SWIMMING BEACH WATER QUALITY

Significance – Operators of public swimming/bathing beaches are required to monitor the bacterial water quality by sampling for E. coli bacteria. It may be prudent for owners of private lakes and ponds used for swimming to take this lead. Epidemiological studies of fresh water bathing beaches have established a direct relationship between the density of Escherichia coli (E. coli) in water and the occurrence of swimming-associated gastroenteritis.

E. Coli Bacteria – Escherichia coli (E. coli) bacteria live in the digestive systems of humans and other warm-blooded animals. Most strains of the E. coli bacteria are not dangerous, but they can indicate the presence of other disease-causing bacteria. There are a variety of sources that contribute bacteria and other pathogens to the surface water. These sources include illicit waste connections to storm sewers or roadside ditches, septic systems, combined and sanitary sewer overflows, storm (rain) runoff, animal waste, waterfowl, and agriculture runoff.

Sampling procedure – Normally three locations are sampled each time a public beach is monitored. Collect samples in sterile bottles of 125 milliliter (4 oz.) or larger volume. Samples are generally drawn about one foot below the surface in water between 3-6 feet in depth. Plunge the opened sample bottle vertically downward until you reach the one foot depth then scoop the sample up and away from your body. Take samples in different locations to obtain an average over the beach area. Chill samples in a cooler and rush to the lab so testing can start within 6 hours.

What the lab results mean – The level of E. coli in the sample will be reported as colony forming units (CFU) or most probable number (MPN) of colonies per 100 milliliter of sample volume. The lower the bacterial count the better the water quality.

E. coli result	Bathing Suitability
Under 130	Suitable
130-300	Suitable – (Note: may not be suitable for public beaches where the 30 day geometric mean of samples is over 130*)
Over 300	Unsuitable – (some samples over 300 may be acceptable providing the daily geometric mean is below 300*)

*Contact your county health department beach program coordinator for a determination of the 30 day geometric mean and daily geometric mean.

Beach closure – Lab results of public beach sampling are to be sent to the local county health department beach coordinator. The coordinator uses the lab results to calculate geometric mean values. The daily geometric mean must be below 300 E. coli per 100 ml sample for the water to be safe for swimming. Also, after several sampling events, the 30 day geometric mean must be below 130 E. coli per 100 ml sample to be considered safe for swimming. A beach is closed if E. coli levels exceed these values by authority of county health officials through the Michigan Public Health Code and Rule 323.1062(1) of the Part 4 Water Quality Standards (Promulgated pursuant to Part 31 of the Natural Resources and Environmental Protection Act, 1997 PA 451, as amended).

Lowering E. coli levels – Identify and eliminate possible sources of E. coli (refer to "E. coli bacteria" paragraph above). Factors such as wind and wave action, as well as ultraviolet light from the sun help to reduce the level of bacteria. The amount of time needed to reduce bacteria levels after a heavy rain can be unpredictable, however it usually takes less than 48 hours.