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# **WASTEWATER TREATMENT Engineering Report**

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**West Mattituck  
Mattituck, Suffolk County, New York**

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**December 2013**

**AWM Project # E01489AA**

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NATURAL SYSTEMS UTILITIES

**Applied Water Management**

**An NSU Company**

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**This report was executed on behalf of:**

Peconic Green Growth, Inc  
651 West Main Street  
Riverhead, NY 11901

**Funded by a grant from:**

**The Long Island Sound Study and the National Fish and Wildlife Foundation**

## **1.0 EXECUTIVE SUMMARY**

On behalf of Peconic Green Growth, Inc., Natural Systems Utilities (NSU) has prepared this preliminary technical report, which evaluates the implementation of a wastewater collection system and wastewater treatment plant (WWTP) as a means of mitigating nitrogen loadings that are affecting the quality of the Long Island Sound Watershed. This report was prepared in accordance with a grant funded by the Long Island Sound Study and the National Fish and Wildlife Foundation (Grant Project ID# 1401.12.033406).

This report evaluates a decentralized wastewater collection/treatment system that would serve the existing residential community referred to herein as “West Mattituck”. West Mattituck is located on the western banks of Mattituck Creek in the Town of Southhold, Suffolk County, NY. Project boundaries are shown on the map provided in Figure 1 of Appendix A. West Mattituck was selected by Peconic Green Growth, Inc. (PGG) after careful analysis of existing communities located within the Towns of Riverhead and Southhold. West Mattituck was determined to be suitable for a decentralized sewer system as it meets the following criteria.

- Environmental need is defined. Nitrogen present in marine environments serves as a food source for algal blooms. When these algal blooms thrive, they can severely reduce dissolved oxygen concentrations, which is essential to the survival of most marine life. In addition, in certain cases, algal blooms can lead to the formation of toxins (i.e. saxitoxin) that can be harmful to humans. As in the case of Mattituck Creek, there have been recent shellfish bed closures due to toxic algal blooms caused by Alexandrium. Alexandrium synthesizes saxitoxin that leads to the human illness known as paralytic shellfish poisoning. In 2009, Mattituck Creek had higher densities of Alexandrium than any other system monitored on Long Island (Gobler 2011; Final report to the Long Island Sound Study). In August of 2013, Stony Brook University surveyed oxygen levels in bottom waters of tributaries across Nassau and Suffolk County. Mattituck Creek had the lowest oxygen levels at 0.04 mg per liter, a level that is practically anoxic (severely oxygen deficient).
- Existing disposal systems are comprised of either cesspools or septic systems. In the case of West Mattituck, all existing properties located within the proposed sewer service area utilize

individual cesspools or septic systems for waste treatment and disposal. The lack of treatment provided by these existing systems contributes to excessive nitrogen levels found in the Mattituck Creek.

- The sewer service area is located within close proximity to an impaired water body.
- A large majority of the existing buildings fall within an area which has been identified as having “Somewhat Limited” septic tank absorption rating according to the “Town of Southold, Mattituck, Soils – Septic Tank Absorption Rate” map prepared by the Town of Southampton GIS Department - 3/11/2013.
- There is no feasible alternative for connection to a centralized sewer facility. The nearest town sewer system is in Riverhead, which is located several miles away.

A preliminary concept design was prepared to define the components of the West Mattituck Sewer System (WMSS). High-level capital and operational cost estimates were prepared for the collection system, treatment system, and disposal system. The costs were utilized in a financial evaluation that estimated the cost per user that would be required in order to deploy a decentralized sewer system at this location.

## **2.0 SEWER SERVICE AREA**

The properties included within the proposed West Mattituck Sewer Service Area (SSA) are depicted on the Sewer Service Area Map (Figure 1 in Appendix A). The SSA is located on the west side of Mattituck Creek north of Route 48 in the hamlet of Mattituck, Town of Southold, Suffolk County, NY. The sewer service area consists of approximately 376 occupied lots and 36 vacant lots (412 lots in total). The proposed SSA totals 375 acres, exclusive of right-of-ways. The average parcel area is 0.90 acres. A majority of the SSA is located within zone R-40 Residential Low Density (1 acre). A majority of the construction located within the SSA consists of single-family homes.

Existing topography is shown on the Elevation Map (Figure 3 Appendix A). The SSA ranges in elevation between 5 feet - 50 feet amsl. The depth to groundwater within the SSA limits is greater than 13.1 ft in most locations. However, there are areas, primarily along the shoreline along Point Pleasant Road, where the depth to groundwater is less than 1 ft.

West Mattituck is located within Groundwater Management Zone IV. Wastewater generated by the homes within the community currently discharges to individual cesspools or septic systems, depending on when the home was built. There are no existing sewer districts located within several miles of West Mattituck. The lack of sewer systems within the vicinity of the project supports the concept of a decentralized system to mitigate nitrogen.

### 3.0 WASTEWATER DESIGN PARAMETERS

The wastewater design parameters used in this analysis are detailed in the following sections of this report.

#### 3.1 Design Flow

The SSA consists of 405 lots in total. The lot use was evaluated based on the “Town of Southold, Mattituck, Land Use” Map prepared by the Town of Southampton GIS Department on 3/11/2013. Approximately 365 of the existing lots are occupied by single-family homes. Three (3) lots are zoned for agricultural use. One (1) lot is zoned for institutional use and is occupied by a church. The remaining 36 lots are vacant. For purposes of this report, it is assumed that a single family home will be built on each vacant lot. A build out analysis will be completed to determine the feasibility of constructing future homes on vacant parcels.

Wastewater flow estimates provided in Table 1 below were calculated using the hydraulic load unit flow criteria provided in the “Standards for Approval of Plans and Construction for Sewage Disposal Systems for Other Than Single-Family Residences” issued by the Suffolk County Department of Health Services (SCDHS).

**Table 1: Design Flow Calculation**

Design Flow from Existing Uses:						
Qty	Lot Type	Description	Design Flow Rate		Project Flow	
365	Single-Family Residence		300	GPD/unit	109,500	GPD
1	Greenhouse*	102,000 SF	0.03	GPD/SF	3,060	GPD
1	House of Worship*	100 seats	1.5	GPD/seat	400	GPD
1	Industrial - Agric. Bldg.*	8,500 SF	0.04	GPD/SF	340	GPD
* Size and flows estimated based on aerial photos					TOTAL	113,300 GPD
Potential Future Flow from Vacant Lots:						
Qty	Lot Type	Description	Design Flow Rate		Project Flow	
36	Single-Family Residence		300	GPD/unit	10,800	GPD
					TOTAL	10,800 GPD
					Projected Flow @ Buildout	124,100 GPD

For purposes of this report, it is assumed that all existing and future flows identified in the table above will be served by the decentralized sewer system. This would result in a design flow of 125,000 gpd.

### Population Estimate

The total population served by the wastewater treatment system is estimated at 1,667 persons based on the following:

$$125,000 \text{ gpd} / 75 \text{ gpd per capita} = 1,667 \text{ persons}$$

### **3.2 Influent Characteristics**

The SCDHS recommended design influent characteristics as summarized in Table 1 were used for this project.

