Wisconsin Wastewater Operations Association
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THE PLAIN ENGLISH GUIDE TO THE NEW PHOSPHORUS REGULATIONS

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Negotiating the Maize (Maze)

DNR, EAGS, Local Elected Officials, Ag. Etc.
NR 217.15 (1) (c)-If a permittee discharges phosphorus, but *does not have a technology based limitation* for phosphorus in their permit, the department ...determine whether a discharge will cause, has the *reasonable potential* to cause or *contribute to*, an *exceedance* of the phosphorus water quality criteria in the receiving or *downstream* waters.

**Note:** Reasonable Potential(p 99)-Effluent Phosphorus Exceeds Water Quality Based Effluent Limit (WQBEL)

**Limited Aquatic Life Streams Exempt except for “Downstream**
DNR Implementation Guidance Defines “Downstream” for LAL Streams

Limited Aquatic Life Streams Exempt except for “Downstream”

“Downstream” for LAL = Stream Classification Change

DNR Implementation Guidance
Basic Formula – Streams and Rivers

- WQBEL = [(WQC) (Qs+(1−f)Qe) − (Qs−fQe) (Cs)]/Qe
- WQBEL = [WQC (Qs+Qe)−Qs*Cs]/Qe

Where:
  - WQBEL - Water Quality Based Effluent Limitation
  - WQC - Water Quality Criteria
  - Qs - Stream Flow (7Q2 or 30Q3)
  - Qe - Plant Effluent Flow
Background (Cs) and Stream Flow (Qs) Determines WQBELs – Streams (75 ug/L)

Note: For Simplicity, f=0

Qs /Qe

WQBEL (mg/L)

Cs-30 ug/L  Cs-75 ug/L

WQBEL Envelope
53% Exceed Criteria Statewide-USGS Study

http://pubs.usgs.gov/pp/pp1722/

IF CRITERIA EXCEEDED
LIMIT = CRITERIA
Background (Cs) and Stream Flow (Qs) Determines WQBELs – Rivers (100 µg/L)

Note: For Simplicity
f=0

WQBEL Envelope

Qs/Qe

WQBEL (mg/L)

Cs-30 µg/L

Cs-100 µg/L
NR 102 Criteria – Rivers (100 ug/L)
46 Enumerated Rivers

- Fox River near New Munster
- Sugar River near Brodhead
- Pecatonica River at Maritintown
- Rock River at Afton
- Yahara River near Fulton
- Rock River at Fort Atkinson
- Bark River at State Highway D
- Crawfish River at Milford
- Grant River at Barton
- Kickapoo River at Steuben
- Wisconsin River at Muscoda
- Baraboo River near Baraboo
- Lemonweir River near New Lisbon
- La Crosse River at La Crosse
- Black River near Gainesville
- Trempealeau River at Dodge
- Buffalo River near Tell
- Chippewa River at Durand
- Red Cedar River at Colfax
- Eau Claire River near Fall Creek
- St. Croix River near Truscott
- Flambeau River near Kruse
- South Fork Flambeau River near Phillips
- Eau Claire River near Oxford
- Chippewa River near Bruce
- St. Croix River at St. Croix Falls
- St. Croix River near Danbury
- Namekagon River at Trego
- Milwaukee River at Milwaukee
- Sheboygan River at Sheboygan
- Fox River near Waukesha
- Little Wolf River at Royalton
- Wolf River at New London
- Emissary River near Embarrass
- Wolf River near Shawano
- Fox River at Berlin
- Oconto River near Giblett
- Peshtigo River at Peshtigo
- Menominee River near McAllister
- White River near Ashland
- Wisconsin River at Portage
- Wisconsin River at Grandfather Dam

52 % of 46 Rivers Exceed Criteria-USGS Study
http://pubs.usgs.gov/pp/1754/
Great Lakes and Green Bay Criteria

- Lake Michigan - 7ug/L
- Lake Superior - 5ug/L
- Green Bay - Unique Case
- Interim Limits - Near Shore or Whole Lake Models (Note: Both Lakes meet Whole Lake Criteria)
- Interim Limits Option
  - The department may set an interim effluent limit based on the best readily available phosphorus removal technology commonly used in Wisconsin.
  - **Note: At the time this rule was promulgated, December 1, 2010, the best readily available phosphorus removal technology indicates a limit of 0.6 mg/L.**
Direct Dischargers to Inland Lakes – Meet Criteria

