

## Attachment 2

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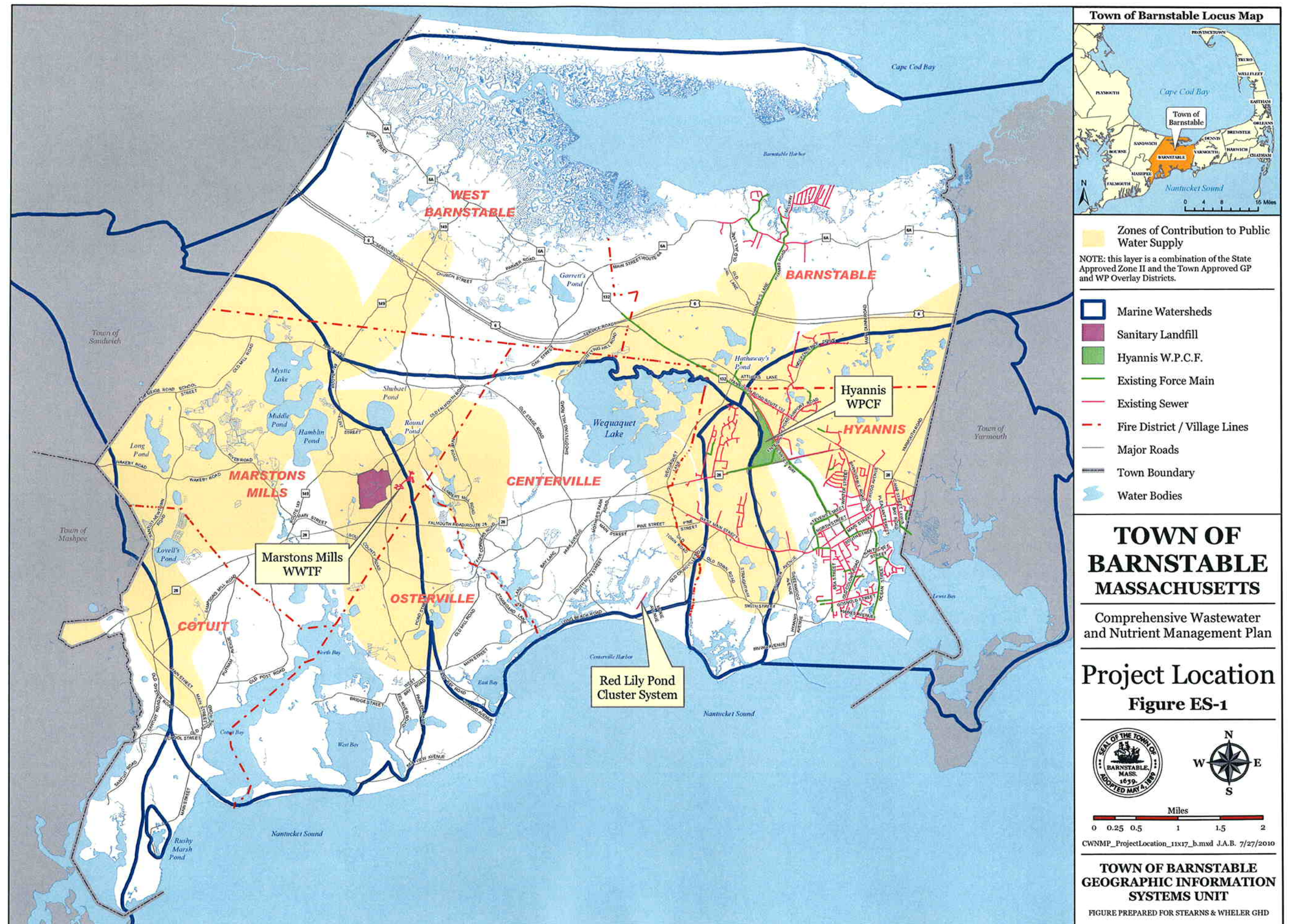
### Figures<sup>1</sup>

- ES-1: Project Location
- ES-2: Existing Septic System Nitrogen Removal Needed to Meet TMDLs
- 5-3: Hydrology and Related Areas
- 5-4: Sensitive Habitat and Natural Areas
- 5-5: Shellfish Resource Map
- 5-6: Topography Map
- 5-7: Geology Map
- 5-8: Soils Map
- 5-9: Flood Zones Map
- 5-10: Open Space Map
- 5-11: Land Use Map
- 5-12: Historic Districts

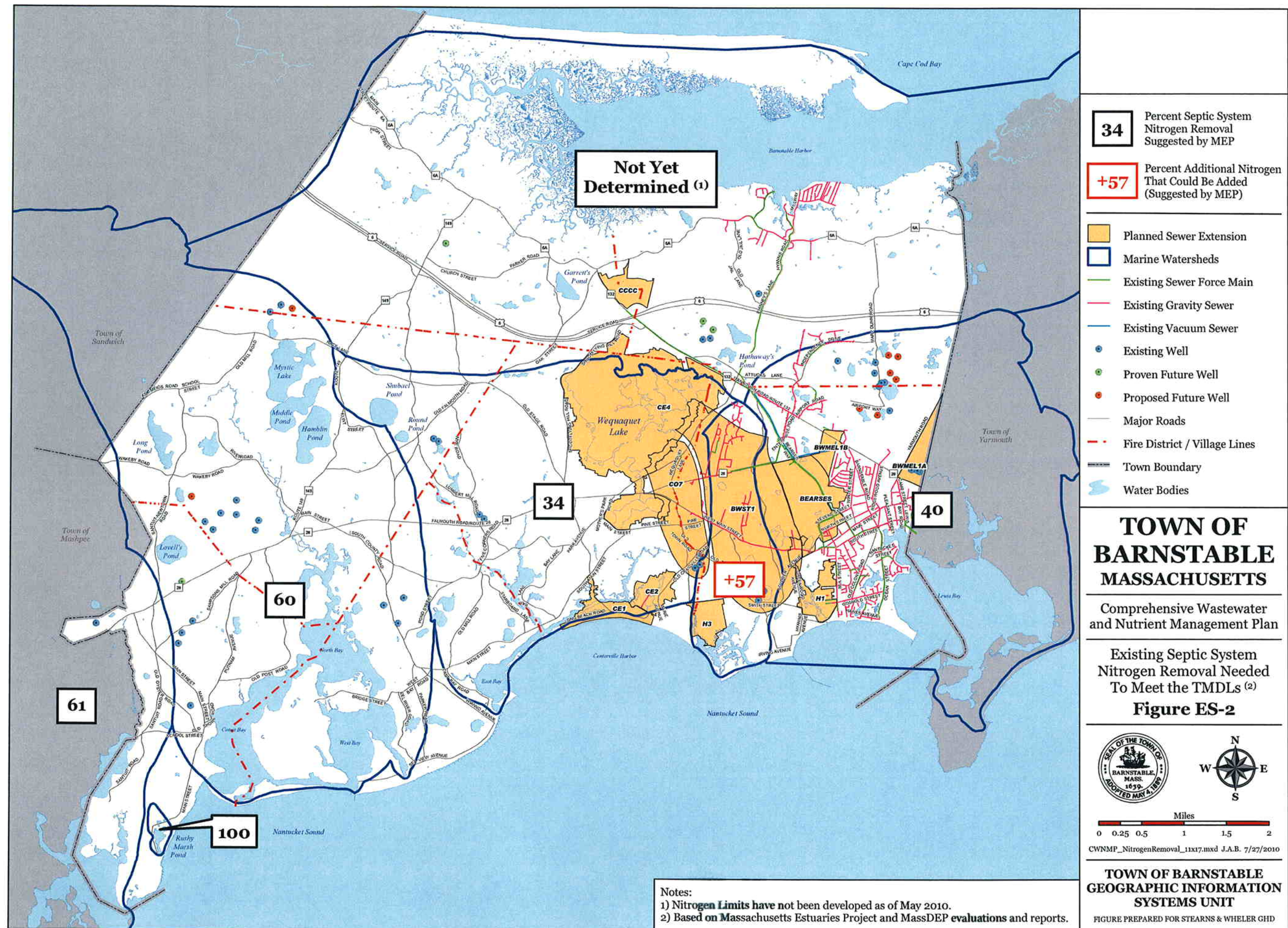
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<sup>1</sup> All figures are from the Needs Assessment Report (contained in Attachment 4) and the figure numbering is maintained from the Needs Assessment Report.

