoring suggest that bacterial levels are higher in areas of agricultural use. **Appendix E** contains data on streams that do not receive appreciable amounts of domestic sewage treatment effluent. Higher bacteria levels are evident in streams in the northern regions of the state where agricultural land uses are more prevalent.
Should non-point sources be identified as the cause for water quality exceeding bacterial standards, an effort will be required to assist these sources in reducing their contributions. Several incentive-based, non-regulatory programs are currently available to address the sources.

Costs to the General Public:

Costs associated with upgrading domestic wastewater treatment facilities are often passed on to the individual users in the form of increased sewer rates. Whether or not sewer rate increases occur and the amount of these increases is determined by each owner of the facility and can not be reasonably predicted in this Report.

Economic Benefits Associated with WBCR Use Designation:

Some studies have been completed on the economic value of surface waters and the effect pollution has on these values. Based on a study in New Hampshire (see reference # 37 in Section 2 of this Report), many studies have identified swimming, fishing, and boating as top recreational uses of surface water, and therefore important contributors to the water's economic value. A study in Maine estimated that $1.09 billion in direct recreational expenditures resulted in $1.7 billion in total economic activity and $208 million in net economic value per year. Additional value ranging in the hundreds of millions of dollars was also found in other non-recreational uses, such as public drinking water, agricultural, industrial/commercial and lakefront properties.

These values would strongly suggest a correlation between water quality and economic benefits. To make a unbiased comparison between the economic costs mentioned in previous sections of this Report and the economic benefits mentioned in this paragraph, a study must be done on the actual money spent on enjoying water related activities in the specific waters potentially impacted by the discharges from the 911 domestic wastewater treatment facilities identified in **Table 5 and Appendix G**. No such analysis was completed because of the significant effort it would involve.

5. **Probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenue.**

The impact on state revenue is the same for both this proposed amendment and the proposed amendment to 10 CSR 20-7.015, Effluent Regulations. The cost and figures are included in the documentation for both rules, although the cost will only be incurred once. (See explanation in Section 4 of this report.)

Costs to the state will be primarily from having to upgrade state-owned wastewater treatment facilities and from having to conduct or review Use Attainability Analyses on waters newly designated for WBCR use.

The state owns or operates twenty-five (25) permitted domestic wastewater treatment facilities that appear on the list in **Appendix G**. Using the same cost analysis as shown in Tables 3 and 4, and explained in **Appendix D**, the total potential cost to the state for achieving disinfection for these facilities is $1,252,316.

With respect to conducting Use Attainability Analyses (UAAs), revisions to the WQS may potentially cost the state two hundred thirty-five thousand five hundred dollars ($235,500) annually with an additional first year cost of eighteen thousand three hundred fifty dollars ($18,350) for purchasing equipment necessary to conduct the surveys. The annual costs would be the result of conducting UAAs associated with the designation of all classified waters in Tables G and H in the WQS for WBCR. It should be noted that the state is not obligated by regulation to conduct UAAs. The department or any entity, private or public, may follow the approved procedure for developing a UAA for recreational use. Tables 10 and 11 itemize the potential cost to the department for conducting UAAs.

Table 10. Initial Costs due to Recreational UAAs

Resource	Unit(s)	Cost per Unit	Total Cost
Digital cameras	3	$252	$756
GPS units	3	$5,212	$15,636
GPS software	1	$1,955	$1,955
Total			$18,347

Table 11. Annual Costs due to Recreational UAAs

Resource	Unit(s)	Cost per Unit	Total Cost
Full-time employee (FTE)	3	$35,050.80	$105,152.40
Interns/part-time employees	4	$12,000.00	$48,000.00
Vehicle mileage	45,000	$0.33	$14,850.00
Lodging (excludes taxes)	$420	$73.80	$30,996.00
Food expense	$630	$39.80	$25,074.00
Internal review committee members	3	$3,791.25	$11,373.75
Total			$235,446.15

The staff and associated resources for the cost calculation in the table above were based on the UAA program conducted by Kansas Department of Health and Environment (KDHE). Several assumptions are explained below.

These cost calculations for conducting UAAs are solely based on the investigation of depth requirements (criteria #2 of the recreational UAA document). If analysis is needed for other components of the UAA, such as bacteria or economics, the department or other entities may have additional costs.

Several resources are presently accessed or owned by the department. These include mapping programs to determine survey sites, highway maps to determine the best route, computers, copy machines, one digital camera, two handheld global positioning system (GPS) units, and vehicles to use in the field.

The department would need to acquire or develop the following in order to conduct recreational UAAs. Currently the KDHE staff consists of three full-time employees (FTE) and three part-time employees for the stream UAA program and the use of two department staff part-time for the lake UAA program. The staff time for the lake program was estimated as a total of 0.5 FTE, since lake UAAs consume less time than stream UAAs and the number of lakes are small. The FTEs itemized in the calculation will be responsible for doing preparatory work, field surveys, data entry, and report writing. The UAA information will be used in the potential revision of the WQS and submitted to EPA.

The estimated salary for an FTE was calculated from the average of the salary range for each of the Environmental Specialist I, II, and III categories. With the recreational season lasting from April 1 to October 31 of each year, part-time salaries were computed based on an average of thirty (30) weeks at forty (40) hours per week and a pay rate of $10 per hour.

The cost estimate included three additional digital cameras and two additional GPS units with corresponding software.

Location data could be added to the existing Water Quality Information System (WQIS), but not all the data collected due to a UAA could be added to this database. Another database or organizational tool will be needed to collect all data (pictures, descriptions, analyses, etc.). This would be included in the FTEs' duties. Therefore, no additional cost for database creation or management will be needed.

Travel expenses include overnight stays, meals, and vehicle mileage. Under the assumption that three days per week are spent in the field, two nights of lodging are needed each week. The cost of lodging and meals were figured using the average of each region within Missouri at the maximum per diem rate. Vehicle usage was assessed as mileage with an average of 125 miles per day based on the area of the state and the average state rate of thirty-three cents per mile.

An internal review committee and quality assurance/quality control (QA/QC) program would need to be developed in order to insure consistency in re-designation of recreational uses. Based on the number of UAAs completed by Kansas during 2001 and 2002, an estimated five water bodies could be investigated per day. The review committee is assumed to consist of three department staff spending an average of one-half hour per UAA. The QA/QC program would be included in the field staff's time.

A rulemaking effort would be needed to remove WBCR as a designated use from a water body following a UAA that demonstrated the use couldn't be attained. At this time, the cost or number of potential rulemakings because of re-designation cannot be predicted.

The maximum number of UAAs that could be investigated is 3,774 based on current water body segment tallies. Based on the number of segments investigated by KDHE, all UAAs could be completed in 8.387 recreational seasons. It should be noted that this number represents a worse case scenario. Assumptions include five (5) water body segments per day and 3 days of fieldwork for 30 weeks during the recreational season.

$$5 \times 3 \times 30 = 450 \text{ water body segments per recreational season}$$
$$3{,}774 \div 450 = 8.387 \text{ recreational seasons}$$

Additional impacts on the state's revenue may be the potential listing of additional waters on the 303(d) list, which results in Total Maximum Daily Loads (TMDLs), due to WBCR designation. These costs cannot be measured at this time since the number of waters potentially falling into this category is unknown.

The fiscal impact to the department may also include the cost of recalculating water quality based effluent limits (WQBELs). The potential number of affected entities would be those facilities in Tables 12-16. Water quality reviews can range from simple calculation to extensive modeling. Therefore, it is difficult to reasonably estimate the cost to the department. Section 9 of this report discusses this issue in a general way.

The department has not assessed the effect of implementing the antidegradation policy. Since the implementation procedure has not been developed, as of yet, it would be difficult to determine the extent of the implementation. Therefore, costs cannot be calculated at this time.

6. Comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction, which includes both economic and environmental costs and benefits.

Section 4 of this Report explains the difficulty encountered in making a comparison between the costs and benefits of the proposed rule. This section explains the further difficulties encountered in making a comparison with the impacts potentially associated with inaction, i.e. not proposing a rule revision.

Failure to act would lead to EPA promulgation, as required by 40 CFR 131.22. The cost associated with federal promulgation is unknown but thought to be the same due to similar promulgation in Kansas. In the case of Kansas, EPA calculated disinfection costs based on Kansas Department of Health and Environment's assessment.

The WQS are designed to protect all waters of the state. Because EPA has determined the current state standards to be less effective than the federal standards, it might be assumed that if this rulemaking does not become effective, some of those resources will not be protected to the extent required by federal law. In addition, public health might be more greatly affected and water use impairment might result if the state fails to promulgate more stringent water quality criteria for adequate protection of aquatic life (fish consumption), recreational uses, and drinking water supplies. Many of these impacts are immeasurable in terms of costs simply because the exact effects from lack of action are unknown and incalculable. No comparison can be made to environmental benefits without associating a cost to lowered health of citizens and the environmental impacts that this rulemaking is intended to prevent.

The state of the economy depends to some extent on the state of the environment. An overall economic benefit might be seen in an area that can advertise good water quality. An environment free of water-use impairments is attractive to many human activities, from tourism to industry. Further explanation of this relationship is provided in Section 4.

7. Determination of whether there are less costly or less intrusive methods for achieving the proposed rule.

During the1970s, the department accepted authority through EPA to administer a water quality management program that would ensure full implementation of all federal standards relevant to the Clean Water Act. As part of that delegated responsibility, the department must develop and administer the program that is functionally equivalent to the federal standards. For state standards to be equivalent, the standards must be either based on the same facts and science used by EPA, or based on a similar level of science and knowledge. The state can not achieve that level of scientific research and data gathering without a tremendous expansion or diversion of resources toward that goal. Furthermore, it is unknown whether state standards would be significantly different until the research is complete and the expenses are incurred. Consequently, the department has generally participated with EPA during their national efforts to develop water quality criteria and accepted the science behind the federal standards.

Accepting the federal standards limits the options for choosing other methods of achieving water quality goals. However, that lack of flexibility is balanced by the eligibility of federal grants for a number of beneficial program implementation efforts, non-point source projects, and treatment plant construction financing. Because of the ability for a state-level water quality program to balance the program with other state priorities and needs, it would appear likely that administering a state-level program is less intrusive than if it were managed by EPA.

Regional organizations, county governments, or municipal governments could enact laws or policies that provide similar or greater protection of water resources within their jurisdiction. This has been done in a few select areas of the state, but it does not provide adequate protection for the entire state population and resources.

The designation of a WBCR use to all classified waters of the state and the need for disinfection of effluent can be avoided if a study is conducted that either shows the water incapable of attaining a WBCR or that the water quality standards for bacteria will not be exceeded without disinfection. Facilities facing the possible need of upgrading treatment may conduct either study if they believe the receiving stream has a reasonable likelihood of not benefiting from disinfection. Methods for conducting these studies can be find in EPA guidance. The method for conducting a Use Attainability Analysis can be reviewed on the department's web site at
http://www.dnr.mo.gov/wpscd/wpcp/wqstandards/wpp_wqs_uaa.pdf

8. Description of any alternative method for achieving the purpose of the proposed rule that were seriously considered by the department and the reasons why they were rejected in favor of the proposed rule.

Several alternatives were initially considered. Due to the need for Missouri's water quality standards to be fundamentally equivalent to the federal CWA and regulations, many of these alternatives were not viable.

As stated in the stakeholder minutes in **Appendices B & C**, a phased approach to recreational use designations was discussed. This consisted of conducting surveys to determine appropriate designation of recreational uses. This alternative would have allowed individuals time to collect sufficient evidence to determine proper designation of recreational uses. Although this alternative was considered, the federal CWA requires the designation for WBCR.

During consideration of WBCR alternatives, the Departments of Natural Resources and Agriculture worked on a memorandum of understanding (MOU). Although the MOU was never finalized, the Department of Agriculture had preliminarily agreed to help the Department of Natural Resources in an advisory capacity for assessing the suitability of classified water bodies in agricultural areas for whole body contact recreation designation. The department plans to continue pursuing an agreement with the Department of Agriculture on conducting UAAs and on water classification efforts.

In response to the need for a procedure to document waters not attaining recreational uses, a UAA protocol was developed by staff. A UAA is a structured scientific assessment of the factors affecting the attainment of the use that may include physical, chemical, biological and economic factors as described in 40 CFR 131.10(g). Using this procedure, the WBCR designation could be removed from a water when evidence supports that approach. The intent of the department was to avoid unnecessary requirements due to the WBCR designation should a waterbody not support the use.

Initial options explored for high flow exemption included

1. Setting the exemption at 1-in-10 year flood flow level;
2. Setting the exemption at 1-in-25 year flood flow level;
3. Setting the exemption at an in-stream flow that allows for safe recreation;
4. Setting the exemption for when the stream exceeds 125% of normal flow;
5. Conducting a study of fecal coliform loading per ecoregion by watershed size to determine specific high flow exemption;
6. Setting the exemption at one foot above the normal high water mark; or
7. Eliminating the high flow exemption.

Option #2 was initially considered the best option based on best professional judgement and feasibility. The application of statewide criteria creates a simpler approach to administer, but fails to consider possible existing uses. Option #3 was not chosen since the focus of draft regulations is on water quality not safety. The department later, through stakeholder discussion, explored the development of an exemption based on a site-specific analysis of the stream conditions and relating those conditions to use attainability. The proposed rule was redrafted to include a procedure for determining an exemption on a case by case basis that examines the stream for an existing WBCR use and correlates that with a defined period (and measurable condition) of high flow. Consideration was given to making the procedure easy to implement and protective of uses only during the time the use exists.

A tiered approach to aquatic life designations was also considered during the 2001 stakeholder meetings. Associated with this revision was the proposed adoption of revised dissolved oxygen criteria based on those tiers. These were not included in this rulemaking because of time constraints, but the options will be investigated in the future.

Another alternative that was discussed is tiered recreational uses. The discussion suggested an expansion of the primary and secondary recreational use definitions to reflect the various types of recreational activities appropriate for each designation. The CWC recommended this approach and suggested specific changes to the Boating and Canoeing use definition (see document references, which is currently in the draft WQS. Following the latest stakeholder discussions, the department drafted tiered WBCR use designations and criteria based on factors such as use frequency, public accessibility to the water, and safety factors.

For most of the proposed rules, EPA requires a regulatory program to ensure the effective administration of clean water standards. No other state agency has the authority or funding source to administer such a program. EPA has delegated its authority only to the department for administering a water quality program and that delegation hinges on the program being functionally equivalent to the federal Clean Water Act. An alternative of not regulating would result in promulgation by EPA. For instance, EPA promulgated primary contact recreation (similar to WBCR) in Kansas. This alternative is discussed in the Introduction.

Because the EPA guidelines offer the only current rationale for the selection of the proposed standards, the department defers to EPA's rationale for the science used in developing the standards. In order to establish standards other than those contained in EPA's guidelines, the state would need to provide rationale that is equally persuasive. That effort would take years and enormous resources, and would not likely lead to standards significantly different then those developed by EPA.

9. Analysis of both short-term and long-term consequences of the proposed rule.

The following paragraphs explain the portions of the WQS that would be affected by the rulemaking and the likely consequences of each revision. The Report previously discusses the consequences (in terms of the short and long-term costs and benefits) of the proposed designation of WBCR to all classified waters. The reader should refer to Sections 4 and 5 for a complete discussion on that subject. The following paragraphs offer further discusses the consequences of the other changes proposed in the draft rule.

Definitions

The intent of several phrases in the previously submitted regulations has been better defined. Also, two definitions are present in 10 CSR 20-2 and have been added to the WQS [10 CSR 20-7.031(1)] for easier reference. The addition of these definitions does not implement any changes to the regulation. Therefore, the short- and long-term consequences of this proposed change to the rule are that they create an easier and more direct reference to the definitions applicable to this rule. These definitions should increase the consistency in how the terms are used in implementing the rule.

"Division of Geology and Land Survey" changes to "Geological Survey and Resource Assessment Division"

In 2001, the Missouri Department of Natural Resources Division of Geology and Land Survey was officially renamed the Geological Survey and Resource Assessment Division. The services, requirements, and responsibilities of the division with regards to the stream assessment sections in the WQS will not be changing in any way. This change can be found at 10 CSR 20-7.031(1)*[(L)]***(N)**. Therefore, the short and long term consequence of this proposed change to the rule is that it ensures an accurate reference to another departmental division which recently changed its name. This change will decrease the likelihood of a misunderstanding of the departmental organizational structure.

Antidegradation implementation procedures

The antidegradation policy currently exists in the WQS in section (2) and the language will not be revised. Language has been added to section (2) to state that the department will develop a document for the antidegradation implementation procedures [10 CSR 20-7.031(2)**(D)**]. This procedure will be developed through the stakeholder process and be available to both the public and staff. Therefore, the short- and long-term consequence of this proposed change to the rule is that it will encourage the department to further clarify the rule on antidegradation. Further clarification will promote a more consistent understanding and implementation of the policy

Site-specific criteria for the Protection of Aquatic Life

Currently the WQS have three locations describing site-specific criteria methods for individual criteria. They are found in the dissolved oxygen criteria [10 CSR 20-7.031(4)(A)3.], in the toxic substances criteria [10 CSR 20-7.031(4)(B)1.], and in the sulfate and chloride criteria [10 CSR 20-7.031(4)(L)3.]. This language has been deleted and a new subsection [10 CSR 20-7.031(4)(**R**)] has been added to further explain the method of developing site-specific criteria for the protection of aquatic life for all water quality criteria. Therefore, the short- and long-term consequence of this proposed change to the rule is that it will provide a clearer understanding of the specific steps necessary to establish alternative WQS where conditions are unique. The development of alternative standards can offer relief from standards that are unnecessarily burdensome or can offer standards that better reflect, and therefore better protect, a water's specific biological, chemical or physical characteristics.

Specific criteria methods for wetlands

Wetlands represent a unique group of water bodies in Missouri. There are several types of wetlands making the development of specific numeric criteria for all wetlands difficult. Language has been added to further expand the procedure by which a specific wetland or wetland type could be assigned specific criteria for the protection of its designated uses [10 CSR 20-7.031(4)(A)*[6.]***5.**]. Therefore, the short and long term consequence of this proposed change to the rule is that it will provide a clearer understanding of the specific steps necessary to establish alternative water quality standards for wetlands. The development of alternative standards specific to wetlands can offer relief from standards that are unnecessarily burdensome or can offer standards that better reflect, and therefore better protect, a wetland's specific biological, chemical or physical characteristics.

Analytical method for drinking water supply metals

The present WQS [10 CSR 20-7.031(4)(B)2.B.] for the protection of drinking water supplies require metals to be analyzed by using the dissolved method. The maximum contaminant levels (MCLs) for metals under the Safe Drinking Water Act (SDWA) are analyzed as total recoverable. Therefore, since the drinking water criteria in the WQS are derived from the SDWA, the analytical method for metals based on MCLs are proposed as total recoverable. Those methods based on secondary drinking water regulations will remain as dissolved. The total recoverable method consists of one less step in the sampling technique (sample filtration), making the cost of total recoverable testing less, though not significantly, than the dissolved method. Currently the majority of facilities are reporting metals concentrations as total recoverable due to federal requirements [40 CFR 122.45(c)]. The total recoverable effluent limits are translated from the dissolved water quality criteria.

An increase in treatment cost could occur depending on the quality of the effluent discharged and level of treatment presently employed at each individual facility. The level of treatment at each facility ranges from minimal to advanced treatment. Information on each situation is insufficient to calculate how much alteration of treatment

would be needed. Municipal wastewater treatment plants that receive industrial discharge have pretreatment programs to aid in metals treatment. Municipal entities typically do not have the technology to treat for metals. Some pretreatment programs may have extra capacity for stricter limits since a percentage of their pollutant load may have been reserved for future growth during the original design of the facility. The number of significant industrial users (SIGs) indirectly affected by the pretreatment program is unknown. However, the number of facilities that currently monitor for each drinking water supply metal can be found in Table 12. A total of 79 facilities monitor and report one or more of the drinking water supply metals.

Table 12. Number of Facilities Monitoring for Metals: DWS

Parameter	Public Facilities	Private Facilities	Total
Antimony	2	21	23
Arsenic	19	28	47
Barium	2	24	26
Beryllium	0	22	22
Cadmium	22	30	52
Chromium	28	30	58
Copper	29	41	70
Iron	6	34	40
Lead	27	37	64
Manganese	1	24	25
Mercury	21	26	47
Nickel	22	31	53
Selenium	2	25	27
Silver	15	23	38
Thallium	1	19	20
Zinc	27	37	64

Metals criteria for aquatic life protection

Criteria for the following metals [10 CSR 20-7.031 Table A] were recalculated using the most recent toxicity data sets that included genus Ceriodaphnia: cadmium, trivalent chromium [Cr(III)], hexavalent chromium [Cr(VI)], copper, lead, nickel, silver, and zinc. The results of these criteria recalculations are equation based and, with the exception of hexavalent chromium, are dependent on the hardness of the receiving water. A table of criteria calculated using the minimum hardness value of a range would be provided as a guide. These revised criteria may be stricter or less strict depending on the type of water body receiving each individual discharge, though most will be stricter. Currently the majority of facilities are reporting metals concentrations as total recoverable due to federal requirements [40 CFR 122.45(c)]. The total recoverable effluent limits are translated from the dissolved water quality criteria.

The extent or number of required upgrades in treatment required by this proposed change in the rule will vary on a case-by-case basis depending on the level of treatment presently

employed at each facility. The level of treatment at each facility ranges from minimal to advanced. Information on each situation is insufficient to calculate how much alteration of treatment would be needed. Furthermore, a facility could conduct additional effluent and stream sampling to obtain a more specific metal translator (rather than a default translator) to be used in converting the dissolved water quality criterion into a total recoverable effluent limit. Municipal wastewater treatment plants that receive industrial discharge have pretreatment programs to aid in metals treatment. Municipal entities typically do not have the technology to treat for metals. Some pretreatment programs may have extra capacity for stricter limits since a percentage of their pollutant load may have been reserved for future growth during the original design of the facility. The number of significant industrial users (SIGs) indirectly affected by the pretreatment program is unknown. However, the number of facilities that currently monitor for each metal for the protection of aquatic life can be found in Table 13. A total of 246 facilities monitor and report one or more of these metals.

Table 13. Number of Facilities Monitoring for Metals: AQL

Parameter	Public Facilities	Private Facilities	Total
Cadmium	64	104	168
Chromium	75	98	173
Copper	86	155	241
Lead	74	92	166
Nickel	59	77	136
Silver	41	72	113
Zinc	78	141	219

<u>Mixing zones in Class C streams and streams with a seven (7)-day Q_{10} of 0.1 cfs or less</u>
Mixing zones in Class C streams and classified streams with a seven (7)-day Q_{10} of 0.1 cubic feet per second (cfs) or less [10 CSR 20-7.031(4)(A)*[5.]***4.**] do not have adequate mixing to protect the stream under all hydrologic conditions. The retraction of the allowance for these types of mixing zones may result in a recalculation of water quality based effluent limits, which most likely will become more stringent. Based on the results of the recalculation and depending on the type of treatment and discharge, changes in treatment may be necessary to sufficiently protect the receiving stream. The number of facilities that currently discharge to a Class C stream or a classified stream with a 7Q10 flow of 0.1 cfs or less can be found in Table 14.

U.S. Environmental Protection Agency (EPA) suggested this revision. The retraction of the allowance for a mixing zone only impacts water quality based effluent limits (WQBEL) that are derived either from a waste load allocation (WLA) study or a total maximum daily load (TMDL). In addition, for a facility achieving WQBEL, removing the mixing zone allowance would not necessitate an upgrade. It might, however require improved operation and maintenance. Class C streams, by definition, do not flow during dry periods, but they may have pools that support aquatic life. Streams with a 7Q10 flow of 0.1 cfs or less barely have moving water. In both instances, allowing a mixing zone adversely effects aquatic life because there is not sufficient water for pollutants to

adequate achieve mixing or to transport pollutants safely downstream. Therefore, the flow in the stream is inadequate to provide dilution to the effluent before the stream is degraded below the chronic criterion for aquatic life.

Table 14. Number of Facilities Potentially Affected by Retraction of Mixing Zone

Stream Type	Public Facilities	Private Facilities	Total
Class C	116	360	476
7Q10 of 0.1 cfs or less	3	0	3

E. coli and 1986 criteria

Following additional research and data collection, new bacterial indicators were developed and published in 1986 by EPA. In a document titled "Ambient Water Quality Criteria for Bacteria—1986," *E. coli* was found to be a better indicator of illness in swimmers of freshwater systems than fecal coliform. Hence, a new criterion was developed to accompany the new indicator bacteria. As time progressed, more states have adopted the new indicator bacteria and criterion. Missouri is currently at the point of adoption [10 CSR 20-7.031(4)(C) and Table A]. By adopting the new indicator bacteria, the level of protection for water recreation will be better understood and therefore better managed. The current wastewater treatment used to meet the current criterion will not need to change because of the new criteria unless analyzing for *E. Coli* identifies overall levels of harmful pathogens not identified by the previous analyses for fecal coliform.

High flow exemption

The rules at this time allow for occasional exceedances of bacteria limits in waters designed for WBCR during periods of storm water runoff (high flow exemption). As currently written, the high flow exemption might not ensure that the WBCR use is adequately protected. The current language [10 CSR 20-7.031(4)(C)] allows for broad interpretation and implementation. Therefore, the high flow exemption is proposed as a site-specific review of stream conditions that effect a WBCR use. This revision clarifies the period of time when the exemption will be allowed. Therefore, the short- and long-term consequence of this proposed change to the rule is that it will provide a clearer understanding of the specific circumstances during which compliance with bacterial standards will not be achievable or necessary. This clarification will allow facilities to plan accordingly once a site-specific evaluation is complete.

Table A—Criteria for Designated Uses

Several parameters in 10 CSR 20-7.031 Table A—Criteria for Designated Uses were inconsistent with federal criteria. As a result, the criteria were revised to reflect the more protective federal criteria. The human health protection—fish consumption criteria affected include 2,4,6-trichlorophenol; n-nitrosopyrrolidene; 4-4'-DDE; 4-4'-DDD; and chloroform. The drinking water supply criteria affected include 2,3,7,8-TCDD (dioxin); trihalomethanes; dichlorobromomethane; and methylene chloride. The criteria affected for the protection of both human health—fish consumption and drinking water supply include 1,2,4,5-tetrachlorobenzene; pentachlorobenzene; 4-4'-DDT; bis (chloromethyl) ether; bromoform; chlorodibromomethane; tetrachloroethylene; and 1,2-dichloropropane.

These revised criteria will be slightly more stringent. Depending on the level of treatment presently employed at each facility, the level of additional treatment needed may vary on a case-by-case basis.

The number of facilities monitoring for the specific parameters listed above can be found in Table 15. For parameters not listed in the table, no record exists of any facility currently monitoring and reporting that specific parameter. In addition, some facilities may not be counted in Table 15 since these parameters may be monitored through Whole Effluent Toxicity (WET) tests and/or the general toxic organics test. Industrial facilities that discharge to municipal wastewater treatment plants may be required to go through the pretreatment process. The number of significant industrial users (SIGs) indirectly affected by the pretreatment program is unknown. A total of 15 facilities monitor and report one or more of the specific parameters listed in Table 15.

Table 15. Number of Facilities Monitoring for Select Parameters in Table A

Parameter	Public Facilities	Private Facilities	Total
2,4,6-trichlorophenol	0	4	4
2,3,7,8-tetrachlorodibenzo-p-dioxin [TCDD or dioxin]	0	2	2
methylene chloride	0	8	8
Tetrachloroethylene	0	6	6
1,2-dichloroethylene	0	3	3
Chloroform	0	9	9

Table B—Total Ammonia Nitrogen

Advances in research methods and increases in funding have allowed toxicologists to more accurately assess the toxicity of ammonia to aquatic life. EPA published new ammonia nitrogen standards in December 1999. Accordingly, the department proposes to adopt these changes to reflect improvements to the state's 1984 criteria. In comparison, the 1999 criteria are generally less stringent than the current Missouri standards.

The degree of stringency of the ammonia nitrogen criteria depends on the type and chemistry of the water body receiving each individual discharge. The criteria are based on the pH and temperature of the receiving stream, which cannot be reasonably ascertained for each facility at this time. The number of facilities monitoring ammonia nitrogen can be found in Table 16. A total of 435 facilities monitor and report one or more of the forms of ammonia listed in Table 16.

Table 16. Number of Facilities Monitoring for Ammonia Nitrogen

Parameter	Public Facilities	Private Facilities	Total
NH3	12	13	25
NH3 N	1	1	2
NH3 T	177	243	420
NH4 T	2	1	3

Table C—Cold Water Fisheries

During the last revision several waters were either deleted from this table or modified in some fashion. This revision proposes to return those waters to their original listing. In addition, four of those waters were still listed for cold water fisheries in Tables G (Lakes) & H (Streams), indicating the designation remained. Therefore, the short- and long-term consequence of this proposed change to the rule is that it will ensure proper protection of these waters until valid rationale justifies a change in the type of fishery category under which they're listed.

Table E—Outstanding State Resource Water

The addition of Bull Creek as an Outstanding State Resource Water will provide for the protection of water quality according to the antidegradation policy. Any new discharges into the designated section of the creek or into any tributaries that flow into that section of the creek will be required to first investigate if no-discharging options would be practical. If found that no-discharge options would not be practical or feasible, special effluent limits would need to be developed so that water quality is not allowed to degrade. Currently no permitted wastewater treatment facilities, industrial discharges or general permits exist within the designated section of Bull Creek. Agricultural activities, except those regulated as Confined Animal Feeding Operations (CAFOs), will not be affected since they do not fall under the department's regulatory authority.

Table G—Lake Classification and Use Designation and Table H—Stream Classification and Use Designations

Information about the long-term and short-term consequences can be found throughout this document, particularly in Section 4.

Table I—Biocriteria Reference Locations

Several changes are being proposed to the Biocriteria Reference Locations due to water withdrawal for irrigation, accessibility limitations, and refinement of selection processes. These revisions affect which reference locations will be assessed in order to gather more data and compare that data to other waters as part of the assessment process.

Miscellaneous typographical errors

Through a rulemaking process spelling, grammar, and typographical errors can occur without notice before a rule becomes effective. These simple mistakes are then corrected during the next revision to the rule. For example, the unit of measurement for volatile organics is currently listed as grams per liter (g/L) which was a typographical error. The

correct unit of measurement is micrograms per liter (µg/L) and is being proposed as a change. Corrections made in this manner do not change the intent of the regulations.

10. Explanation of the risks to human health, public welfare or the environment addressed by the proposed rule.

Because the department is adopting federal criteria, further information on risk assessment may be obtained by reviewing EPA's criteria documents listed in **Appendix A** and the references contained within. Of the newly adopted criteria, if the department has not developed any specific to the state, then adoption of federal water quality criteria is required by default. Section 4 of this report explains the most significant potential public risks (economic and environmental costs) that may exist should the environment not be protected to the new standards proposed by this rulemaking.

11. Identification of the sources of scientific information used in evaluating the risk and a summary of such information.

Because the department is adopting federal criteria, further information on risk assessment may be obtained by reviewing EPA's criteria documents and the references contained within. Of the newly adopted criteria, if the department has not developed any specific to the state, then adoption of federal water quality criteria is required by default. Section 2 and **Appendix A** of this report presents the information used in developing this proposed rule.

12. Description and impact statement of any uncertainties and assumptions made in conducting the analysis on the resulting risk estimate.

Because the department is adopting federal standards, further information on risk assessment may be obtained by reviewing EPA's criteria documents and the references contained within Section 2 of this Report. Providing information on uncertainties and assumptions would require an analysis of the preamble to the federal rule and it is uncertain to what extent EPA documented all of the uncertainties and assumptions involved in their rule development.

13. Description of any significant countervailing risks that may be caused by the proposed rule.

The proposed designation of all classified waters in Tables G & H for WBCR will require a significant number of existing domestic wastewater treatment facilities to disinfect their effluent. Disinfection through chlorination can produce other harmful byproducts, such as trihalomethanes. Trihalomethanes are harmful to human health if consumed through drinking water supplies. Because discharges of treated effluent is prohibited above public drinking water supply intakes, this risk will only be posed where discharges are to losing streams having a hydrologic connection to private wells and where sufficient treatment of the drinking water source is not provided. The department is unable to determine the number of instances where this risk may exist but will assess for this risk at the time a discharge permit is requested and may require alternative means to disinfection, such as

ultraviolet light, to eliminate the potential for introducing trihalomethanes into groundwater or drinking waters supplies.

Chlorination may also result in residual chlorine that is harmful to aquatic life. Dechlorination of the effluent may be required to reduce the amount of total residual chlorine to safe levels.

Dechlorination is not known to cause significant risks. The level of chemicals used for dechlorination would not produce byproducts at concentrations harmful to aquatic life or human health. One of the chemicals used in dechlorination is sodium thiosulfate. According to the material safety data sheet (MSDS) for sodium thiosulfate, no known carcinogenic effect is known or anticipated.

Chlorine is also an explosive and dangerous chemical and requires safe handling and storage practices at the facility. With the assistance of industry experts, the staff of the journal Hazards Intelligence (HInt) have prepared a report (see document reference # 38 in Section 2 of this Report) analyzing over 1,000 incidents which occurred between January 2000 and December 2004 involving chlorine and its compounds. According to the report by ility, these incidents resulted in at least 68 deaths and over 800 injuries.

Despite the dangers, chlorine is relatively simple to apply and control. It is introduced into the wastewater by solution feeders or gas injectors. Chlorine gas is normally stored in steel containers (150-pound or 1-ton cylinders) and transported in railroad cars and tanker trucks. Sodium hypochlorite solution must be stored in rubber-lined steel or fiberglass storage tanks. Calcium hypochlorite is shipped in drums or tanker trucks and stored with great care.

Because chlorine is hazardous, safety precautions must be exercised during all phases of shipment, storage, handling, and use. Emergency response plans are needed for onsite storage of gaseous chlorine. Several large cities have switched to hypochlorite to avoid the transport of chlorine through populated areas. A routine O&M schedule should be developed and followed for any chlorine disinfection system. Regular O&M involves disassembling and cleaning the various components, such as meters and floats, once every 6 months. Iron and manganese deposits can be removed with muriatic acid. Booster pumps have the same maintenance requirements as any other pump. Valves and springs should also be inspected and cleaned annually. All manufacturers' O&M recommendations should be followed, and equipment must be tested and calibrated as recommended by the equipment manufacturer.

14. Identification of alternative regulatory approaches that will produce comparable human health, public welfare or environmental outcomes.

Alternative approaches are discussed in section 8. Other alternatives might be identified following further discussions with stakeholders or during the public comment period on the proposed rule. As previously stated, the revision to the WQS is driven by the need to bring Missouri's water quality regulations in line with federal clean water requirements.

Prior to the changes proposed, EPA identified several WQS as disapproved or inconsistent with federal requirements. Inaction or failure to make the changes will result in EPA promulgation. The department is making every effort to ensure that the state's rules are in agreement with the CWA, so that federal promulgation is not necessary.

15. Information on how to provide comments on the Regulatory Impact Report during the 60-day period before the rule is provided to the Secretary of State.

