

Overview of Water Quality Planning Considerations

Sea Camps Long Pond Property

October 18, 2023



Horsley Witten Group, Inc.



Topics to Discuss

- Hydrology of site and the surrounding neighborhoods
- Pleasant Bay watershed
- New DEP regulations and effect on Herring River watershed planning
- Long Pond water quality
- Zone II drinking water protection area

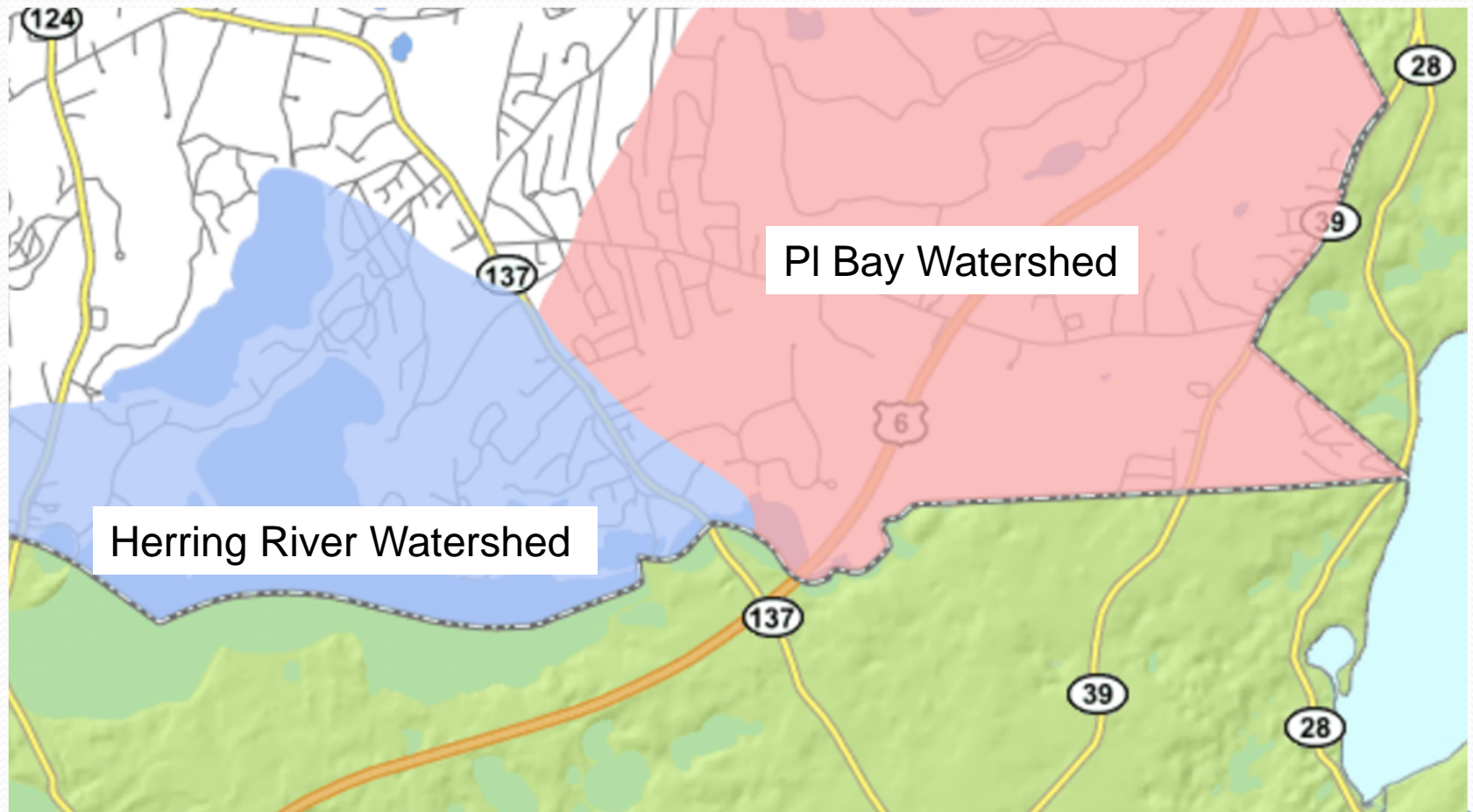


Hydrology

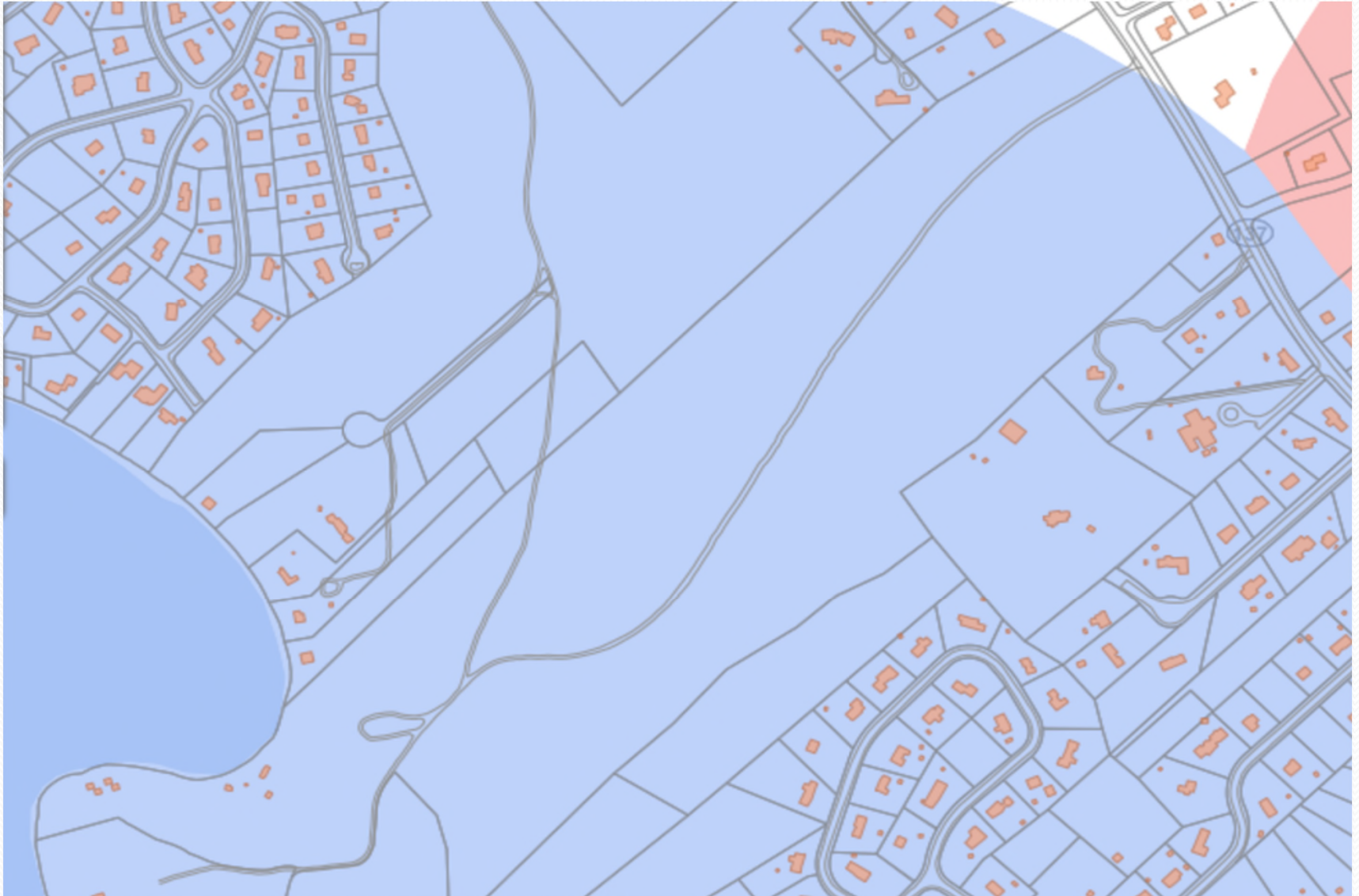
- Groundwater from at least 99% of the property flows to Long Pond.
- A small area in the northeast corner might flow to Cape Cod Bay.
- The site is in the Herring River watershed.
- The eastern half is in a Zone II.



