



2004/2006 Missouri 303(d) List

Frequently Asked Questions

What is the 303(d) List?

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards. The 303(d) list provides a snap shot in time and helps state and federal agencies keep track of waters that do not support all of its designated uses. These waters, because of degraded water quality, do not sustain all of its beneficial uses under state regulation. Water quality standards protect beneficial uses of water such as whole body contact for swimming, maintaining fish and other aquatic life and providing drinking water for people, livestock and wildlife. These waters need to be further addressed by a Total Maximum Daily Load (TMDL) study or requirements for pollution controls to characterize the nature and causes of the impairment. Each state must compile a list biennially and submit it to the U.S. Environmental Protection Agency for approval and proceed with further attention to correct the impairment. Not all impaired waters are included in the 303(d) list. For more information see *Are all impaired waters on the 303(d) List?* on page 2.

How does the department draft the 303(d) List?

The process for drafting the 303(d) List includes several steps. Biennially the U.S. Environmental Protection Agency provides guidance to the states on what measures to use to develop the list. Next, the Department of Natural Resources evaluates EPA's guidance and determines if changes are needed to Missouri's methodology. Then, the Clean Water Commission must approve the listing methodology. Next, the department compiles the list using three tools. These tools include a Listing Methodology, the state's Water Quality Standards and existing water quality data. The department applies the guidelines and techniques described in the methodology and the criteria specified in the water quality standards to all available and valid water quality data. This data may be collected by the department or other agencies and organizations. Together, the department uses these tools to assess water quality and determine which water bodies should be listed. Once the department compiles a draft list, the department places it on public notice for 90 days. The department solicits comments from stakeholders and the public during this time.

The 2004/2006 303(d) list along with the supporting water quality data, a list of waters proposed for delisting from the 2002 list and other information is available on the department's Web site at www.dnr.mo.gov/env/wpp/proposed-2006-303d-pn.htm.

What is the process for finalizing the 303(d) List?

The 2004/2006 303(d) List is open to the public for review and comment for a 90-day period. The department will accept written comments on the proposed list until 5 p.m., Jan. 17, 2007. The department will present the proposed list to the Missouri Clean Water Commission during a public hearing at 9 a.m. on Jan. 10, 2007 in the Lewis and Clark State Office Building,

LaCharrette Conference Room, 1101 Riverside Dr., Jefferson City. The commission may modify the list if it wishes. Any addition to the list requires a further 30-day public notice period. The department will present the response to public comments to the commission after the public comment period closes. If there are no changes to the proposed list, the commission could approve the draft 2004/2006 303(d) List as early as March 7, 2007. Once the commission has approved the list, the department submits the completed list to EPA. EPA may choose to modify the list. EPA's approved list becomes the final 303(d) List. Missouri will then use the list to develop Total Maximum Daily Loads and work on those waters until the 2008 303(d) is completed.

What is the Listing Methodology Document?

The Methodology for the Development of the Section 303(d) List in Missouri is a document that defines what data may be used to develop the 303(d) List, how much data is sufficient to assess a given water and the statistical techniques to be used to interpret the water quality criteria. EPA requires that states develop this methodology so that the methods used to develop the 303(d) List are clear and consistent. The department worked with stakeholders and interested parties to develop a Listing Methodology that provided for a more consistent and understandable process of assessing the water quality data. The current Listing Methodology was approved by the Clean Water Commission on June 7, 2006.

What are Water Quality Standards?

Water quality standards protect all waters of the state. Classified waters are given added protection under these standards based upon the beneficial uses of water such as whole body contact for swimming, maintaining fish and other aquatic life and providing drinking water for people, livestock and wildlife. The water quality standards list the classified bodies of water in the state. All classified waters are identified by beneficial uses. Associated with each use is a set of water quality criteria or standards that must be met to ensure the water can safely be used as designated. Therefore, the water quality is protected appropriately for the specific uses of each water. Beneficial uses include:

- Protection of Aquatic Life and Human Health
- General Warm-Water fishery, Limited Warm-Water fishery, Human Health Fish Consumption and Secondary Contact Recreation
- Protection Of Cold Water Fishery
- Protection Of Cool Water Fishery
- Protection Of Waters Used For Irrigation
- Protection of Waters Used For Livestock and Wildlife Watering
- Protection of Waters Used For Whole Body Contact Recreation
- Protection of Waters Used for Boating and Canoeing
- Protection Of Waters Used For Drinking Water Supply
- Protection of Waters Used for Industrial Process and Cooling Water
- Protection Of Waters Used For Storm And Flood Storage Attenuation
- Protection of Waters Used For Habitat By Resident And Migratory Wildlife Species (including rare and endangered species).
- Protection of Waters Having Recreational, Cultural, Educational, Scientific and Aesthetic Values.

Are all impaired waters on the 303(d) List?

No. The department addresses all waters with known impairments, but not all of these are included on the 303(d) List. The 303(d) List only includes water bodies with documented pollution problems that require control plans to return the water to compliance. Several categories are not included in the 303(d) List. The department does not include a list of waters that have control measures in place. When given a reasonable amount of time, the controls should correct the impairment. Examples of these measures include a water-quality-based discharge permit or voluntary implementation of pollution prevention measures. The list also does not include waters that are known to be impaired by a condition and not caused by a specific pollutant, such as channel modification. The department has also removed an impaired water from the list if it has a completed Total Maximum Daily Load (TMDL) study encompassing all relevant pollutants and has been approved by EPA. The department has also removed all waters listed for mercury. For more information on mercury see question *Why is mercury not included in the 2004/2006 303(d) List?* on page 6.

The department is unable to collect data on every water in Missouri because of its limited monitoring network. Therefore, it is likely there are other waters that are impaired but not listed due a lack of available data.

How many waters are on the draft 2004/2006 303(d) List?

The draft 2004/2006 303(d) List includes 82 waters. Of these, 40 waters are new to the 303(d) List and 42 have been retained from the 2002 List. The retained waters may be the exact listing from the 2002 list or may have different pollutants, segment lengths or locations. The list, along with the supporting water quality data and a list of waters proposed for delisting from the 2002 list, may be viewed at www.dnr.mo.gov/env/wpp/proposed-2006-303d-pn.htm.

Why was there not a 2004 303(d) List?

In August 2002, shortly after the 2002 Missouri 303(d) List was forwarded to EPA, new state legislation required all subsequent Missouri 303(d) Lists approved by the Clean Water Commission be promulgated as state rules. The Clean Water Commission then directed the Water Protection Program to promulgate the 303(d) Listing Methodology Document as a state rule.

A generalized version of the methodology became a state rule, 10 CSR 20-7.050 General Methodology for Development of Impaired Waterbody List, in October 2003. This rule also required the department to develop a more detailed methodology and to promulgate it before using it to compile a 303(d) List. From December 2003 through August 2004, the Water Protection Program conducted a public participation program to revise the more detailed version of the methodology. In September 2004, the Clean Water Commission approved this revised methodology. The department was required to promulgate two rules, the Listing Methodology Document and the actual 303(d) List. Each rule can take 8 months to 18 months to promulgate.

Following the methodology approval, the department began developing its 2004 list. However in July 2005, EPA published new guidance that required the department again to revisit the methodology to address the federal guidance. The department reinitiated stakeholder meetings to redevelop the methodology to reflect the new guidance. The department held these meetings between March and April 2006 and the commission approved the new methodology at its June 7, 2006 meeting.

A new state law was also passed in 2006 that removed the requirement for promulgation of the 303(d) List as a state rule. Now, the department is only required to promulgate the Listing

Methodology Document. The department has used the revised and approved methodology along with the Water Quality Standards to evaluate the available data and compile the draft 2004/2006 List.

What happens to the waters listed on the 303(d) List?

