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# NEW DEVELOPMENTS IN WATER QUALITY STANDARDS

# “Hot Topics”

- Nutrients
- Ammonia
- Antidegradation
- Water Quality Standards Update

# Nutrients

- Very little movement in the past year
- Illinois data was analyzed under the 'Conditional Probability' analysis sponsored by USEPA a year ago
- No clear direction for a phosphorus or nitrogen water quality standard was gained
- The Science Advisory Board (SAB) considered this method recently and was somewhat critical of the method

## Nutrients (cont.)

- USEPA is considering whether to expand the analysis of Illinois data using this method
- Meanwhile... Other States are beginning to consider alternative ways of regulating nutrients, including a dissolved oxygen-based plan similar to that which was proposed by Illinois EPA two years ago

# Current Numeric Phosphorus Values in Other States

- Many State have determined that a total phosphorus standard of between 0.03 and 0.1 mg/L is protective
- Wisconsin for example has proposed a 0.07 mg/L standard of smaller streams and 0.1 mg/L for larger rivers
- Michigan has a 0.04 mg/L value under consideration

# Nutrient Standard Lawsuits

- Florida and USEPA have an agreement to proceed with nutrient standards after an environmental group lawsuit was settled
- Wisconsin was recently named in an intent-to-sue document. USEPA is named with the intent of getting USEPA to force Wisconsin to speed up its nutrient standard adoption process

# USEPA Effluent Limits for P

- USEPA has been setting permit limits in Massachusetts for several years
- 12 STPs have total phosphorus limits of 0.1 mg/l
- 20 STPs have total P limits of 0.2 mg/L
- Some facilities have appealed these limits

# Nutrient Upcoming Events

- IEPA expects to hold another Stakeholder meeting after USEPA decides if they will start an additional study on our data
- We are currently committed to filling a IPCB rulemaking in December 2010
- We still have not received an answer from USEPA on whether nutrient standards will be applied as NPDES permit limits as other WQS are or if a “special method” will exist

# 2009 Draft Ammonia Criteria

- Published in Federal Register for December 30, 2009; Vol. 74 Number 249
- Update of 1999 National Ammonia Criteria
- “Scientific Views” must be received by USEPA by March 1, 2010
- For a copy of the criteria document, go to [www.epa.gov/waterscience/](http://www.epa.gov/waterscience/)

# Changes to the Criteria

- Freshwater mussel (Unionid mussels) data added to the 1985 derivation method (same method as 1999 criteria).
- Several additional species (snails, fish) added
- Two different sets of acute and chronic criteria generated:
  - Freshwater mussels present
  - Freshwater mussels absent
- Criteria are now invertebrate driven rather than fish driven and therefore temperature influences values.

# Numeric Values

- Freshwater mussels present acute value lowered by a factor of 2.
- Freshwater mussels present chronic value lowered by a factor of 5.
- Freshwater mussels absent values increase (become less stringent compared to 1999 and the current state water quality standards).

# Numeric Values: An Example

## 1999 Criteria (2002 IL STD)

Season	pH	Temp
Spring/fall	8.1	19.7
Summer	8.1	27.3
Winter	8.0	5.5

### 30 day average permit limits

Spring/fall	1.5 mg/L
Summer	0.9 mg/L
Winter	4.0 mg/L

## 2009 Draft Criteria

Season	pH	Temp
Spring/fall	8.1	19.7
Summer	8.1	27.3
Winter	8.0	5.5

### 30 day average permit limits

Spring/fall	0.3 mg/L
Summer	0.2 mg/L
Winter	0.8 mg/L

# Implementation Issues

- What does “Freshwater mussels present” mean?
- Unionid mussels are found in most regions of the U.S.
- Historically, unionid mussels were found in every (non-drying) water body in Illinois.
- Unionid mussels have disappeared from many streams in IL, especially in urban areas. (ammonia pollution?)
- The freshwater mussels present criteria will likely apply to all waters in IL although a case could be made for waters that do not have mussel habitat to be subject to the alternate criteria.

# Implementation Issues

- Mixing zones/zones of initial dilution will continue to apply but many will be found to be inadequate to allow the current “no reasonable potential to exceed standards” finding, i.e., no ammonia permit limits.
- What about the hundreds of small facilities, many of them lagoons that would have to be abandoned and replaced by state-of-the-art nitrifying treatment plants? How would these new plants be operated? This question has an exact parallel in the consideration of nutrient standards.

# Implementation Issues

- What technology is available to retrofit treatment plants to meet the new criteria?
- How much would it cost?

# Adoption of State Ammonia Water Quality Standards

- USEPA expects States to adopt the new criteria as State water quality standards “within the triennial review period following finalization of the federal criteria”.
- This is considered a “no brainer” update. Its simply a reaction to new data.
- How reliable are the data?

# Mussel Toxicity Data

- Unionid mussel toxicity testing began in earnest about 10 years ago.
- Difficult organisms to work with.
  - Glochidia
  - Juvenile mussels
- After much experimenting, the toxicity tests are now standardized (ASTM testing method).
- Mussel toxicity testing workshop was held about 5 years ago which converted skeptics.
- Testing is now considered routine and reliable.

# Scientific Views

- What then will valid comments (due March 1) entail?
- Are mussels in winter cold water conditions as sensitive to ammonia?
- Substantive comments are not likely from the perspective of science.
- What about economic comments? Are the new criteria affordable? Can a line based on facility size be drawn? In other words, some kind of exemption? To whom should economic comments be addressed?

# What's Next

- Federal water quality criteria generally get adopted as State water quality standards without significant changes.
- The time to comment on the federal criteria is now, rather than later comments on an IEPA petition to the IPCB.
- The natural progression resulting from the publication of the draft criteria would be a petition to the IPCB two to three years from today.



# Standards Update

- Boron, Fluoride and Manganese
- These are all standards from the original 1972 IPCB rulemaking
- All three are now found to be overly stringent for protection of water body uses
- All three will be converted from the existing one-number standard to acute and chronic standards protective of aquatic life

# Boron, Fluoride and Manganese

- Boron will increase from 1 mg/L to 38 and 7.4 mg/L
- Fluoride will increase from 1.4 mg/L to 6.4 and 3.6 mg/L
- Manganese will increase from 1 mg/L to 3.5 and 1.1 mg/L
- Public water supply intake standards will not increase from current levels
- Petition is expected to be filled with the IPCB in February

## Boron, etc. (cont.)

- We expect little comment or controversy concerning B, F and Mn
- Another part of the petition may ask to IPCB to prohibit mixing zones for mercury
- Some push back has occurred from industrial facilities
- All facilities should evaluate their mercury effluent concentrations and begin to think about compliance options if necessary

# Antidegradation


- Constantly evolving implementation policy
- Driven by IPCB New Lenox case and Appeals Court support of Board's decision against Agency
- New requirements from applicants have been added

# New Antidegradation Requirements

- If a BOD containing wastewater is involved, a model of dissolved oxygen sag in the receiving stream is required
  - Before plant expansion
  - After plant expansion
- If a new or expanded facility has not been designed to removed total nitrogen, what are the additional costs to add this capability?
- Is affordability analysis required?



# Agency Present Antidegradation Process

1. Document findings in record
  2. Identify loadings of all pollutants
  3. Identify uses of receiving stream
  4. Identify all feasible alternatives
  5. Identify impacts of alternatives
  6. Does record support decision
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# Antidegradation Hints

- Involve environmental groups in facility planning
- Discuss project with IEPA early on
- Bob Mosher or Scott Twait
- 217/558-2012