Montana DEQ's Numeric Nutrient Standards Variance Process

Michael Suplee, Ph.D.
Water Quality Standards & Modeling Section
Montana Dept. of Environmental Quality

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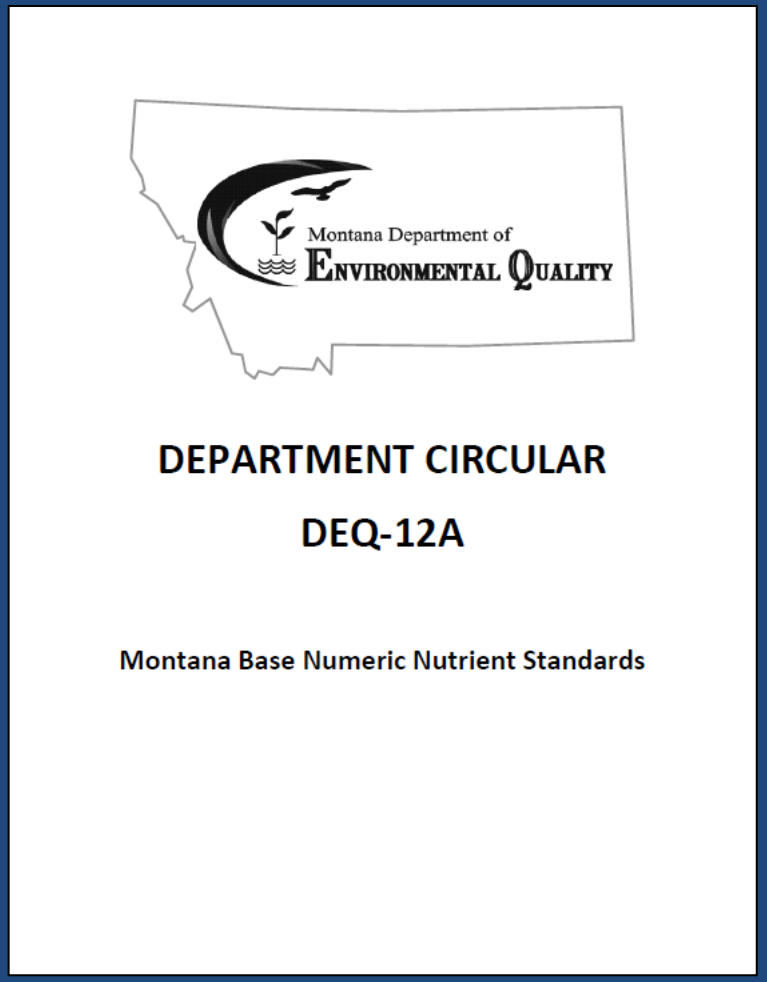
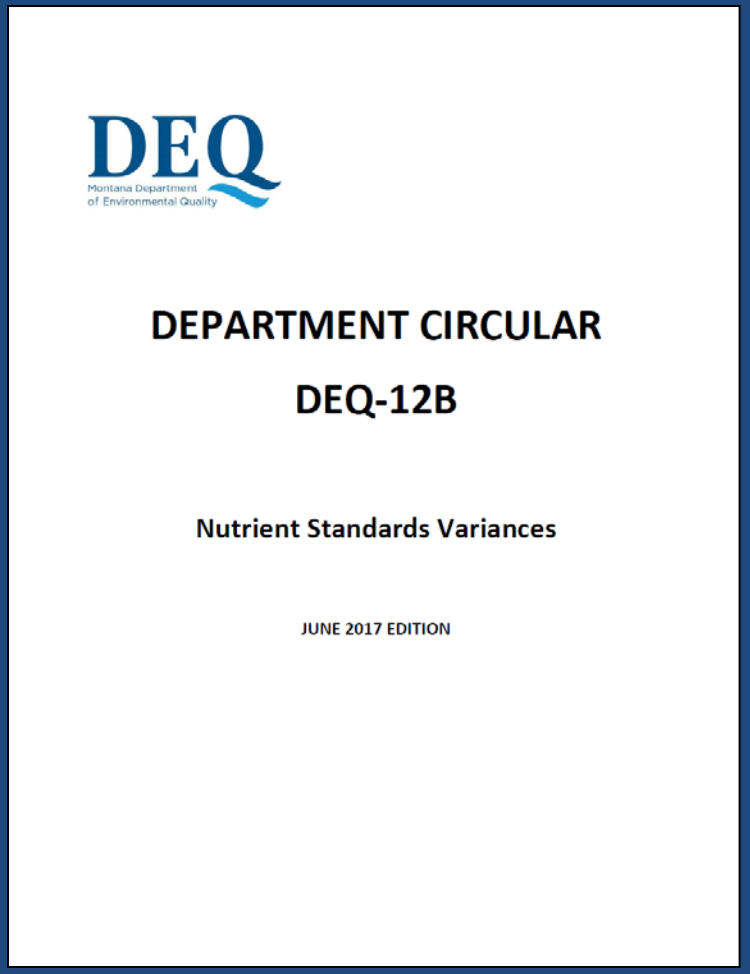
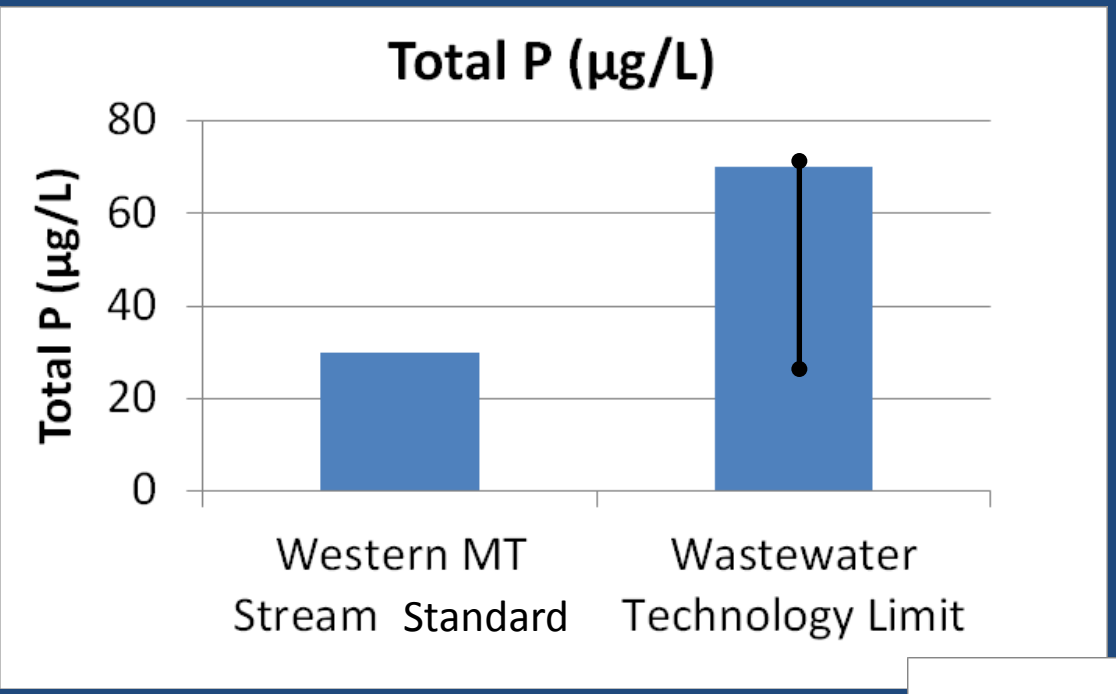
DEQ
Montana Department of Environmental Quality

