



The Phosphorus Rule

Phosphorus Criteria
(s. NR 102.06, Wis. Adm Code)

Rivers: 100 ug/L

Streams: 75 ug/L

Reservoirs: 30 - 40 ug/L

Lakes: 15 - 40 ug/L

SOURCES OF PHOSPHORUS

- **POINT SOURCES:** Phosphorus can be directly added to surface water from piped wastes such as municipal and industrial wastewater treatment plants.
- **NONPOINT SOURCES:** Phosphorus runoff that occurs after heavy rains or melting snow wash over farm fields, feedlots, or urban areas and carry fertilizer, manure soil, and other phosphorus-containing contaminants.
- **NATURAL SOURCES:** Natural sources include natural soil erosion and build up in lake bottom sediments.

ACRONYMS

AM: adaptive management

BMPs: best management practices

DNR: Wisconsin Department of Natural Resources

NPS: nonpoint source

P: phosphorus

TMDL: total maximum daily load

WPDES: Wisconsin Pollutant Discharge Elimination System

WQBEL: water quality based effluent limit

WQT: water quality trading

Excess Phosphorus in Surface Water



PHOSPHORUS IS...

- Phosphorus is an essential nutrient necessary for plant growth
- Phosphorus is recognized as the controlling factor in plant and algae growth in Wisconsin lakes and streams
- Small increases in phosphorus can fuel substantial increases in aquatic plant and algae growth, which in turn can reduce recreational use, property values, and public health
- Phosphorus enters surface waters from point and nonpoint sources of phosphorus pollution

ADDRESSING EXCESS PHOSPHORUS...

- To address excess phosphorus, the “phosphorus rule” was established December 1, 2010
- This rule set the maximum allowable phosphorus concentration in Wisconsin’s waters (also known as phosphorus criteria)
- Point sources may receive more restrictive phosphorus requirements in their WPDES permit to ensure that the new phosphorus criteria are not exceeded
- Agricultural performance standards were also tightened to help curb NPS source phosphorus pollution

Phosphorus & Permits Requirements

Any permit issued or reissued after December 2010 is evaluated for phosphorus water quality based effluent limits. In some cases, new P limits are easily met, while in other instances limits can be very restrictive. When a new effluent limit is required, a compliance schedule is typically included in the permit to provide permittees time to evaluate their compliance options, and come into compliance with the new phosphorus limits. **Compliance schedules can be granted for up to 7 to 9 years.**

Compliance options to meet P limits:

- ◆ **Operational process changes or adding additional chemical.** The Department has developed an optimization worksheet to help facilities with optimization goals.
- ◆ **Adaptive Management & Water Quality Trading.** These options are innovated approaches designed to achieve compliance with P limits in the most cost effective manner possible.
- ◆ **A water quality standard variance.** This option can be used if compliance options are not economically feasible for a facility

SIGNS OF PHOSPHORUS IMPAIRMENT

EXCESS ALGAE GROWTH



DISCOLORATION



HARMFUL ALGAL BLOOMS



Photo taken on Petenwell Flowage & Lake Winnebago, WI

OTHER OPTIONS FOR PERMIT FLEXIBILITY:

In addition to flexible compliance options and extended compliance schedules (7-9 year schedules), permit limits also allow for some flexibility for permittees. Adjustments can be made to phosphorus limits through:

- ◆ **Limits based on six month averages.** This can ease compliance by allowing a longer averaging time for facilities with very stringent phosphorus limits, and is granted automatically by DNR to those who qualify.
- ◆ **Total Maximum Daily Loads (TMDLs).** This option factors in nonpoint sources, balancing reductions from both point and nonpoint sources to meet water quality criteria. TMDL-based phosphorus limits will generally be less stringent than phosphorus limits designed to protect impaired waters without a TMDL.
- ◆ **Site-specific phosphorus criteria.** This option can provide less stringent phosphorus limits in cases where the recreational and fish and aquatic life goals of the waterbody are being met.

Example Management Measures

Any best management practice (BMP) which is proven to reduce phosphorus in runoff can be considered in an AM or WQT plan.



Urban

- Grass swales
- Infiltration practices
- Porous pavement
- Retention/detention basins
- Sand filters



Agricultural

- Use of cover crops
- Contour farming
- Buffer strips
- No-till practices
- Grazing land protection
- Nutrient management



Other

- Stream bank stabilization
- Wetland restoration
- Constructed wetlands



Fact sheet for information only
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Adaptive Management & Water Quality Trading

Both AM and WQT are designed to be used when it is economically preferable to control nonpoint sources or other point sources of P compared with upgrading a particular point source facility (to achieve overall P reduction). Both options allow point sources to take credit for improvements made in their watershed to comply with phosphorus limits.

There are some key differences in how the two compliance options are implemented.

1. **End Goals** — WQT focuses on creating pollution credit to offset the pollution load coming from the discharge; AM focuses on improving water quality by reducing the in-stream P concentration.
2. **Calculating Offsets** — Calculation of WQT offsets requires trade ratios and margins of safety; AM does not.
3. **Timing** — WQT credits must be generated prior to permit issuance; AM allows permittees to reduce effluent P over time.
4. **Monitoring** — AM requires in-stream monitoring; WQT does not.
5. **Eligibility** — Eligibility requirements differ for AM and WQT.

For more information on AM and WQT visit <http://dnr.wi.gov/>, search “adaptive management”.

ADDRESSING NONPOINT SOURCES:

The Department has been addressing nonpoint sources of pollution since 1979, beginning with the development of the Priority Watershed Program (ended in 2009).

- ◆ *Targeted Runoff Management and Urban Nonpoint Source & Storm Water Management Programs* started in 1999 and provide cost-sharing grants to reduce agricultural and urban nonpoint source pollution.
- ◆ *The Notice of Discharge Program (NOD)* which addresses significant water quality issues from agricultural sources has in place since 1984.
- ◆ *Performance standards and prohibitions for both agricultural and urban nonpoint sources* were developed in 2002 and updated in 2010 (ch. NR 151, Wis. Adm. Code) and are being implemented. Implementation of the agricultural performance standards is primarily conducted at the local level through county land conservation departments.

FOR MORE INFORMATION

- Visit the DNR phosphorus website:
<http://dnr.wi.gov/topic/surfacewater/phosphorus.html>
- Review DNR phosphorus implementation guidance
- Send questions to the email address
dnrphosphorus@wisconsin.gov
- View informational webinars
- See Ch. NR 102, 151, & 217, Wis. Admin. Codes