

# Addressing Bacteria Impairments in a Stormwater Pollution Prevention Program

This fact sheet provides information for Municipal Separate Storm Sewer Systems (MS4s) to assist them in addressing a bacteria (fecal coliform or *E. coli*) Total Maximum Daily Load (TMDL) requirement. TMDLs are required under Section 303(d) of the federal Clean Water Act when a water is impaired and not meeting its designated use.

The fact sheet supplements the Minnesota Pollution Control Agency's (MPCA) general guidance for addressing TMDLs in a Stormwater Pollution Prevention Program (SWPPP).

## What are fecal coliform and *E. coli* bacteria?

Fecal coliforms and *E. coli* are groups of bacteria that are passed through the fecal excrement of humans, livestock and wildlife. The presence of these bacteria in a river or stream typically indicates the water has been contaminated with the fecal material of humans or animals.

Fecal coliforms or *E. coli* may indicate the presence of pathogens or disease producing bacteria or viruses. Waterborne pathogenic diseases include ear infections, dysentery, typhoid fever, viral and bacterial gastroenteritis, and hepatitis A.

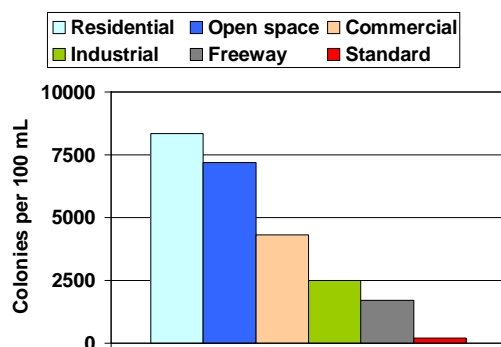
## How do I know if a lake or river is contaminated with bacteria?

Samples collected from a river or stream are used to determine concentrations of fecal coliform or *E. coli* bacteria. The samples are sent to a laboratory for analysis. Samples are usually collected from April through October, when people are most likely to be using the water for recreation.

By growing and counting colonies of bacteria from a water sample, the MPCA determines approximately how many bacteria were originally present. The current state water quality standard allows no more than 200 colonies or organisms of fecal coliform bacteria or 125 colonies or organisms for *E. coli* per 100 mL of sample water based on a monthly mean of at least five samples.

## What are sources of bacteria in stormwater?

Urban stormwater has surprisingly high concentrations of bacteria. The figure below, which summarizes data from several studies, shows concentrations of fecal coliforms are well above the water quality standard for all urban land uses. The primary sources of bacteria include pet waste, wildlife, septic systems, illicit discharges, and combined sewer overflows (CSOs).



Pitt and Maestre, 2005.

## How do TMDLs address fecal coliform bacteria from urban stormwater?

During the TMDL process, municipalities regulated under a National Pollutant Discharge Elimination System permit will receive a wasteload allocation for their stormwater. This allocation, when added to pollutant allocations for other sources such as agriculture and municipal wastewater, represent the maximum amount of pollutant (fecal coliform or E. coli bacteria) that can be discharged to a river or stream and still meet the water quality standard.

Some TMDL studies provide an estimate of the reductions needed from current bacteria contributions to meet their allocation. More typically an across-the-board reduction percentage (70 percent, for example) is provided for all sources believed to be contributing an excess bacterial load. Such a reduction would include stormwater sources.

## How do I comply with the permit requirement?

The Phase 2 MS4 General Permit will be re-issued in 2011. There will be significant changes from the 2006 permit. Specific guidance has not been developed yet as the permit language for the 2011 permit is not finalized. Following is a list of items MS4s can consider addressing until the permit is re-issued.

- Develop a list of TMDL WLAs that apply to the MS4, including baselines. The MPCA can provide this information.
- Develop a list of Best Management Practices (BMPs) that apply toward the WLA(s).
- Develop a list of BMPs to be implemented and applied toward the WLA(s) and schedules for those BMPs.

## Where can I learn more?

MPCA staff can provide additional information on the topics covered in this fact sheet. For example, we can provide information on how to develop and implement an Illicit Discharge Detection and Elimination program.

## References

Pitt, R.E., and A. Maestre. 2005. *Stormwater quality as described in the National Stormwater Quality Database (NSQD)*. 10th International Conference on Urban Drainage, Copenhagen/Denmark.

University of Minnesota. 2007. *Assessment of Stormwater Best Management Practices*. Edited by J. S. Gulliver and J.L. Anderson.