**Table 2: Design Influent Characteristics**

Characteristic	Units	Design Influent Concentration
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L	272
Total Nitrogen (TN) <sup>1)</sup>	mg/L	65
Total Suspended Solids (TSS)	mg/L	300

- 1) For the purpose of this evaluation, it is assumed that there are no nitrites and nitrates in the influent and that TN is equal to Total Kjeldahl Nitrogen (TKN).
- 2) Influent characteristics based on typical values provided by “Wastewater Engineering - Treatment, Disposal, and Reuse”, Metcalf and Eddy, Inc., Third Edition and adjusted from past experience. These values have been used and accepted for previous projects presented to the SCDHS.

### **3.3 Treated Effluent Quality**

The decentralized system will include a wastewater treatment facility that will incorporate advanced treatment to comply with effluent treatment requirements stipulated by the Suffolk County Department of Health Services (Table 2).

**Table 3: Design Effluent Characteristics**

Characteristic	Design Effluent Concentration
Biochemical Oxygen Demand (BOD <sub>5</sub> )	<10 mg/L*
Total Nitrogen (TN)	<10 mg/L
Total Suspended Solids (TSS)	<15 mg/L*
pH	6 – 8.5

\*Parameter is not typically regulated by SPDES Permits

## 4.0 NITROGEN LOADING

The calculation provided below estimates the pounds of nitrogen currently discharged by the existing homes located within the proposed West Mattituck SSA. The calculation is based on an influent Total Kjeldahl Nitrogen (TKN) concentration of 65 mg/L. For purposes of this report, it is assumed that the existing systems achieve an average nitrogen reduction of 5% through existing septics and cesspools.

**Table 4: Existing System Nitrogen Loading**

Projected Flow (gpd)	Nitrogen Concentration in Influent (mg/L)	Nitrogen Concentration in effluent (mg/L)	Nitrogen Loading (lb/d)	Nitrogen Loading (lb/yr)
113,300	65	61.75	58.35	21,297

Table 4 below calculates the nitrogen loading that is anticipated following the installation of a decentralized wastewater treatment system at full build out. Note that the calculation is based on a total nitrogen concentration of 10 mg/L, which is a typical requirement of SPDES permitted facilities. Actual total nitrogen concentration in WWTP discharge varies depending on the treatment system design and operator performance. However, in most cases, the system should consistently discharge less than 10 mg/L if the design and operations are executed properly.

**Table 5: Proposed System Nitrogen Loading**

System Description	Projected Flow (gpd)	Nitrogen Concentration in Influent (mg/L)	Nitrogen Concentration in effluent (mg/L)	Nitrogen Loading (lb/d)	Nitrogen Loading (lb/yr)
WWTP	125,000	65	10	10.4	3,805

Based on the information provided in Tables 3 and 4 above, the total daily nitrogen loading is reduced by 47.95 lbs/d (17,492 lbs/yr) through the implementation of a decentralized wastewater treatment system. This comparison does not take into consideration the location of the WWTP discharge. If the WWTP discharge is situated in a location that has lesser influence on Mattituck Creek, the nitrogen loading could be further reduced.

## 5.0 COLLECTION SYSTEM

The sewer collection system concept is based on a combination of a gravity system and Low Pressure Sewer (LPS) system. A LPS system was considered in certain areas of the project in order to limit the



number of centralized pump stations, minimize the length of deep sewers and to reduce the impact of inflow and infiltration in areas where the depth to groundwater is shallow. A conceptual layout of the system is provided in Figure 4 (Appendix A).

At build-out, a total of 339 properties (307 existing, 32 future) would connect directly to the gravity system (see Figures 4 and 5 in Appendix A). Homes would tie into the collection system by gravity via a 4-inch diameter PVC lateral. The gravity collection system consists primarily of eight (8) inch SDR 35 PVC gravity collection pipes that would be installed along the roadways with access manholes spaced throughout. For purposes of this study, it is assumed that the majority of the collection system will be installed at a depth of 6-10 ft.

A total of 66 properties (62 existing, 4 future) would be served by a LPS system (see Figures 4 and 5 in Appendix A). Each lot will pump wastewater into a low-pressure sewer collection system which discharges to the nearest proposed manhole where the wastewater will begin to flow by gravity. The SSA will be served by multiple LPS collection systems because of the dispersed grouping of houses.

Wastewater conveyed by LPS and gravity collection systems will ultimately discharge to one of four (4) pump stations located in the West Mattituck SSA. The locations of the proposed pump stations are shown in Figure 4 located in Appendix A. Lift Stations 1-3 will serve approximately 75 lots each, and Lift Station 4 will serve approximately 150 lots.

The pump station construction shall be in accordance with SCDPW standards. For purposes of this analysis, each pump station will include a duplex submersible-type pump system installed in a 6' diameter x 12' deep concrete wet well. The proposed pump stations will also include a control system, an autodialer and a standby generator. A concrete meter pit will be provided downstream of the wet well and will house valving and a flowmeter. Land must be acquired for the pump station installations.

The following approximate quantities for the collection system were calculated based on 405 residences:

#### Gravity Component

- 28,900 LF of 8" to 10" PVC
- 105 Manholes
- 16,950 LF of 4" PVC house services
- Abandonment of 307 existing septic systems or cesspools

#### Low Pressure Component

- 1,320 LF of 4" PVC from house to pumping station
- 1,980 LF of 1-1/4" PVC from pumping station to main
- 6,900 LF of 2" to 4" HDPE LPS pipe (off road)

- 66 Simplex pumping stations with controls
- 8 Flushing connections
- Abandonment of 62 existing septic systems or cesspools

#### Pump Stations and Forcemains

- (4) 6 ft diameter concrete wet wells with duplex submersible pump systems
- (4) concrete valve and meter chambers
- 6,400 LF of 4" to 6" PVC force main
- 10 cleanout/air relief valve chambers
- (4) Standby generators

A cost estimate for the collection system is provided in Section 7.0 of this report.

## 6.0 WWTP AND DISPOSAL

Many different wastewater treatment technologies are available to provide the treatment required for this project. Technologies frequently implemented in Suffolk County include Membrane Bioreactor (MBR), Sequencing Batch Reactor (SBR) and Biologically Engineered Single Sludge Treatment (BESST). These technologies are described briefly below.

Membrane Bioreactor (MBR) - An MBR uses an activated sludge process that utilizes tertiary filtration as a polishing step in wastewater treatment. Total nitrogen is removed by sequencing nitrification and denitrification processes in the aeration and anoxic tanks. A return activated sludge loop is implemented to maintain biological activity and increase treatment. Membrane units located in the membrane tank filter out solids to produce a clear, high quality effluent.