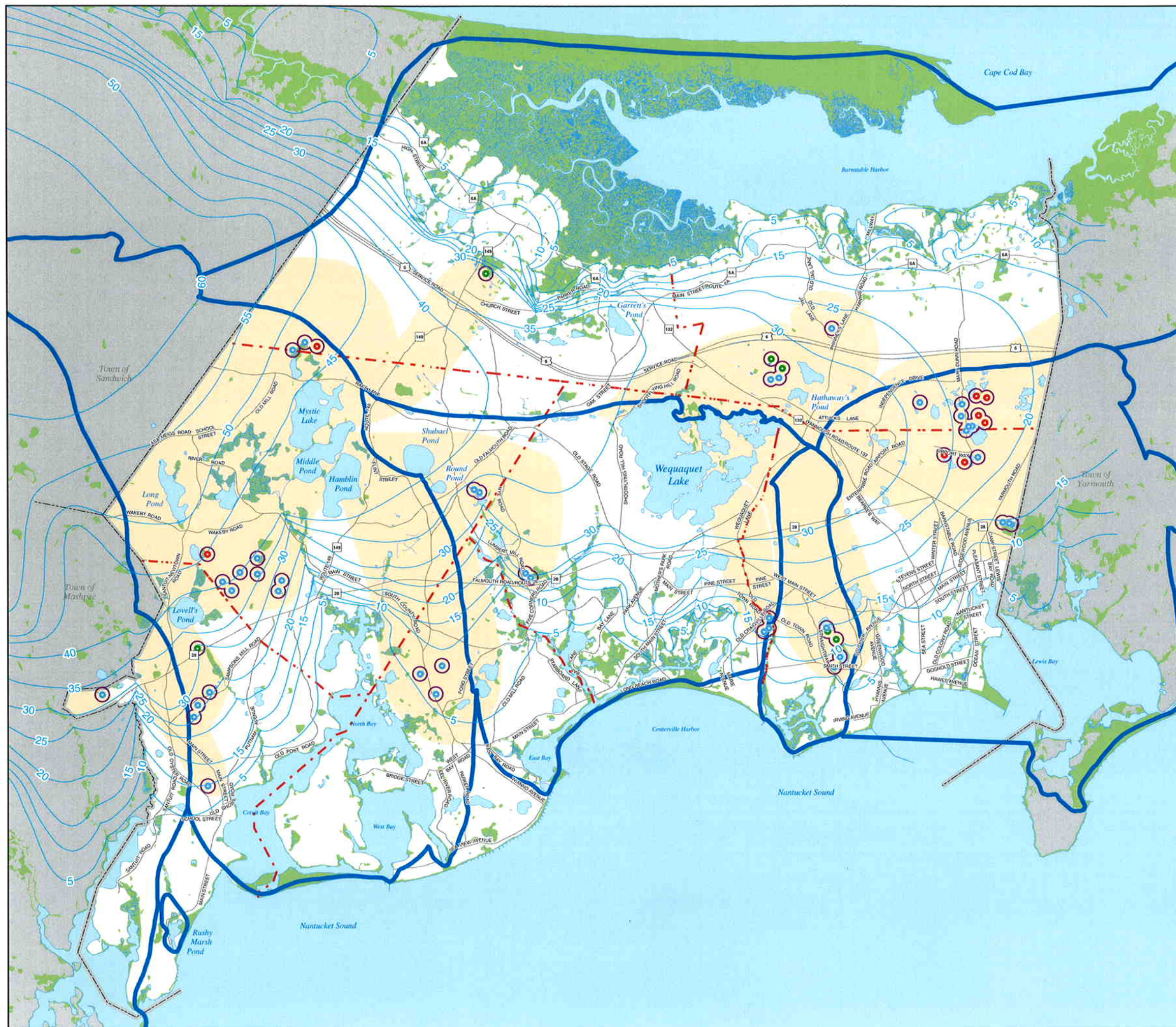












#### Public Water Supply Wells

- Existing Well
- Proven Future Well
- Proposed Future Well

#### Groundwater Contours Elevation Above Sea Level

NOTE: Groundwater Contours are based on June 1992 Gaherty & Miller groundwater model.

- Zone I - 400 Ft. Radius Circles Around Public Wells
- Zones of Contribution to Public Water Supply

NOTE: this layer is a combination of the State Approved Zone II and the Town Approved GP and WP Overlay Districts.

- Marine Watersheds
- Wetlands
- Fire District / Village Lines
- Major Roads
- Town Boundary
- Water Bodies

