East marion
Wastewater in our Watersheds
N Mitigation Goals

LONG ISLAND SOUND GOAL:

Total: 58.5% by 2014. Nonpoint sources: **10% - 19%**

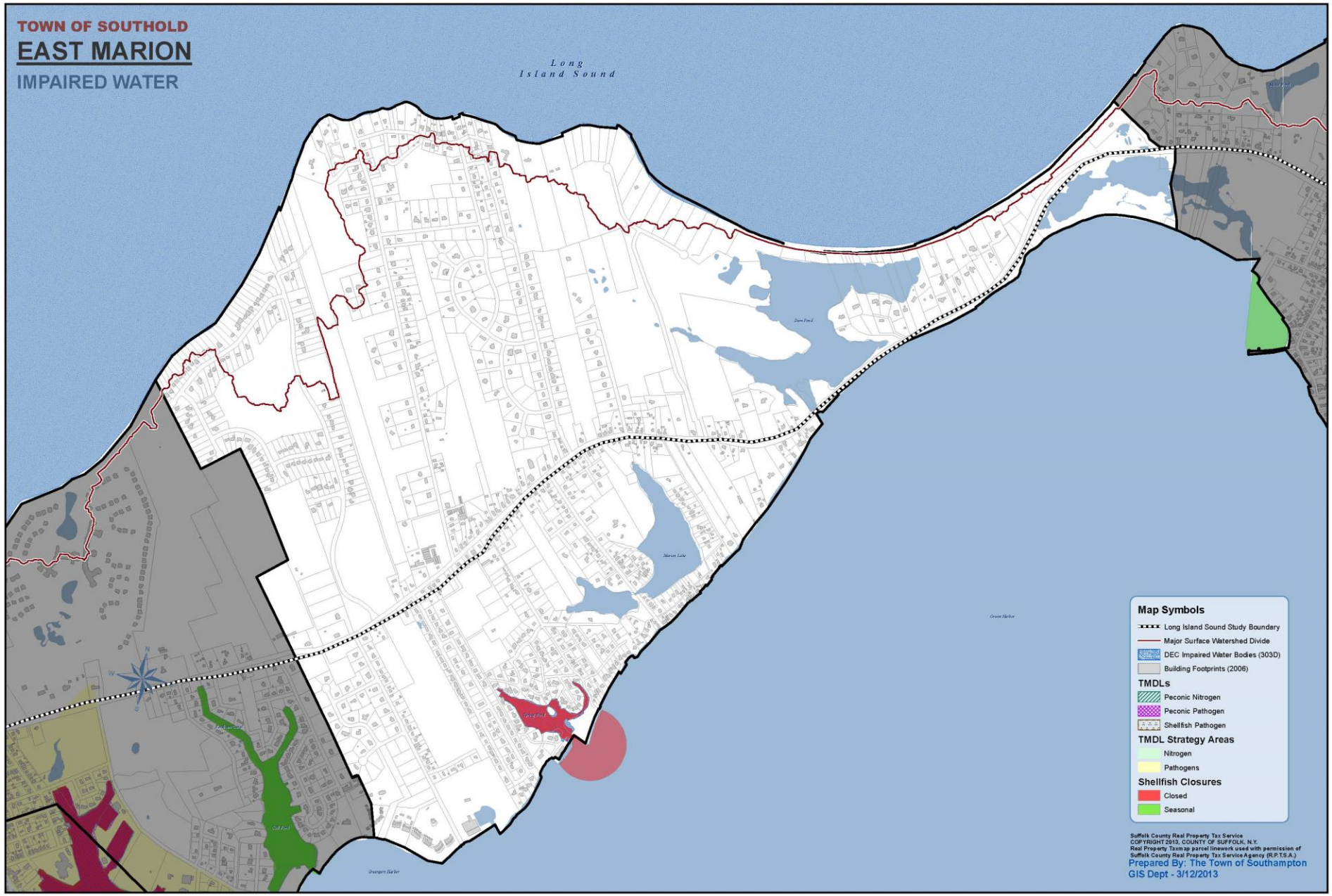
PECONIC ESTUARY GOAL:

Existing Dev. **33% or 25%**

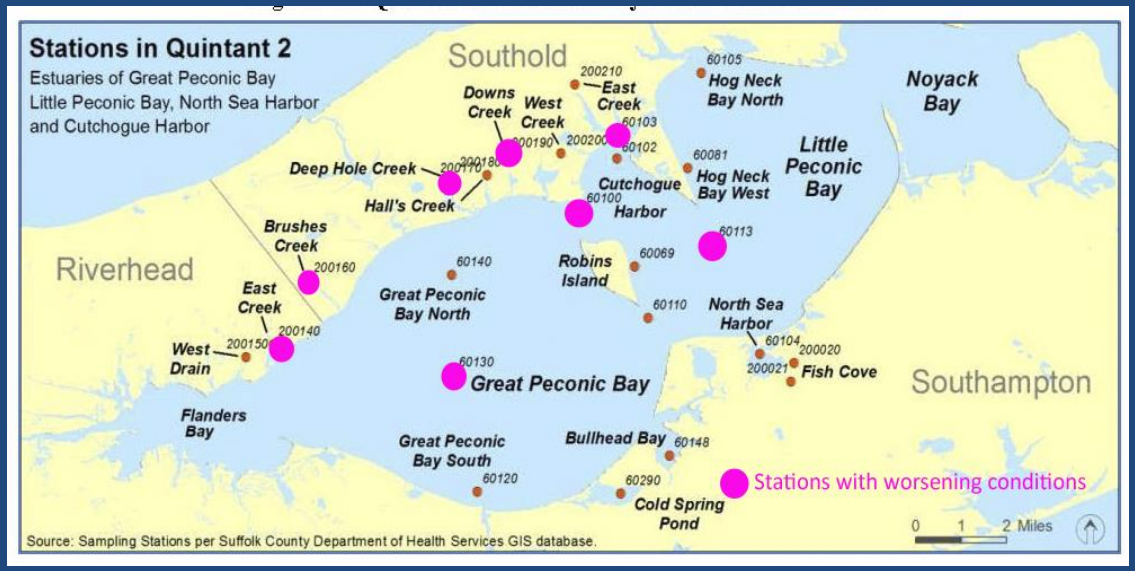
New Construction: **50% or 37.5%**

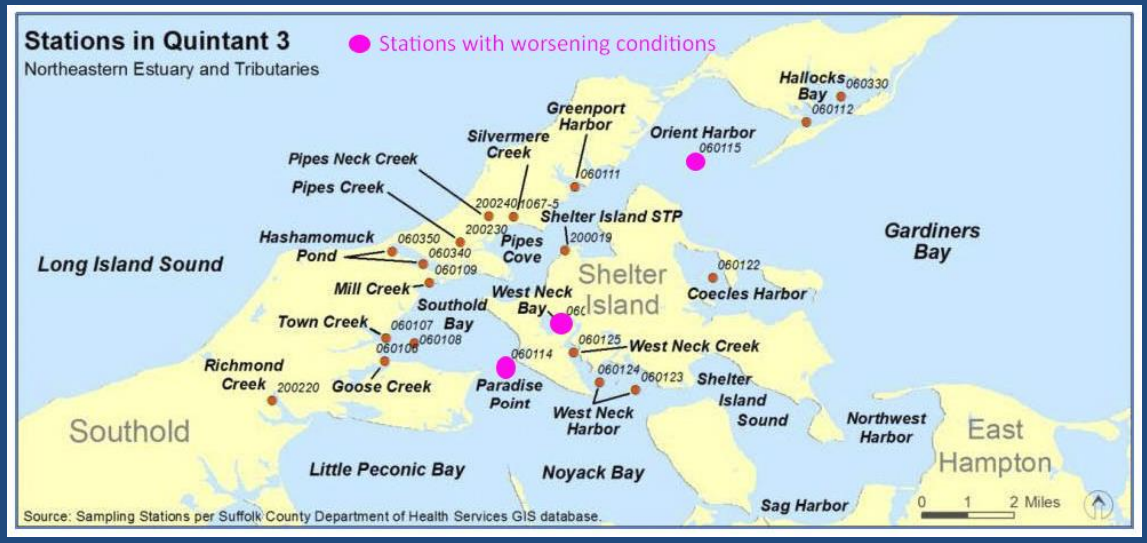
BUT by PGG calculations for the subwatershed, it should b 90%

