# Overview of Harwich Final CWMP for CCC DRI Hearing

## Town of Harwich, Massachusetts

**David Young, P.E.**
**CDM Smith**

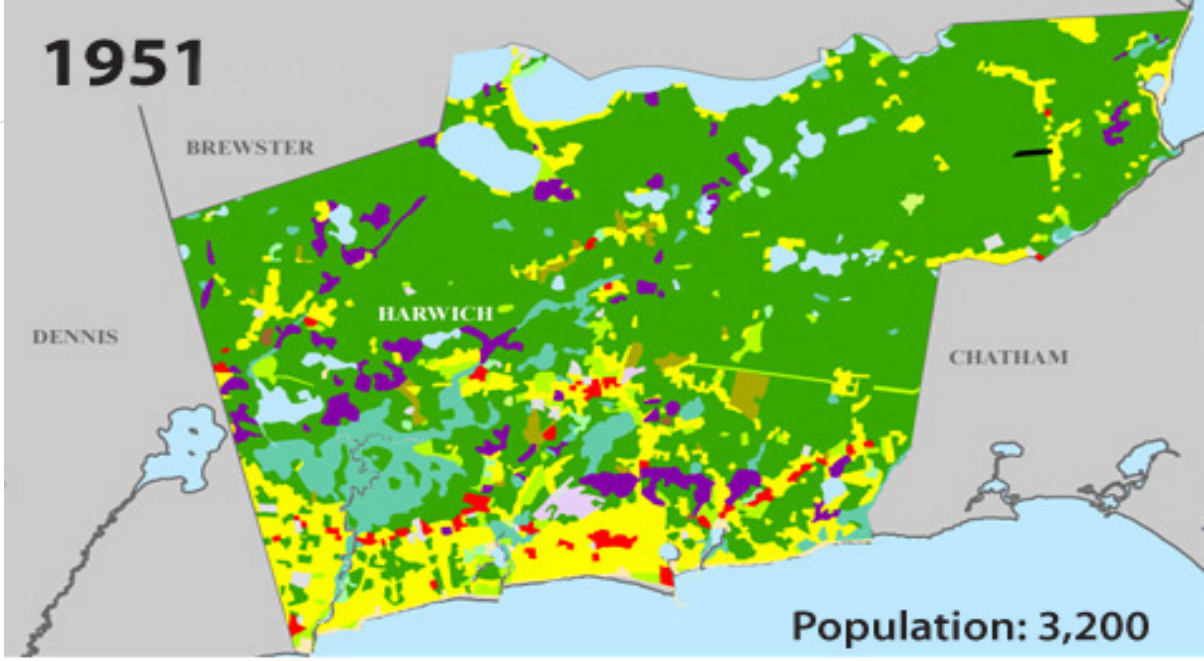
**Presentation on August 18, 2016**

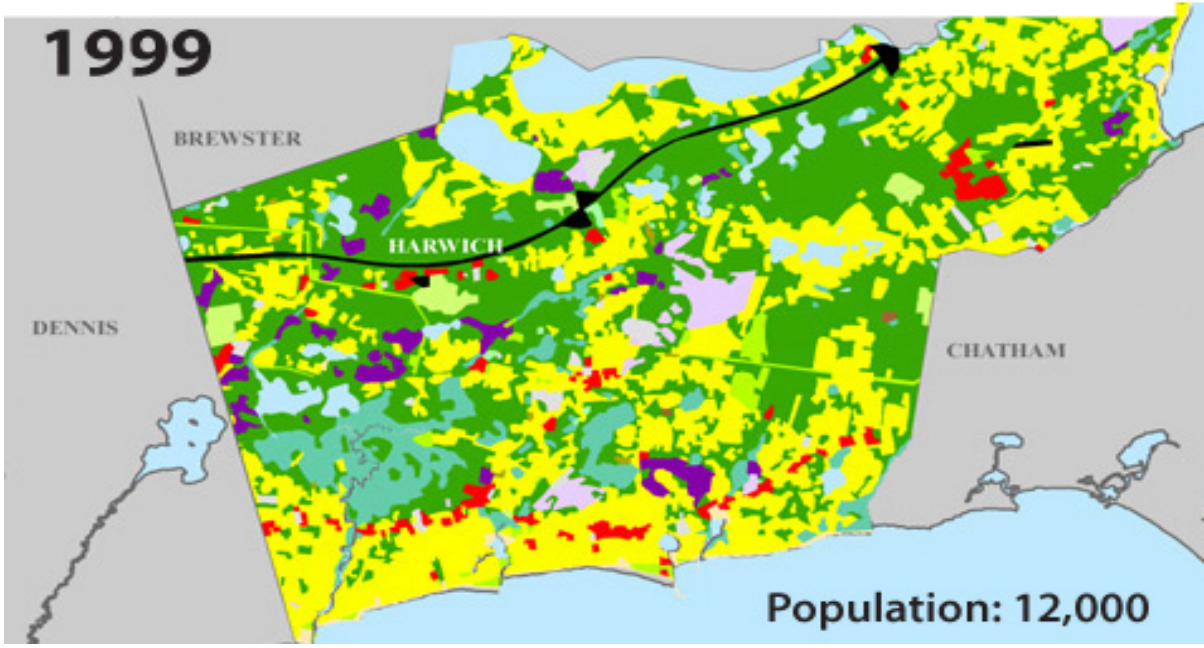
# Presentation

- Overview of Harwich Comprehensive Wastewater Management Plan (CWMP).
- Status of initial phase program components.
- What is next?
- Questions and comments.

