

Reducing Bacterial Pollution in the Willamette Basin

Bacterial Concerns

The lower portion of the Willamette River and many tributaries have been identified as not meeting water quality standards for bacteria.

People can be affected by bacteria present in water when enjoying water activities such as swimming, wading, wind surfing, water skiing, boating or fishing. Ingestion or contact with water contaminated with bacteria can cause skin and respiratory ailments, gastroenteritis and other illnesses in humans.

Sources of Bacteria

Bacteria comes from a variety of sources including failing septic systems, discharges of untreated or poorly treated sewage resulting from sewer malfunctions or overflows, and stormwater runoff that carries feces from pets, domesticated animals or wildlife from urban, residential, and agricultural lands.

Another source of bacteria in the Portland area is combined sewers where sanitary and stormwater systems are mixed. Most were built before the 1960's and overflow into the Willamette nearly every time it rains. The City of Portland is addressing these overflows through a series of projects that will be completed by 2011. For more information see <http://www.portlandonline.com/cso>.

Total Maximum Daily Load

When water quality standards are not met, the federal Clean Water Act requires the establishment of a Total Maximum Daily Load (TMDL). A TMDL determines how much pollution can be added to the river without exceeding water quality standards. The TMDL identifies where pollution comes from within the basin, calculates pollution loads that will meet water quality standards and divides or "allocates" the pollution loads among different sources.

TMDL Results

DEQ worked in cooperation with various agencies, land managers, municipalities and watershed councils to collect data on bacteria.

Water quality data for the Willamette Basin shows that many small Willamette tributaries draining urban and agricultural land exceed the bacteria standard throughout the year. The lower

Willamette River generally meets the standard in the summer but frequently exceeds it during the heavy rainfall events at other times of the year.

Under current conditions, DEQ found nonpoint sources contribute approximately 58% of bacteria loading, industrial and municipal point sources contribute less than 1%, and the City of Portland's CSO contributes approximately 41% to the mainstem Willamette River.

How Much Bacteria Needs to be Reduced?

Depending upon the location, it will take 30 to 90% reductions in bacterial loading from nonpoint sources to meet the bacteria standard, along with full implementation of Portland's Combined Sewer Overflow (CSO) strategy.

TMDL Implementation

Facilities and urban areas covered under an NPDES stormwater permit are required to implement stormwater quality best management practices to reduce pollutants. Permittees must show progress towards reducing bacteria loads through use of benchmarks. A benchmark is a total pollution load reduction estimate for each TMDL pollutant. Permittees are required to evaluate progress towards meeting the benchmarks or implement changes to the stormwater management plan in order to meet the benchmarks.

Agricultural Water Quality Management Area Plans developed by local stakeholders and approved by the Oregon Department of Agriculture will address bacteria pollution coming from agricultural activities. In addition, Confined Animal Feeding Operations are not allowed to discharge bacteria under their current permits.

DEQ-issued National Pollution Discharge Elimination System (NPDES) permit for industrial and municipal discharges will continue to be based on meeting the bacteria standard at the point of discharge. Portland's CSO program, which is under a Department Order, will reduce CSO discharges by 94% when finished in 2011.



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Note: DEQ uses an indicator group of bacteria, Escherichia coli (E. coli) to assess bacteria pollution. Numeric bacteria criteria are assessed as a single sample limit of 406 E. coli organisms or a 30-day log mean of 126 E. coli organisms with a minimum of 5 samples.

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

Loads from forestry lands and natural sources generally do not exceed the bacteria criteria and therefore do not require reductions.

What can one person do?

There are many sources of information regarding what one individual can do to prevent bacteria pollution. Several are listed below:

- Maintain your septic system, including the drain field. Follow manufacturer instructions regarding pumping and maintenance service. This prevents the discharge of raw sewage into storm drains and nearby rivers following heavy rainfall.
- Pet owners should pick up pet droppings. Storm water runoff can wash pet droppings directly into surface waters or bacteria can be carried to rivers and lakes through the storm sewer systems.
- Avoid feeding geese, ducks and other birds. Bird feces can be a significant contributor to bacteria levels. High bird populations can compound the problem.
- Diaper-aged children should be outfitted with appropriate swimwear. Many swimsuits are now made with specially-designed diapers built in. As well, rubber pants and diapers made for swimming will help keep fecal matter contained until diapers can be changed.
- Fence horses and cows away from streams and provide alternative watering devices.
- Boaters with on-board lavatories should make sure that their sanitary systems are discharged into a holding tank or sanitary sewer and not directly into the water.

Adaptive Management

Because of the uncertainties involved in the development of any TMDL and in the effectiveness of best management practices or strategies to reduce pollution, it is necessary to use an “adaptive management” approach to implementing bacteria TMDLs. The adaptive management approach involves continual tracking and evaluation of actions or strategies taken to reduce pollution. TMDL implementation will be adjusted based on actual pollution reductions and water quality improvement.

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The Willamette website is:

<http://www.deq.state.or.us/wq/tmdls/willamette.htm>

Alternative Formats

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Streams not meeting the Water Quality Standard for Bacteria - 2006