East Marion Impaired Waters



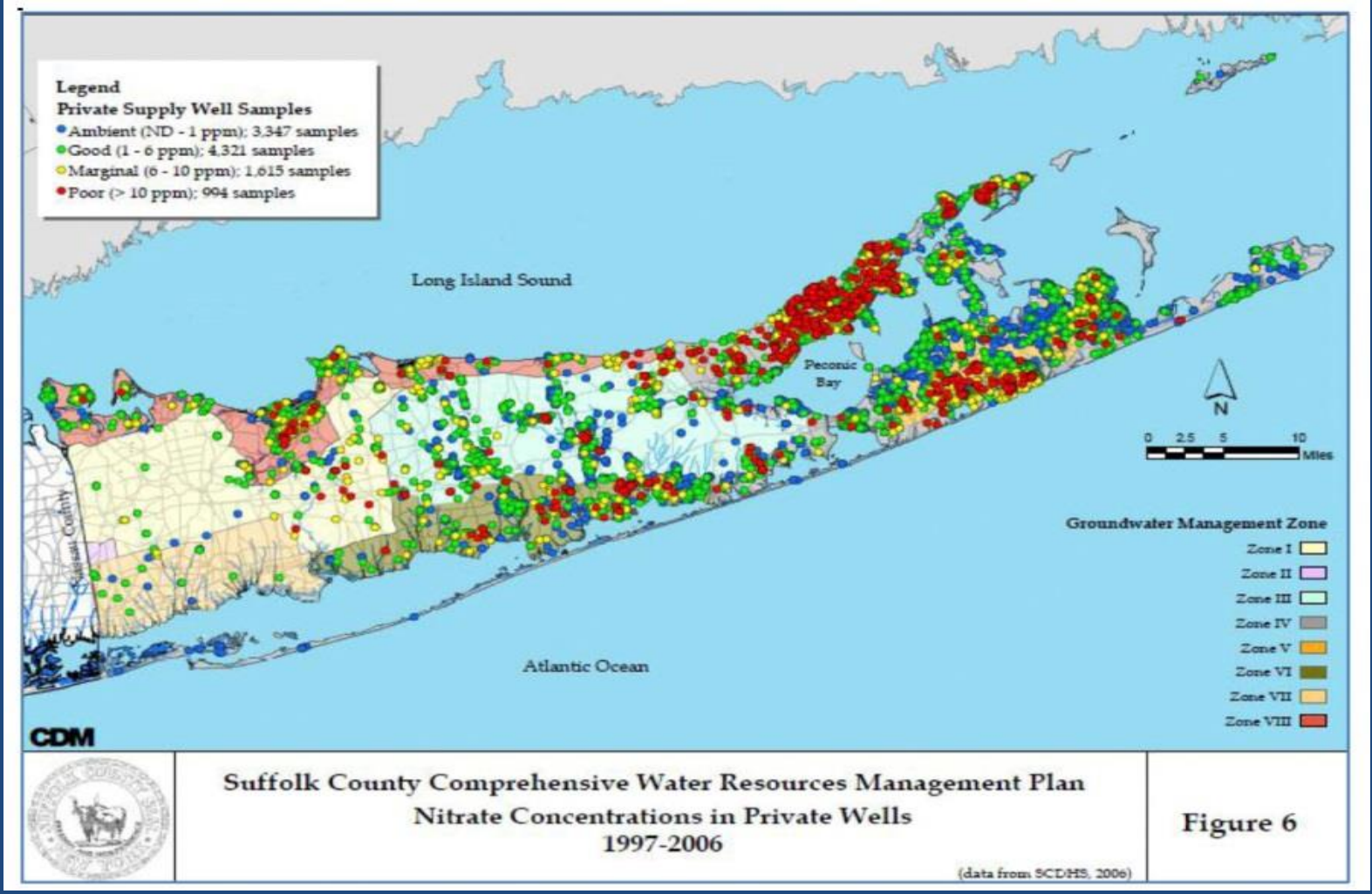
Southold – Worsening N Conditions



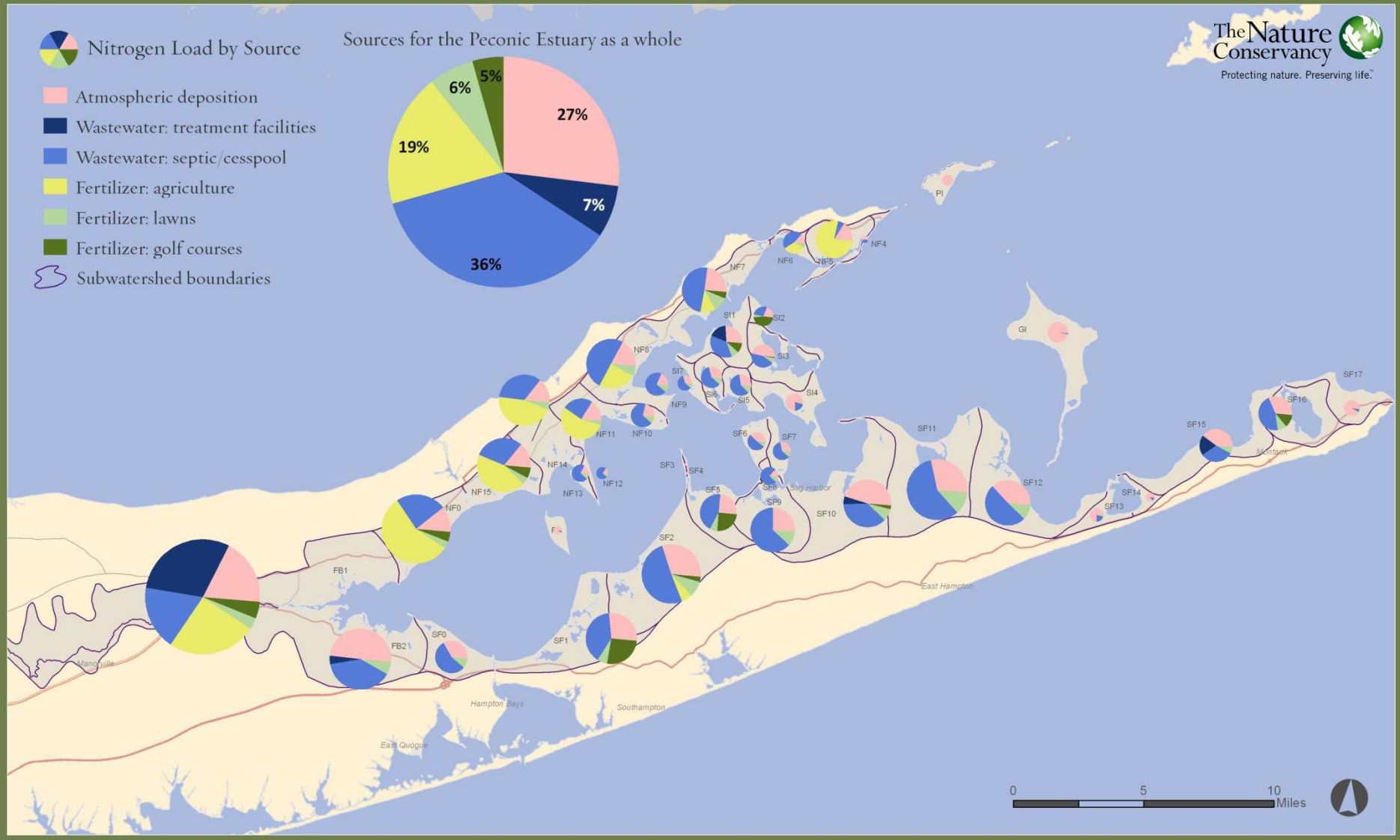


From Peconic Estuary Water Quality Status and Trends – Combines data from PE CCMP

Groundwater Nitrate Levels

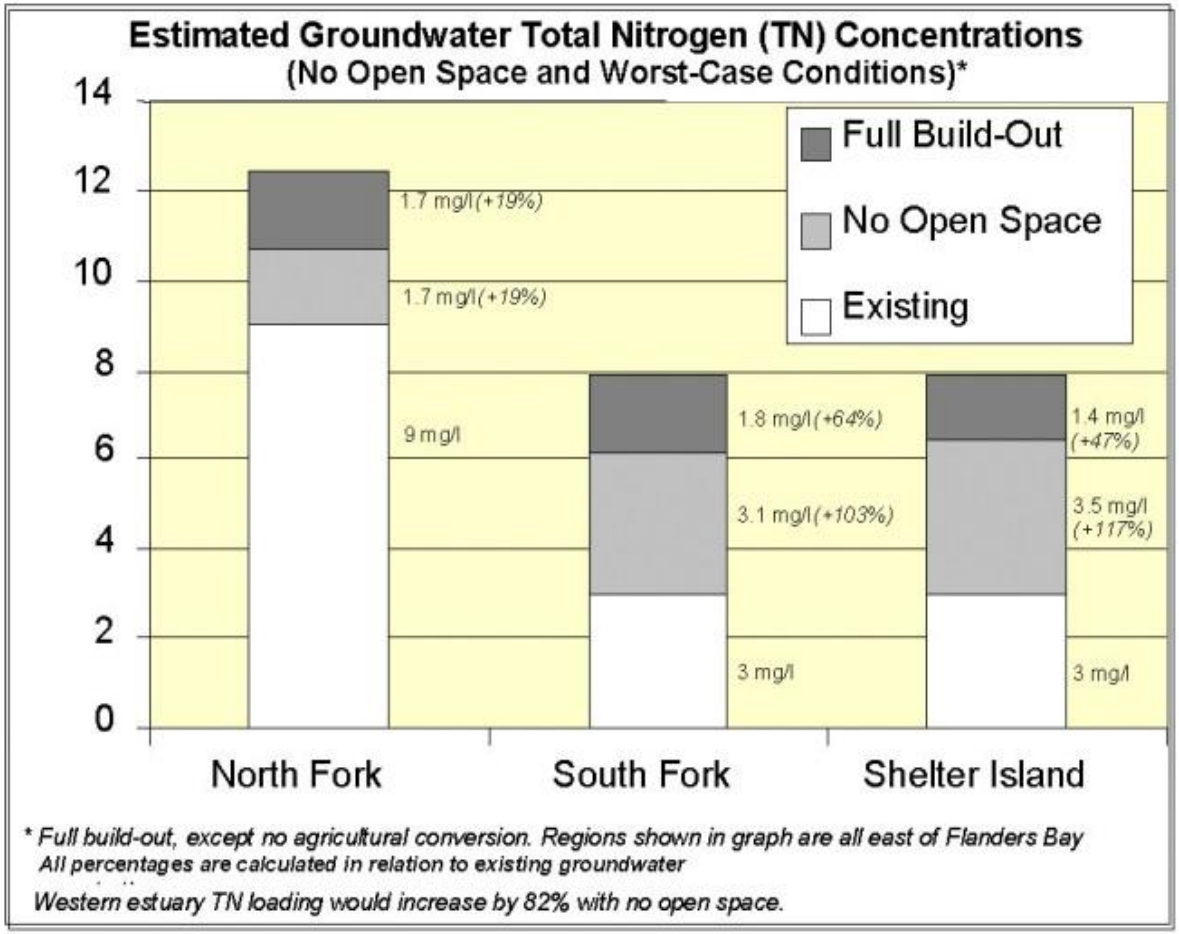


Nitrogen Loading to the Peconic Estuary



Courtesy of The Nature Conservancy and Prof. Christopher Gobler

Full Build-out Estimates



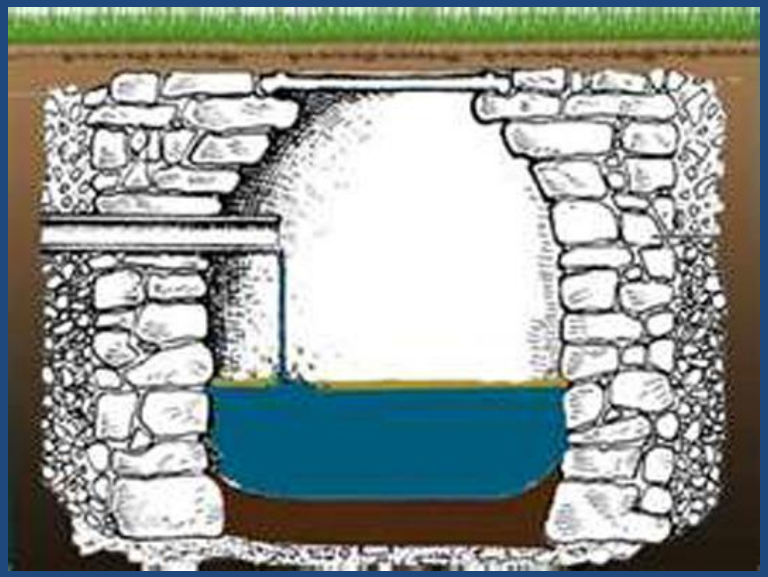
PECCMP Figure 3-14

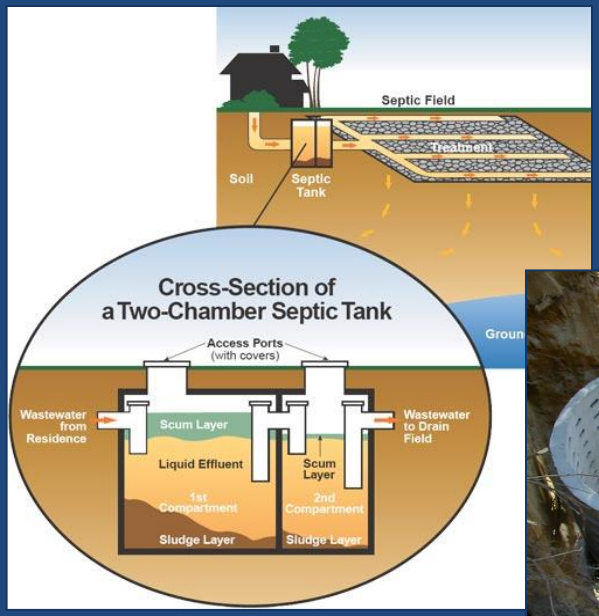
PGG SURVEY

1	When was your house built?						
		All Responses			Peconic Estuary		
	Before 1946	216	28.7%	28.7%	Before 1946	123	33.9%	33.9%
	1947-72	207	27.5%	56.3%	1947-72	100	27.5%	61.4%
	1973-2002	218	29.0%	85.2%	1973-2002	99	27.3%	88.7%
	2003+	84	11.2%	96.4%	2003+	34	9.4%	98.1%
	Not sure/unanswered	27	3.6	100.0%	Not sure	7	1.9%	100.0%
		752				363		

Government and Standards On-Site Systems:

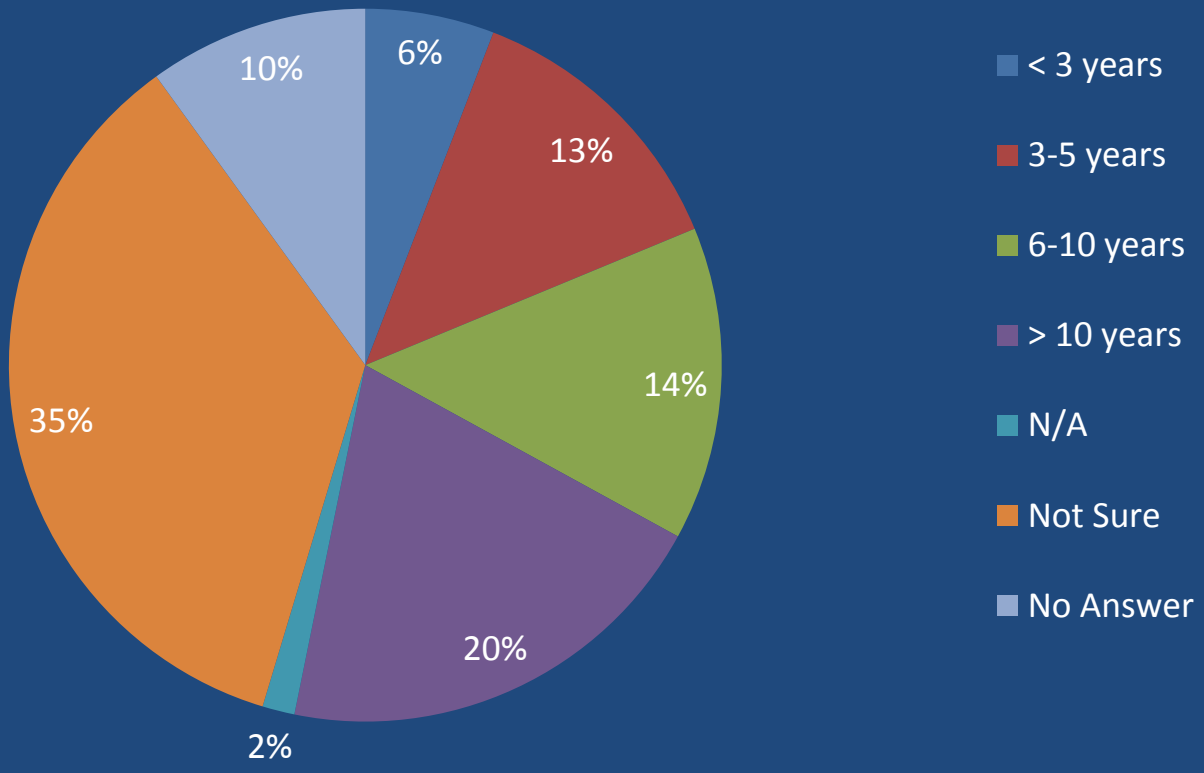
Cesspools < 1973 vs. Septic Systems, Leaching Pits or Fields