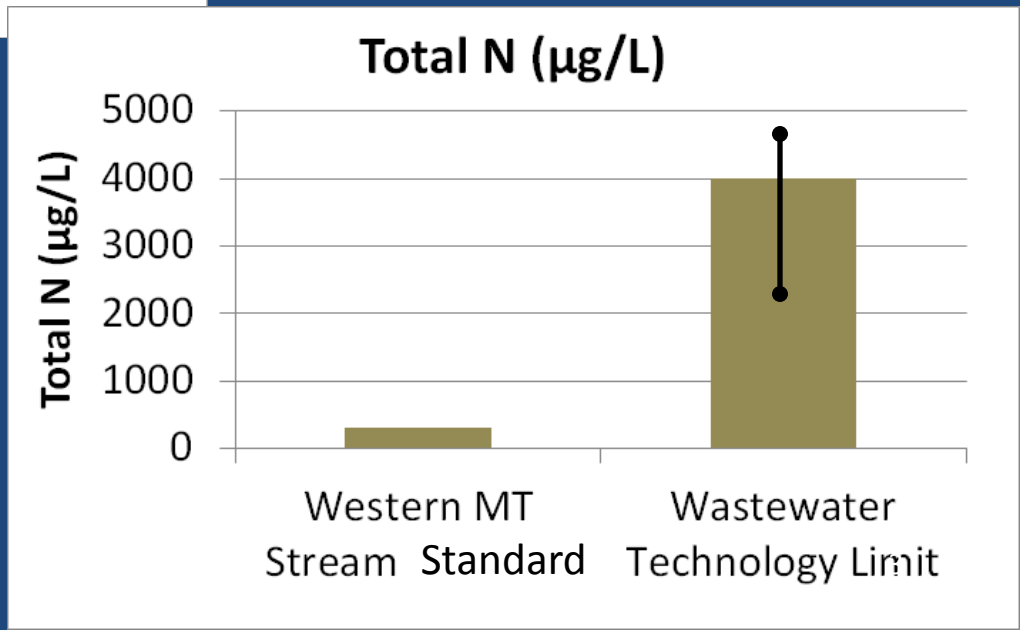




http://deq.mt.gov/Water/WQPB/Standards

The Implementation Challenge





Water Quality Standards Variances

- The variance procedure is designed to encourage compliance with the Clean Water Act within a reasonable timeframe
- An alternative to beneficial use removal or downgrade on the receiving stream
- Time limited, provides dischargers time to come into compliance with the standards

Variances, Cont.

- Due to the gap between scientifically-defensible NNCs and current wastewater technology, variances were considered critical to implementation

- MT DEQ considered 20 years to be a reasonable timeframe to determine if a water quality problem was correctable or not
  - Aligns with typical financing period for wastewater facility upgrades
  - Wastewater technologies for mechanical plants likely to improve over this time (and become cheaper)

- Variances allow MT DEQ time to explore novel, low-cost technologies for wastewater lagoons, and further advance nonpoint source improvements

Senate bills 95 (2009 Legislature) and 367 (2011 Legislature) (now §75-5-313, MCA)

- Montana DEQ given authority to grant variances from nutrient criteria
- Based on economic harm that would have resulted from immediate implementation of the standards
  - Variances up to 20 years, subject to 3-year reviews

  - General Variance: Can be requested if criteria can't be met, but these can:
  - > 1 MGD: 1 mg TP/L, 10 mg TN/L
  - < 1 MGD: 2 mg TP/L, 15 mg TN/L
  - Lagoons: Maintain current performance

  Had to be adopted in Dept. rule by 5/31/2016 (DONE)

  - Individual Variance: Case-by-case analysis if (for example) meeting general variance is still cost prohibitive.

Economic Analyses

Montana Department of Environmental Quality

Demonstration of Substantial and Widespread Economic Impacts to Montana That Would Result if Base Numeric Nutrient Standards had to be Met by Entities in the Private Sector in 2011/2012

December 2012

Prepared by:
Water Quality Planning Bureau, Water Quality Standards Section
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

WQPBWQSTR-002

Montana Department of Environmental Quality

Demonstration of Substantial and Widespread Economic Impacts to Montana That Would Result if Base Numeric Nutrient Standards had to be Met in 2011/2012

April 26, 2012

Prepared by:
Water Quality Planning Bureau, Water Quality Standards Section
Montana Department of Environmental Quality
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

WQPBWQSTR-002

http://deq.mt.gov/wqinfo/standards/NumericNutrientCriteria.mcpx

Montana DEQ developed the general variance to be widely available to permittees that needed it

- ≥1 MGD
- <1MGD
- Lagoons

It is implemented through the Permit

- If permittee can't meet NNCs, they can apply for general variance (or individual var., if they want)

General Variance progression, as envisioned at adoption (2014), if no major technological advances were to occur

1. For facilities > 1 million gallons per day:

- A. By 2016 (or first receipt of general nutrient standards variance): 10 mg TN/L, 1.0 mg TP/L
- B. Next permit cycle (5 year later): 8 mg TN/L, 0.8 mg TP/L
- C. Next permit cycle (5 years later): 8 mg TN/L, 0.5 mg TP/L
- D. Next permit cycle (5 years later): *Under Development*
-

