

Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

West Fork Black River

Water Body Segment at a Glance:

County:	Reynolds
Nearby Cities:	Centerville, Bunker
Length of impaired segment:	31.7 miles
Pollutants 1, 2:	Lead and nickel (in sediment)
Length of impairment within segment:	1.3 miles
Source:	Doe Run West Fork Mine
Pollutant 3:	Nutrients
Length of impairment within segment:	31.7 miles
Source:	Not identified



Schedule for TMDL development: 2013 (Lead and nickel)
Nutrients TMDL approved by U.S. EPA December 23, 2010

Description of the Problem

Designated beneficial uses of West Fork Black River

- Livestock and Wildlife Watering
- Protection of Warm-Water Aquatic Life
- Protection of Cool Water Fishery
- Human Health Protection (Fish Consumption)
- Whole Body Contact Recreation

Uses that are impaired

- Protection of Warm-Water Aquatic Life (Metals)
- General Criteria (Nutrients)

Standards that apply

- Missouri's Water Quality Standards (WQS) contain no criteria for metals in sediment. Likewise, the U.S. Environmental Protection Agency has not yet established federal guidelines for toxic chemicals in stream or lake sediments. In lieu of such criteria, Probable

Effect Concentrations suggested by McDonald, et. al¹, are used. PECs are the concentrations above which some toxic effect on aquatic life is likely.

- In addition, the WQS also do not contain criteria for nutrients. Though there are no specific criteria that apply to this river for either metals or nutrients, all Missouri water bodies are protected by the general (narrative) criteria found at 10 CSR 20-7.031(3). The general criteria that apply to the West Fork Black River include:
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.
 - Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.
- Also, Missouri's WQS Specific Criteria at 10 CSR 20-7.031(4)(A) state, in part, that:
 - The maximum chronic toxicity criteria in Tables A and B shall apply to waters designated for the indicated uses given in Tables G and H. All Table A and B criteria are chronic toxicity criteria, except those specifically identified as acute criteria. Water contaminants shall not cause or contribute to concentrations in excess of these values.
- Additionally, Missouri WQS at 10 CSR 20-7.031(4)(B)1 state:
 - Water contaminants shall not cause the criteria in Tables A and B to be exceeded. Concentrations of these substances in bottom sediments or waters shall not harm benthic organisms and shall not accumulate through the food chain in harmful concentrations, nor shall state and federal maximum fish tissue levels for fish consumption be exceeded.