## TOWN OF BARNSTABLE MASSACHUSETTS

Comprehensive Wastewater  
and Nutrient Management Plan

### Hydrology Figure 5-3

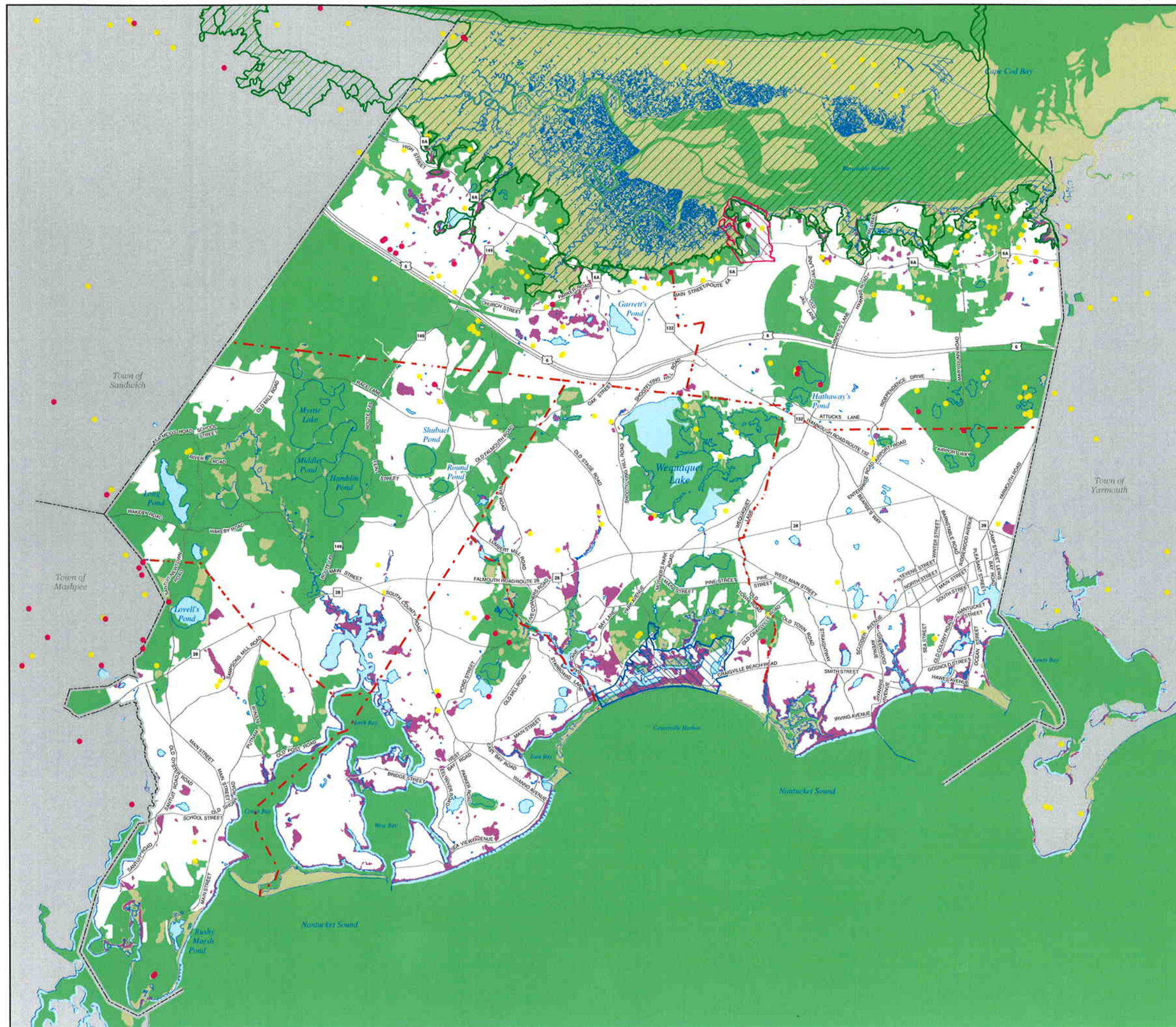


CWNMP\_Hydrology\_11x17.mxd J.A.B. 3/30/2010

TOWN OF BARNSTABLE  
GEOGRAPHIC INFORMATION  
SYSTEMS UNIT

FIGURE PREPARED FOR STEARNS & WHEELER GHD





**Natural Heritage & Endangered Species Program (NHESP) Habitat**

- Combined NHESP Habitat
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools

NOTE: the combined NHESP habitat layer is a combination of seven NHESP layers obtained from MassGIS including: Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, BioMap Core Habitat, BioMap Supporting Natural Landscape, Living Waters Core Habitats, Living Waters Critical Supporting Watersheds, and Natural Communities. Certified and Potential Vernal Pool layers were also obtained from MassGIS. The NHESP layers shown here are current with the latest MassGIS versions as of 3/31/2010.

**Wetlands**

SOURCE: "DEP Wetlands (1:12,000) - April 2007" layer obtained from MassGIS.

**Wetlands & NHESP Habitat**

Indicates where the Wetlands and NHESP Habitat layers overlap.

**Districts of Critical Planning Concern (DCPC)**

- Pond Village DCPC
- Centerville DCPC

NOTE: The "Barnstable DCPC" encompasses the entire Town of Barnstable and is not shown on this map.

- Area of Critical Environmental Concern (ACEC)
- Fire District / Village Lines
- Major Roads
- Town Boundary
- Water Bodies (May be obscured)

