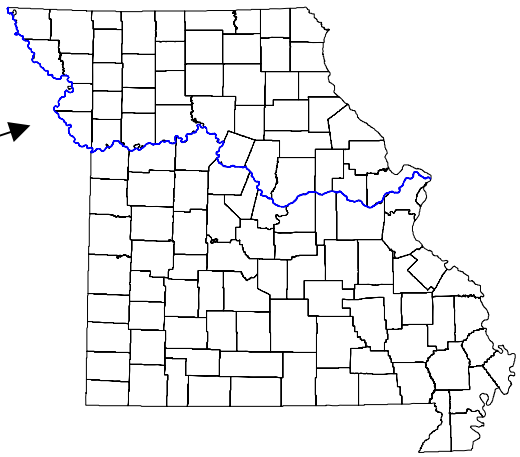
Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Missouri River

Waterbody Segment at a Glance:

Counties: Twenty-five counties
Nearby Cities: Numerous cities and towns
Length of impairment: 533 miles (highlighted on map)
Pollutant: Chlordane and PCBs (poly-chlorinated biphenyls) in fish
Source: Many point/nonpoint sources



TMDL Priority Ranking: TMDL Approved 2006

Description of the Problem

Beneficial uses of Missouri River

- Livestock and Wildlife Watering
- Protection of Aquatic Life and Human Health associated with Fish Consumption
- Whole Body Contact, Category B
- Secondary Contact Recreation
- Irrigation
- Drinking Water Supply
- Industrial

Use that is impaired

- Protection of Human Health associated with Fish Consumption

Standards that apply

- The action level for technical chlordane in fish tissue, established by the U.S. Food and Drug Administration (FDA), is 0.3 milligrams per kilogram (mg/kg) or parts per million (ppm). The department, however, uses sum of the isomers of chlordane, which carries an action level of 0.1 mg/kg.
- The FDA sets a 2.0 mg/kg PCBs limit on interstate shipment of fish for human consumption. The department currently uses this level for judging impairment of the fish consumption use.

Background information and Water Quality Data

Chlordane is a pesticide that was commonly used in the past for termite control. It was also used at nurseries, on golf courses and in agriculture. Chlordane was banned for agricultural use in 1975 and for all uses in 1988, but eroding contaminated soil can provide a continuing source of chlordane to streams and lakes due to persistence of the compound. PCBs are a mixture of up to 200 different chlorinated compounds and are stable under conditions of high pressure and high temperature. PCBs were commonly used in transformers and other electrical equipment such as fluorescent light fixtures as coolants and lubricants and were also used as hydraulic oils. U.S. production ended in 1977 due to concerns about the persistence of PCBs in the environment. Chlordane and PCBs degrade very slowly and bio-accumulate in fish tissue, particularly in bottom-dwelling/feeding fish.

The Missouri Department of Conservation (MDC) has monitored levels of toxic contaminants in fish from Missouri lakes and rivers since 1984. At that time, MDC discovered elevated levels of chlordane in fish in the Missouri, Mississippi and Meramec rivers. MDC, the U.S. Environmental Protection Agency (EPA) and the department all provide fish tissue sample results to the Missouri Department of Health and Senior Services (DHSS) for use in determining health risks to fish consumers. DHSS, in turn, issues fish consumption advisories. DHSS has issued advisories based on pesticide contaminants in fish since 1985. Past DHSS fish advisories instructed anglers to limit consumption of fatty fish (carp, catfish, buffalo, drum, suckers and paddlefish) to one meal per week. This advisory was rescinded in 2001. Trout also have a high level of fat, but are considered safe to eat from anywhere in the state. In 2002, sturgeon eggs were added to the only existing PCB advisory, which has been in place for sturgeon meat from the Missouri River since 1997.

DHSS issues its fish advisory every year around March or April. The advisory is made available to the public through press releases and may be accessed by calling DHSS at 1-866-628-9891. These advisories are also distributed to all Missouri county health departments and are posted on the Internet. The 2006 advisory may be found at www.dhss.mo.gov/NewsAndPublicNotices/06FishAdvisory.pdf.

The table below gives information on the levels of chlordane and PCBs in fish fillets in the Missouri River within or where it borders the State of Missouri.

Chlordane (as sum of the isomers) and PCBs (in mg/kg) in the Missouri River Within or Bordering the State of Missouri

Org	Site	Site Name	Year	Species	No. in Sample	Wt. Lbs	Fat	Chlor	PCB
MDC	226/99.6	Missouri R. @ Nodaway Island Access	2004	SHSTUR	5		2	0.0224	0.23
MDC	226/99.6	Missouri R. @ Nodaway Island Access	2004	SHSTUR	5	1.6	3	0.0383	0.422
MDC	226/99.6	Missouri R. @ Nodaway Island Access	2004	SHSTUR	5	1.5	4	0.0309	0.22
MDC	226/93.4	Missouri R. bl. Nodaway R.	2000	CH CAT	15	0.8	2	0.009	0.0093
MDC	226/80.5	Missouri R.@St. Joseph, Mo.	2000	CARP	10	3.6	5	0.092	0.029
MDC	226/80.5	Missouri R.@St. Joseph, Mo.	2000	CARP	15	3.5	4	0.04	0.022
MDC	356/87.7	Missouri R. @ Napoleon	2004	SHSTUR	15	1.8	4	0.0504	0.483
MDC	356/23.4	Missouri R. @ Miami	2004	SHSTUR	5	1.4	3	0.0369	0.229
MDC	356/23.4	Missouri R. @ Miami	2004	SHSTUR	5	1.4	3	0.018	0.165

MDC	356/23.4	Missouri R. @ Miami	2004	SHSTUR	5	1.2	2	0.0236	0.278
MDC	701/19.7	Missouri R. @ Mokane	2004	SHSTUR	5	2.1	2	0.025	0.393
MDC	701/19.7	Missouri R. @ Mokane	2004	SHSTUR	5	1.8	6	0.0488	0.346
MDC	701/19.7	Missouri R. @ Mokane	2004	SHSTUR	5	1.9	8	0.0928	0.807
MDC	701/80.7	Missouri R. nr. Columbia	2002	CARP	26	3.2	3	0.018	0.028
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2000	FH CAT	16	2.6	1	0.016	0.053
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2002	CARP	15	5	6	0.04	0.052
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2002	FH CAT	17	5.3	2	0.028	0.077
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2004	SHSTUR	5	1.8	6	0.0575	0.431
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2004	SHSTUR	5	1.8	4	0.0356	0.184
MDC	1604/47.5	Missouri R. @ Weldon Spring CA	2004	SHSTUR	5	2	8	0.0575	0.739

No. in Sample = number of fish in sample; CH CAT = channel catfish; SHSTUR = shovel nose sturgeon

Data in the table above are from 2000 to 2005, for fillets of fish only. These are the data used in the most recent assessment of the Missouri River for impairment due to chlordane and PCBs. A more complete chart of all data for chlordane as sum of the isomers and PCBs (including whole fish and fish eggs) is appended to the TMDL.

As mentioned, these pollutants degrade slowly and are extremely persistent in the environment. However, since they are no longer produced, a downward trend is inevitable and the department recommends the development of a consistent protocol for measurement of the pollutants in fish tissue and continued sampling.

The U.S. Environmental Protection Agency approved this TMDL November 3, 2006.

For more information call or write:

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