The department posted a notice in the Jefferson City News Tribune that the Regulatory Impact Report was available for public comment for a period of 60 days. The same notice was posted on the department's web page at www.dnr.mo.gov/wpscd/wpcp/index.html. Persons wanting to comment on the RIR were asked to submit them in writing to Ms. Marlene Kirchner, Commission Secretary, Missouri Clean Water Commission, Water Protection Program at P.O. Box 176, Jefferson City, Missouri 65102. The department accepted faxed comments. The deadline for submitting comments was clearly explained in the newspaper advertisement and in the web page announcement.

The department received 13 letters with comments on this Report. Revisions to the RIR in response to comments have been made. Copies of the revised RIR and public comment letters are available on the department's web page at <http://www.dnr.mo.gov/wpscd/wpcp/rules/wpp-rule-dev.htm>.

16. Information on how to request a copy of comments or the web information about where the comments will be located.

Requests for copies of the comments received on this RIR may be sent to Ms. Marlene Kirchner, Commission Secretary, Missouri Clean Water Commission, Water Protection Program at P.O. Box 176, Jefferson City, Missouri 65102, or faxed to (573) 526-1146. Comments on the report will be posted on the department's web page at <http://www.dnr.mo.gov/wpscd/wpcp/rules/wpp-rule-dev.htm> along with copies of the revised RIR.

Appendix A
Technical Documents and Data Used in Developing Proposed Rule

A. Peer-Reviewed Publications

1. Maidment D. (1993). Handbook of Hydrology. McGraw Hill.
2. Missouri Revised Statutes, Chapter 536 – Administrative Procedure and Review. http://www.moga.state.mo.us/STATUTES/C536.HTM
3. Rulemaking Manual. http://www.sos.mo.gov/adrules/manual/manual.asp
4. United States Environmental Protection Agency (1994). Interim Guidance on the Determination and Use of Water Effect Ratios (WERs) for Metals. http://yosemite.epa.gov/water/owrccatalog.nsf/0/513131cce81a689485256b0600723dd6?OpenDocument
5. United States Environmental Protection Agency (1999). 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA-822-R-90-014. http://www.epa.gov/waterscience/standards/ammonia/99update.pdf
6. United States Environmental Protection Agency (1999). National Recommended Water Quality Criteria 1999. EPA-822-Z-99-001. http://www.epa.gov/waterscience/pc/1999table.pdf
7. United States Environmental Protection Agency (1986). Ambient Water Quality Criteria for Bacteria—1986. EPA 440-5-84-002. http://www.epa.gov/waterscience/beaches/1986crit.pdf
8. United States Environmental Protection Agency (2002). Implementation Guidance for Ambient Water Quality Criteria for Bacteria—Draft. EPA 823-B-02-003. http://www.epa.gov/ost/standards/bacteria/bacteria.pdf

B. Non-Peer Reviewed Publications
1. ESP performed biological assessment and habitat studies for several watersheds.
2. Stream survey reports developed by department staff.
3. Water quality reports developed by department staff for lakes.

The Department used these reports to estimate the effect of new criteria and corresponding rule change on the environment and on the economic growth of the impacted industry or community.

C. Raw Data
1. Hydrologic data collected by department staff and external groups.
   - U.S. Geologic Survey (USGS), <http://nwis.waterdata.usgs.gov/mo/nwis/discharge>
2. Water quality data collected by department staff and external groups.
   - USGS; <http://www.umesc.usgs.gov/ltrmp.html>
   - USGS; <http://water.usgs.gov/nawqa/>
3. Weather data collected by external groups.
   - National Oceanic and Atmospheric Administration (NOAA); <http://www.nws.noaa.gov/>
   - USEPA & NOAA; <http://www.epa.gov/waterscience/basins/metadata/wdm.htm>

- NOAA; <http://www.ncdc.noaa.gov/oa/climate/online/coop-precip.html>

Raw data were analyzed to detect any historic trends of a given pollutant concentration and the expected concentration after modification of criterion. This data was not used to establish new or revised criteria for this rulemaking. Water quality data monitoring parameters, locations, and frequency must be adequate to gauge and assess the waters of the state. Any monitoring plan must be designed to meet the requirements of the proposed criteria.

Appendix B

Clean Water Commission Meetings
Regarding
Revisions to Water Quality Standards

Because of the length of the minutes, this Report is providing a direct reference to the date of the meeting during which significant discussions took place and the page within the minutes where the discussion can be found. Copies of the Commission Meeting Minutes are available from the department's web site at http://www.dnr.mo.gov/wpscd/wpcp/cwc-main.htm#cwc-events or can be obtained by requesting a copy from the Commission's Secretary, Marlene Kirchner, MDNR, P.O. Box 176, Jefferson City, MO 65102.

Minutes of June 18, 2003 – Pages 20 through 26
Minutes of July 30, 2003 – Pages 35 through 29
Minutes of September 10, 2003 – Pages 11 through 29
Minutes of October 22, 2003 – Pages 25 through 26
Minutes of December 11, 2003 – Pages 18 through 23
Minutes of January 7, 2004 – Pages 2 through 26
Minutes of January 28, 2004 – Pages 15 through 20
Minutes of March 10, 2004 – Page 38
Minutes of June 2, 2004 – Page 12
Minutes of September 13, 2004 (Discussions regarding WBCR use designation w/i UAA protocol) – Pages 2 through 10

Appendix C
Minutes from Stakeholder Meetings

Stakeholders Involvement Meeting for
2001 Water Quality Standards Review Process

April 3, 2001
Bennett Springs Conference Room
1738 E. Elm St.
Jefferson City, Missouri

Attendees:

Karen Bataille	MDC	John Lodderhose	MSD
Michael Bollinger	Ameren	John Madras	MDNR/DEQ/WPCP
Patrick Costello	EPA Region VII	Andy McCord	RCGA
Cindy DiStephano	MDC	Tom Sanders	City of Moberly
Jack Dutra	JD Information Services, Inc.	Darlene Schaben	MDNR/DEQ/WPCP
John Ford	MDNR/DEQ/WPCP	Don Torretti	MSD
Bob Hentges	MO Public Utility Alliance	Chris Zell	MDNR/DEQ/WPCP
Mike Irwin	MDNR/DEQ/WPCP	Leanna Zweig	MDC

John Madras went over the topics that are planned to be discussed at the different meetings. A package was mailed to interested parties and others, including a letter from MDNR to EPA describing how we plan to address the approvals they made as well as the disapproved items from previous standards makings and parts they felt inconsistent with the Clean Water Act.

The disapproved and inconsistent with the Clean Water Act items will be addressed first. EPA is bound to do federal rulemaking if the states don't change the rules to correct the deficiencies. Another topic to address is wood harvesting. The Clean Water Commission (CWC) directed staff to investigate potential rules under water pollution authorities that might address potential problems from chip mills. Discussions have turned into how to minimize impacts from intensive wood harvesting. Designation of metropolitan no-discharge streams will be another topic. Discussions have been held regarding Peruque Creek in St. Charles and Warren counties.

John mentioned that some other discussions raised were that some "guidelines" (Channel Modification and Sand & Gravel Guidelines) should be implemented into rules since they are required for water quality certifications. They would have to go through the formal rulemaking process.

The "Other Management Practices" topic is open-ended. Sand & Gravel Excavation Guidelines are expected to go through the CWC as well as the Land Reclamation Program Commission rulemaking process. We should end up with identical rules.

Today's topics include Metal's Criteria and Hardness Ranges. Chris Zell gave a presentation on Hardness Ranges. Chris started with some background on hardness ranges. Metals that hardness

has a good relationship to toxicity include cadmium, chromium, copper, lead, nickel, silver and zinc. All recalculations for metals are natural base e. Chris showed equation samples. Separate criteria are available for three hardness ranges. EPA feels streams are underprotected when hardness is near the lower end of the range. Some options to fix this might be: 1) maintain status quo but errors can range from 10-30%; 2) further define the hardness ranges; 3) incorporate the actual equations into the standards. The third option is the more favorable.

A suggestion was made on option 2 to add ranges but to use of the lowest number at the end of the range.

Mike Irwin gave a presentation on Aquatic Life Metals Criteria. This is designed to protect aquatic life from acute and chronic exposures to metals. There is EPA guidance on this issue. There are different ambient water quality criteria manuals for each metal. Calculations are done for each metal. EPA did the original calculations for Missouri criteria in 1988. Species deletions were made public during the 1989 hearing process and implemented into the Water Quality Standards. No negative comments were received. EPA stated in their letter that MDNR did not provide adequate documentation in their assumptions for recalculations. In the original EPA recalculations all genera of Order Cladocera (water fleas) were deleted. They are representative of other invertebrates not in the national database. *Ceriodaphnia* are used for whole effluent toxicity (WET) tests. So, there is a discrepancy. Staff agree that removal of Order Cladocera was not justified. Recalculation of aquatic life metals criteria would use Order Cladocera. Metals criteria would become more stringent.

John asked the group how they would like to see the water quality standards fixed. A question was raised about including an equation in the permit. Permits need to be as reasonable as possible. Currently, there are a couple that toggle with flow. Decisions will need to be made on how hardness will be looked at.

Another question was about the difference between the amount of time spent in permit writing and data collection versus just increasing hardness by equation. 1) See how streams are known (could make an educated guess) where there are proposed discharges or 2) look at the rule and say – any changes in metals criteria in a permit is a new water quality based limitation that allows three years to meet the standard. Three years of hardness data may show if that is the right number. There are options to carry this out. There can be a happy medium of tighter range of values and an equation.

It was suggested to check and see what other states use. It was stated that Illinois has a formula in their standards but was unsure of how it was incorporated into permits.

A suggestion was made to present this as a table or matrix with an equation at the top. Several liked that idea. The Secretary of State's office has suggested that we not have more tables but make it as a publication.

A question was brought up about mercury. All mercury in the database is highly suspect because of potential contamination. It is in the water in small concentrations. USGS has been measuring mercury in water for years. Accuracy of measuring mercury is still a question.

John said the changes to the metals criteria will be sent to everyone when they are ready.

There was a question of adding mussels to the database. EPA will check on this. There may be something already there that is equivalent.

John asked the group for suggestions for other topics that are not listed. It was noticed that sediment was not on the list. There is a statewide concern about the impacts of sediment. It was mentioned that monitoring would be expensive and complicated. Biological monitoring may be possible and the better method. The problem is that it's usually done after the fact.

The next meeting will be April 17 in Columbia at the USGS Columbia Environmental Research Center following the Water Quality Coordinating Committee meeting.

The plan is to submit as many standards' changes that are ready for hearing to the Clean Water Commission at the October Commission meeting. Proposed changes need to be completed by the end of June. Responses from the group will need to have a quick turnaround time.

Stakeholder Involvement Meetings for
2001 Missouri Water Quality Standards Review Process
April 17, 2001

USGS Columbia Environmental Research Center
Columbia, Missouri

Attendees:

John Hoke	MDNR/DEQ/WPCP	Ted Heisel	MO Coalition for the Env
Trent Stober	Midwest Env Consultants	Mike Irwin	MDNR/DEQ/WPCP
John Ford	MDNR/DEQ/WPCP	Chris Zell	MDNR/DEQ/WPCP
Andy McCord	RCGA	Tom Sanders	City of Moberly
Paul Andre	Dept. of Ag	Douglas Henry	City of Moberly
Jack Dutra	JD Information Services, Inc.	Mary West	City of Moberly
Buffy Skinner	St. Louis MSD	Michael Bollinger	Ameren
John Lodderhose	MSD	John Pozzo	Ameren
Kenny Duzan	MDNR/DEQ/PDWP	Patrick Costello	EPA Region 7
Cindy DiStephano	MDC	Cheryl Crisler	EPA Region 7
Rob Dobson	Sustainable Env Solutions	Cory Ridenhour	MO Forest Products Assn
Leanna Zweig	MDC	Dorris Bender	City of Independence
Tom Kruzan	Ozark RiverKeepers Network	Bob Steiert	EPA Region 7
Ken Midkiff	Sierra Club	Darlene Schaben	MDNR/DEQ/WPCP
Kevin Perry	REGFORM	John Madras	MDNR/DEQ/WPCP

Introductions were made.

Today's meeting covers Drinking Water Metals Criteria and Background Dissolved Oxygen Criteria.

Sedimentation issues raised at the first meeting may be a bigger issue than we can deal with in the short time that we have to put together the draft rule. But we need to figure out what we can do as a state to deal with those problems.

The rule writing process needs to be completed by July 4, 2001. Through these meetings we hope to find out the most important parts so the rule can be written well the first time.

There was a question about "Other Metals" on the schedule. With the Aquatic Life Metals Criteria recalculations being discussed, we wouldn't know what the metals criteria would be to be able to discuss it at this point. Other metals--lead, copper, cadmium, zinc—would be chronic criteria rather than acute. There was a concern whether WET tests will detect chronic toxicity levels.

Mike Irwin presented information on Drinking Water Metals Criteria. Drinking water supply is listed as a beneficial use in the water quality standards and designed to be protective of human health. Metals with numeric criteria for drinking water supply include antimony, arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel,

selenium, silver, thallium and zinc. The core issue is that national drinking water standards for metals are based on total metals and not dissolved (soluble metals). According to EPA, Missouri numeric criteria for drinking water metals could be underprotective. Staff concerns are that total metals include metals that are adsorbed with other solids. These solids and metals are removed in conventional surface drinking water treatment. Therefore, dissolved soluble metals are a primary concern for water suppliers.

Some options would be to maintain use of dissolved metals criteria, but this would not be equal to the national standard. Staff feel it a better representation of finished water and health risk. Another option is to switch to total metals criteria. This would be more protective and EPA would approve. Staff feel this would be less representative of finished water and health risk. EPA suggested why not retain both if there is concern of representation of risk to human health. It was felt that we would get a lot of water quality exceedences and would have to list waters in the 305(b) report and the 303(d) list, several of which wouldn't need to be there. This would be from source water.

It was mentioned that there is a need for clarification from EPA. Most metals are being regulated at the MCL level, based on Safe Drinking Water Act capability. MDNR is placing very stringent standards, developed by EPA criteria, to be protective of human health after drinking water treatment. Applying the very same standard in the stream without consideration of the fact that the water is going to receive drinking water treatment is not representative of the real human health risk. This seems inconsistent with the regulation developed in which MCLs were first derived. A question was asked if other states are using total metals utilizing MCL concentrations as their water quality standards. EPA will have to research this.

Some sludge is land applied when metals are removed through the treatment process. The sludge is regulated through the wastewater discharge permit and managed through the permit conditions.

In source waters there are concerns for other materials not taken out by conventional treatment but are taken out by advanced treatment, i.e., pesticides taken out by activated carbon. For this the source water would be held accountable for meeting the drinking water standard. Most drinking water sources use this method anyway.

It was asked if we have determined where metals are coming from. 90% are background from soil erosion/particles. Most of the improvements are done through soil conservation.

Chris Zell gave a presentation on Background Dissolved Oxygen Criteria. MDNR will look at the statewide dissolved oxygen criteria—fishery type and procedures--to develop site-specific criteria.

Factors that effect DO in stream oxygen are temperature, pressure, salinity, turbulence and biologic activity. Some of the MDNR concerns are that the present standard (5.0 mg/l) may not provide adequate protection; protection of unclassified waters; and flexible standard that allows site-specific criteria.

Some EPA concerns are that MDNR needs to provide detailed procedures for development of site specific criteria; potential to further impair a water body (more documentation is needed); and determination of natural background.

Cold water fisheries early life stage protection is December 1-March 31; cool water fisheries is March 1-June 30; warm water fisheries is April 1-August 31. This is a compromise between EPA guidelines for cool and warm water. Chris showed proposed criteria for chronic and acute values for cold, cool and warm water fisheries. This is based on daily average values.

It was suggested that copies of the presentation should be sent to the group. The presentations will later be on the MDNR web site.

Dissolved oxygen criteria are not applied to unclassified waters at this time but has been suggestions that it should. The proposal would be when flow is greater than 0.1 cfs is present, a criterion of 3.0 mg/l is to be achieved at all times. This is a suggested change by staff.

Chris went over the background dissolved oxygen issues—ecoregional differences, NPDES compliance, determination of minimally impacted sites, develop reference condition methodology and sampling. To come up with what is the natural background, we would have to define reference condition.

It was felt that an issue not addressed was releases to impoundments. Low dissolved oxygen conditions occur seasonally below every major reservoir in the state. Existing standard may not be met and clearly won't be met at 6 ppm for general warm water fisheries criteria. There was a question of the validity of the numbers in light of extensive fishery. Also, a question of the mechanics of what MDNR would do to small wastewater treatment plants up and down the river that discharge into the river below reservoirs. MDC did not think this to be a concern. Ameren is involved in a number of studies to start soon to look at biological impacts on fisheries and mussels water quality impacts. This may be placing more stringent criteria, and may be doing so without acknowledgement of a pre-existing condition on major reservoirs and severe impacts on many people. It was mentioned that we should recognize a pre-existing condition in complying with current standards before applying more stringent standards. EPA thought we could do this through site-specific studies.

MDNR uses the 1986 Gold Book for ambient water quality criteria for dissolved oxygen. MDNR is trying to set the overall framework for dissolved oxygen criteria for the state of Missouri and the process for development of site-specific criteria. Dams may not fit the mold. The main problem in establishing site-specific criteria is anthropogenic, the condition to use as a baseline. Consideration has been given to extending DO criteria up into classified waters with permanent flows. EPA's objected to the vagueness, lack of specificity, as to what constitutes natural background DO.

There was a suggestion to stick specifically to EPA disapproved issues because of the short timeframe. Budget is a problem when a UAA would be necessary. A UAA would be used to downgrade the use.

If a water is on the 303(d) list, there is an opportunity to do site-specific criteria. A process for doing site-specific criteria needs to be set up and put into rule. The public notice process would be used for establishing site-specific criteria, but the standard would not be changed.

There was a question about how site-specific criteria are different than variances. Site-specific criteria is not time limited. Variance is a time limit excursion. A cost benefit analysis for site-specific criteria could be done for DO, as well as other criteria. This would show up in antidegradation. Small town may have budget problems doing a cost benefit analysis.

EPA would approve a standard if it included a reference condition methodology defining natural background DO. EPA would like to see the Triennial Review process played out to fix the inconsistencies. The Water Quality Standards need refined with new studies and new findings.

There was a suggestion to look further than the EPA Gold Book. Another suggested that streams with low DO should be addressed now. Most monitoring is done on medium-sized and larger rivers with conditions of summer weather and low flow when oxygen level is lowest.

Chris asked for suggestions on procedures for how to determine site-specific criteria, how to sample, what is considered a reference condition, what is considered minimal impact. It was suggested to conduct studies to see what data we are dealing with then establish a monitoring program. Another suggestion was to do a paired approach with a candidate stream and one reference stream. Or, maybe do a lot of sampling over an ecoregion and develop data. It was decided to let EPA and MDNR look at it and bring back to the group what an appropriate background level would be.

In collecting DO data, it would be interesting to go back to streams done on QUAL2E modeling to see how well calibrated the model still is.

It was mentioned that in Georgia, in low DO conditions, a 10% reduction was allowed if they couldn't meet the DO from anthropogenic causes. Maybe after a reference condition was developed, a look at a 10% reduction could be looked at.

EPA has national data regarding protective aquatic life conditions.

MDNR needs data on small rivers for setting site-specific criteria. There are EPA approved methods for sampling of DO. EPA is checking with headquarters in Washington on acceptance of measuring metal's criteria at a wastewater treatment plant if it is removed through the treatment process.

Any other comments can be brought up at later meetings.

Stakeholder Involvement Meetings for
2001 Missouri Water Quality Standards Review Process
May 1, 2001

Bennett Springs Room, MDNR Conference Complex
Jefferson City, Missouri

Attendees:

Buffy Skinner	St. Louis MSD	Jerry Lawson	Marshall Municipal Util.
Bob Zeman	St. Louis MSD	Kent Spainhour	Chillicothe Municipal Util.
Ken Midkiff	Sierra Club	Bill Breeden	Chillicothe Municipal Util.
Bob Williamson	KCMO Water Services	Chris Zell	MDNR/DEQ/WPCP
James Gasich	Lake St. Louis Community Assn	John Hoke	MDNR/DEQ/WPCP
Rhonda Ferrett	City of Lake St. Louis	Trent Stober	Midwest Env Consultants
Michael Bollinger	Ameren	Terry Eaton	KC Power & Light
Scott Goodin	MDNR/DEQ/WPCP	Michael Katzman	KC Power & Light
John Ford	MDNR/DEQ/WPCP	Steve Taylor	MO Corn Growers Assn
Mike Irwin	MDNR/DEQ/WPCP	Loring Bullard	Watershed Committee
Kevin Perry	REGFORM	Steve VanRhein	Watershed Committee
Don Nikodim	MO Pork Producers	Ted Heisel	MO Coalition for the Env
Lee C. Redmond	MO Chapter Amer Fisheries Society	Leanna Zweig	MDC
Dorris Bender	City of Independence	Leslie Holloway	MO Farm Bureau
Doug Farrow	City of Moberly	Darlene Schaben	MDNR/DEQ/WPCP
Tom Sanders	City of Moberly	John Madras	MDNR/DEQ/WPCP
Mary West	City of Moberly		

Today's topics are Whole Body Contact Use and High Flow Exemptions.

Whole Body Contact Use – Chris Zell, WPCP
According to Section 101(a) of the Clean Water Act, all waters are intended to be fishable and swimmable. EPA disapproved that part of Missouri's Water Quality Standards because not all waters are listed for whole body contact. Chris read the definition of whole body contact use. Not all of Missouri's classified waters are expected to be used for whole body contact use recreation. Missouri would have to disinfect all waters of the state to reach the swimmable goal. If this were to happen Missouri would encourage use of non-chlorine disinfection methods such as ozone and ultra-violet radiation.

Alternatives would include designating all waters for whole body contact or conduct UAAs. There are 2000-2500 classified water body that are not designated as whole body contact use. This would involve adding disinfection limits to NPDES permits.

High Flow Exemptions – John Hoke, WPCP
High flow events may lead to water quality standards violations. Increased storm-water runoff may result in short-term increases in fecal coliform concentrations. To address this, the WQS contain an exemption of whole body contact waters from fecal coliform criteria during high flow events. This is located in the Missouri Water Quality Standards at 10 CSR 7.031(4)(c).

EPA requested that MDNR review, revise or eliminate the high flow exemption due to the broad and qualitative nature of the standard. Other states that have similar high flow exemptions were reviewed.

Options may include setting high flow exemption at 1-in-10 year flood flow level; setting high flow exemption at 1-in-25 year flood flow level; conduct a study of fecal coliform loading per ecoregion by watershed size to determine specific high flow exemption; or eliminate high flow exemption.

John Madras said an option to address this would be to adopt a blanket criteria for whole body contact throughout the state and do away with high flow exemption. This would cause problems for Missouri. About a ¼ of Missouri waters are protected for whole body contact.

EPA does not look favorable on the concept of having secondary contact recreation use. The problems are generally still there.

Most every stream in the state would be listed on the 303(d) list if Missouri would require the disinfection process. Any facility that discharges into a recreation or losing classified stream has disinfection limits in their permits. CAFOs are permitted as non-discharging facilities.

A comment was made that the amount of chlorine necessary for disinfection may create other problems for the surface drinking water plants downstream.

Some engineers feel that going to disinfection by ultraviolet light will require filtration to some extent. It may be easier to do a UAA for barges and currents.

The Missouri and Mississippi rivers were not included in the water quality standards due to safety reasons. It was suggested to sub-divide the Missouri and Mississippi rivers to designate for WBCR.

A question was raised about the realism of classifying the smaller streams as whole body contact. Chlorine disinfection by-products would have a more serious affect on these.

A question was raised about the handling of issues relating to nonpoint source and point source. The Nonpoint Source Management Plan is the major tool in dealing with those issues. Another question was how to handle the CSOs. EPA has draft guidance on CSOs.

There was discussion of liability/responsibility of informing the public of certain waters to not swim in. Are the standards numbers safe enough to not pose a risk? At times during low flows fecal coliform____ levels above 200 colonies per 100 ml have been observed.

A comment was made that there is really no way to handle or deal with nonpoint sources. There are a lot of streams that do have low flows with deep pools that people swim in.

Certain streams can be put off-limits for new small treatment plants because there are alternatives available for wastewater treatment. The process for getting on a "no-discharge" list is to have this advisory group make a suggestion to the Clean Water Commission.

To prevent nonpoint source pollution issues, best management practices are encouraged. Cost-share is available through SWCD, EQIP, etc., for fencing and alternate watering systems.

Enforcement action can be taken on point source water quality standard violations. Action on nonpoint source violations can be taken using long-term solutions and information/education. Point source and nonpoint source violations cannot be handled the same. With regard to how to do the UAA, there are protocol that can be set up that EPA can accept. If we end up with additional classifications for contact recreation, the process can be streamlined so that the UAA can be usable as a tool.

It was suggested that it may make sense to include dissolved oxygen in the UAA also.

It was suggested that the streams and lakes designated as whole body contact have discharges be limited to 200 daily max/100 monthly average, with a fall back of 400/200; secondary contact 1000/400 (current designation for whole body contact). Though this was thought to be too high, particularly on some high volume discharges in a low flow stream. Something may need added to allow for distinction for low flow discharge and high flow stream.

It's not only fecal coliform that is a concern but also nutrients released from package treatment plants that cause degradation of water quality.

There may need to be a better definition of what a whole body contact stream is. May need to include depth, water during normal flow, if standing pools during a number of months of the year, if over a certain diameter in depth, or numeric limits. The current definition is accepted by EPA.

It was asked if a county could place stricter regulations than MDNR. A lot of times a county will have to depend on whatever specific authority they have; whether it is through their ability to write health-based ordinances or others things the county has adopted.

EPA's goal is to have all waters fishable and swimmable. Under the Water Quality Standards, MDNR is allowed 3 years to implement new water quality based limits in permits (3 years from the time it gets in a permit). Most permits would be modified when they come up for renewal. The process could take 3-8 years.

If we are moving to doing UAAs, the state would need to set up guidance.

Missouri's recreation season is April 1 to October 31. Some areas do seasonal disinfection. The monitoring network will not increase. Currently, monitoring is being done by ESP, WPCP, Regional Offices, USGS, UMC and the permittee.

A question was asked about how would chlorine by-products be addressed and balanced. A study would need done to determine the use; then determine if that use is attainable.

It was mentioned that wetlands filtration seems to be promising and has not been mentioned yet. Columbia is using this on large municipal plants. Treatment is not only for fecal coliform but also for some of the nutrient problems. Most of the treatment is done by bacteria.

Atrazine is tested for quarterly in the public drinking water reservoirs.

A comment was made that the UAA seems to be a critical factor. We are faced with taking a federal mandate and utilizing that process to appropriately apply it on a site-specific or local basis. The state should pursue the process for systems that will be significant in their impact on point sources such as the Mississippi River. For smaller systems with localized impacts, the state should develop guidance for local municipalities for consultants to go by. It was suggested that an advisory committee be set up to follow-up on this.

The point of these discussions is to set criteria to protect the uses that are there. The criteria reflect what we expect from water bodies. Swimming criteria can pretty well be the same statewide but it could be tailored for when criteria would need to be met.

There was a question of the timeline for response to EPA. EPA is willing to work with states to figure out what is reasonable. The response letter to EPA included Missouri's plan to address the problems.

It was asked if other states have been successful. Wyoming, in Region 8, has developed UAA guidance for whole body contact.

The PowerPoint presentations will be sent out.

Stakeholder Involvement Meetings for
2001 Missouri Water Quality Standards Review Process
May 14, 2001

Bennett Springs Conference Room
1738 E. Elm St.
Jefferson City, Missouri

Attendees:

John Madras	MDNR/DEQ/WPCP	Roy Hengerson	Sierra Club
Darlene Schaben	MDNR/DEQ/WPCP	Roland Biehl	MSD
Mike Irwin	MDNR/DEQ/WPCP	Bruce Litzsinger	MSD
Patrick Costello	EPA Region 7	Steve Taylor	MO Corn Growers Assn.
Steve Rudloff	MO Limestone Producers Assn.	Leslie Holloway	MO Farm Bureau
Scott Goodin	MDNR/DEQ/WPCP	Bruce Boomer	Farmland Industries
Steve VanRhein	Watershed Comm of the Ozarks	Scott Harding	SCI Engineering
Loring Bullard	Watershed Comm of the Ozarks	Jerry Fick	
Michael Bollinger	Ameren	Bob Ziehmer	MO Dept. of Conservation
Lee Redmond	MO Chapter Amer Fisheries Society	Ken Midkiff	Sierra Club
Ted Heisel	MO Coalition for the Env	Cindy DiStephano	MO Dept. of Conservation
Trent Stober	Midwest Env Consultants	Leanna Zweig	MO Dept. of Conservation
Ray Bohlken	Capital Sand Company, Inc.	Paul Calvert	MO Dept. of Conservation
John Howland	MoDOT	Kevin Perry	REGFORM

Introductions were made.

Channel Modification Guidelines, John Madras
John gave a brief history of the Channel Modification Guidelines. The guidelines describe the different types of precautions that people are advised to take if they change a stream channel or make a modification to the channel. These were adopted by the Clean Water Commission in 1981. Considerations include protection of in-stream uses, to just protect water quality and particular concerns for special waters.

In the guidelines there is a list to follow, in order: bank protection measures, selective snagging, clearing and snagging, widening, deepening, by-pass channel development, and channel realignment. It is important to maintain the natural sinuosity of the channel. Channel realignment is usually the last option looked at.

A general guideline to use is 3:1 horizontal to vertical slope in conducting bank stabilization. Maintaining the grade of the bottom is important. The main use of the guideline is for section 404 permits. A question was asked about whom determines when it is necessary to do channel modifications. In the 404 permit process, the state does not have a role to decide if a particular project is necessary. The Corps of Engineers (COE) is tasked with deciding if a particular project is in the public's interest. The water quality certification is the way the state can add conditions to the permit to lessen the effects to protect water quality. Through the 404 permit process, the COE will initiate their 3-step process – avoidance, minimize and mitigation.

The goal for the guideline is to get feedback on a 20-year old document. If the guidelines would become a rule, the changes in the permitting process, from MDNR's point, would be more definitive on administering the guidelines. It would add surety to the process. This would allow the applicant to see beforehand what would be expected from MDNR. It was suggested to include punitive damages and a mitigation component to the guidelines. Another suggestion was to add topics for qualifying how good a stream is for mitigation ratios. It was mentioned that an initial assessment of streams would need to be done. These may be used by developers, engineers or an applicant as a starting point.

The topics need to be in the rule to evaluate the application may include—watershed size, aquatic species, diversity, riparian corridor, habitat.

It was asked if there could be a step above where snagging would be the least damaging; maybe a retention basin. There should be a presumption that channel modification will impact water quality and then if you meet certain criteria, that presumption could be removed.

One quandary is that some activities are regulated by COE and we have an opportunity to address them. It is an interesting concept to think that we won't be accommodating the effects of an unregulated activity in the permitting process.

The Channel Modification Guidelines show a guideline but now how it is to be done. Copies of the guideline were handed out. The COE & MDNR view the definition of channel modifications differently.

There is a frustration when an "after-the-fact" is issued. The damage has already been done.

With channel modifications there will be bank stabilization. It has been seen that riprap gets dumped for bank stabilization. It was requested to include that vegetation is the preferred method.

It was asked when widening would be appropriate. The most frequent instance would be where there is more water coming down the stream channel resulting in local flooding. Widening would be when a "shelf" is built so when water comes up, it has a wider cross sectional area. Then at lower flows it is back in the channel again. Deepening a channel is hard to maintain unless you are maintaining a grade.

The biocriteria standards are being planned for next year.

Site-specific issues could be included in this rulemaking if they were not too prescriptive. There could not be a one-size-fits-all. Maybe introduce a quality of topics, not quantity.

Sand & Gravel Guidelines, John Madras
Sand & Gravel Guidelines are relatively new. They were designed to protect water quality while allowing activities to occur. These were developed in 1993 with the development of the general

permit issued under section 404. The thought in developing the guideline was to look at a stream channel and see how we can get sand and gravel out of the riparian and stream environment with doing as little damage to water quality and the stream channel. John went over the 15 guidelines.

A lot of sand and gravel discussions have been on buffers. The main concern is protecting vegetation on the stream bank. Vegetation is the preferred buffer on stream banks. If there is too much gravel taken from the stream bed, other gravel comes from somewhere else, usually from the stream bank.

Spawning season was one of the guidelines that operators had a problem with. March through June is the busiest time for operators. They concluded that if buffers are maintained, work can continue. There are still small streams where this will not work. Most of the guidelines are common sense.

Options include to maintain guidance as guidance only or incorporate them as rules with opportunities for site-specific consideration.

The down side of putting these into rule is that there may be situations that come up later that do not fit these current guidelines.

It was asked about the COE jurisdiction. If an activity is mining gravel in the stream, they will need a COE permit.

It was mentioned that it seems that no one is enforcing that the guidelines are being followed. It was thought that the guidelines should be a rule so enforcement could be done. There was some discussion on enforcement.

At the last Land Reclamation Commission meeting, they suggested leaving them as guidelines and not adopting them into the land reclamation rules.

MDC has talked about plans to do a 3-phase study regarding operations following the guidelines, how successful they have been and have they had the desired effect.

Any comments can be sent to John Madras at any time.

Meeting adjourned. The next meeting will be held on June 5 in Jefferson City.

Stakeholder Involvement Meetings for
2001 Missouri Water Quality Standards Review Process
June 5, 2001

Bennett Springs Conference Room
1738 E. Elm St.
Jefferson City, Missouri

Attendees:

John Madras	MDNR/DEQ/WPCP	Clif Baumer	NRCS
Chris Zell	MDNR/DEQ/WPCP	Buffy Skinner	St. Louis MSD
Dorris Bender	City of Independence	Roy Hengerson	Sierra Club
C. Ted Turney	Kansas City Water Services Dept.	Michael Katzman	KC Power & Light
Richard Gaskin	Kansas City Water Services Dept.	Robert Brundage	PSF
Scott Goodin	MDNR/DEQ/WPCP	Bob Hentges	MO Public Utility Alliance
Leslie Holloway	MO Farm Bureau	John Howland	MoDOT
Ken Midkiff	Sierra Club	Scott Harding	SCI Engineering
Ted Heisel	MO Coalition for the Env	Clayton Bellamy	Associated Press
Darlene Schaben	MDNR/DEQ/WPCP	Jeff Halderman	KLIK
Joseph Hughes	Corps of Engineers, KC District	Kevin Perry	REGFORM
Sarah Kornblet	MO Coalition for the Env	Leanna Zweig	MDC
Chris Hamilton	NRCS	Mary West	City of Moberly
Pat Graham	NRCS	Patrick Costello	EPA Region 7

Introductions were made.

Agenda: Outstanding National Resource Waters; Mitigation Guidelines; & Wetlands Criteria.

Outstanding National Resource Waters, John Madras

There are 3 waters on this list of Outstanding National Resource Waters (ONRW). They include the Current River, Jacks Fork River and the Eleven Point River. The criteria of these waters apply to the entire watershed, not just the rivers. These are listed in Chapter 7 of the Clean Water Regulations.

