# Water Quality Standards Ammonia Criteria and Variances


**Our Mission: To protect and improve the health and environment of all Kansans.**

# Objectives

Provide details on:

- Brief history of ammonia criteria
- Legislative actions on variances
- Kansas Water Quality Standard (WQS) Variances
  - General information
  - Types
  - Variance request / submissions
- Kansas' Ammonia ($NH_3$) Multiple Discharger Variance (MDV)

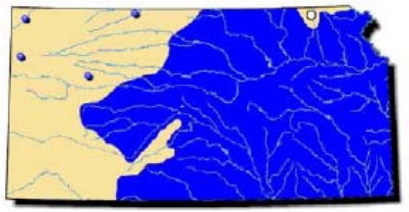
# Brief History of Ammonia Criteria

- 1984 – EPA published original ammonia ($NH_3$) criteria
- 1987 – KDHE adopted the 1984 $NH_3$ criteria
- 1994 – KDHE proposed new $NH_3$ criteria
  - Based on preliminary EPA work adjusting pH
  - Legislature put on hold
- EPA published 1999 aquatic life $NH_3$ criteria
  - Took into account pH and early life stages
- KDHE adopted the 1999 criteria in 2001
- EPA proposed $NH_3$ criteria in 2009
  - Took into account sensitive mussel impact
  - Would drop chronic 1999 criteria by 5 times
  - KS submitted many comments on the proposed criteria

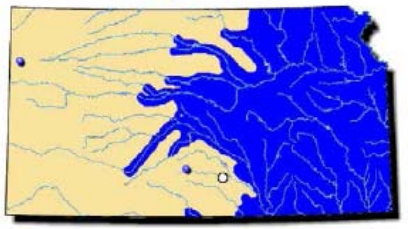
# Brief History of Ammonia Criteria

- 2013 – EPA published new $NH_3$ criteria
  - Mussels and snails both considered
  - Drop 1999 chronic criteria by about 54%
  - Makes acute criteria temperature dependent
  - Analysis shows most modern mechanical plants can meet
    - A handful of older mechanical plants cannot
      - 15-17 appear to have consistent problems
        - » 20+ on the bubble – ops may solve
    - Initially assumed snails/mussels present east of Hays for analysis
  - Lagoons cannot meet criteria year round
    - Winter and summer limits more stringent
    - EPA recognizes this

Pondhorn



Maple Leaf



# Brief History of Ammonia Criteria

- 2014 – NACWA, WEF, WERF, ACWA, EPA meeting
  - Discussed implementation of new criteria
  - Will not be simple to do mussel-absent studies
  - General interest in KS Variance process
  - Many consultants and larger utilities – should be able to comply
- 2016 – KDHE is proposing to adopt new $NH_3$ criteria
  - Acute and chronic aquatic life criteria for total NH3 – mussels present
  - Same rulemaking to include new variance language

# Legislative Update

- H2303 – The “variance” bill
  - Introduced in Appropriations Committee by Rep Schwartz
  - Amended in the Senate in S124
    - passed April 2, 2015
  - Bill clearly gives Secretary of KDHE authority to establish water quality standard (WQS) variances
  - We foresee the ability to adopt variances as an important tool in the future
    - Ammonia criteria compliance and possibly future nutrient criteria

# Kansas WQS Variances

- Met with EPA HQ/R7 staff on monthly calls for past 18 months
- EPA issued the WQS Rule in summer of 2015
  - Significant language revisions regarding variances
- Development of draft language to comply with new rule
  - Lots of back and forth with EPA on language
  - EPA cautious with lots of national interest / precedence
- Regulations are drafted and going through the regulation update process

# Kansas WQS Variances

- A time-limited designated use and criterion that reflects the highest attainable condition (HAC) as an alternative to one or more of the following factors:
  1) naturally occurring pollutant concentrations prevent the attainment of the use
  2) natural, ephemeral , intermittent or low flow conditions or water levels prevent the attainment of the use, unless augmented by effluent or other discharges
  3) human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than leave in place
  4) dams, diversion or other types of hydrologic modifications preclude the attainment of the use and cannot be modified or operated to attain the use

# Kansas WQS Variances

5) physical conditions of the natural water features of the water body, such as lack of a proper substrate, or inadequate cover, flow, depth, pools, or riffles preclude the attainment of the aquatic life use
6) controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact
7) actions necessary to facilitate lake, wetland or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the use while actions are being implemented