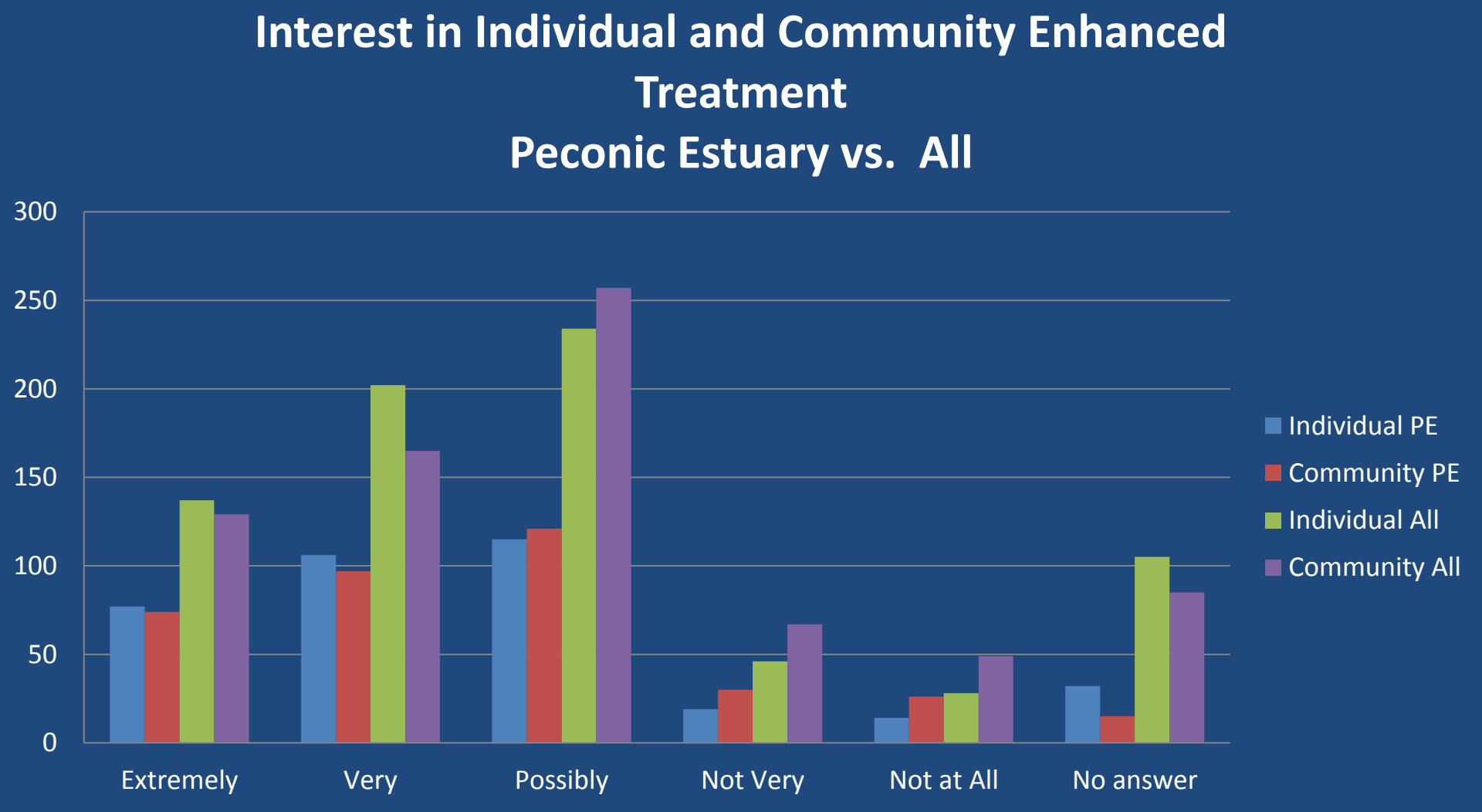


PGG SURVEY

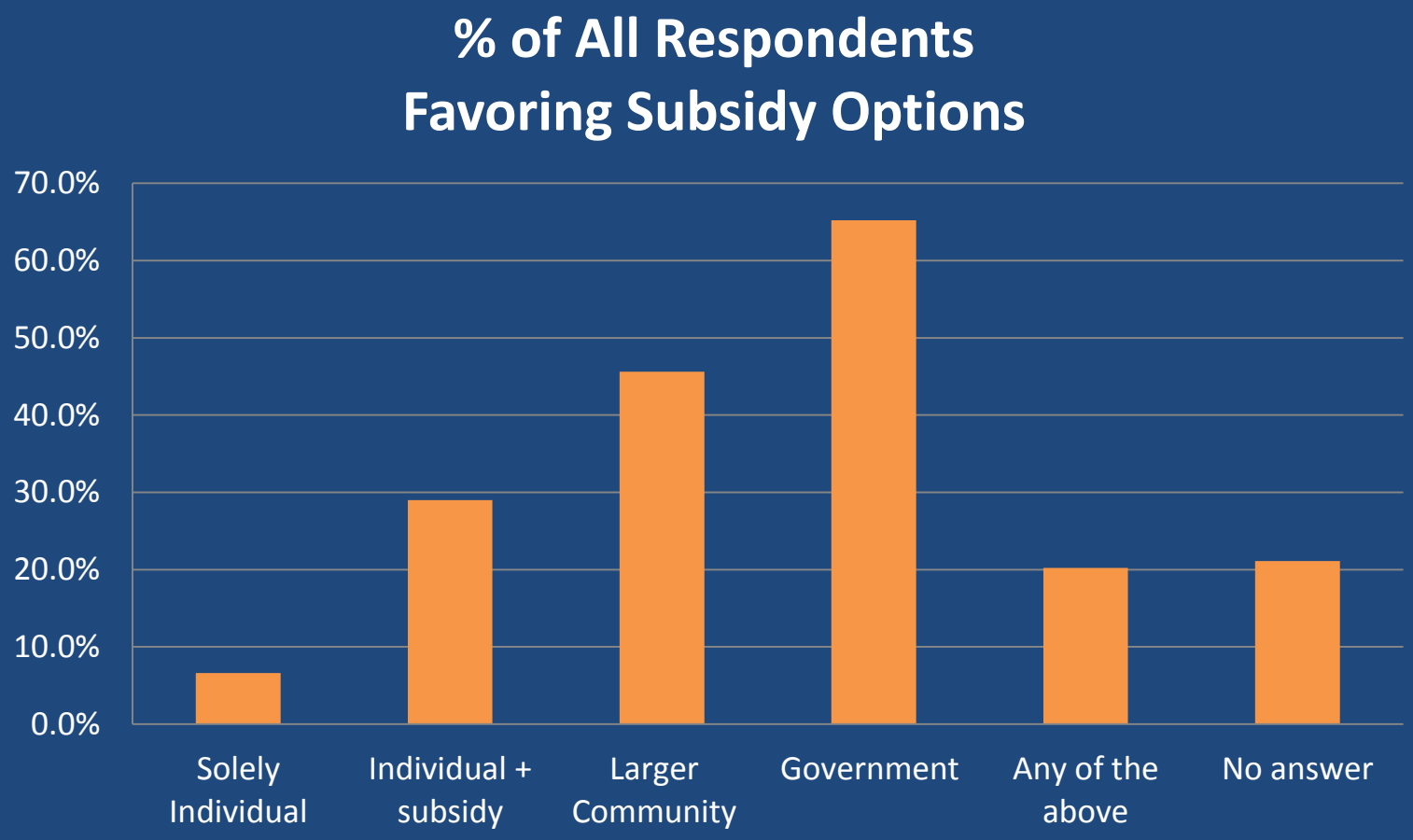
Frequency of Pump-out Need
All Responses

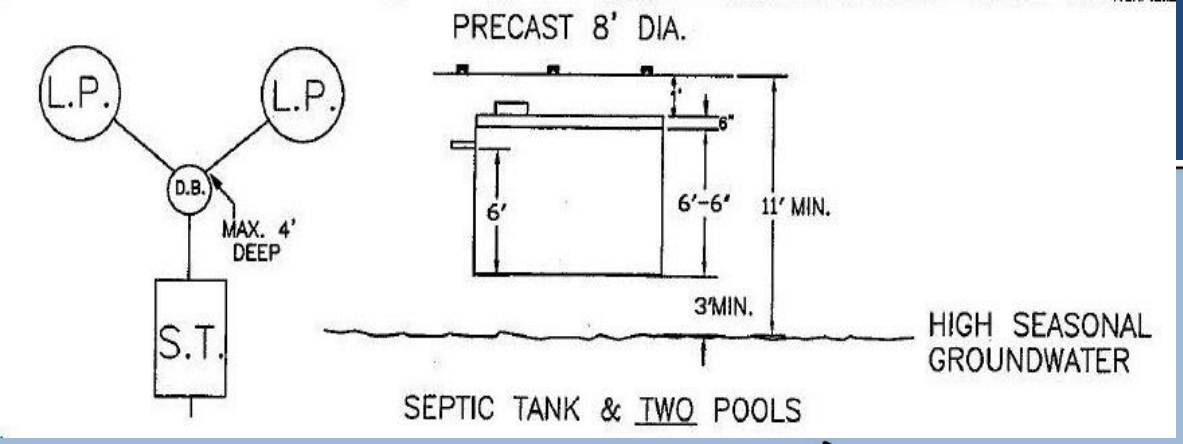


SURVEY


Interest in Individual and Community Enhanced Treatment
Peconic Estuary vs. All
300
250
200
150
100
50
0
Extremely
Very
Possibly
Not Very
Not at All
No answer
Individual PE
Community PE
Individual All
Community All

PGG SURVEY


% of All Respondents
Favoring Subsidy Options
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Solely Individual
Individual + subsidy
Larger Community
Government
Any of the above
No answer



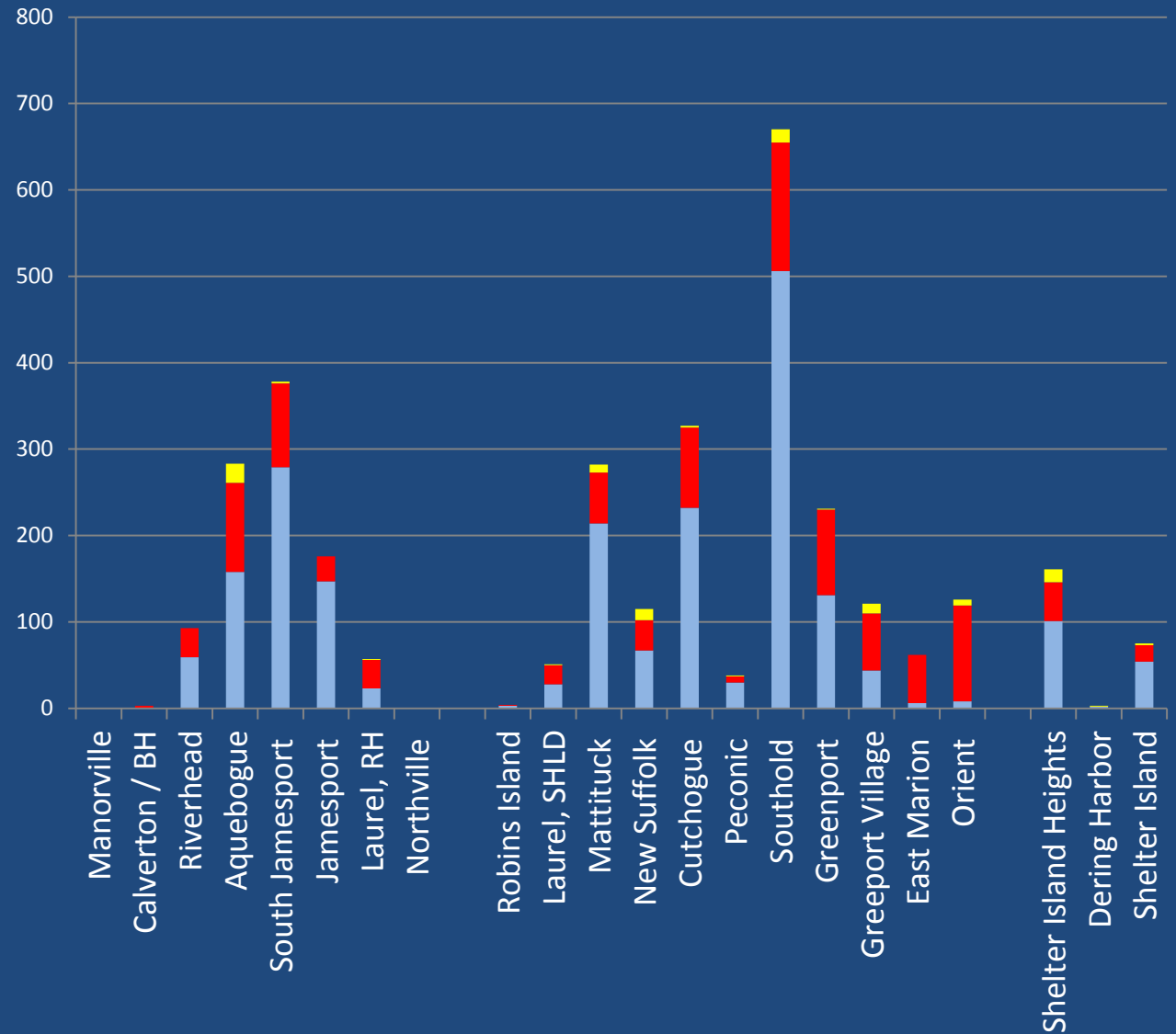
East Marion
168/524 Bldg.
32% in PE

Depth to Groundwater

Ground Water Depth
-26 - 1 ft
1.1 - 3 ft
3.1 - 9 ft
9.1 - 11 ft
11.1 - 13 ft
13.1 - 262 ft
LI Sound Future Fund Boundary
Building Footprints (2006)