EPA's concern is that there are allowed discharges and new permits in these waters if it is a publicly owned treatment works (POTW). Our options are to remove it and take no more applications for permits from public facilities or leave it in and let EPA take whatever action they deem appropriate.

Land application could be an option but the land is not suitable. In other states, there aren't as much land mass tied up in these categories of water. It was mentioned that redesignation or renaming may be an option. But lowering the protection would not work. It was suggested to remove the POTW clause.

It was also suggested that given that there are some discharges currently permitted, it might be possible to maintain a condition of no lowered water quality by a trading scheme. It was mentioned that trading represents a net reduction.

EPA supports removing the POTW clause.

Mitigation Guidelines, John Madras

The guidelines were written in cooperation with other agencies. A copy of the Mitigation Guidelines was passed out. The main goals of the guidelines are to carry out the state and federal responsibilities under the CWA and also to comply with Executive Orders, both state and federal, to see that we have no net loss of wetlands. The authorities for the guidelines are from the Clean Water Act, National Environmental Policy Act, Executive Orders & Missouri Clean Water Law.

The guidelines define mitigation and are in a thought process order: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating impacts. The guidelines address different types of criteria: the kind of site it is, the type of wetland it is, the method used to complete the restoration or mitigation, the ratio that mitigation occurs. The guidelines show the current ratios used. The guidelines provide opportunity to use higher ratios when mitigation is delayed or when one project impacts another.

A suggestion was to include the criteria of identifying/quantifying quality streams. For example, perennial vs. intermittent, size of the watershed, flood protection/storage, aquatic species, adjacent riparian corridor, habitat value in a stream. A challenge is that there is no objective way of defining aquatic values that are being mitigated for.

There were some discussions on the definition of "in-lieu-fee" mitigation and how the state became involved with mitigation. It was mentioned that the COE mitigation ratios are different from what the state requires. MDNR is tried to set the guidelines to be in common agreement and get everyone on the same page.

The COE goal is no net loss of wetlands. The COE does not have a preset guideline on mitigation and what is required. Because of determinations they have to make, they do not have a predetermined mitigation policy with ratios. There was discussion on the COE issuing a provisional permit.

It was asked if there is a comfort level in establishing a ratio for specific projects. It is very helpful for an applicant to have a specific number. Any project that impacts more than $1/10^{th}$ of an acre requires mitigation. It was seconded that the guidelines should have a specific number rather than a range.

Some felt that the ratio range has been helpful with some projects and thought there was a background history on why the ranges are as they are.

It was asked who monitored to ensure that conditions are met and mitigation is occurring at the prescribed ratio. The applicant's consultant is required to provide an annual monitoring report for either site specific mitigation or for mitigation banks. The COE has also done site visits.

It was suggested that the mitigation guidelines address the concept of compensatory mitigation. In replacing a bridge in an agricultural area, the bank is eroding away at the abutment. The bridge and bank is armored to reduce erosion. This has been interpreted by MDNR as a stream impact. MDC feels that by using riprap for bank stabilization, the stream is being damaged further downstream. MDC recommends using vegetation. Federal guidelines will not allow MoDOT to use federal dollars to vegetate clear zones (from the shoulder to the barbwire fence). There may be things they can do to increase the roughness and dissipate energy at that location. It was mentioned that Steve Goff, St. Louis, did research on Fishpot Creek in similar situations.

More creedence would need to be given to in-lieu-fees if the guidelines are going to be a rule. There are programs available that could be taken advantage of.

It was asked if consideration is given to resources, where natural streams, open spaces or green spaces are quickly disappearing, in urban areas. It was thought that more technical information assigned to streams, qualifying/ quantifying their functions and providing some estimates on mitigative value. The St. Louis COE has already applied the higher ratios for out of watershed mitigation.

Wetlands Criteria, Chris Zell

Before 1993, the wetland criteria applied to wetlands adjacent to classified water bodies. In 1993, a clause was inserted into the WQS that said wetlands that are delineated according to the COE 1987 Delineation Manual were what we had so that actually expanded the number of wetlands we were giving protection to. The narrative criteria for the state are applicable to those wetlands delineated by the 1987 manual. EPA thought this was a reduction in protection. But after discussion with EPA, this is no longer an issue.

The state is now considering clarifying that wetlands are waters of the U.S. and waters of the state; and clarify that the narrative standards apply to wetlands. Other things to consider are use classifications for wetlands, consider what tier of the antidegradation policy to put these on, and numeric criteria.
It was thought that assigning numeric criteria would be difficult to do. The definition of a wetland is still a question, so applying criteria would be difficult. If you would choose to follow the antidegradation policy, you would have to know the current water quality condition.

It was suggested to add definitions of wooded wetland, scrub-shrub, etc. A lot of time is spent trying to figure out what the project actually is.

It was recommended to change the definition of a wetland so that it isn't tied to the federal definition. It was noted that if the COE's manual is used for identifying wetlands, they are not all waters of the U.S.

It was suggested the guidelines include a water dependency requirement like the COE regulations. Standards need to be set on how to avoid impacts to wetlands.

For the next meeting, if anyone has a particular question/issue they want to raise, let John know in order to form an agenda. Other issues raised at earlier meetings will be followed up on. The rule will be put together by gathering thoughts from meetings, EPA material and comments. A hearing should be held toward the end of the year.

All issues that EPA identified will be done first. Issues brought up at meetings, such as sedimentation and designation of Peruque Creek, will be taken up later.

The group will be informed when the draft rule comes out. Comments from the group should be sent to John as soon as possible.

It was suggested to set up a process for solving differences between the COE and MDNR on conflicting conditions, i.e., deed restrictions. Discussion on deed restrictions followed.

The next meeting will be held in Columbia on June 19.

Meeting adjourned.

Stakeholder Involvement Meetings for
2001 Missouri Water Quality Standards Review Process
June 19, 2001

USGS Columbia Environmental Research Center
4200 New Haven Rd.
Columbia, Missouri

Attendees:

Gayle Unruh	MoDOT	Patrick Costello	EPA Region 7
Scott Harding	SCI Engineering	Michael Katzman	KC Power & Light
Gerry Boehm	Brookside Env Services	Llona Weiss	MDNR/Office of the Director
Rhonda Ferrett	City of Lake St. Louis	Bob Ball	USDA, NRCS
Paul Schattgen	Resident, Lake St. Louis	Darlene Schaben	MDNR/DEQ/WPCP
Ray Grossmann	Eng & Facilities, Lake St. Louis	Dorris Bender	City of Independence
Leanna Zweig	MO Dept. of Conservation	Bob Zeman	MSD
Steve Fischer	MO Dept. of Conservation	Bob Hentges	MO Public Utility Alliance
Cindy DiStefano	MO Dept. of Conservation	Sachiko Fujimoto	MO Coalition for the Env
Todd Gemeinhardt	MO Dept. of Conservation	Ted Heisel	MO Coalition for the Env
Roy Hengerson	Sierra Club	Richard Gaskin	KC MO Water Services Dept.
Trent Stober	Midwest Env Consultants	Scott Goodin	MDNR/DEQ/WPCP
Steve Taylor	MO Corn Growers Assn	John Hoke	MDNR/DEQ/WPCP
		John Madras	MDNR/DEQ/WPCP

Introductions were made.

Agenda: Changes discussed at previous meetings; other changes for a later time; suggestions

Some of the changes include metals aquatic life criteria. According to EPA, we are currently in conflict with the methodology on how state's calculate criteria for metals. Recalculations were done. Copies of those were handed out. The problems were that the numbers were off from the actual calculations and the categories of hardness were under protective. The table at the top of the handout showed the recalculated metals. The lower box show how we arrived at those numbers. We are contemplating using the actual equations as part of the standards as opposed to the ranges. Recalculations were done according to procedures from EPA using what EPA refers to as the "Bruno Box." The criteria of the methodology for doing species recalculations and put it into a spreadsheet where you can add or delete certain species sensitive to these metals. This is based on a national database that headquarters developed for obtaining different criteria. If there are some problems, recalculations can be done. Let John know if you would like to see the actual calculations.

The main concern is that the numbers are generally lower than the current standards. It may pose some problem in writing permits or meeting permit limits as time goes on.

Order Cladocera is being added back in for EPA approval.

If there are problems arising from the numbers appearing too low, there is opportunity to adjust those on a site-specific basis. The handout, Derivation of Site Specific Criteria for Protection of Aquatic Life in Missouri, is one way available to address site-specific conditions where the standards may be more protective than needed. This is a draft document and comments are welcome.

With WBCR there has been criticism that of the waters in the water quality standards, Missouri only protects ¼ of them for swimming. At some point all waters will be fishable and swimmable. Waters that don't meet that criteria need to have a way to get through the permitting process so they don't have to meet a requirement that doesn't make sense. To do this, a Use Attainability Worksheet, adopted from another region, is being suggested. The permit applicant would fill out the worksheet. An example of the worksheet was handed out. EPA will be sending additional comments in writing. This protocol is being used elsewhere in the country as well as other protocol in other regions. This form is being used in Region 8. There will be a comment period both as an addition to the Standards and also when a permit is on public notice.

Other changes being contemplated are to incorporate several guidance documents—channel modification guidelines, aquatic resource mitigation guidelines, and the sand & gravel excavation guidelines. Edits will be made to these documents according to comments made. Whole Effluent Toxicity testing procedures are also being contemplated to include in the Standards at a later date. It looks like Missouri, while protecting toxicity, aquatic life was not being protected to the extent as in other states. Other rulemaking may include chip mills. There have been concerns regarding timber harvesting coming into Missouri. There will be future meetings on this topic.

Some of the technical qualifications will be added to the guidance to have something closer to the resource.
It was mentioned that there is nothing relating to accumulated effects of whole effluent toxicity. It would be good to see this in the standards. It was explained that there is no TMDL done unless an impairment is being remedied. A waste load allocation is done in advance. This process is already in place. The main concerns have been BOD and ammonia. This may show up more when we start looking at nutrient criteria.

There is a concern in Lake St. Louis regarding the nitrate level with accumulative effect of discharges to the streams. John explained how the whole effluent toxicity standards were arrived. Nutrients are addressed by looking to see if there are violations of narrative criteria.

It was mentioned that we need to see the regulations as reactive not proactive. We don't want to wait three years to see the negative effects.

It was asked if there is a way to lock out additional pemittees to prevent a stream from getting to the stage of impairment. No, because of wastewater and the classification of metropolitan no-discharge. Though, there is a possibility of issuing permit with lower limits.

We need to be able to prevent problems relating to timber harvesting before they become a problem. We still have questions on what could the standard be. The Chip Mill Committee recommended forest landowner education. It was mentioned that most problems don't get the attention or timely response they deserve.

One of the challenges in the guidelines, is to make the guidelines work with the 404 permits.

For dissolved oxygen criteria, there are two main questions. Some situations, like Buffalo Ditch in Poplar Bluff, are that there is no way a water body would hold 5 ppm dissolved oxygen in the summer. On the other hand, there are cold water fisheries but to support spawning, the standards represent those needs. We need to know what the resources are and what their needs are. Low dissolved oxygen for intermittent streams may also be addressed.

There was a question of whether to use total metals vs. dissolved metals. The state will use total metals like most other states. Iron and manganese are still a concern.

Ray Grossmann, Chairman of the Lake St. Louis Engineering and Facilities Committee, passed out information and talked about concerns in the Peruque Creek Watershed in St. Charles County.

The most significant threat to aquatic life in Missouri is erosion from construction and agriculture land. In the past, agriculture has been forced to be responsible. Urban runoff and stormwater construction have not caught up with agriculture erosion controls. Sediment enters streams and results in streams being void of aquatic life. Sediment is tied to stormwater runoff and precipitation. It is hard to get anyone held responsible for erosion control. In the future, MDC would like to work with MDNR to set up some numeric criteria for sediment in an effort to protect the streams and possibly assist in prosecuting responsible parties for extreme negligence for erosion control and BMPs. MDC will make available a presentation of the effect on aquatic life.

It was mentioned that the county could include a county ordinance for stormwater. The problem with Peruque Creek is that it is in several counties. The development of numeric criteria would allow states to have a better handle on sediment. Voluntary use of BMPs doesn't seem to be working.

It was asked if thought has been given to regulating contaminants in sediments or just quantity. Mainly in Missouri quantities of sediment is seen. These are dealt with in the permits.

If there are any other items or comments, please forward them to John Madras. John thanked everyone for sitting in on these meetings. Draft rules should go before the Clean Water Commission.

Stakeholder Meeting to Discuss Issue of Whole Body Contact Use Designation
October 24, 2003
2:30 – 4:30 p.m., Jefferson City, Missouri

Participants:

Robert Brundage, Missouri Ag Industries Council
Gale Carlson, Missouri Department of Health and Senior Services
Patrick Costello, EPA Region 7
Aimee Davenport, MDNR Water Protection and Soil Conservation Division
Chad Davis, Trenton Municipal Utilities
Cindy DiStefano, Missouri Department of Conservation
Ted Heisel, Missouri Coalition for the Environment
Bob Hentges, MPUA
Leslie Holloway, Missouri Farm Bureau
Jim Hull, MDNR Water Protection and Soil Conservation Division
Jane Lale, MDNR, Division of State Parks
Mary Lappin, City of Kansas City
Jim Mellem, City of Kansas City
Ken Midkiff, Sierra Club (by phone for a brief time)
Becky Shannon (facilitator), MDNR Water Protection and Soil Conservation Division
Amy Randles, Missouri Attorney General's Office
Kris Ricketts, MDNR Water Protection and Soil Conservation Division
Buffy Skinner, St. Louis Metropolitan Sewer District
Steve Taylor, Environmental Resources Coalition
Mary West, City of Moberly
Jim Yancey, MDNR, Division of State Parks

Whole Body Contact Recreation Discussion:

In Sept of 2000, EPA asked for Missouri's water quality standards to be revised. Whole Body Contact Recreation (WBCR) use designation was an issue identified. MDNR looked at ways to accomplish the recommendation of designating all waters for WBCR or documenting through a UAA that the use cannot be attained. A Memorandum of Understanding with an approach for addressing the issue was proposed. The Missouri Coalition for the Environment filed suit against EPA; one issue of the 16 was to compel EPA to designate all of Missouri's waters for WBCR use. When last discussed with the Missouri Clean Water Commission, the Commission directed staff to get with stakeholders to find an acceptable approach.

Acting as facilitator, Becky Shannon set up the parameters for a spectrum of alternatives and asked participants to suggest alternatives to the two ends of the spectrum identified. The following discussion addresses each end of the spectrum and the various suggestions that were offered. In some cases, different components of each suggestion are split out here, as compared to how they were discussed in the meeting, to be clearer.

During the discussion, a number of related issues were brought up. These were noted and are included in a list at the end of this summary. An essential issue listed with direct impact on the discussion of use designation was what constitutes an acceptable UAA.

One end of the Spectrum:

1. **Immediately designate all waters.**

The other end of the spectrum:

2. **Draft MOU as proposed to CWC.**
   - Evaluate all waters on a non-prioritized schedule.
   - (Un)Designate or do UAA for each of the waters over a period of six years
   - Default is to designate all unevaluated waters in 2009.

   (Pat Costello, EPA, says roughly 90% of the classified water bodies in this state are not designated. Ted H. indicated 403 of 4205 reaches are designated. Approximately 3700 are not designated.)

   It was pointed out that there were other options that could be considered "the other end of the spectrum" from immediately designating. For example, **"Do Nothing"** could be considered an alternative.

Alternatives suggested by participants:

3. **Prioritize waters.**
   CHALLENGES: How will waters be prioritized?
   Some suggested prioritization methods:
   - High population/urban streams,
   - Use historic water quality data and/or stream characteristics,
   - Access points,
   - Location of point source discharges,
   - Greatest Public Use (public survey data available??), and/or
   - Nature of the point source (municipal vs. industrial, volume of discharge relative to receiving water).

4. **Shorten the time frame for designation.**
   CHALLENGES:
   - Shortage of resources in MDNR or elsewhere (resources include money, data, people).
   - Complexity of documentation.
   - Time to acquire data that's not readily available.

5. **Announce that waters will be designated on a particular date, providing anyone an opportunity to "petition" to have waters not designated.**
   CHALLENGES:
   - What would petition include?
   - Same resource issues as in alternative number four.
   - Would result in many appeals to CWC (this could be said of all options).

Additionally there was discussion of:

Should evaluation of waters and UAA be done by MDNR or the entity desiring the removal of the use?

CHALLENGES:

- Resource challenges for all involved.
- MDNR will need to review submittals regardless.
- Quality assurance of data/submittal needed.

Related Issues Raised by Participants:

- Which waters will be affected by designation—classified only or all waters of the state (including unclassified)?
- Some classified waters aren't apparently impacted by point sources.
- Evaluating all waters is not doable by the state.
- Ability to prove the documentation depends on what documentation is required—what's in UAA?
- Where do agricultural and other non-point sources come in? Point sources are low hanging fruit.
- What about multiple discharge sources in one stream reach?
- Areas with multiple sources need not involve all sources in UAA.
- UAA may result in identification of sources thereby offending people.
- All use changes are by rule. Public notice will be done.
- What types of waters were in the approximately 1400 UAA's in Kansas?
- Tiered approach to WBCR is an option—primary contact, secondary contact.
- Fecal coliform versus *E. coli* as bacterial indicator.
- High flow exemption needs to be addressed. Is there or isn't there an exemption now and in future?
- Examples of approved UAA's from other states would be helpful regarding use of economic factors to remove designated use.
- Plan an implementation schedule in a manner appropriate for the location.
- Consider watershed approach in implementation schedule (point sources and nonpoint sources).
- Non-human sources of bacteria and the impact on in-stream bacteria level (as an implementation issue, implications in terms of TMDL if water is impaired).

Becky asked participants to send her preferences for a date for a follow-up meeting, choosing among November 3, 4, 5 and 6th. The meeting adjourned at 4:33 p.m.

Stakeholder Meeting to Discuss Issue of Whole Body Contact Use Designation
November 4, 2003
Jefferson City, Missouri

Participants:

Ali Almai, City of Kansas City Water Services
Paul Anderson, MDNR Water Protection and Soil Conservation Division
John Dieter, City of Kansas City Water Services
Dave Dillon, Missouri Department of Agriculture
Cindy DiStefano, Missouri Department of Conservation
Rochelle Kuster, Missouri Department of Health and Senior Services
Jane Lale, MDNR, Division of State Parks
Becky Shannon (facilitator), MDNR Water Protection and Soil Conservation Division
Amy Randles, Missouri Attorney General's Office
Kris Ricketts, MDNR Water Protection and Soil Conservation Division
Gale Roberts, MDNR Southwest Regional Office
Buffy Skinner, St. Louis Metropolitan Sewer District
Steve Taylor, Environmental Resources Coalition
Mary West, City of Moberly
Jim Yancey, MDNR, Division of State Parks

Issues:

- Classified only or all (including unclassified).
- Some classified waters aren't apparently impacted by point sources.
- Evaluating all waters is not doable by state.
- Ability to prove the documentation depends on what documentation is required. What's in UAA?
- Where do Ag and other nonpoint sources come in? Point sources are low hanging fruit.
- What about multiple discharge sources?
- Areas with multiple sources need not involve all sources in UAA.
- UAA may result in identification of sources offending people.
- All use changes are by rule. Public notice will be done.

Defining UAA comes first.

- Shorter time.
- Documentation provided by those who are requesting the removal or at least no expectation that the state evaluate all waters.
- Prioritize the waters, then MDNR does the evaluation.
  - Costello threw out some schemes for how to do so (i.e, location of point source discharges).
  - Ted said his perspective was to look at streams with the greatest public use or based on population, etc.
  - Jim? said nature of point source, like volume relative to stream.
  - Jim Y. said use existing or historic water quality, socio-economic uses. Is there public survey data available?
  - Cindy said public access points.

- Mary West asked where the Ag sources are considered?
- Bob Hentges asked why we don't public notice the intent to designate all waters as WBC and allow "petitioners" to provide documentation. Request would include a schedule.

What about streams coming from out-of-state which may have fecal coliform contamination? Becky said each state is responsible for ensuring all discharges meet their own water quality standards.

Considering shortening the time frame, Dave Dillon said one of the drafts to EPA said the target of how many UAA's would be done per year, and that should stay on the table.
He also talked about the MOU with EPA in terms of bringing in various governmental and quasi-governmental agencies to help work though the UAA's. Will EPA give us time to do this? Ag views this as extending to non-point sources, not just point sources. Wants a workable process to phase in these protections.

Ali said don't we need a fair amount of data. Dave said there are certain streams that clearly aren't WBC candidates. Becky said there are a few opportunities.

Becky clarified that the consequence of having a WBC standard is that each point source would have a bacterial limit [for effluent]. In-stream for some.

John said KC is working on a long-term control plan.
This gets complicated when more than one agency has to make decisions. How quickly could it be physically performed? What are kind of criteria for prioritizing the waters?

Applies to classified waters only.
Assumption is that if it has enough water in it, it's probably whole body contact. Although, that doesn't hold true for Missouri River.

Dave was worried about mission creep to impaired waters designation for all waters.

Jim Y. asked if WBC set by federal rule, would removals from the list have to be a federal rule. Amy didn't know, but said it wouldn't be surprising. Dave thought it may be that EPA would force MDNR to implement it.

Becky got back to prioritization criteria.

- High residential population/urban streams.
- Use historic water quality data and/or stream characteristics-flow data.
- Access points and other known recreational spots, greatest public use.
- Location of point source discharges (related to the whole risk issue, or whether or not the stream was composed of effluent).
- Nature of the point source (municipal vs. industrial, volume of discharge relative to receiving water).

What about developing a matrix weighting the criteria variables?

Need to prioritize those waters with the highest risks.

Gale asked if we could separate human sewage by natural (animal based?) bacteria. Becky said no, but they are looking at *E. Coli*, not just the broader category of fecal coliforms.

Dave wanted it not designated as a blanket fix, and to not have everyone spend money "fixing" it.

Becky's going to look at storm water runoff.

Becky said historical data is an issue. Jim said, isn't prioritization a form of UAA?
Yes, then wouldn't we take off the big rivers?

Gale suggested we designate by ecoregion, designating Ozarks first, then medium, then big rivers.

Becky said we could also look at designating perennial streams, class C streams, etc.

Amy asked if there is a schedule and method of prioritization that could be used.

Design

Designate All Waters Now	Designate high priority waters right away, others later.	Unprioritized schedule for designation over 6 years

Implementation (i.e. when you have to disinfect)

Amy said try tier approach:
1. High risk, simple UAA
2. High risk, complex UAA
3. Low risk

Risk definition based on high population, high use, effluent dominated streams

Cindy/Becky discussed draft UAA. They talked about what factors need to be considered, not what the specific criteria for. Cindy suggested we finalize the UAA, to allow people to get started on it.

Dave said the MOU was sent up to remove those waters from consideration that can't be WBC.

Amy said the problem is that when a stream is designated, it could be tested, found to not meet fecal or *E. coli*, then hit the 303(d) list. It can then be delisted based on further studies, but every step is in the rulemaking process.

In general, the group is okay with the idea of a prioritized approach to designation, and is okay with the utilization of population, use and effluent dominated factors, understanding that entities have an opportunity or schedule in which to provide an UAA before they are required to implement. Where there's a complex UAA, make sure UAA procedure is available.

Schedule?

Expired permits. Fear is that the permits may come out in the next few months. If they'd been renewed when they should have been, they'd have until 2007 to implement. Now they'll have to implement immediately.

Question in terms of high population: Use the same criteria for this as for Phase II? No, the cutoff for Phase II was 1,000 per square mile or 10,000 total population.

December 11 meeting with Commission. Joint w/ HWP in the morning, only CWC in the afternoon.

Stakeholders Meeting to Discuss Regulatory Impact Reports

January 18, 2005
Jefferson City, MO

Comments: The 911 number may not be capturing the entire universe. The list of facilities should be an addendum to the RIR. Costs to small businesses, indirect dischargers and all contributors to WWTF (e.g. increased rates) not included in RIR. The cost of borrowing money to upgrade has not been considered.
Actions:

- Additional statements will be added to section 3 of the RIRs. The number of facilities used in calculating the cost of disinfection may not be totally inclusive. In addition, the costs associated with an upgrade project's loan fees and similar costs were not calculated since each case is specific. The general public may notice sewer rate increases. Municipalities may need to change ordinances. Businesses discharging as part of a pre-treatment program might also be affected. The department is not able to find sufficient data to quantify these costs.
- Individual WWTFs were asked to help the department bring more information to the next meeting.
- The RIR will include the list of facilities impacted by the disinfection requirement as Appendix E.

Comments: Economic costs and benefits are not quantified fully. The cost of foregone recreation value if water isn't "clean" should be considered. Estimates should be made on the cost of treating illness due to swimming. Informational resources could include the Center for Disease Control (CDC), EPA, Division of Tourism, MDC (e.g., recreational use value). Look at costs for doctor visits. Property values decrease with impairments. How many people are affected by high bacterial levels—entire state population, certain risk percentage? For every cost or regulatory change, a benefit should be identified. First identify areas involving costs, then put a value to them.
Actions:

- Staff looked and will continue to look at informational resources. As of yet, no state-level information can be found for Missouri. The CDC has national information regarding illnesses due to contact with recreational water (swimming pools, lakes, and streams). The Missouri Department of Health and Senior Services became involved in the National Environmental Health Tracking Program in 2002. Data is not yet reliable to determine illness trends, risks, and costs in Missouri.
- Since we cannot find accurate data on illnesses in Missouri, the number of individuals affected by high bacterial levels cannot be determined. An alternative approach would be to determine the national rate of illness due to swimming in unprotected waters and assume the same values could apply in Missouri.
- The waters in 10 CSR 20-7.031 Tables G—Lakes & H—Streams are presumed to have a whole body contact use according to the rebuttable presumption in Section 101(a)(2) of the Federal Clean Water Act. This presumed use does not indicate an actual use. Only a Use Attainability Analysis (UAA) will determine actual use.

Comment: The statement in RIR that no scientific justification exists is misleading.
Actions:

- Statements will be added to the RIR clarifying this issue. The department did not directly use data to determine and calculate appropriate water quality criteria contained in this rule. The department is proposing to adopt federal recommended criteria and is relying on USEPA's scientific procedures and data used when determining the federal criteria. The department has not reviewed the federal data.

Comments: Costs may be over- or under-estimated. Costs should include other point source and all non-point source pollution. Storm water systems also affected. Combined sewer overflow (CSO) systems may affect costs.
Actions:

- Statements will be added to the RIR to indicate all entities affected by the rule may not have been included in the costs. Storm water discharges, CSOs, and nonpoint source pollution was not included in the cost estimates. Some of those discharges contribute to higher bacteria levels within a water. However, data is not available from which to determine the level of treatment needed to achieve safe bacteria levels in these instances. Due to the high quantity of water discharging from a CSO, treatment for bacteria would be extremely expensive.
- Additional information (e.g., estimated cost) from permittee would be helpful.

Comments: Not sure UV disinfection is effective. The department should be able to determine which of the 911 facilities require filtration using DMR data. It is not reasonable to assume filtration will not be needed in UV disinfection. Could do this using a representative sample of 911, such as 10 %.
Actions:

- Staff has started an analysis and will bring information back to the group after a representative sample has been investigated.
- Using the per unit costs found in Appendix D of the Water Quality Standards RIR, a cost can be calculated for a situation where facilities will use only chlorination disinfection. This is considered by the department as the absolute worse case scenario for the estimated 911 facilities.

Table 1. Chlorination Only Cost for 911 Facilities.

Total Cost			
Flow (MGD)	Installation	O & M	First Year Total
Q <= 0.05	$7,987,500.00	$17,572,500.00	$25,560,000.00
0.05 < Q <= 1.0	$4,487,875.00	$37,025,526.25	$41,513,401.25
1.0 < Q <= 20.0	$93,536,572.50	$7,141,050.00	$100,677,622.50
Q > 20.0	$227,332,420.00	$38,813,827.50	$266,146,247.50
Total	$333,344,367.50	$100,552,903.75	$433,897,271.25

Comments: How will water monitoring be completed? Will permittees be required to monitor for bacteria? Cost needs to be determined for in-stream monitoring.
Actions:

- Statements will be added. The need for in-stream monitoring will be determined on a case-by-case basis. In-stream monitoring may be required in some cases, but this will not replace the department's obligation for water monitoring. The cost to facilities cannot be determined since it is not known how many facilities will have that requirement placed in their NPDES permit.
- Any water monitoring costs incurred by the state due to this rulemaking will be absorbed in the department's current budget by shifting priorities and workload focus. (Section 5)

Comment: Number of outfalls (versus number of facilities) may affect costs.
Actions:

- Staff has found that there are 1166 outfalls for the 911 facilities. Ninety-five of the 911 facilities have multiple outfalls. These outfalls are being researched to determine if they would require disinfection. Should any of these outfalls require disinfection, the cost estimate will be revised to reflect the potential need for the additional treatment.

Comment: Bacteria standards drive what the cities do about CSOs. The department should consider CSOs in cost estimate.
Action:

- Staff will add a statement acknowledging this potential cost impact. It is not obvious how it can be quantified. This issue is tied to the high flow exemption. CSOs may be able to have a site-specific exemption from the bacteria criterion.

Comment: Individuals are interested in seeing the draft Memorandum of Understanding (MOU) developed with the Missouri Department of Agriculture. Could it be put in the RIR?
Action:

- This document was originally drafted in November 2002 and was never finalized. Because it is outdated, it was not added as part of the RIR. The MOU outlined the process by which federal and state agencies as well as volunteer citizens could help the department in determining accurate existing whole body contact use. It also contained a schedule for when waters would be assessed, revised, and proposed in rule.

Comments: RIR should address costs related to the revised high flow exemption. Also information should be provided on what authority was used to determine the 25-year 24-hour storm event. Can high flow exemption be set aside from this rulemaking package? The revision to the high flow exemption greatly impacts CSOs. What about a chronic storm event (e.g., rainfall over a period of days but does not qualify as "catastrophic")? If level is kept at a catastrophic storm event and restricting the high flow exemption to such, a cost needs to be determined.
Actions:

- The number of entities affected by the revisions to the high flow exemption would be those facilities whose discharge violates bacteria criteria during a storm event. The number of discharge monitoring reports (DMRs) that report in-stream water quality data is limited. In addition, to determine when each facility was impacted by each storm event would require an

extensive case-by-case investigation. However, staff will attempt to determine how many emergency storm water flows exceeded the bacteria criterion.

Comment: RIR doesn't address alternative approaches to addressing the federal requirements.
Actions:

- In section 8, alternative approaches were added as a revision. Section 14 also states alternatives of regulating. A regulatory alternative not mentioned before included the department developing water quality criteria specific to Missouri instead of adopting the federal criteria. However, the department does not have the data or staff to make this a viable option. In addition, since the RIR was prepared after alternatives were considered and rule drafted, little flexibility existed. The objective of this rulemaking is to meet Clean Water Act (CWA) requirements. The RIR reflects that.

Comment: Stakeholder discussions and minutes don't reflect the fact that stakeholders didn't see draft rule at the time of the meeting.
Action:

- Staff will add a statement explaining the circumstances, including that the stakeholders didn't have a copy of the draft regulations at the time of the 2001 and 2003 meetings.

Comment: Cost for doing UAAs was not considered for entities other than the department. Also, entities other than permittees may incur this cost at times.
Actions:

- Statements have been added to indicate the department, facilities, individuals, and other may incur costs due to UAAs. The department does not have the resources to conduct UAAs for the removal of whole body contact recreation. However, EPA has made funding available to conduct UAAs at this time. Staff will provide technical assistance to other entities interested in completing this process. Individuals impacted by the designation can chose to do a recreational UAAs. At this time there are several permittees who have informed the department that they are conducting UAAs. This number is less than 1% of those estimated to be affected. Approximately 100 UAAs will be completed through special federal grants.

Comment: The RIR does not address costs on the removal of mixing zone in streams with a 7Q10 of 0.1 cfs or less.
Action:

- The elimination of the mixing zone will not require significant increases in treatment costs because little mixing presently occurs in these situations. Therefore, current permits on small flow streams do not provide an allowance for dilution. The estimated number of facilities affected can be found in the RIR. Staff is currently investigating a random representative sample of affected permittees to further evaluate impacts.

Comment: Effluent dominated streams should be considered.
Action:

- This topic has not yet been addressed in the rulemaking process. Therefore, effluent dominated streams will not be addressed in the RIR. In the future, stakeholder meetings

will be conducted to solicit opinions and approaches appropriate for the state. This issue will also be discussed in contents of the water classification guidelines.

Comments: Costs for treating at new metals and toxicity limits are not included in the RIR. DMRs could be used to determine if exceedances have occurred and, therefore, the number of facilities affected. Pre-treatment program information should be available and can determine number of industries affected. Some ordinances may need to be revised when dealing with changes to a pre-treatment program. If nothing else, note additional costs may be incurred by other entities.
Actions:

- It will be noted in the RIR that additional costs may be incurred by other entities, such as those in pre-treatment programs. The DMRs have some data, but they don't tell us what treatment upgrade might be needed to achieve water quality standards. If the average treatment cost for upgrades could be determined then that value would be multiplied by the number of affected entities currently stated in the RIR. However, each treatment process may be different depending on the criteria being discharged.
- Staff will continue searching for the potential number of significant industrial users (SIGs) affected by pre-treatment programs.

Comment: The cost of completing and implementing a TMDL affects more people than the entities directly involved.
Action:

- Staff will add a statement that the impact of the TMDL could be more widespread than just those cited in the TMDL.

Comments: The state should consider USGS data regarding bacteria levels. Has the department looked at bacteria data from Missouri/Mississippi Rivers? The department should determine if and what waters already meet bacteria limits.
Actions:

- Staff will look at existing data, though this data is limited to bigger rivers and lakes. The results of analyzes will be brought to the next meeting.

Comment: Costs for developing antidegradation procedure are not addressed.
Actions:

- Staff will include a statement on the costs of *developing* the antidegradation implementation procedure, but not on the cost of implementation itself. The costs of developing this procedure include staff time, stakeholder time, meeting supplies, printing, and rulemaking efforts. An exact cost cannot be determined due to the uncertainty of length of discussions, number of stakeholders involved, and number of meetings.

Comments: Some sentences do not seem to belong. These general statements are not quantified. The department should to keep some general references to maintain balance.
Actions:

- Staff is revising RIR to remove some sweeping general comments in order to be more specific. The first two sentences in the first paragraph on page 16 of the Water Quality Standards RIR and page 5 of the Effluent Regulations RIR will be deleted.

Comment: Include specific references (e.g. section, pages), not just general references to EPA guidance, as they pertain to each revision in section 11 of RIR.
Action:

- Staff will add more specific information about the location of scientific data and the basis for some of the revisions.

Comment: Look at the issue of chlorination by-products, which include trihalomethanes and other chlorinated organics, and there impact on water supplies.
Action:

- Some general information is currently in the RIR with regards to chlorination by-products. However, staff acknowledges that additional by-products exist and will investigate this issue further. Any information found will be presented in the RIR.

Comments: RIR doesn't address chlorine risks (i.e., release of chlorine gas). The department's air program and EPA Region 7 air program should have information about chlorine releases. Risk management plans may provide some useful data.
Actions:

- Staff will discuss this issue with both the state and federal air programs and look at the risk management plans. Additional statements will be added to the RIR after the investigation has been completed.