2. For facilities < 1 million gallons per day:

- A. By 2016 (or first receipt of general nutrient standards variance): 15 mg TN/L, 2.0 mg TP/L
- B. Next permit cycle (5 year later): 12 mg TN/L, 2.0 mg TP/L
- C. Next permit cycle (5 years later): 10 mg TN/L, 1.0 mg TP/L
- D. Next permit cycle (5 years later): 8 mg TN/L, 0.8 mg TP/L
-

3. For lagoons not designed to actively remove nutrients:

- A. By 2016 (or first receipt of general nutrient standards variance): Maintain current lagoon performance and commence nutrient monitoring in the effluent
- B. Next permit cycles (5 years later): Implement BMPs identified during optimization study

Changes to Federal Rules

- 2014: DEQ and Board adopt nutrient standards and variances

- 2015: EPA updated its rules regarding variances
  - Much more detailed, more specific requirements

- Federal updates affect DEQ's 1st triennial review and variance process
  - Highest Attainable Condition (HAC)
  - Time to achieve HAC
  - Pollutant minimization program

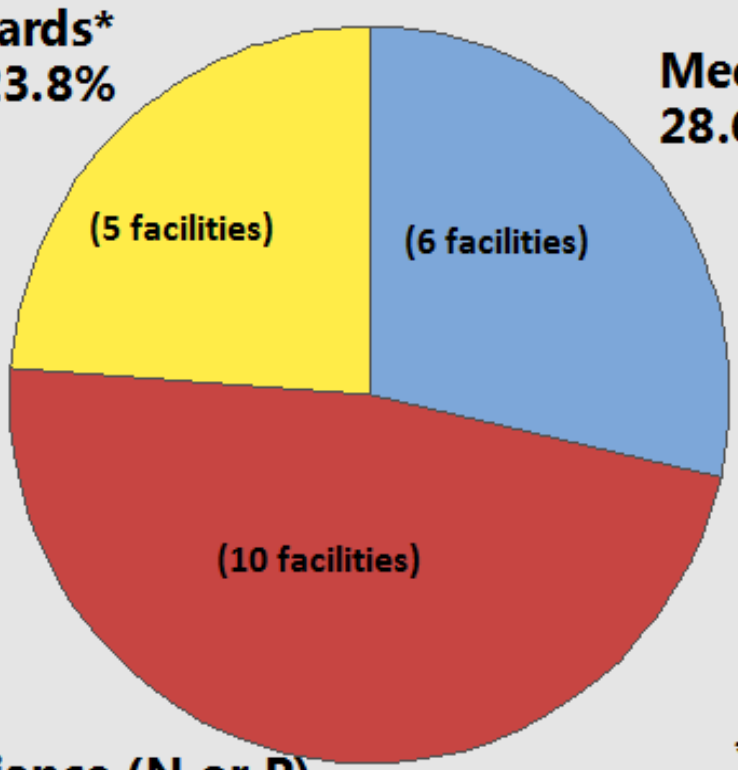
1st Triennial Review of Circular DEQ-12B (Nutrient Variances)

2016/2017

First step-which facilities were likely to need a variance?