# TOWN OF BARNSTABLE MASSACHUSETTS

Comprehensive Wastewater and Nutrient Management Plan

## Sensitive Habitat and Natural Areas

### Figure 5-4

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# Legend

Anadromous Fish Presence

Shellfish Suitability Area

Shellfish Sampling Station

## Designated Shellfish Growing Area

Approved

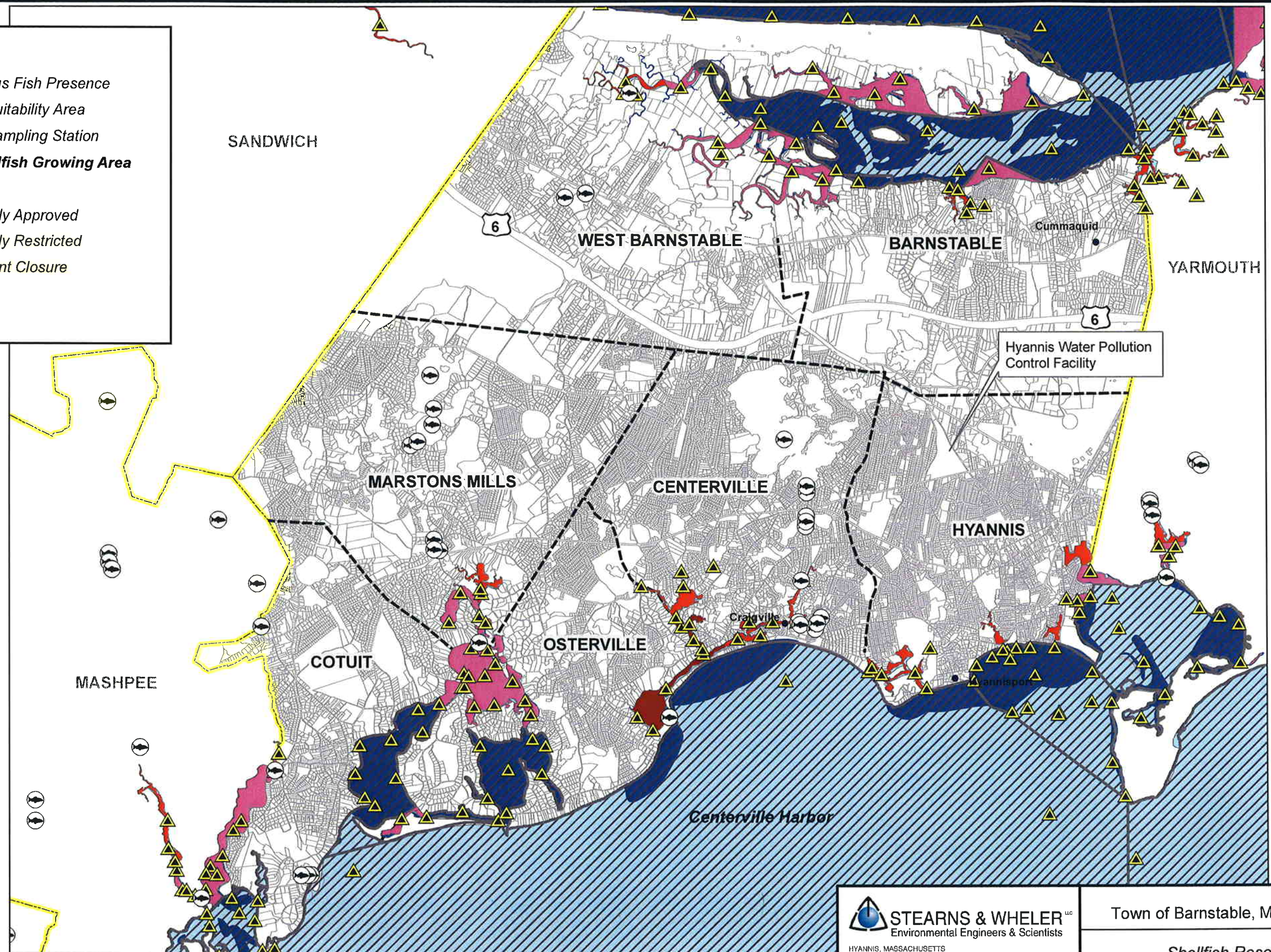
Conditionally Approved

Conditionally Restricted

Management Closure

Prohibited

Restricted



Data Source: Mass GIS

\*Note: Entire area is within Lobster Harvest zone

**STEARNS & WHEELER**<sup>LLC</sup>  
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HYANNIS, MASSACHUSETTS

1645 Iyennough Road  
Phone: 508 382-5580  
Fax: 508 382-5584  
Web: stearnswheeler.com

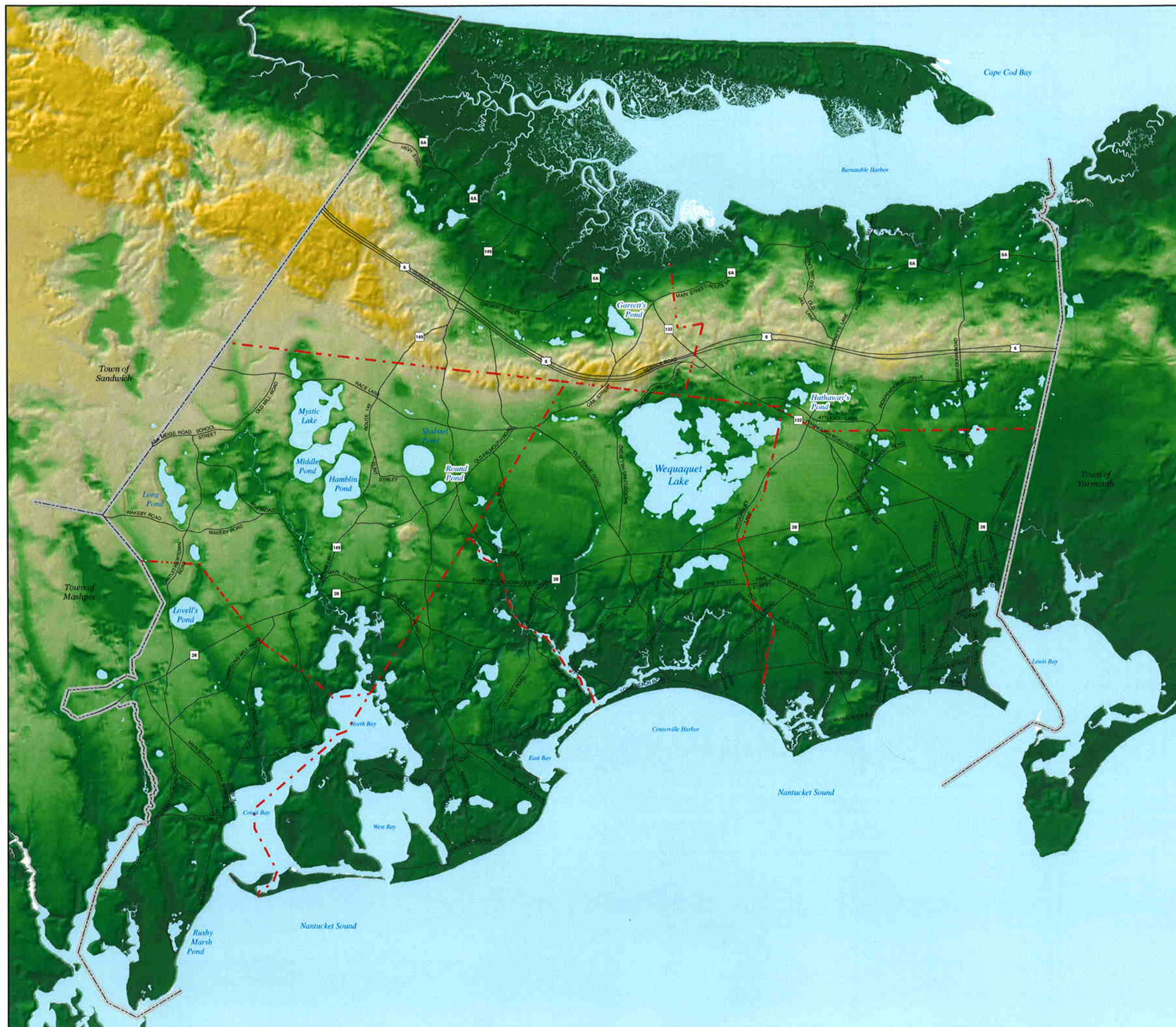
Date: 4/23/2010

Town of Barnstable, Massachusetts

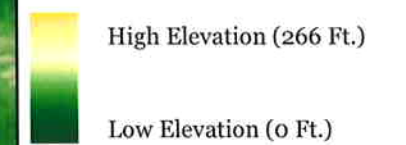
Shellfish Resources Map

FIGURE 5-5





**Surface Elevation**



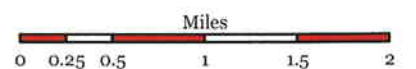
SOURCE: Shaded relief and hillshade data obtained from MassGIS.