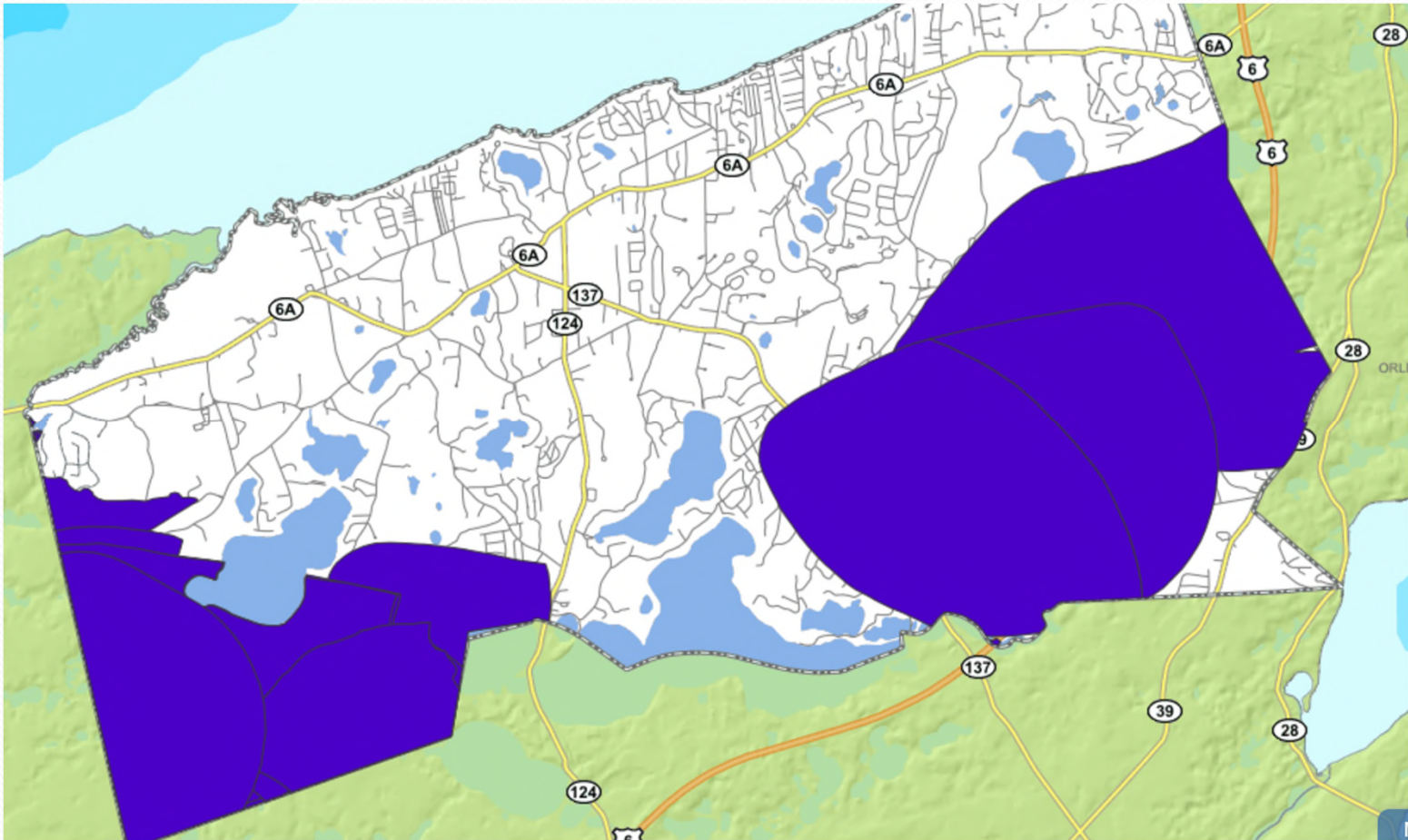
Watersheds to Coastal Estuaries



Watershed Boundaries on Parcel



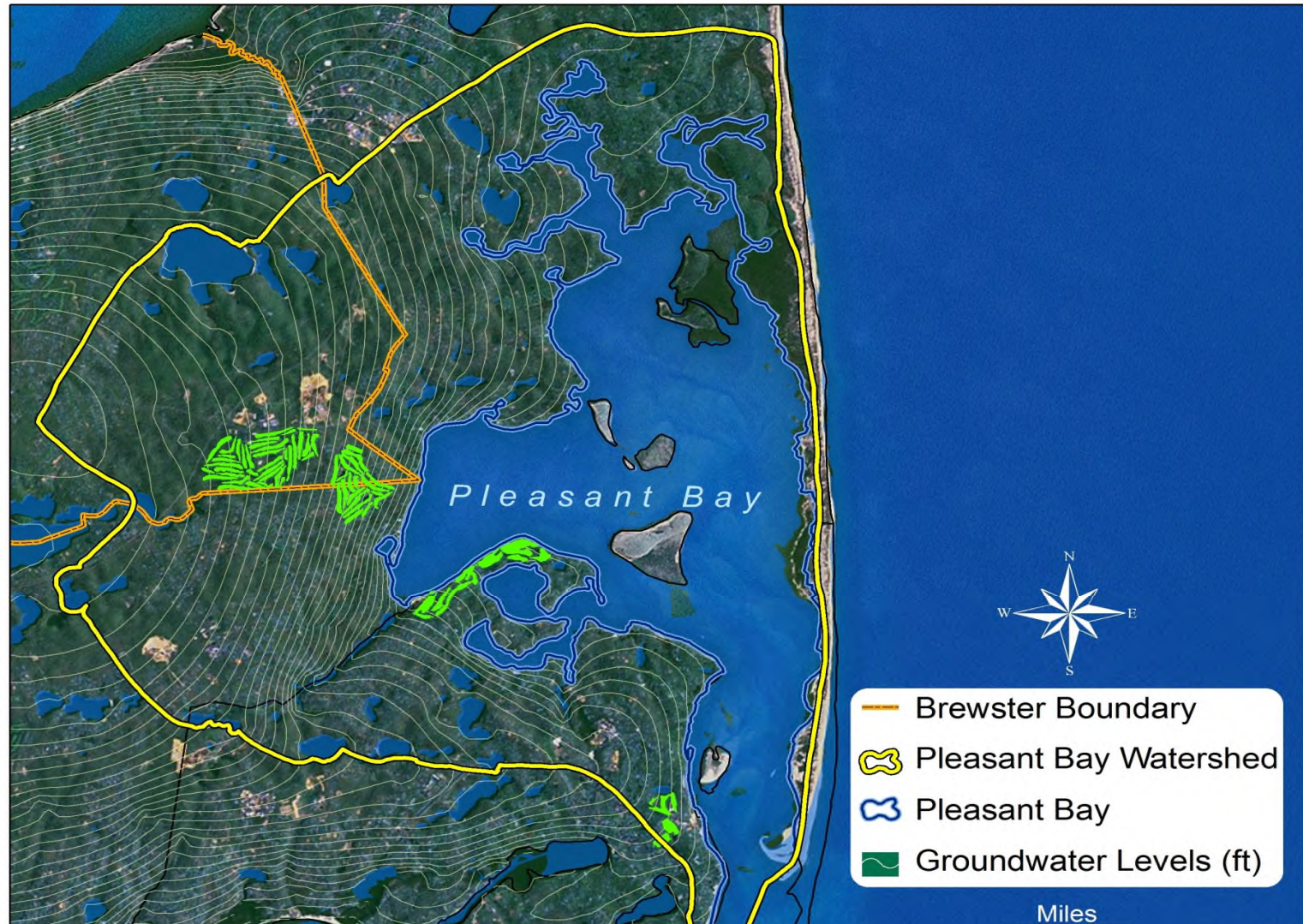
Zone II PWS Protection Areas



Zone II On Parcel



Pleasant Bay Watershed Permit



Pleasant Bay Permit Update

- Captains Golf Course Fertilizer Reductions Have Already Attained More Than 80% of Brewster's Nitrogen Removal under Watershed Permit.
- Ongoing Golf Course Fertilizer Leaching Rate Study May Document Additional Nitrogen Load Reductions.