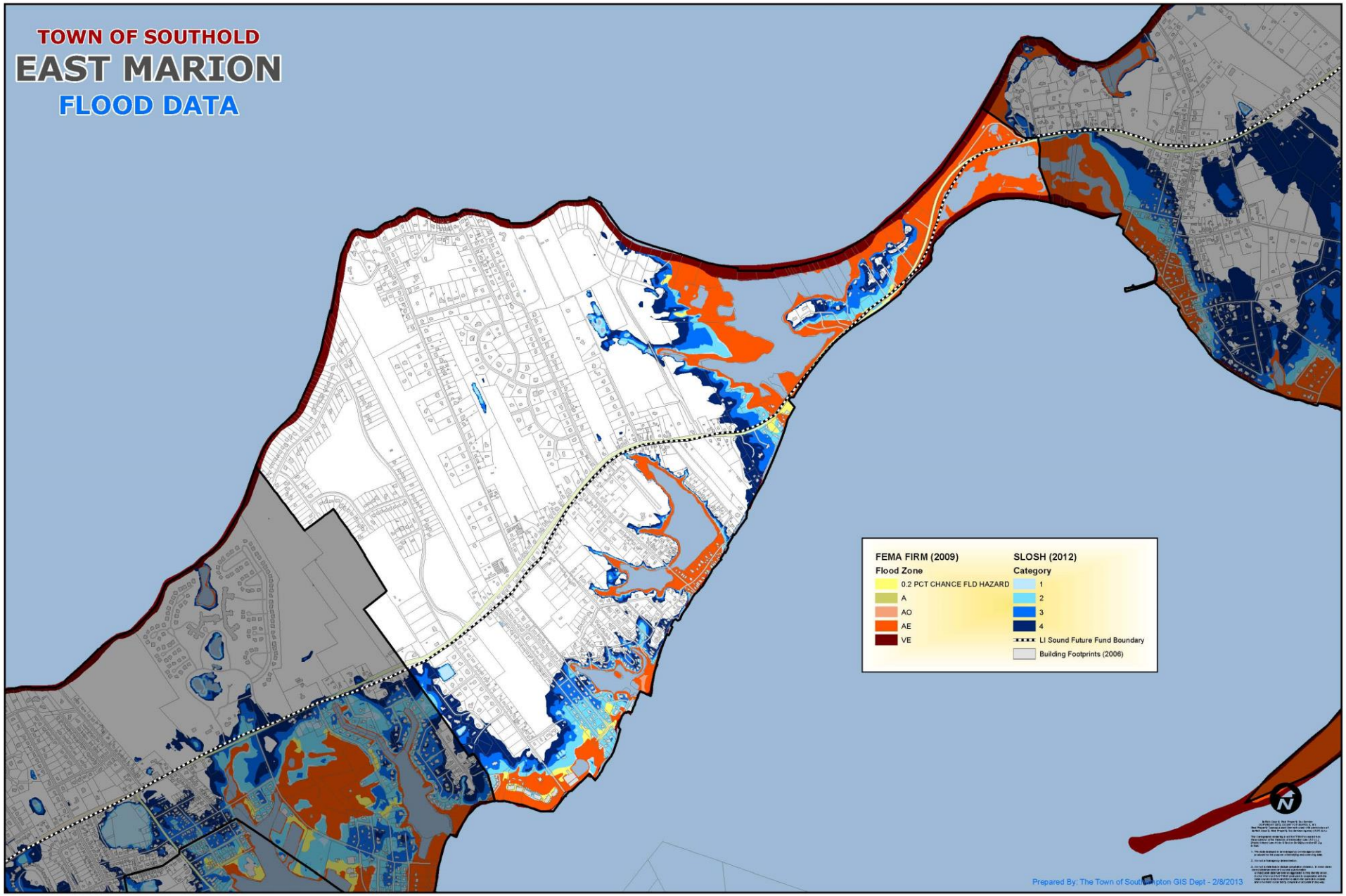
Prepared By: The Town of Southampton GIS Dept - 2/8/2013

Flood % of Bldgs. by Hamlet, PE

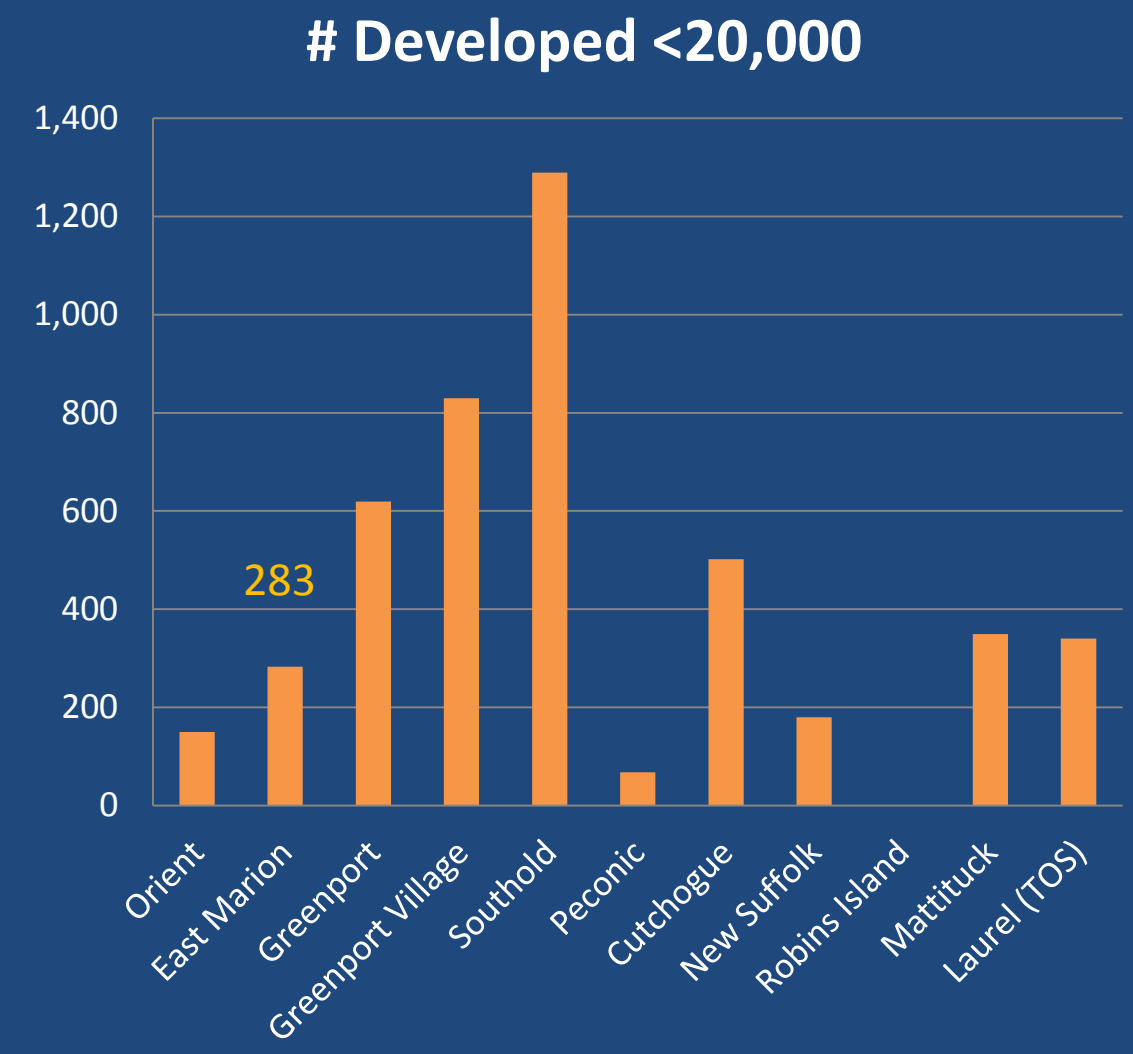


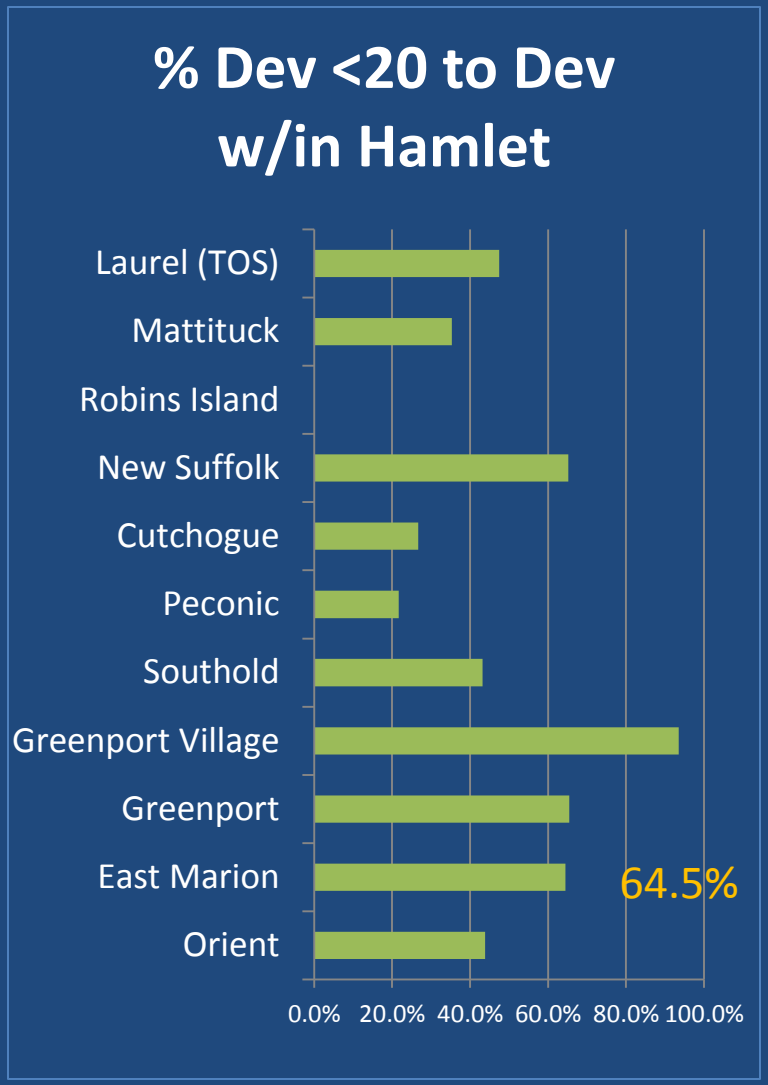
East Marion, PE:
11.8% in Flood zone
35% in SLOSH Zone

