



INTERPRETING WATER ANALYSIS FOR INDICATOR BACTERIA

FACT SHEET

Escherichia coli, E. coli for short, is a family of bacteria commonly found in the intestines of warm-blooded animals. The primary sources of E. coli contamination in surface waters are untreated wastes from combined sewer overflows, failing septic systems, nonpoint runoff from livestock farms, agricultural fields fertilized with manure and improperly operating wastewater treatment plants. While E. coli does pose a threat to human health, that is not the primary concern about its presence in surface water. E. coli in rivers, streams, and lakes suggests the presence of untreated waste, which contains bacteria and viruses that are even more dangerous. Because analysis for these other contaminants takes weeks, A & L Laboratory uses a technique that detects E. coli in 24 hours. Thus, if E. coli is found to be present as an indicator, it is likely that other more harmful bacteria and viruses are present.

Recommended Limits of Coliform and E. coli bacteria *

Type of water	Total Coliform per 100 mL		E. Coli per 100 mL	
	Desirable	Permissible	Desirable	Permissible
Potable and Well Water	0	0	0	0
Primary contact water (swimming)	<1000	<2400	<200	<1000
Secondary contact water (boating and fishing)	<5000	<10,000	<1000	<5000
Treated sewage effluent	Coliform levels should not exceed those of water receiving the discharge.			

Ranges of indicator bacteria found in surface water and contaminated surface water *

Bacterial Group	Surface Water Colonies per 100 mL	Fecal contaminated surface water Colonies per 100 mL
Total Coliform	<1 to 80,000	1200 to >4,000,000
Fecal Coliform	<1 to 5000	200 to >2,200,000
Escherichia Coli	<1 to 576	126 to >2,000,000
Fecal Streptococcus	<1 to 1000	400 to >1,000,000

* U.S. Environmental Protection Agency, 1986.

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Human Diseases caused from contact with contaminated surface water **

Disease	Reservoir	Symptoms in brief	Prevention & Control
Cryptosporidium	Man, cattle & domestic animals	Diarrhea, cramps, nausea & vomiting	Sanitary sewage disposal, education and personal hygiene
Gastroenteritis (Diarrhea)	Man and animals	Diarrhea, nausea, vomiting, cramps & fever	Environmental sanitation, education and personal hygiene
Giardiasis	Bowel discharges of infected persons, dogs & beavers	Prolonged diarrhea, cramps, severe weight loss & fatigue	Food, water, sewage sanitation and personal hygiene
Hepatitis A	Discharges of infected persons	Fever, nausea, loss of appetite, vomiting, fatigue, headache & jaundice	Sanitary sewage disposal, food sanitation, personal hygiene, and water purification
Shigellosis	Bowel discharges of carriers and infected people	Diarrhea, fever, blood and/or mucus in stools	Food, water, sewage sanitation and fly control
St. Louis Encephalitis	Unknown - possibly wild animals, birds or mosquito eggs	Acute onset, headache, high fever and meningeal symptoms	Destruction of mosquito larvae and breeding places, repellents and insecticides
Typhoid Fever	Feces and urine of typhoid carriers or patients	General infection, fever, spots & diarrhea	Sanitary sewage disposal, protection of water supply and personal hygiene

** Indiana State Department of Health, February 1996.