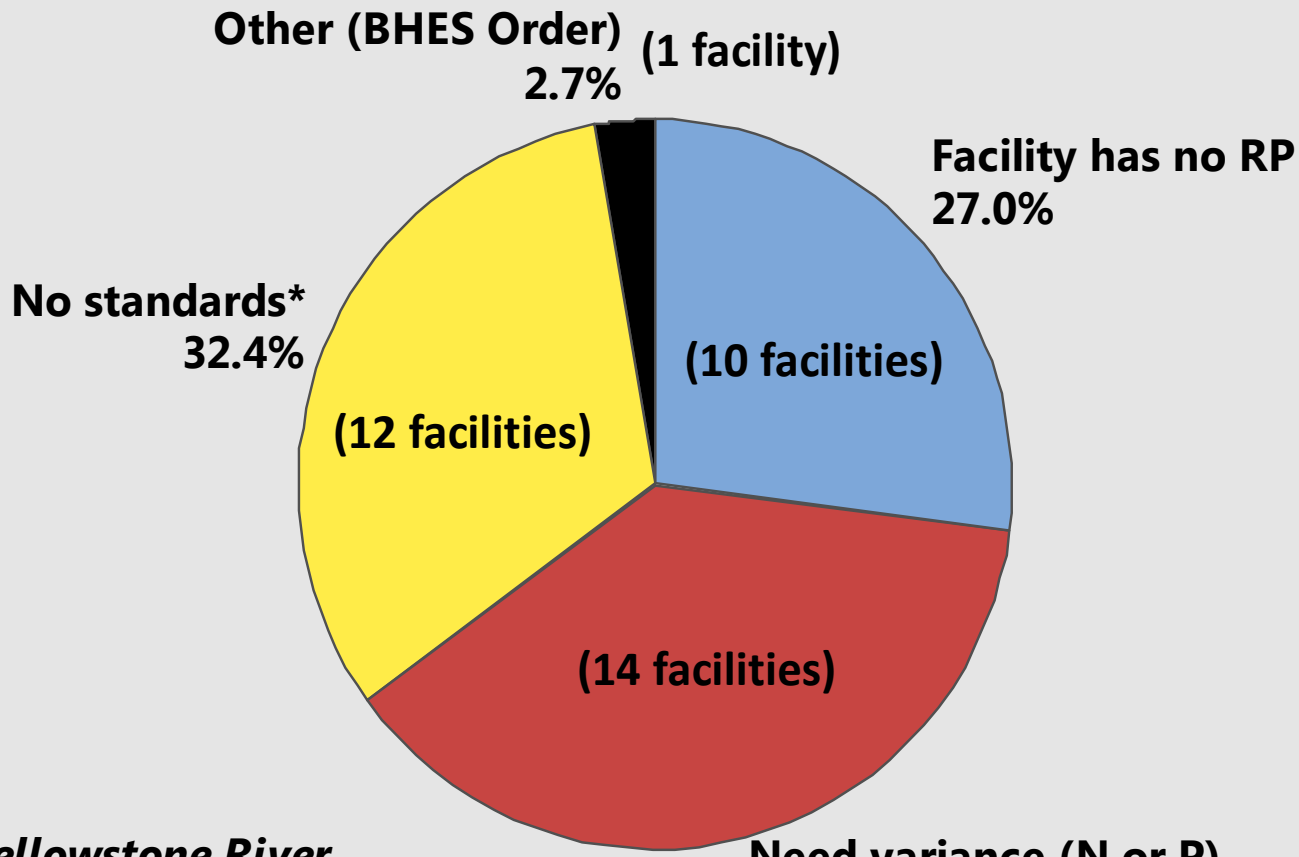
- Detailed analysis on mechanical facilities (≥1 MGD group, <1MGD group)
- Assumed most/all lagoons would need one

≥1MGD Group



Except Yellowstone River, where estimated standards were used, where needed.

<1MGD Group



Except Yellowstone River, where estimated standards were used, where needed.

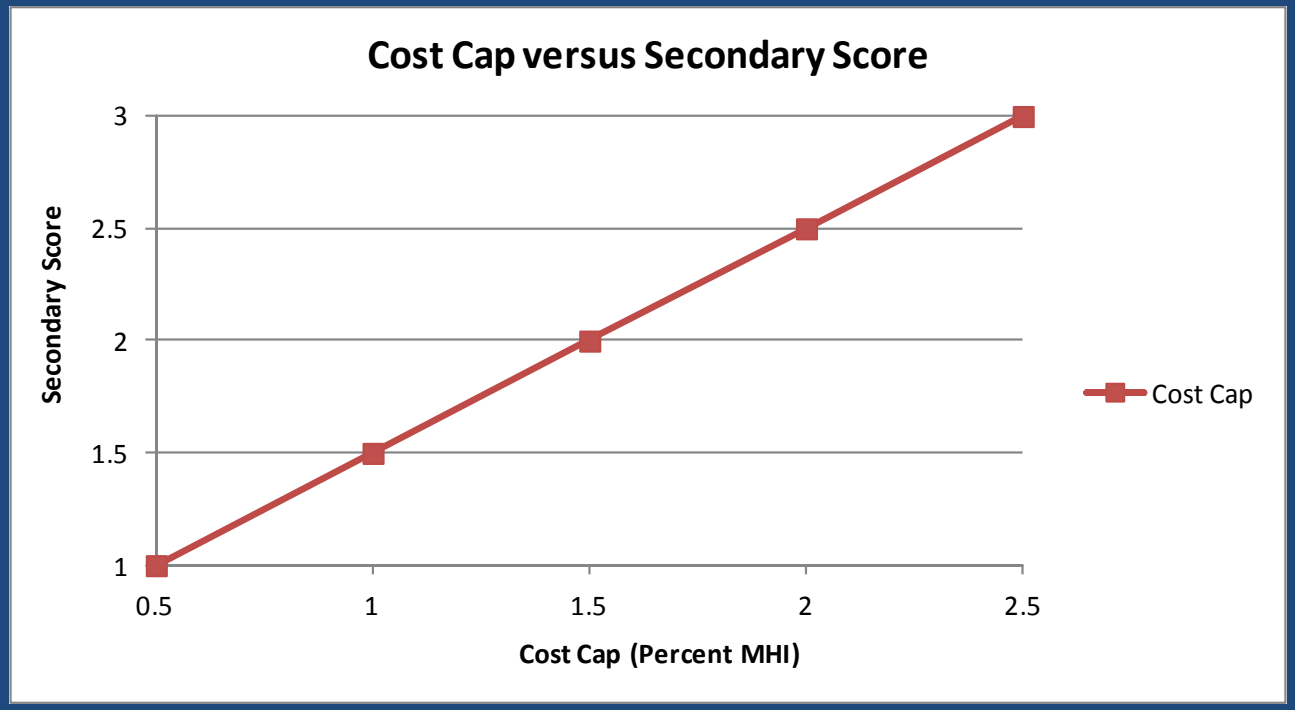
What is highest attainable condition (HAC)?

