Newman Lake Advanced Wastewater Treatment Pilot Study Update

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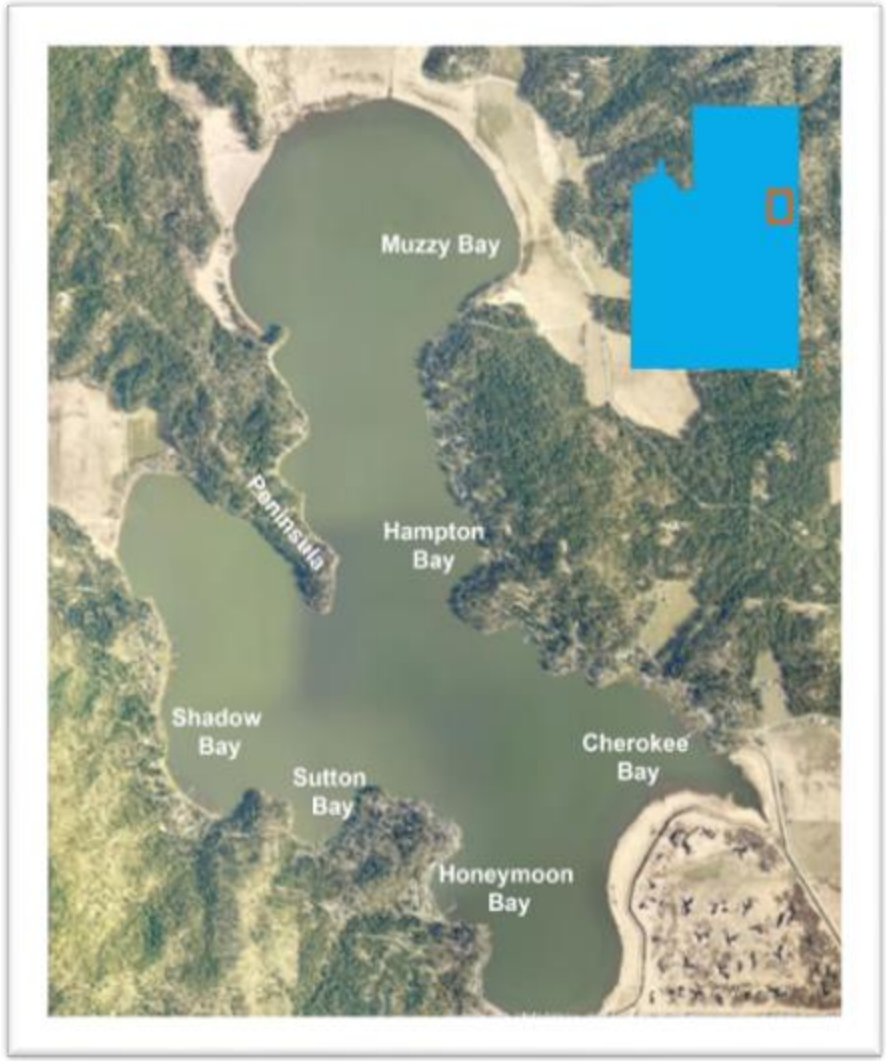
Newman Lake

- 1,200 acres
- Shallow
- Mixed land use
- Heavily developed shoreline
- Extensive, shallow bedrock and seasonally shallow water table



The Problem

- Stormwater, runoff
- Cesspools
- High Phosphorus and Nitrogen
- Constant algal blooms
  - No swimming typical July/August

History of Lake Management

- Extensive monitoring (1970s-onward)
- Water quality complaints-HAB's
- Failing OSS
- Oxygenation and alum systems
- TMDL for Total Phosphorus