The Clean Water Act requires states to develop and implement studies to correct impairments of all waters on the 303(d) List. Generally, this study takes the form of a Total Maximum Daily Load (TMDL). A TMDL describes the maximum amount of a pollutant that may enter a water without violating water quality standards. It then allocates portions of this total load to the various sources in the watershed. The TMDL also contains an implementation plan to ensure that the necessary actions are taken to correct the problem. If the pollutant is unknown, the first step in the TMDL will be to identify the pollutant. If an impairment is due to one facility operating under a water quality permit from the department, it may be possible for a permit designed to meet water quality criteria to take the place of a TMDL. This is known as a Permit in Lieu of TMDL, or PIL.

Why was there such a large increase in the number of water bodies listed for bacteria?

There are 26 waters on the draft 2004/2006 List for bacteria compared to seven on the 2002 List. The increase in the number of streams listed for bacteria is due to changes in the water quality standards. In 2005, the Clean Water Commission adopted revisions to the Water Quality Standards, which added a use designation known as Whole Body Contact Recreation to the classified waters that were not currently designated for whole body contact, except where it has been shown that no swimming uses occur and stream characteristics make any swimming in the water highly unlikely. As a result, the percentage of stream miles required to meet bacterial standards increased from 25 to 96 percent.

Why is the pollutant for some waters on the list described as “unknown”?

There are seven waters on the proposed 2004/2006 List for unknown pollutants. These listings are supported not by water quality data, but biological data, which measures the abundance and diversity of the aquatic biological community of a water. Because of the lack of other data from the given water, it may not be immediately possible to attribute a cause to the impairment, but it is important to recognize where biological communities are impaired, and to work to identify and rectify the causes.

How does the department use reference waters when assessing the biological health of a water body?

When conducting biological monitoring, the biological community of a given water is compared to a reference water that is believed to represent undisturbed conditions. If the difference is significant, the water may be considered impaired. This type of monitoring is an important and effective means of measuring the ecological health of Missouri waters.

What is dissolved oxygen?

Dissolved oxygen is the amount of oxygen in the water. Fish and most other forms of aquatic life require oxygen, just as we do, for breathing. A daily dissolved oxygen cycle occurs in most streams as a result of photosynthesis by algae and other aquatic plants. Daily dissolved oxygen usually is lowest near dawn then rises as more sunlight falls on the stream powering the uptake of carbon dioxide and the release of oxygen by aquatic plants. The rate of dissolved oxygen increase between dawn and early afternoon is an indication of the activity of aquatic plants in a particular stream.

How does the department address low dissolved oxygen with an unknown source?

The department's assessment of water quality included a review of the dissolved oxygen levels within a select number of water bodies. The statewide standard for dissolved oxygen is five mg/L. As more data becomes available, the department is recognizing a pattern of lower dissolved oxygen in streams. Natural conditions can affect dissolved oxygen. The water quality data combined with the department's understanding of dissolved oxygen raises the question whether a water is impaired by a pollutant or its naturally low dissolved oxygen.

A listing of waters that exhibit naturally low dissolved oxygen would create a misconception that these waters are affected by the discharge of pollutants and therefore need pollution restrictions to address water quality. To avoid this misconception and the needless development of a Total Maximum Daily Load, the department is providing this explanation in lieu of listing these waters where evidence indicates a natural dissolved oxygen condition. The department is also reevaluating the statewide dissolved oxygen standard and will likely be proposing a revised dissolved oxygen standard, such as an ecoregionally based standard, to reflect the dissolved oxygen levels which occur naturally with Missouri's waters.

A total of 44 waters with low dissolved oxygen levels but no apparent pollutant sources, four previously listed in 2002 and 40 other waters, were not placed on the 2004/2006 303(d) List.

How are waters removed from the 303(d) List?

Waters may be removed from the 303(d) List only during the normal listing creation process. The department will recommend a water for delisting if the available data indicates that the water is unimpaired, if the impairment has been shown to be the result of a condition other than a specific pollutant, if the available data is considered insufficient to demonstrate impairment, or if a Total Maximum Daily Load or Permit in Lieu has been completed. The commission must approve the composition of the proposed list. Finally, EPA has final responsibility for all waters added, removed or retained.

Why are so many water bodies proposed for delisting?