Stratified reservoirs 30 ug/L
Non-stratified 40 ug/L. (Lake Winnebago)
Stratified, two-story fishery lakes 15 ug/L.
Drainage, stratified lakes 30 ug/L.
Drainage, non-stratified lakes 40 ug/L.
Seepage, stratified lakes 20 ug/L.
Seepage non-stratified lakes 40 ug/L.

Note: Waters impounded on rivers or streams that don’t meet the definition of reservoir in this section (14 day resident time) and shall meet the river and stream criterion that applies to the primary stream or river entering the impounded water (75 ug/L for streams and 100 ug/L for enumerated rivers).
TMDLs May Drive Limits “Downstream”

• Lower Fox-Main Stem-Draft 2010
• Rock River TMDL-Draft 2010 (Varied Limits)
• Red Cedar River TMDL-Draft 2011
• Planned TMDLs
  – Upper Fox/Wolf
  – Wisconsin River-Data Collection Phase
• Lake Pepin
• Lake St. Croix (Hudson)-Draft 2011
Potential Limits - WQBEL vs. TMDL

Rock River Watershed

Effluent Phosphorus Limitations (mg/L)

- DNR Calculated Concentrations
- Dec. 2010 Draft TMDL Daily Loads
- WQBEL Annual Limit
- WQBEL Monthly Limit

Month:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December
Effluent Dominated Stream

The final calculated effluent limitations for phosphorus are 0.075 mg/L, annual average and 0.225 mg/L, monthly average. These final effluent limits are included for informational purposes only and do not take effect until the permit reissuance. Please see the phosphorus compliance schedule included in the Schedules section of this permit. The phosphorus compliance schedule designates a final compliance date beyond the term of this permit. The interim effluent limitation for phosphorus of 0.6 mg/L, expressed as a six-monthly average (January-June and July-December) has been included. This interim limit of 0.6 mg/L, along with the current limit of 1.0 mg/L (monthly average), become effective on permit reissuance.

FACILITY IS LOCATED IN ROCK RIVER WATERSHED (ROCK RIVER TMDL)
Wisconsin DNR Compliance Schedule - September 30, 2011 Expiration Date

- Submit ONR-Minor Facility Modifications  Sept. 30, 2012
  - Increase Chemical Dose to Lower Effluent P
    - Chemical Only
    - Bio-P
- Submit Facility Plan  Sept. 30, 2014
  - Upgrading to meet WQBEL
  - Adaptive Management
  - Water Quality Trading
- Refine Facility Plan and Obtain DNR Approval  Sept. 30, 2015
- Submit Plans and Specifications (If Required)  June 30, 2016
Wisconsin DNR Compliance Schedule—September 30, 2011 Expiration Date

• Informational Steps
  – Progress Reports Annually to 2019
  – Facility Start-Up and Compliance Sept 30, 2020
Permit Schedule with New Limits < 0.6 for Mechanical and 1.5 mg/L for Lagoons

- Facility Start-Up and Compliance
- Information Progress Report
- Information Progress Report
- Information Progress Report
- Obtain Plans and Specifications Approval
- Submit Plans and Specifications, If Required
- Refine Facility Plan and Obtain DNR Approval
- Submit Facility Plan, If Required
- Facility Plan Status Report, if Required
- Submit ONR-Minor Facility Modifications
Effluent Dominated Stream- TMDL in Development

• 2.2.1.4 Phosphorus Limitation(s)

The final calculated effluent limitations for phosphorus are an annual average limit of 0.075mg/L (0.38 lbs/d) and a monthly average limitation of 0.22 mg/L. This final effluent limit is included for informational purposes only and does not take effect until the next permit reissuance. The limitation may be recalculated at the next reissuance based on additional data or new information. See the phosphorus compliance schedule included in the Schedules section of this permit. The phosphorus compliance schedule designates a final compliance date beyond the term of this permit. Note that the interim limitation of 1 mg/L remains enforceable until the final phosphorus limitation becomes effective in the next permit issuance.