- Fire District / Village Lines
- Major Roads
- Town Boundary
- Water Bodies

**TOWN OF  
BARNSTABLE  
MASSACHUSETTS**

Comprehensive Wastewater  
and Nutrient Management Plan

**Topography  
Figure 5-6**

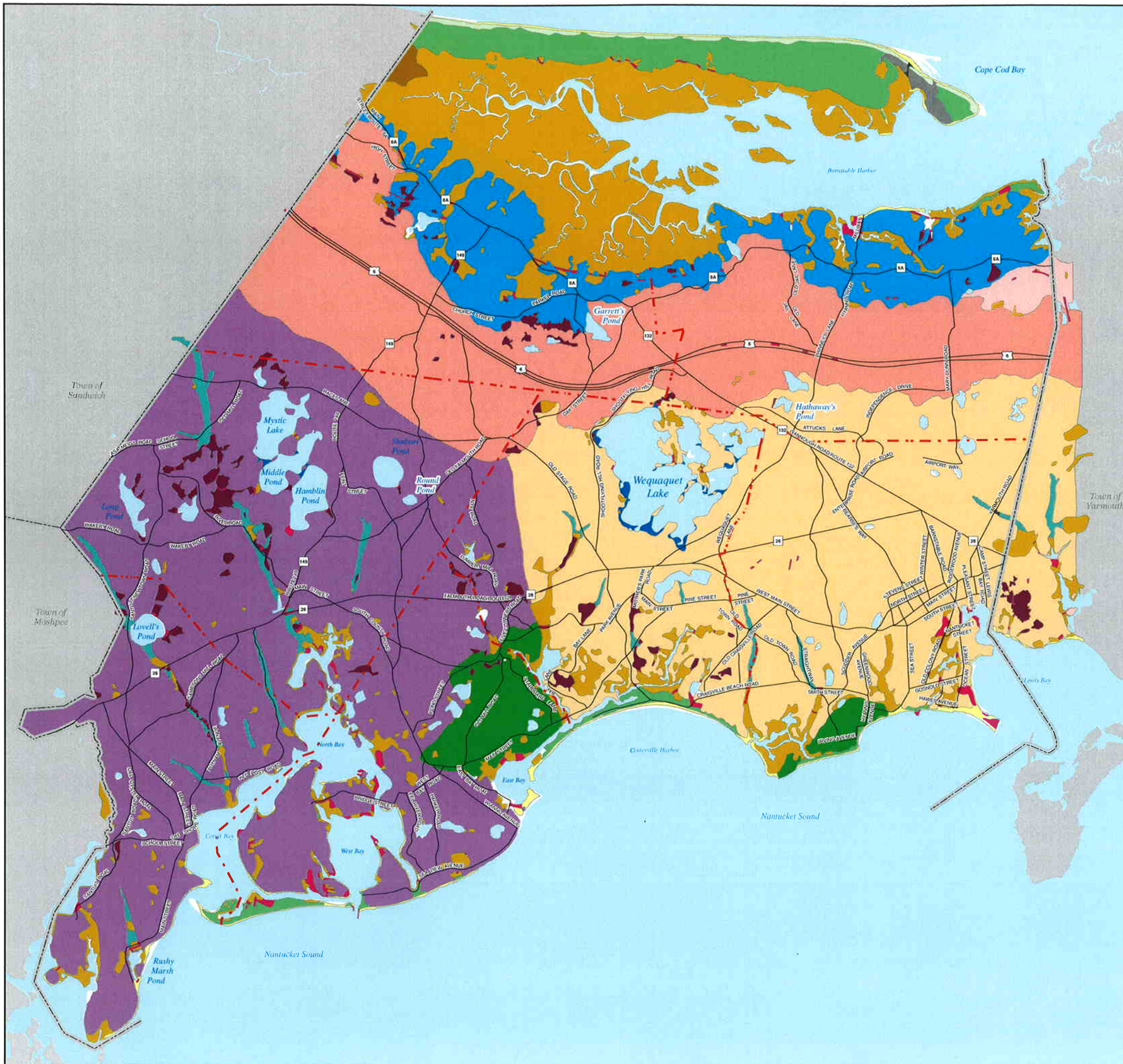


CWNMP\_Topography\_11x17.mxd J.A.B. 4/28/2010

**TOWN OF BARNSTABLE  
GEOGRAPHIC INFORMATION  
SYSTEMS UNIT**

FIGURE PREPARED FOR STEARNS & WHEELER GHD





### Geology Key

af - Artificial Fill

Locally derived sand, gravel, and boulders.

cb - Cranberry Bog

Freshwater marsh or swamp deposits capped with a top dressing of sand.

Qd - Dune Deposits

Mostly sand derived from beach deposits, deposited by wind action to form dunes.

Qf - Foredune Deposits

A ridge of wind deposited sand parallel to the shore.

Qbd - Beach & Dune Deposits

Wind deposited sand in isolated dunes and beach deposits of sand, pebbles, and small boulders.

Qb - Beach Deposits

Mostly sand with some gravel and widely scattered boulders, derived from glacial deposits by wave erosion, transported along the shore and deposited above sea level by waves and currents.

Qbs - Storm Beach Deposits

Sand to small boulders in the bottom of storm sluices and as overwash fans. The sluice on the east end of Sandy Neck was probably cut by a major northeast storm.

Qls - Lakeshore Deposits

Formed along the shores of ponds and lakes, consists of beaches of well sorted sand and gravel with lag deposits of cobble from the wave winnowing of glacial deposits.

Qs - Marsh & Swamp Deposits

Mostly decaying marine marsh plants mixed varying amounts of sand, silt, and clay. Underlain by glacial, marine, or freshwater deposits, capped by live marine marsh plants.

Qvf - Valley Floor Deposits

Sediments deposited in the floors of valleys (furrows) cut into the outwash plains.

Qld - Delta Deposits

Gravelly sand and pebble with some silt and clay. Deposits were the result of a river system emptying into a proglacial lake which occupied the current area of Cape Cod Bay.

Ql2 - Glacial Lake Deposits

Deposits associated with the proglacial lake in Cape Cod Bay. Mostly a discontinuous veneer of clay and silt over ice-contact deposits composed of gravelly sand, gravel, till, and large boulders.

Qhw - Harwich Outwash Plain Deposits

Mostly gravelly sand, north of the Sandwich moraine ice-contact deposits of the outwash plain include till, silt, clay, and large boulders.

Qsm - Sandwich Moraine Deposits

A veneer of sandy to silty till from 3 - 25 ft. thick underlain by stratified sand and gravel.

Qmp - Mashpee Pitted-Plain Deposits

Mostly gravelly sand with some pebble and small boulders

Qbo - Barnstable Outwash Plain Deposits

Mostly gravelly sand with some pebble and small boulders. North part of the deposits include some till, clayey silt, and large boulders. Some areas may be underlain by silt and clay.

Qk - Kame Deposits

Mostly gravelly sand with some pebble and small boulder gravel, includes some scattered boulders.

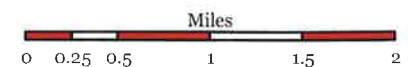
Source: Geologic data was digitized from 1:24,000 scale 1974 & 1975 USGS Geologic Quadrangle Maps of Hyannis, Cotuit, & Sandwich.

