

# Nitrogen Requirements for NPDES Permits in the Long Island Sound Watershed

June 7, 2019

# Presentation Overview

- Long Island Sound (LIS) and the LIS TMDL
- Permitting actions to date
- New approach for implementing the TMDL through NPDES permits
- Anticipated timeline for issuing permits
- Potential funding sources
- Technical assistance

# Long Island Sound (LIS)

- LIS unable to meet WQS for dissolved oxygen, due to excess nitrogen loading
- CT and NY developed DO TMDL in 2000
  - Approved by EPA in 2001
  - Focuses on reduction in nitrogen loading to achieve DO standards in the Sound



# LIS TMDL Allocations

- CT and NY: 58.5 % reduction, 10% from nonpoint sources and remainder from point sources (primarily WWTPs)
- Upper basin\* (MA, NH, VT): 25% from point sources, 10% from nonpoint sources



\*Upper basin referred to as “out-of-basin” in LIS TMDL

# Progress Under LIS TMDL

- CT point source reduction target met through statewide nitrogen trading program
- NY met point source reductions through treatment plant upgrades
- Upper basin states have met aggregate nitrogen reduction goal
- Current and planned actions by states expected to fall short of LIS TMDL goals
  - Dissolved oxygen standards are not being met in LIS

# LIS Nitrogen Reduction Strategy

- Separate and ongoing effort conducted by EPA - not related to this new approach to implementing the LIS TMDL
- Recognizes more work may need to be done, particularly in coastal embayments and estuarine portions of rivers that flow into LIS
- EPA working to establish nitrogen thresholds for several coastal embayments
- Possibility of more stringent effluent limits in the future
- For more information, see <http://longislandsoundstudy.net/issues-actions/water-quality/nitrogen-strategy/>

# NPDES Permitting in Upper Basin to Date

- Evaluation of current and/or alternative methods of operating facility to optimize nitrogen removal
- Annual report documenting efforts to optimize nitrogen removal, annual nitrogen load from facility, and trends relative to previous year
- Non-enforceable nitrogen loading “cap”/”benchmark”
- Weekly, monthly, or quarterly effluent nitrogen monitoring



# Estimated Upper Basin Point Source Nitrogen Loadings to Connecticut, Housatonic, and Thames Watersheds

Basin	1998 Baseline Loading (lb/day)	TMDL WLA (lb/day)	Max Loading 2013-2017 (lb/day)
Connecticut River	21,672	16,254	14,395
Housatonic River	3,286	2,464	1,628
Thames River	1,253	939	666
<b>Total</b>	<b>26,211</b>	<b>19,657</b>	<b>16,689</b>



# Need for new approach

- Optimization requirements have resulted in nitrogen reductions, but not enforceable
- Some current caps/benchmarks result in very low concentrations at design flow
- Cannot prevent increases in nitrogen loads from population growth or new industrial sources
- LIS still impaired for dissolved oxygen
- Concerns raised by the state of Connecticut and citizens about potential for increased loading
- Enforceable limits will ensure that new growth in communities does not result in increased nitrogen loads that further degrade LIS

# New approach for nitrogen permit requirements in Massachusetts

- Enforceable nitrogen limits for wastewater treatment plants (WWTPs)\* with design flow 1 MGD or greater
- Rolling annual average mass-based loading limit (in lb/day)
- Optimization requirement for all WWTPs and industrial facilities with design flow 0.1 MGD or greater
- Monitoring only for all WWTPs and industrial facilities with design flow < 0.1 MGD

**WWTPs = Publicly and privately owned treatment works**

# WWTPs $\geq 1$ MGD

Rolling Annual Average Mass-based Loading Limit  
(lb/day) + optimization

- Facilities  $\geq 50$  MGD
  - 2,591.4 lb/day
- Facilities  $\geq 10$  MGD and  $< 50$  MGD
  - Limit equivalent to 5 mg/L at design flow
- Facilities  $\geq 5$  MGD and  $< 10$  MGD
  - Limit equivalent to 8 mg/L at design flow
- Facilities  $\geq 1$  MGD and  $< 5$  MGD
  - Limit equivalent to 10 mg/L at design flow

# WWTPs $\geq$ 1 MGD Examples

- Chicopee (Design Flow = 15.5 MGD)
  - Limit = 15.5 MGD x 5 mg/L x 8.345 = **646.7 lb/day**
- Amherst (Design Flow = 7.1 MGD)
  - Limit = 7.1 MGD x 8 mg/L x 8.345 = **474.0 lb/day**
- Great Barrington (Design Flow = 3.2 MGD)
  - Limit = 3.2 MGD x 10 mg/L x 8.345 = **267.0 lb/day**

# WWTPs < 1 MGD

- Facilities  $\geq 0.1$  MGD and  $< 1$  MGD
  - Optimize with no limits, monitor
  - Example: North Brookfield (0.76 MGD)
- Facilities  $< 0.1$  MGD
  - Monitor only
  - Example: Charlemont (0.05 MGD)

# Industrial Facilities

- Facilities  $\geq 0.1$  MGD and  $< 1$  MGD
  - Optimize with no limits, monitor
  - Example: Chang Farm (Expected maximum flow 0.65 MGD)
- Facilities  $< 0.1$  MGD
  - Monitor only
  - Example: Solutia Chemical (expected maximum flow 0.015 MGD)

# Anticipated Timeline for WWTP Permits

- Great Barrington, Lee, Lenox
  - Drafts to be public noticed in next week or two
- Chicopee, Gardner, Pittsfield
  - Public Notice Fall 2019
- Millers River Permits
  - Templeton, Orange, Athol, Erving POTW 1, Erving Center WWTP 2, Winchendon
  - 2020
- WWTP General Permit
  - 2020

# Potential Funding Sources

- MassDEP State Revolving Fund Loans
  - Standard low interest loans (2 %)
  - Nutrient reduction projects may be eligible for 0% loans (special conditions apply)
  - Solicitation of proposals each June, proposals due in August
- Long Island Sound Futures Fund
  - Grant funding
  - Cannot be used to meet permit requirements; could be used prior to permit issuance
  - 2019 proposals due in May, look out for 2020 funding



# Technical Assistance Contacts

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# Resources

- NEIWPCC Report – Low Cost Retrofits for Nitrogen Removal at Wastewater Treatment Plants in the Upper LIS Watershed:  
[http://click.neiwpcc.org/neiwpcc\\_docs/LIS%20Low%20Cost%20Retrofit%20Final%20Report%20-%20March%202015%20\(revised\).pdf](http://click.neiwpcc.org/neiwpcc_docs/LIS%20Low%20Cost%20Retrofit%20Final%20Report%20-%20March%202015%20(revised).pdf)
- EPA Report – Case Studies on Implementing Low-Cost Modifications to Improve Nutrient Reduction at WWTPs: <https://www.epa.gov/nutrient-policy-data/case-studies-implementing-low-cost-modifications-improve-nutrient-reduction>

# Questions?

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