Stakeholders Meeting to Discuss Regulatory Impact Reports and Draft Rules

January 27, 2005
Jefferson City, MO

Regulatory Impact Report Comments

Comments: Fishable/swimmable statement should include "wherever attainable" for public's benefit/understanding.
Actions:

- The phrase "wherever attainable" will be added as appropriate to the revised RIR.

Comments: High flow exemptions should be discussed with the Combined Sewer Overflow Systems (CSOs) and wet weather work group. This item is contained in the settlement agreement with an action date of April 30, 2006. After that date, EPA would be forced to take action. It is the intention of the work group to work parallel with the standards revisions.
Actions:

- This issue will be discussed during the CSO/wet weather work group meetings, which will occur simultaneously as the water quality revisions.

Comments: The department should do an economic analysis on mixing zones and the rulemaking effects. What are the alternatives to the approach taken? It is the department's responsibility to list all alternatives.
Actions:

- Alternatives to the types of mixing zone have been added to the RIR.
- The explanation for the lack of economic analysis is also contained in the revised RIR.

Comments: Classification guidelines. When does a ditch become a stream? Will effluent dominated waters be addressed in the future? This rulemaking does not mention effluent dominated waters, but it will effect them.
Actions:

- Effluent dominated waters will be addressed in the future. This issue is complicated and may take longer than this rulemaking to work out. Stakeholders need to be involved in the process. This issue will be addressed within the water classification guidelines, as it remains unsettled.

Comments: Dissolved oxygen (DO) alternatives were discussed during the stakeholder meeting in 2001. Why were the proposed criteria not included in this rulemaking? The department should include alternatives that were discussed. The department proposed criteria in response to EPA's September 8, 2000, letter. The criteria were based on EPA's 1986 DO criteria document. A change of course needs an explanation. The department's suggested criteria were not protective of aquatic life. Define "natural" conditions.
Actions:

- The issues identified by EPA in their letter to the department will be addressed in the next triennial review. The 1986 DO criterion document published by EPA has information on the specific concentrations for different aquatic life groups (e.g., cold water, warm water).

- Due to information received from concerned parties and internal discussions, this issue was put on hold until further stakeholder discussions could be accomplished.
- Staff will attempt to further define "natural" conditions.

Comments: Site-specific criteria put the burden of proof on the regulated community. "Not protective" is misleading. EPA has methods for site-specific criteria; therefore, the department does not need to include site-specific methods. The only change that needed to be made is "natural" to "non-anthropogenic." In a different section of EPA's letter, they suggest that the department develop site-specific criteria methods.
Actions:

- In order to provide a clear approach to establishing site-specific criteria, language was added. This was a suggestion by EPA.

Comments: The department should consider more than one alternative.
Actions:

- When revising water quality criteria, the department has two options:
- (1) Develop criteria based on conditions in Missouri using EPA's recommended methods or an alternative but scientifically defensible method, or
- (2) Adopt EPA's recommended criteria.
- The department does not have the staff or resources to establish new criteria or to review EPA's science and related administrative records. Staff relies on EPA's science without question since it has been developed by individuals familiar with establishing criteria and peer-reviewed by the nation.
- Staff will identify specific sections and/or page numbers for the reference documents.

Comments: Benefits need to be listed to justify rulemaking. Alternatives exist in how the state implements EPA requirements. For example, list all classified waters for WBCR now or establish a phased approach. Look at benefits to the state if WBCR designations were implemented in 1983. Determine probable cost to the state. Alternatives do make a difference when they are known. Cost needs to be determined for agricultural sector also. Insure all options/costs to agency are explored, including 303(d) listings.
Actions:

- Benefits and alternatives will be added to the revised RIR.
- Three scenarios are being developed for the disinfection requirement.

Rule Comments
Comments: Does the site-specific criteria exist for anthropogenic conditions?
Actions:

- Staff will explore this option.
- Should a condition exist that has been caused by human activity but cannot be remedied or is effected by widespread economic impacts, a UAA may be possible.

Comment: The analytical method for drinking water supply (DWS) metals should all be total recoverable.
Action:

- The draft rule will be changed to indicate all DWS metals should be analyzed using a total recoverable method.

Comments: Return fisheries types (e.g., cold water fishery, warm water fishery) back to Table A. Explore criteria based on fishery types. At a minimum, separate out cold water fishery (CDF). Cadmium must include all trout species in the criteria equation.
Actions:
- Staff will research this issue.
- Discussions with EPA will continue to determine why the equation staff calculated will not be adequate. Changes will be made accordingly.

Comments: Cadmium, lead, and zinc can often be found together in Missouri. These metals may separately meet water quality standards, but together can cause adverse effects to aquatic life. Actual criteria may not protect Missouri streams. Maybe add a footnote about synergistic effects. Some of the criteria are below background conditions. Is copper that leashes from household pipes considered background?
Actions:
- A footnote will be added to make individuals aware of the possible synergistic effect of pollutants in the water.
- As stated before, the department must adopt EPA criteria or provide scientifically defensible methods to determine state criteria. The department, at this time, chose to adopt EPA's recommended criteria, since no state specific criteria exist.
- Should certain areas in Missouri be naturally below the criteria listed in Table A, site-specific criteria could be developed for that specific location.

Comments: What other waters need revisions to CDF designation?
Actions:
- Any discrepancies beyond those EPA suggested in Table C—Cold water fisheries will be looked at during the next triennial review.

Comments: If a community no longer uses a water for drinking water, the DWS designation should not exist.
Actions:
- The department is looking into this issue.
- A Use Attainability Analysis (UAA) will need to be developed and completed for DWS designated use removal.

Comments: In the designation of WBCR, how are nonpoint sources addressed?
Actions:
- Nonpoint source pollution is addressed through best management practices (BMP), which are voluntary.

Comments: Criteria for DWS are the same as what drinking water treatment plants treat for potable water. Wastewater treatment facilities (WWTFs) do not have the same technology. These criteria are basically requiring a drinking water plant at the end of the WWTF. Is in-stream water considered potable? Trihalomethane (THM) criteria can be treated and should not be at raw water level. Has atrazine criteria for raw water supplies been investigated?
Actions:

- Historically the department has adopted Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) for DWS criteria. When no MCL has been established, the department has adopted EPA's recommended 304(a) organism plus water criteria. Typically, MCL values are less stringent than 304(a) criteria. Below are tables of the department's current criteria, MCLs, and 304(a) criteria.

Table 1. Priority Pollutants

EPA #	CAS #	Pollutant (µg/l)	WQS Table A	SDWA MCL	1999 EPA 304(a) Criteria	2002 EPA 304(a) Criteria
PP #031	78875	1,2-dichloropropane	100	5	0.52	0.50
PP #016	1746016	2,3,7,8-TCDD (dioxin)	.00003	0.00003	0.000000013	0.000000005
PP #110	72548	4-4'-DDD	---	---	0.00083	0.00031
PP #109	72559	4-4'-DDE	---	---	0.00059	0.00022
PP #108	50293	4-4'-DDT [and metabolites]	.002	---	0.00059	0.00022
PP #020	75252	Bromoform (THM)	---	80[1]	4.30	4.30
PP #023	124481	Chlorodibromomethane (THM)	---	80[1]	0.41	0.40
PP #026	67663	Chloroform (THM)	---	80[1]	5.70	5.70
PP #027	75274	Dichlorobromomethane (THM)	---	80[1]	0.56	0.55
PP #036	75092	Methylene Chloride	5	---	4.70	4.60
PP #038	127184	Tetrachloroethylene	5	5	0.80	0.69
---	---	Trihalomethanes (THM)	100	80[1]	---	---

[1] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes is 80 µg/L.

Table 2. Non-Priority Pollutants.

EPA #	CA #	Pollutant (µg/l)	WQS Table A	SDWA MCL	1999 EPA 304(a) Criteria	2002 EPA 304(a) Criteria
NPP #43	95943	1,2,4,5-tetrachlorobenzene	38	---	2.3	0.97
NPP #15	542881	Bis (chloromethyl) ether	0.00016	---	0.00013	0.00010
NPP #34	608935	pentachlorobenzene	74	---	3.5	1.40

Comments: Applying Tier 3 antidegradation to the watershed of outstanding resource waters is beyond the requirement of EPA. No discharge to the outstanding national resource waters (ONRW) and their watersheds should be allowed. ONRWs are located in Karst areas so protection should remain for the entire watershed. No discharge should occur in ONRWs while no lowering of water quality should exist in the watershed. The department should re-examine wording. Does rule prohibit discharges directly to ONRW?
Actions:

- Current language in the Effluent Regulations (ER) states that section 6 applies to "limits for Wild and Scenic Rivers and Ozark National Scenic Riverways and Drainages Thereto." Staff extending that same protection to OSRW.
- Staff will look into this issue.

Comments: Is the recreational uses considered a tiered approach? Will boating and canoeing (BTG) be default when whole body contact recreation (WBCR) is found to not exist by the UAA process?
Actions:

- WBCR will be designated separately from BTG. BTG use will be assigned as it is identified through the UAA process. BTG will not be default.

Comments: The title of "Boating and canoeing" is inappropriate and should be revised. "Secondary contact recreation" is an option. The types of activity under BTG should be revised. Kayaking is a whole body contact recreational sport. "Intent" should not be in the definition since water submersion is accidental. The definition needs to be reworded. The definition should be based on the risk to human health from submersion.
Actions:

- The title of BTG will be renamed to secondary contact recreation, following the language that many states and EPA use.
- The definition of each recreational use and the activities associated with each will be reviewed.

Comments: EPA guidance allows for bacterial indicator criteria to be based on 8 to 14 illnesses per 1,000 swimmers. Tiered standards should be developed based on frequency of use within the designation of WBCR.
Actions:

- A tiered approach within the WBCR designated use could be developed based on frequency of use (e.g., beaches, waters flowing through private property). Should this approach be taken, these locations would have to be identified. EPA sets out bacteria indicator criteria in this instance.

Comments: Mixing zone language should be examined. Maybe state "Class C streams and **classified** streams…" Could different beneficial uses be assigned in effluent dominated streams than non-effluent dominated streams due to distinct biotic assemblages? All mixing zones should be eliminated for all waters of the state. Language should be added to general criteria to eliminate confusion of whether mixing zones apply to unclassified waters.
Actions:

- Implementation of mixing zones needs to be established, especially in how they apply to effluent dominated waters.
- Mixing zones are based on flow only, not classification, when applied to effluent limits. Revised language will be suggested to clarify this rule.

Comments: High flow exemption. Reference climatic data to ensure credible data regarding rain events are looked at. No state has an approved high flow exemption. Site-specific exemptions are allowed. Kansas will publish another attempt on defining a high flow exemption soon. Need a work group on this issue and include EPA in the discussion. Concern that bacteria levels remain high for an extended time period after the initial rain event. Cities have concern about CSOs and wet weather issues. Can this discussion be done concurrently with the rule revisions? Watch how newly issued permits and those permits close to issuance will be dealt with.
Actions:

- Options for high flow exemptions will be discussed as part of the CSO/wet weather group. These discussions will be parallel to the general WQS discussions.

General Comments
Comment: Why was Ash Slough Ditch deleted in Table I? What reference waters will represent the Boothill region?
Action:

- The department is currently working with Arkansas on reference waters. Staff will research why Ash Slough Ditch is being proposed for deletion.

Comments: Default specific criteria and designated uses need to be established for the protection of unclassified waters. Make unclassified waters consistent with federal law. Maybe this issue falls under the Antidegradation Implementation Procedure.
Actions:

- Unclassified waters will be discussed during the next triennial review.

Comment: Define "zones of passage" on page 8 of the WQS.
Action:

- Zone of passage as they related to mixing zones is currently defined at 10 CSR 20-7.031(1)*[W]***(DD)** as "a continuous water route necessary to allow passage of organisms with no acutely toxic effects produced on their populations."

Comments: Outstanding State Resource Waters (OSRWs) determination should not be based on location within or next to public land. Do away with this third restriction.
Action:

- This issue will need to be brought before the Clean Water Commission.

How is follow-up going to be dealt with?

- Have final draft RIR based on comments for Feb. 4 meeting.
- Documents on the web will be dated. Also documents for each meeting will state which workgroup session it came from.

Appendix D
Disinfection Cost Calculations and Assumptions

Table D-1. Facility Installation Unit Cost

Design Flow	Disinfection System	
	UV	Chlorination
Flow less than 0.05 MGD	$51,662.50	$12,500.00
Flow between 0.05 & 1.0 MGD	$146,382.50	$20,125.00
Flow between 1.0 & 20.0 MGD	$1,215,000.00	$2,227,061.25
Flow greater than 20.0 MGD	$23,220,001.25	$32,476,060.00

Table D-2. Facility Operating & Maintenance Unit Cost per Year

Design Flow	Disinfection System	
	UV	Chlorination
Flow less than 0.05 MGD	$2,187.50	$27,500.00
Flow between 0.05 & 1.0 MGD	$6,195.00	$166,033.75
Flow between 1.0 & 20.0 MGD	$81,985.00	$170,025.00
Flow greater than 20.0 MGD	$1,566,827.50	$5,544,832.50

Chlorination
Cost Estimates were derived from cost estimate data provided by a National Small Flows Clearinghouse fact sheet titled, 'Chlorine Disinfection.' Cost estimates from outside manufacturers of chlorinating tablet feeders were also used for the smaller wastewater treatment plants. The numbers in the 'Chlorine Disinfection' document were from 1995. All of the cost estimates given below have been adjusted to reflect the cost of equipment, O and M, and installation cost for year 2004 using the Engineering News Record Construction Cost Index (CCI). The average CCI for 1995 was 5471 and the current CCI is 6825.

1. Chlorination/Dechlorination (design flows <= 0.05 MGD)

Assumptions:

- The average flow (ADDF) of 36,000gpd and a peak flow (PWWF) of 144,000gpd (peak factor of 4).
- 25% engineering contingency
- Chlorine dose based on peak flows
- 10 mg/L dosing concentration
- Tablet Chlorination/Dechlorination

Capitol Costs:

Chlorination Feeder	$ 1,500
Dechlorination Feeder	$ 1,500
Concrete Contact Basin	$ 7,000
Total	$10,000

Add an additional 25% contingency	$ 2,500
Total Cost/WWTP	$12,500

O&M Costs:

Chemicals	$20,000
Misc.	$ 2,000
Total	$22,000/yr
Add an additional 25% contingency	$ 5,500
Total Cost/WWTP	$27,500/yr

2. Chlorination/Dechlorination (design flows > 0.05 MGD and <= 1.00 MGD)

Assumptions:

- The average flow (ADDF) of 255,000gpd and a peak flow of 894,000gpd (peak factor of 3.5).
- 25% engineering contingency
- Chlorine dose based on peak flows
- 10 mg/L dosing concentration
- Tablet Chlorination/Dechlorination

Capitol Costs:

Chlorinator	$ 2,500
Dechlorinator	$ 2,500
Concrete Contact Basin	$ 11,100
Total	$ 16,100
Add an additional 25% contingency	$ 4,025
Total Cost/WWTP	$20,125

O&M Costs:

Chemicals	$122,827
Misc.	$ 10,000
Total	$132,827/yr
Add an additional 25% contingency	$ 33,206.75
Total Cost/WWTP	$166,033.75/yr

3. Chlorination/Dechlorination (design flows >1.00 MGD and <=20.00 MGD)

Assumptions:

- The average flow (ADDF) of 3.60MGD and a peak wet weather flow of 10.81MGD (peak factor of 3.0).
- gas chlorination
- 25% engineering contingency

- Chlorine dose based on peak flows
- 10 mg/L dosing concentration

Capitol Costs:

Chlorination	$ 1,234,933.00
Dechlorination	$ 387,760.00
Uniform Fire Code (UFC)	$ 158,956.00
Total	$ 1,781,649.00
Add an additional 25% contingency	$ 445,412.25
Total Cost/WWTP	$ 2,227,061.25

O&M Costs:

Total	$ 136,020/yr
Add an additional 25% contingency	$ 3,400
Total Cost/WWTP	$ 170,025/yr

4. Chlorination/Dechlorination (design flows >20.00 MGD)

Assumptions:

- The average flow (ADDF) of 91.4MGD and a peak wet weather flow of 228.4MGD (peak factor of 2.5).
- gas chlorination
- 25% engineering contingency
- Chlorine dose based on peak flows
- 10 mg/L dosing concentration

Capitol Costs:

Chlorination	$16,356,116
Dechlorination	$ 5,106,116
Uniform Fire Code (UFC)	$ 4,518,616
Total	$25,980,848
Add an additional 25% contingency	$ 6,495,212
Total Cost/WWTP	$32,476,060

O&M Costs:

Total	$ 4,435,866.00/yr
Add an additional 25% contingency	$ 1,108,966.50
Total Cost/WWTP	$ 5,544,832.50/yr

Ultraviolet

Cost Estimates were derived from cost estimate data provided by an EPA document titled, 'Ultraviolet Disinfection Technology Assessment.' The numbers in this document were from 1990. All of the cost estimates given below have been adjusted to reflect the cost of equipment,

O and M, and installation cost for year 2004 using the Engineering News Record Construction Cost Index (CCI). The average CCI for 1990 was 4732 and the current CCI is 6825.

5. UV Disinfection System (design flows <= 0.05 MGD)

Assumptions:

- The average flow (ADDF) of 36,000gpd and a peak flow of 144,000gpd (peak factor of 4).
- 58-inch arc UV lamps were used.
- UV lamps needs replacement once per year
- 25% engineering contingency
- 1 UV KW = 37 lamps/1 MGD
- number of lamps are based on peak flows
- Cost for constructing a building is approximately equal the cost of lamps for WWTP using less than 100 lamps
- Cost for constructing a building is approximately 75% the cost of lamps for WWTP using more than 100 lamps
- Lagoons were not use UV for disinfection cost
- Includes redundancy and additional spare lamps

Installation Cost/Construction Cost:

UV Lamps	12 lamps	$13,870
UV Lamp Installation		$13,590
Facility Building/Structure		$13,870
Total		$41,330
Add an additional 25% contingency		$10,332.50
Total Cost/WWTP		$51,662.50

O&M Costs:

Total	$ 1,750.00/yr
Add an additional 25% contingency	$ 437.50
Total Cost/WWTP	$ 2,187.50/yr

6. UV Disinfection System (design flows > 0.05 MGD and <= 1.00 MGD)

Assumptions:

- The average flow (ADDF) of 255,000gpd and a peak flow of 894,000gpd (peak factor of 3.5).
- 58-inch arc UV lamps were used.
- UV lamps needs replacement once per year
- 25% engineering contingency
- 1 UV KW = 37 lamps/1 MGD
- number of lamps are based on peak flows

- Cost for constructing a building is approximately equal the cost of lamps for WWTP using less than 100 lamps
- Cost for constructing a building is approximately 75% the cost of lamps for WWTP using more than 100 lamps
- Lagoons were not use UV for disinfection cost
- Includes redundancy and additional spare lamps

Installation Cost/Construction Costs:

UV Lamps	40 lamps	$ 39,300
UV Lamp Installation		$ 38,506
Facility Building/Structure		$ 39,300
Total		$117,106
Add an additional 25% contingency		$ 29,276.50
Total Cost/WWTP		$146,382.50

O&M Costs:

Total	$ 4,956/yr
Add an additional 25% contingency	$ 1,239
Total Cost/WWTP	$ 6,195

7. UV Disinfection System (design flows > 1.00 MGD and <= 20.00 MGD)

Assumptions:

- The average flow (ADDF) of 3.6MGD and a peak flow of 10.81MGD (peak factor of 3).
- 58-inch arc UV lamps were used.
- UV lamps needs replacement once per year
- 25% engineering contingency
- 1 UV kW = 37 lamps/1 MGD
- number of lamps are based on peak flows
- Cost for constructing a building is approximately equal the cost of lamps for WWTP using less than 100 lamps
- Cost for constructing a building is approximately 75% the cost of lamps for WWTP using more than 100 lamps
- Lagoons were not use UV for disinfection cost
- # of UV Lamps includes redundancy and additional spare lamps

Installation Cost/Construction Costs:

UV Lamps	450 lamps	$ 385,297
UV Lamp Installation		$ 297,730
Facility Building/Structure		$ 288,973
Total		$ 972,000
Add an additional 25% contingency		$ 243,000
Total Cost/WWTP		$1,215,000

O&M Costs:

Total	$ 65,588/yr
Add an additional 25% contingency	$ 16,397
Total Cost/WWTP	$ 81,985/yr

8. UV Disinfection System (design flows > 20.00 MGD)

Assumptions:

- The average flow (ADDF) of 91.4MGD and a peak flow of 228.4MGD (peak factor of 2.5).
- 58-inch arc UV lamps were used.
- UV lamps needs replacement once per year
- 25% engineering contingency
- 1 UV kW = 37 lamps/1 MGD
- number of lamps are based on peak flows
- Cost for constructing a building is approximately equal the cost of lamps for WWTP using less than 100 lamps
- Cost for constructing a building is approximately 75% the cost of lamps for WWTP using more than 100 lamps
- Lagoons were not used for UV disinfection cost
- # of UV Lamps includes redundancy and additional spare lamps

Installation Cost/Construction Costs

UV Lamps	8600 lamps	$ 7,363,460
UV Lamp Installation		$ 5,689,946
Facility Building/Structure		$ 5,522,595
Total		$18,576,001
Add an additional 25% contingency		$ 4,644,000.25
Total Cost/WWTP		$23,220,001.25

O&M Costs

Total	$1,253,462.00
Add an additional 25% contingency	$ 313,365.50
Total Cost/WWTP	$1,566,827.50

Appendix E
E.Coli Data in Select Missouri Streams

Province	Stream	Location	F.Coliform	E. Coli
Plains	Cuivre R.	Troy	122	70
Plains	Nodaway R.	Oregon	279	51
Plains	Platte R.	Sharps Station		69
Plains	M. Fk. Grand R.	Grant City	348	174
Plains	E. Fk. Grand R.	Allendale	115	97
Plains	Lower Grand R.	Sumner	123	63
Plains	Lower Chariton R.	Prairie Hill	142	78
Plains	Mussel Fk.	Mystic	239	213
Plains	E. Fk. L. Chariton R.	Huntsville	92	48
Mean: Plains			**182.5**	**95.889**
Ozark Border	Pomme de Terre R.	Polk	141	123
Ozark Border	Lamine R.	Pilot Grove	88	55
Mean: Ozark Border			**114.5**	**89**
Ozark Plateau	Castor R.	Zalma	69	30
Ozark Plateau	Niangua R.	Below Bennett	55	32
Ozark Plateau	Lower Osage R.	St. Thomas	14	21
Ozark Plateau	Big Piney R.	Devil's Elbow	25	8
Ozark Plateau	Gasconade R.	Jerome	13	6
Ozark Plateau	Bryant Cr.	Rippee CA	33	16
Ozark Plateau	N. Fk. White R.	Tecumseh	19	5
Ozark Plateau	Current R.	Doniphan	8	5
Ozark Plateau	Jack's Fork	Two Rivers	21	12
Ozark Plateau	Eleven Point	Bardley	16	7
Mean: Ozark Plateau			**27.3**	**14.2**

Appendix F
Multiple Scenarios for Determining Costs

These disinfection costs do not include storm water or combined sewer overflows (CSOs). These systems can be very complicated and cost calculations would be hard to compute. Each outfall has the potential to need disinfection, but the extent of disinfection varies with flow, water quality of outfall, and storm event to name a few. The cost calculations are based on dollar values for 2004. Inflation for 2005 has not been calculated.

Ultraviolet (UV) disinfection is assumed to suffice for a treatment plant with secondary treatment. These calculations do not take into account the need for filtration equipment. To determine need for filtration, a case-by-case determination would be necessary.

Pre-aeration was not considered in these calculations. The need for aeration would depend on current treatment equipment. Again, determining cost for pre-aeration would require a case-by-case analysis.

Most likely scenario: Disinfection by UV and Chlorination

The scenario would allow smaller facilities and facilities with certain types treatment plants (e.g., lagoons) to economically and practically disinfect. The initial cost of installing an UV system on a small facility (i.e., those with a design flow equal to or less than 1.0 MGD) is greater than the cost of installing a chlorination system. For long-term operating and maintenance costs, larger facilities benefit by installing UV systems.

Table 1. UV & Chlorine Disinfection

Total Installation Cost	
Flow (MGD)	Private & Public
Q <= 0.05	$16,015,812.50
0.05 < Q <= 1.0	$13,073,385.00
1.0 < Q <= 20.0	$59,126,490.00
Q > 20.0	$162,540,008.75
Total	$250,755,696.25

Total O & M Cost per Year	
Flow (MGD)	Private & Public
Q <= 0.05	$12,383,437.50
0.05 < Q <= 1.0	$26,156,491.25
1.0 < Q <= 20.0	$4,147,690.00
Q > 20.0	$10,967,792.50
Total	$53,655,411.25

Total Cost First Year	
Flow (MGD)	Private & Public
Q <= 0.05	$28,399,250.00
0.05 < Q <= 1.0	$39,229,876.25
1.0 < Q <= 20.0	$63,274,180.00
Q > 20.0	$173,507,801.25
Total	$304,411,107.50

Lowest cost scenario: All 911 Facilities Disinfected by UV

Relying on UV disinfection would not be feasible for many of the 911 treatment plants, particularly lagoons. Lagoon systems would most likely need, at a minimum, filtration equipment. Depending on how the lagoon system is setup, pre-aeration may also be essential.

Table 2. UV Disinfection Only

Total Installation Cost	
Flow (MGD)	Private & Public
Q <= 0.05	$33,012,337.50
0.05 < Q <= 1.0	$32,643,297.50
1.0 < Q <= 20.0	$51,030,000.00
Q > 20.0	$162,540,008.75
Total	$279,225,643.75

Total O & M Cost per Year	
Flow (MGD)	Private & Public
Q <= 0.05	$1,397,812.50
0.05 < Q <= 1.0	$1,381,485.00
1.0 < Q <= 20.0	$3,443,370.00
Q > 20.0	$10,967,792.50
Total	$17,190,460.00

Total Cost First Year	
Flow (MGD)	Private & Public
Q <= 0.05	$34,410,150.00
0.05 < Q <= 1.0	$34,024,782.50
1.0 < Q <= 20.0	$54,473,370.00
Q > 20.0	$173,507,801.25
Total	$296,416,103.75

Highest cost scenario: All 911 Facilities Disinfected by Chlorination

Should all facilities choose to disinfect by chlorination, this would greatly increase the cost at the larger facilities in the long term (e.g., operation and maintenance costs). Also the impact of complete chlorine disinfection to the environment would be greater than a combination of UV and chlorine disinfection. The risk of accidental chlorine releases and chlorination by-products could all potentially increase.

Table 3. Chlorine Disinfection Only

Total Installation Cost	
Flow (MGD)	Private & Public
Q <= 0.05	$7,987,500.00
0.05 < Q <= 1.0	$4,487,875.00
1.0 < Q <= 20.0	$93,536,572.50
Q > 20.0	$227,332,420.00
Total	$333,344,367.50

Total O & M Cost per Year	
Flow (MGD)	Private & Public
Q <= 0.05	$17,572,500.00
0.05 < Q <= 1.0	$37,025,526.25
1.0 < Q <= 20.0	$7,141,050.00
Q > 20.0	$38,813,827.50
Total	$100,552,903.75

Total Cost First Year	
Flow (MGD)	Private & Public
Q <= 0.05	$25,560,000.00
0.05 < Q <= 1.0	$41,513,401.25
1.0 < Q <= 20.0	$100,677,622.50
Q > 20.0	$266,146,247.50
Total	$433,897,271.25

Appendix G - List of Domestic Wastewater Treatment Facilities Not Currently Disinfecting and within 2 miles of a Classified Water

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0056154	CAPE GIRARDEAU REG AIRPOR	SCOTT CITY	SCOTT	0.008	0.008	DITCH #1	U			
MO0098957	PERRYVILLE AIRPORT WWTF	PERRYVILLE	PERRY	0.015	0.012	BOIS BRULE DITCH	U	1785	TR BOIS BRULE DITCH2	C
MO0048844	WESTWOOD MANOR APARTMENTS	POPLAR BLUFF	BUTLER	0.001	0.001	TRIB CAVERN DITCH	U			
MO0104353	LINN MEADOW APARTMENTS	LINN	OSAGE	0.006	0.001	TRIB LINN CR	U	833	LINN CR.	C
MO0104400	LAURA MEADOWS APTS	WASHINGTON	FRANKLIN	0.0035	0.0012	ST JOHNS CREEK	U			
MO0104621	SUNRISE VALLEY APARTMENTS	WASHINGTON	FRANKLIN	0.024	0.001	TRIB ST. JOHNS CREEK	U	1678	ST. JOHNS CR.	P
MO0105937	PLEASANT VIEW APARTMENTS	WASHINGTON	FRANKLIN	0.011	0.006	TRIB ST. JOHNS CR	U			
MO0109185	ABILENE ACRES APARTMENTS	COLUMBIA	BOONE	0.001	0.001	TRIB PERCHE CR	U			
MO0112372	PERRINE APARTMENTS	WARRENSBURG	JOHNSON	0.003		TRIB BEAR CR	U	933	BEAR CR.	C
MO0118052	JOHN MARTIN DUPLEX DEVELO	FULTON	CALLAWAY	0.004	0.004	SNYDER CR	U	7179	HERRING LAKE	L3
MO0118273	HILLTOP FARM	COLUMBIA	BOONE	0.001	0.001	COW BR/BEAR CR	C	1015	BEAR CR.	C
MO0118354	HINTON APARTMENTS	COLUMBIA	BOONE	0.001	0.001	TRIB ROCKY RK CR	U	1014	ROCKY FK.	C
MO0118427	STARDUST MOTOR INN	SEDALIA	PETTIS	0.003	0.002	TRIB FLAT CR	U	865	FLAT CR.	C
MO0122734	MILAN MOTEL	MILAN	SULLIVAN	0.009	0.009	TRIB LOCUST CR	U	606	LOCUST CR.	P
MO0124532	PALMER APARTMENTS	COLUMBIA	BOONE	0.001	0.001	TRIB ROCKY FK CR	U			
MO0121215	PEPPER'S PIZZA	COLUMBIA	BOONE	0.0014	0.00059	TRIB COW BR	U			
MO0126845	UPPER DECK, THE	COLUMBIA	BOONE	0.001		TRIB SLACKS BR	U	7202	BOCOMO LAKE	L3
MO0029378	USAF, WHITEMAN AFB	WHITEMAN AFB	JOHNSON	2.19	0.636	BREWER BRANCH	U	935	CLEAR FK.	P
MO0037052	MDPS, CAMP CLARK	NEVADA	VERNON	0.1	0.0362	TRIB W FK CLEAR CR.	U	1335	W. FK. CLEAR CR.	C
MO0101664	USA,WAPPAPELLO TRAIN SITE	POPLAR BLUFF	BUTLER	0.02	0.016	TRIB ST FRANCOIS R	U	2968	ST. FRANCIS R.	P
MO0116904	MO NATIONAL GUARD WWTF	JEFFERSON CITY	COLE	0.05	0.02	RISING CR	C			
MO0121291	MO NAT GUARD, CENTERTOWN	CENTERTOWN	COLE	0.006	0.0002	TRIB ROCK CREEK	U			
MO0000531	NR, MEXICO WORKS	MEXICO	AUDRAIN	0.017	0.008	S FK SALT R	C			
MO0119491	MAJOR CUSTOM CABLE, INC	JACKSON	CAPE GIRARDEAU	0.001	0.001	TRIB HUBBLE CR	U	2197	HUBBLE CR.	P
MO0035645	LOST CANYON LAKES	STEEDMAN	CALLAWAY	0.025		COW CR	U	707	COW CR.	C
MO0086436	KOA,SELSOR DEVELOPMNT GRP	BARNHART	JEFFERSON	0.004		TRIB MISSISSIPPI R.	U			
MO0108961	HAVA SPARE RV PARK	GRAVOIS MILLS	MORGAN	0.003	0.001	MILL CR	U	7205	OZARKS, LAKE OF THE	L2
MO0109819	BASSWOOD COUNTRY RV	PLATTE CITY	PLATTE	0.003	0.003	TRIB PLATTE R	U			
MO0112241	MARANATHA BIBLE CAMP	MILLER	LAWRENCE	0.01	0.003	TRIB EDDINGTON BR	U	1424	EDDINGTON BR.	P
MO0116556	CAMP PALESTINE WWTF	CHILHOWEE	JOHNSON	0.02913	0.02474	TRIB E FK POST OAK	U			
MO0117048	JELLYSTONE PARK	PACIFIC	ST. LOUIS	0.006		TRIB FOX CR	U	1843	LONG BR.	P