Pleasant Bay Permit Update

- The Need for I/A Septic Systems Or a Neighborhood Wastewater Treatment Plant is Still Being Evaluated.
- Possibility of a Combined Plant to Serve Pleasant Bay and Herring River Watersheds.
- Decisions Will Account for the Nitrogen Load from Future Development.



Herring River Watershed

- Groundwater from the site flows to Long Pond and eventually to the Herring River in Harwich.
- The Herring River watershed is subject to the new DEP regulations (Nitrogen Sensitive Area).



Title 5 Changes

- Septic Systems In Impaired Watersheds Must Be Upgraded to Innovative/ Alternative (I/A) to Treat Nitrogen within 5 Years of the Regulations
 - Unless:
- Town Files a Notice of Intent to Obtain a Watershed Permit or requests a de minimis exemption.



Watershed Permits

- Select Board Voted to Submit a Notice of Intent to DEP that Watershed Permit will be submitted for Brewster's Part of the Herring River Watershed.
- Watershed Permit will take up to 5 years to develop.
- NOI will pause the need for Septic Upgrades in this Watershed.

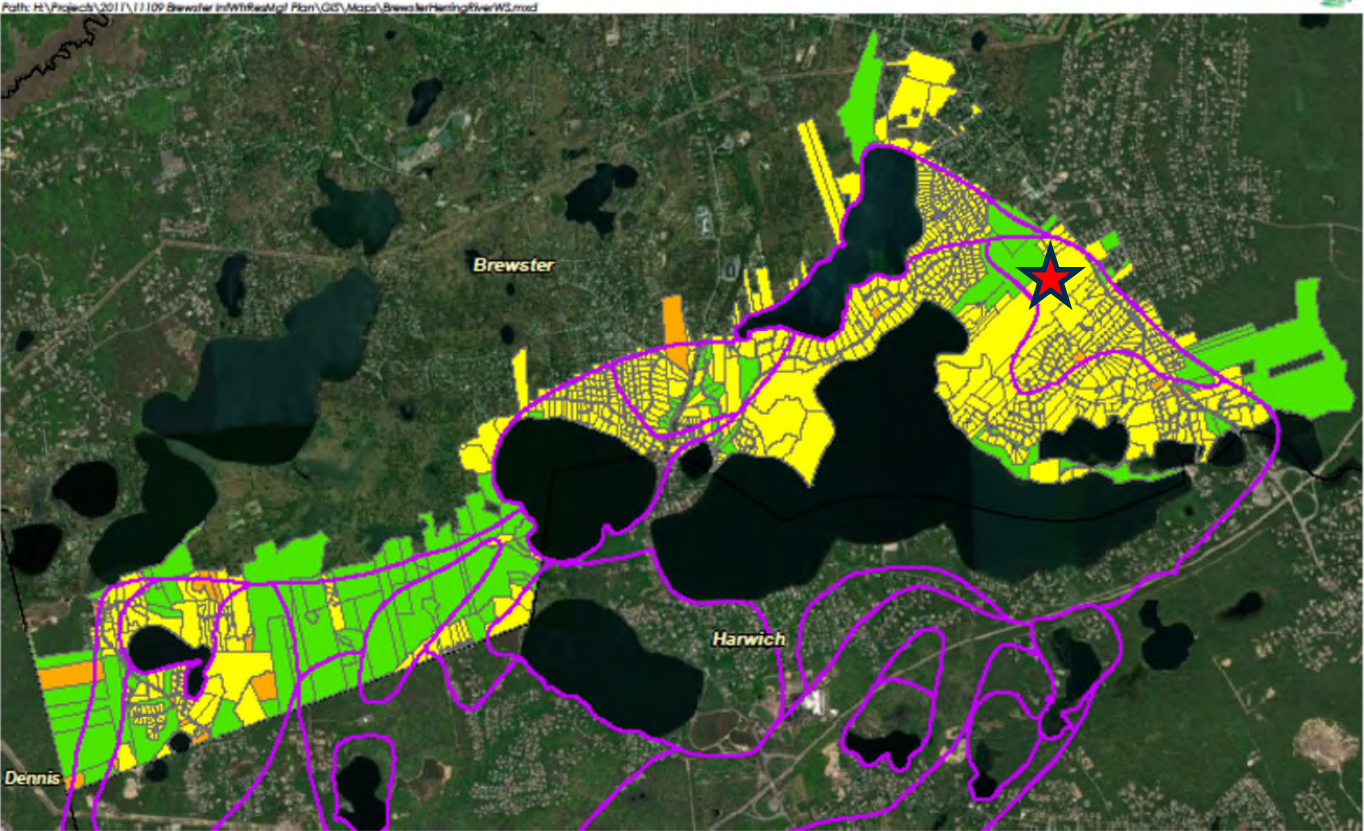


Herring River Watershed

- Recent Data Suggests Brewster will Only Need to Manage Nitrogen Load from development that was built after 2013 (Baseline Year) or in the future.
- Many Ponds are Within the Town's Portion of Watershed (Long, Sheep, Seymour, Elbow, etc) - Reducing the Nitrogen Load that Must Be Managed Due to Attenuation.



Herring River Watershed



★ Sea Camp Parcel

Date: 8/16/2023
Data Sources: Bureau of Geographic Information (MassGIS), ESR
This map is for informational purposes and may not be suitable for legal, engineering, or surveying purposes.

- Herring River Watersheds
- Municipal Boundary
- Brewster Parcels**
- Developed/Residential
- Protected
- Vacant Land - Unprotected

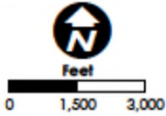


Figure 2
Brewster Parcels within Herring River Watersheds

Herring River Watershed

- Options For Managing the Load from Future Development Include:
 - Septic System Upgrades
 - Neighborhood Sewer Systems
 - Fertilizer and Stormwater Management
 - Nitrogen Trade
- Strategies to Reduce Nitrogen Loads Should Consider Beneficial Impacts on Ponds



