



Missouri Department of Natural Resources

# Total Maximum Daily Load Information Sheet

## Des Moines River

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### Water Body Segment at a Glance:

**County:** Clark  
**Nearby Cities:** Alexandria  
**Length of impaired segment:** 29 miles  
**Pollutant:** Bacteria  
**Source(s):** Multiple Point and Nonpoint Sources  
**Water Body ID:** 0036



State Map Showing Location of Watershed

**Scheduled for TMDL development:** 2014

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### Description of the Problem

#### Beneficial uses of Des Moines River

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category A
- Secondary Contact Recreation

#### Use that is impaired

- Whole Body Contact Recreation – Category A

#### Standards that apply

- Missouri’s Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E.coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

#### Background information and water quality data

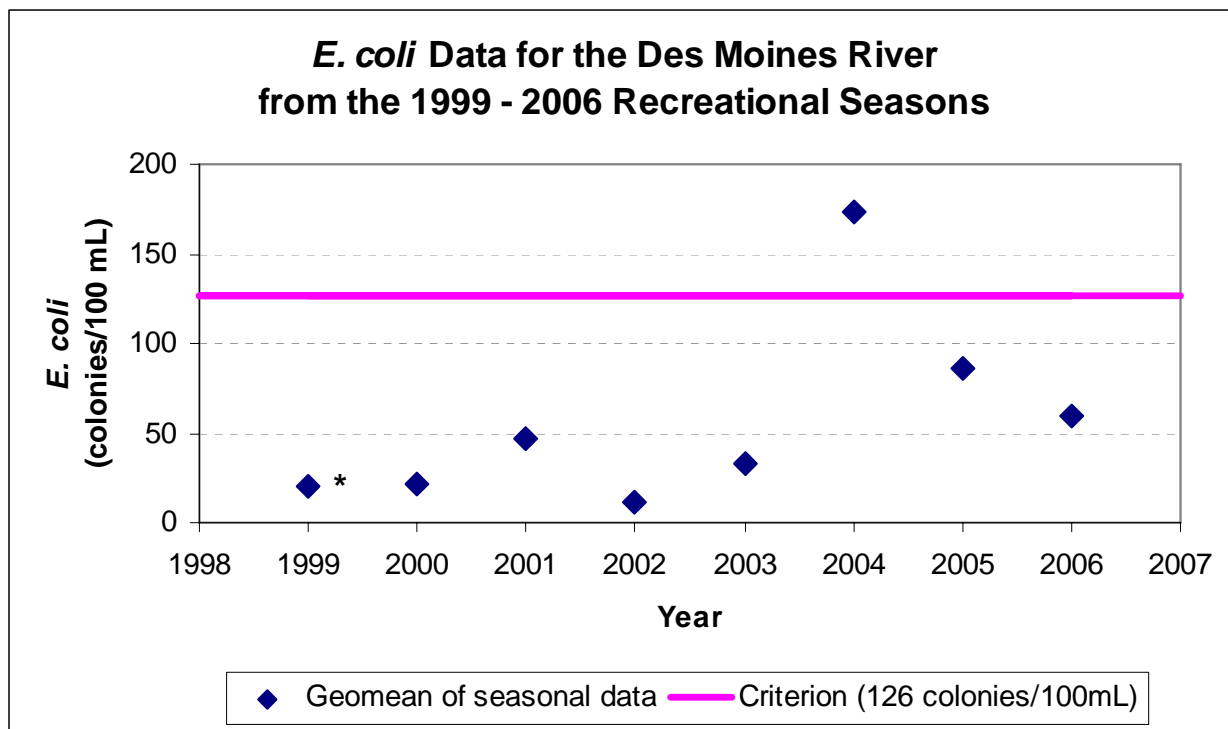
The Des Moines River forms the border between Missouri and Iowa along the northeast “corner” of Missouri. It is designated as Category A for the whole body contact recreation use, which means it has swimming areas which are open to and fully accessible by the public. The data supporting this impairment were gathered by the Iowa Department of Natural Resources from 1999-2006. The Listing Methodology states that if the annual average for at least one of the last three years of

available data exceeds the 126 col/100 mL criteria, the stream is judged to be impaired. The 2004 recreation season data exceeded the bacteria criteria.

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. *E. coli*, are bacteria found in the intestines of warm blooded animals and used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine<sup>1,2</sup>. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

The 2004 recreation season data from the Des Moines River exceeded the bacteria criteria of 126 col/100 mL for Category A. The monitoring site is near St. Francisville, Mo., and the geometric mean for 2004 was 173.5 col/100 mL (See graph below).