- Fire District / Village Lines
- Major Roads
- Town Boundary
- Water Bodies

## TOWN OF BARNSTABLE MASSACHUSETTS

### Comprehensive Wastewater and Nutrient Management Plan

## Geology Figure 5-7

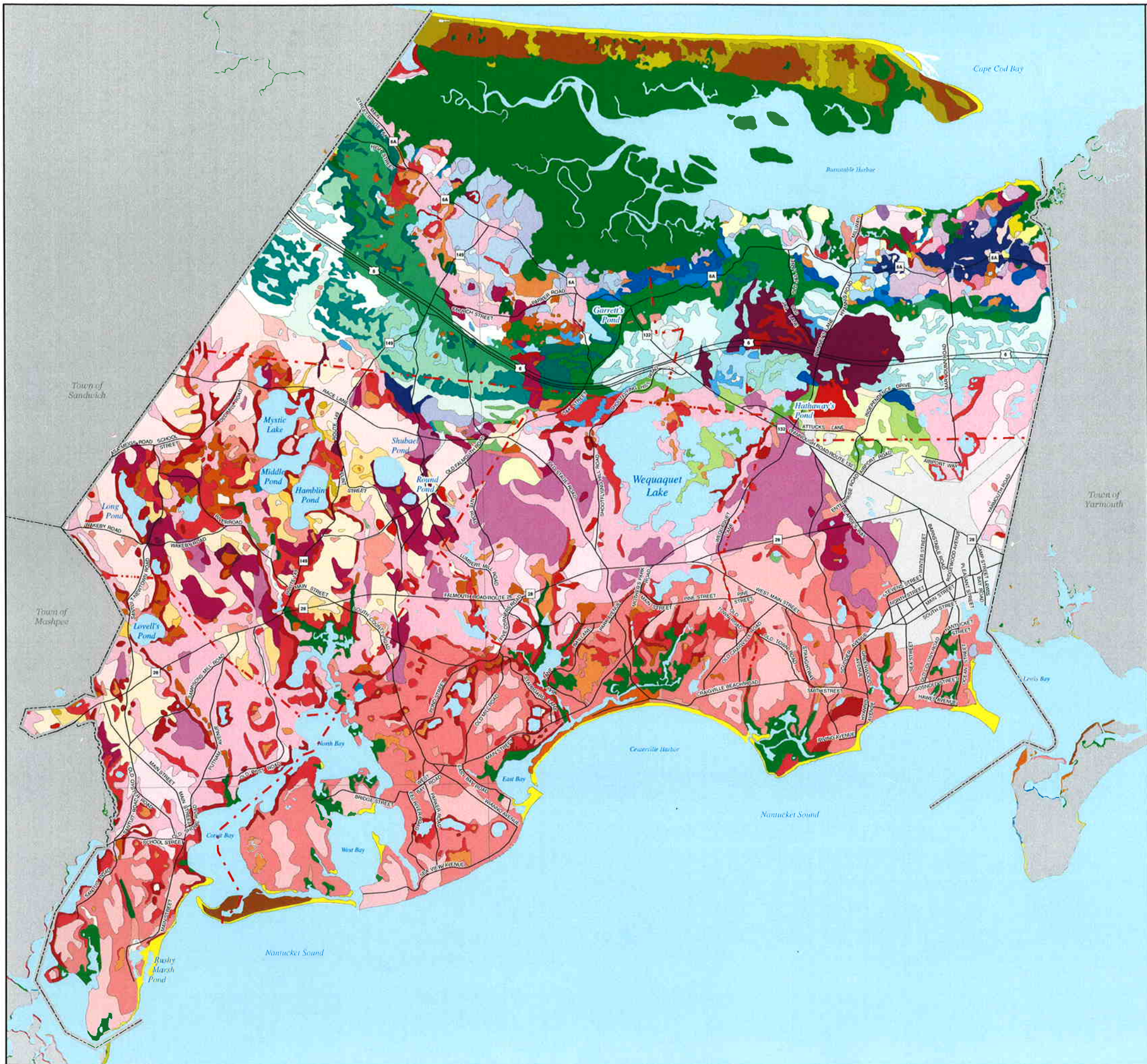


CWNMP\_Geology\_11x17.mxd J.A.B. 4/28/2010

## TOWN OF BARNSTABLE GEOGRAPHIC INFORMATION SYSTEMS UNIT

FIGURE PREPARED FOR STEARNS & WHEELER GHD





**Soils Key**

- AmA - Amstons sandy loam
- BaB - Barnstable sandy loam
- BaC - Barnstable sandy loam
- BcC - Barnstable-Plymouth complex
- BdB - Barnstable-Plymouth complex
- BdC - Barnstable-Plymouth complex
- BfC - Barnstable-Plymouth-Nantucket complex
- BgC - Barnstable-Plymouth-Nantucket complex
- BlB - Belgrade silt loam
- BmA - Berryland mucky loamy coarse sand
- BoA - Boxford silt loam
- BoB - Boxford silt loam
- CcA - Carver loamy coarse sand
- CcB - Carver loamy coarse sand
- CdA - Carver coarse sand
- CdB - Carver coarse sand
- CdC - Carver coarse sand
- CdD - Carver coarse sand
- CoB - Carver-Hinesburg loamy coarse sands
- CoC - Carver-Hinesburg loamy coarse sands
- DeA - Deerfield loamy fine sand
- EaA - Eastchop loamy fine sand
- EaB - Eastchop loamy fine sand
- EaC - Eastchop loamy fine sand
- EnA - Enfield silt loam
- EnB - Enfield silt loam
- EnC - Enfield silt loam
- FmA - Freetown mucky peat
- FsA - Freetown & Swansea mucks
- FLA - Freetown coarse sand
- HeA - Hinckley sandy loam
- HeB - Hinckley sandy loam
- HkC - Hinckley gravelly sandy loam
- HkD - Hinckley gravelly sandy loam
- HnA - Hinesburg sandy loam
- HnB - Hinesburg sandy loam
- HnC - Hinesburg sandy loam
- HoC - Hooksan sand
- HoD - Hooksan sand
- HxC - Hooksan-Dune land complex
- ImA - Ipswich, Pawcatuck & Matunuck peats
- MaA - Maybid silt loam
- MeA - Merrimac sandy loam
- MeB - Merrimac sandy loam
- MeC - Merrimac sandy loam
- MeD - Merrimac sandy loam
- NaB - Nantucket sandy loam
- NaC - Nantucket sandy loam
- NsB - Nantucket sandy loam
- NsC - Nantucket sandy loam
- PeA - Pipestone loamy coarse sand
- PmB - Plymouth loamy coarse sand
- PmC - Plymouth loamy coarse sand
- PmD - Plymouth loamy coarse sand
- PsB - Plymouth loamy coarse sand
- PsC - Plymouth loamy coarse sand
- PsD - Plymouth loamy coarse sand
- PvC - Plymouth-Barnstable complex
- PvD - Plymouth-Barnstable complex
- PxD - Plymouth-Barnstable complex
- PyD - Plymouth-Barnstable-Nantucket complex
- ScA - Scitico silt loam
- SdA - Sudbury fine sandy loam
- Bh - Beaches
- Dm - Dumps, landfill
- Dn - Dune land
- Pg - Pits, sand & gravel
- Ud - Udipsanments, smoothed
- Ur - Urban land
- W - Water
- WS - Water

--- Fire District / Village Lines  
— Major Roads  
--- Town Boundary  
Water Bodies

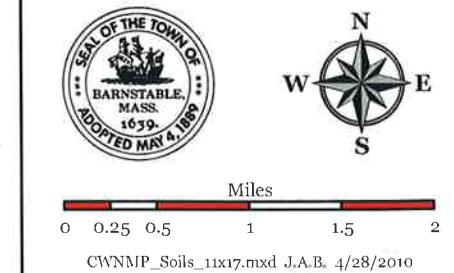
Source: soils data obtained from MassGIS in 2001. The data is based on the United States Department of Agriculture & National Cooperative Soil Survey soil survey of Barnstable County, Massachusetts, conducted in 1983. Information and explanations about the soil data displayed on this map may be found in the USDA Soil Conservation Service publication: Soil Survey of Barnstable County, Massachusetts, 1993.