Flood + Storm Surge

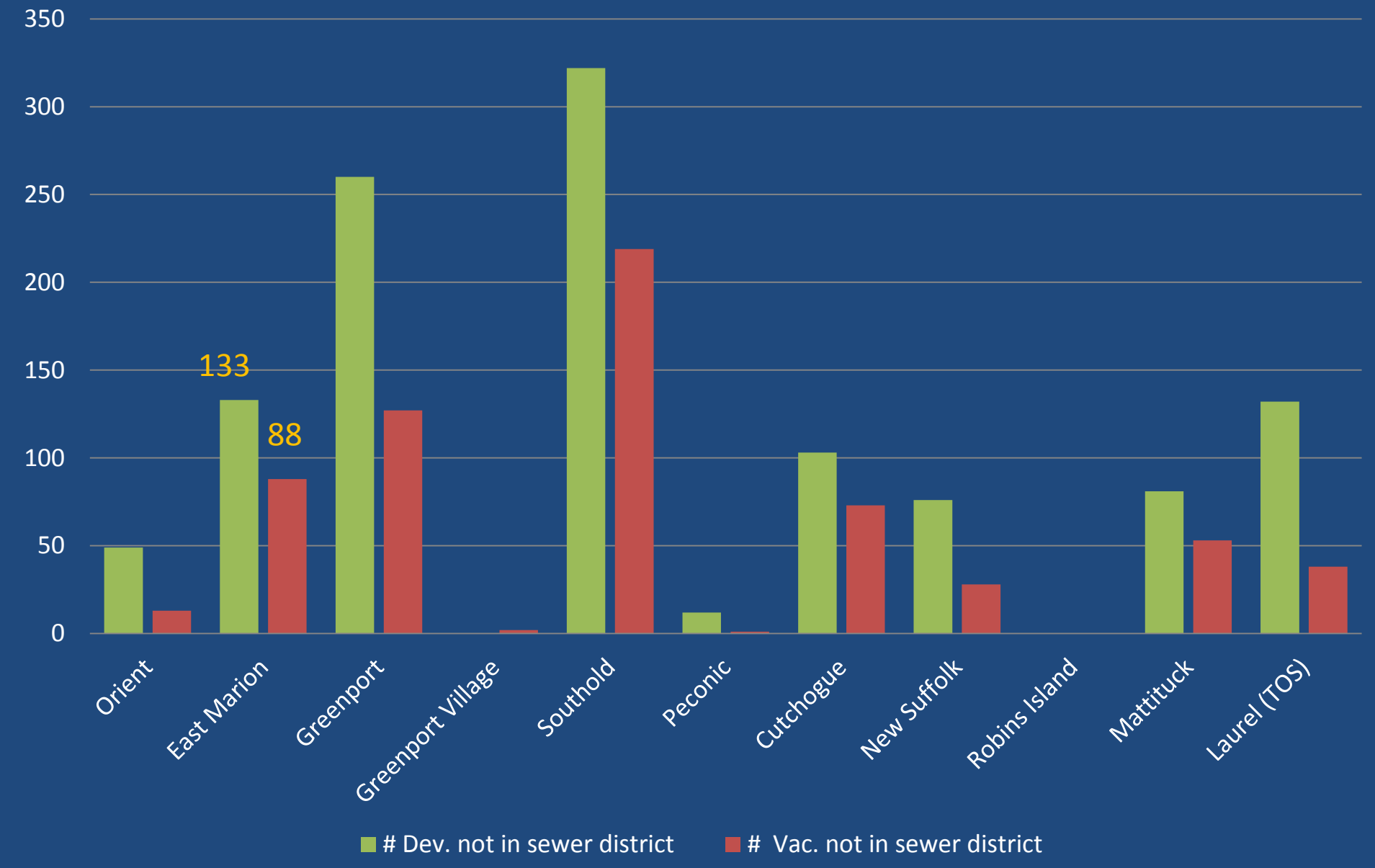


Number of Nonconforming Lots Less Than 20,000 SF in the Town of Southold

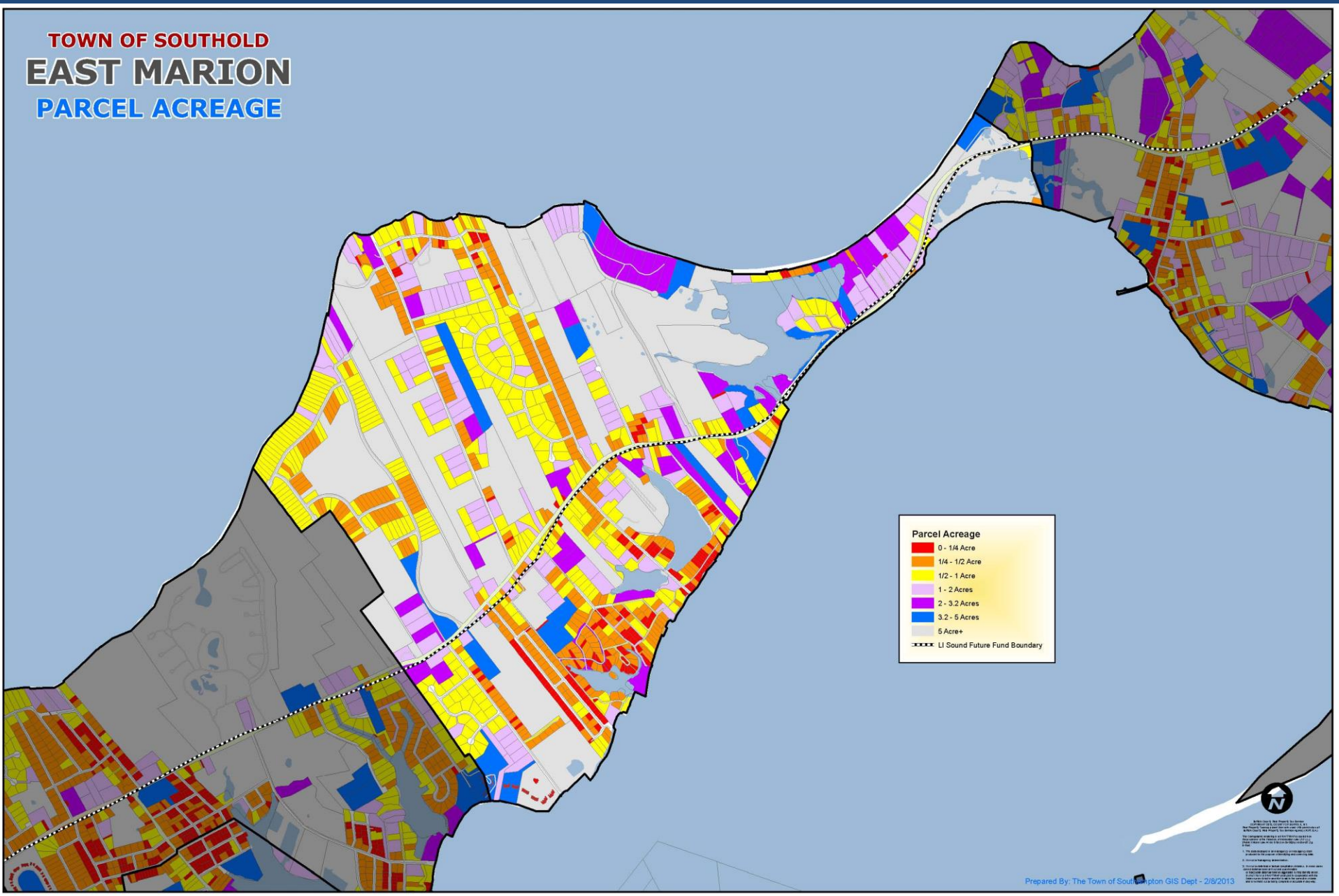




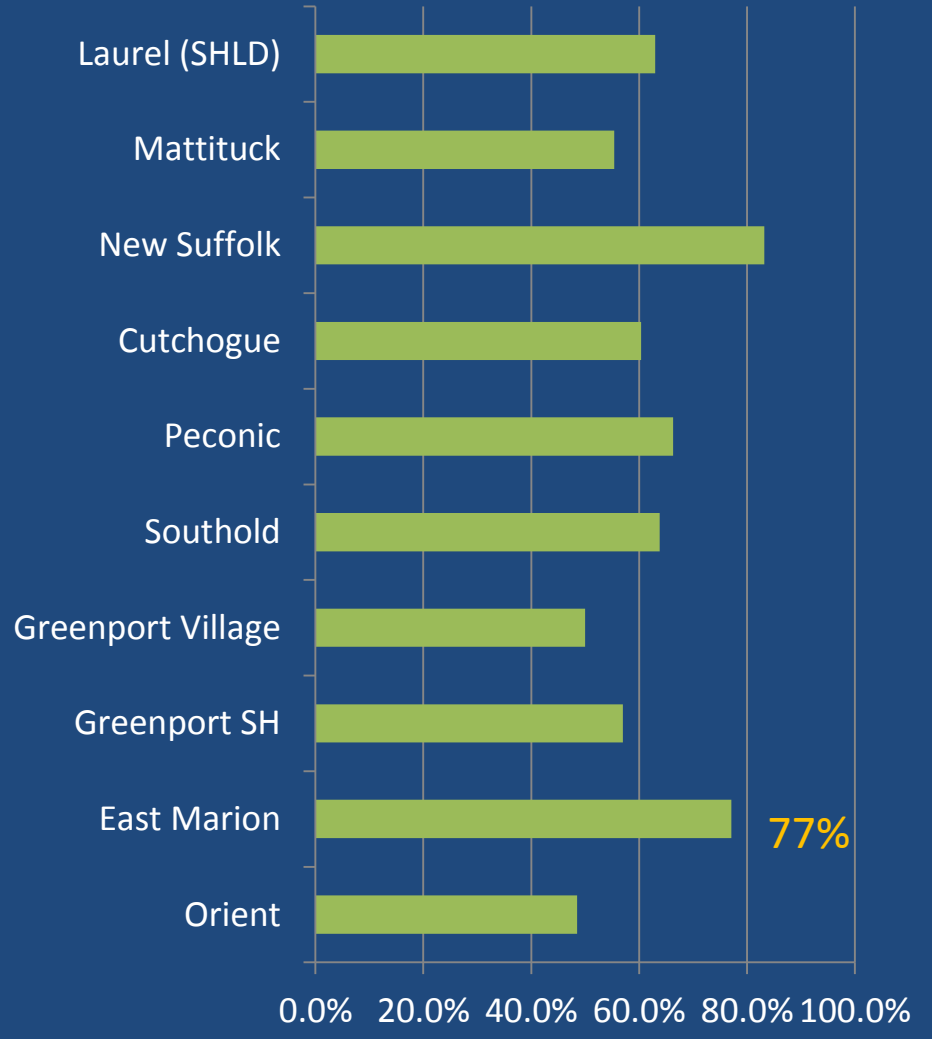
Parcels ≤ 1/4 Acre



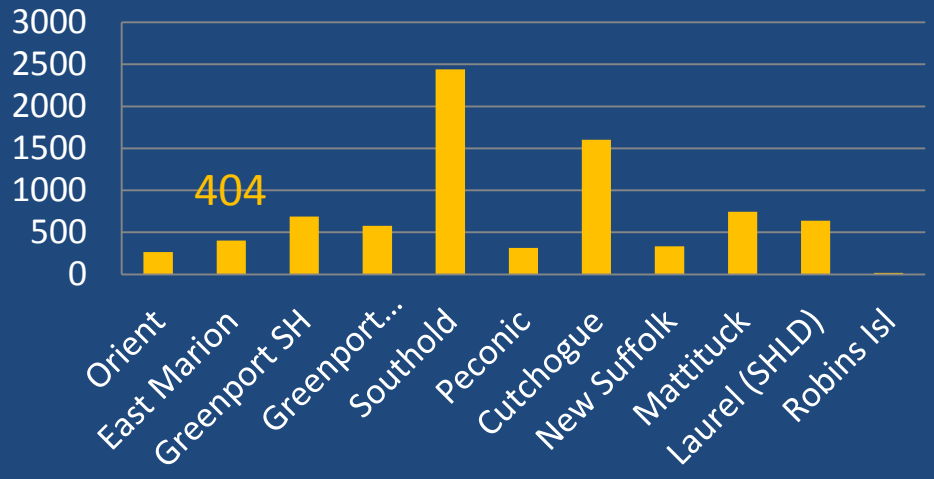
PARCEL SIZE


TOWN OF SOUTHOLD
EAST MARION
PARCEL ACREAGE
Parcel Acreage
0 - 1/4 Acre
1/4 - 1/2 Acre
1/2 - 1 Acre
1 - 2 Acres
2 - 3.2 Acres
3.2 - 5 Acres
5 Acre+
LI Sound Future Fund Boundary
Prepared By: The Town of Southampton GIS Dept - 2/8/2013

% of Bldgs. >450 SF / Hamlet Bldgs. In 0-2 yr. Influence Zone

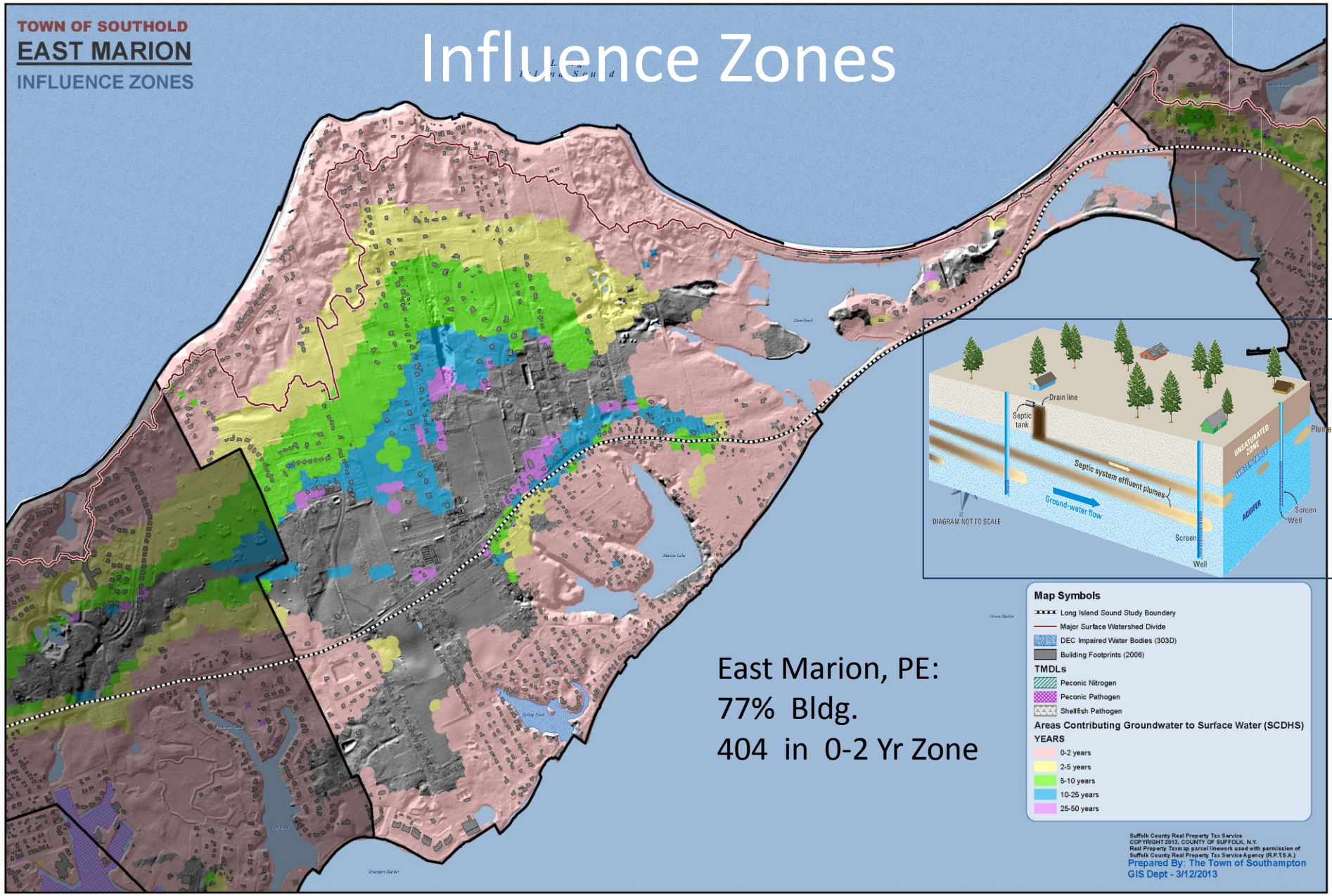


Bldgs. > 450 SF in 0-2 Year Inf. Zone



GROUNDWATER MIGRATION:

Influence Zones

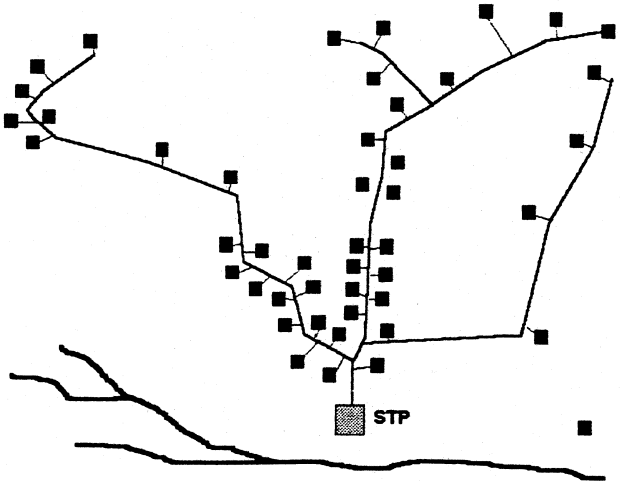


East Marion, PE:
77% Bldg.
404 in 0-2 Yr Zone

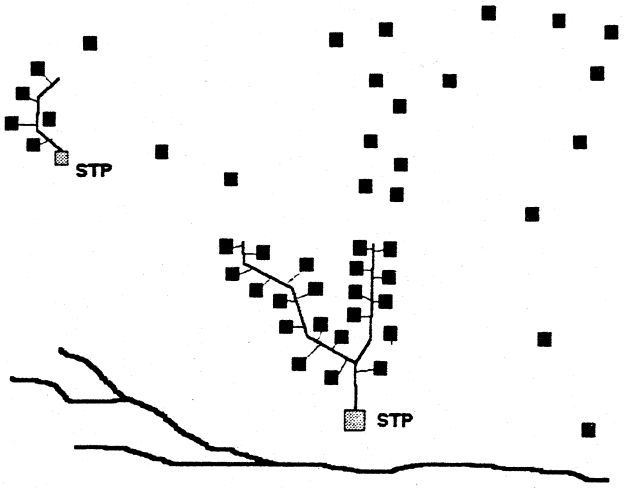
Approaches:

- **Clustered Systems**
- **Central Sewer Districts**

Centralized wastewater treatment vs. the decentralized approach.