At federal level:

The highest attainable interim criterion *or* the Interim effluent condition that reflects the greatest pollutant reduction achievable

- In Montana, this essentially translates as the highest cost for effluent treatment that can be afforded based on the state's economic affordability process
  - Because our general variance is based on Factor 6

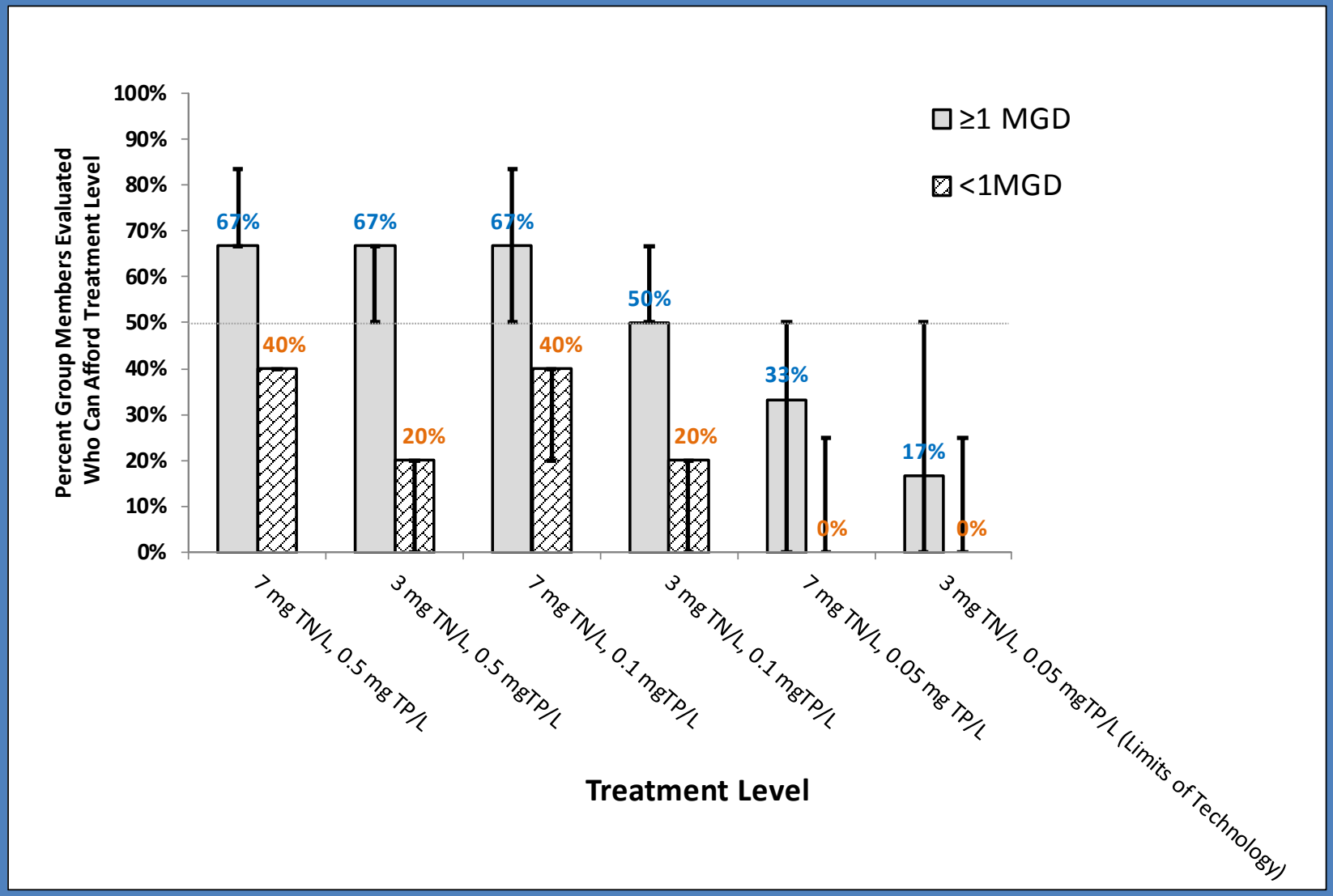
Process DEQ used to ID Potential Group HACs