A map showing the river and the sample site is on the next page.

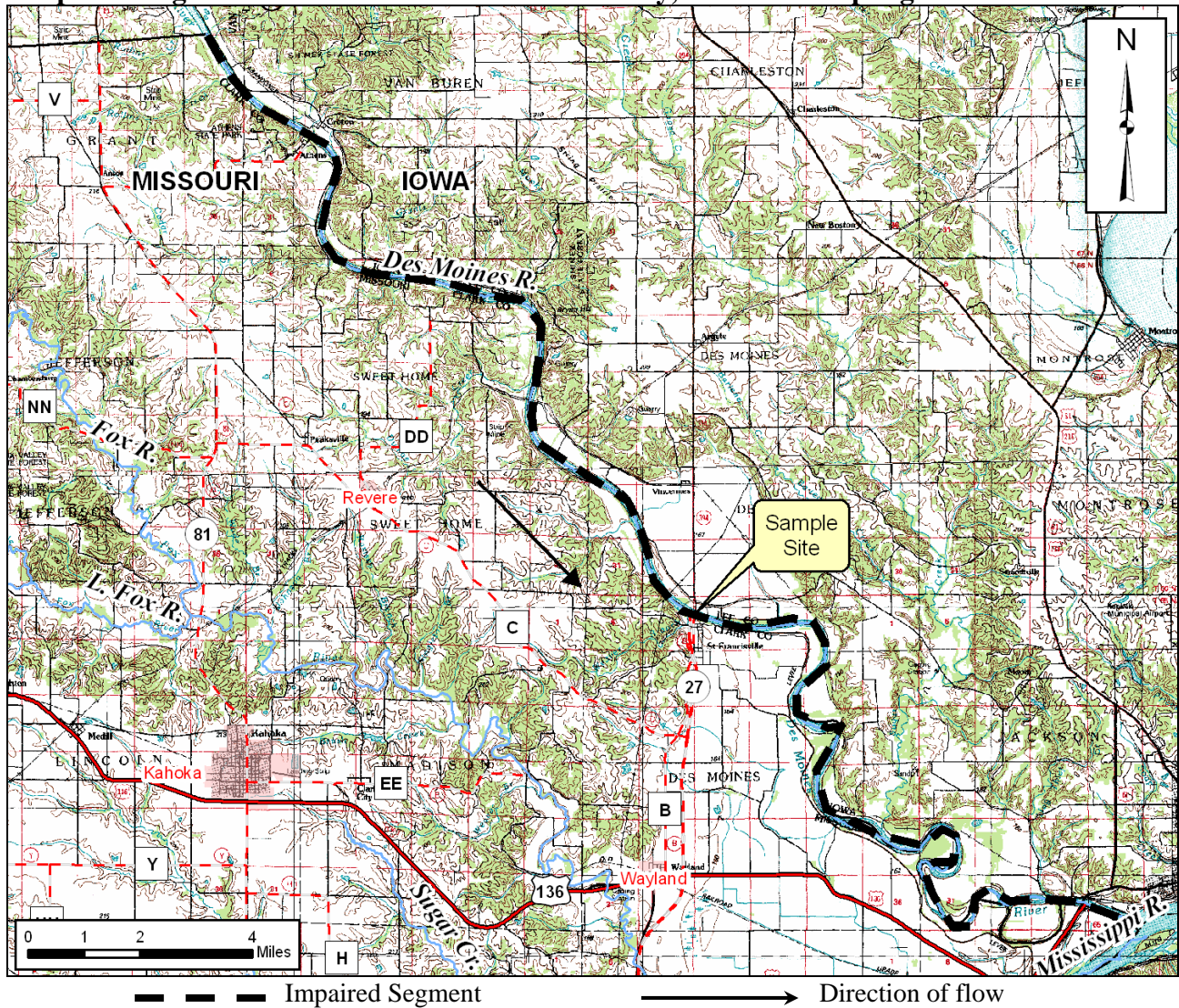


\* Geomean calculated using fewer than five (5) samples

<sup>1</sup> Hudault S, Guignot J, Servin AL (July 2001). "[Escherichia coli strains colonising the gastrointestinal tract protect germfree mice against Salmonella typhimurium infection](#)". *Gut* **49** (1): 47-55

<sup>2</sup> Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424-8.

**Map Showing the Des Moines River in Clark County, Mo. and Sampling Site**



**Sample Sites**  
1 – Des Moines River at State Highway B

**For more information call or write:**  
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 P.O. Box 176, Jefferson City, MO 65102-0176  
 1-800-361-4827 or 573-751-1300 office or 573-522-9920 fax  
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