Options for Implementation Approaches & Issues Specific to Ammonia in Freshwater

Association of Clean Water Administrators

Ammonia Stakeholder Meeting
October 29, 2014
ACWA Team

• State Representatives
  – Bob Mosher, IL - WQS
  – Adam Schnieders, IA - Permitting
  – Mike Tate, KS - CWA Administration
  – Walt Baker, UT - CWA Administration
  – Melissa McCoy – ACWA Environmental Program Mgr
State Identified Issues

• Criteria around 2.5X more stringent than 2001
  – Cost for upgrade can be substantial
    • Especially if recovering a relatively
  – Plant operations control becomes more demanding
    • Enforcement expectations for single violations?

• Need clear guidance/understanding of options to mitigate cost where appropriate

• Where upgrade needed
  – Nitrification and denitrification should be the goal
    • Don’t create a nitrate issue
    • Achieve total nitrogen reduction

• Where upgrade might not be needed
  – Identify how we get there
Implementation

Comparison of 2009 vs 2013 Ammonia Limits
Wichita, KS Plant #3

Ammonia (mg/L)

Month

Chronic Limit - 2013
Acute Limit - 2013
Chronic Limit - 2007
Acute Limit - 2007
Wichita, KS Actual Performance

Wichita Plant #3

NH₃ (mg/L) Date

20030506 20031022 20040513 20050511 20051023 20060423 20061025 20070506 20071110 20080512 20081211 20090618 20091228 20100624 20110102 20110718 20130117 20130711 20140102 20140804

Wichita Actual  New Acute  New Chronic
State Identified Issues

- **Costs for small systems**
  - If mussels present
    - Prohibitive for many
      - Capital
      - O&M
      - Properly trained ops
      - Variance cost
      - Declining rate base
  - If mussels may not be present
    - Cost of study to prove it

- **Costs for States**
  - Expectation for some will be that
    - Mussel presence is not a rebuttable presumption—State must prove
    - State bears UAA costs

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**Graph:**
- **Cost Per Household For Nitrification/De-Nit**
  - 500 Population
  - $145/mo/HH
- **Table:**
<table>
<thead>
<tr>
<th>State</th>
<th>MHI</th>
<th>%MHI</th>
</tr>
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<tbody>
<tr>
<td>IL</td>
<td>$56,853</td>
<td>3.1%</td>
</tr>
<tr>
<td>IA</td>
<td>$51,129</td>
<td>3.4%</td>
</tr>
<tr>
<td>KS</td>
<td>$51,273</td>
<td>3.4%</td>
</tr>
<tr>
<td>UT</td>
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</table>

Adapted from Foess, Steinbrecher, Williams, and Garrett - FL Water Resources Journal - December 1998
State Identified Issues

• Guidance on which modification tool is best suited
  – UAA vs Variance
    • What are EPA views on why and how each should be used?
    • UAA and variance both based on 40 CFR §131.10(g) factors
      – In the case of (g)(6) – cost – what is really different?
        » UAA is more permanent and perhaps applicable for small towns
  – For UAA, is factor (g)(5) appropriate?
    • Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses
    • Ideas for data required to make showing?
Mitigation Options – Tried and True

• Species Recalculation/Site-Specific Criteria
  – Species determination (mussels/snails) key element

• Mixing Zones
  – Potentially a big player depending on ability to use

• Revise Uses
  – Use Attainability Analyses (UAAs)

• Variances due to compliance cost
  – Delay compliance for life of variance(s)

• Schedules of Compliance (SOCs)
  – Delay compliance during life of schedule
Species Recalculation/Site-Specific Criteria

- Significant interest in mussel presence/absence determination
- Interest in snail presence/absence determination
- If both absent, criteria similar to current criteria
  - Acute still lowers in warmer weather
- What is the yardstick for pres/abs?
  - Waterbody or discharger specific?
  - Applicability of “range” maps similar to T&E
  - Were present at the site in the past, are not currently present at the site due to degraded conditions?
  - Are present in nearby bodies of water, are not currently present at the site due to degraded conditions?
- Can limiting habitat override water quality?
Mixing Zones

• Some believe chronic MZ should be prohibited
  – Mussels can’t move to a zone of passage

• Some believe acute MZ should be prohibited
  – Seems to defeat the purpose of an acute MZ

• Allowance of MZ has substantial impact
  – In KS, 31 of 120 mechanical plants would violate w/MZ
    • 49 of 120 would fail w/no MZ
      – 60% increase in number of facilities

• Need to understand EPA thinking on MZ
Revised Uses

- Use Attainability Analyses (UAAs) are generally resource intensive

- Basis for use change
  - Which 40 CFR §131.10(g) factors?
    - Likely cost based – (g)(6)
    - 1994 Interim Economic Guidance needs updating

- Aquatic life support is typically an existing use
  - Need subcategory use - limited ammonia ALS?
    - What does that entail?

- Expectations to revisit modified use?
Variance

- Delay compliance for life of variance(s)
- Variances are use changes
  - Must meet one of the §131.10(g) factors
- WQS Clarification Rule will tell us a lot about variance
  - Length of variance
  - How often revisited/renewed
- Multi-Discharger Variance for similar type facilities
  - KS looking at facultative lagoon MDV for small towns
- Individual variances
  - Who performs – permittee or permitting authority?
Schedules of Compliance (SOCs)

- If allowed in a State’s WQS
- Anticipates discharger can comply if given time
- Delay compliance during life of schedule
  - Delay as short as possible, otherwise can extend across multiple 5-yr permits
- Applies to individual facilities
Mitigation Options – Anything New?

• DNA testing for mussel presence
• Similar waterbody knowledge
  – Similar to species exclusion allowance for finding mussels in nearby waterbodies
    • If not present in nearby bodies of water, not likely present?
• General UAA
  – Based on stream characteristics, no mussel study req’d.
    • Headwater
    • Intermittent flow
    • Effluent created
• Modeling downstream impacts
  – NH$_3$ degradation/dilution
    • How far upstream of mussels is discharge appropriate?
Modeling Downstream Impacts

Currently Exceeds 2013 Criteria

Modeled to Comply With 2013 Criteria

1. Distance Required to Study?
2. Buffer Distance?