Background information and water quality

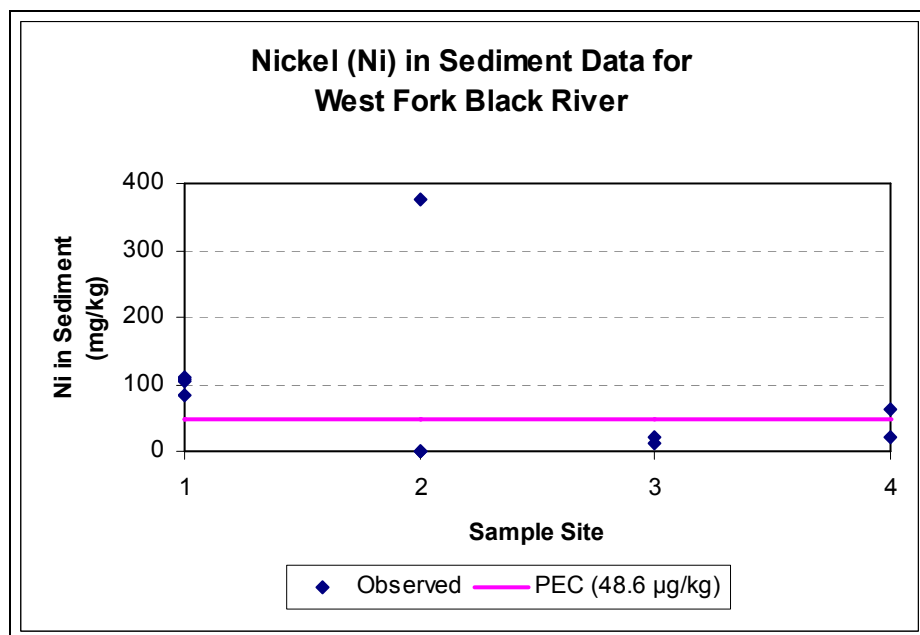
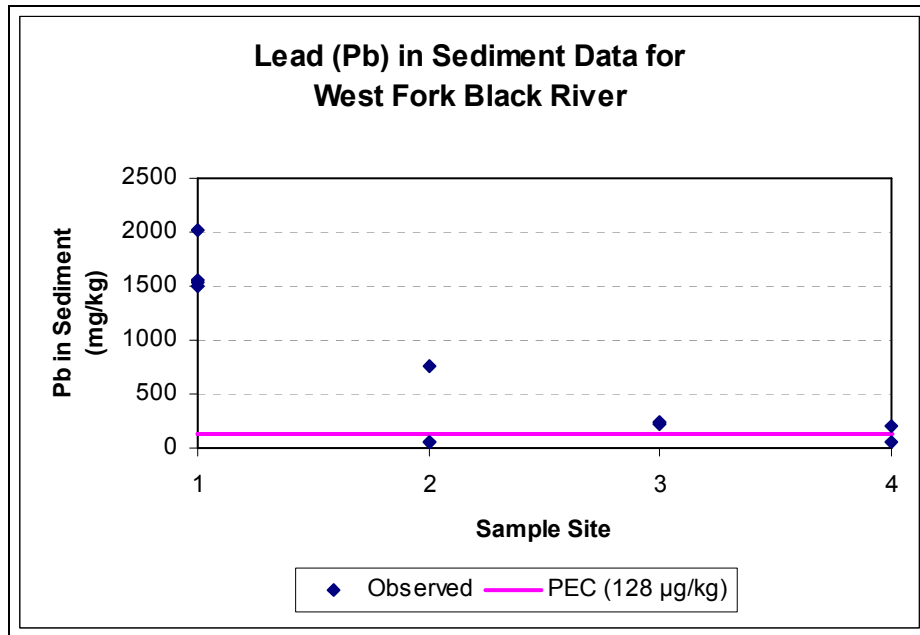
The West Fork Black River, a tributary to the Black River, is located in southeast Missouri, near the town of Centerville in Reynolds County. The West Fork Black River watershed is within the confines of the Mark Twain National Forest in the Ozark Highlands ecoregion. The watershed is rural, with relatively few residents. The Doe Run mining company and logging activities account for the majority of the commerce in the watershed.

The West Fork Black River is listed on the 2008 303(d) List of impaired waters due to elevated levels of nutrients in the water, as well as lead and nickel in the stream bed sediment. The Missouri Department of Natural Resources has received many complaints about unsightly bottom growths in a swimming area downstream of the West Fork Mine. While one source of nitrogen and phosphorus contributing to excessive algae on the stream bottom may be underground water pumped from the mine, several studies that have been conducted are inconclusive on this point, and the source of these nutrients is not identified on the 2008 303(d) List. The West Fork Black River TMDL addressing the nutrient impairment was approved by EPA on December 23, 2010.

