

## **Eastern Kentucky's Watershed Conditions**

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### **Abstract**

Five years study of Eastern Kentucky's watershed condition has been performed since 2013 thru 2017 to identify the main type of pollution present in the area. The area of samplings consisted of eight counties: Boyd, Elliot, Floyd, Greenup, Johnson, Lawrence, Martin, and Pike counties. Samples were mainly taken three times a year: spring (May), summer (July), and fall (September). All water samples were collected according to U.S. EPA sampling method for biological contaminants. Samples were collected into sterile 125 mL plastic bottles then placed into a cooler at temperature lower than 10oC. The samples then were delivered to laboratory to be analysed. The holding times of the samples were under 48 hours. To avoid contaminations, samplers were instructed to wear gloves, and open the seals and caps of the bottles at the sampling locations and times. The chain of custody forms were also filled out and signed during the sampling times by samplers, runners, and the technician who analysed the samples to make sure the samples were analysed within the holding times. Results showed that the main pollutants present in the Eastern Kentucky's water system was coliforms. Coliforms are group of bacteria that can cause some infectious diseases such as diarrhea and disruption of kidney functions. Many sampling sites were in red or poor conditions of water continuously during the five years sampling periods. These conditions lead to the use of abundance chemicals by water treatment plant facilities to disinfect the water for public drinking water. The abundant use of disinfectants usually increases some harmful chemical in drinking water, such as trihalomethane (THM) and haloacetic acids (HAA5). These harmful chemicals are predicted to cause some bad effects in human health, such as skin irritation, birth defects, and risk of cancer. This study shows the important of clean water system to prevent and protect some human health problems. It also shows the important of people's awareness and involvements in environmental activities to serve and help others with valuable scientific data information.

Keywords: Eastern Kentucky's watershed, water system, human helth