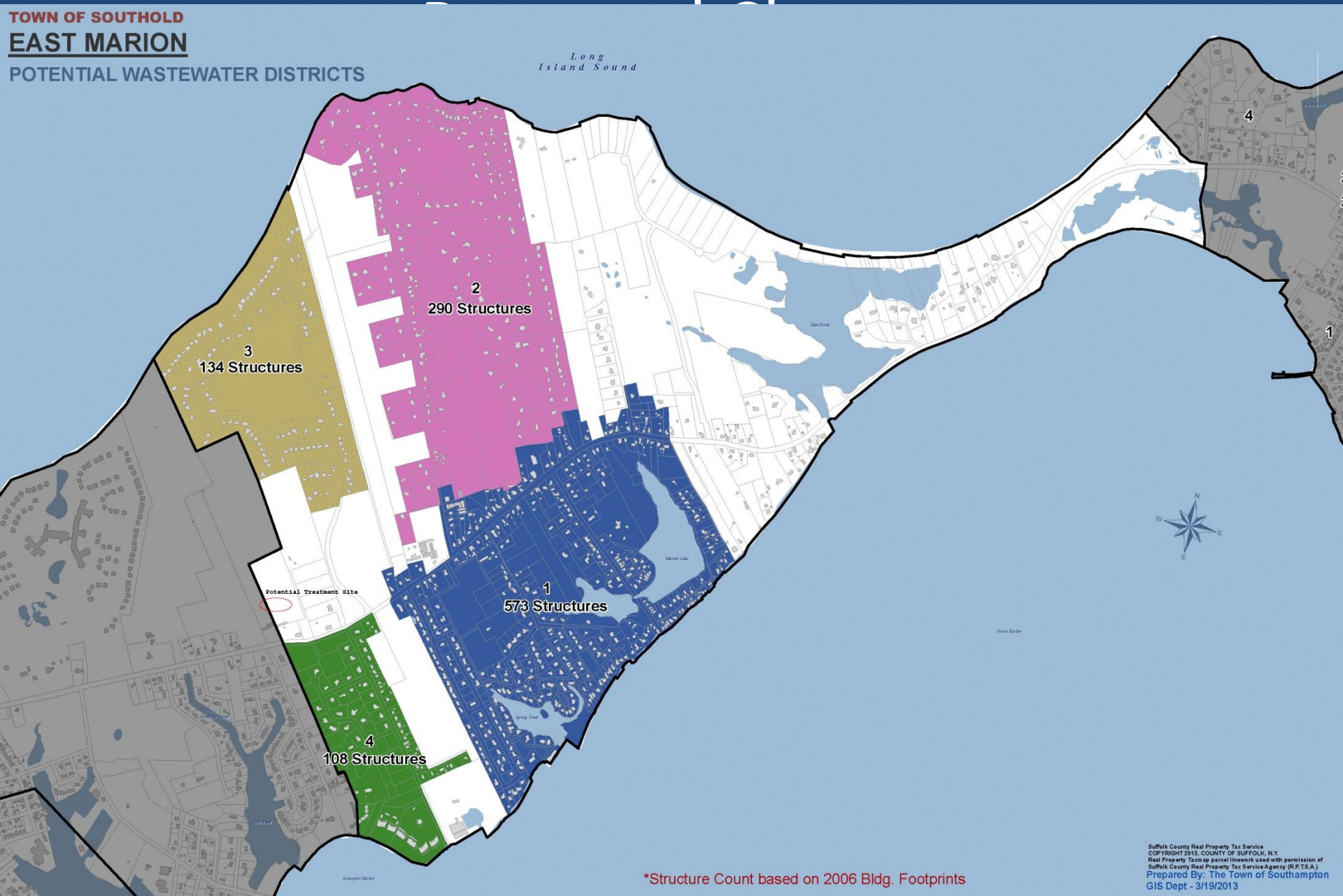


Centralized wastewater treatment

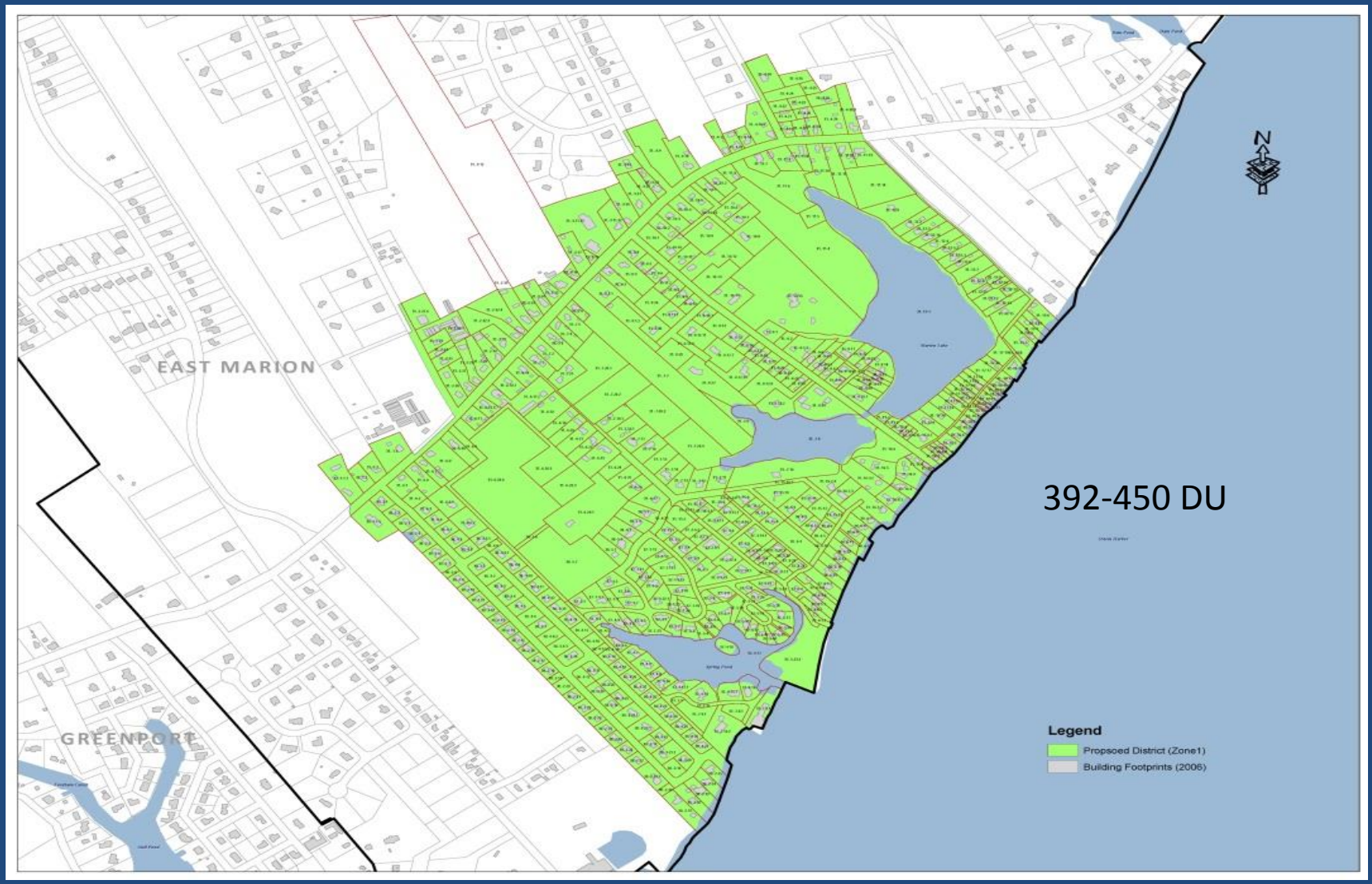


Decentralized approach

East Marion


TOWN OF SOUTHOLD
EAST MARION
POTENTIAL WASTEWATER DISTRICTS
Long Island Sound
2
290 Structures
3
134 Structures
1
573 Structures
4
108 Structures
4
1
Potential Treatment Site
*Structure Count based on 2006 Bldg. Footprints
Suffolk County Real Property Tax Service
COPYRIGHT 2013, COUNTY OF SUFFOLK, N.Y.
Real Property Tax map parcel linework used with permission of
Suffolk County Real Property Tax Service Agency (R.P.T.S.A.)
Prepared By: The Town of Southampton
GIS Dept - 3/19/2013

East Marion
Proposed Cluster

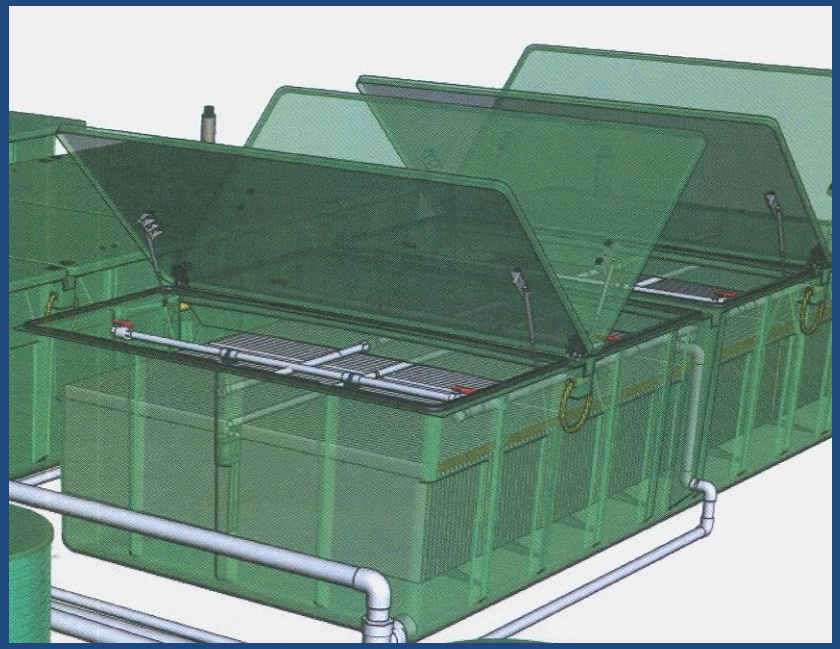


Components of a Clustered Effluent Collection & Treatment Approach

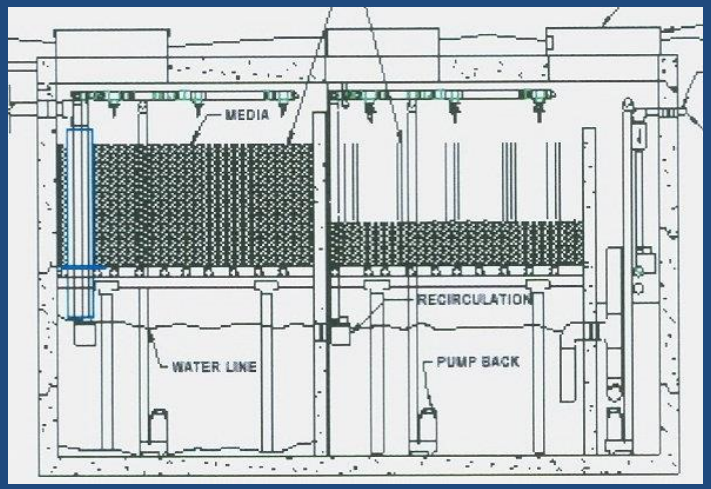
Wastewater Quality - Hillsdale

Parameter	Influent	Effluent
BOD	160 mg/l	15 mg/l
TSS	42 mg/l	8 mg/l
TKN	44 mg/l	12 mg/l
Nitrate	---	5 mg/l
pH	---	7.3