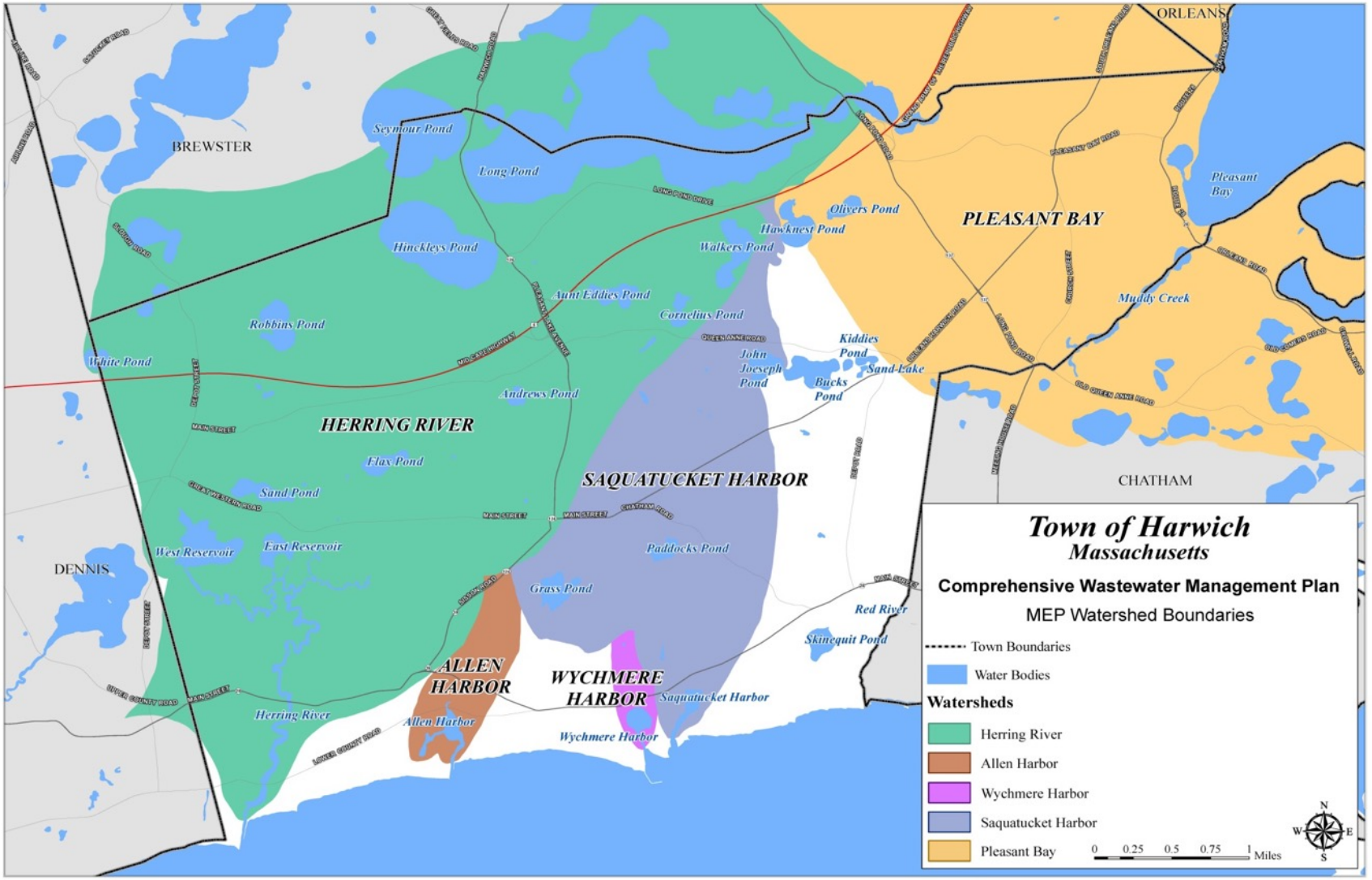
# Harwich Land Use Development 1951 and 1999