Sequencing Batch Reactor (SBR) – The SBR is also an activated sludge process that achieves treatment in a single reactor (tank). The tank operates in batches in which the following stages of treatment occur: fill, react, settle, decant, and idle. The SBR is followed by a filter which removes solids. Typically, SBRs are comprised of at least two identically equipped reactors in parallel. This allows the process tankage to receive a consistent inflow of wastewater throughout all hours of the day.

Biologically Engineered Single Sludge Treatment (BESST) - The BESST system is an activated sludge process that utilizes an upflow clarifier to settle solids and a cloth microfilter to screen the effluent.

**Figure 1: Example Building for MBR, SBR or BESST Systems**



At the design flow of 125,000 gpd, the estimated cost of the design and construction of any of these technologies is estimated to be approximately \$30/gallon or \$3,750,000. The minimum land area needed for the WWTP was calculated based on a typical layout of a facility designed to process and dispose of 125,000 gpd of wastewater. In addition, a 150' setback to the property line was applied. For the mechanical treatment systems (BESST, MBR, and SBR) the required land area would be approximately 4 acres.

The proposed location of the WWTP is on Lot 15000 Block 1200. The lot is approximately 37.3 acres and is designated Recreation and Open Space on the Town of Southold Land Use Map prepared by the Town of Southampton GIS Department. There are no existing buildings on the property. The proposed property is located in the southern portion of the SSA along Route 48. Figure 6 in Appendix A shows the proposed location of the WWTP building. The large lot area ensures that a 150' property line setback and 200' existing building setback can be maintained. This property provides adequate space for various treated effluent discharge technologies.

Another effluent discharge option that should be considered is reusing the treated effluent as a water source for irrigation of neighboring agricultural lands. As noted above, three agricultural properties are located within the SSA and many more agricultural properties are located west of the SSA. This option would require the installation of a piping network and storage tanks. A conceptual design and cost for such a system was beyond the scope of this report.

## 7.0 COST ESTIMATE

Based on the conceptual design described in previous sections, a summary of the capital and operational costs is presented below.

**Table 6: Capital Cost for the Proposed System**

<b>CAPITAL COSTS</b>	
<b>WEST MATTITUCK, SOUTHOLD, NY</b>	
	<b>Capital Cost</b>
Gravity Components	\$ 3,308,230
Low Pressure Components	\$ 686,020
Pump Stations and Force Mains	\$ 1,337,200
WWTP	\$ 3,750,000
<b>Construction Subtotal</b>	<b>\$ 9,081,450</b>
Engineering (12%)	\$ 1,089,774
Administration (4% of Const. & Eng.)	\$ 406,849
<b>TOTAL</b>	<b>\$ 10,578,073</b>

Cost Estimate Assumptions:

1. A land acquisition cost of \$700,00 is based on average land prices in the area and approximate acreage needed. It includes land for the WWTP and the 4 pump stations. This cost is not included in the financial model.
2. Engineering cost percentages are based on the WWTP, pump station, collection system and force main construction costs.
3. The estimate assumes that small diameter piping can be installed using a trenching machine rather than open excavation and that no blasting or dewatering will be needed.
4. The estimate includes prevailing wage rates.
5. Cost estimate accurate to +/- 25% and do not include a contingency.
6. Gravity mains are assumed to be in the road and installed by conventional excavation. LPS mains are assumed to be off-pavement and installed by trenching machine. Force mains from pump stations are assumed to be in the road and installed by conventional excavation. Costs for house laterals assume an average of 50' from house to the main.
7. The low pressure system uses simplex pumping stations.
8. The estimate includes abandoning all existing cesspools or septic tanks.

**Table 7: Annual Operating Cost**

<b>WWTP - OPERATING COSTS WEST MATTITUCK, SOUTHOLD, NY</b>	
	<b>WWTP (Cost/Year)</b>
Labor/Maintenance	\$ 65,000
Power	\$ 54,000
Sludge Hauling	\$ 20,000
Chemicals	\$ 5,000
	<b>Collection System (Cost/Year)</b>
Labor/Maintenance	\$ 45,000
Power	\$ 13,600
<b>TOTAL</b>	<b>\$ 202,600</b>

Cost Estimate Assumptions:

1. Labor/Maintenance is based on one operator performing site visitations 3x/week plus costs for equipment repair or replacement. Sampling and compliance are included. Sampling requirements meet typical SPDES permit criteria. Maintenance typically includes 7-day coverage but this may be reduced if the system design and the regulatory authorities allow it. Remote monitoring may also reduce coverage. For the sake of this study, it is assumed that SCDHS will accept this concept.
2. Power cost is based on a service rate of \$0.2/kWh.
3. Sludge production is estimated. Sludge hauling cost = \$0.12/gal
4. Chemical costs are projected based on actual chemical usage for similar sized facilities throughout the Northeastern US.
5. Annual power consumption for the LPS collection system is based on the equivalent of a 40 W light bulb per pump station, as per manufacturer calculations plus the cost to run the 4 larger pump stations 10 hours/day.
6. Maintenance cost for the collection system includes a lifetime maintenance contract valued at \$40 annual charge per home as determined by the manufacturer. Service would include checking the pump amperage to make sure the pump is working properly. Contract excludes emergency repair. Also includes maintenance of the large pump station and mains.

The entire system is estimated to cost approximately \$10.58M to construct. The costs above were used in the financial model discussed further in Section 8.0

## **8.0 OWNERSHIP STRUCTURE AND FINANCING**

Development and financing of small-scale decentralized wastewater infrastructure has historically been challenging in Suffolk County. Most municipalities do not have the expertise or the resources to efficiently develop and manage dispersed wastewater infrastructure. Also many municipalities as well as Suffolk County have been exploring innovative approaches to delivering decentralized wastewater infrastructure. Therefore, this study will review alternative and innovative public private partnership

approaches that are successfully working in other states such as New Jersey. These approaches leverage the expertise and capital of a private entity that specializes in deploying and managing decentralized wastewater infrastructure and harnesses a municipality’s access to low cost debt, ability to assess fees to its residents and legal right to build infrastructure in public rights of way.

**Public Private Partnership** – An alternative to the historical approach used in Suffolk County would be to form a public private partnership that would entail the local municipality and a private entity jointly funding and implementing the project. This partnership can take several forms (i.e. sewer maintenance district), but generally harnesses the municipality’s access to low costs debt and leverages some amount of capital from the private entity. The private entity would be responsible to turnkey the design, build and/or long term operations of the system. This approach has been used to some extent in New York as well as other states such as New Jersey and Massachusetts.

It is critical that the public private partnership leverage as much grant and incentive funding as possible in order to reduce costs to the residents. There are many different potential funding scenarios with different combinations of grants, municipal debt and private equity. The following summarizes a few funding scenarios and their estimated impact on user fees per customer. It is important to note that these economics assume the costs are spread over 405 users. If alternatively the costs were allocated to all customers of the town (households and commercial), then the individual cost per user would be significantly reduced.