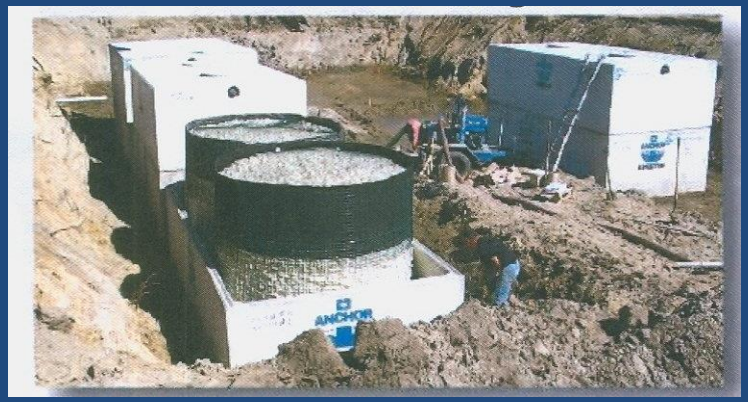
Nitrex



AdvanTex



Septitech

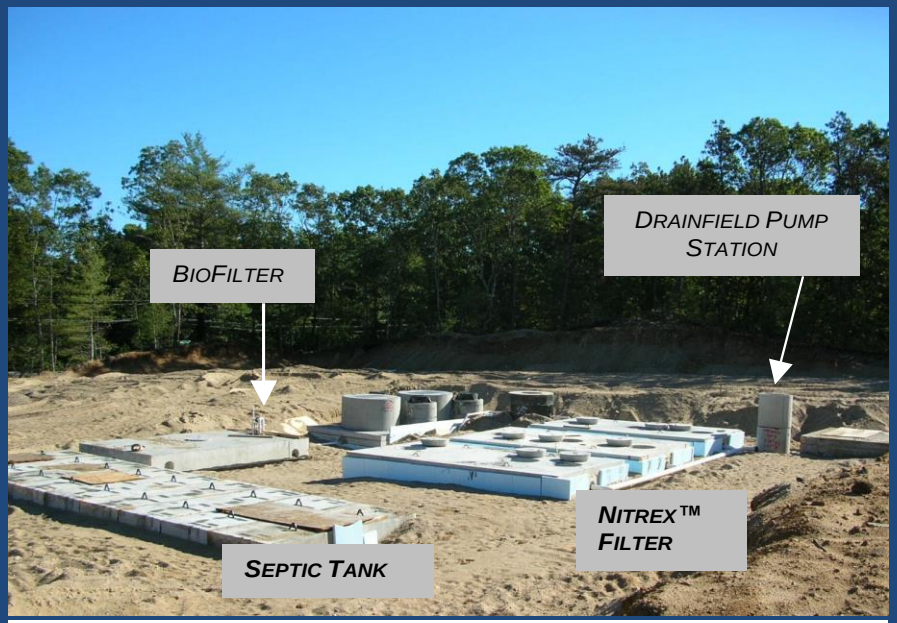


Waterloo

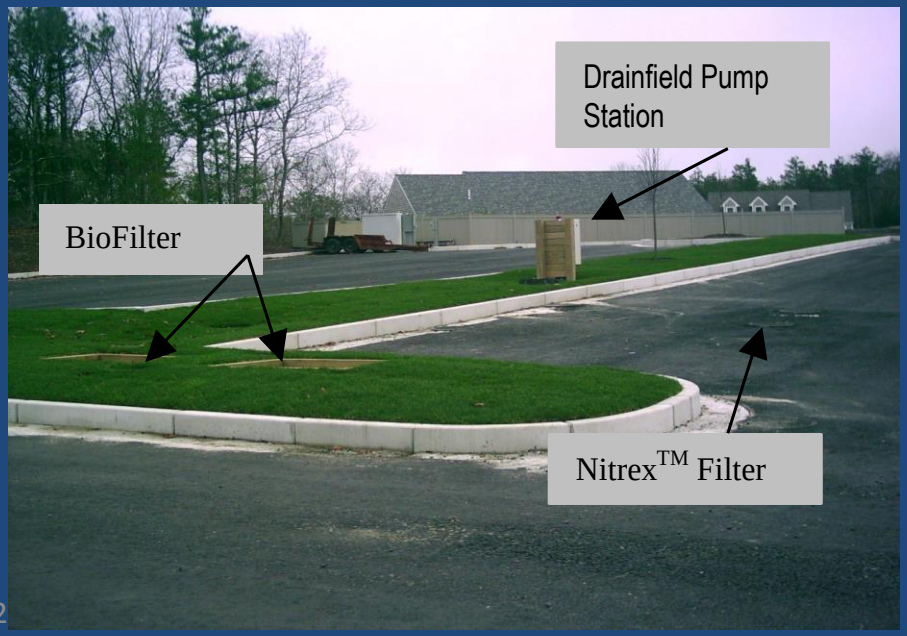
Fixed-film nitrification

Nitrex

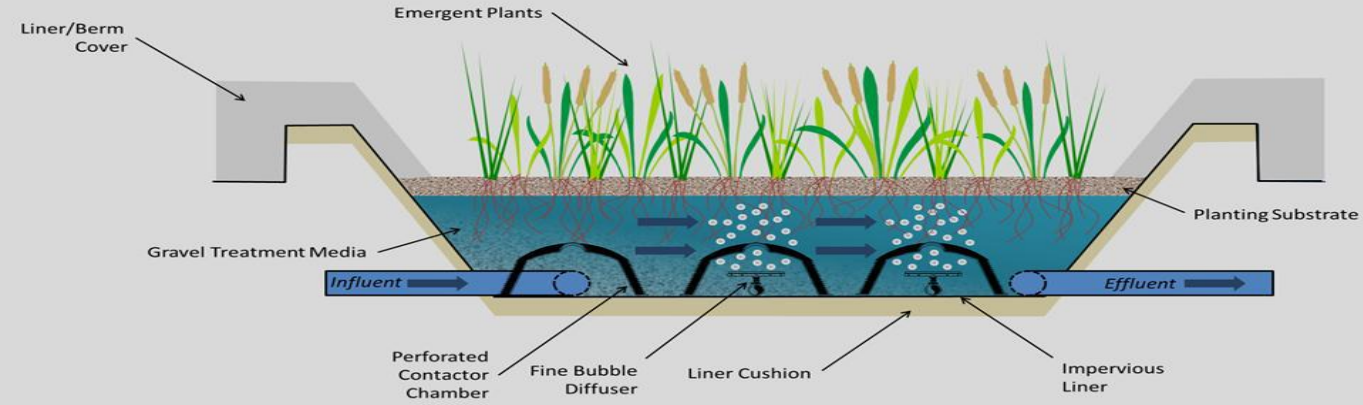
Advanced Treatment



Mashpee, MA Wastewater System at Substantial Completion



Mashpee, MA Wastewater System at Completion

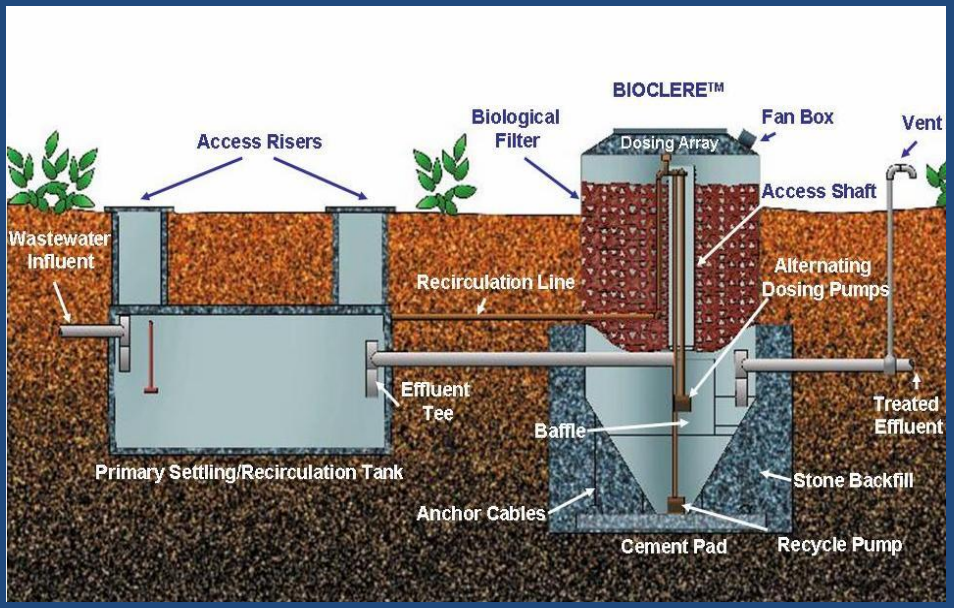

Liner/Berm Cover
Emergent Plants
Planting Substrate
Gravel Treatment Media
Influent
Effluent
Perforated Contactor Chamber
Fine Bubble Diffuser
Liner Cushion
Impervious Liner

Roux

Natural Wetlands Treatment System

Courtesy Natural Systems Utilities

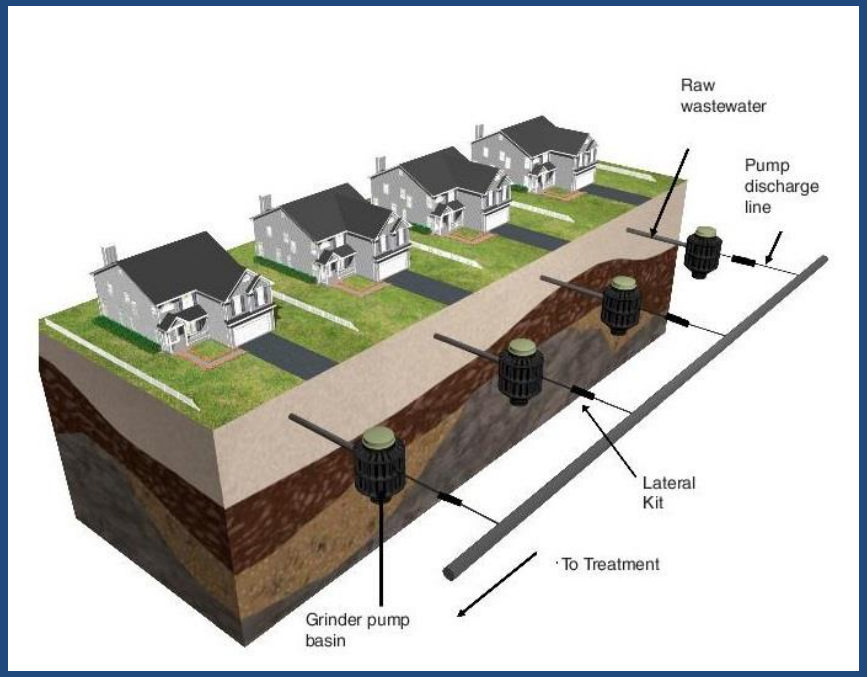
Aqua Point - Bioclere



- Influent Nitrogen – 44 mg/L
- Effluent Nitrogen – 8.4 mg/L
- Cost - ~ $50 /gallon