# Kansas WQS Variances

- Concept of the Kansas variance process has been based on EPA's release of 40 C.F.R. 131.14
- Variance may be requested and adopted for:
  - Individual discharger
  - Multiple dischargers
  - Waterbody specific
- Compliance with all other underlying WQSs, TBELs or WQBELs is still required
- All variances are considered WQSs
  - subject to the public participation process

# Kansas WQS Variances

- Variance requests shall demonstrate the assessment and consideration of the following factors:
  - Technology-based controls are sufficient to meet WQBELs derived to meet the underlying designated use and criteria at issue in the variance
  - Ensure there is no jeopardy to threatened or endangered species
  - Ensure there is no unreasonable risk to human health
  - Ensure the HAC applicable throughout the term of the variance does not result in lowering currently attained ambient water quality

# Kansas WQS Variances

- Submission requirements include:
  - Identify the applicable pollutant(s) or water quality criterion, and the water body/waterbody segment(s)
  - Identify the discharger(s)
  - All applicable requirements that represent the HAC throughout the term of the variance
  - Provide a quantitative expression for the discharger(s)-specific sites or water body or waterbody segment
  - A statement providing that the requirements of the variance are derived from the HAC
  - The term of the WQS variance

# Kansas WQS Variance

- A schedule for reevaluation
- A provision that the variance is no longer applicable if reevaluation is not consistent with the schedule

- Supporting documentation:
  - Submit documentation demonstrating the term of the variance is only as long as necessary to achieve HAC
  - Water body or waterbody segment variances require additional supporting documentation for nonpoint source controls or other process(s) that can improve water quality

# Kansas $NH_3$ Multiple Discharger Variance (MDV)

- Multiple discharger variance process is driven by factor 6, and the 2013 $NH_3$ criteria

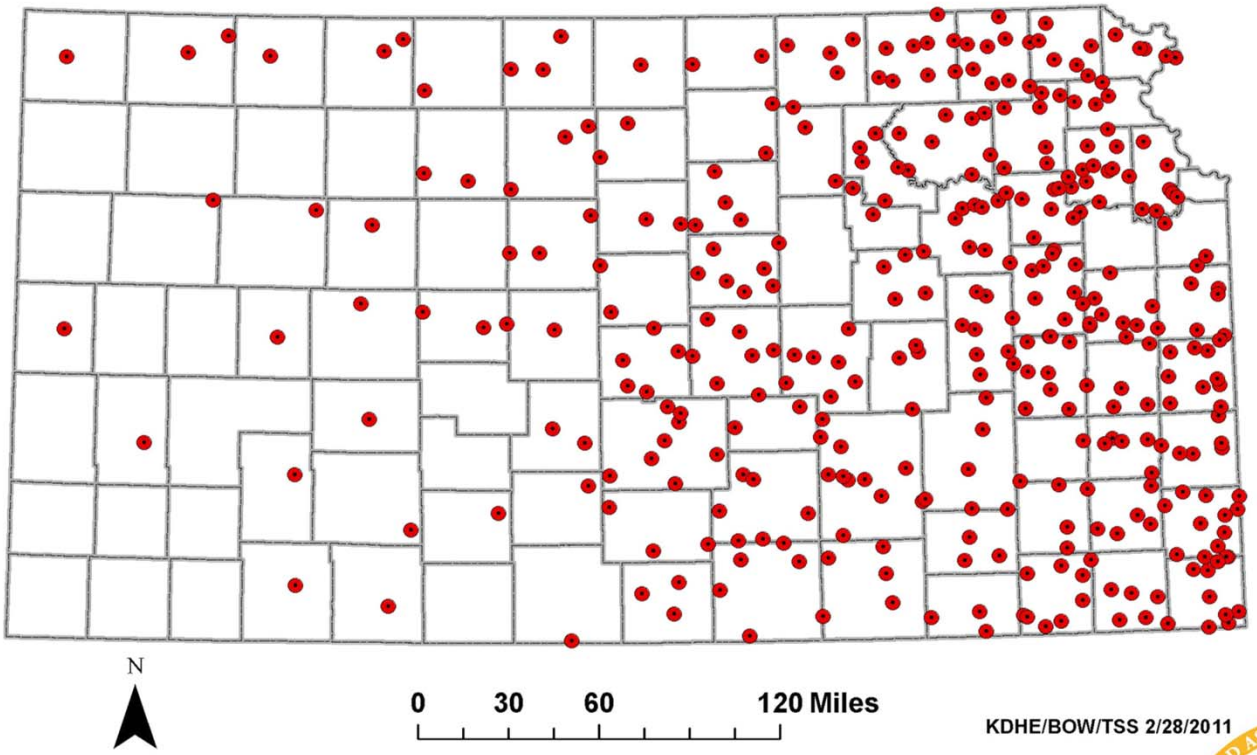
- KDHE established MDV eligibility by considering
  - median household income (MHI) threshold
  - population threshold
  - maximum revenue generation
  - cost for mechanical treatment
  - Compare cost to maximum revenue