Example (for a community):

Estimated cost to upgrade to 7 mg TN/L, 0.1 mg TP/L: $389,927.00
Upgrade cost, as % of MHI (including current sewer bill): 2.28%
Community economic evaluation (i.e., secondary score): 2.6
Cost Cap (per graph, above), as MHI: 2.1%
Can treatment level be afforded? NO (2.28% > 2.1%).

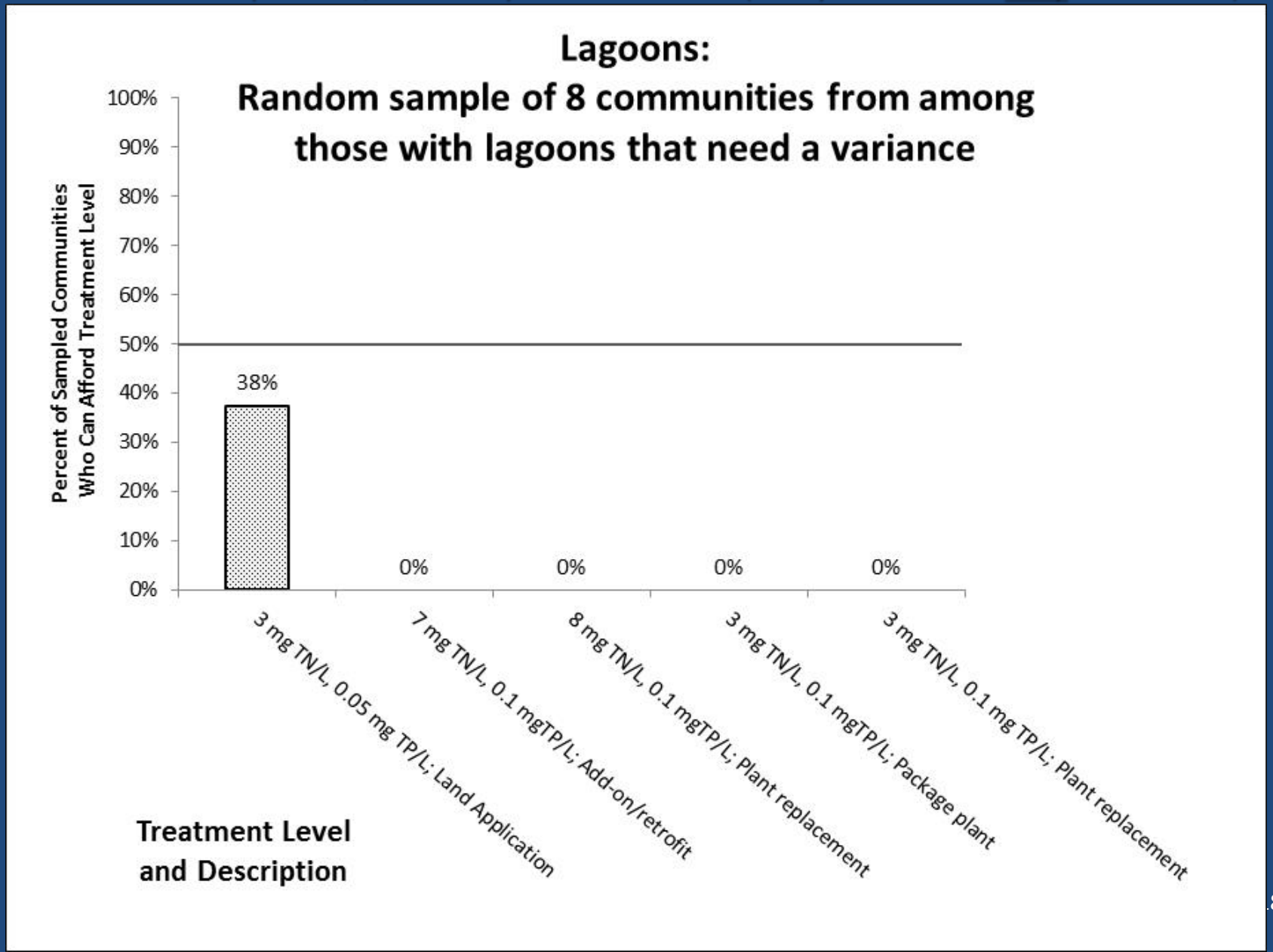
≥1MGD, <1MGD Mechanical Categories



Percent of Members in a Discharger Group (≥ 1MGD, <1MGD) Who Can Affordably Meet (Per DEQ Methods) a Specified Wastewater Treatment Level. Only POTW group members are shown, and, among them, only those that will probably need a variance. Error bars are the % of members who can afford a treatment level, based on a range of cost estimates for the facility upgrades (per class 5 engineering planning estimates).

Lagoon Category (random sample of 8 lagoons)

65 individual permits, ≤40 likely need variance (analysis below is only for POTWs)



Final Treatment Requirements adopted in Circular DEQ-12B:

- ≥1MGD Discharge Category: 6mg TN/L, and 0.3 mg TP/L
- <1MGD Discharge Category: 10 mg TN/L, and 1.0 mg TP/L
- Lagoons: Maintain long-term average and implement the PMP/optimization
- Recipients of variances will be required to carry out optimization of their facilities for nutrient removal

Variance Permitting Process for TN, TP Today

- To MT DEQ, variance treatment requirements are long term averages (LTA), and limits are expressed (per statute) as Average Monthly Limit (AML), so:

Permitted Load Limit

Variance (mg/L) * Table 5-2 $value_{95th}$ * Design Flow * conversions = (lb/day)

From Permitting's Technical Support Document—based on coefficient of variation (CV; SD/mean) as calculated from samples from discharger's effluent