Long Pond Water Quality

- Primary issue is phosphorus as a small increase in concentration can affect water quality.
- Biggest phosphorus concern relates to septic systems close to the shore – within 300 feet.
- Larger systems can be an issue further away if treatment is not provided.



Long Pond Water Quality

- Nitrogen can also affect a pond if phosphorus levels are high.
- Phosphorus in wastewater effluent can be treated effectively, in both onsite I/A systems and in larger treatment plants.



Water Quality Review Bylaw

- Currently regulates areas with Zone IIs and the Pleasant Bay Watershed.
- Nitrogen loads from development cannot exceed 5 mg/L – designed to reduce impacts to PWS wells and to Pleasant Bay.
- State drinking water standard for nitrogen is 10 mg/L.



Water Quality Concerns

- Lawn Fertilizers
- Road Runoff
- Wastewater Effluent



Water Quality Concerns

- Lawn Fertilizers – Phosphorus typically not used in fertilizer.
- A lawn can be managed without fertilizer.
- Road Runoff – treatment and infiltration of stormwater managed under Town bylaw – no phosphorus impacts to Long Pond.



Water Quality Concerns

- Wastewater can be treated to reduce nitrogen to a level that complies with the WQR Bylaw requirements.
- Phosphorus treatment also possible.
- Depth to groundwater and distance to pond minimizes phosphorus impacts on Long Pond



Water Quality Concerns

- Town must offset nitrogen load from buildout under Herring River watershed permit.
- I/A systems or a neighborhood treatment facility provide options to manage this need.



I/A Septic Systems

- More technologies are proving to treat nitrogen at or below 10 mg/L.
- Shubael's Pond study in Barnstable shows Nitroex system can treat below 5 mg/L - close to General Use Approval from DEP.
- DEP regulations require transition to I/A in NSAs if no watershed permits.



Treatment Facility Layout and Sizing

- Treatment System can be mostly below ground with small control shed.
- 15,000 gpd system –
 - Approximately 138 bedrooms
 - Size <3,000 sq. ft. facility with 5,000 sq. ft leaching area.



Treatment Facility Example

Approx 15,000 gpd



Questions?

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