

**Creating Attainable Water Quality Criteria; Evaluation of Menomonee River,
Milwaukee, Wisconsin
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The Milwaukee Metropolitan Sewerage District (MMSD) performs routine, comprehensive sampling and monitoring of the waterways in the Milwaukee area. In 1994, the MMSD installed an Inline Storage System (ISS) in order to reduce the number of combined sewer overflows to the Milwaukee waterways from approximately 50 per year to an average of two per year. This presentation will use MMSD water quality monitoring data collected on the Menomonee River from 1994 to 2001 to evaluate how well the waterway (upstream and downstream of the combined sewer service area) is meeting the designated fecal coliform standards and if the corresponding criteria are in fact reasonable and achievable. The presentation will provide recommendations for creating criteria that are attainable and measured on a routine basis.

The Wisconsin Department of Natural Resources (WDNR) classifies all water bodies of the State by their ability to support "designated" or "beneficial" uses. The designated use identifies the type of aquatic community that the WDNR has determined that the water body should be able to support and the functions it is expected to provide. The WDNR developed five (5) biological use objectives and a recreational use objective to be applied to all water bodies.

- Cold Water Community (CW)
- Warm Water Sport Fish Communities (WWSF)
- Warm Water Forage Fish Communities (WWFF)
- Limited Forage Fishery (intermediate surface waters)
- Limited Aquatic Life (marginal surface waters)
- Recreational Use (Full body contact and partial body contact)

The WDNR established water quality criteria, which set forth the numerical water quality values or narrative criterion that must be maintained for the water body to meet its use designation or to protect human health and welfare.

For example, the Menomonee River is designated as a WWSF Community and full recreational use throughout much of its length. In order to meet the criterion for full recreational use, the surface water fecal coliform count may not exceed 200/100 ml as a geometric mean (based on not less than 5 samples per month), nor exceed 400/100 ml in more than 10% of all sample during any month. Certain sections of the river and its streams are granted variances from the surface water criteria for dissolved oxygen, fecal coliform and temperature. The variance criterion is 1,000/100ml (monthly geometric mean), nor exceed 2,000 per 100 ml in more than 10% of all samples during any month.

Using the Menomonee River as an example, this presentation will address the attainability of meeting the criteria and will provide recommended criteria based on long-term monitoring. This presentation will also explore the relationships between river flow and fecal coliform counts. Bacterial criteria similar to those in the Menomonee River are

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applied to Milwaukee area Lake Michigan Beaches. The presentation will summarize research that indicates that the principal bacterial sources are from nonpoint sources. The research includes bacterial loading calculations, bacterial DNA profiling, and an investigation of the link between Health Department beach closing orders and bacteria measurements.