**Table 8: Annual User Fees**

Funding Options	User Fee* West Mattituck Only (\$/year/customer)	User Fee* Entire Community** (\$/year/customer)	
		Connected Customer	Other Customer
100% Municipal Debt Financing	\$1,626	\$500	\$286
100% Grant Financing	\$500	\$500	\$0
80% Grant / 20% Private Equity	\$1,249	\$500	\$190

\* The user fees are estimates based on certain financial assumptions. Administrative costs for legal services, insurance, billing and collections were not included. A cost of capital of 15% is included in the option using private equity.

\*\* Assumes 2,000 users in the Town of Mattituck based on recent demographic and parcel data and reasonable estimates. The 405 connected users pay a flat fee of \$500 per year. The remaining cost is divided equally among the other 1,595 customers.

## **9.0 RECOMMENDATIONS FOR POLICY AND REGULATORY CHANGE**

A few approaches could be used to implement Public Private Partnerships for sewer systems in Suffolk County. There are models from other states that have been used successfully and could be applied in Suffolk County. Further discussion would be needed with the State of New York and Suffolk County DPW to determine whether this type of approach could be implemented under current regulations. The State of New York has not historically allowed Design-Build projects, but recent efforts having yielded limited acceptance for certain projects conducted by DOT, Parks, DEC and a few other State Agencies.

## **10.0 CONCLUSIONS**

The wastewater generated by the proposed West Mattituck Sewer Service Area in Mattituck, NY can be treated cost effectively via a decentralized collection system and wastewater treatment plant located near the community. Assuming an average daily flow of 125,000 gpd, the proposed system would result in a drastic reduction in the total amount of pollutants discharged each year. Such a system would reduce the discharge of total nitrogen to local waterways by 17,492 lbs annually over the existing wastewater management methods and provide immense environmental benefit to the community, Mattituck Inlet, and the Long Island Sound.

\* \* \*

# **APPENDIX A**

## **DRAWINGS AND FIGURES**

**FIGURE 1. SEWER SERVICE AREA**

**FIGURE 2. 2A. SOUTHEAST TAX MAP**

**2B. SOUTHWEST TAX MAP**

**2C. NORTHWEST TAX MAP**

**2D. NORTHEAST TAX MAP**

**FIGURE 3. ELEVATION MAP**

**FIGURE 4. COMBINED GRAVITY/LPS COLLECTION SYSTEM – AERIAL**

**FIGURE 5. COMBINED GRAVITY/LPS COLLECTION SYSTEM – ELEVATION**

**FIGURE 6. WWTP SITE LOCATION**

### **TOWN OF SOUTHDOLD MAPPING**

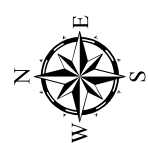
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- **Land Use**
- **Soils – Drainage Class**
- **Ground Water Depth**
- **Impaired Water**
- **Influence Zones**



**Legend**

- Wastewater Treatment Plant
- Sewer Service Area
- Parcels

Source:  
 NYS GIS Clearinghouse: <http://gis.ny.gov/>  
 Peconic Green Growth



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**SEWER SERVICE AREA  
 WEST MATTITUCK  
 TOWN OF SOUTHOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013

Drawn By: ACH

Designed By: DCS

Checked By: DCS

Project: E01489AA

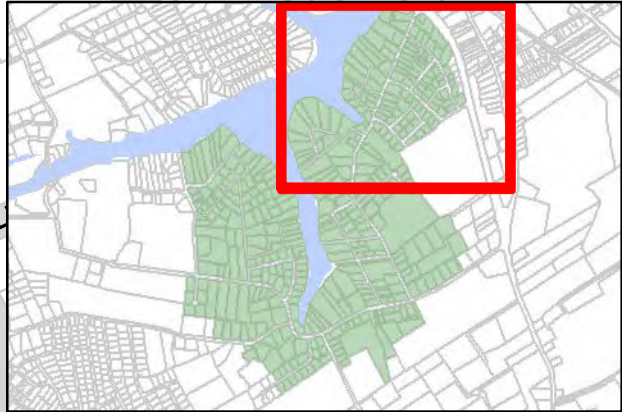
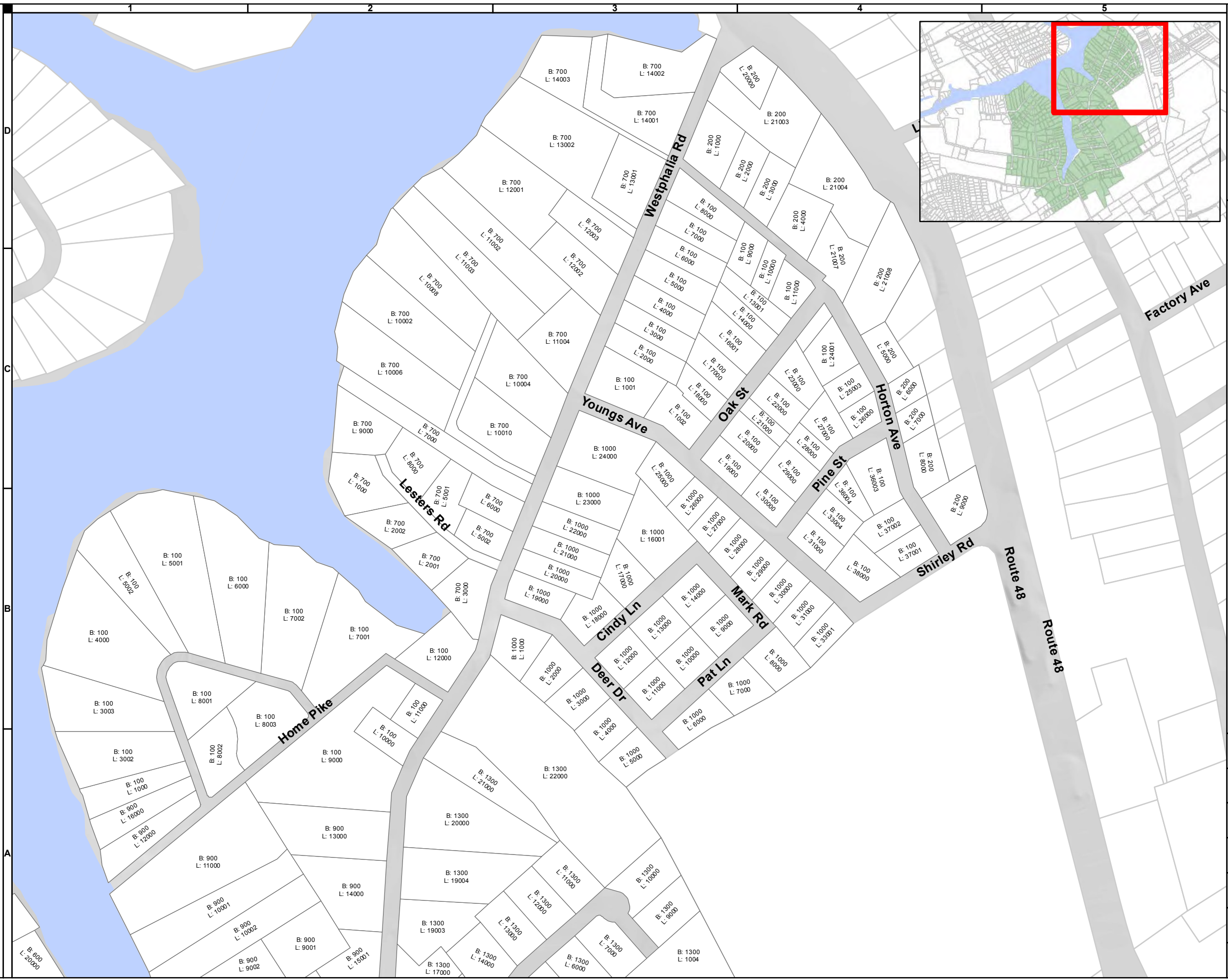
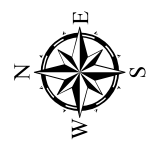
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**Legend**

Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth



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**SOUTH EAST TAX MAP  
WEST MATTITUCK  
TOWN OF SOUTHOOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013

Drawn By: ACH

Designed By: DCS

Checked By: DCS

Project: E01489AA

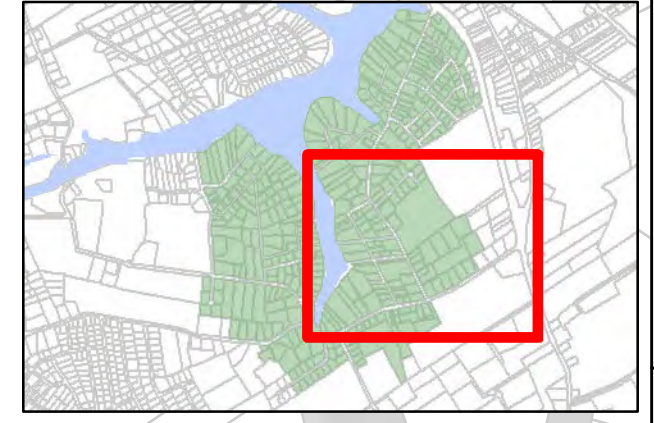
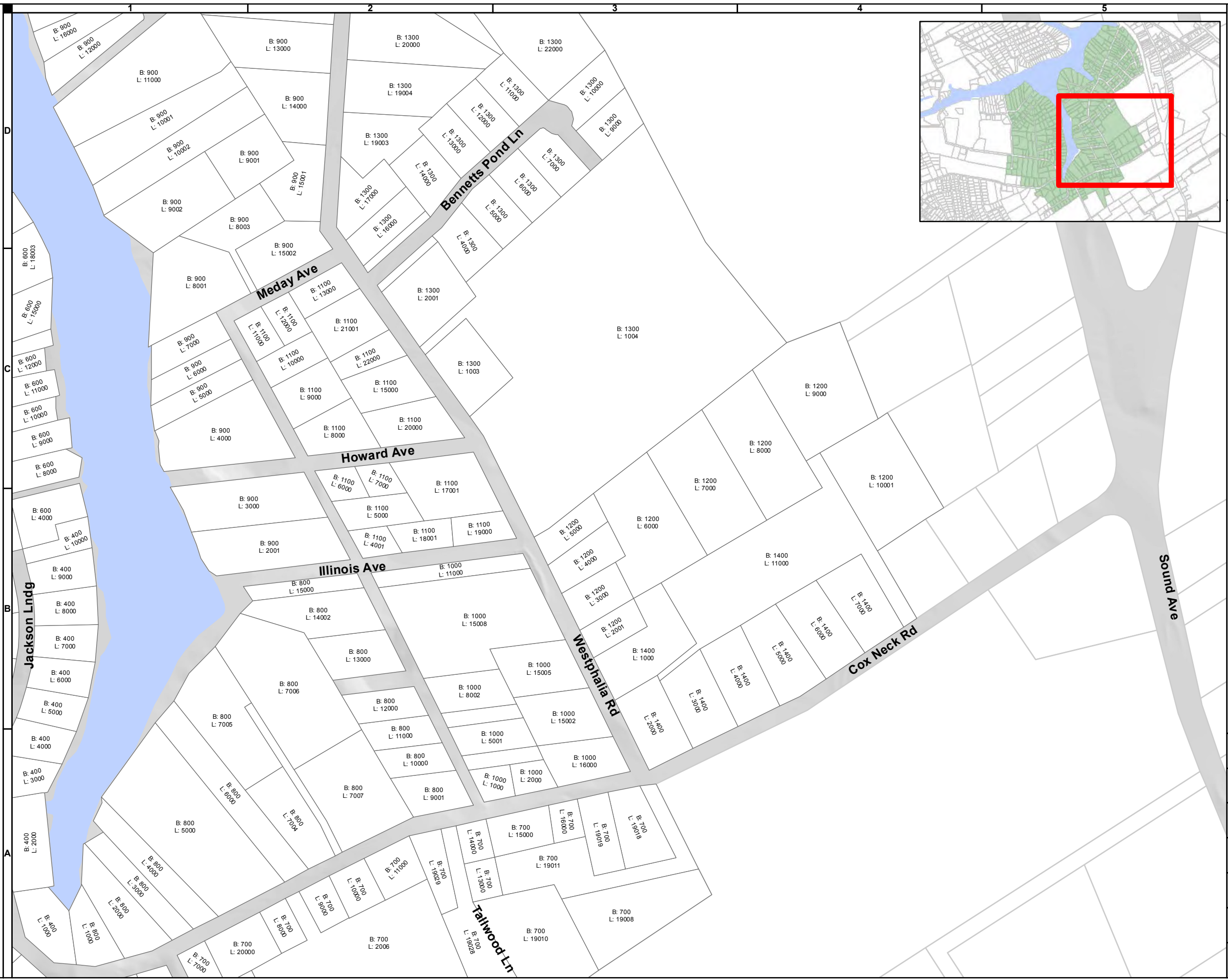
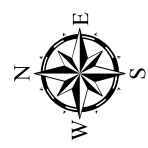
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Rev: Figure: 2A

**Legend**

Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
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**SOUTH WEST TAX MAP  
WEST MATTITUCK  
TOWN OF SOUTHWOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013