On the draft 2004/2006 303(d) List, the department has retained 42 of the 207 waters from the 2002 List. The department is proposing to delist the other 165 waters from the 2002 List. There are several reasons why a water may be removed from the list. The department has recommended that over 85 waters be removed from the 303(d) List. Of those waters, 30 waters now meet water quality standards. The department is removing these waters because the data shows the water is attaining the Water Quality Standards or measures have been put in place to address the impairment. These measures could be either an approved Total Maximum Daily Load or permit limitations.

Two other reasons are changes to the data requirements and methodology, and changes to Missouri's water quality standards. For example, there are no longer criteria governing manganese in waters designated for use as drinking water supplies. Many waters have been recommended for delisting for two or more of these reasons. A list of all such waters, with the specific reasons the department is recommending to remove from the list, may be found on the department's Web site at www.dnr.mo.gov/env/wpp/proposed-2006-303d-pn.htm.

What does it mean when a water is proposed for delisting because of insufficient data?

The department is following a new Listing Methodology since the 2002 303(d) List. The requirement of the amount of data necessary to conduct an assessment has been significantly strengthened since 2002. Forty-eight water bodies have been recommended for removal due to the absence of sufficient data to support a listing.

What happens to a water that was removed due to insufficient data?

If the department suspects that a water may be impaired but lacks sufficient data to prove impairment, the department will give it higher priority for water quality monitoring in the future. Where a pollutant was removed from the Water Quality Standards and is no longer recognized as a pollutant, these waters will be listed as unimpaired.

Why are the Missouri and Mississippi rivers being proposed for delisting?

The Missouri and Mississippi rivers were previously listed due to the amounts of chlordane and Polychlorinated Biphenyl (PCBs) found in fish tissue. A review of all available fish tissue data in 2006 indicates levels of chlordane and PCBs meet the current guidelines used by the department. A five-mile section of the Mississippi River was also listed due to lead and zinc in river sediments. Additional data gathered since the previous list now indicates sediments in this section of the river are not contaminated.

Why are some water bodies listed for nutrients although the department does not have nutrient criteria?

Missouri is still developing its numeric criteria for nutrients, mainly nitrogen and phosphorous. Until those are developed and put into Missouri's Water Quality Standards, the Listing Methodology developed for Missouri does not recognize any streams as impaired for nutrients. However, the department is recommending that Table Rock Lake, Fellows Lake and Cave Spring Branch be retained from the 2002 list and included on the 2004/2006 list.

The department recognizes that there are compelling state interests to support continued listing of Table Rock Lake. In the past four years, public and private interests have spent considerable resources to reduce the nutrients in Table Rock Lake and restore the outstanding quality for which it was once famous. The lake is a vital natural and economic resource to that region, and the department is concerned that removing the designation in the absence of any standard would result in unacceptable backsliding of these efforts. Similarly, Fellows Lake, which is a drinking water source for the City of Springfield, has seen improvements in the recent past, and continued listing will help continue that success.

Why is mercury not included in the 2004/2006 303(d) List?

The department's assessment of water quality includes a review of mercury contamination in fish taken from a select group of Missouri's lakes and streams. Sampling by the department, the Missouri Department of Conservation and EPA has resulted in 55 sampling locations in the state where the department has sufficient data to confidently establish mercury levels in fish. Of these 55 sites, 14 sites on 13 waters show levels of mercury in fish sufficient to raise health concerns related to regular fish consumption. General observations of the data would indicate that mercury contamination of certain fish may be a statewide problem. Each year, the Missouri Department of Health and Senior Services issues a statewide advisory on the consumption of fish taken from Missouri's lakes and streams. The advisory provides guidance on appropriate steps to take

to safeguard public health from possible mercury poisoning and helps ensure that the public is aware of the potential contamination.

Generally, waters that have mercury levels sufficient to contaminate fish are considered eligible for placement on the 303(d) List. However, listing only the few waters with data available and indicating a problem may create a misconception that only those waters are affected. Likewise, listing all of the state's waters could cause a belief that all waters contain fish unsafe to eat. Neither scenario is likely true. Furthermore, the listing may cause an excessive focus on sources of mercury within Missouri when most of the mercury in fish sampled in this state comes from air sources outside of the state via atmospheric deposition.