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0120073	BSA, CAMP THUNDERBIRD	CAIRO	RANDOLPH	0.025	0.004	TRIB MUD CR	U			
MO0120090	JJ CAMPGROUND	HOLT	CLAY	0.004		TRIB MUDDY FK	U	391	MUDDY FK.	C
MO0120766	CAMP FARWESTA	STEWARTSVILLE	DE KALB	0.018	0.004	TRIB CASTILE CREEK	U	322	CASTILE CR.	C
MO0127035	CAMP TAMBO	UNION	FRANKLIN	0.001		TRIB ROTH CR	U	2035	BACHELOR CR.	C
MO0127574	BLUE MOUNTAIN METHODIST	FREDERICKTOWN	MADISON	0.0105	0.0078	TRIB ROCK CR	U	2900	ROCK CR.	P
MO0116955	COLUMBIA FREIGHTLNR SALES	MILLERSBURG	CALLAWAY	0.001		TRIB CEDAR CR	U	737	CEDAR CR.	C
MO0038776	FARMERS MUTUAL INSURANCE	MACON	MACON	0.001	0.001	TRIB MID FK SALT R	U			
MO0088901	IMPERIAL HOMES	IMPERIAL	JEFFERSON	0.001		TRIB TO ROCK CR.	U	1713	GRAVOIS CR.	C
MO0108421	MIDWAY ARMS INC	COLUMBIA	BOONE	0.002	0.002	TRIB PERCHE CREEK	U	1013	PERCHE CR.	P
MO0109070	STATESIDE PLAZA	KNOB NOSTER	JOHNSON	0.001	0.001	TRIB CLEAR FORK	U	935	CLEAR FK.	P
MO0120863	SIKESTON BUSINESS/TECH PK	SIKESTON	SCOTT	0.4	0.103	L RIVER DITCHES	P			
MO0121100	MILLERSBURG BUSINESS PARK	MILLERSBURG	CALLAWAY	0.018		SALLY BR	U			
MO0122050	SOUTHWEST BUSINESS PK TP	WINFIELD	LINCOLN	0.007	0.001	TRIB MCLEAN CR	U	31	MCLEAN CR.	C
MO0124711	TOTAL RESTORATION CO	ROCHEPORT	BOONE	0.001		SUGAR BR	U			
MO0048771	CONCEPTION ABBEY LAGOON	CONCEPTION	NODAWAY	0.033	0.033	TRIB WILDCAT CR.	U	484	TRIB. TO WILDCAT CR.	C
MO0090158	CONCORDIA LUTHERAN SCHOOL	FROHNA	PERRY	0.004	0.004	TRIB BRAZEAU CR	U	1796	BRAZEAU CR.	P
MO0090310	BENEDICTINE CONVENT	CLYDE	NODAWAY	0.024	0.007	TRIB WILDCAT CR	U			
MO0092088	EMMANUEL BAPTIST CHURCH	DOE RUN	ST. FRANCOIS	0.002	0.001	TRIB DOE RUN CR	U	2885	DOE RUN CR.	C
MO0093866	ARNOLD-CHURCH OF NAZARENE	ARNOLD	JEFFERSON	0.002		BR POMME CR	U	2192	POMME CR.	C
MO0107221	PISGAH BAPTIST CHURCH	RICHMOND	RAY	0.001	0.001	TRIB TO MILES CREEK	U	383	FISHING R.	P
MO0108847	ST PAUL UNITED CHURCH	OLD MONROE	LINCOLN	0.001	0.001	TRIB CUIVRE RIVER	U	152	CUIVRE R.	P
MO0115363	NEW SALEM BAPTIST CHURCH	WINFIELD	LINCOLN	0.001		TRIB BIRKHEAD BR	U	34	BIRKHEAD BR.	C
MO0127337	LIVING BREAD FELOWSHP STP	WASHINGTON	FRANKLIN	0.001		TRIB ST JOHNS CR	U	1678	ST. JOHNS CR.	P
MO0101788	RALSTON PURINA COMPANY	BLOOMFIELD	STODDARD	0.008	0.004	TRIB TO CASTOR R.	U			
MO0087025	POTOSI ELKS CLUB #2218	POTOSI	WASHINGTON	0.001	0.001	TRIB MINE-A-BRETON C	U	2101	MINE A BRETON CR.	P
MO0127469	BROOKFIELD COUNTRY CLUB	BROOKFIELD	LINN	0.010	0.008	TRIB W FK YELLOW CR	U			
MO0003948	AECI, THOMAS HILL ENERGY	CLIFTON HILL	RANDOLPH	0.022	0.001	TRIB M FORK CHARITON	U	691	M. FK. CHARITON R.	P
MO0123706	UMC, SINCLAIR RESEARCH FM	COLUMBIA	BOONE	0.003		TRIB L BONNE FEMME C	U			
MO0000035	RIVER CEMENT CO-SELMA PLT	FESTUS	JEFFERSON	0.002		CLIFFDALE HOLLOW	U			
MO0000809	LONE STAR INDUSTRIES INC	CAPE GIRARDEAU	CAPE GIRARDEAU	0.005	0.002	MISSISSIPPI RIVER	P			
MO0002666	LAFARGE CORP, SUGAR CR PT	SUGAR CREEK	JACKSON	0.006		MISSOURI RIVER	P	356	MISSOURI R.	P
MO0125296	SHANGRI-LA TOWNHOUSES	CENTERTOWN	COLE	0.003		TRIB STROBEL BR	U	948	TRIB. TO STROBEL BR.	C

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0114031	ROADWAY MINI-MART	LA MONTE	PETTIS	0.001	0.001	TRIB MUDDY CR	U			
MO0119903	TOUCH OF DUTCH COUNTRY ST	STOVER	MORGAN	0.001		TRIB GABRIEL CR	U			
MO0124486	RANDY'S MARKET	COLUMBIA	BOONE	0.001	0.001	COW BRANCH	U			
MO0128241	DAIRY FARMERS OF AMERICA	MONETT	BARRY	0.027	0.028	TRIB HUDSON CR	U			
MO0083810	SHIRLEY SCHOOL	POTOSI	WASHINGTON	0.000	0.000	TRIB RACE CREEK	U	2094	RACE CR.	P
MO0117994	LIGHTHOUSE FELLOWSHIP CHU	ELDON	MILLER	0.001	0.001	LITTLE SALINE CR	U	1050	L. SALINE CR.	P
MO0120464	SMALL MIRACLES LEARNING	JEFFERSON CITY	COLE	0.002	0.001	TRIB HONEY CR	U	1002	HONEY CR.	C
MO0127515	LION'S DEN OUTDOOR LRNG	IMPERIAL	JEFFERSON	0.008		ROCK CR	C	1715	ROCK CR.	C
MO0056065	LONGHORN MOTEL/RESTAURANT	FREDERICKTOWN	MADISON	0.005	0.003	TRIB TWELVE MILE CR.	U	2846	TWELVE MILE CR.	C
MO0085758	CLUB 51	ZALMA	BOLLINGER	0.000	0.000	ROADSIDE DITCH	U	3085	DUCK CR.	C
MO0086088	STUCKEY'S DAIRY QUEEN	MILLERSBURG	CALLAWAY	0.001	0.001	TRIB CEDAR CREEK	U	737	CEDAR CR.	C
MO0087734	STUCKEY'S #130	NELSON	SALINE	0.002	0.001	TRIB TO HEATH'S CK	U	848	HEATHS CR.	P
MO0101834	SOCIAL RESTAURANT/LOUNGE	MEMPHIS	SCOTLAND	0.001	0.001	TRIB N FABIUS R	U			
MO0108448	63 DINER	COLUMBIA	BOONE	0.005	0.003	ROCKY FORK CR	U	1014	ROCKY FK.	C
MO0110442	TWO DAYS BARBECUE	EDWARDS	BENTON	0.001	0.001	TRIB RAINY CR	U	1127	RAINY CR.	C
MO0118214	SNEADS BARBEQUE	BELTON	CASS	0.002	0.002	MILL CR	U	3311	MILL CR.	C
MO0119849	MEXICO LINDO RESTAUR/CLUB	SEDALIA	PETTIS	0.001	0.001	TRIB FLAT CR	U	865	FLAT CR.	C
MO0120812	KRAKOW STORE	WASHINGTON	FRANKLIN	0.001		TRIB BUSCH CR	U	1686	TRIB. TO BUSCH CR.2	C
MO0119075	RAPCO INTERNATIONAL	JACKSON	CAPE GIRARDEAU	0.004	0.002	HORREL CR	U	2212	HORRELL CR.	C
MO0121851	CENTRAL ELECTRIC COMPANY	FULTON	CALLAWAY	0.001	0.001	TRIB HILLERS CR	U	728	HILLERS CR.	C
MO0124494	SKC ELECTRIC	COLUMBIA	BOONE	0.001	0.001	COW BR	U			
MO0124575	NE MO GRAIN PROCESR ETHNL	MACON	MACON	0.001		TRIB MID FK SALT R	U	123	MIDDLE FK. SALT R.	C
MO0123919	BOONE CO FIRE PRO DIST #9	COLUMBIA	BOONE	0.001		TRIB HENDERSON BR	U	1013	PERCHE CR.	P
MO0127213	SUMMIT LAKE WINERY	HOLTS SUMMIT	CALLAWAY	0.001	0.001	TRIB TURKEY CR	U	732	TURKEY CR.	C
MO0123501	POWELL GARDENS WWTF	KINGSVILLE	JOHNSON	0.007		TR S FK BLACKWATER R	U	924	S. FK. BLACKWATER R.	C
MO0045403	SIKESTON HEALTH CARE INC	SIKESTON	NEW MADRID	0.011	0.011	TRIB TO ASH SLOUGH	U			
MO0080730	SHADY LAWN REST HOME	SAVANNAH	ANDREW	0.009	0.008	TRIB TO 102 R	U			
MO0081426	ST JOSEPH'S HILL INFIRMAR	EUREKA	ST. LOUIS	0.02	0.005	LA BARQUE CR	U	2033	TRIB TO LABARQUE CR.	C
MO0084751	JONES WILDWOOD CARE CNTR	MADISON	MONROE	0.003		REESE FORK BR	C	136	REESE FK.	C
MO0086631	MILLER CO NURSING HOME	TUSCUMBIA	MILLER	0.01	0.007	CATTAIL CR.	U	1060	DOG CR.	C
MO0088064	COUNTRY VALLEY HOME	ST. JAMES	PHELPS	0.003	0.002	COX BR.	U	3559	COX BR.	C
MO0088137	FERNDALE, INC	ST. JAMES	PHELPS	0.003		TRIB COX BR	U			

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0089974	SEVILLE CARE CENTER	SALEM	DENT	0.01	0.009	TRIB SPRING BR CR	U	1870	SPRING BR.	P
MO0093653	ARBOR PLACE OF FESTUS	FESTUS	JEFFERSON	0.007	0.003	HOCUM HOLLOW/PLATTIN	U			
MO0097055	ST ELIZABETH HEALTH CENTR	ST. ELIZABETH	MILLER	0.01	0.003	TRIB TO TAVERN CR	U			
MO0099708	TEXAS CO RESIDENTIAL CARE	HOUSTON	TEXAS	0.003	0.001	TRIB INDIAN CR	U	1592	BRUSHY CR.	P
MO0099953	MARY'S RANCH, INC	MARBLE HILL	BOLLINGER	0.006	0.004	TRIB HOG CR	U	2249	HOG CR.	P
MO0100552	CENTERTOWN LEISURE VILLAG	CENTERTOWN	COLE	0.001	0.001	TRIB STROBEL BR	U	948	TRIB. TO STROBEL BR.	C
MO0101176	ESSEX RESIDENTIAL CARE	ESSEX	STODDARD	0.007	0.003	TRIB WILSON CR	U	3094	DITCH #8	C
MO0103535	EMMAUS HOMES INC	MARTHASVILLE	WARREN	0.02	0.015	COLLEGE CR	U	1611	WOLF CR.	C
MO0107271	RIDGEWAY NURSING HOME	SULLIVAN	FRANKLIN	0.002	0.001	TRIB STATER CR	U			
MO0112941	COUNTRY GARDENS RES CARE	CAPE GIRARDEAU	CAPE GIRARDEAU	0.007		TR CAPE LA CROIX CR.	U	1836	CAPE LA CROIX CR.	P
MO0118621	STONEY RIDGE VILLAGE	SEDALIA	PETTIS	0.015	0.009	TRIB MUDDY CR	U	3488	TRIB. TO MUDDY CR.	C
MO0120171	ANNA DODSON NURSING HOME	FARMINGTON	ST. FRANCOIS	0.004	0.003	TRIB WOLF CR	U			
MO0120588	CEDAR KNOLL RETIRE/FAC II	ST. JAMES	PHELPS	0.0023	0.002	COX BR	U			
MO0120928	WHISPERING OAKS ESTATES	BLAND	GASCONADE	0.004	0.001	TRIB GREEDY CR	U			
MO0121843	CLINTON CARE & REHAB CNTR	PLATTSBURG	CLINTON	0.001		TRIB PLATTE R	U	352	L. PLATTE R.	C
MO0122823	SHOW-ME CHRISTIAN YOUTH H	LA MONTE	PETTIS	0.004		LONG BR	U	857	LONG BR.	C
MO0123633	NEW HOPE RESIDENTIAL	PARK HILLS	ST. FRANCOIS	0.002	0.001	TRIB FLAT RIVER CR	U	2168	FLAT RIVER CR.	C
MO0100412	MISSOURI GIRLS TOWN	KINGDOM CITY	CALLAWAY	0.006	0.005	TRIB AUXVASSE CR.	U	706	AUXVASSE CR.	C
MO0107395	RES FOREST MONASTERY	DUNNEGAN	POLK	0.002	0.001	TRIB TO FLINT CREEK	U			
MO0123277	GOOD SAMARITAN BOYS RANCH	BRIGHTON	POLK	0.006	0.004	TRIB N DRY SAC R	U	1392	N. DRY SAC R.	P
MO0087076	SALEM MEMORIAL DIST HOSP	SALEM	DENT	0.004	0.002	TRIB SPRING BR CR	U	1870	SPRING BR.	P
MO0092398	ELK INN COMPLEX	ROCKPORT	ATCHISON	0.017	0.001	TRIB ROCK CR	U			
MO0125652	RIVERCENE BED & BREAKFAST	NEW FRANKLIN	HOWARD	0.002		TRIB MISSOURI R	U	701	MISSOURI R.	P
MO0000591	AP GREEN INDUSTRIES INC	MEXICO	AUDRAIN	0.001	0.001	S FORK SALT RIVER	C	142	S. FK. SALT R.	C
MO0002577	SECO PRODUCTS CORP	WASHINGTON	FRANKLIN	0.004	0.003	DUBOIS CR.	P			
MO0043842	HENSCHEL MGF	SEDGEWICKVILLE	BOLLINGER	0.001	0.001	TRIB WOLF CR	U			
MO0053821	CAPE GIRARDEAU IND PARK	CAPE GIRARDEAU	CAPE GIRARDEAU	0.35	0.35	LITTLE R. DITCH #47	U	3052	DITCH #1	C
MO0089532	GASLIGHT INDUSTRIAL PARK	COLUMBIA	BOONE	0.001		COW BR	U	1015	BEAR CR.	C
MO0098132	WIRE ROPE CORP OF AMERICA	SEDALIA	PETTIS	0.008	0.006	BRUSHY/MUDDY CR	U	859	BRUSHY CR.	C
MO0098965	TRINITY MARINE CARUTHERSV	CARUTHERSVILLE	PEMISCOT	0.008	0.002	MISSISSIPPI R.	P			
MO0103691	GENCORP AUTOMOTIVE	BERGER	FRANKLIN	0.01	0.004	LITTLE BERGER CR	P			
MO0109061	ST ELIZABETH IND COMPLEX	ST. ELIZABETH	MILLER	0.003	0.000	SULLIVAN BR	U			

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0110400	TWIN CITIES IND PARK WWTF	MOUNTAIN GROVE	TEXAS	0.006	0.006	BEAVER CR	U	1510	TRIB. TO BEAVER CR.	C
MO0112887	FRM CHEM INC	UNION	FRANKLIN	0.001	0.001	TRIB DUBOIS CR	U	1688	DUBOIS CR.	C
MO0113671	LANDMARK MFG CORP	GALLATIN	DAVIESS	0.001	0.005	TRIB BIG MUDDY CR	U	436	BIG MUDDY CR.	P
MO0121185	GLOBAL FIREWORKS, INC	CAMERON	CLINTON	0.001		TRIB SHOAL CR	U			
MO0123749	KEY INDUSTRIAL PARK	OAK GROVE	JACKSON	0.010		TRIB SNI-A-BAR CR	U	399	SNI-A-BAR CR.	P
MO0104337	COLUMBIA FOODS COMPANY	COLUMBIA	BOONE	0.037	0.004	TRIB HINKSON CR	U	1008	HINKSON CR.	C
MO0025011	KC, NORTHLAND MHP STP	KANSAS CITY	CLAY	0.090	0.052	WILKERSON CR	U			
MO0035441	OAKCREST MHP	MEXICO	AUDRAIN	0.009		SCATTERING FORK	U			
MO0039012	AQUASOURCE, THE HIGHLANDS	HOLTS SUMMIT	CALLAWAY	0.014		TRIB TO TURKEY CR.	U	732	TURKEY CR.	C
MO0041467	PEACEFUL VALLEY LAKE EST	OWENSVILLE	GASCONADE	0.030	0.014	CEDAR BR/3RD CREEK	U	1552	CEDAR CR.	C
MO0043389	SCCPWSD #2,ROLLING MEADOW	O'FALLON	ST. CHARLES	0.210	0.057	LITTLE DARDENNE CR	C	221	DARDENNE CR.	P
MO0044016	BERRY ESTATES MHP	LONEJACK	JACKSON	0.005	0.004	E BR CRAWFORD CREEK	U	1255	E. BR. CRAWFORD CR.	C
MO0044661	CIRCLE 4 MOBILE HOME PARK	ROLLA	PHELPS	0.005	0.001	TRIB IRON ORE CR.	U			
MO0045501	LAKE ROAD VILLAGE PARK	KIRKSVILLE	ADAIR	0.017	0.003	TRIB FOREST LAKE	U	7151	FOREST LAKE	L1
MO0045578	MOBILE VILLAGE MHP	COLUMBIA	BOONE	0.022	0.02	TRIB ROCKY FK CR	U	1014	ROCKY FK.	C
MO0050199	HORSE SHOE BEND MHP	UNION	FRANKLIN	0.007		BR FENTON CREEK	U	3335	FENTON CR.	C
MO0050474	LEDBETTERS MHP	HANNIBAL	RALLS	0.004		TRIB BEAR CR	U	9	BEAR CR.	C
MO0051021	CLOVER HILL TRAILER PARK	JACKSON	CAPE GIRARDEAU	0.005	0.001	TRIB GOOSE CREEK	U			
MO0052051	GASLIGHT VILLAGE MHP	MARSHFIELD	WEBSTER	0.005	0.003	TRIB W FK NIANGUA R.	U	1175	W. FK. NIANGUA R.	P
MO0054038	ELMWOOD MHP	MEXICO	AUDRAIN	0.005	0.004	TRIB DAVIS CR	U	144	DAVIS CR.	C
MO0054259	INDIAN CREEK MHP	JACKSON	CAPE GIRARDEAU	0.010	0.003	TRIB TO INDIAN CR	U	1828	INDIAN CR.	P
MO0054372	HICKORY HOLLOW MHP	CAPE GIRARDEAU	CAPE GIRARDEAU	0.002	0.001	TRIB WILLIAMS CR	U	2198	WILLIAMS CR.	P
MO0055026	PARKWOOD LAKE ESTATES W	CAPE GIRARDEAU	CAPE GIRARDEAU	0.023	0.02	TRIB RAMSEY BR	U	2194	RAMSEY BR.	P
MO0055271	PARKWOOD LAKE EST MHP	CAPE GIRARDEAU	CAPE GIRARDEAU	0.020	0.015	RAMSEY CR.	U	2194	RAMSEY BR.	P
MO0056111	I-70 MOBILE CITY MHP	BATES CITY	LAFAYETTE	0.100	0.011	TRIB HORSESHOE CR	U	3690	L. HORSESHOE CR.	C
MO0056448	MAPA ACRES MHP	HILLSBORO	JEFFERSON	0.012	0.004	TRIB SANDY CR	U	1720	SANDY CR.	C
MO0056600	SCOTCHMAN PLACE MHP	NEW BLOOMFIELD	CALLAWAY	0.013	0.002	TRIB FITZHUGH BR	U	728	HILLERS CR.	C
MO0057380	GLENDALE VILLAGE MHP	FARMINGTON	ST. FRANCOIS	0.002	0.001	TRIB WOLF CR	U			
MO0080918	KNOB NOSTER TRAILER PARK	KNOB NOSTER	JOHNSON	0.02	0.012	TRIB WALNUT CR	U			
MO0081027	J & E MHP	PACIFIC	FRANKLIN	0.003	0.001	TRIB BRUSH CR	U			
MO0081108	LAVNANED MHP	PACIFIC	FRANKLIN	0.002	0.002	TRIB TO BRUSH CR.	U	1844	BRUSH CR.	C
MO0081264	SCCPWSD #2 TK MHP	ST. CHARLES	ST. CHARLES	0.021	0.011	SCHOTE CR/DARDENNE C	U	221	DARDENNE CR.	P

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MO0081485	PARADISE MHP	ST. CLAIR	FRANKLIN	0.006	0.005	BR BIRCH CR	U	2073	BIRCH CR.	C
MO0081558	KINGSWAY MHP	PACIFIC	FRANKLIN	0.010	0.005	TRIB BRUSH CR	U			
MO0081850	SKYLINE VILLAGE MHP	MEXICO	AUDRAIN	0.016	0.010	TRIB DAVIS CR	U	144	DAVIS CR.	C
MO0081957	FERRELL MHP	BENTON	SCOTT	0.026	0.016	BLUE DITCH	U	3147	BLUE DITCH	C
MO0081981	NORTHWYE MHP	ROLLA	PHELPS	0.005	0.001	TRIB BURGHER BR	U			
MO0084395	GRANDVIEW PLAZA MHP	POTOSI	WASHINGTON	0.008	0.005	FOUNTAIN FARM BR	U			
MO0084581	CLET'S TRAILER COURT	POPLAR BLUFF	BUTLER	0.008	0.004	TRIB TO CANE CR.	U			
MO0085545	WHITEMAN MHP	KNOB NOSTER	JOHNSON	0.012	0.009	TRIB CLEAR FORK	U	935	CLEAR FK.	P
MO0085782	GASLIGHT MHP	COLUMBIA	BOONE	0.006	0.006	TRIB COW BR	U	1015	BEAR CR.	C
MO0085855	LIBERTY VILLAGE MHP	LIBERTY	CLAY	0.025	0.020	HOLMES CR	U	383	FISHING R.	P
MO0086037	GREEN HILLS MHP	COLUMBIA	BOONE	0.012	0.005	TRIB ROCKY FORK CR	U	1014	ROCKY FK.	C
MO0086975	CLARINGTON COURT MHP	ROLLA	PHELPS	0.0053	0.001	IRON ORE CR	U			
MO0087360	PETER J'S	CUBA	CRAWFORD	0.002	0.001	PLEASANT VALLEY CR.	U	2058	PLEASANT VALLEY CR.	C
MO0087408	WHITACRES MHP	WASHINGTON	FRANKLIN	0.001	0.001	TRIB BUSCH CR.	U	1686	TRIB. TO BUSCH CR.2	C
MO0089087	SPRING MEADOW MH ESTATES	LONEDELL	FRANKLIN	0.015	0.009	N FK OF L MERAMEC R	U	2026	N. FK. L. MERAMEC R.	P
MO0089168	AVERY MOBILE HOME PARK	PACIFIC	FRANKLIN	0.004		TRIB BRUSH CR	U			
MO0089303	SUNRISE ACRES TRAILER PK	HOLTS SUMMIT	CALLAWAY	0.002	0.002	TRIB TURKEY CR	U			
MO0089745	SERENITY MHP	CADET	WASHINGTON	0.002	0.001	TRIB RUBENEAU BR	U			
MO0089893	WHISPERING PINES MHP	POTOSI	WASHINGTON	0.001		BR WALLEN CR	C	2139	WALLEN CR.	C
MO0090522	SUMMIT ACRES MHP	MINERAL POINT	WASHINGTON	0.007	0.007	TRIB W BR MILL CR.	U	2126	TRIB. TO MILL CR.	C
MO0091413	CIRCLE "C" MHP	PACIFIC	FRANKLIN	0.006	0.004	TRIB BRUSH CR	U	1844	BRUSH CR.	C
MO0091553	SUNSET VILLAGE MHP	SEDALIA	PETTIS	0.027		TRIB MUDDY CREEK	U			
MO0091910	DREAMLAND MHC	FARMINGTON	ST. FRANCOIS	0.011	0.005	TRIB KOEN CR	U	2171	KOEN CR.	C
MO0091952	LINN ACRES MHP	LINN	OSAGE	0.001		TRIB LOOSE CR	U			
MO0092011	TWIN BRIDGES MH VILLAGE	JEFFERSON CITY	COLE	0.004	0.003	TRIB MOREAU RIVER	U			
MO0092070	TALL OAKS MHP	POPLAR BLUFF	BUTLER	0.012	0.004	PIKE SLOUGH	U			
MO0092118	TRINITY MOBILE HOME PARK	BLOOMSDALE	STE. GENEVIEVE	0.004	0.001	TR S FK ISL DU BO CR	U	1738	S FK ISLE DU BOIS CR	C
MO0092134	RUSTIC ACRES MHP	FARMINGTON	ST. FRANCOIS	0.007	0.003	TRIB KOEN CR	U			
MO0092207	MAPLE HILL PARK	VILLA RIDGE	FRANKLIN	0.001		BRANCH LABADIE CR	U	1695	TRIB. TO LABADIE CR.	C
MO0092711	CEDAR GROVE MHP	IMPERIAL	JEFFERSON	0.011	0.006	CHESLEY ISLND SLOUGH	U			
MO0092789	SHADY LANE MHP	ROLLA	PHELPS	0.004	0.001	TRIB TO BOURBEUSE R.	U	2049	BOURBEUSE R.	C
MO0093092	WOODLAWN MANOR TRAILER CT	PACIFIC	FRANKLIN	0.005	0.005	TRIB BRUSH CR	U	1844	BRUSH CR.	C

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MO0093149	HOMESTEAD TRAILER PARK	SEDALIA	PETTIS	0.008	0.005	SEWER BR	U	860	SEWER BR.	C
MO0094153	HART'S MOBILE HOME ESTATE	POPLAR BLUFF	BUTLER	0.011	0.002	TRIB CRAVENS DITCH	U	2816	CRAVEN DITCH	C
MO0094277	LAKEWOOD MH COMMUNITY	KNOB NOSTER	JOHNSON	0.030	0.010	TRIB CLEAR FK	U	935	CLEAR FK.	P
MO0094471	ROUTE W MHP	CAPE GIRARDEAU	CAPE GIRARDEAU	0.031	0.005	CAPE LA CROIX CR	U	1837	CAPE LA CROIX CR.	C
MO0095974	CRESCENT MEADOWS MHP	COLUMBIA	BOONE	0.056	0.005	COW BR OF BEAR CK	U	1015	BEAR CR.	C
MO0096580	COUNTRY SQUIRE ESTATES	COLUMBIA	BOONE	0.010	0.004	COW BR.	U	1015	BEAR CR.	C
MO0098299	PROPST TRAILER COURT	JEFFERSON CITY	COLE	0.002		TRIB TO MOREAU R.	U			
MO0098558	WOODLANDS MHP	IRONTON	IRON	0.002	0.001	TRIB STOUTS CREEK	U			
MO0098710	LAKE HEIGHTS ESTATES MHP	COLUMBIA	BOONE	0.006	0.007	TRIB ROCKY FK CR	U			
MO0099198	MATHIS TRAILER COURT	COLUMBIA	BOONE	0.002	0.001	TRIB TO COW BR	U			
MO0100609	MIDWEST ENERGY, INC	JACKSON	CAPE GIRARDEAU	0.029	0.010	HUBBLE CR	U			
MO0100625	HIGH HILL CIRCLE MHP	COLUMBIA	BOONE	0.028	0.014	GANS CR/PERCHE CR	U	1004	GANS CR.	C
MO0101052	MAC'S MOBILE MANOR	FULTON	CALLAWAY	0.015	0.007	RICHLAND CR	C	715	RICHLAND CR.	C
MO0101290	WINFIELD MOBILE MANOR	WINFIELD	LINCOLN	0.007	0.004	TRIB BRUSHY CR	U	33	BRUSHY FK.	C
MO0101397	PECK'S PIKE CREEK ESTATES	POPLAR BLUFF	BUTLER	0.002	0.001	TRIB PIKE CR	U	2815	PIKE CR.2	C
MO0101656	LAKE VILLAGE	PARIS	MONROE	0.036	0.007	TRIB ELK FK SALT R	U	131	ELK FK. SALT R.	C
MO0101796	OASIS MHP	BELTON	CASS	0.02	0.01	TRIB W FK E CR	U	3310	W. FK. EAST CR.	C
MO0102091	COUNTRY MEADOWS ESTATE	POPLAR BLUFF	BUTLER	0.011	0.005	PIKE SLOUGH	P	2815	PIKE CR.2	C
MO0104485	HAZELWOOD COURT MHP	PEVELY	JEFFERSON	0.010	0.003	TRIB TO SANDY CR.	U	1720	SANDY CR.	C
MO0105520	ELRAY MHP	COLUMBIA	BOONE	0.008	0.006	TRIB HOMINY BR	U			
MO0106755	MEADOWLARK MHP	SEDALIA	PETTIS	0.018	0.003	TRIB SPRING FK CR	U			
MO0107298	DML ESTATES	KNOB NOSTER	JOHNSON	0.004	0.003	CLEAR FK BLACKWATER	U	935	CLEAR FK.	P
MO0108391	STATELY MANSIONS MOBILE M	ROLLA	PHELPS	0.026	0.008	TRIB L DRY FK	U	1864	L. DRY FK.	C
MO0109207	HENRY'S MOBILE HOME PARK	WEST PLAINS	HOWELL	0.007	0.006	TRIB SPRING CR.	U	7318	STOKES LAKE	L3
MO0109380	CRESTVIEW MHP	SEDALIA	PETTIS	0.004		TRIB SHAVER CR	U	862	SHAVER CR.	P
MO0109631	LAKE OF THE WOODS MHP	COLUMBIA	BOONE	0.005	0.003	HOMINY BRANCH	U	1011	HOMINY CR.	C
MO0109746	FOUNTAIN PLAZA RV AND MHP	MARSHFIELD	WEBSTER	0.007	0.005	TRIB W FK	U	1175	W. FK. NIANGUA R.	P
MO0110043	WEISS MH COMMUNITY	JACKSON	CAPE GIRARDEAU	0.021		TRIB CANE CR	U			
MO0110493	JOST TRAILER PARK	CUBA	CRAWFORD	0.005	0.004	TR PLEASANT VALLEY C	U	2058	PLEASANT VALLEY CR.	C
MO0110515	HIDDEN VALLEY MHP	OLD MONROE	LINCOLN	0.003	0.004	TRIB BOB'S CR	U			
MO0110621	MULBERRY ACRES	FRUITLAND	CAPE GIRARDEAU	0.067	0.024	TRIB CANE CREEK	U			
MO0112291	HILLCREST MHC	SEDALIA	PETTIS	0.002	0.002	TRIB FLAT CREEK	U	865	FLAT CR.	C

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MO0112801	BOLEY MOBILE ESTATES	WINFIELD	LINCOLN	0.008	0.001	TRIB BIRKHEAD BR	U	34	BIRKHEAD BR.	C
MO0112852	PESCHANG'S MHP	JEFFERSON CITY	COLE	0.002	0.002	TR HONEY CREEK	U			
MO0113409	E & M MHP	JEFFERSON CITY	COLE	0.006	0.004	TRIB. MOREAU RIVER	U	1001	TRIB. TO MOREAU R.	C
MO0113484	SOUTHWOODS ESTATES MHP	COLUMBIA	BOONE	0.001	0.001	TRIB L BOONE FEMME C	U			
MO0114898	COUNTRY AIRE MOBI HOM EST	WARRENSBURG	JOHNSON	0.01	0.01	FLETCHER CR	U	929	W. FK. POSTOAK CR.	C
MO0114979	LITTLE DIXIE MHP	MILLERSBURG	CALLAWAY	0.004		OWL CREEK	U	741	OWL CR.	C
MO0115126	BALDWIN MOBILE HOME PARK	KAHOKA	CLARK	0.016	0.005	TRIB FOX RIVER	U	38	FOX R.	P
MO0115908	RUSSELL MHC	WINFIELD	LINCOLN	0.003	0.001	TRIB MCLEAN CR	U	31	MCLEAN CR.	C
MO0116106	LINDEMANN MHP #1	TROY	LINCOLN	0.005		TRIB COON CR	U			
MO0116262	LINDEMANN-HOME TOWN MHC	TROY	LINCOLN	0.004		TRIB CROOKED CR	U	202	CROOKED CR.	C
MO0116360	WHISPERING PINES MHP	WARRENSBURG	JOHNSON	0.006	0.003	VINEGAR BR	U			
MO0117200	COUNTRY ACRES MHP	LINCOLN	BENTON	0.007	0.002	TRIB LITTLE TEBO CR	U	1205	L. TEBO CR.	C
MO0117897	AIRY ACRES MOBILE HOME CT	GOWER	CLINTON	0.015	0.004	TRIB CASTILE CREEK	U			
MO0118915	CEDAR LANE MHP	WASHINGTON	FRANKLIN	0.003	0.001	TRIB ST JOHN'S CR	U	1682	TRIB ST.JOHN'S CR.2	C
MO0119041	CIRCLE WOODS MHP	FOLEY	LINCOLN	0.012	0.002	TRIB BOBS CR	U	35	BOBS CR.	C
MO0119059	COUNTRY HILL ESTATES MHP	FOLEY	LINCOLN	0.009		TRIB BOBS CR	U	35	BOBS CR.	C
MO0119156	TIMBERLINE MHP	WINFIELD	LINCOLN	0.007		TRIB BIRKHEAD BR	U	34	BIRKHEAD BR.	C
MO0119261	SNOW HILL MEADOWS MHP	ELSBERRY	LINCOLN	0.0145		TRIB BAILY'S BR	U			
MO0119270	MAXEY & PINET MHP	HOLTS SUMMIT	CALLAWAY	0.002		TRIB TURKEY CR	U	732	TURKEY CR.	C
MO0119296	WEISS LAGOON	FRUITLAND	CAPE GIRARDEAU	0.045	0.032	TRIB HUBBLE CR	U			
MO0119377	LEHENBAUER PRE-MANUFACTUR	KINGDOM CITY	CALLAWAY	0.048		TRIB AUXVASSE CR	U	706	AUXVASSE CR.	C
MO0119512	FARM VIEW MHP	FOLEY	LINCOLN	0.007		TRIB CUNNINGHAM CR	U			
MO0119547	WESTERN VIEW ESTATES	SEDALIA	PETTIS	0.013	0.012	TRIB BRUSHY CR	U			
MO0120286	WAGON WHEEL MHP	COLUMBIA	BOONE	0.006		CLAYS FK	U	1014	ROCKY FK.	C
MO0121517	WHISPERING OAKS MHP	CROCKER	PULASKI	0.0017	0.002	TRIB BELL CREEK	U	1470	BELL CR.	C
MO0121533	SUNSET HILLS TRAILER CT	LINN	OSAGE	0.002	0.001	TRIB LINN CREEK	U			
MO0122947	ROGERS MHP	CUBA	CRAWFORD	0.002		TRIB PRAIRIE CR	U			
MO0123340	OAK RIDGE MHP	KNOB LICK	ST. FRANCOIS	0.002	0.002	MUSCO CR	U			
MO0123587	L.S. MOBILE HOME ESTATES	WARRENSBURG	JOHNSON	0.003	0.003	TRIB POST OAK CR	U			
MO0123960	ROCKWOOD CREEK MH VILLAGE	CAMERON	DE KALB	0.018	0.006	TRIB WAMSLEY CR	C	505	WAMSLEY CR.	C
MO0124303	TANGLEWOOD MHP	ST. JAMES	PHELPS	0.009	0.009	TRIB ROBINSON CR	U	3558	ROBINSON CR.	P
MO0124681	GEISENDORFER MHP	EWING	LEWIS	0.005	0.005	TRIB GRASSY CR	U			