- 400% population growth from 1951 to 1999

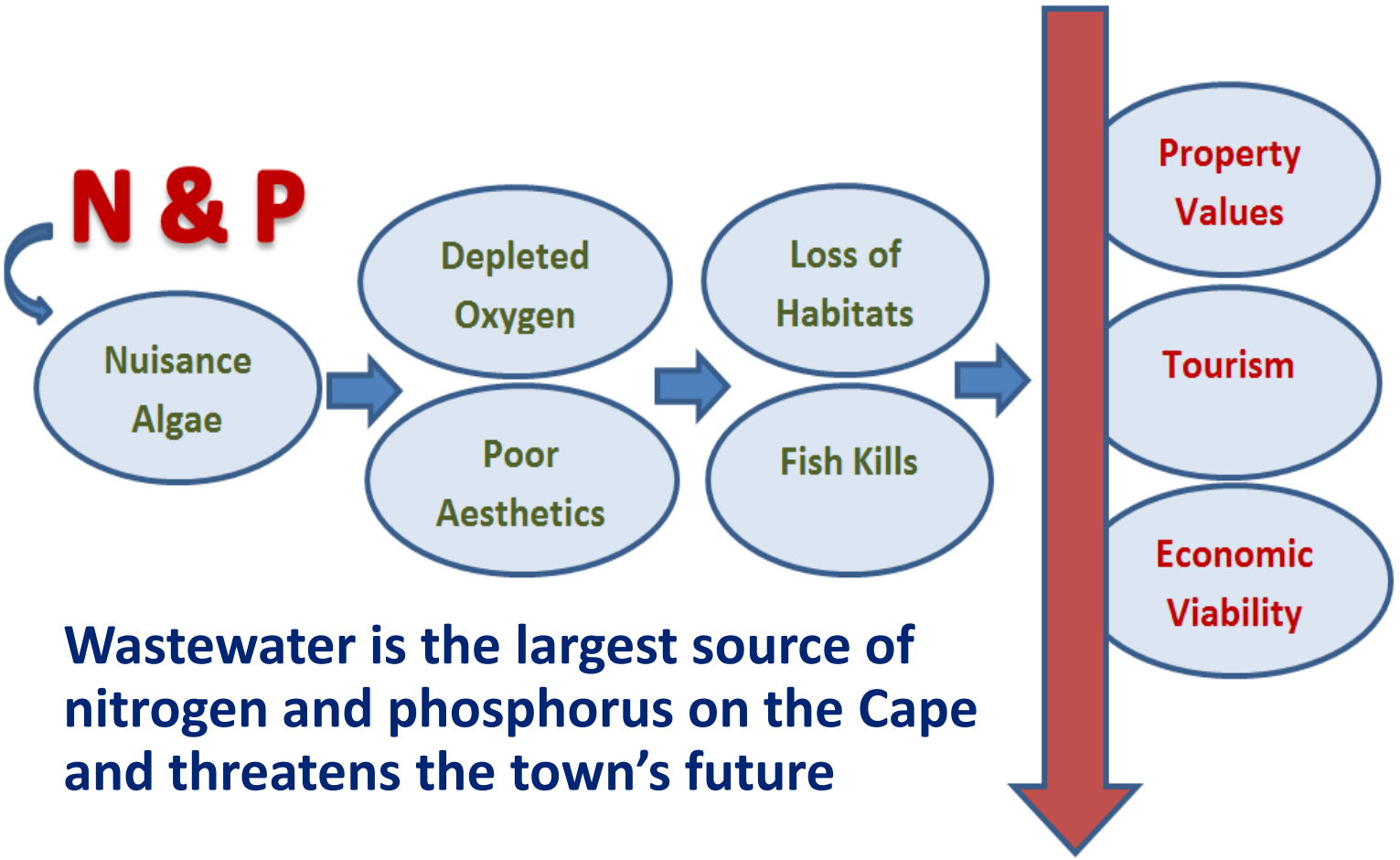


# Harwich watersheds

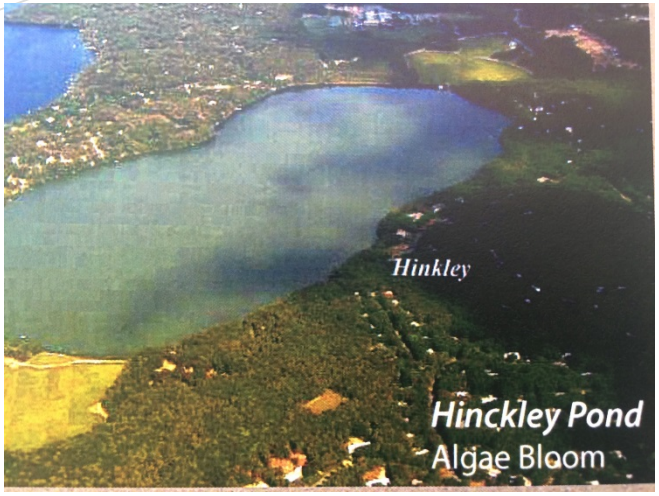


# The Issue…




**Wastewater is the largest source of nitrogen and phosphorus on the Cape and threatens the town's future**

# Algae Blooms in Harwich waters




Hinckleys Pond (P)

Allen Harbor (N)

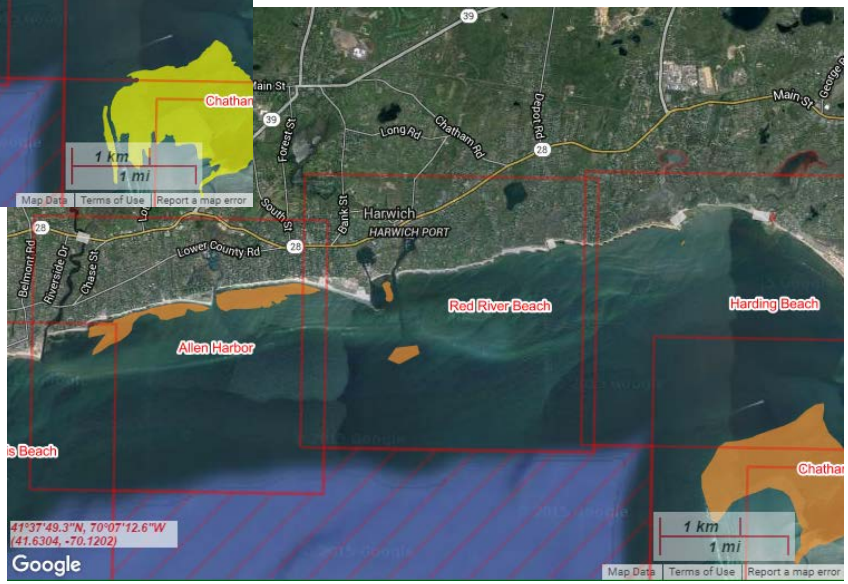
- Both fresh and salt water areas have been affected by algae blooms.
- Excessive nutrients in water bodies can cause algae blooms
- When the algae dies it decomposes and depletes dissolved oxygen levels which results in an unhealthy environment for fish and other organisms.

# MassDEP Eel Grass Mapping

**2001**


**1995**


**2010-2013**

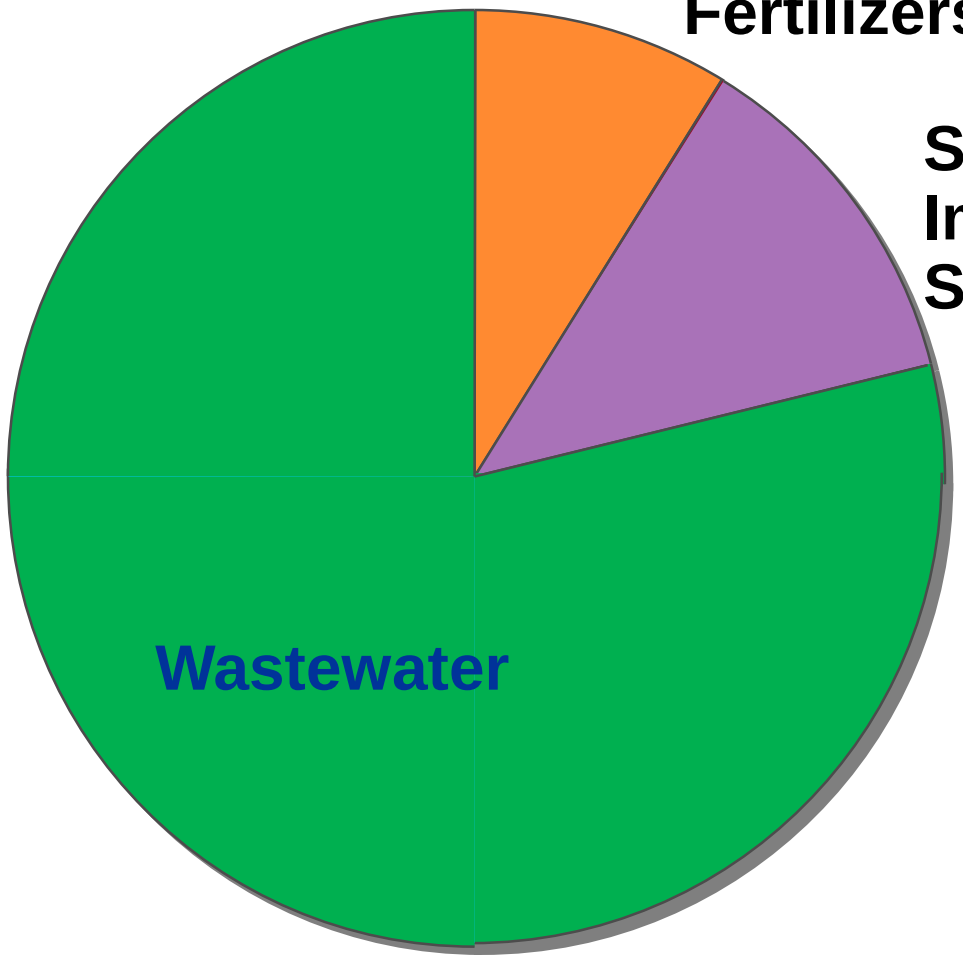


# Harwich Wastewater Needs

Wastewater flow needs are based on:

