

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Total Maximum Daily Load Information Sheet

Bens Branch

Water Body ID: 3960¹ (3980 in the 2014 303(d) List)

Water Body Segment at a Glance:

County: Jasper
Nearby Cities: Webb City and Cartersville
Length: 5.8 miles
Pollutants: Cadmium (in sediment)
Lead (in sediment)
Zinc (in sediment)
Source: Oronogo Duenweg mining belt



State Map Showing Location of Watershed

Schedule for TMDL development:

TMDL development schedules are subject to change.

The most current schedule for TMDL development is available on the department's website at dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm

Description of the Problem

A water body is considered impaired when it fails to meet applicable water quality standards. Water quality standards consist of designated uses, water quality criteria, an antidegradation policy and implementation procedures. Bens Branch is impaired due to exceedances of state water quality criteria that protect aquatic life designated uses.

Designated uses of Bens Branch*

- Warm Water Habitat (WWH)
- Whole Body Contact Recreation Category B (WBC-B)
- Secondary Contact Recreation (SCR)
- Human Health Protection (HHP)
- Irrigation (IRR)
- Livestock and Wildlife Protection (LWP)

* In addition to these specific uses, all waters of the state are protected by the general water quality criteria that are specified in the state's Water Quality Standards at 10 CSR 20-7.031(4).

¹ The 2014 303(d) List of impaired waters refers to this stream as water body ID 3980, however this water body ID does not yet appear in Missouri's Use Designation Dataset and Water Quality Standards.

Designated uses that are impaired

- Warm Water Habitat (WWH)
- General Criteria

Criteria that Apply

- Missouri streams are protected from sediment toxicity by the general criteria found at 10 CSR 20-7.031(4). The particular general criteria that apply to Ben Branch include:

(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal, or aquatic life.

(G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

- Missouri has no numeric criteria for metals in sediment. Likewise, federal guidelines have not yet been established for toxic chemicals in stream or lake sediments. In lieu of such criteria, Probable Effect Concentrations, or PECs, suggested by McDonald, et al., are used to assess toxicity in stream sediments.² PECs are the concentrations at which some toxic effect on aquatic life is likely.

Water Quality Data

The relationship between the amount of a toxicant in sediment and the strength of the toxicity it exerts on aquatic life is not simple or straightforward. While neither Missouri nor EPA has standards or guidelines for sediment toxicity, the USGS has reviewed a large number of research papers on the subject. Based on this review, the USGS suggests numeric guidelines that could be used to judge the potential for toxicity to aquatic life. These are the PECs mentioned in the discussion of “criteria that apply.” A stream is judged to be impaired due to metals in sediment if the geometric mean of the observed data exceed the PEC value by more than 150 percent (Table 1).

Table 1. Metals in Sediment Data for Bens Branch (data from 1991 – 2007)

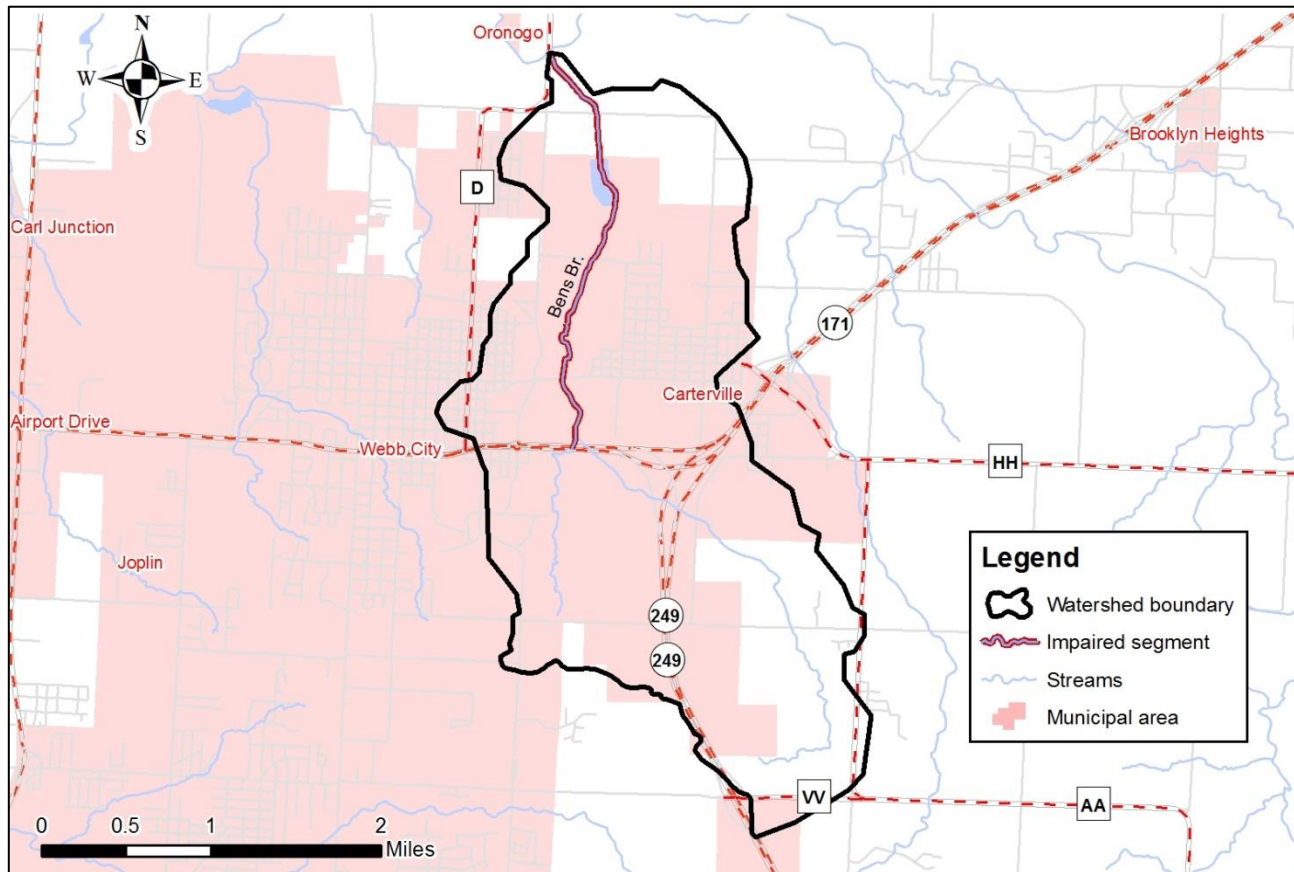
<i>Pollutant</i>	<i>PEC (mg/L)</i>	<i>Bens Branch Geometric Mean (mg/L)</i>
Lead	128	1,202
Cadmium	4.98	159.10
Zinc	459	5,772

TMDL for Bens Branch

The Bens Branch TMDL will calculate the maximum amount of each listed pollutant that the stream can receive and still meet water quality standards. The TMDL will also identify all potential or suspected pollutant sources in the watershed and distribute the allowable pollutant loads among those various sources. When developed, the Bens Branch TMDL will use the most current and available data. For this reason, the final TMDL may present information that differs from that contained in this information sheet.

² *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*, D. MacDonald, et al., 2000. USGS

Map of the Bens Branch Watershed



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