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0124745	OAK GROVE ESTATES	KNOB NOSTER	JOHNSON	0.003	0	BREWER BRANCH	U			
MO0124796	WALNUT GROVE PARK	FARMINGTON	ST. FRANCOIS		0.028	TRIB BACK CR	U	2880	BACK CR.	C
MO0125491	COUNTRY SQUIRE MHP	SULLIVAN	CRAWFORD	0.014		TRIB STATER CREEK	U	1850	STATER CR.	C
MO0126420	BILLINGSVILLE-N. LEONARD	BOONVILLE	COOPER	0.001		TRIB PETITE SALINE C	U	786	PETITE SALINE CR.	C
MO0126977	BONNE FEMME MHP	COLUMBIA	BOONE	0.005	0.004	TRIB BONNE FEMME CR	C	753	BONNE FEMME CR.	C
MO0127400	CROWN TRAILER SALES, INC	BELTON	CASS	0.05	0.027	EAST CR	C	1265	EAST CR.	C
MO0127965	SEBELIUS LAGOON	ST. JAMES	PHELPS	0.001	0.001	TRIB ROBINSON CRK	U	3558	ROBINSON CR.	P
MO0002003	DOE RUN, BUICK MINE	VIBURNUM	IRON	2.3		STROTHER CREEK	U			
MO0034410	BLUE TOP MOTEL AND CAFE	LAMAR	BARTON	0.009		N FK SPRING R.	U	3188	N. FK. SPRING R.	C
MO0055956	CORRAL MOTEL,CHEROKEE PAS	FREDERICKTOWN	MADISON	0.002	0.002	TRIB TWELVE MILE CR	U	2846	TWELVE MILE CR.	C
MO0056758	DIAMONDS RESTAURANT/MOTEL	GRAY SUMMIT	FRANKLIN	0.027	0.008	TRIB TO LABADIE CR.	U	1694	TRIB. TO LABADIE CR.	P
MO0081752	GRAF & SONS, INC.	MEXICO	AUDRAIN	0.008		TRIB S FK SALT R.	U	7045	TEAL LAKE	L3
MO0084018	RELAX MOTEL	POPLAR BLUFF	BUTLER	0.002	0.002	TRIB CRAVEN DITCH	U	2816	CRAVEN DITCH	C
MO0087211	ROY-L UTILITIES	HIGH HILL	MONTGOMERY	0.077	0.001	BEAR CREEK	C			
MO0089290	Q T INN	BOONVILLE	COOPER	0.004	0.004	TRIB PETITE SALINE C	U	785	PETITE SALINE CR.	P
MO0100137	ATLASTA MOTEL	BOONVILLE	COOPER	0.001	0.001	TR PETITE SALINE CR.	U			
MO0109754	EL RANCHO MOTEL	SEDALIA	PETTIS	0.001		TRIB TO COON CREEK	U	3498	TRIB. TO COON CR.2	C
MO0114651	NADLER BED & BREAKFAST	DEFIANCE	ST. CHARLES	0.001	0.001	TRIB FEMME OSAGE CR	U	1605	FEMME OSAGE CR.	P
MO0115592	SUNSET MOTEL	SEDALIA	PETTIS	0.002	0.001	TRIB FLAT CR	U	865	FLAT CR.	C
MO0118516	BUDGET HOST SUPER 7 MOTEL	SEDALIA	PETTIS	0.003		TRIB FLAT CR	U			
MO0120456	SUPER 8 MOTEL WWTF	LAMAR	BARTON	0.006		TRIB N FK SPRING R	U	3188	N. FK. SPRING R.	C
MO0121487	RIGBY BUNKHOUSE SUITES	LINCOLN	BENTON	0.002		TRIB BIRD BR	U	3294	TRIB TO BIRD BRANCH	C
MO0123846	JUNCTION RESTAURANT/LOUNG	PERRY	RALLS	0.003	0.003	TRIB MACE BRANCH	U	7048	PERRY LAKE #2	L3
MO0125750	PLUMMER FAMLY CLUB WW LAG	FARMINGTON	ST. FRANCOIS	0.001	0.001	TRIB MUSCO CREEK	U	2873	MUSCO CR.	C
MO0120596	PARADISE HOMES	WARRENSBURG	JOHNSON	0.001	0.001	DEVILS BR CR	U	928	POSTOAK CR.	P
MO0115061	TYSON FOODS-SEDALIA PROCE	SEDALIA	PETTIS	1.8	1.95	TRIB MUDDY CR	U	855	MUDDY CR.	C
MO0034916	MDNR, TRAIL OF TEARS ST P	JACKSON	CAPE GIRARDEAU	0.003	0.003	TRIB MISSISSIPPI R.	U	1707	MISSISSIPPI R.	P
MO0051748	MDNR, PERSHING ST PK	LACLEDE	LINN	0.001	0.001	LOCUST CR	U			
MO0097993	MDNR, ST JOE STATE PARK	PARK HILLS	ST. FRANCOIS	0.002		HARRIS BR TO FLAT R	U	2168	FLAT RIVER CR.	C
MO0122726	FORT OSAGE PARK	SIBLEY	JACKSON	0.002	0.001	MISSOURI R	P	356	MISSOURI R.	P
MO0098388	MDC, CAPE GIRARDEAU REG	CAPE GIRARDEAU	CAPE GIRARDEAU	0.005	0.001	TRIB CAPE LACROIX CR	U	1836	CAPE LA CROIX CR.	P
MO0108006	MDNR, WESTON BEND ST PK	WESTON	PLATTE	0.009	0.009	TRIB BEE CR	C			

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MO0121347	MDNR, WALLACE STATE PARK	CAMERON	CLINTON	0.003		TRIB DEER CR	U	528	SHOAL CR.	C
MO0127116	MDC,EAGLE BLUFFS CONSERVA	COLUMBIA	BOONE	0.001	0.001	TRIB PERCHE CR	C	1006	TRIB. TO PERCHE CR.	C
MO0123129	BOLAND OIL COMPANY	BEAUFORT	FRANKLIN	0.001		FOX CR	U	2034	BOURBEUSE R.	P
MO0001601	LOUISIANA DOCK COMPANY	ST. LOUIS	ST. LOUIS	0.002	0.001	MISSISSIPPI R.	P	1707	MISSISSIPPI R.	P
MO0120421	SE MO PORT AUTHORITY LAG	SCOTT CITY	CAPE GIRARDEAU	0.009	0.002	MISSISSIPPI R	P			
MO0004391	MSD, MISSOURI RIVER WWTF	ST. LOUIS	ST. LOUIS	28	24	CREVE COEUR CR	P	1702	CREVE COEUR CR.	P
MO0021105	APPLETON CITY WWTF	APPLETON CITY	ST. CLAIR	0.78	0.14	MONEGAW CREEK	U	1234	MONEGAW CR.	C
MO0021423	GIDEON WWTP	GIDEON	NEW MADRID	0.177	0.12	DRAINAGE DITCH #3	P	3100	DITCH #3	P
MO0021458	RAVENWOOD WWTF	RAVENWOOD	NODAWAY	0.05	0.006	PLATTE RIVER	P	312	PLATTE R.	P
MO0021750	EAST PRAIRIE WWTP	EAST PRAIRIE	MISSISSIPPI	0.6	0.4	LEE ROWE DITCH	C	3137	LEE ROWE DITCH	C
MO0021768	SALEM WWTF	SALEM	DENT	0.741	0.634	SPRING BRANCH	P	1870	SPRING BR.	P
MO0021822	RICHMOND N WWTF	RICHMOND	RAY	0.75	0.628	TR W FK CROOKED CR	U			
MO0022080	HAMILTON NE WWTF	HAMILTON	CALDWELL	0.13	0.1	BR LICK FK	U	515	LICK FK.	C
MO0022331	HOLCOMB WWTF	HOLCOMB	DUNKLIN	0.094	0.07	MAIN DITCH NO.2	P	3112	MAIN DITCH	P
MO0022373	BOLIVAR WWTF	BOLIVAR	POLK	2.554	1.4	TOWN BRANCH	P	1444	PIPER CR.	P
MO0022845	NEW MADRID WWTP	NEW MADRID	NEW MADRID	0.393	0.3	ST JOHNS BAYOU	P	3123	ST. JOHNS BAYOU	P
MO0022853	JACKSON MUNICIPAL WWTP	JACKSON	CAPE GIRARDEAU	2.4	1.8	GOOSE CR	P	2197	HUBBLE CR.	P
MO0022861	CAMPBELL AERATED LAGOON	CAMPBELL	DUNKLIN	0.412	0.412	FRISCO DITCH	U			
MO0022888	MALDEN INDUSTRIAL PK WWTF	MALDEN	DUNKLIN	0.6	0.2	TRIB OF DITCH #1	U	3108	E. DITCH #1	C
MO0022918	ORRICK LAGOON	ORRICK	RAY	0.118	0.114	KEENEY CR.	C	384	KEENEY CR.	C
MO0022969	SKIDMORE WWTF	SKIDMORE	NODAWAY	0.065	0.03	NODAWAY R	P	279	NODAWAY R.	P
MO0023019	SEDALIA CENTRAL WWTF	SEDALIA	PETTIS	2.5	1.3	BRUSHY CREEK	U	859	BRUSHY CR.	C
MO0023043	ST JOSEPH WWTP	ST JOSEPH	BUCHANAN	27	19	MISSOURI R	P	226	MISSOURI R.	P
MO0023051	ST JOSEPH WWTP, ROSECRANS	ST JOSEPH	BUCHANAN	0.061	0.061	DITCH TO BROWNING LK	U	7063	BROWNING LAKE	L3
MO0023060	ST JOSEPH, FARAON ST LAG	ST. JOSEPH	BUCHANAN	0.414	0.011	102 RIVER	P	342	102 R.	P
MO0023094	HIGGINSVILLE I-70 N LAGOO	HIGGINSVILLE	LAFAYETTE	0.023	0.01	TRIB TO DAVIS CR.	U	907	DAVIS CR.	P
MO0023108	HIGGINSVILLE S LAGOON	HIGGINSVILLE	LAFAYETTE	0.6	0.57	MARIES CR.	U	907	DAVIS CR.	P
MO0023116	HIGGINSVILLE N LAGOON	HIGGINSVILLE	LAFAYETTE	0.4	0.2	TRIB TABO CR	U	405	TABO CR.	P
MO0023159	MARIONVILLE WWTF	MARIONVILLE	LAWRENCE	0.25	0.235	HONEY CR	P	3170	HONEY CR.	C
MO0023191	WRIGHT CITY WWTF	WRIGHT CITY	WARREN	0.35	0.29	PERUQUE CR.	U			
MO0023213	DEXTER E LAGOON	DEXTER	STODDARD	1.12	0.9	TRIB DITCH #2	U	3105	LAT #2 MAIN DITCH	P
MO0023221	MACON WWTF	MACON	MACON	2.5	1.5	SEWER CR	U	123	MIDDLE FK. SALT R.	C

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MO0023281	CALIFORNIA N LAGOON	CALIFORNIA	MONITEAU	0.821	0.571	TRIB E BRUSH CR	U	811	E. BRUSH CR.	C
MO0024911	KC, BLUE RIVER STP	KANSAS CITY	JACKSON	105	75	MISSOURI RIVER	P	356	MISSOURI R.	P
MO0024929	KC, WESTSIDE WWTP	KANSAS CITY	JACKSON	22.5	10	MISSOURI R.	P	356	MISSOURI R.	P
MO0024961	KC, TODD CREEK WWTP	KANSAS CITY	PLATTE	2.7	1.4	TODD CR	C	316	TODD CR.	C
MO0025178	MSD, BISSEL POINT WWTP	ST. LOUIS	ST. LOUIS	250	108	MISSISSIPPI R.	P	1707	MISSISSIPPI R.	P
MO0025208	CONCORDIA WWTF NORTH	CONCORDIA	LAFAYETTE	0.705	0.115	DAVIS CR	P	907	DAVIS CR.	P
MO0025216	LEXINGTON WWTF	LEXINGTON	LAFAYETTE	0.75	0.421	MISSOURI RIVER	P	356	MISSOURI R.	P
MO0025259	WAVERLY WWTP	WAVERLY	LAFAYETTE	0.119	0.032	TRIB TO MISSOURI R.	P	356	MISSOURI R.	P
MO0025305	CHAFFEE LAGOON	CHAFFEE	SCOTT	0.51	0.3	DITCH NO.1	U			
MO0025313	SALISBURY N 6 ACRE LAGOON	SALISBURY	CHARITON	0.196	0.12	MID FK LITTLE CHAR R	U			
MO0025810	WASHINGTON SEWAGE TREATME	WASHINGTON	FRANKLIN	2.3	2	DUBOIS CR.	P	1684	DUBOIS CR.	P
MO0025828	SMITHTON LAGOON	SMITHTON	PETTIS	0.062	0.04	TRIB FLAT CR	U	3509	TRIB. TO FLAT CR.2	C
MO0025852	RISCO WWTF	RISCO	NEW MADRID	0.09	0.05	DITCH NO. 8	C	3094	DITCH #8	C
MO0026298	PLATTE CITY WWTP	PLATTE CITY	PLATTE	2	0.5	PLATTE RIVER	P	312	PLATTE R.	P
MO0026379	ODESSA NW WWTF	ODESSA	LAFAYETTE	0.144	0.144	OWL CR	U			
MO0026387	ODESSA SE LAGOON	ODESSA	LAFAYETTE	0.375		TRIB DAVIS CR	C	912	DAVIS CR.	C
MO0026395	ODESSA W LAGOON	ODESSA	LAFAYETTE	0.064	0.027	TRIB E FK SNI-A-BAR	U			
MO0026671	LOWRY CITY SEWAGE LAGOON	LOWRY CITY	ST. CLAIR	0.103	0.07	TRIB GALLINIPPER CR	C	1227	GALLINIPPER CR.2	C
MO0027570	GAINESVILLE WWTP	GAINESVILLE	OZARK	0.206	0.031	LICK CR	C			
MO0027600	GRANT CITY W SANI LAGOON	GRANT CITY	WORTH	0.14	0.042	TRIB MARLOWE CR	U			
MO0027634	MATTHEWS WASTE STABIL LAG	MATTHEWS	NEW MADRID	0.083	0.076	DITCH #104	U			
MO0028053	HAWK POINT MUNICIPAL WWTF	HAWK POINT	LINCOLN	0.054		TRIB TURKEY CR	U	199	TURKEY CR.	C
MO0028061	BRAYMER WWTF	BRAYMER	CALDWELL	0.145	0.139	MUD CREEK	P	538	MUD CR.	P
MO0028070	HARRISONVILLE WWTP	HARRISONVILLE	CASS	3	1.8	TOWN CR	U	1264	EAST BR.	C
MO0028568	KENNETT WWTF	KENNETT	DUNKLIN	1.4	1	BUFFALO DITCH	P	3118	BUFFALO DITCH	P
MO0028584	EMMA SOUTH MUNICIPAL WWTF	SWEET SPRINGS	SALINE	0.022	0.007	GOOSE CR.	U			
MO0028592	EMMA N WWTF	EMMA	SALINE	0.078	0.078	DAVIS CR	P	907	DAVIS CR.	P
MO0028711	MOUNTAIN GROVE E WWTF	MOUNTAIN GROVE	WRIGHT	0.22		WHETSTONE CR	U	1505	WHETSTONE CR.	C
MO0028746	BROOKFIELD NE WWTF	BROOKFIELD	LINN	0.606	0.6	W. YELLOW CR.	P	599	W FK YELLOW CR.	P
MO0028762	PRINCETON WWTF	PRINCETON	MERCER	0.283	0.118	TRIB WELDON R	U	560	WELDON R.	P
MO0028843	EXCELSIOR SPRINGS WWTF	EXCELSIOR SPRIN	CLAY	2.1	2.4	FISHING RIVER	P	383	FISHING R.	P
MO0028860	FARMINGTON E WWTP	FARMINGTON	ST. FRANCOIS	1.3	0.9	KENNEDY BR WOLF CR.	U	3588	TRIB. TO WOLF CR.	P

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MO0028886	BLUE SPRINGS, SNI-A-BAR	GRAIN VALLEY	JACKSON	6	3.89	SNI-A-BAR CR	P	399	SNI-A-BAR CR.	P
MO0030791	NORBORNE WWTF	NORBORNE	CARROLL	0.11	0.085	MOSS CR	U	369	MOSS CR.	P
MO0030821	MOREHOUSE WWTF	MOREHOUSE	NEW MADRID	0.17	0.15	LITTLE R.	P	3041	OLD CHAN. LITTLE R.	P
MO0030970	ST PETERS, SPENCER CR STP	ST. PETERS	ST. CHARLES	6.9	5.5	SPENCER CR	C	224	SPENCER CR.	C
MO0031585	WESTON MUNICIPAL LAGOON	WESTON	PLATTE	0.21	0.07	BEAR CREEK	C			
MO0031658	GOLDEN CITY WWTF	GOLDEN CITY	BARTON	0.125		TRIB N FK SPRING R.	U	3188	N. FK. SPRING R.	C
MO0032174	MAITLAND WWTF	MAITLAND	HOLT	0.032	0.03	NODAWAY RIVER	P	279	NODAWAY R.	P
MO0033251	DEARBORN WWTF	DEARBORN	PLATTE	0.1	0.015	BEE CREEK	C			
MO0033286	MARYVILLE WWTF	MARYVILLE	NODAWAY	1.9	1.4	102 RIVER	P	342	102 R.	P
MO0033502	BETHANY WWTP	BETHANY	HARRISON	0.778	0.389	BIG CREEK	P	444	BIG CR.	P
MO0034240	GLASGOW WWTF	GLASGOW	HOWARD	0.18	0.148	HURRICANE CREEK	C			
MO0035009	SIKESTON WWTF	SIKESTON	SCOTT	5	2.2	ST. JOHN'S DITCH	P	3138	ST. JOHNS DITCH	P
MO0036218	WOOD HEIGHTS WWTP	WOODS HEIGHTS	RAY	0.15	0.04	WOOD BR/E FK FISHING	U	386	E. FK. FISHING R.	C
MO0036242	MEXICO WWTP	MEXICO	AUDRAIN	3	2.6	S FK SALT R	C	142	S. FK. SALT R.	C
MO0039624	CHAMOIS MUNICIPAL WWTF	CHAMOIS	OSAGE	0.0546	0.0424	MISSOURI RIVER	P			
MO0039691	LANCASTER WWTF	LANCASTER	SCHUYLER	0.157		N FK MIDDLE FABIUS R	U			
MO0039748	TRENTON MUNIC UTIL WWTF	TRENTON	GRUNDY	1.9	1.4	MUDDY CR	P	557	MUDDY CR.	P
MO0039764	URICH WWTF	URICH	HENRY	0.06	0.05	TRIB SOUTH GRAND R	U			
MO0039900	PARMA WWTF	PARMA	NEW MADRID	0.174	0.04	TRIB L RIV DITCH #8	U			
MO0040134	FRANKFORD WWTF	FRANKFORD	PIKE	0.062	0.013	TRIB TO PENO CR.	U	99	PENO CR.	C
MO0040142	PEVELY WWTP	PEVELY	JEFFERSON	1.2	0.72	TRIB SANDY CR	U	1720	SANDY CR.	C
MO0040738	BOONVILLE WWTP	BOONVILLE	COOPER	1.5	1.07	MISSOURI R	P			
MO0040819	HUNTSVILLE NW WWTF	HUNTSVILLE	RANDOLPH	0.132	0.053	TRIB E FK CHARITON R	U	682	E. FK. CHARITON R.	P
MO0040827	HUNTSVILLE NE WWTF	HUNTSVILLE	RANDOLPH	0.026	0.012	TRIB SUGAR CR	U	686	SUGAR CR.	P
MO0040860	WEAUBLEAU WWTF	WEAUBLEAU	HICKORY	0.09	0.037	TRIB S FK WEAUBLEAU	U	1240	S. FK. WEAUBLEAU CR.	C
MO0040886	OAK GROVE N WWTF	OAK GROVE	JACKSON	0.2	0.2	HORSESHOE/SNI-A-BAR	U	3413	HORSESHOE CR.	C
MO0041050	WELLSVILLE SW LAGOON	WELLSVILLE	MONTGOMERY	0.118	0.105	COAL BRANCH	U			
MO0041068	OWENSVILLE WWTF	OWENSVILLE	GASCONADE	0.41	0.288	TRIB OF RED OAK CR.	U	3361	TRIB. TO RED OAK CR3	C
MO0041106	MAYSVILLE LAGOONS	MAYSVILLE	DE KALB	0.16	0.125	W FK LOST CR	C			
MO0041114	MEADVILLE STF	MEADVILLE	LINN	0.064	0.035	PARSONS CR	P	614	PARSON CR.	P
MO0041149	MILLER WWTF	MILLER	LAWRENCE	0.075	0.075	STAHL CR	P			
MO0041165	WELLINGTON WWTF	WELLINGTON	LAFAYETTE	0.092	0.02	MCCLULLAN BR/SNIABAR	U	402	E. FK. SNI-A-BAR CR.	P

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MO0041190	BARNARD LAGOON	BARNARD	NODAWAY	0.026	0.008	TRIB 102 RIVER	P			
MO0042111	MOUNTAIN GROVE W WWTF	MOUNTAIN GROVE	WRIGHT	0.65	0.462	WHETSTONE/BUTTERMILK	U	1505	WHETSTONE CR.	C
MO0043231	STANBERRY WWTF	STANBERRY	GENTRY	0.225	0.18	TRIB WILDCAT CR	U	480	WILDCAT CR.	P
MO0043583	MOUND CITY LAGOON	MOUND CITY	HOLT	0.14	0.09	TRIB DAVIS CR	C	254	TRIB. TO DAVIS CR.	C
MO0043648	POPLAR BLUFF WWTP	POPLAR BLUFF	BUTLER	2.9		MAIN DITCH	C	2814	MAIN DITCH	C
MO0044113	MARTHASVILLE	MARTHASVILLE	WARREN	0.12	0.098	TRIB TUQUE CR	U			
MO0044172	LAMAR WWTF	LAMAR	BARTON	0.9	0.5	NORTH FK OF SPRING R	C	3188	N. FK. SPRING R.	C
MO0045811	BARING S WWTF	BARING	KNOX	0.016	0.013	TRIB BRIDGE CR	U	70	BRIDGE CR.	C
MO0045837	LIBERAL WWTF	LIBERAL	BARTON	0.1	0.07	BITTER CR	U	1320	E. FK. DRYWOOD CR.	C
MO0046078	ROCKPORT WWTF	ROCKPORT	ATCHISON	0.21	0.29	ROCK CR	C	237	ROCK CR.	C
MO0046990	BRASHEAR WWTF	BRASHEAR	ADAIR	0.053	0.075	TRIB HOG BR.	U			
MO0047040	STOVER NW LAGOON	STOVER	MORGAN	0.073	0.031	GABRIEL CR	C	883	GABRIEL CR.	C
MO0047058	STOVER SW LAGOON	STOVER	MORGAN	0.12	0.031	GABRIEL CR.	C	883	GABRIEL CR.	C
MO0047317	WINDSOR SE LAGOON	WINDSOR	PETTIS	0.1284	0.097	ELM CREEK	C			
MO0047325	WINDSOR SW LAGOON	WINDSOR	HENRY	0.2556	0.201	E FK TEBO CR.	C			
MO0047341	PIEDMONT WWTF	PIEDMONT	WAYNE	1	0.7	MCKENZIE CR	P			
MO0048054	BERNIE WWTF	BERNIE	STODDARD	0.35	0.26	STODDARD CO DITCH 37	C	3105	LAT #2 MAIN DITCH	P
MO0048151	MILAN WWTP	MILAN	SULLIVAN	1	0.59	E FK LOCUST CR.	P	608	E. FK. LOCUST CR.	P
MO0048178	LILBOURN WWTF	LILBOURN	NEW MADRID	0.21	0.075	TRIB OLD CHANNEL L R	U	3041	OLD CHAN. LITTLE R.	P
MO0048194	BURLINGTON JUNCTION WWTF	BURLINGTON JUNC	NODAWAY	0.076	0.04	NODAWAY RIVER	C			
MO0048208	ARCHIE WWT LAGOON	ARCHIE	CASS	0.13	0.055	EIGHT MILE CR	U	1249	S. GRAND R.	P
MO0048305	KC, ROCKY BRANCH STP	KANSAS CITY	CLAY	0.75	0.9	ROCKY BR CR	C			
MO0048313	KC, FISHING RIVER WWTP	KANSAS CITY	CLAY	1	0.215	FISHING RIVER	C	394	FISHING R.	C
MO0048640	KEYTESVILLE WWTF	KEYTESVILLE	CHARITON	0.063	0.05	MUSSEL FORK	P	670	MUSSEL FORK CR.	P
MO0048666	SENATH LAGOON	SENATH	DUNKLIN	0.256	0.218	POLE CAT SLOUGH	P	3120	DITCH TO BUFFALO DCH	P
MO0048712	KNOB NOSTER WWTF	KNOB NOSTER	JOHNSON	0.5	0.28	TRIB CLEAR FORK	U	935	CLEAR FK.	P
MO0049620	TRACY WWTP	TRACY	PLATTE	0.008	0.008	TRIB PLATTE R	U			
MO0050601	FAIRFAX LAGOON	FAIRFAX	ATCHISON	0.11	0.077	TRIB TARKIO RIVER	P	242	TARKIO R.	P
MO0050652	ROLLA SE WWTP	ROLLA	PHELPS	2.64	2	BURGHER BRANCH	C	1865	BURGHER BR.	C
MO0050687	ARCADIA W WWTF	ARCADIA	IRON	0.055	0.045	STOUTS CREEK	P	2893	STOUTS CR.2	P
MO0051144	PERRYVILLE SE WWTF	PERRYVILLE	PERRY	1.8	1	CINQUE HOMMES CR	C	1781	CINQUE HOMMES CR.	P
MO0051551	LINN WWTF	LINN	OSAGE	0.16	0.13	LINN CREEK	C	833	LINN CR.	C

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0051608	TARKIO WWTF	TARKIO	ATCHISON	0.28	0.2	TARKIO RIVER	P			
MO0051616	BROWNING WWTF	BROWNING	LINN	0.05	0.007	LOCUST CR	P	606	LOCUST CR.	P
MO0052132	WARDELL WASTEWATER LAGOON	WARDELL	PEMISCOT	0.08	0.06	DITCH NO. 66	C	3037	OLD CHAN. LITTLE R.	C
MO0052141	DELTA MUNICIPAL WWTF	DELTA	CAPE GIRARDEAU	0.08	0.06	WHITEWATER R.	P	3060	WHITEWATER R.	C
MO0052159	STE GENEVIEVE STF	STE. GENEVIEVE	STE. GENEVIEVE	0.7	0.45	S GABOURI CR	U	1707	MISSISSIPPI R.	P
MO0052663	CLARKTON WWTF	CLARKTON	DUNKLIN	0.2	0.2	DITCH NO.1	P	3107	E. DITCH #1	P
MO0053457	WAYLAND WWTF	WAYLAND	CLARK	0.05		TRIB FOX R	U			
MO0054089	HUGHESVILLE LAGOON	HUGHESVILLE	PETTIS	0.03	0.014	HESS CR.	U	849	HEATHS CR.	C
MO0054518	SWEET SPRINGS WWTF	SWEET SPRINGS	SALINE	0.271	0.115	TRIB TO DAVIS CR.	U			
MO0054569	UNIONVILLE N WWTF	UNIONVILLE	PUTNAM	0.11	0.108	TRIB N BLACKBIRD CR.	U	654	N. BLACKBIRD CR.	C
MO0054593	WARRENSBURG N LAGOON	WARRENSBURG	JOHNSON	0.366	0.272	BLACKWATER R	P			
MO0054691	ELSBERRY WWTF	ELSBERRY	LINCOLN	0.236	0.198	LOST CR.	U	28	OLD KINGS LAKE SL.	C
MO0054704	SHELBYVILLE WWTF	SHELBYVILLE	SHELBY	0.074	0.065	TRIB TO BLACK CR.	U	111	BLACK CR.	P
MO0054755	HOPKINS WWTF	HOPKINS	NODAWAY	0.063	0.06	MIDDLE FK TO 102 R	P	342	102 R.	P
MO0055123	HORNERSVILLE LAGOON	HORNERSVILLE	DUNKLIN	0.081	0.07	LITTLE R. DITCH #81	P	3102	DITCH #81	P
MO0055158	PUXICO WWTF	PUXICO	STODDARD	0.0131	0.134	TURKEY CREEK	C			
MO0055182	BENTON WWTP	BENTON	SCOTT	0.12	0.1	TRIB CANEY CR	U	3051	CANEY CR.	C
MO0055204	SMITHVILLE WWTF	SMITHVILLE	CLAY	0.75	0.4	LITTLE PLATTE RIVER	P			
MO0055280	STOCKTON WWTP	STOCKTON	CEDAR	0.26	0.22	STOCKTON BRANCH	C	1361	STOCKTON BR.	C
MO0055387	MIDDLETOWN CITY LAGOON	MIDDLETOWN	MONTGOMERY	0.032	0.005	COON CR.	C	187	COON CR.	C
MO0055425	LAKE LOTAWANA LAGOON	LAKE LOTAWANA	JACKSON	0.287	0.1	W FK SNI-A-BAR CR	P			
MO0055824	CARDWELL WWTF	CARDWELL	DUNKLIN	0.1	0.096	TRIB KENNEMORE SLOUG	C	3122	KINNEMORE DITCH	C
MO0055905	WARRENSBURG W WWTP	WARRENSBURG	JOHNSON	0.91	0.89	POSTOAK CREEK	P	928	POSTOAK CR.	P
MO0055981	BUNCETON WWTF	BUNCETON	COOPER	0.048	0.03	TRIB STEPHENS CR	U			
MO0056057	MERCER WWTF	MERCER	MERCER	0.048	0.027	TRIB MUDDY CR	U			
MO0056545	HOMESTEAD VILLAGE WWTP	EXCELSIOR SPRIN	RAY	0.02	0.02	TRIB E FK FISHING R.	U	386	E. FK. FISHING R.	C
MO0056626	COLE CAMP WWTF	COLE CAMP	BENTON	0.145	0.085	COLE CAMP CREEK	C	3303	COLE CAMP CR.	C
MO0056642	BARING N WWTF	BARING	KNOX	0.01	0.013	TRIB BRIDGE CR	U	70	BRIDGE CR.	C
MO0057410	JAMESTOWN N LAGOON	JAMESTOWN	MONITEAU	0.0172	0.0151	TRIB FACTORY CR	U	804	FACTORY CR.	C
MO0057673	HAYTI AERATED WWT LAGOON	HAYTI	PEMISCOT	0.57	0.43	LATERAL #22	U	3031	MAIN DITCH #8	P
MO0057908	HOLDEN WWTF	HOLDEN	JOHNSON	0.25	0.17	PIN OAK CREEK	U	926	PIN OAK CR.	C
MO0058203	JAMESTOWN S LAGOON	JAMESTOWN	MONITEAU	0.022	0.019	TRIB HALDIMAN CR	U	807	HALDIMAN BR.	C

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MO0058351	ST CHARLES MISSOURI RIVER	ST. CHARLES	ST. CHARLES	5	3.4	MISSOURI R	P	1604	MISSOURI R.	P
MO0058629	PLEASANT HILL WWTF	PLEASANT HILL	CASS	0.73	0.425	BIG CR.	P			
MO0080594	BELL CITY WWTF	BELL CITY	STODDARD	0.05	0.05	TR DRAIN DITCH #24	U			
MO0080667	ARCADIA E LAGOON	ARCADIA	IRON	0.012	0.02	TRIB STOUTS CR	U	2893	STOUTS CR.2	P
MO0084158	MONTGOMERY CITY E WWTP	MONTGOMERY CITY	MONTGOMERY	0.35	0.275	ELKHORN CR	C	189	ELKHORN CR.	C
MO0087122	CALHOUN WW LAGOON	CALHOUN	HENRY	0.05	0.035	MIDDLE FK TEBO CR.	C			
MO0088676	WINFIELD MUNICIPAL LAGOON	WINFIELD	LINCOLN	0.196	0.082	MCLEAN CR	C	31	MCLEAN CR.	C
MO0089036	ALBA WWTP	ALBA	JASPER	0.1	0.05	TRIB BUCK BR	U			
MO0089109	NEVADA WWTF	NEVADA	VERNON	1.75	1	LITTLE DRYWOOD CR	P	1325	L. DRYWOOD CR.	P
MO0089273	ESSEX WWTF	ESSEX	STODDARD	0.065	0.058	DITCH #6	C			
MO0089681	INDEPENDENCE,ROCK CR WWTF	INDEPENDENCE	JACKSON	10	8.2	ROCK CR	U	417	BLUE R.3	P
MO0090832	OREGON WWTF	OREGON	HOLT	0.1	0.075	MILL CR	U	265	MILL CR.	P
MO0091367	ROSEBUD NORTH LAGOON	ROSEBUD	GASCONADE	0.003	0.001	TRIB BOEUF CR	U			
MO0091375	ROSEBUD SOUTH LAGOON	ROSEBUD	GASCONADE	0.038	0.028	TRIB SOAP/REDBUD CR	U			
MO0091642	GREENTOP WWTF	KIRKSVILLE	ADAIR	0.075	0.075	TRIB N FK SALT R	U	113	N. FK. SALT R.	C
MO0092321	HOWARDVILLE WW LAGOON	HOWARDVILLE	NEW MADRID	0.07	0.063	TR LITTLE R. LATERAL	U	3041	OLD CHAN. LITTLE R.	P
MO0092827	FISK WWTF	FISK	BUTLER	0.091	0.04	MENORKENUT SLOUGH	U			
MO0092932	LACLEDE WWTF	LACLEDE	LINN	0.055	0.044	TRIB TURKEY CR	U	605	TURKEY CR.	C
MO0093076	PILOT GROVE E WWTF	PILOT GROVE	COOPER	0.06	0.049	TRIB PETITE SALINE C	U			
MO0093165	ATLANTA WWTP	ATLANTA	MACON	0.05	0.03	TRIB LONG BR CR	U	696	LONG BRANCH CR.	C
MO0093491	LINNEUS WWTF	LINNEUS	LINN	0.058	0.03	TRIB MUDDY CR	U	607	MUDDY CR.	C
MO0093564	ST JAMES STP	ST. JAMES	PHELPS	0.658	0.385	ROBINSON CREEK	U	3558	ROBINSON CR.	P
MO0093599	WENTZVILLE WATER RECLAMAT	WENTZVILLE	ST. CHARLES	4.1	1.6	MCCOY CR	C			
MO0093891	BRECKENRIDGE WW LAGOON	BRECKENRIDGE	CALDWELL	0.08	0.04	TRIB PANTHER BR	U			
MO0094137	REEDS SPRING WWTP	REEDS SPRING	STONE	0.18	0.075	RAILEY CR	U	2349	RAILEY CR.	C
MO0094188	TIPTON WWTF	TIPTON	MONITEAU	0.735	0.543	WILLOW FORK BR	C			
MO0094307	GRAHAM WWTF	GRAHAM	NODAWAY	0.025	0.016	ELKHORN CR	C	287	ELKHORN CR.	C
MO0094366	ELMO WWTF	ELMO	NODAWAY	0.023		MILL CR	P	301	MILL CR.	P
MO0094404	MALTA BEND WWTF	MALTA BEND	SALINE	0.05	0.045	SALT FORK	C	899	SALT FK.	C
MO0094692	LAREDO WWTF	LAREDO	GRUNDY	0.045	0.019	TRIB MEDICINE CR.	U			
MO0094714	MENDON WWTF	MENDON	CHARITON	0.033	0.025	HICKORY BRANCH	C			
MO0094846	JEFFERSON CITY WPC PLANT	JEFFERSON CITY	CALLAWAY	7.1	8	MISSOURI R	P	701	MISSOURI R.	P