- Nitrogen removal requirements by watershed at buildout.
- Water supply protection.
- Desired economic development – smart growth.
- Title 5 issues.
- Potential freshwater pond protection.

# Controllable Sources of Nitrogen



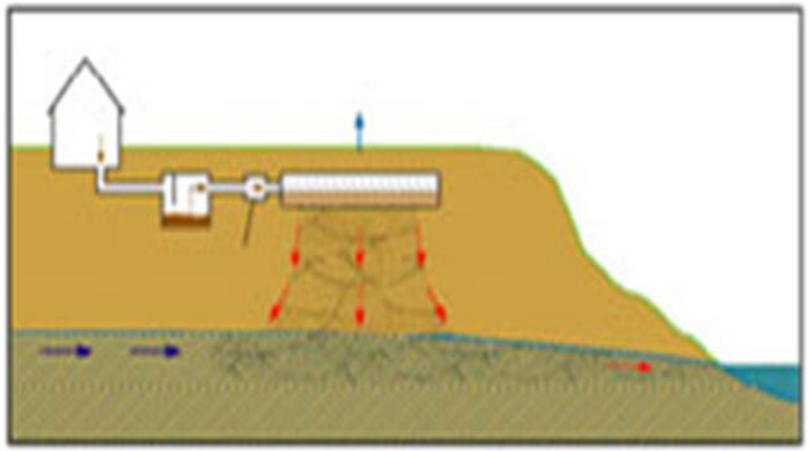

**Local Control – Typical Percentages**

# Nutrients From Title 5 Septic Systems Is Our Biggest Issue

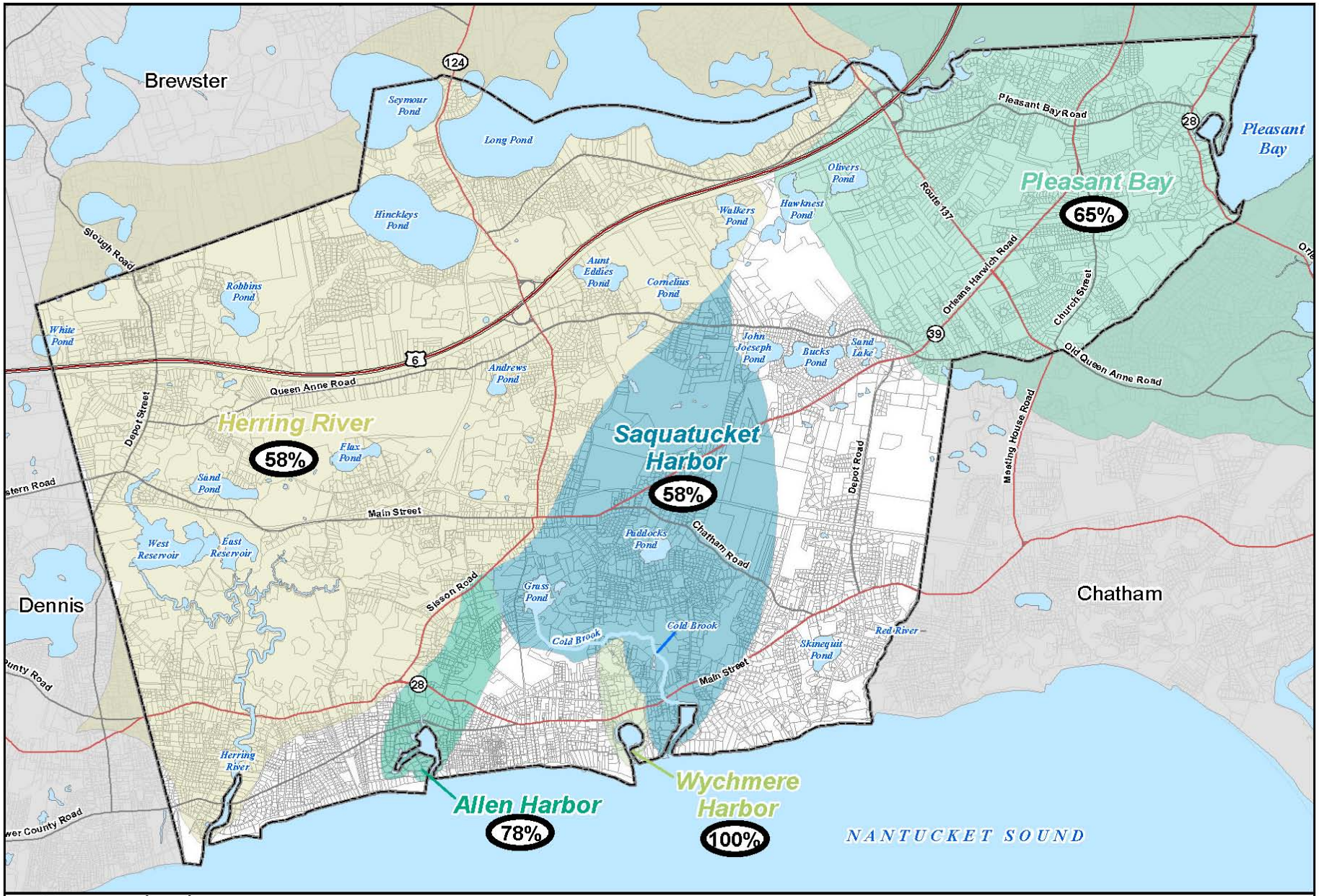
Water Quality Harwich

## Septic Systems Permit Nitrogen to:

- Invade Our Ground Water
- Travel with Groundwater to the Beaches & Rivers



CDM Smith




**Legend**
**Watersheds**

- Allens Harbor
- Herring River
- Pleasant Bay
- Saquatucket Harbor
- Wychmere Harbor
- 78% Septic Load Decrease to Meet Threshold