Drawn By: ACH

Designed By: DCS

Checked By: DCS

Project: E01489AA

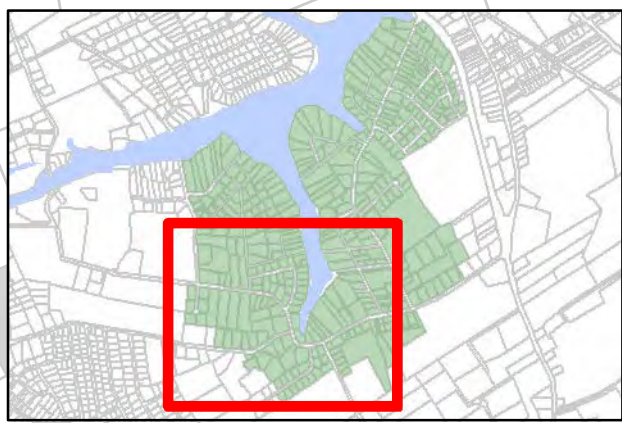
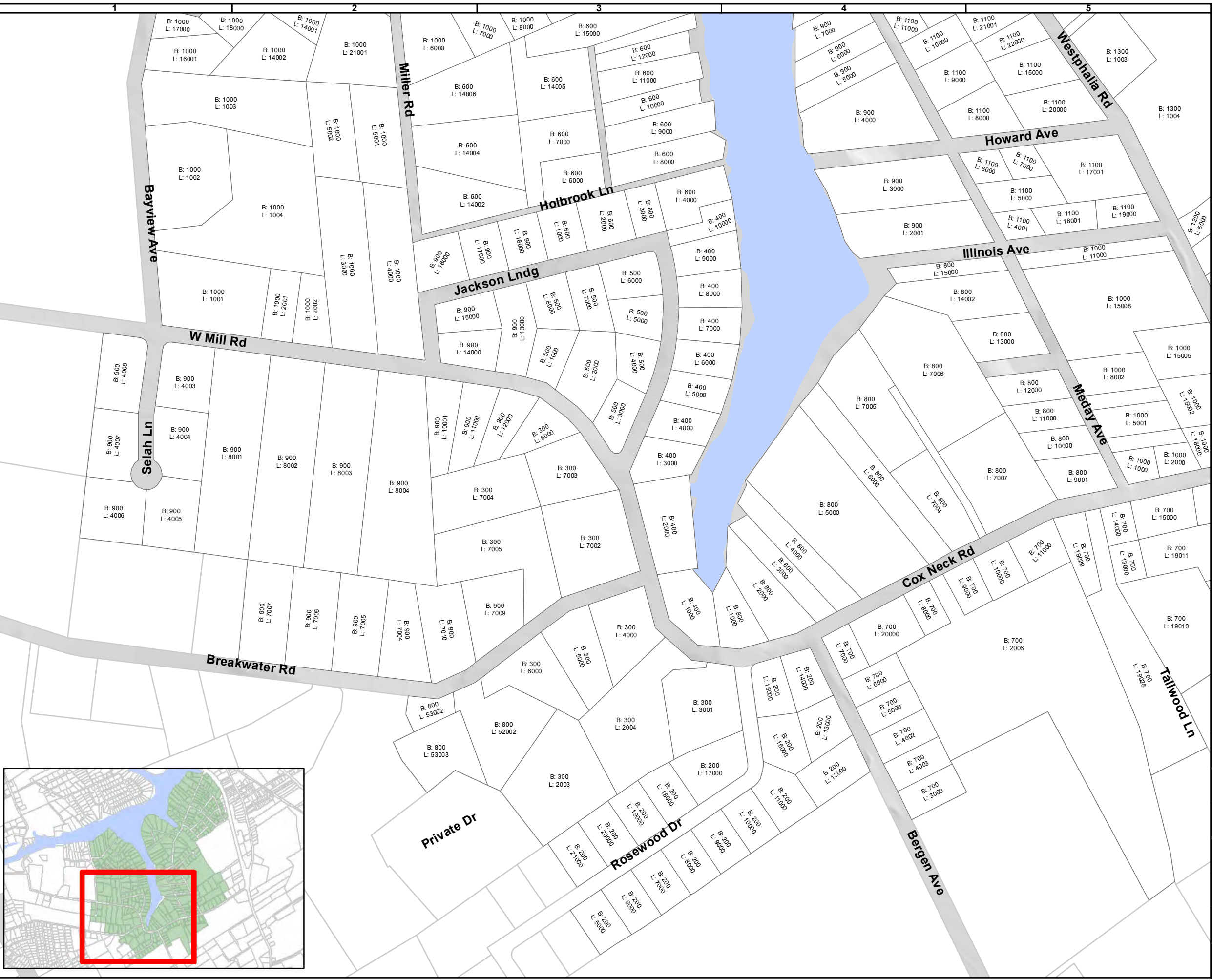
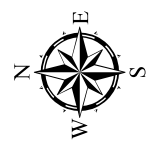
Scale: 1" = 300'

Rev: Figure: 2B

**Legend**

Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth



2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

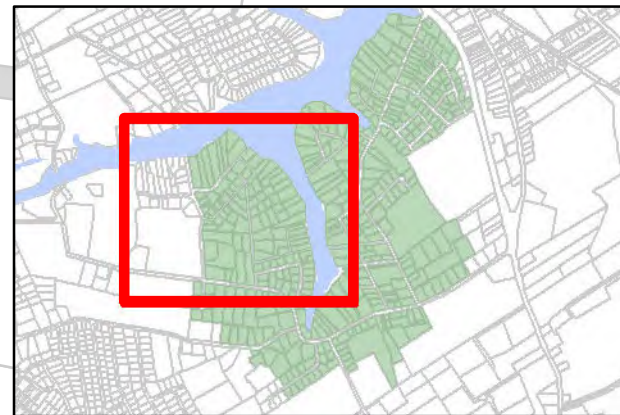
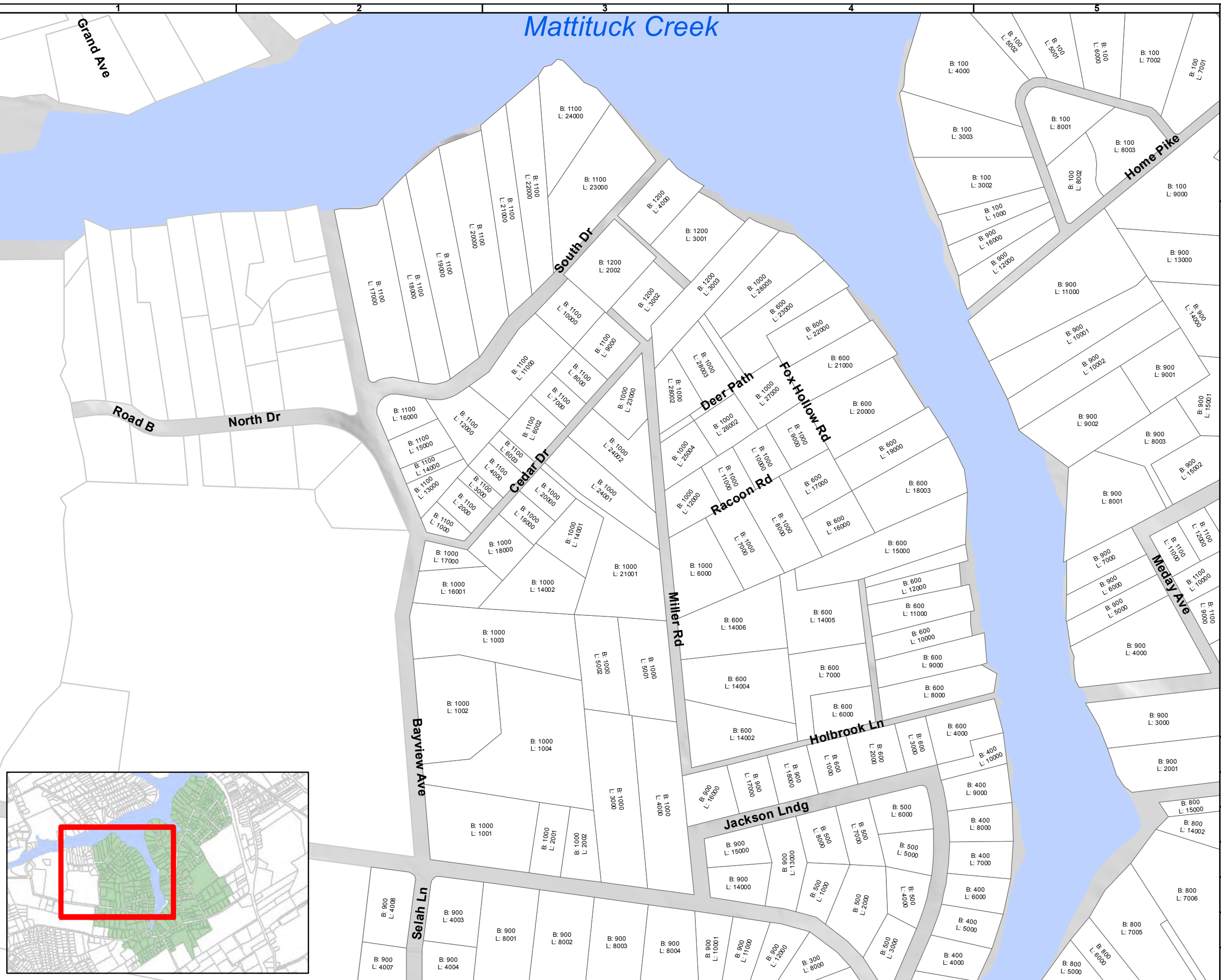
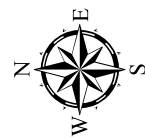
**NORTH WEST TAX MAP  
WEST MATTITUCK  
TOWN OF SOUTHDOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013
Drawn By: ACH
Designed By: DCS
Checked By: DCS
Project: E01489AA
Scale: 1" = 300'
Rev: Figure: 2C