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MO0094854	BUFFALO WWTP	BUFFALO	DALLAS	0.59	0.462	L LINDLEY CR	U	1438	L. LINDLEY CR.	C
MO0094919	CUBA WWTF	CUBA	CRAWFORD	0.92	0.8	PLEASANT VALLEY CR.	C			
MO0094927	VERSAILLES WWTP	VERSAILLES	MORGAN	0.55	0.3	STRAIGHT FK MOREAU R	C	959	STRAIGHT FK.	C
MO0094935	QULIN WWTF	QULIN	BUTLER	0.1	0.045	CACHE R DITCH	C	3009	CACHE R. DITCH	C
MO0094943	CROCKER WWTP	CROCKER	PULASKI	0.2	0.15	TRIB TAVERN CREEK	U	1068	TAVERN CR.	C
MO0095176	URBANA WWTF	URBANA	DALLAS	0.045	0.035	E BR CAHOOCHIE CR	U			
MO0095214	BEVIER WWTF	BEVIER	MACON	0.104	0.031	TRIB MID.FK.CHARITON	U	698	M. FK. CHARITON R.	C
MO0095222	ROCHEPORT WWTF	ROCHEPORT	BOONE	0.03	0.012	MONITEAU CR.	P			
MO0095567	STEELVILLE WWTF	STEELVILLE	CRAWFORD	0.33	0.19	WHITTENBURG CR.	P			
MO0095729	GALT WWTF	GALT	GRUNDY	0.04	0.021	WEST FK MEDICINE CR.	P	623	W. FK. MEDICINE CR.	P
MO0096202	UNION STAR SEW WW LAGOON	UNION STAR	DE KALB	0.07	0.032	THIRD FK PLATTE R.	C	327	THIRD FK. PLATTE R.	C
MO0096229	BUTLER WWTP	BUTLER	BATES	0.7	0.6	MOUND BR	C	1300	MOUND BR.	C
MO0096318	CARROLLTON WWTP	CARROLLTON	CARROLL	3.3	1.5	WAKENDA CR	U	360	WAKENDA CR.	P
MO0097110	BLOOMSDALE WPC PLANT	BLOOMSDALE	STE. GENEVIEVE	0.07	0.025	FOURCH A DUCLOS CR	P			
MO0098094	BUCKNER WWTF	BUCKNER	JACKSON	0.5	0.4	FIRE PRAIRIE/WETLAND	U	3412	FIRE PRAIRIE CR.	P
MO0099155	PIERCE CITY WWTF	PIERCE CITY	LAWRENCE	0.2	0.2	CLEAR CR	P			
MO0099171	EDINA WWTF	EDINA	KNOX	0.22	0.17	N FK S FABIUS R.	C			
MO0099279	NAYLOR MUNICIPAL WWTF	NAYLOR	RIPLEY	0.075	0.045	DITCH NO 2	C			
MO0099287	GOWER WWTP	GOWER	CLINTON	0.3	0.139	JENKINS BR	U			
MO0099431	POTOSI WWTP #1	POTOSI	WASHINGTON	0.683	0.5	BRUSHY HOLLOW BR	P	2106	BRUSHY HOLLOW BR.	P
MO0099457	PALMYRA WWTF	PALMYRA	MARION	0.5	0.319	NORTH RIVER	P			
MO0099732	POTOSI WWTF #2	POTOSI	WASHINGTON	0.21	0.13	MILL CR	C			
MO0099961	EAST LYNNE WW STAB LAGOON	EAST LYNNE	CASS	0.038	0.012	TRIB CAMP BR CR	U	1258	CAMP BR.	C
MO0100030	MALDEN WWTP W	MALDEN	DUNKLIN	0.85	0.4	DITCH NO. 14	C	3113	LATERAL DITCH #2	C
MO0100111	BERTRAND WWTF	BERTRAND	MISSISSIPPI	0.1	0.049	ASH CR/ST JOHNS DITC	U	3142	ASH DITCH	C
MO0100129	DIXON WWTP	DIXON	PULASKI	0.3624	0.25	TRIB TO MARIES RIVER	U	1088	MARIES R.	C
MO0100234	PARIS WWTF	PARIS	MONROE	0.2	0.15	MIDDLE FK SALT R	P	121	M. FK. SALT R.	P
MO0100676	ELDON WWTP	ELDON	MILLER	1	0.6	TRIB BLYTHE'S CR	U			
MO0100731	ST MARY SEWAGE TREAT FAC	ST. MARYS	STE. GENEVIEVE	0.098	0.043	ST LAURENTS CR	U	1749	OLD R.(SLOUGH MISS.)	P
MO0100803	CLEARMONT LAGOON	CLEARMONT	NODAWAY	0.037	0.014	CLEAR CR.	C	292	CLEAR CR.	C
MO0101346	ARBYRD WWTF	ARBYRD	DUNKLIN	0.079	0.068	TR HONEY CYPRESS DIT	U	3121	HONEY CYPRESS DITCH	P
MO0101567	SEDALIA SE WWTP	SEDALIA	PETTIS	6.5	1.4	BREAKFAST BRANCH CR	U	864	FLAT CR.	P

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MO0102032	NOVELTY WWTF	NOVELTY	KNOX	0.026	0.008	NORTH R.	U	83	NORTH R.	C
MO0102181	DUDLEY WWTF	DUDLEY	STODDARD	0.04	0.03	LICK CR DITCH	P	2980	LICK CR. DITCH	C
MO0103331	FULTON WWTP	FULTON	CALLAWAY	2.93	1.6	STINSON CREEK	C	710	STINSON CR.	C
MO0103349	JOPLIN, TURKEY CREEK WWTP	JOPLIN	JASPER	15	9.3	TRUKEY CR	P	3216	TURKEY CR.	P
MO0103594	SCOTT CITY WWTF	SCOTT CITY	SCOTT	0.78	0.088	DORRITY CR	U	1707	MISSISSIPPI R.	P
MO0103748	ROCKVILLE WWTP	ROCKVILLE	BATES	0.025	0.018	TRIB PANTHER CR	U			
MO0103764	BELLFLOWER WWTF	BELLFLOWER	MONTGOMERY	0.06	0.03	E BR BRUSH CR.	U	192	BRUSH CR.	C
MO0104299	CAMERON WWTF	CAMERON	DE KALB	1.6	1	TRIB BRUSH CR	U	531	BRUSHY CR.	C
MO0104809	HARRISBURG WWTF	HARRISBURG	BOONE	0.024	0.019	TRIB TO PERCHE CR.	U	1023	PERCHE CR.	C
MO0104914	CONCEPTION JUNCTION STF	CONCEPTION JUNC	NODAWAY	0.035	0.015	TRIB PLATTE R	U	312	PLATTE R.	P
MO0104990	HALLSVILLE LAND APP SYS	HALLSVILLE	BOONE	0.203	0.120	TRIB KELLEY BR	U			
MO0105627	NEELYVILLE WWTF	NEELYVILLE	BUTLER	0.08	0.022	BIG CANE CREEK	P	2833	CANE CR.	C
MO0106259	OAK GROVE S WWTP	BATES CITY	LAFAYETTE	0.497	0.442	HORSESHOE CR.	C			
MO0106275	MOKANE WWTF	MOKANE	CALLAWAY	0.077	0.03	COLLIER CR	U	721	COLLIER CR.	C
MO0106585	HERMANN WWTF	HERMANN	GASCONADE	0.35	0.25	MISSOURI R	P	1604	MISSOURI R.	P
MO0106844	ASHLAND LAGOONS	ASHLAND	BOONE	0.29	0.21	TRIB FOSTER BR	U	747	FOWLER CR.	C
MO0107883	KEARNEY SBR WWTF	KEARNEY	CLAY	1.125	0.5	FISHING RIVER	C	383	FISHING R.	P
MO0108081	LA MONTE SE LAGOON	LA MONTE	PETTIS	0.11	0.1	TRIB MUDDY CR	U	3499	TRIB. TO MUDDY CR.5	C
MO0108880	STEWARTSVILLE WW LAGOON	PLATTSBURG	CLINTON	0.104	0.066	CASTILE CR	C			
MO0109002	HOLT WASTEWATER LAGOON	HOLT	CLAY	0.071	0.047	MUDDY FORK CR	C	391	MUDDY FK.	C
MO0109240	DOWNING WWTF	DOWNING	SCHUYLER	0.055		TRIB N FABIUS R	U	56	N. FABIUS R.	P
MO0110001	BETHEL WWTF	BETHEL	SHELBY	0.015	0.018	NORTH RIVER	P			
MO0111023	SELIGMAN WWTF	SELIGMAN	BARRY	0.15	0.05	SELIGMAN HOLLOW	U	3451	MILL CR.	C
MO0111236	EDGERTON WWTF	EDGERTON	PLATTE	0.074	0.05	TRIB PLATTE R	U	312	PLATTE R.	P
MO0111848	HIGGINSVILLE I-70 S LAG	HIGGINSVILLE	LAFAYETTE	0.01	0.005	DAVIS CREEK	P	907	DAVIS CR.	P
MO0112470	EOLIA WWTF	EOLIA	PIKE	0.039	0.02	BRUSHY CREEK	U			
MO0112623	ADRIAN WWTF	ADRIAN	BATES	0.27	0.07	S FORK BIG DEER CR	U	1276	BIG DEER CR.	C
MO0112631	FAIRVIEW WWTF	FAIRVIEW	NEWTON	0.029	0.02	MIDDLE INDIAN CR	C	3263	MIDDLE INDIAN CR.	P
MO0113026	SPICKARD WWTF	SPICKARD	GRUNDY	0.04	0.03	TRIB WELDON R.	U	560	WELDON R.	P
MO0113085	PARKVILLE SBR WWTP	PARKVILLE	PLATTE	0.749	0.437	RUSH CREEK	C	278	RUSH CR.	P
MO0113395	FCPWSD #3, ST ALBANS WWTP	ST. ALBANS	FRANKLIN	0.268		FIDDLE CR/LABADIE CR	C	1698	FIDDLE CR.	C
MO0113514	FAIR PLAY WWTF	FAIR PLAY	POLK	0.086	0.066	BEAR CREEK	P			

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MO0113751	TRIMBLE WWTF	TRIMBLE	CLINTON	0.09	0.044	TRIB DICKS CR	U			
MO0113808	FOREST CITY WWTF	FOREST CITY	HOLT	0.05	0.016	HOWLEY BRANCH	U	263	KIMSEY CR.	C
MO0113883	LIBERTY, UPPER RUSH CK WW	LIBERTY	CLAY	0.476		TRIB RUSH CR	U			
MO0114421	CALLAO WWTF	CALLAO	MACON	0.035	0.002	TRIB M FK CHARITON R	U			
MO0114740	ASBURY WWTF	ASBURY	JASPER	0.018	0.018	TRIB SPRING RIVER	U	3160	SPRING R.	P
MO0114928	ANNISTON WWTF	ANNISTON	MISSISSIPPI	0.127	0.032	TRIB SPILLWAY DITCH	U	3135	STEVENSON BAYOU	C
MO0115118	KELSO WWTF	KELSO	SCOTT	0.075	0.051	TRIB RAMSEY CR	P			
MO0116009	HERMANN IND TRACT LAGOON	HERMANN	GASCONADE	0.46	0.002	MISSOURI RIVER	P	1604	MISSOURI R.	P
MO0116076	LEETON WWTF	LEETON	JOHNSON	0.087	0.03	TRIB WADE CR	U	1291	WADES CR.	C
MO0116114	FORISTELL INTERIM STP	FORISTELL	ST. CHARLES	0.022	0.016	TRIB PERUQUE CR	U	218	PERUQUE CR.	C
MO0117013	RHINELAND WWTP	RHINELAND	MONTGOMERY	0.02	0.017	MODOC CR	U			
MO0117161	CLARKSDALE WWTF	CLARKSDALE	DE KALB	0.039		TRIB PLATTE RIVER	C	328	L THIRD FK PLATTE R.	C
MO0117412	BELTON WWTF	BELTON	CASS	2.26	0.91	EAST CR	C			
MO0117722	FILLMORE WWTF	FILLMORE	ANDREW	0.0362	0.015	TRIB NODAWAY RIVER	U			
MO0117862	COFFEY WWTF	COFFEY	DAVIESS	0.018		TRIB CYPRESS CR	U	443	CYPRESS CR.	C
MO0117871	NEWTOWN WWTF	NEWTOWN	SULLIVAN	0.025	0.021	TRIB E FK MEDICINE C	U	619	E. FK. MEDICINE CR.	P
MO0117960	MOBERLY EAST WWTP	MOBERLY	RANDOLPH	2.5	1.92	BR COON CR	C	133	TRIB. TO COON CR.	C
MO0118010	JAMESON WWTF	JAMESON	DAVIESS	0.022		TRIB BIG MUDDY CR	U	441	BIG MUDDY CR.	C
MO0118192	TRUXTON LAGOON	TRUXTON	LINCOLN	0.012	0.006	TRIB BEAR CR	U	193	BEAR CR.	C
MO0118320	EVERTON STP	EVERTON	DADE	0.048	0.02	SINKING CR	P			
MO0119016	MORRISON WWTP	MORRISON	GASCONADE	0.015	0.012	BAILEY'S CR	P	842	BAILEYS CR.	P
MO0119172	ROCKPORT I-29 WWTP	ROCKPORT	ATCHISON	0.073	0.032	OLD CH NISHNABOTNA R	P	238	OLD CH NISHNABOTNA R	P
MO0119750	HUMPHREYS WWTF,VILLAGE OF	HUMPHREYS	SULLIVAN	0.013		TRIB E FK MEDICINE C	U	619	E. FK. MEDICINE CR.	P
MO0119890	FIDDLESTICKS (NEW MELLE)	NEW MELLE	ST. CHARLES	0.056	0.007	DARDENNE CR	U	222	DARDENNE CR.	C
MO0120227	LINCOLN WWTP	LINCOLN	BENTON	0.2	0.102	TRIB LITTLE TEBO CR	U	1205	L. TEBO CR.	C
MO0120405	KINGSTON WWTF	KINGSTON	CALDWELL	0.031	0.025	SHOAL CR	C	528	SHOAL CR.	C
MO0121363	AUGUSTA WWTP	AUGUSTA	ST. CHARLES	0.06		MISSOURI R	U			
MO0121886	LINCOLN CO PWSD #1 WWTF	WINFIELD	LINCOLN	0.155	0.093	BOB'S CR	C	35	BOBS CR.	C
MO0122467	CAINSVILLE WWTF	CAINSVILLE	HARRISON	0.05		TRIB BRUSHY CR	U	549	THOMPSON R.	P
MO0122599	VANDUSER WWT LAGOON	VANDUSER	SCOTT	0.035	0.027	TRIB OLD CHANNEL L R	U	3041	OLD CHAN. LITTLE R.	P
MO0123081	BLYTHEDALE WWTF	BLYTHEDALE	HARRISON	0.022	0.022	TRIB E FK BIG CR	U			
MO0123579	LONE JACK WWTP	LONEJACK	JACKSON	0.105		TRIB SNI-A-BAR CR	U			

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MO0124281	STELLA WWTF	STELLA	NEWTON	0.034		SOUTH INDIAN CR	U			
MO0124931	CENTRAL RIVERS-WILMAR EST	LIBERTY	CLAY	0.029		TRIB ROCK CR	U	3323	ROCK CR.	C
MO0125091	AMSTERDAM WWTF	AMSTERDAM	BATES	0.028	0.023	TRIB MULBERRY CR	U	1305	MULBERRY CR.	C
MO0125211	PCWSD #2,GREENLEFE TREAT	ROLLA	PHELPS	0.024		TRIB DAILEY BR	U	1863	L. DRY FK.	P
MO0125369	WESTBORO WWTF	WESTBORO	ATCHISON	0.0261	0.018	TRIB MIDDLE TARKIO C	C			
MO0125539	FCPWSD #1, COBBLESTONE CR	KRAKOW	FRANKLIN	0.022		TRIB ST. JOHN'S CR	U	1678	ST. JOHNS CR.	P
MO0125598	MALDEN INDUSTRIAL PK LAG	MALDEN	DUNKLIN	0.4	0.2	TRIB DITCH O	U			
MO0125636	PARNELL LAGOONS	PARNELL	NODAWAY	0.025	0.01	TRIB GRANTHAM CR	U			
MO0126241	FCPWSD #1 KRAKOW AREA LAG	WASHINGTON	FRANKLIN	0.18	0.066	LONG BRANCH CREEK	U			
MO0126331	ARROW ROCK WWTF	ARROW ROCK	SALINE	0.022	0.009	TRIB MISSOURI R	U	701	MISSOURI R.	P
MO0126403	FCPWSD #3, EASTLAND OAKS	WASHINGTON	FRANKLIN	0.03		BROWN'S BR	C			
MO0126594	SCCPWSD #2, BOONE RIDGE E	WENTZVILLE	ST. CHARLES	0.024		TRIB PERUQUE CREEK	U	218	PERUQUE CR.	C
MO0126624	BCSD, BROOKFIELD ESTATES	COLUMBIA	BOONE	0.01		TRIB L BOONE FEMME C	P	1003	L. BONNE FEMME CR.	P
MO0126730	PCWSD#2, COLLEGE HILLS	ROLLA	PHELPS	0.025		TRIB FRANZ BRANCH	U	1863	L. DRY FK.	P
MO0126888	MONROE CO PWSD#2,RUSH HIL	RUSH HILL	AUDRAIN	0.015	0.0121	TRIB LITTLEBY CR	U	147	LITTLEBY CR.	C
MO0127124	MONTGOMERY CITY CLEAR CR	MONTGOMERY CITY	MONTGOMERY	0.3		CLEAR CR	U	1631	CLEAR CR.2	C
MO0128767	AMORET WWT LAGOON	AMORET	BATES	0.03		TRIB HOG BR	U			
MO0001082	AMERENUE, TAUM SAUK PP	ANNAPOLIS	REYNOLDS	0.001		E FK BLACK R.	P	2737	E. FK. BLACK R.	P
MO0082996	KCPL, IATAN GENERATING ST	WESTON	PLATTE	0.005	0.004	MISSOURI RIVER	P	226	MISSOURI R.	P
MO0092894	UNITED ELECTRIC COOP INC	MARYVILLE	NODAWAY	0.001	0.001	TRIB 102 R	U			
MO0122556	USDA BUILDING WWTF	PARIS	MONROE	0.001	0.001	TRIB MIDDLE FK	U	121	M. FK. SALT R.	P
MO0031496	MDSS,W.E. SEARS YOUTH CTR	POPLAR BLUFF	BUTLER	0.017	0.014	TRIB GOOSE CR	U			
MO0044300	ALGOA REGIONAL WWTF	JEFFERSON CITY	COLE	0.8	0.275	RISING CR	P	828	RISING CR.	P
MO0097659	MDOC, CENTRAL MO CORRCNT	JEFFERSON CITY	COLE	0.26	0.18	WORKMAN CR.	U	823	WORKMAN CR.	P
MO0111279	DAKOTA BOYS RANCH	DUTZOW	WARREN	0.015		LAKE CREEK	U	1613	CHARRETTE CR.	P
MO0119369	MDOC, MARYVILLE TREATMENT	MARYVILLE	NODAWAY	0.066	0.066	ONE HUNDRED & TWO R	P	342	102 R.	P
MO0122092	SCHWEISSGUTH BROTHERS WWT	DUTZOW	WARREN	0.001		LAKE CREEK	U	1613	CHARRETTE CR.	P
MO0084255	MODOT, MINEOLA I-70 REST	MINEOLA	MONTGOMERY	0.009	0.001	TRIB LOUTRE R	U	1624	LOUTRE R.	P
MO0084263	MODOT, MINEOLA I-70 REST	MINEOLA	MONTGOMERY	0.009	0.001	TRIB LOUTRE R	U	1624	LOUTRE R.	P
MO0085804	MODOT, I-70 REST AREA	CONCORDIA	LAFAYETTE	0.037	0.001	TRIB DAVIS CR	U	907	DAVIS CR.	P
MO0085961	MODOT, I-44 REST AREA	MOUNT VERNON	LAWRENCE	0.02	0.004	TRIB JOHNSON CREEK	U			
MO0089311	MODOT,MOUND CTY REST AREA	MOUND CITY	HOLT	0.005	0.002	BLUFF POOL-SQUAW C R	U	253	DAVIS CR. DITCH	C

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0090581	MODOT, I-55 REST AREA	BLOOMSDALE	STE. GENEVIEVE	0.016	0.005	FOURCHE A DU CLOS CR	U			
MO0091103	MODOT, I-55 REST AREA	STEELE	PEMISCOT	0.005	0.001	ROADSIDE/MAIN DITCH	U			
MO0091111	MODOT, I-55 REST AREA NOR	STEELE	PEMISCOT	0.005	0.001	ROADSIDE/MAIN DITCH	U			
MO0094021	MODOT, I-55 REST AREA	FRUITLAND	CAPE GIRARDEAU	0.012	0.012	TRIB HORRELL CR	U			
MO0122122	MODOT, COFFEY REST AREA	COFFEY	DAVIESS	0.005	0.002	TRIB BIG CR	U	444	BIG CR.	P
MO0129453	MODOT, I-29 DEARBORN REST	CAMDEN POINT	PLATTE	0.0089	0.0068	TRIB OWL CR	U			
MO0103161	LOST VALLEY LAKE RESORTS	OWENSVILLE	GASCONADE	0.06		TRIB BIG BR	U	1661	BOEUF CR.	P
MO0123439	EAGLES NEST R.V. PARK	WARSAW	BENTON	0.002	0.001	TRUMAN RESERVOIR	U	7207	H.S TRUMAN LAKE	L2
MO0004286	ALCAN CABLE	SEDALIA	PETTIS	0.005	0.0017	TRIB MUDDY CR	U	855	MUDDY CR.	C
MO0100404	MINGO JOB CORPS STP	PUXICO	STODDARD	0.03	0.016	TURKEY CR.	C			
MO0111899	RCSD, SUBURBAN AUTO AUCTN	IMPERIAL	JEFFERSON	0.001		TRIB TO ROCK CR	U			
MO0109827	EMERY TRUCK PLAZA WWTF	DEERFIELD	VERNON	0.004	0.001	DRYWOOD CREEK	U	1314	DRYWOOD CR.	P
MO0114049	MIKE'S TOTAL	COLUMBIA	BOONE	0.001	0.001	TRIB KELLEY BR	U			
MO0115932	I-70 TEXACO	BOONVILLE	COOPER	0.001	0.001	TRIB PETITE SALINE C	U	785	PETITE SALINE CR.	P
MO0119733	JEFFERSON BARRACKS MARINE	ST. LOUIS	ST. LOUIS	0.001	0.001	MISSISSIPPI R	P	1707	MISSISSIPPI R.	P
MO0129402	TEMP-STOP #103/PIT STOP	SEDALIA	PETTIS	1.5	1.5	TRIB FLAT CR	U			
MO0049379	RCSD, RHONDA SUE ACRES	IMPERIAL	JEFFERSON	0.016		TRIB TO ROCK CR.	U			
MO0057991	NW LEWISTOWN SEWER ASSOCI	LEWISTOWN	LEWIS	0.017	0.008	TRIB MIDDLE FABIUS R	U	63	MIDDLE FABIUS R.	P
MO0084484	CASTLEREAGH ESTATES SUBD	FLORISSANT	ST. LOUIS	0.027		MILL CR.	U	1604	MISSOURI R.	P
MO0087858	LEWISTOWN NE SEWER WWTF	LEWISTOWN	LEWIS	0.02	0.008	MIDDLE FABIUS R	U	63	MIDDLE FABIUS R.	P
MO0110884	TIMBER CREEK STP	PLATTE CITY	PLATTE	0.015	0.008	TRIB CLEAR BRANCH	U	312	PLATTE R.	P
MO0122653	TBJ SEWER SYSTEM, INC	VILLA RIDGE	FRANKLIN	0.023	0.009	TRIB BROWNS BR	U	1690	TRIB. TO BROWNS BR.	C
MO0025151	MSD, LEMAY WWTP	ST. LOUIS	ST. LOUIS	167	131	MISSISSIPPI R	P	1707	MISSISSIPPI R.	P
MO0034444	BCSD, LAKE OF THE WOODS	COLUMBIA	BOONE	0.065	0.056	N FK GRINDSTONE CR	U	1010	N.FK. GRINDSTONE CR.	C
MO0038792	BCSD, ROLLINGWOOD SUB P#1	COLUMBIA	BOONE	0.01	0.006	MIDWAY BRANCH	U			
MO0038806	BCSD,ROLLINGWOOD SUB PLT2	COLUMBIA	BOONE	0.021	0.018	TRIB SUGAR BRANCH	U	1029	SUGAR BR.	P
MO0047619	BCSD, BON-GOR LAKE EST	COLUMBIA	BOONE	0.056	0.02	TRIB ROCKY FORK	U	1014	ROCKY FK.	C
MO0049361	RCSD, ROCK CREEK ESTATES	IMPERIAL	JEFFERSON	0.022		TRIB TO ROCK CR.	P	1715	ROCK CR.	C
MO0049913	BCSD, SUN VALLEY ESTATES	COLUMBIA	BOONE	0.03	0.018	TRIB HINKSON CREEK	U			
MO0050148	BCSD, WALNUT BROOK NE	COLUMBIA	BOONE	0.005	0.004	TRIB L. BONNE FEMME	U	1003	L. BONNE FEMME CR.	P
MO0055395	BLAND WWTF	BLAND	GASCONADE	0.078	0.064	TRIB GREEDY CR	U	3357	GREEDY CR.	C
MO0056162	GLAIZE CRK SEW DIST	BARNHART	JEFFERSON	0.557		GLAIZE CR	P	1716	GLAIZE CR.	P

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0081302	ST CHARLES BOSCHERTWN LAG	ST. CHARLES	ST. CHARLES	0.3	0.366	MISSOURI R	P	1604	MISSOURI R.	P
MO0083500	BCSD SUGAR TREE HILL SUB	COLUMBIA	BOONE	0.018	0.007	PERCHE CR	U	1013	PERCHE CR.	P
MO0083526	BCSD, UNIVERSITY ESTATES	COLUMBIA	BOONE	0.004	0.002	TRIB L BONNE FEMME C	U	1003	L. BONNE FEMME CR.	P
MO0084433	RCSD, SPANISH MANOR MHP	IMPERIAL	JEFFERSON	0.012		TRIB TO ROCK CR.	U	1715	ROCK CR.	C
MO0084824	BCSD, OLD PLANK ROAD SUBD	COLUMBIA	BOONE	0.003	0.003	TR L. BONNE FEMME CR	U	1003	L. BONNE FEMME CR.	P
MO0084832	BCSD, LEISURE HILLS	COLUMBIA	BOONE	0.007	0.002	TRIB NELSON CR	U			
MO0085472	DCSD, TREATMENT PLANT #1	O'FALLON	ST. CHARLES	5	5	DUCKETT CR	U	1604	MISSOURI R.	P
MO0085944	BCSD, CLEARVIEW ACRES SUB	COLUMBIA	BOONE	0.228	0.1	ROCKY FORK CR	U	1014	ROCKY FK.	C
MO0085952	BCSD, SHARIDAN HILLS	COLUMBIA	BOONE	0.03	0.035	TRIB TO HINKSON CR	U	1008	HINKSON CR.	C
MO0086606	BCSD, GASLIGHT ACRES	COLUMBIA	BOONE	0.021	0.01	COW BRANCH	U	1015	BEAR CR.	C
MO0087173	BCSD, SOUTH ROUTE K WWTF	COLUMBIA	BOONE	0.104	0.09	L BONNE FEMME C	U			
MO0087629	RCSD, SECKMAN VALLEY WWTP	IMPERIAL	JEFFERSON	0.192	0.2	ROCK CR	P			
MO0088340	BCSD, WALNUT BROOK WWTP	COLUMBIA	BOONE	0.031	0.03	LITTLE BONNE FEMME C	U	1003	L. BONNE FEMME CR.	P
MO0088668	BCSD, HILLVIEW ACRES SUBD	COLUMBIA	BOONE	0.022	0.02	TRIB HINKSON CR	U	1008	HINKSON CR.	C
MO0091766	BCSD, EL REY HEIGHTS	COLUMBIA	BOONE	0.014	0.0107	TRIB NELSON CREEK	U			
MO0092002	BCSD, TRAILS WEST SUBD	COLUMBIA	BOONE	0.057	0.029	TRIB SUGAR BR	U			
MO0092886	BCSD, BOONE INDUSTRIAL PK	COLUMBIA	BOONE	0.005	0.005	TRIB COW BR	U			
MO0094293	BCSD, WAGON TRAIL HTS SUB	COLUMBIA	BOONE	0.003	0.003	CLAYS FK.	U	1014	ROCKY FK.	C
MO0095354	BCSD, SUNNYSLOPE SUBD	HALLSVILLE	BOONE	0.005	0.004	TRIB KELLEY BR	U			
MO0096938	BCSD, COUNTY DOWNES	COLUMBIA	BOONE	0.053	0.027	TRIB ROCKY FK CR	U	1014	ROCKY FK.	C
MO0097837	COLUMBIA REGIONAL WWTP	COLUMBIA	BOONE	17.7	14.5	EAGLE BLUFFS CONSERV	U	1007	HINKSON CR.	P
MO0098442	BCSD MEADOW VILLAGE	COLUMBIA	BOONE	0.006	0.004	LITTLE CEDAR CREEK	C	737	CEDAR CR.	C
MO0098981	GRAY SUMMIT SEWER DIST	GRAY SUMMIT	FRANKLIN	0.032	0.01	TRIB TO LABADIE CR.	U	1694	TRIB. TO LABADIE CR.	P
MO0099261	BCSD,RAYFIELD SUBDIVISION	COLUMBIA	BOONE	0.009	0.008	ROCKY FORK CREEK	C			
MO0100463	BCSD, SPRINGPARK SUBD	COLUMBIA	BOONE	0.003	0.003	TRIB PERCHE CR	U	1006	TRIB. TO PERCHE CR.	C
MO0100811	BCSD, PHENORA SUBD SOUTH	COLUMBIA	BOONE	0.007	0.014	TRIB ROCKY FK	U	1014	ROCKY FK.	C
MO0101087	LBVSD, ATHERTON PLANT	INDEPENDENCE	JACKSON	40	28.1	MISSOURI RIVER	P	356	MISSOURI R.	P
MO0101885	BCSD, TWIN LAKES SUBD	COLUMBIA	BOONE	0.019	0.0111	TRIB TO PERCHE CR.	U	1013	PERCHE CR.	P
MO0102113	BCSD, LEE HEIGHTS	COLUMBIA	BOONE	0.005	0.003	TRIB L CEDAR CR	U	744	L. CEDAR CR.	C
MO0105121	RCSD, OAK POINTE SUBD STP	IMPERIAL	JEFFERSON	0.034	0.03	BR OF CHESLEY ISLAND	U	1707	MISSISSIPPI R.	P
MO0106461	RCSD, KIMMSWICK WWTP	KIMMSWICK	JEFFERSON	0.5	0.33	MISSISSIPPI RIVER	P	1707	MISSISSIPPI R.	P
MO0106593	FCSD #1,EVERGREEN TERRACE	UNION	FRANKLIN	0.012	0.006	TRIB FENTON CR	U	2034	BOURBEUSE R.	P

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MO0108995	BCSD HARTSBURG WW SYSTEM	HARTSBURG	BOONE	0.014	0.007	TRIB SLATE CR	C	701	MISSOURI R.	P
MO0109908	FCPWSD #3,TARA PLACE SUBD	VILLA RIDGE	FRANKLIN	0.019	0.015	TRIB BROWNS BR	U	1689	BROWNS BR.	C
MO0110850	PCRSD, VALLEYBROOK WEST	PARKVILLE	PLATTE	0.007	0.006	TRIB BRUSH CREEK	U			
MO0111554	FCPWSD #3,PINE LK EST SUB	GRAY SUMMIT	FRANKLIN	0.016	0.012	TRIB LABADIE CR	U	1694	TRIB. TO LABADIE CR.	P
MO0112828	FCPWSD #1 EMERALD CITY	WASHINGTON	FRANKLIN	0.023	0.014	TRIB BUSCH CR	U	1685	BUSCH CR.	C
MO0114782	BCSD, LAKE CAPRI SUBD	COLUMBIA	BOONE	0.021	0.002	TRIB HINKSON CREEK	C	1008	HINKSON CR.	C
MO0114910	LABADIE SEWER DIST LAGOON	LABADIE	FRANKLIN	0.074	,020	LABADIE CR	P	1693	LABADIE CR.	P
MO0114987	FCPWSD #3, CHARING CROSS	VILLA RIDGE	FRANKLIN	0.068	0.025	TRIB PIN OAK CR	U	2034	BOURBEUSE R.	P
MO0117773	BCSD, ARROWHEAD LAKE ESTS	COLUMBIA	BOONE	0.012	0.003	TRIB L BONNE FEMME	U	1003	L. BONNE FEMME CR.	P
MO0119393	PCRSD, ALAN ACRES WWTF	PARKVILLE	PLATTE	0.011		TRIB TODD CR	U	316	TODD CR.	C
MO0119474	PCRSD, BRUSH CREEK FAC	PARKVILLE	PLATTE	1	0.62	BRUSH CR	C	276	BRUSH CR.	C
MO0120529	DCSD, AUGUSTA SHORES	AUGUSTA	ST. CHARLES	0.06		TRIB MISSOURI R	U	1604	MISSOURI R.	P
MO0122441	PCRSD, MISTY SPRINGS WWTF	PARKVILLE	PLATTE	0.008		PRAIRIE CR	U	313	PRAIRIE CR.	C
MO0126691	FCPWSD #3, MING ESTATES	WASHINGTON	FRANKLIN	0.026		TRIB MISSOURI R	U	1604	MISSOURI R.	P
MO0103837	VIP INDUSTRIES	JACKSON	CAPE GIRARDEAU	0.001	0.001	HUBBLE CR.	U	2197	HUBBLE CR.	P
MO0043770	WINDMILL COMMERCIAL COMP	STANTON	FRANKLIN	0.024	0.003	TRIB TO LOLLAR BR.	U			
MO0085715	WALNUT BOWL FAC STORE #9	MILLERSBURG	CALLAWAY	0.001	0.001	TRIB CEDAR CR	U	737	CEDAR CR.	C
MO0087424	LAURIE SHOPPING CENTER	LAURIE	MORGAN	0.001		BRUSH CR.	U	1101	BRUSH CR.	C
MO0100536	BIG SHOT FIREWORKS LAND	STANTON	FRANKLIN	0.001	0.001	TRIB LOLLAR BR	U			
MO0108201	MILLERSBURG COUNTRY STORE	FULTON	CALLAWAY	0.002		TRIB CEDAR CR.	U	737	CEDAR CR.	C
MO0113158	J & L PACKAGE LIQUOR	FULTON	CALLAWAY	0.001	0.001	OWL CREEK	U	741	OWL CR.	C
MO0114057	EASE INC-WALKERS CORNER	EDWARDS	BENTON	0.001	0.000	TRIB KNOBBY CREEK	U			
MO0122904	CHIPMAN FLEA MARKET/DRIVI	FREDERICKTOWN	MADISON	0.001	0.001	TRIB MILL CR	U	2846	TWELVE MILE CR.	C
MO0037087	LONEDELL R-14 SCHOOL	LONEDELL	FRANKLIN	0.005	0.001	TRIB L MERAMEC R.	U	2027	N. FK. L. MERAMEC R.	C
MO0043818	GRANDVIEW R-2 SCHOOL DIST	HILLSBORO	JEFFERSON	0.013	0.006	TRIB DRY CR	U	3418	DRY CR.	P
MO0049905	CONST IND LABOR TRAIN SCH	BELTON	CASS	0.004	0.002	EAST CR	C	1265	EAST CR.	C
MO0053228	MEADOW HTS R-II SCH DIST	PATTON	BOLLINGER	0.0122	0.0122	LITTLE MUDDY CREEK	U			
MO0055344	ROSS ELEM SCHOOL	WARDELL	PEMISCOT	0.008	0.002	MAIN DITCH NO. 8	C	3032	MAIN DITCH #8	C
MO0057070	NELL HOLCOMB R-IV SCHOOL	CAPE GIRARDEAU	CAPE GIRARDEAU	0.002		TRIB SOAKIE CR.	U			
MO0057304	AMAZONIA ELEMENTARY SCHOO	AMAZONIA	ANDREW	0.001		DITCH TO MACE CR	U			
MO0081345	SOUTHWEST LIVINGSTON R-1	LUDLOW	LIVINGSTON	0.008	0.002	TRIB RATTLESNAKE CR.	U			
MO0082139	COLE CO R-V SCHOOL DIST	EUGENE	COLE	0.013		TRIB BOIS BRULE CR.	U			