Town of Harwich
Comprehensive Wastewater Management Plan

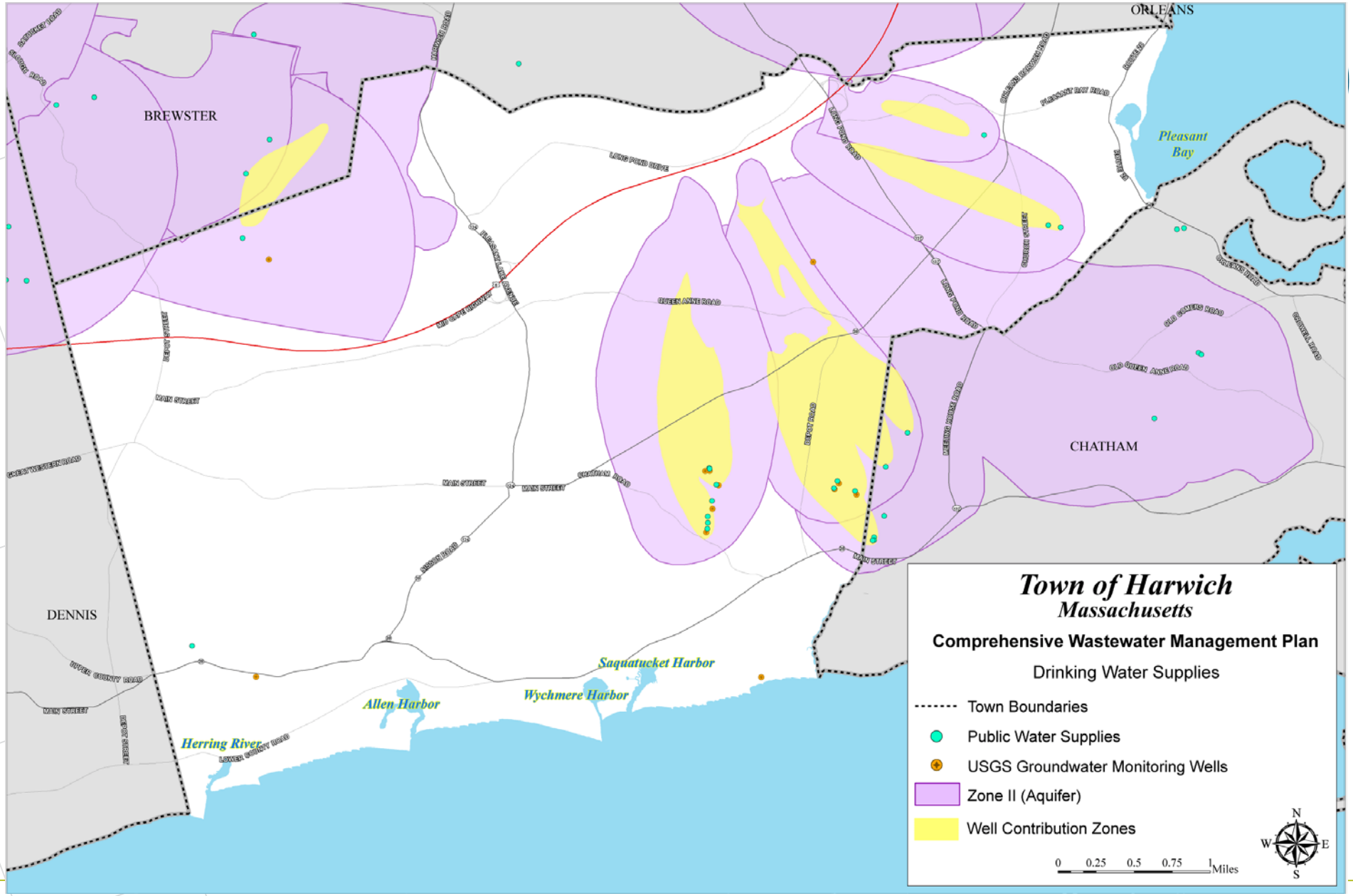
1 inch = 4,000 feet
0 1,000 2,000 4,000 Feet

**Figure 13-2**
Watershed Septic Load Reductions

CDM Smith

Z:\Harwich\Harwich_cwmg\MXD\Section_13\Fig13-2_watershed_septic_reductions.mxd NEWELLJD 11/29/2012

# Existing Conditions – Drinking Water Supplies



# East Harwich Village Center – Buildout Wastewater Flow Allowance

Draft CWMP Assumptions:

250 additional residential dwelling units at 150 gpd/unit

equals 37,500 gpd

500,000 SF of additional commercial space at 35 gpd/1,000 SF equals 17,500 gpd

Total = 55,000 gpd allowance

Final CWMP Revised Assumptions:

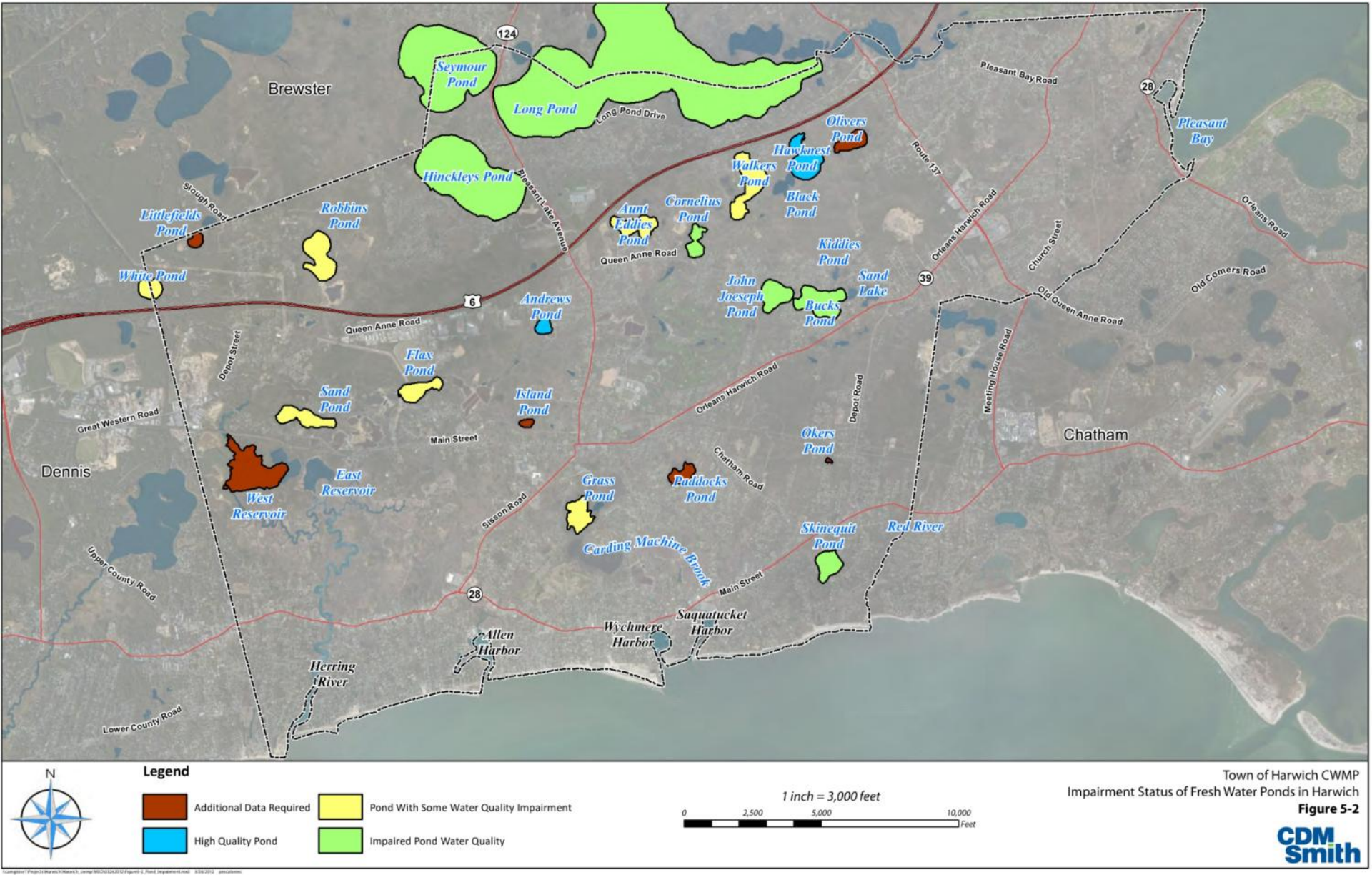
200 additional residential dwelling units at 150 gpd/unit