# Kansas $NH_3$ MDV

- Kansas has 325 NPDES Permits issued to municipal discharging lagoons, more to commercial facilities
- Small towns, small populations, small flows, and even smaller discharge amounts due to evaporation and seepage
- Kansas municipal discharging lagoons serve about 227,400 population, about 8% of total population, about 10% of population served by sewer systems
- About 3 dozen lagoon facilities serve 2,000 or larger population
- About 1 dozen lagoon facilities serve 3,000 or larger population

# Kansas $NH_3$ MDV

Municipal Discharge Lagoons



# Kansas $NH_3$ Multiple Discharger Variance

- Eligibility:
  - KDHE has developed a screening process to identify eligible dischargers
  - Municipal discharging lagoon facilities will be sent an acceptance document to sign and accept the terms of the multiple discharger variance
  - After receipt of the signed form, KDHE will determine eligibility

# MDV Eligibility

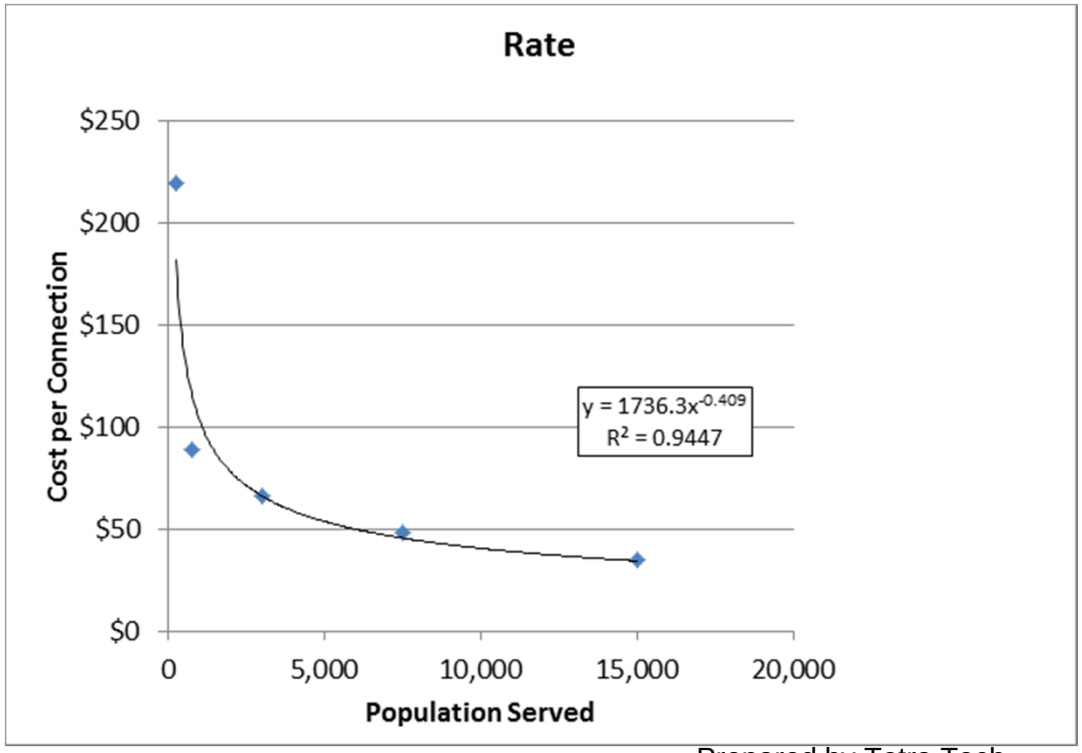
- Eligibility determination process
  - KDHE will:
    - review NPDES permit to determine if a discharger can potentially meet the new $NH_3$ criteria
    - calculate projected ammonia criteria limits
    - compare the historical ammonia effluent data to projected 2013 ammonia criteria limits
    - determine financial eligibility

