



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION



Bureau of Clean Water

# Chesapeake Bay Phase III WIP

## Wastewater Workgroup

***DRAFT*** Scenario Recommendations

Tom Wolf, Governor

Patrick McDonnell, Secretary

# Workgroup Recommendations

- Maintain Existing Nutrient Reduction (NR) Strategy for Dischargers
- Encourage NR Optimization
- Incentivize Plant Optimization
- Required Nonsignificant Sewage Facilities to consider cost effectiveness of NR technology
- Sewage Management for onlot (septic) systems

# Chesapeake Bay TMDL

| Sector                 | WLA Type   | Total of TN WLAs (lbs/yr) | Total of TP WLAs (lbs/yr) |
|------------------------|------------|---------------------------|---------------------------|
| Significant Sewage     | Individual | 10,001,276                | 1,314,603                 |
| Significant Industrial | Individual | 1,820,139                 | 64,684                    |
| CSOs                   | Individual | 212,920                   | 34,709                    |
| Non-Significant        | Aggregate  | 3,006,667                 | 842,104                   |
|                        | Totals:    | 15,041,002                | 2,256,100                 |

# Historical Perspective

- Point Source Allocation Strategy
  - Goal: Meet WLA for the wastewater sector
- Nutrient CAP Load established in NPDES
- Significant Reductions from Wastewater
  - Typical Pre-Bay TN at Sig Sew Fac – 20 to 25 mg/L
  - Bay TN Concentration CAP Load basis – 6 mg/L
- Sig Sew Dischargers – 95% of TN WW Load

# Historical Perspective

- Sig Sew Discharges - CAP Load for 190 facilities
  - Flows > 0.4 MGD
  - NPDES Permit Annual Load Limits
    - TN Load = Design Flow @ 6.0 mg/L Total Nitrogen
    - TP Load = Design Flow @ 0.8 mg/L Total Phosphorus
- Sig IW Dischargers – CAP Loads for 23 facilities
- Non-Sig Dischargers- 2300 facilities

# Current Status

- Successfully operating under the WLA established in the TMDL
- On track to continue to be under WLA in 2025
- Limited way to get reductions from Sector
  - Upgrading the treatment technologies
  - Optimization of existing facilities

# Reduction Scenarios Considered

Scenario No. 1 - Significant Sewage  
Dischargers to ENR

# Reduction Scenarios

## Sig Sew to ENR

- Levels of Nutrient Removal
  - Biological Nutrient Removal
    - TN – 8.0 mg/L and TP – 1.0 mg/L
  - PA Biological Nutrient Removal
    - TN – 6.0 mg/L and TP – 0.8 mg/L
  - Enhanced Nutrient Removal
    - TN - 4 mg/L and TP - 0.3 mg/L
- PA Requirements more restrictive than BNR but less than ENR.



# Reduction Scenarios

## Sig Sew to ENR

- Reductions at discharge design flow
  - 3,270,771 lbs/yr TN & 807,815 lbs/yr TP
- Reductions at 2025 flow
  - 2,835,176 lbs/yr TN & 567,737 lbs/yr TP
- Nutrient Reduction Cost Estimates
  - 11 Facilities with 4 or 5 more in the works



# Reduction Scenario

## Sig Sew to ENR

Sig Sew Discharger upgrade to ENR Scenario Not Recommended by Wastewater Workgroup due to cost per lb of TN reduction.

# Reduction Scenarios Considered

## Scenario No. 2 - Significant Sewage Dischargers Optimization

# Reduction Scenario

## Sig Sew Optimization

- Sig Sew Discharger – Limit = Lbs/yr not mg/L
- 2017 water year data
  - 98 dischargers > 6.0 mg/L TN based on annual avg
  - 89 dischargers > 0.8 mg/L TP based on annual avg
- Reductions at discharge design flow
  - 1,648,587 lbs/yr TN, 208,885 lbs/yr TP
- Reductions at 2025 flow
  - 628,519 lbs/yr TN, 37,227 lbs/yr TP

# Reduction Scenario

## Sig Sew Optimization

- Existing DEP Plant Optimization Program
  - Outreach for facilities with compliance issues
  - DEP Deploys instrumentation that measure real-time performance
  - Program could be expanded to facilitate nutrient optimization.

# Reduction Scenario

## Sig Sew Optimization

- Workgroup recommends establishing a nutrient removal optimization program and encouraging discharger participation.
- Considering 2 Alternatives
  - Program run fully by DEP
  - Program relying on DEP data collection and consultant to help discharger optimize

# Reduction Scenario

## Sig Sew Optimization

- Workgroup recommends establishing an operation and maintenance reimbursement program similar to Maryland's.
  - Incentivize plant optimization
  - Costs for optimization have not been developed since they are plant specific.
  - Cost could be developed as part of the optimization program



# Reduction Scenarios Considered

Scenario No. 3 – Non-Significant Sewage  
Dischargers to BNR

# Reduction Scenario

## Non-Sig Sew to BNR

- Limitation to successful BNR implementation
  - Design Flow cut-off of 0.075 mgd left 181 of the Non-sig Sew Dischargers
  - 72 of 181 have actual flow greater than 0.075 mgd
- Reductions at 2017 annual average flow
  - 401,699 lbs/yr TN
  - Reductions at 2025 flow
  - 327,303 lbs/yr TN

# Reduction Scenario

## Non-Sig Sew to BNR

Wastewater Workgroup recommends the Non-Sig Sewage Dischargers perform a nutrient reduction alternative evaluation prior to any upgrade or major capital improvement that includes the biological treatment component of their facility.

# Reduction Scenarios Considered

Scenario No. 4 – Onlot (Septic)

# Reduction Scenario

## Onlot (Septic) TN Reduction

- Estimated Onlot TN Load – 2,897,000 lbs/yr
  - Reduction through treatment technology
    - Only One PA approved system, 50% Reduction
    - Cost of technology ≈ \$10K
  - Sewage Management Program for Onlot Systems
    - Inspection of system, ensures O&M being performed and septic tank is pumped
    - Reduction for Implementation of Sewage Management
      - 5% reduction or 144,000 lbs TN/yr.

# Reduction Scenario

## Onlot (Septic) TN Reduction

Wastewater Workgroup recommends implementation of sewage management.

DEP should develop a GIS based online monitoring and reporting system that municipalities could use to manage program and report data to DEP for reporting.

# General Recommendations

- Develop a program to better facilitate trading between sectors. Sectors that fall short of their load reductions could be offset through reductions in the wastewater sector. These reductions could be funded through a dedicated fund to offset cost for facility optimization or capital improvements.



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# Questions???

## Wastewater Workgroup

### Co-Chairs

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