equals 30,000 gpd

250,000 SF additional commercial space at 100 gpd/1,000 SF equals 25,000 gpd

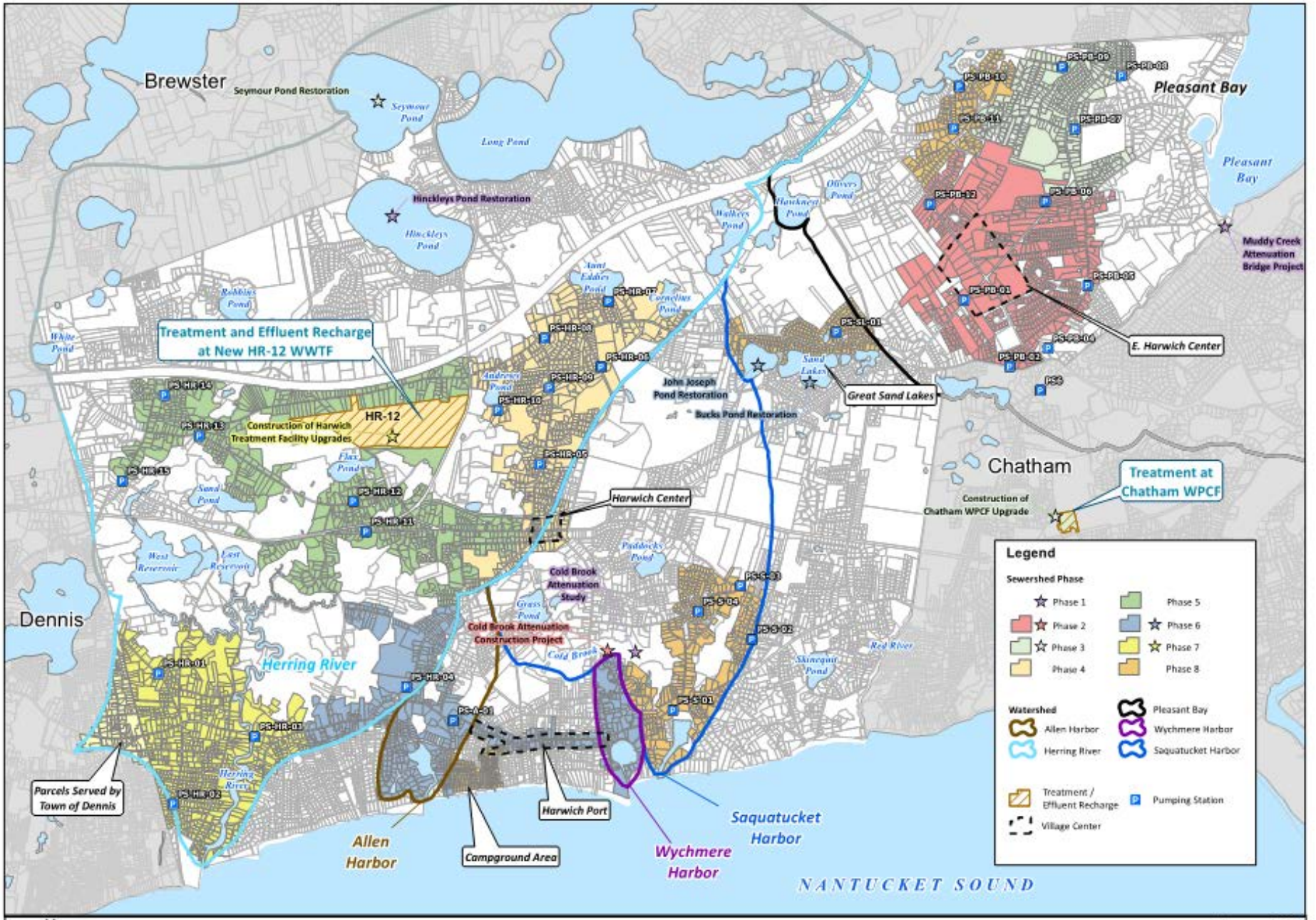
Total + 55,000 gpd allowance

# Impaired Fresh Water Ponds in Harwich



# Components of Recommended Program


- Eight phases over 40 years
- Muddy Creek inlet widening to increase flushing
- Cold Brook natural nitrogen attenuation study
- Harwich/Chatham Inter-Municipal Agreement for treatment
- Core system relies on sewers for collection of wastewater with treatment and effluent recharge at two locations
- Potential permeable reactive barrier at one recharge site
- Other: stormwater best management practices, fertilizer education, open space acquisition, zoning review, public education, fresh water pond restorations, shellfish seeding program, etc.




Sewer Service Area by Phase

1 inch = 4,000 feet

**Figure 13-3**
Recommended Phasing Plan

CDM Smith

# Nitrogen Reduction via Increased Flushing at Muddy Creek

# Muddy Creek 2012

# Small Inlets to Muddy Creek - 2015

# New 24-ft Inlet to Muddy Creek - 2016

CDM Smith

# Nitrogen Reduction by Natural Attenuation at Cold Brook Bogs – Bank Street

CDM Smith

# Cold Brook – Natural Nitrogen Attenuation



CDM Smith

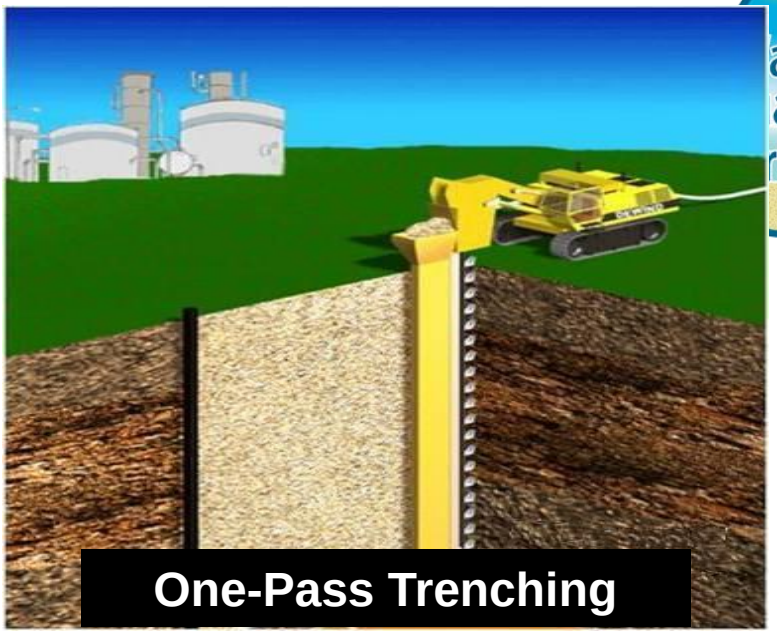
# Chatham Wastewater Treatment Plant (1.1 million gallon per day average flow with open infiltration basins)