# MDV Eligibility

- Eligibility determination process
  - KDHE will:
    - calculate primary screener – calculate the percent of MHI that city sewer utility residential customers would be paying to fund a new mechanical plant
      - If municipal primary screener > 4.0% than alternate effluent limits are calculated
      - If municipal screener is < 4.0% calculate secondary screener
    - calculate secondary screener – Can city afford to build a new mechanical treatment facility?

# Kansas $NH_3$ MDV

## Small Flows Biological Nutrient Removal Activated Sludge Cost Curve




Prepared by Tetra Tech

- Cost per connection to construct and operate for biological nutrient reduction treatment process
- Costs are beyond financial capability of small Kansas towns

## SECONDARY INDICATORS

| | Secondary Indicators | | | |
|---|---|---|---|---|
| **Indicator** | **Weak** | **Mid-Range** | **Strong** | **Typical KS** |
| Bond Rating | Below BBB (S&P)<br>Below Baa (Moody's) | BBB (S&P)<br>Baa (Moody's) | Above BBB (S&P)<br>or Baa (Moody's) | 0 |
| Overall Net Debt as Percent of Full Market Value of Taxable Property | Above 5% | 2%-5% | Below 2% | 2 |
| Unemployment | More than 1% above National Average | National Average | More than 1% below National Average | 2 |
| Median Household Income | More than 10% below State Median | State Median | More than 10% above State Median | 1 |
| Property Tax Revenues as a Percent of Full Market Value of Taxable Property | Above 4% | 2%-4% | Below 2% | 2 |
| Property Tax Collection Rate | < 94% | 94% - 98% | >98% | 2 |
| | ① | ② | ③ | |

# MDV Eligibility

ASSESSMENT OF SUBSTANTIAL IMPACTS MATRIX

| Secondary Score | Municipal Preliminary Screener | | |
|---|---|---|---|
| | Less than 1.0 Percent | Between 1.0 and 2.0 Percent | Greater than 2.0 Percent |
| Less than 1.5 | ? | X | X |
| Between 1.5 and 2.5 | ✓ | ? | X |
| Greater than 2.5 | ✓ | ✓ | ? |

Secondary Score:_____

Key:

- ? Uncertain, studies need to be performed.
- X No, the city cannot afford the proposed mechanical plant and the variance can be granted.
- ✓ Yes, the city can afford the proposed mechanical plant and no variance will be granted and the city is not eligible for the MDV. A city or facility may, on its own, request an individual variance.

# MDV Eligibility

- MDV decision
  - If determined to be eligible for the MDV: alternate ammonia effluent limits will be issued
    - 99$^{th}$ percentile or the highest value of recent historical effluent discharge data (serves as the HAC)
    - Quarterly Monitoring assessed against alt limit (HAC)
  - The alternate ammonia effluent permit limit and the Pollutant Minimization Plan (PMP) will be included in the NPDES permit

# MDV Eligibility

- PMP requirements:
  - retain a certified operator as required by regulations
  - provide reasonable and adequate maintenance
  - maintain operation and performance of the existing lagoon system to comply with secondary treatment limitations
  - does not allow industrial strength wastewater containing high concentrations of nitrogen
  - monitor the depth of accumulated sludge
  - plan for expansion of the lagoon system should population and its associated pollutant loading approach the rated design capacity of the existing lagoon system.

# MDV Eligibility

- MDV decision
  - If it is uncertain as to whether the municipality can afford the mechanical plant, the NPDES permit may be issued a temporary variance while further studies are conducted
    - An alternate ammonia effluent permit limit and the PMP will be included in the NPDES permit

# Recap

- The 2013 $NH_3$ criteria will likely be adopted in the near future
  - Implement with permits expiring 9/2017 ?
- The revised variance regulations are currently under internal review
- The Kansas $NH_3$ MDV will aid small municipalities in obtaining the HAC with existing lagoon systems, minimizing the financial burden relative to large scale upgrades

# Questions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