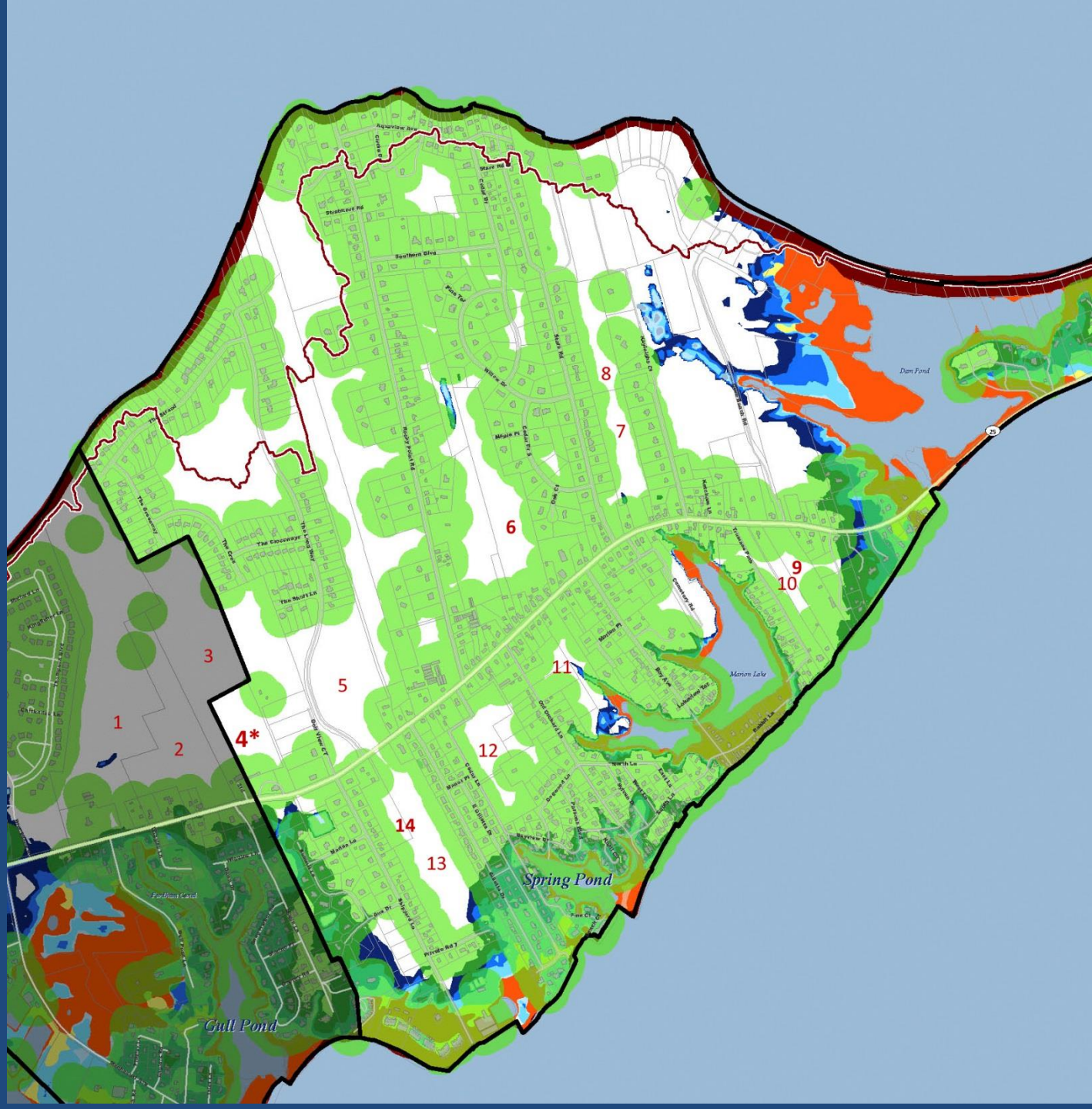
Fixed-film nitrification

Membrane Bioreactor



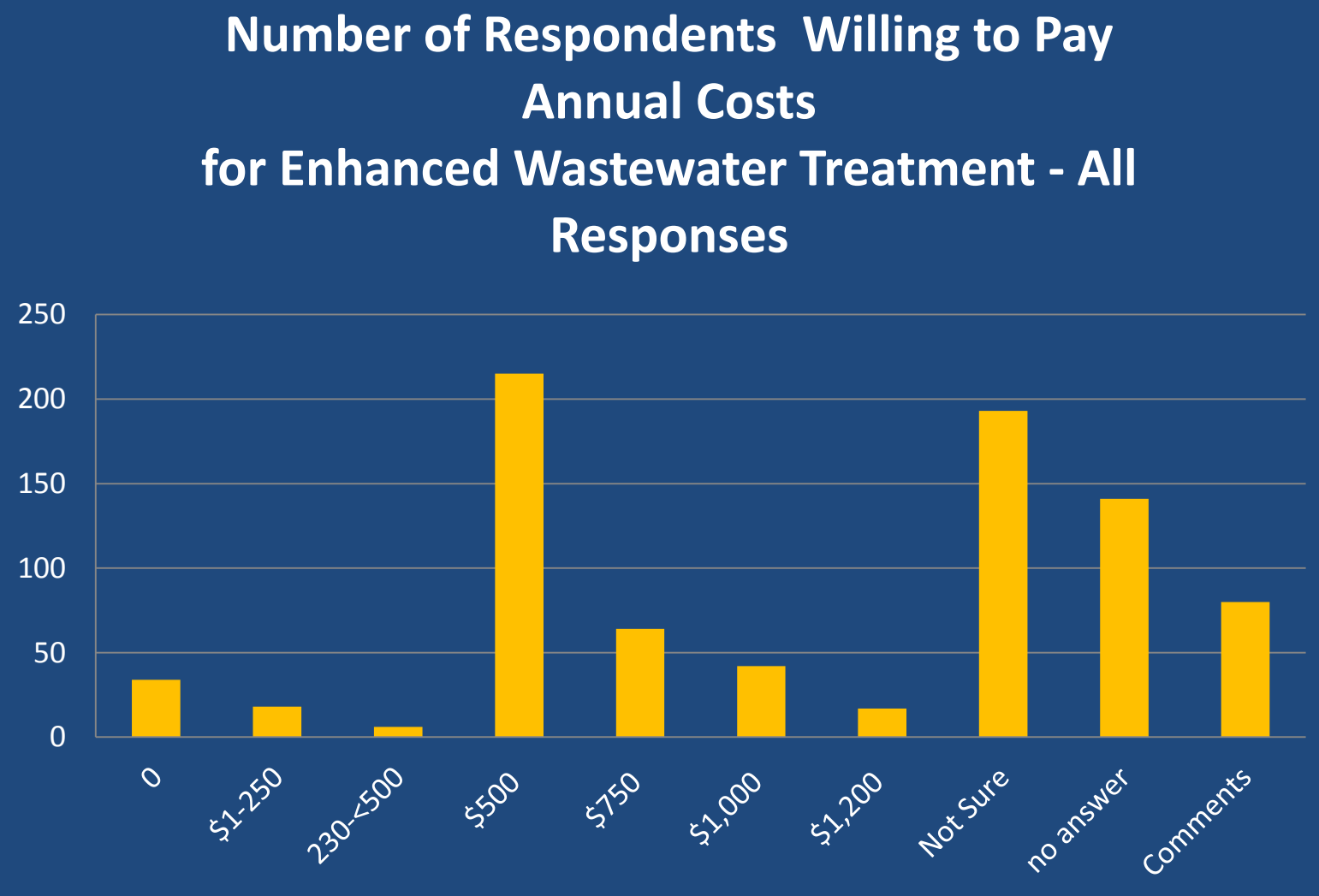
SITING

Collective Treatment



East Marion
Proposed Cluster

Target Cost


Number of Respondents Willing to Pay Annual Costs for Enhanced Wastewater Treatment - All Responses
250
200
150
100
50
0
0
$1-250
230-<500
$500
$750
$1,000
$1,200
Not Sure
no answer
Comments

Estimated Cost

Cost Estimate: East Marion STEP system

Capital Cost Summary	*Onlot Costs* [1]	*Submains for each property*	*Treatment/ unit*	*Subtotal $/EDU*	*# DU*	*$/Subtotal*	*Alternative Dispersal*
Per Lot	$9,500	$1,800	$7,500	$18,800	$450	$8,460,000	

Collection Costs	*Dia.*	*Total Length*	*Price per foot ($)*	*Estimated Cost*		
Pipe Summary	2" green	8770 feet	$15	$131,550		
	3" yellow	16296 feet	$18	$293,328		
Design	4" purple	7045 feet	$26	$183,170		
Contingency	6" lt. blue	3425 feet	$34	$116,450		
						$724,498
Dispersal with Leaching Pits		#				
capacity 6000g ea (500'lf)	10'dia x 12'd	23	$3,600	$82,800		
Additional costs				$95,000		$177,800

[1] Onlot Costs include: 1,500 gal.STEP Tank + service Laterals, pump package, control panel

Subtotal	$9,362,298
Engineering costs 12%	$1,123,476
Contingency 10%	$936,230
Subtotal	$11,422,004
Land purchase/lease	$300,000
Fencing -assume 565' x $30/ft	$16,950
Subtotal	$11,738,954
Cost/DU	$26,086.56

Operations Cost	$17.59	Includes
		Excludes repair/replacement for the plant, administration, overhead
Chemical feed (5-10%)	$1.76	
	$19.35	Per DU

Target Cost

For 450 DU	$11,750,000 total project
Cost per household equiv.	$26,100 Capital
Monthly costs incl. capital and operational	$36 - $150 / month
TARGET MAX	$500 - $600/year

Comparison Costs

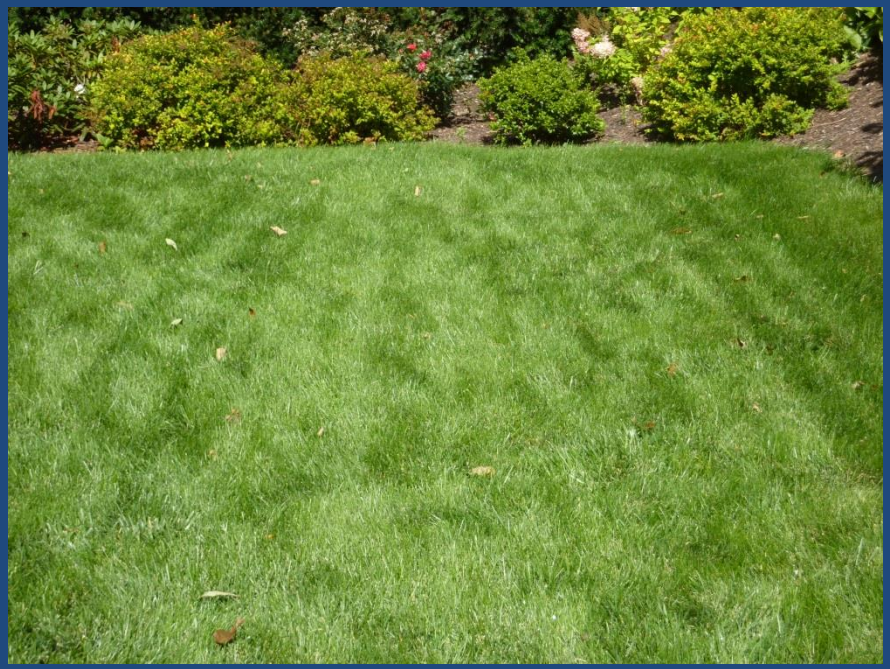
Options	Cost
Pump-Out	$500-$800
Cesspool Replacement	$ 1-$3,000
Septic Systems	$5,000 – 8,000
Leaching Field Denitrification	$10,000 - $13,000
Single onsite Enhancement	$15,000 - $35,000
STEP system	$25,000 - $28,00
Greenport Hook-up	$15,000 + new costs
Central Sewer	$55,000 – $66,000

RATE ANALYSIS

System	1,500 gal STEP w/ AdvanTex	
Loan Option	Interest Rate (%)	Term (yrs)
Loan Option 1	3.00%	40
Loan Option 2	3.50%	30
Loan Option 3	5.00%	20
System, Loan Option 1		
% Grant or Connection Fee	Debt Retirement ($/Month/EDU)	Total Debt & O&M ($/Month/EDU)
0%	$70.37	$88.90
25%	$52.78	$71.30
50%	$35.18	$53.71
75%	$17.59	$36.12
System, Loan Option 2		
% Grant or Connection Fee	Debt Retirement ($/Month/EDU)	Total Debt & O&M ($/Month/EDU)
0%	$88.44	$106.97
25%	$66.33	$84.86
50%	$44.22	$62.75
75%	$22.11	$40.64
System, Loan Option 3		
% Grant or Connection Fee	Debt Retirement ($/Month/EDU)	Total Debt & O&M ($/Month/EDU)
0%	$130.52	$149.05
25%	$97.89	$116.42
50%	$65.26	$83.79
75%	$32.63	$51.16

Opportunity

Land Use
Reuse
Vacant Lots

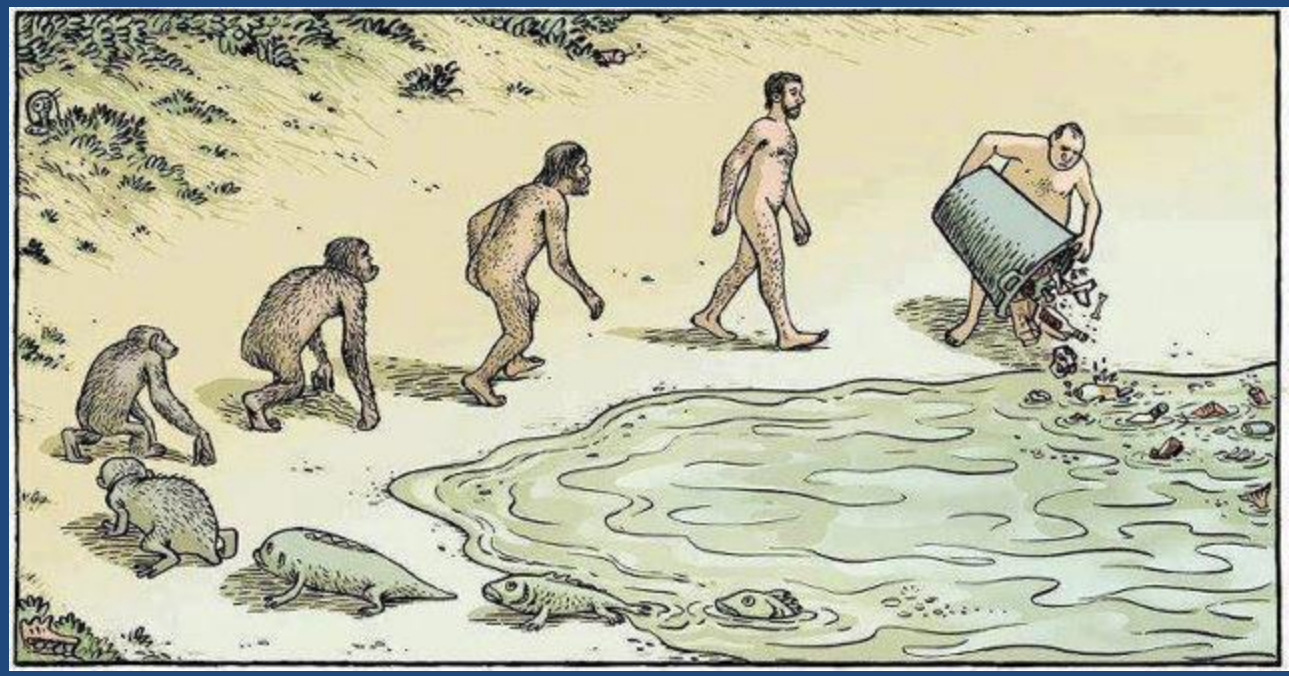


NEXT STEPS

- SURVEY – INTEREST/WILLINGNESS to PARTICIPATE
- IDENTIFICATION/APPROVAL of SITE FOR TREATMENT
- DISTRICT FORMATION
- RESPONSIBLE MANAGEMENT ENTITY
- APPLICATIONS FOR FUNDING
- DESIGN
- CONSTRUCTION

THANK YOU

http://peconicgreengrowth.org



Presentation by
Glynis Berry, AIA, LEED AP
PECONIC GEEN GROWTH, Inc.

- Long Island Sound Futures Fund/NFWF
- Henry Phillip Kraft Family Memorial Fund at the Long Island Community Foundation
- Suffolk County Water Quality Protection and Restoration Program
- Patagonia, Inc.
- GIS by the Town of Southampton
- Engineering: Natural Systems Utilities and Orenco/PGG