CDM Smith

# HR-12 – Adjacent to Former Town Landfill In the Herring River Watershed

# PRB - Construction Techniques

One-Pass Trenching



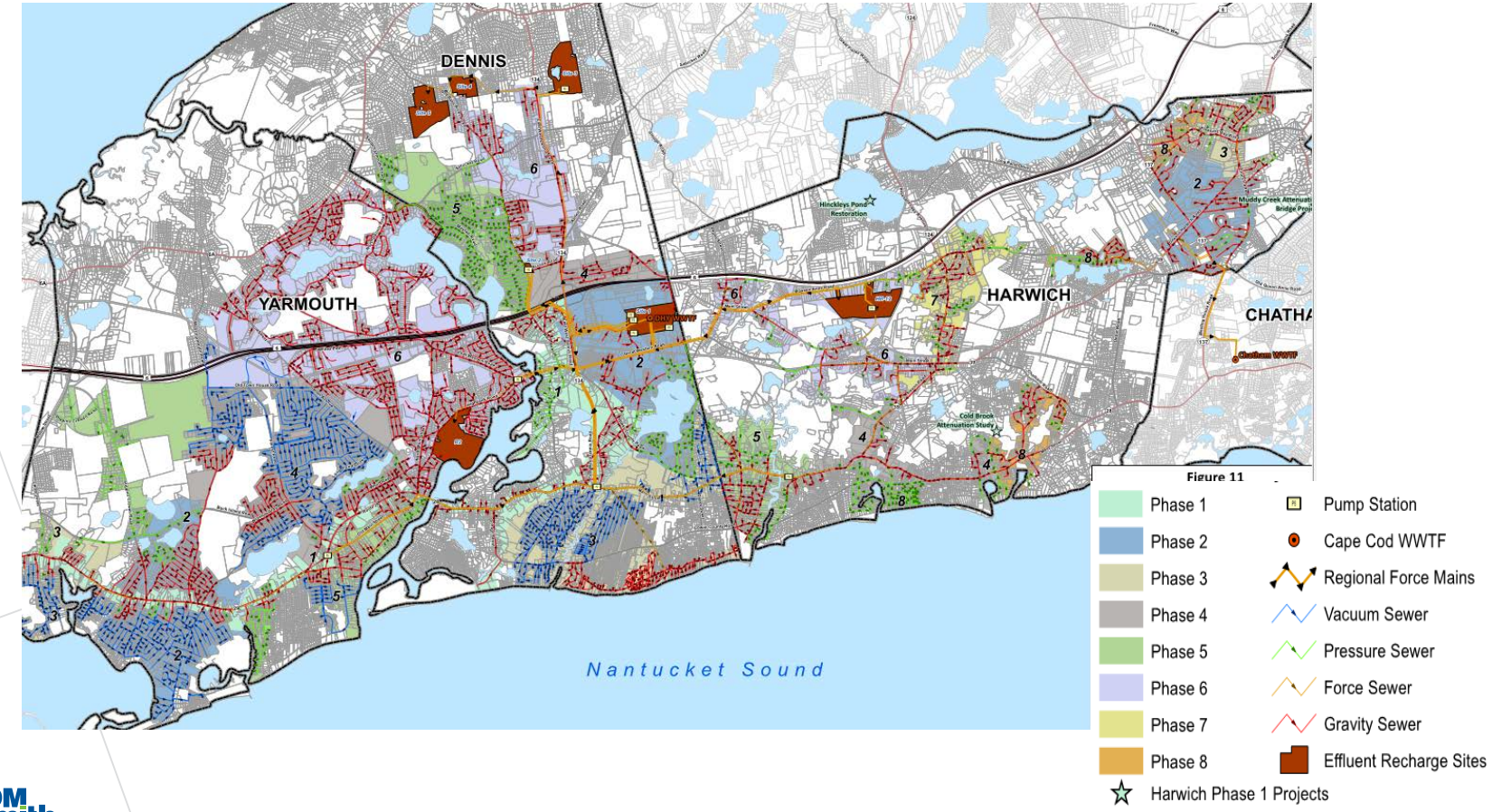
One-Pass Trenching

Traditional Trenching


Traditional Trenching

# Community Partnership Option

- Dennis, Harwich, and Yarmouth are currently evaluating the construction of one centralized treatment facility in order to save on capital and operation and maintenance costs.



# Seeded Shellfish Areas


Herring River


Allen's Harbor


Round Cove/Pleasant Bay


Wychmere Harbor

CDM Smith

# Watershed Reports

The Harwich Board of Selectmen acting as the Wastewater Management Agency (WMA) for the town submitted watershed reports to the Cape Cod Commission in June 2016 for:

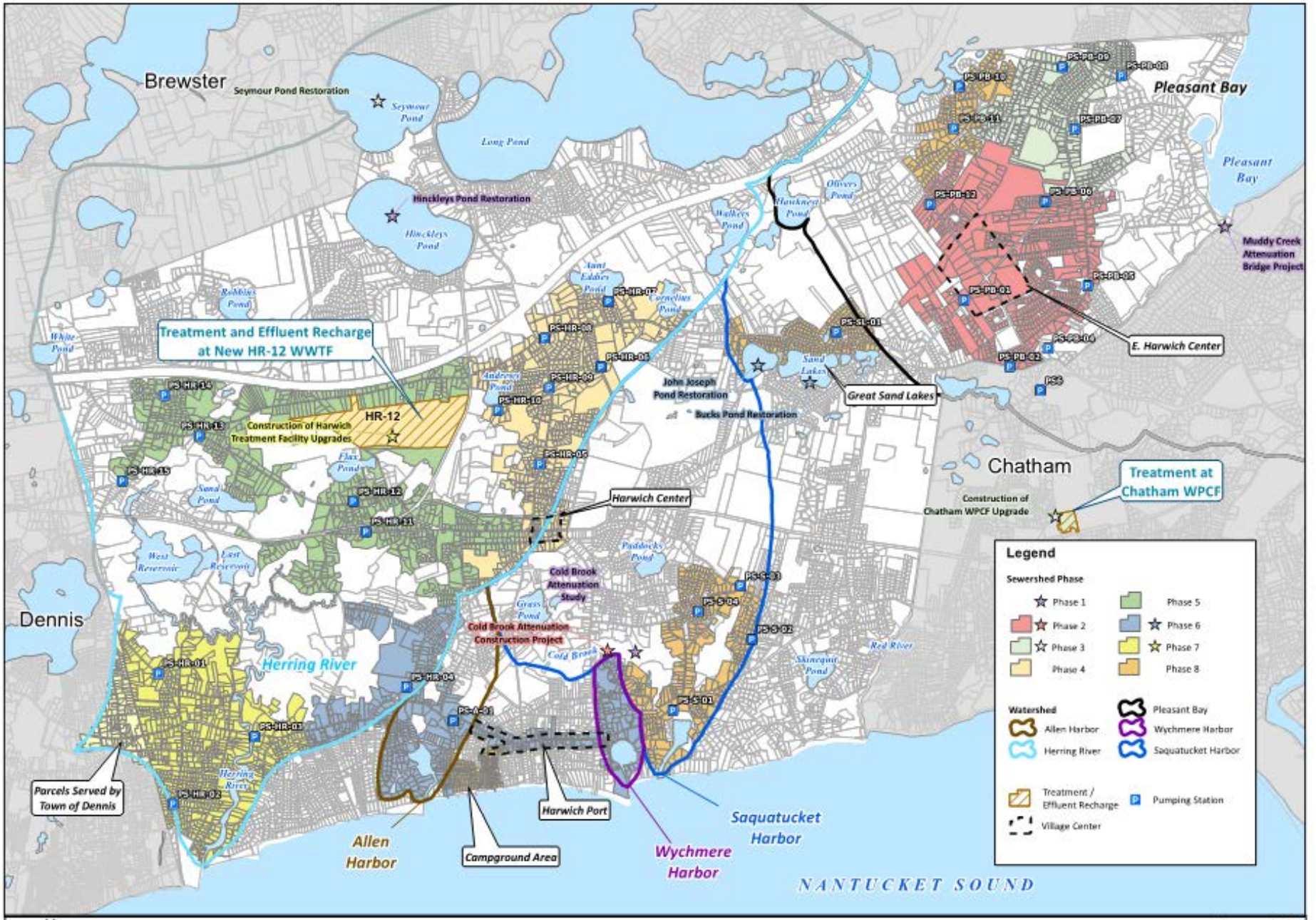
- Pleasant Bay Watershed
- Herring River Watershed
- Allen, Wychmere and Saquatucket Watersheds

# What's Next

- Complete DRI review process.
- Complete Chatham IMA negotiations.
- Wastewater Implementation Committee (WIC) working on public outreach and implementation and monitoring components.
- Participate in community partnership option discussions
- Potential Spring 2017 Town Meeting Articles
  - Approval of Chatham IMA
  - Land Use Controls (flow neutral)
  - Initial phase design costs
  - Other

# Questions and Comments

Algae Bloom in Allen Harbor, Harwich, Swan Pond, Dennis and Mill Creek, Yarmouth




Sewer Service Area by Phase

1 inch = 4,000 feet

**Figure 13-3**
Recommended Phasing Plan

CDM Smith