# TOWN OF BARNSTABLE MASSACHUSETTS

Comprehensive Wastewater and Nutrient Management Plan

## Soils

Figure 5-8

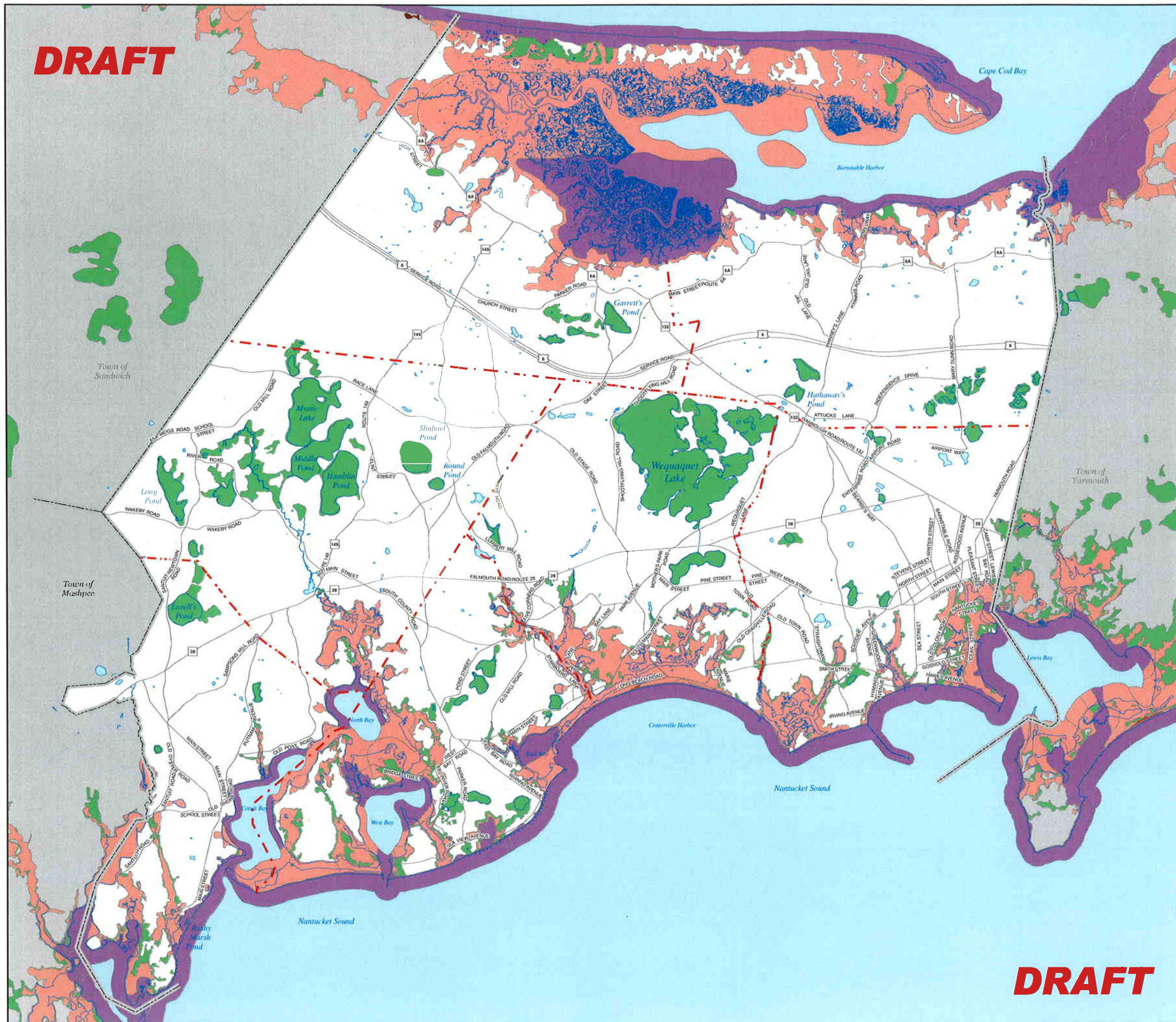


TOWN OF BARNSTABLE  
GEOGRAPHIC INFORMATION  
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FIGURE PREPARED FOR STEARNS & WHEELER GHD



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### Special Flood Hazard Areas (SFHAs) Subject to Inundation by the 1% Annual Chance Flood

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood.

- Zone AE - Base Flood Elevations determined.
- Zone AO - Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- Zone AH - Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- Zone VE - Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

### Other Flood Areas

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

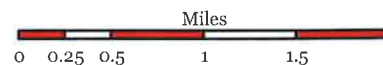
NOTE: The flood zones shown here represent the 2009 Preliminary Revised FEMA Flood Insurance Rate Maps. These maps are preliminary and have not yet been adopted. These are preliminary data that may be subject to appeal and may change before final adoption and cannot be used for making final determinations.

- Fire District / Village Lines
- Major Roads
- Town Boundary
- Shoreline
- Water Bodies (May be obscured)

## TOWN OF BARNSTABLE MASSACHUSETTS

Comprehensive Wastewater and Nutrient Management Plan

### Flood Zones Figure 5-9



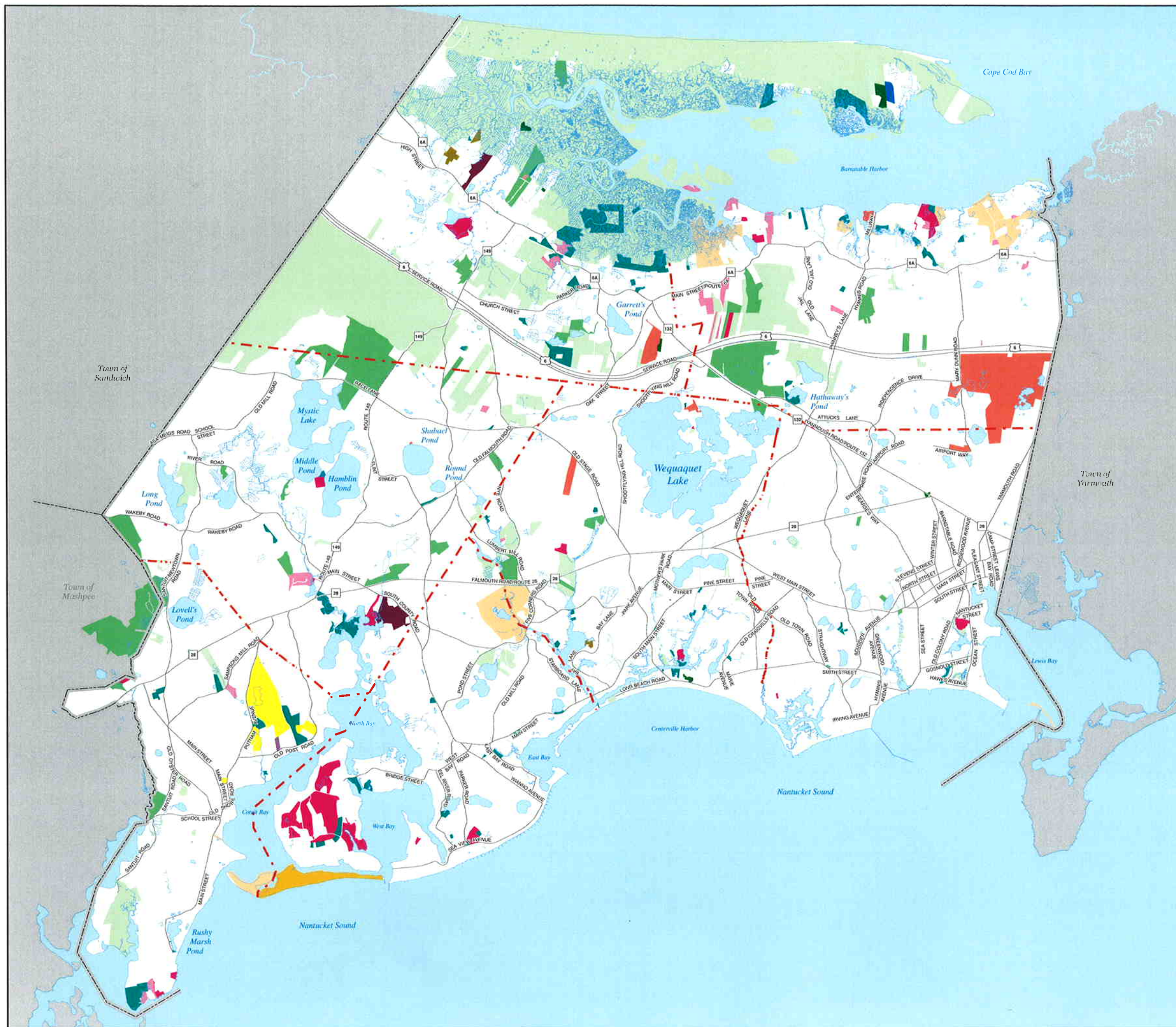
CWNMP\_FloodZones\_11x17.mxd J.A.B. 4/28/2010