Because of the complexity of the mercury problem, the department is participating in a state mercury taskforce to look at mercury sources and control strategies in Missouri. Placing a few or all waters on the 303(d) List may confuse, rather than facilitate, the ongoing efforts to address the broader-based mercury concern since many waters, but not all, likely share this problem while only a relatively small number are selected for mercury monitoring. The department is addressing the potential health threat created by mercury contamination as a state-wide initiative instead of through a water body-by-water body approach as would be dictated by the limited number of locations where adequate monitoring has occurred.

How does mercury enter the environment?

Mercury occurs in the environment through natural processes and human activity. Naturally occurring mercury is released to the environment by volcanoes, hot springs and the weathering of rock and soil. Substantial amounts of mercury can be released to the environment from human sources. Several industrial processes such as electroplating, coal combustion for production of electricity, pulp and paper manufacturing and the formulation of pesticides use mercury. Improper disposal of such mercury-containing products as thermometers, batteries and electrical switches increases the amount of mercury released to the environment. Because it can vaporize, a large amount of mercury enters the atmosphere and is deposited globally in precipitation. Once this mercury is released to the atmosphere, it can travel great distances before it settles back to the earth and enters our streams, rivers, ponds or lakes.

How does the department plan to address atmospheric deposition of mercury in waters of the state?

Because of the complexity of the problem, the department is participating in a state mercury taskforce to look at mercury sources and control strategies in Missouri. Placing a few or all waters on the 303(d) List may confuse, rather than facilitate, the ongoing efforts to address the broader-based mercury concern since many waters, but not all, likely share this problem while only a relatively small number are selected for mercury monitoring.

How does mercury affect human health?

Mercury affects the human central nervous system. The organic form of mercury, methylmercury, is extremely toxic to humans. According to the Missouri Department of Health and Senior Services, health effects of eating methylmercury-contaminated fish include, in cases of high levels of exposure, impaired central nervous system function, kidney damage and failure, and gastro-intestinal damage. At lower exposures, developmental delays may occur in children. More recent studies have found that, along with being a neurotoxin, methylmercury increases risk for cardiovascular diseases.

Is there a risk of mercury consumption from eating fish?

Yes. Sampling and analysis of fish indicate that mercury contamination is widespread, and present in fish throughout Missouri. Mercury can accumulate to unsafe levels in fish. The amount of mercury in fish seems to be mostly related to their size and the type of food they eat. Predatory fish such as bass, walleye and gar have much higher levels of mercury. Mercury has also been found in large bottom feeders such as carp, catfish, drum and suckers. The amount of human health risk depends on the amount of fish eaten and the levels of mercury in the fish that are being consumed. Preparing fish by skinning and trimming does not reduce the amount of mercury because it accumulates in fish muscle tissue (fillets). Cooking or drying fish can concentrate mercury levels to even higher levels.

How does Missouri monitor the waterways affected by mercury?

The department has strengthened the criteria used to analyze mercury in fish. The Department of Natural Resources works in conjunction with the Department Conservation following a detailed, written sampling plan to collect fish tissue samples. The plan includes the type, size and number of samples required keeping the data consistent. The fish tissue data is then given to the Missouri Department of Health and Senior Services (DHSS) to complete a health risk analysis. Each year DHSS issues a Fish Advisory for mercury. Missouri's 2006 Fish Advisory recommends pregnant women, women of childbearing age, nursing mothers and children under 13 years old should limit consumption to one meal per month of bass species greater than 12 inches, two meals per week of carp greater than 21 inches, and one meal per week of all other fish found in Missouri waters. In addition, DHSS recommends all consumers limit flathead, channel and blue catfish greater than 17 inches that are caught in the Mississippi and Missouri rivers to one meal per week. At least 10 other states have similar Fish Consumption Advisories. For more information on the Missouri Fish Advisory, consult the following Web sites:

- Missouri Department of Conservation: www.mdc.mo.gov
- Missouri Department of Health and Senior Services: www.dhss.mo.gov

For More Information call or write:

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