

# Episodic Elevated Coliform in Vadose-Zone Water within Mammoth Cave National Park, Kentucky

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## Abstract

In October 2006, microbiology researchers identified elevated levels of fecal coliforms (and in many cases *Escherichia coli*) in some vadose-zone waters in Mammoth Cave National Park (the Park). They were identified in several waterfalls and seeps that are fed by water from the area of the park containing the visitor center, parking lots, and campground. The fecal coliform levels vary from less than ten colony-forming units per 100 milliliter to several thousand colony-forming units per 100 milliliter. Often spikes in coliform level are linked to rain events. Spikes have not been identified from areas that are not associated with development.

The identification of the elevated coliform levels led to several responses. Rapid testing determined what areas were showing fecal coliform contamination. Initial testing and discussions with the Public Health Service determined that Kentucky secondary contact standards would apply to the situation. Synoptic testing of two areas (the waterfalls at the Historic Entrance and Mammoth Dome) is continuing to monitor for possible risks to human health; however, the health standard has not been exceeded to date. A more research oriented program involving dye tracing to better understand vadose-zone flow in the developed area, systematic synoptic and event-based sampling, and efforts to source-type the bacteria has started. In addition, inspections of the sewer lines in the park indicated locations of some breaks in sewer pipes. These breaks were repaired.

Elevated coliform within Mammoth Cave is an on-going issue of concern at the Park. The current status of both the research and the Park's response will be discussed.