Project Goals

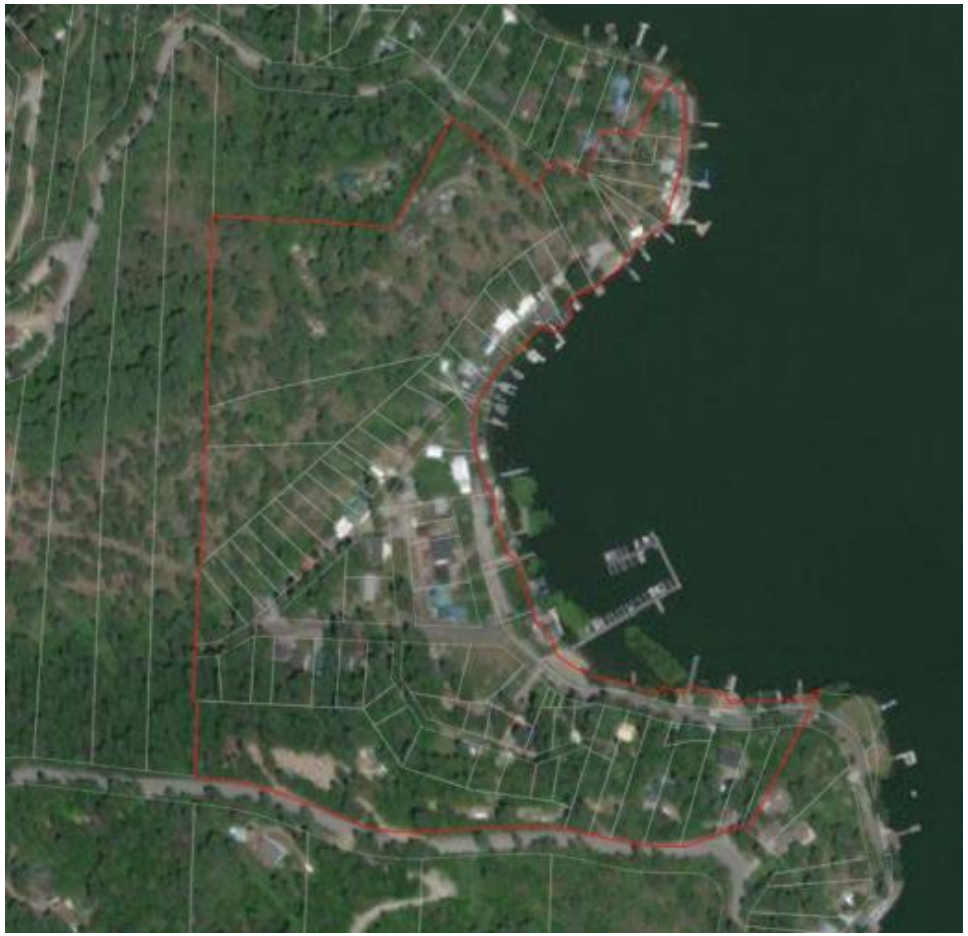
- Reduce nutrient inputs and protect water quality
- Address failing OSS
- Engage with wide array of partners to find a *cost-effective* wastewater treatment alternative

Previously Considered Options

- Centralized Collection Systems
  - STEP system to pressurized bed
  - Land treatment
  - STEP to subsurface drip

No willing landowners at time of feasibility study

- Individual Systems
  - Membrane Bioreactor Technology
    - High quality effluent
    - Space efficient
    - In-ground/above-ground options



Pilot Study Phase 1 – Install/Test MBR's

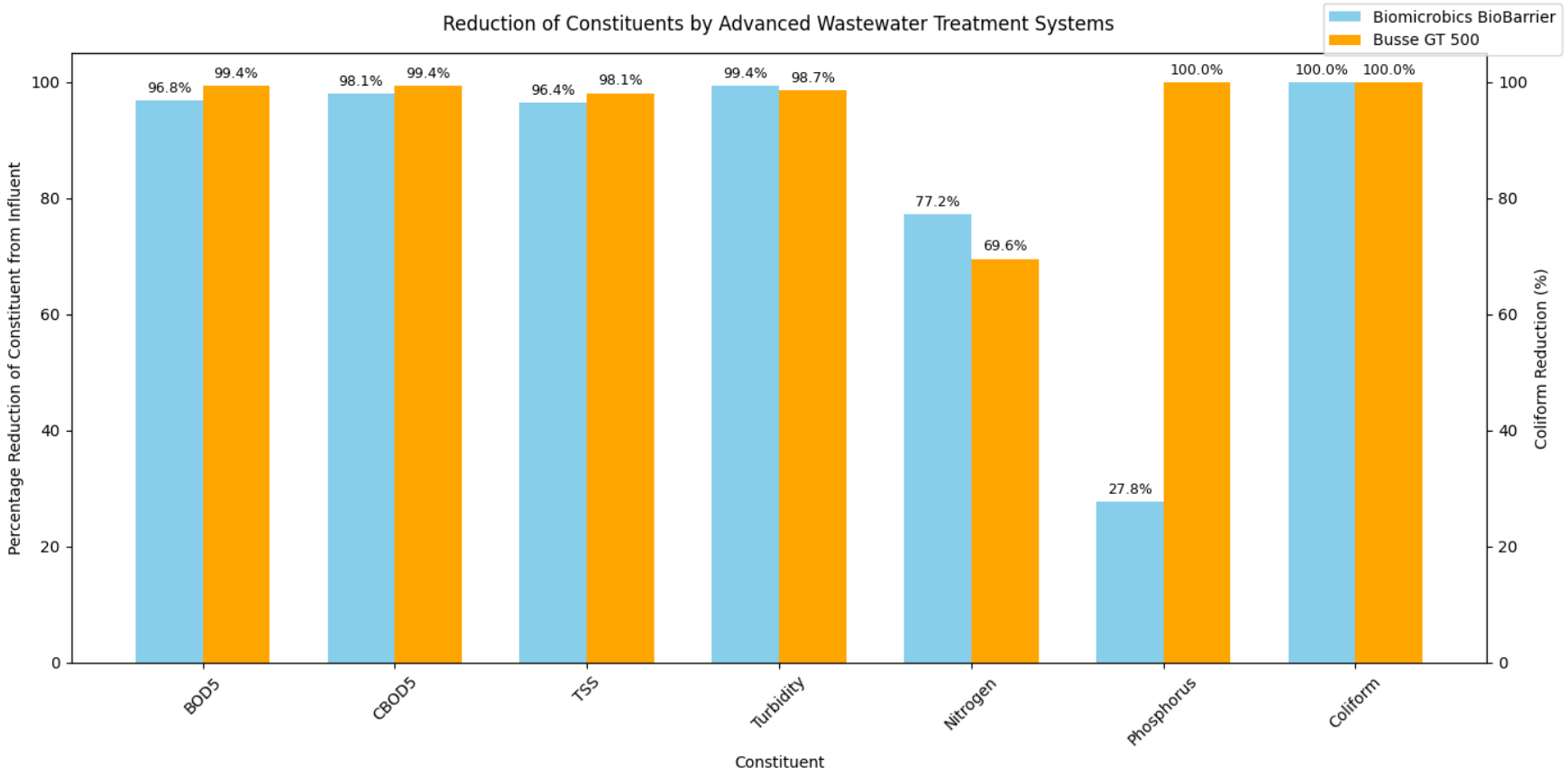
Conducted because no permit mechanism available