• Compliance Schedule-Nominal 9 Year Compliance Schedule
2.2.1.3 Phosphorus Limitation(s)

The final calculated effluent limitations for phosphorus are an annual average limit of 0.075 mg/L (0.015 lbs/d) and a monthly average limitation of 0.22 mg/L. This final effluent limit is included for informational purposes only and does not take effect until the next permit reissuance. The limitation may be recalculated at the next reissuance based on additional data or new information. See the phosphorus compliance schedule included in the Schedules section of this permit. The phosphorus compliance schedule designates a final compliance date beyond the term of this permit. Note that the interim limitation of 6.3 mg/L remains enforceable until the final phosphorus limitation becomes effective in the next permit issuance.

Nominal 9 Year Compliance Schedule
Permit Compliance Schedule-Limit > 0.6 mg/L for Mechanical and > 1.5 mg/L for Lagoons
If the phosphorus limitation based on an approved TMDL is less stringent than the water quality based effluent limitation calculated in s. NR 217.13 (*WQBEL*), the department may include the TMDL based limit in lieu of the limit calculated in s. NR 217.13 *if the limit calculated under s. NR 217.13 has not yet taken effect.*
Permit Reissuance Steps – Review

• Draft Water Quality Memo-Logic for Changed Phosphorus Limit in Permit
• Draft WPDES Permit (Compliance Schedules)
  – Opportunity and Need for Comment
• Public Noticed WPDES Permit
  – Opportunity and Need for Comment
• Final Issuance
  – Sets Time Frame for Variance Request
  – Note Variance Can be Requested with Permit Application Pending DNR Form Development
Option/Strategy 1
Accept WQBEL/TMDL Limit

• Compliance Schedule
  – Facilities Not Requiring Filtration-7 years
    (DNR Guidance Suggests 4.5 years not 7 years)
  – Facilities Requiring Filtration-9 years
    (DNR Guidance Suggests Construction in 7 to 8 years)

• Potential Compliance Dates
  – Permits Issued in 2011 (2108)

• Willingness of Governing Body to Pay for Compliance Costs in the Future

• Ability of Technology to Meet Limits in Your Facility
Option/Strategy 2a
Adaptive Management (AM)

• Plan Potentially Required at Time of Permit Reissuance Application (See DNR Implementation Guidance)
• May Not be Applicable to Effluent Dominated Stream Communities
• Interim Limits lower than NR 217 limit of 1 mg/L (0.6 mg/L in first permit term)
• Potential Loss of AM if Water Quality Criteria are not met after Two Permit Terms
  – Compliance Date 5 years after end of Second Permit Term (2026 if permit reissued in 2011)
Available for Any Discharger

Guidance, Statutory and Regulations late 2012 at the earliest if development authorized
Types of Trades
- TMDL Compliance (Drainage Area Contributing to Impaired Segment)
- WQBEL Compliance (Upstream Only)

Trading Partners
- Point to Point
- Point to Non-Point
- Non-Point to Non-Point
Water Quality Trading Framework

Required Statutory/Rule Changes

- Chapter 283
- Guidance not Rulemaking
  - List of Management Practices
  - Credit Threshold Analysis
  - Liability and Risk Management
  - Permit Writing Guidance
  - Water Quality Trading Application Form
  - Compliance Investigations
  - Pollutant Reduction Credit Tracking
Option/Strategy 3
Variances and Negotiations

• If WQBEL or TMDL limit at Point of Discharge <Current NR 217 Costs of Compliance > Willingness to Pay Governing Body Support
• Ability to meet limits at your facility
• May? Provide Opportunity for Alternative Limits or Trading for Some Dischargers
• Allow for Completion of TMDL Before WQBEL Limit (Third Party TMDLs?)
• Loss of Future Flexibility for Future Permits if variance not filed with first permit?
• Ability to Demonstrate Designated Use Not Impaired
Limits May Push Current Limits of Technology (LOTS)
Example of LOTS – EPA Nutrient Control Design Manual (August 2010)
Membranes $6,000,000 (0.075 mg/L ?)
Fuzzy Filter $2,000,000 (0.200 mg/l)
Incremental Cost for P Removal
- Difference 300 lbs/year at 0.84 mgd
- Incremental Capital Cost $13,000/lb P on Capital Basis
- Incremental Capital Cost $1,300/lb P on Annual Operating Basis-Debt Retirement
Operating Costs – Significant Factor