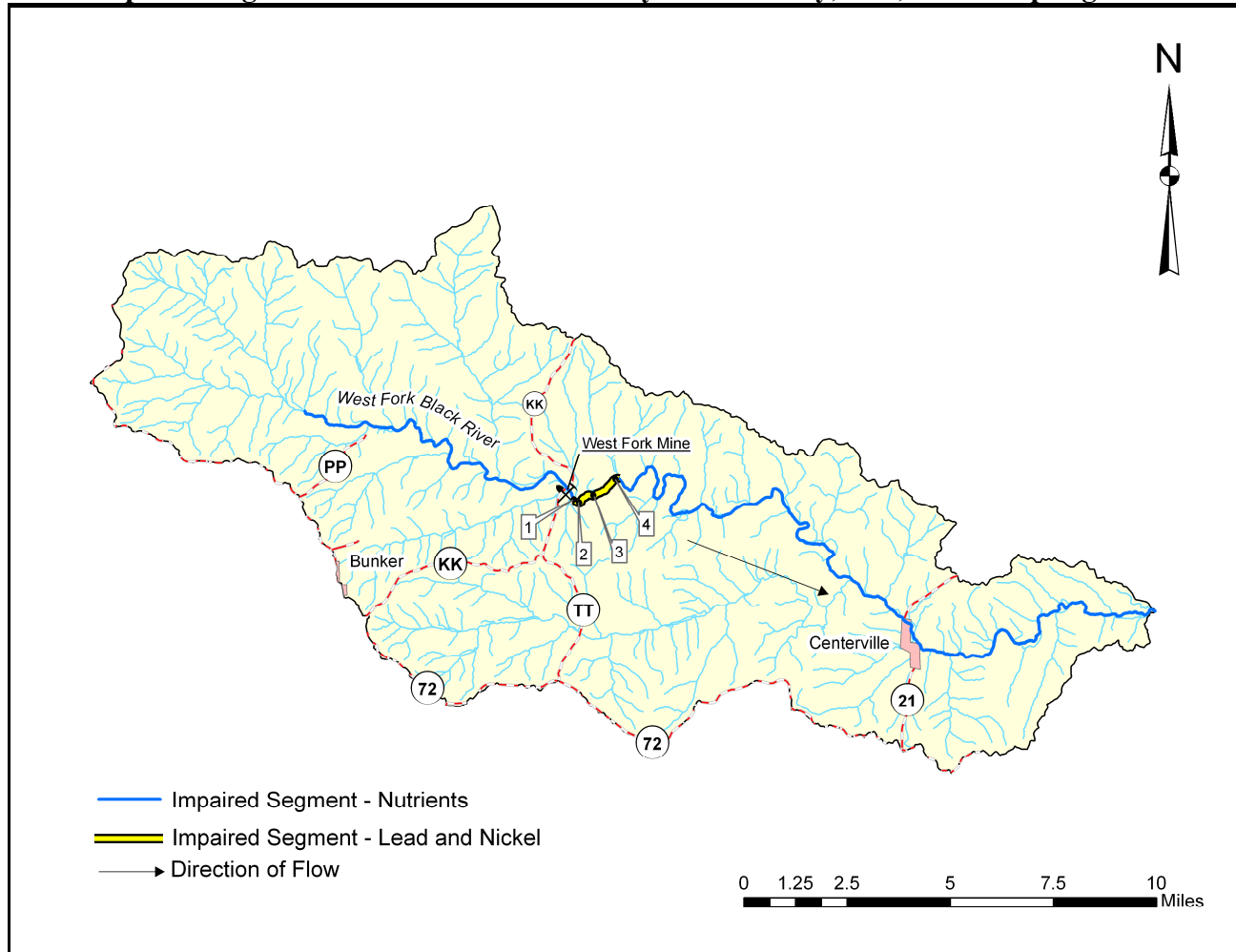
¹ *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*, D. MacDonald, et al., 2000

Currently permitted mining operations in the watershed (i.e., the Doe Run West Fork Mine) have contributed to the impairment of metals in the sediment of the West Fork Black River. The impairment for lead and nickel in sediment is based on data collected by the department from 1995 – 2007. The mean levels of both lead and nickel in sediment sampled for two miles downstream of the West Fork Mine outfall exceeded 150% of PEC values for each metal. For lead, the PEC value is 128 mg/kg (milligrams per kilogram or parts per million) and for nickel that value is 48.6 mg/kg.

Metals data and a map of sample sites used to assess the impairment can be found below.



Map showing West Fork Black River in Reynolds County, Mo., with sampling sites



Sample Site Index

- 1 – West Fork Black River at West Fork Mine outfall
- 2 – West Fork Black River 0.2 miles below West Fork Mine outfall
- 3 – West Fork Black River 0.6 miles below West Fork Mine outfall
- 4 – West Fork Black River 1.3 miles below West Fork Mine outfall

The final West Fork Black River TMDL will be based on the most current available data and information. For TMDL status or additional information, please contact the Water Protection Program at:

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