- 2019
  - OSS and LOSS (WAC 246-272a, b) options deemed unavailable due to lack of soil treatment
  - Reclaimed water rule (WAC 173-219) identified as unlikely
  - Ecology recommends state waste discharge permit (WAC 173-216)
- 2020
  - Ecology endorses SCD to install 2 systems to test effectiveness of treatment
  - Systems installed, monitored, results as expected

Phase 1 Systems

- **Busse GT500** *above ground*
  - Replaced cesspool
  - Added drip irrigation
  - Drainfield size reduction allowed by SRHD
- **Biomicrobics BioBarrier** *subsurface*
  - Replacing undersized drainfield with drip irrigation-SRHD allowed size reduction
  - Managed stormwater issues previously causing drainfield failures

Water Quality Results



Latest Sampling

BOD, CBOD, TSS, pH, DO are all at reclaimed water levels.

Turbidity is within sample maximum

Yearly maintenance required to maintain results

Pilot Study Phase 1 – Permitting Pathways

- 2021-2022
  - Favorable results allow funding for Phase 2 to be secured for more systems
  - Sewer districts explored
  - Unable to identify State Waste Discharge Permit holder to administer permit to individual homeowners
  - 2021 Rejected by reclaimed water workgroup for individuals or private business.
- 2023
  - Sewer district options continued
  - Ecology re-initiates discussion of OSS permit with SRHD
  - Design revisions accepted with waivers to fit OSS permit
- 2024
  - Design revisions accepted with waivers to fit OSS permit
- 2025
  - Installed retrofits for Phase 1 systems as approved by SRHD

Phase II – Next Steps

- Based on initial monitoring results (2020), SCD secured funding from Ecology to expand the pilot
- Financial assistance paired with Lake Care outreach
- Additional installations contingent on permitting pathway

- System Maintenance
  - Long term maintenance on homeowners-manufacture (representative)
  - Systems work when maintained, voided if not
  - Required maintenance per new OSS rules (WAC 246-272A-0238)

Phase II – Timeline to System Install

- Spring 2025
  - Sites Visited
  - Engineering design summer
  - Apply for permit from SRHD Fall 2025
  - Install Fall 2025/Spring 2026
- Focused on sites that can meet SRHD OSS requirements (with waivers)
  - Still need soil
  - 50+% drainfield size reduction allowed

Phase II – Adjacent Efforts

- Lake Care
  - Reduce phosphorous runoff
  - Community involvement
    - Reinvigorating desire of participants and shoreline improvements
- Regulatory
  - Ecology/Local health jurisdictions
  - Providing support on-call as requested
    - Engineering support
    - Pilot study example support
    - Reclaimed Water Rule support?

Broader Implications

- Shorelines across Washington need access to MBR's
  - Less than 5% of lakes have sewer districts or centralized systems
- Are there other configurations that may allow these systems to proceed now (clusters with drainfield, etc)?
- Are MBRs able to provide adequate treatment in other sensitive environmental areas?

Questions?

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O/M Considerations

Operations Permitting Requirements:

- OSS (WAC 246-272a) new requirements
  - LHJ requirements
    - No operation requirements
- Reclaimed water rule (173-219) operations requirements
  - constant turbidity sampling
  - water quality sampling frequency based on beneficial reuse
- State Waste Discharge (173-216) operations requirements
  - TMDL considerations
  - Water quality frequency