Annual Operating Costs - 0.84 mgd

- Replacement
  - Membrane Filtration
  - Fuzzy Filter-Deep Bed Filtration

- Process Power
- Pumping Power
- Additional Chemical

10 Molar Dose
Total Present Worth - "Trading" Driving Force

Trading "Gap"
NR 200 Variance

- Submit within 60 Days of WPDES Permit Reissuance
- Variance Subject to Administrative Hearing conducted by DNR Hearing Administrator
- Valid for Current Permit Term Only
- Reapply with Each Permit
- Attorney Not Required but Recommended
- Technical Assistance Required to Document Variance Conditions
- May Allow Negotiation for “Trading” with a Limit Less Stringent Than WQBEL
- Current WPDES Permit Terms Apply to Items Requested in Variance
- Needs Strong Governing Body Support over Time
Chapter 283 Variance

- Submit within 60 Days of WPDES Permit Reissuance (*30 days is suggested*)
- Variance Subject to Court Proceedings
- Valid for Current Permit Term Only
- Reapply with Each Permit
- Attorney Required
- Technical Assistance Required to Document Variance Conditions
- May Allow Negotiation for “Trading” with a Limit Less Stringent Than WQBEL
- Current WPDES Permit Terms Apply to Items Requested in Variance
- May Allow Demonstration That Receiving Stream Meets Designated Use Despite Phosphorus Criteria Exceedance
- Needs Strong Governing Body Support over Time
Chapter 283 Variance-Basis

• The secretary shall approve all or part of a requested variance, or modify and approve a requested variance if the permittee demonstrates, by the greater weight of the credible evidence, that attaining the water quality standard is not feasible because:

• a. Naturally occurring pollutant concentrations prevent the attainment of the standard;

• b. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating water conservation requirements;

• c. Human caused conditions or sources of pollution prevent the attainment of the standard and cannot be remedied or would cause more environmental damage to correct than to leave in place;

• d. Dams, diversions or other types of hydrologic modifications preclude the attainment of the standard, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the standard;

• e. Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

• f. The standard, as applied to the permittee, will cause substantial and widespread adverse social and economic impacts in the area where the permittee is located.
Options/Strategies for Negotiating the Maize (Maze)

• WQBEL Limit > Current NR 217
  – Maintain NR 217 Technology Based Limit
  – Dischargers < 150 lbs/month
    • Limit Required Unless Effluent P < WQBEL

• Accept WQBEL Limits or TMDL Limit If Available with Extended Compliance Schedule if
  – Limit < 0.6 mg/L-Mechanical
  – Limit<1.5 mg/L-Lagoon

• Adaptive Management/Trading

• Lagoon Variance (1 mg/L limit ?-Chemical Addition Likely to be Required per DNR Implementation Guidance)

• Chapter NR 200 and Wis. Statutes Chapter 283 Variances and Negotiations

• Hybrid Strategies-Effluent Reuse or Land Disposal

• The selected option for each discharger will likely be different depending on circumstances
What Should you Do Now?

• Retain a Qualified/Experienced Technical Consultant unless Staff has Necessary Experience
  – Outline Options to Governing Body
  – Review Applicability of Options for Your Specific Situation
• Review Advisability of Variances with both Technical Consultant and Legal Consultant
• Collect Appropriate Data (See DNR Implementation Guidance)
  – Plant Operations
  – Stream Data
• Consider Watershed Alliances with Other Dischargers in your Watershed
• Develop Relationships with Non-Point Contributors especially if Adaptive Management and/or Trading are Options to Pursue
Stay Tuned

DNR Guidance-Draft
August 25, 2011

Total Nitrogen Limits ?

Blending (SSOs) ?

Future TMDLs ?

Trading Guidance and
Additional Issues

Technology
Enhancements ?