But if a permittee is already meeting a lower load limit from an existing permit, they must continue to meet that limit (no back-sliding)

Variance Permitting Process for TN, TP Today

- Variances are expressed in the permit only as a load (lb/day)
- Idea is to encourage permittees to find alternative approaches to reducing load to stream
  - Land application, purple pipe, etc.

Variance (mg/L) * Table 5-2 value$_{95th}$ * Design Flow * conversions = Permitted Load Limit (lb/day)

EPA's Review of Montana Nutrient Standards Variances (2017)

- EPA only approved some of Montana's variance procedures
- In light of this, MT DEQ is evaluating how it will implement its general variance efficiently
- Discussions on our process are ongoing between MT DEQ and EPA

Thank you

Questions?

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Optimization, and Pollution Minimization Program Requirement (PMP)

- Going forward, the optimization plan—which previously only had to be completed—will be required to be implemented

- PMP: Required by those under a variance when they achieve treatment requirements in Table 12B-1
  - Time to achieve the treatment requirements will vary

- PMP is a structured set of activities to improve processes and pollutant controls that will prevent & reduce pollutant loading

- PMP examples include:
  - reducing pollutants before they enter the wastewater treatment system
  - BMPs to mitigate nonpoint source nutrient inputs

Coefficient of Variation (CV) in the variance permitting process

- Currently based on CV of *past* data
- CVs likely to go up at lower nutrient effluent concentrations; could lead to compliance problems
- Using a fixed CV of 0.6 is a realistic CV for nutrient effluent data at low concentrations
  - Can be used by permit writer when appropriate