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MO0083241	NE VERNON CO R-I SCHOOL	SCHELL CITY	VERNON	0.003	0.001	MILLER BR	U			
MO0083747	RUNNING FOX SCHOOL	ALEXANDRIA	CLARK	0.011	0.0021	FOX RIVER	P			
MO0083763	COFFMAN R-5 SCHOOL BUILDI	STE. GENEVIEVE	STE. GENEVIEVE	0.003	0.002	TRIB BLOOM CR .	C			
MO0083780	CAMPBELLTON ELEM SCH	NEW HAVEN	FRANKLIN	0.004	0.004	TRIB SLAUGHTER BR	U			
MO0083828	POTOSI R-3 MINERAL POINT	MINERAL POINT	WASHINGTON	0.002	0.001	TRIB MILL CREEK	U	2123	RUBENEAU BR.	C
MO0085111	BELLEVIEW R-3 SCHOOL	BELLEVIEW	IRON	0.003	0.002	TRIB TO REID CR.	U	3410	REID CR.	C
MO0085413	UNION CHAPEL ELEM SCHOOL	KANSAS CITY	PLATTE	0.015	0.012	TRIB BRUSH CR	C			
MO0085421	STEELVILLE R-3 HIGH SCH	STEELVILLE	CRAWFORD	0.003	0.002	TRIB WHITTENBURG CR	U	1899	WHITTENBURG CR.	C
MO0085707	BOYS & GIRLS TOWN OF MO	ST. JAMES	PHELPS	0.009	0.008	TRIB DRY FORK CREEK	U			
MO0088927	RICHWOODS R-VII SCH DIST	RICHWOODS	WASHINGTON	0.003	0.002	BR L INDIAN CR	C	2017	L. INDIAN CR.	C
MO0091065	DEV SERV OF JEFFERSON CTY	MAPAVILLE	JEFFERSON	0.001	0.001	TRIB SANDY CR	U	1720	SANDY CR.	C
MO0091405	BELLEFOUNTAINE SCHOOL	CADET	WASHINGTON	0.001	0.001	SHIBBOLETH BR/MILL C	U			
MO0091677	GORIN R-III SCHOOL	GORIN	SCOTLAND	0.002	0.001	TRIB BEAR CREEK	U			
MO0094561	MIAMI TOWNSHIP R-I SCH	MIAMI	SALINE	0.001	0.001	TRIB TO MUDDY CREEK	U			
MO0097560	LONE JACK ELEM SCHOOL	LONEJACK	JACKSON	0.002	0.003	TRIB SNI-A-BAR CR	U			
MO0097781	CALLAWAY HILLS ELEM SCHOO	HOLTS SUMMIT	CALLAWAY	0.007	0.005	TRIB CASON BRANCH	U			
MO0098582	VALLEY R-VI HIGH SCHOOL	CALEDONIA	WASHINGTON	0.007	0.005	TRIB GOOSE CR.	U	2080	BIG R.	P
MO0099058	MDESE, MAPAVILLE ST SCH	MAPAVILLE	JEFFERSON	0.007	0.001	WET WEATHER BR	U	1719	JOACHIM CR.	P
MO0099139	HATTON-MCCREDIE ELEM SCH	KINGDOM CITY	CALLAWAY	0.004		ROCKY BR OF AUXVASSE	C	706	AUXVASSE CR.	C
MO0099520	ST JOSEPH SCHOOL	STE. GENEVIEVE	STE. GENEVIEVE	0.004	0.001	TRIB INDIAN CR	U	1747	INDIAN CR.	C
MO0101559	CU, ST FRANCIS XAVIER SCH	JEFFERSON CITY	COLE	0.006	0.004	TRIB SANFORD CR	U	829	RISING CR.	C
MO0109282	CASS CO MIDWY R-I SCH DIS	CLEVELAND	CASS	0.024	0.007	TRIB PONEY CR	U	3313	PONY CR	C
MO0109983	OAK RIDGE R-VI SCHOOL	OAK RIDGE	CAPE GIRARDEAU	0.013	0.004	TRIB HUGHES CR	U	1814	HUGHES CR.	C
MO0111171	ST VINCENT DEPAUL SCHOOL	MARTHASVILLE	WARREN	0.003		TRIB MISSOURI R	U	1604	MISSOURI R.	P
MO0116611	BLOOMSDALE ELEM SCH WW	BLOOMSDALE	STE. GENEVIEVE	0.006	0.001	FOURCHE A DUCLOS CR	U	1740	FOURCHE A DUCLOS CR.	P
MO0117650	LEWIS COUNTY ELEMENTARY	LEWISTOWN	LEWIS	0.023	0.003	TRIB GRASSY CR	U			
MO0119032	LAKELAND R-III SCHOOL WWT	LOWRY CITY	ST. CLAIR	0.024	0.004	TRIB BIG OTTER CR	U	1224	BIG OTTER CR.	C
MO0119130	HEARTLAND COMMUNITY WWTF	NEWARK	KNOX	0.166	0.037	TRIB L FABIUS R	U			
MO0122696	MIDWAY HEIGHTS ELEM SCH	COLUMBIA	BOONE	0.008	0.001	MIDWAY CR	U			
MO0123609	LONE JACK KINDERGARTEN-1	LONEJACK	JACKSON	0.002	0.002	TRIB SNI-A-BAR CR	U			
MO0101117	KCPL, MONTROSE STATION	CLINTON	HENRY	0.263	0.263	MONTROSE LAKE	L3			
MO0033910	CHOCTAW RIDGE LAGOON	HOLTS SUMMIT	CALLAWAY	0.032	0.007	TRIB TO TURKEY CREEK	U			

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0035700	TERRE DU LAC NORTH	BONNE TERRE	ST. FRANCOIS	0.24	0.2	THREE HILL CR.	U			
MO0035742	LAKE FOREST ESTATES SUBD	STE. GENEVIEVE	STE. GENEVIEVE	0.032	0.072	BIG BOTTOM CR.	C	1746	BIG BOTTOM CR.	C
MO0039527	CHERRY LANE SUBD	PEVELY	JEFFERSON	0.002	0.001	TRIB TO SANDY CR.	U			
MO0040363	AFSHARI ESTATES, PLAT #3	FLORISSANT	ST. LOUIS	0.005	0.002	TRIB MILL CR	U	1604	MISSOURI R.	P
MO0042153	VERNON CO SD-ROLLING MEAD	NEVADA	VERNON	0.024	0.016	TRIB L DRYWOOD CR	U			
MO0048810	ASSLP, LEHMEN ACRES SUBD	JEFFERSON CITY	COLE	0.006	0.001	TRIB MOREAU R	U			
MO0049654	GREEN RIDGE LAGOON	GREEN RIDGE	PETTIS	0.068	0.041	BASIN FORK CREEK	U	867	BASIN FK.	C
MO0050202	COUNTRY ACRES HMOWN ASOC	KNOB NOSTER	JOHNSON	0.015	0.009	WALNUT CR	C	937	WALNUT CR.	C
MO0052744	BROOKVIEW DUPLX-GRAND HIL	BELTON	CASS	0.013	0.004	LITTLE BLUE R	U			
MO0053171	BCSD, WESTWOOD MEADOWS	COLUMBIA	BOONE	0.0146	0.007	TRIB HARMONY BRANCH	U			
MO0054381	ALBERT WESSELL DEV LAGOON	GORDONVILLE	CAPE GIRARDEAU	0.003	0.001	TRIB HUBBLE CR	U	2197	HUBBLE CR.	P
MO0055034	DEGUIRE SUBDIVISION	FREDERICKTOWN	MADISON	0.004	0.004	TWELVE MILE CR.	U	2846	TWELVE MILE CR.	C
MO0056651	SEABAUGH ACRES INC	JACKSON	CAPE GIRARDEAU	0.008	0.006	TRIB TO BYRD CR.	U	2210	BYRD CR.	P
MO0057215	WILDFLOWER COMMUNITY ASOC	UNIONVILLE	PUTNAM	0.085	0.066	NORTH BLACKBIRD CR.	U	654	N. BLACKBIRD CR.	C
MO0057347	BRETZ SUBD	JACKSON	CAPE GIRARDEAU	0.004	0.003	TRIB TO CANE CR	U	2208	CANE CR.	C
MO0057916	EL VALLEJO SUBD	WASHINGTON	FRANKLIN	0.022	0.015	TRIB TO BROWN'S BR.	U			
MO0058459	SPRING LAKE ESTATES SUBDI	JACKSON	CAPE GIRARDEAU	0.0125	0.007	TRIB HUBBLE CR	U			
MO0081655	SOUTHERN HILLS STF	WARRENSBURG	JOHNSON	0.014	0.008	TRIB W BEAR CR.	U			
MO0081922	MANCHESTER HEIGHTS SUBD	COLUMBIA	BOONE	0.013	0.009	TRIB HOMINY CR.	U	1011	HOMINY CR.	C
MO0082147	CROWLEY SUBDIVISION	COLUMBIA	BOONE	0.004	0.001	TR TO BEAR CREEK	U			
MO0083984	ADAMS SUBD ASOC, INC	SALEM	DENT	0.009	0.009	SPRING BRANCH CR	U	1870	SPRING BR.	P
MO0084191	GLADLO WATER & SEWER CO	ROLLA	PHELPS	0.023	0.023	TRIB BOURBEUSE R	U			
MO0084697	BEAUFORT APARTMENTS	BEAUFORT	FRANKLIN	0.001		TRIB ST JOHN'S CR	U	1680	ST. JOHNS CR.	C
MO0084816	OLD PLANK ROAD SUBD	COLUMBIA	BOONE	0.0018	0.0014	TRIB L BONNE FEMME C	U			
MO0087688	BCSD, POWELL COMM. LAGOON	COLUMBIA	BOONE	0.013	0.006	ROCKY FORK CREEK	C	1014	ROCKY FK.	C
MO0087874	SALISBURY, CIRCLEVIEW SUB	SALISBURY	CHARITON	0.021	0.018	TRIB M FK CHARITON R	U	691	M. FK. CHARITON R.	P
MO0087955	WILDWOOD HILLS SUBD	WRIGHT CITY	WARREN	0.005	0.003	TRIB CHARRETTE CR.	U	1615	CHARRETTE CR.	C
MO0088072	HILLCREST UTILITIES CO	CAPE GIRARDEAU	CAPE GIRARDEAU	0.092	0.028	WILLIAMS CR	U	2198	WILLIAMS CR.	P
MO0088200	CORNELL'S FRIENDLY ACRES	COLUMBIA	BOONE	0.022	0.0037	TRIB L BONNE FEMME C	U	1003	L. BONNE FEMME CR.	P
MO0088382	ELM HILLS PARK	SEDALIA	PETTIS	0.059	0.035	TRIB FLAT CREEK	U	865	FLAT CR.	C
MO0088498	HORIZON SUBDIVISION	JEFFERSON CITY	COLE	0.0031	0.0017	TRIB HONEY CREEK	U			
MO0088510	LAKE NEHAI TONKAYEA WWTF	MARCELINE	CHARITON	0.009	0.004	TRIB MUSSEL FK. CR.	P			

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0088986	CU, LAKE CARMEL WWTF	EUGENE	COLE	0.012	0.006	CLARK FK	U	1000	CLARK FK.	C
MO0089338	CU, TWEHOUS ACRES WWTP	JEFFERSON CITY	COLE	0.015	0.011	TRIB RISING CR	U	829	RISING CR.	C
MO0090131	SUNSET ESTATES SUBDIVISIO	WASHINGTON	FRANKLIN	0.012	0.002	LONG BR	U			
MO0090263	SOUTH WALNUT HILLS SUBD	SEDALIA	PETTIS	0.023	0.01	TRIB TO COON CR.	U			
MO0090395	EL CHAPARREL ESTATES SUBD	CEDAR HILL	JEFFERSON	0.017	0.01	TRIB SAND CREEK	U	2074	BIG R.	P
MO0090778	LIBERTY, BOWLES ADDITION	LIBERTY	CLAY	0.003	0.001	TRIB TO RUSH CR.	U			
MO0091006	FESTUS,LAMBERT HILLS SUBD	FESTUS	JEFFERSON	0.003	0.001	TRIB TO JOACHIM CR.	U	1719	JOACHIM CR.	P
MO0091529	LAKE SHERWOOD ESTATES SUB	LAKE SHERWOOD	WARREN	0.001	0.385	WOLF CR	C			
MO0092771	GRIFFITH'S FIRST ADDITION	PEVELY	JEFFERSON	0.001		TRIB SANDY CR.	U			
MO0094196	SOUTHGATE SUBDIVISION	SEDALIA	PETTIS	0.020	0.015	TRIB BREAKFAST BR	U			
MO0095656	CU, GROTHOFF WWTP	JEFFERSON CITY	COLE	0.011	0.002	TRIB HONEY CR	U	1002	HONEY CR.	C
MO0096831	MONSEES LAKE EST	SEDALIA	PETTIS	0.028	0.004	L SHAVER CR	U	863	L. SHAVER CR.	C
MO0097276	OAK TREE APARTMENTS WWTF	SEDALIA	PETTIS	0.001		TRIB FLAT CR	U			
MO0097411	ASSLP, WILLIBRAND ACRES	TAOS	COLE	0.0185	0.00144	TRIB RISING CR	U			
MO0097594	HILLSIDE ESTATES	BOLIVAR	POLK	0.007	0.004	MILE BR PIPER CR	U	1444	PIPER CR.	P
MO0098680	SK & M & SEWER CO	PERRYVILLE	PERRY	0.12	0.03	TRIB CINQUE HOMMES C	U	1781	CINQUE HOMMES CR.	P
MO0098841	COUNTRYSIDE ESTATES SUBD.	KENNETT	DUNKLIN	0.008	0.004	TRIB ST FRANCIS R	U			
MO0098906	INNSBROOK ESTATES	WRIGHT CITY	WARREN	0.02	0.017	TRIB CHARRETTE CREEK	U	1615	CHARRETTE CR.	C
MO0099759	FRONTIER FOOD MART	JACKSON	CAPE GIRARDEAU	0.001		TRIB CANE CR	U	2208	CANE CR.	C
MO0099911	PHENORA SUBD N LAGOON	COLUMBIA	BOONE	0.002	0.002	TRIB ROCKY FK	U	1014	ROCKY FK.	C
MO0100277	WESTBRIDGE PLACE SUBD	JACKSON	CAPE GIRARDEAU	0.002	0.002	CANE CR	C			
MO0102300	PICKERING PLACE, INC WWTF	BELTON	CASS	0.03	0.007	EAST CREEK	U	1265	EAST CR.	C
MO0102768	SHERIDAN RURAL RENTAL HSG	SHERIDAN	WORTH	0.002	0.001	TRIB PLATTE RIVER	U			
MO0103551	AUSTIN TRAILS	CEDAR HILL	JEFFERSON	0.002	0.001	TRIB SAND CR	U	3697	SAND CR.	P
MO0105589	FCPWSD #3,WOODRIDGE FARMS	VILLA RIDGE	FRANKLIN	0.014		TRIB PIN OAK CR	U	2034	BOURBEUSE R.	P
MO0105996	STANLEY SUBDIVISION	COLUMBIA	BOONE	0.001	0.001	L BONNE FEMME CR	U	1003	L. BONNE FEMME CR.	P
MO0106011	WILEY APARTMENTS	COLUMBIA	BOONE	0.001	0.001	TRIB L BONNE FEMME C	U	1003	L. BONNE FEMME CR.	P
MO0107841	CENTURY ESTATES SUBD	WASHINGTON	FRANKLIN	0.013	0.007	LITTLE BOEUF CREEK	U			
MO0108014	PARKVILLE, RIVERCHASE SEW	PARKVILLE	PLATTE	0.015		MISSOURI R	P			
MO0108235	SOUTH FORK PROPERTY OWNER	WARRENSBURG	JOHNSON	0.018	0.003	TRIB WEST BEAR CREEK	U	933	BEAR CR.	C
MO0108332	LAKE CHATEAU SUBDIVISION	COLUMBIA	BOONE	0.006		TRIB LITTLE CEDAR CR	U	744	L. CEDAR CR.	C
MO0108588	WATKINS SUBD	CAMDENTON	CAMDEN	0.02		TRIB LAKE OF OZARKS	U			

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MO0108901	SUMMIT HILLS FARM SUBD	PACIFIC	FRANKLIN	0.016	0.011	TRIB BRUSH CR	U	1844	BRUSH CR.	C
MO0109142	VILLAGES AT WHITEMAN	KNOB NOSTER	JOHNSON	0.1	0.021	TRIB LONG BRANCH CR	U	857	LONG BR.	C
MO0109177	BEAUTY VIEW ACRES SEW DIS	GRAY SUMMIT	FRANKLIN	0.026	0.015	TRIB LABADIE CR	U	1694	TRIB. TO LABADIE CR.	P
MO0109452	MACKS CREEK SR CITIZEN HS	MACKS CREEK	CAMDEN	0.002		TRIB MACKS CREEK	U	1201	MACKS CR.	C
MO0109592	HUNTERS RIDGE SUBDIVISION	SEDALIA	PETTIS	0.051		TRIB COON CR.	C	3490	TRIB. L. MUDDY CR.2	C
MO0110094	MEADOW LAKE FARM SUBD	WASHINGTON	FRANKLIN	0.02	0.014	BR BUSCH CR	U	1685	BUSCH CR.	C
MO0111121	DEER RUN APARTMENTS	ROLLA	PHELPS	0.001	0.001	TRI LITTLE BEAVER CR	U	1530	TRIB L. BEAVER CR.	C
MO0111759	CEDAR GROVE VILLAGE SUBD	WARRENTON	WARREN	0.01	0.007	TRIB TO LOST CR	U	1618	LOST CR.	C
MO0112224	HIGHVIEW SUBD W LAGOON	FULTON	CALLAWAY	0.003		TRIB MIDDLE RIVER	U			
MO0112402	HERMIT HOLLOW SUBD	LABADIE	FRANKLIN	0.002	0.001	LARTTO CREEK	U			
MO0112551	CHRISTOPHER SUBD #3	FULTON	CALLAWAY	0.003		TRIB MIDDLE R	U	724	MIDDLE R.	C
MO0112569	SARATOGA SUBD	FULTON	CALLAWAY	0.002	0.001	TRIB CEDAR CR	U	737	CEDAR CR.	C
MO0112585	WILDHORSE SPRING FARM	CHESTERFIELD	ST. LOUIS	0.02		TRIB WILDHORSE CR	U	1700	WILDHORSE CR.	C
MO0113221	WESTRIDGE 7TH ADD LAGOON	PACIFIC	FRANKLIN	0.006	0.002	TRIB BRUSH CR	U	1844	BRUSH CR.	C
MO0113263	OAK FOREST SUBDIVISION	ROLLA	PHELPS	0.0136	0.0065	TRIB BURGHER BRANCH	U			
MO0113450	OLSON ACRES	BELTON	CASS	0.012	0.01	TRIB WEST FORK	U	3310	W. FK. EAST CR.	C
MO0113573	STATE PARK VILL WWTP	WARRENSBURG	JOHNSON	0.02	0.006	TRIB CLEAR FK	U	935	CLEAR FK.	P
MO0113760	COUNTRY HOME ESTATES	WARRENSBURG	JOHNSON	0.0066	0.0013	TRIB WEST BEAR CR	U			
MO0113948	LAKESIDE ESTATES SUBD	MEXICO	AUDRAIN	0.011		DAVIS CR	C	144	DAVIS CR.	C
MO0114332	FRANCE COUNTRY PLACE	COLUMBIA	BOONE	0.0015	0.001	TRIB LITTLE CEDAR CR	U			
MO0114618	ST ALBAN'S VALLEY	GLENCOE	ST. LOUIS	0.004		TRIB TAVERN CREEK	U	1697	BIG TAVERN CR.	P
MO0116301	COUNTY LINE EST HMOWN ASO	MILLERSBURG	CALLAWAY	0.011		SALLY BR CEDAR CR	U			
MO0116343	DEER RUN MEADOWS SUBD	TROY	LINCOLN	0.005		SPRING CR	U	3444	SPRING CR.	C
MO0116700	ST ALBAN'S FOREST	GLENCOE	ST. LOUIS	0.011	0.001	TRIB BIG TAVERN CR	U	1697	BIG TAVERN CR.	P
MO0116742	COUNTRY EAST SUBDIVISION	FULTON	CALLAWAY	0.005	0.003	BR OF CEDAR CR	U	737	CEDAR CR.	C
MO0116807	COLONIAL HILL SUBDIVISION	FULTON	CALLAWAY	0.001		TRIB CEDAR CR	U			
MO0116998	PORT PERRY SERVICE CO	PERRYVILLE	PERRY	0.074	0.01	NATIONS CR	C	1780	NATIONS CR.	C
MO0117323	BCSD, OBERLIN VALLEY	COLUMBIA	BOONE	0.025		COW BR CR/BEAR CR	U	1015	BEAR CR.	C
MO0117447	CENTENNIAL ACRES WWTF	TRIMBLE	CLINTON	0.010	0.001	TRIB GROVE CR	U			
MO0118290	CARLOS ACRES	COLUMBIA	BOONE	0.001	0.001	LITTLE BR	U			
MO0118664	LAKESIDE COMMUNITY, INC	ROLLA	PHELPS	0.037		TRIB BOURBEUSE	U	2049	BOURBEUSE R.	C
MO0119121	PCPWSD #2, PINES SUBD	ROLLA	PHELPS	0.0344	0.0103	TRIB FRANZ BR	U	1863	L. DRY FK.	P

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MO0119148	PLATTE CLAY/HOLMES CR HIL	KEARNEY	CLAY	0.026		HOLMES CR	U	383	FISHING R.	P
MO0119318	AUBURN HILLS WWTF	MILAN	SULLIVAN	0.02		TRIB E BR LOCUST CR	U			
MO0119822	COUNTRYSIDE MEADOWS WWTF	ORRICK	RAY	0.006	0.002	EAST FK ROLLINS CR	U			
MO0119946	BONNOT SUBDIVISION	ELDON	MILLER	0.001	0.001	TRIB S MOREAU CR	U	992	TRIB S. MOREAU CR.3	C
MO0120006	FOX RUN	KEARNEY	CLAY	0.011		TRIB ROCK CR	U			
MO0120308	CU, RABBIT RUN SUBD	HOLTS SUMMIT	CALLAWAY	0.004		TRIB NIEMANS CR	U	701	MISSOURI R.	P
MO0120341	ST ALBANS HILLS	WILDWOOD	ST. LOUIS	0.003		TRIB BIG TAVERN CR	U	1697	BIG TAVERN CR.	P
MO0120871	BRIARWOOD ESTATES	DE SOTO	JEFFERSON	0.035		TRIB JOACHIM CREEK	U			
MO0120898	ODOM LAGOON	WRIGHT CITY	WARREN	0.001		TRIB N FK CHARRETTE	U	7248	INNSBROOK LAKE	L3
MO0120995	LAKE BREEZE ESTATE SUBD	MILLERSBURG	CALLAWAY	0.02	0.01	TRIB OWL CR	U			
MO0121061	AQUASOURCE, CEDAR HLS	HOLTS SUMMIT	CALLAWAY	0.005		TRIB CASON BR	U			
MO0121274	GREENWOOD HILLS DEVELOP	FULTON	CALLAWAY	0.0059	0.001	TRIB MIDDLE R	U			
MO0121355	CU, TWEHOUS EXCAVATING	JEFFERSON CITY	COLE	0.004		TRIB SANFORD CREEK	U			
MO0121410	ASSLP, ANDERSON LAKE WWTF	JEFFERSON CITY	COLE	0.002	0.0015	TRIB BENNIE BR	U			
MO0121894	CARDINAL MEADOWS SUBD	UNION	FRANKLIN	0.008		TRIB ST JOHN'S CR	C	1678	ST. JOHNS CR.	P
MO0122106	AQUASOURCE, BIG SKY SUBD	HOLTS SUMMIT	CALLAWAY	0.012		TRIB RIVAUX CR	U	731	RIVAUX CR.	C
MO0122301	EASTSIDE HOMEOWNRS LAGOON	BROOKFIELD	LINN	0.004		TRIB W. FK YELLOW CR	U	599	W FK YELLOW CR.	P
MO0122939	AQUASOURCE,SUNRISE MEADOW	TAOS	COLE	0.015		SANFORD CR	U	1032	SANFORD CR.	C
MO0123056	PLEASANT LAKE ESTATES	JACKSON	CAPE GIRARDEAU	0.019		TRIB INDIAN CR	U			
MO0123072	BCSD, FALL CR DIVISION	COLUMBIA	BOONE	0.003		TRIB HINKSON CR	U			
MO0123099	TIMBER SPRINGS EST WWTF	TRIMBLE	CLINTON	0.032	0.001	TRIB GROVE CR	U			
MO0123528	WILLOWBROOK SUBDIVISION	POPLAR BLUFF	BUTLER	0.005		TRIB CANE CR	U			
MO0124036	WINTERWOOD SUBDIVISION	HOUSE SPRINGS	JEFFERSON	0.02		TRIB LA BARQUE CR	U	2033	TRIB TO LABARQUE CR.	C
MO0124346	SOUTHWOOD II SUBD	ROLLA	PHELPS	0.005		TRIB LITTLE DRY FK	U			
MO0124591	WESTBOROUGH ESTATES	TROY	LINCOLN	0.028	0.005	SPRING CR	U	3444	SPRING CR.	C
MO0124761	IDEAL VILLA-3RD ADDITION	HANNIBAL	RALLS	0.0133	0.013	TRIB BEAR CR	U	9	BEAR CR.	C
MO0125032	PCPW&WWD #2, FOREST LK	ROLLA	PHELPS	0.017	0	TRIB FRANZ BR	U	1863	L. DRY FK.	P
MO0125148	ROBB 4-PLEX LAGOON	COLUMBIA	BOONE	0.001	0.001	TRIB ROCKY FORK CR	C			
MO0125181	OAKVIEW ESTATES	WRIGHT CITY	WARREN	0.023		CHARRETTE CR	C			
MO0125393	TIMBERLAKE ESTATES	BOONVILLE	COOPER	0.045	0.016	THOMAS BR	U	701	MISSOURI R.	P
MO0125628	CAMBRIDGE VILLAGE	SEDALIA	PETTIS	0.025	0.007	TRIB FLAT CR	C	865	FLAT CR.	C
MO0125644	HICKORY FARMS SUBDIVISION	HAWK POINT	LINCOLN	0.004		TRIB COON CREEK	U	208	COON CR.	C

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0125997	MARSH LAGOON GROUP	MACON	MACON	0.002		TRIB E FK CHARITON R	C			
MO0126101	VILLAGE OF FOUNTAIN 'N LK	MOSCOW MILLS	LINCOLN	0.03		BOB'S CR	U			
MO0126446	BCSD QUARTER MILE HILLS S	HALLSVILLE	BOONE	0.005		TRIB KELLEY BRANCH	U	1018	KELLEY BR.	C
MO0126462	CRABTREE LAGOON SYSTEM	WARRENSBURG	JOHNSON	0.006	0.001	TRIB POSTOAK CREEK	U			
MO0127493	HERBEL LAGOON	WARRENTON	WARREN	0.001		TRIB LOST CR	U	1618	LOST CR.	C
MO0127698	LINCOLN COUNTY PWSD #1	ELSBERRY	LINCOLN	0.0154		TRIB BOB'S CR	U	35	BOBS CR.	C
MO0128279	ARBOR TRAILS SUBDIVISION	FRUITLAND	CAPE GIRARDEAU	0.036		HUBBLE CREEK	U	2202	HUBBLE CR.	C
MO0129216	TWIN LAKE WWTF	MERCER	MERCER	0.14	0.14	TRIB HIDDEN VALLEY L	U			
MO0129305	SHORELINE WWTF	CAIRO	RANDOLPH	0.0074		NORTH FORK	U			
MO0129348	BRIAR OAKS ESTATES	KIRKSVILLE	ADAIR	0.003	0.002	TRIB FOREST LAKE	U			
MO0035726	AQUASOURCE, MAPLEWOOD SUB	SEDALIA	PETTIS	0.132	0.128	TRIB FLAT CR	U			
MO0093025	WOODLAND TERRACE APTS	MEXICO	AUDRAIN	0.002	0.001	SKULL LICK CK	U			
MO0094897	LAKE BELLA VISTA SUBD	JACKSON	CAPE GIRARDEAU	0.04	0.019	INDIAN CR	U			
MO0096342	AQUASOURCE, DOVE LK WWTF	TAOS	COLE	0.02	0.01	TRIB RISING CREEK	U	829	RISING CR.	C
MO0097632	ASSLP. SHAMROCK HGTS SUBD	JEFFERSON CITY	COLE	0.0012	0.0012	RISING CR.	U			
MO0105490	AQUASOURCE,BRIAR VILLAGE	JEFFERSON CITY	COLE	0.01	0.008	TRIB GRAYS CR	U			
MO0106887	CHALET PARK WWTP	COLUMBIA	BOONE	0.002	0.002	TRIB L CEDAR CR	U	737	CEDAR CR.	C
MO0107433	ASSLP, CEDAR GROVE LAGOON	TAOS	COLE	0.005	0.001	TRIB RISING CR	U			
MO0111864	AQUASOURCE,SUMMIT VIEW DR	HOLTS SUMMIT	CALLAWAY	0.011		TRIB TURKEY CREEK	U			
MO0113271	RAINBOW ACRES SUBDIVISION	KNOB NOSTER	JOHNSON	0.0275	0.008	WALNUT CREEK	C			
MO0114243	CU, LEE STREET LAGOON	HOLTS SUMMIT	CALLAWAY	0.012	0.002	TRIB TURKEY CREEK	U			
MO0116963	ASSLP, VAN LOO WWTF	JEFFERSON CITY	COLE	0.004	0.003	COON CR	U	941	MOREAU R.	P
MO0118800	CU, GOLDEN POND'S SUBD	HOLTS SUMMIT	CALLAWAY	0.012		SKUNK CR	U			
MO0120022	ASSLP, MAPLE LEAF	HOLTS SUMMIT	CALLAWAY	0.007	0.001	TRIB CASON BRANCH	U			
MO0127019	SKY'S THE LIMIT, THE	INDEPENDENCE	JACKSON	0.006	0.005	TRIB L BLUE R	U	422	L. BLUE R.	P
MO0048798	MOTOR HARBOR INC	POPLAR BLUFF	BUTLER	0.002	0.002	TRIB BLACK CR	U	2815	PIKE CR.2	C
MO0096733	TRI-COUNTY TRUCK STOP	UNION	FRANKLIN	0.034	0.004	TRIB TO BRUSH CR.	U	1844	BRUSH CR.	C
MO0100862	MIDWAY AUTO/TRUCK PLAZA	COLUMBIA	BOONE	0.024	0.014	HENDERSON BR.	U			
MO0103683	SQUAW CREEK TRUCK PLAZA	MOUND CITY	HOLT	0.005	0.01	BLAIR CR	U	263	KIMSEY CR.	C
MO0104493	LITTLE DIXIE TRUCK STOP	ROLLA	PHELPS	0.003	0.002	TRIB BOURBEUSE RIVER	U	2049	BOURBEUSE R.	C
MO0106330	177 TRUCK STOP	JACKSON	CAPE GIRARDEAU	0.003		TRIB INDIAN CR	U	1828	INDIAN CR.	P
MO0106542	LANCE L COX	MEXICO	AUDRAIN	0.002	0.002	TRIB S FK SALT R	U	142	S. FK. SALT R.	C

FAC_ID	Facility	City	County	Design Q: mgd	Actual Flow	FIRST_REC_	Class	WB_#	WB	WB_C
MO0108197	D & M OIL COMPANY, INC.	RICHLAND	PULASKI	0.003	0.003	TRIB BARLOW CR	U	1455	GASCONADE R.	P
MO0113964	MID-AMERICAN COACHES	WASHINGTON	FRANKLIN	0.003		BRANCH BUSCH CREEK	U	1687	TRIB. TO BUSCH CR.	C
MO0120723	PLEASANT HILL BANK-291 WW	HARRISONVILLE	CASS	0.002		TRIB POLECAT CR	U	1264	EAST BR.	C
MO0120740	POUR BOY OIL COMPANY #7	LATHROP	CLINTON	0.002	0.001	TRIB MUDDY FK	U	391	MUDDY FK.	C
MO0120758	FARRIS FIVE, INC.	FAUCETT	BUCHANAN	0.011	0.01	TRIB BEE CR	U			
MO0122611	MOBIL PUMP HANDLE	LEASBURG	CRAWFORD	0.000		TRIB L BOURBEUSE	U			
MO0124729	ELM QUICK MART	KINGSVILLE	JOHNSON	0.01	0.001	TRIB S FK BLACKWATER	U	924	S. FK. BLACKWATER R.	C
MO0124966	ST JAMES VFW POST 5608	ST. JAMES	PHELPS	0.001	0.001	TRIB ROBINSON CR	U			
MO0058297	SHILO WAREHOUSE	WASHINGTON	FRANKLIN	0.004	0.002	TRIB DUBOIS CR	U			
MO0095290	TYSON FOODS SERVICE CENTR	SEDALIA	PETTIS	0.005	0.000	TRIB LITTLE MUDDY CR	U	855	MUDDY CR.	C
MO0124141	MFA AGRI SERVICES	FULTON	CALLAWAY	0.001		TRIB CEDER CR	U	737	CEDAR CR.	C
MO0125822	AMERICAN BUILDING PRODUCT	JEFFERSON CITY	COLE	0.001		RISING CREEK	P	828	RISING CR.	P
MO0127086	MAIL & MORE, INC	FULTON	CALLAWAY	0.001		TRIB OWL CR	U	741	OWL CR.	C
MO0003735	ST LOUIS CO WATER-NORTH	FLORISSANT	ST. LOUIS	0.001	0.001	MISSOURI RIVER	P			
MO0122220	USFWS, SQUAW CREEK NWR	MOUND CITY	HOLT	0.0008	0.0008	DAVIS CR DITCH	C			
MO0125849	EXOTIC ANIMAL PARADISE	NORTHVIEW	WEBSTER	0.003	0.003	TRIB DAVIS CR	U	2372	TRIB. TO DAVIS CR.	C