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- Protected Open Space**
- Town Conservation
  - Town Land Bank
  - Town CPA Open Space
  - State Owned Protected Land
  - Fire District with Conservation Restriction
  - Barnstable Land Trust
  - Mary Barton Conservation
  - Massachusetts Audubon Society
  - The Nature Conservancy
  - Orenda Wildlife Land Trust
  - Three Bays Preservation Inc.
  - Compact of Cape Cod Conservation Trusts
  - Trustees of Reservations
  - Private Land with Conservation Restriction

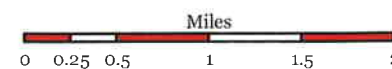
NOTE: This data is not necessarily complete or definitive. This data was compiled from sources including: Town of Barnstable FY 2010 Assessor records, Town of Barnstable Community Preservation Committee, Town of Barnstable Growth Management Dept., Town of Barnstable Attorney's Office, and Barnstable Land Trust.

- Fire District / Village Lines
- Major Roads
- Town Boundary
- Water Bodies

## TOWN OF BARNSTABLE MASSACHUSETTS

Comprehensive Wastewater and Nutrient Management Plan

### Open Space Figure 5-10



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**TOWN OF BARNSTABLE  
GEOGRAPHIC INFORMATION  
SYSTEMS UNIT**

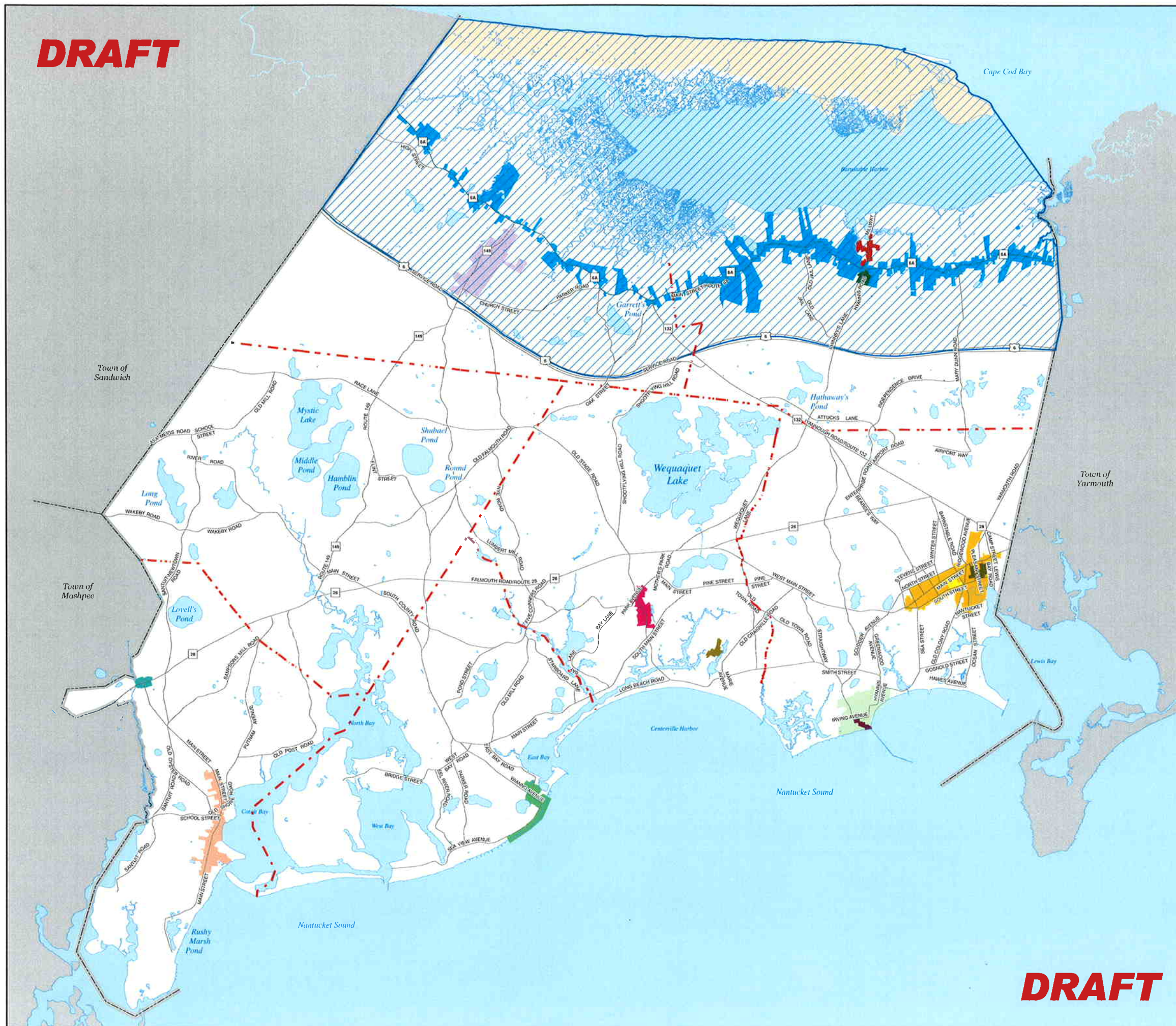
FIGURE PREPARED FOR STEARNS & WHEELER GHD







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**National Register Historic Districts**

- Old Kings Highway National Historic District
- Sandy Neck Cultural Resources District
- Barnstable Harbor Historic District
- Hyannis Road Historic District
- West Barnstable Historic District
- Santuit Historic District
- Cotuit Historic District
- Wianno Historic District
- Centerville Historic District
- Craigville Historic District
- Hyannisport Historic District
- Kennedy Compound National Historic Landmark
- Municipal Group Historic District
- Pleasant Street School Street Historic District

**Local Historic Districts**

- Old Kings Highway Local Historic District
- Hyannis Main Street Waterfront Historic District

- Fire District / Village Lines
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**TOWN OF  
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Comprehensive Wastewater  
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**Historic Districts  
Figure 5-12**



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**TOWN OF BARNSTABLE  
GEOGRAPHIC INFORMATION  
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