**Legend**

Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth







2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

**NORTH EAST TAX MAP  
WEST MATTITUCK  
TOWN OF SOUTHDOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013
Drawn By: ACH
Designed By: DCS
Checked By: DCS
Project: E01489AA
Scale: 1" = 300'
Rev:
Figure: 2D

**Legend**

-  ContoursCLIP
-  Wastewater Treatment Plant
-  Sewer Service Area
-  Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth



0 400 800  
Feet



**ELEVATION MAP  
WEST MATTITUCK  
TOWN OF SOUTHOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013

Drawn By: ACH

Designed By: DCS

Checked By: DCS

Project: E01489AA

Scale: 1" = 800'

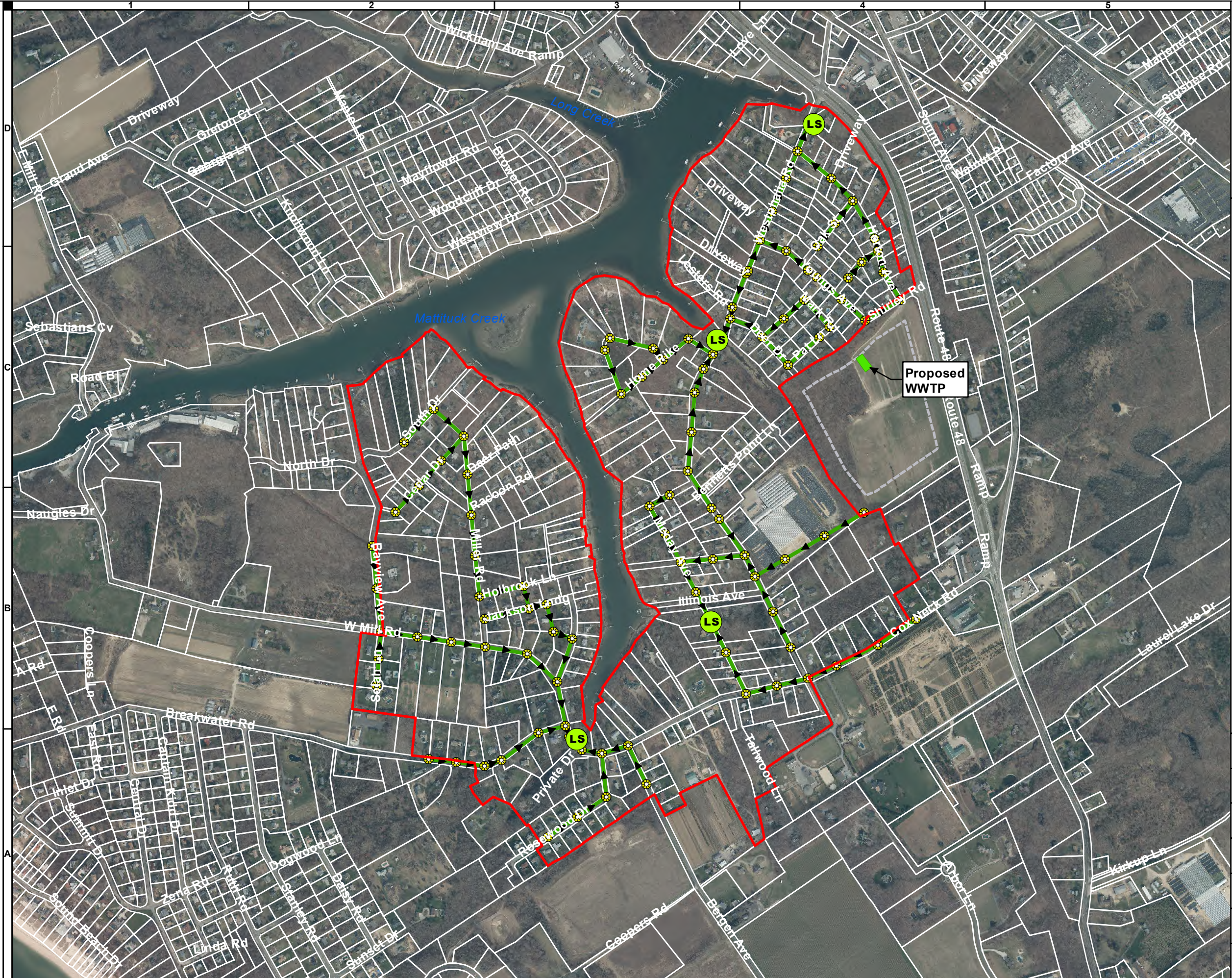
Rev: Figure: 3

2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

**Legend**

- Sewer Service Area
- Wastewater Treatment Plant
- LS Pump Station (4)
- Manhole (105)
- Gravity Main - 28,200 LF
- Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth

2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

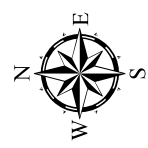
**COMBINED GRAVITY/LPS  
COLLECTION SYSTEM AERIAL  
WEST MATTITUCK  
TOWN OF SOUTHOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013	
Drawn By: ACH	
Designed By: DCS	
Checked By: DCS	
Project: E01489AA	
Scale: 1" = 800'	
Rev:	Figure: 4

**Legend**

- Wastewater Treatment Plant
- Pump Station (4)
- Manhole (105)
- Gravity Main - 28,200 LF
- Parcels

Source:  
NYS GIS Clearinghouse: <http://gis.ny.gov/>  
Peconic Green Growth








2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

**COMBINED GRAVITY/LPS  
COLLECTION SYSTEM AERIAL  
WEST MATTITUCK  
TOWN OF SOUTHOLD, SUFFOLK COUNTY, NEW YORK**

Date: 11/14/2013	
Drawn By: ACH	
Designed By: DCS	
Checked By: DCS	
Project: E01489AA	
Scale: 1" = 800'	
Rev:	Figure: 5



**Legend**

-  Wastewater Treatment Plant
-  Pump Station (4)
-  Manhole (105)
-  Gravity Main - 28,200 LF
-  Parcels

Source:  
NYS GIS Clearinghouse; <http://gis.ny.gov/>  
Peconic Green Growth



**WWTP SITE LOCATION  
WEST MATTITUCK  
TOWN OF SOUTHOLD, SUFFOLK COUNTY, NEW YORK**

2 CLERICO LANE, SUITE 1  
HILLSBOROUGH, NJ 08844  
PHONE: (908) 359-5501  
FAX: (908) 359-8286

Date: 11/14/2013

Drawn By: ACH

Designed By: DCS

Checked By: DCS

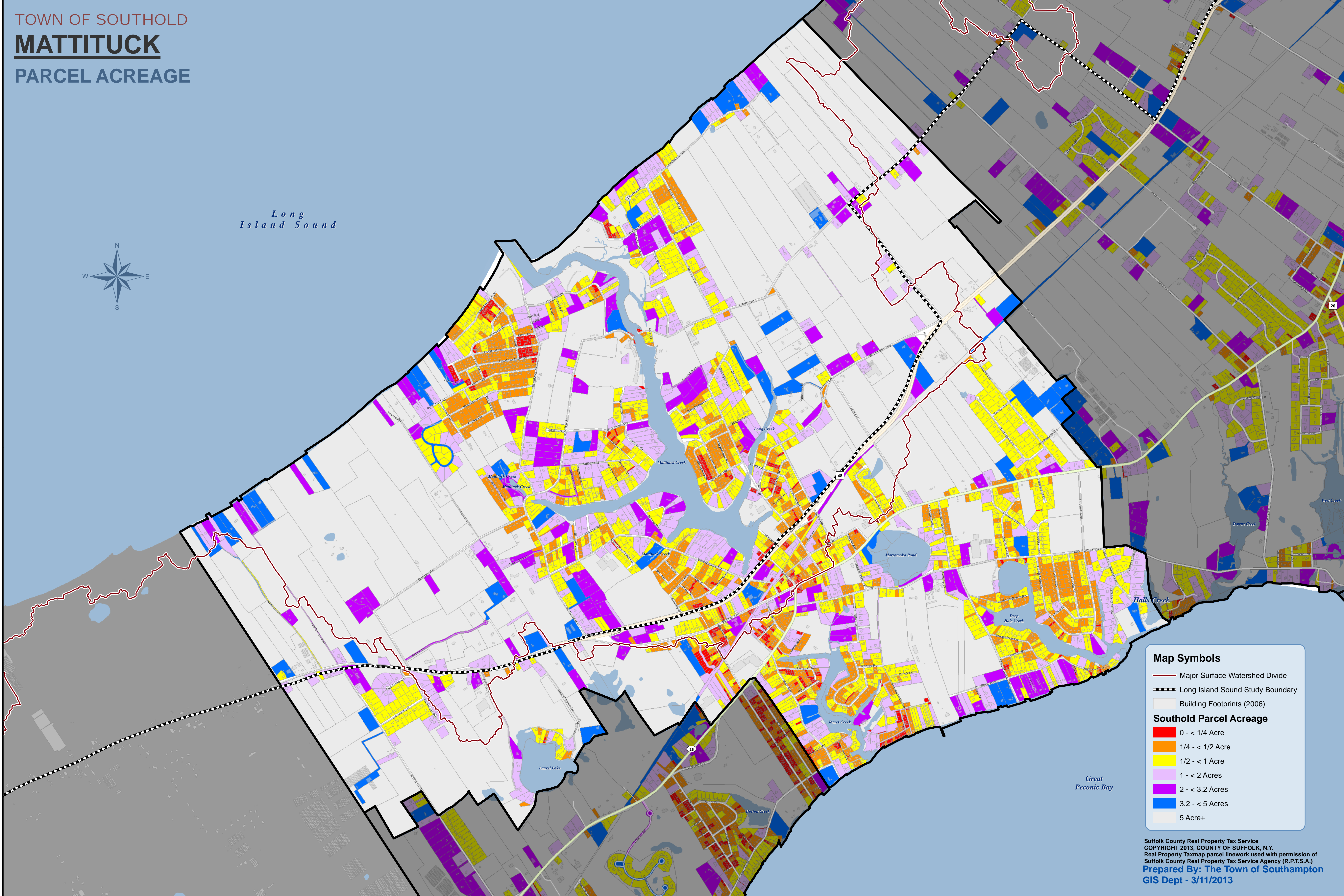
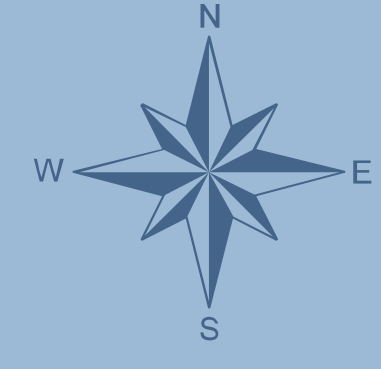
Project: E01489AA

Scale: 1" = 200'

Rev: Figure: 6

TOWN OF SOUTHOLD  
**MATTITUCK**  
PARCEL ACREAGE

*Long  
Island Sound*



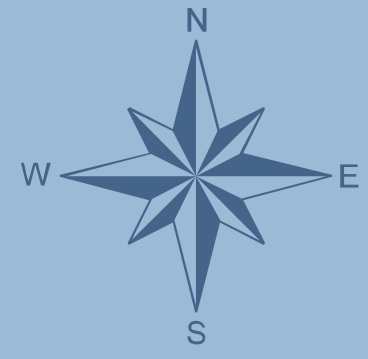
**Map Symbols**

- Major Surface Watershed Divide
- Long Island Sound Study Boundary
- Building Footprints (2006)

**Southold 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+

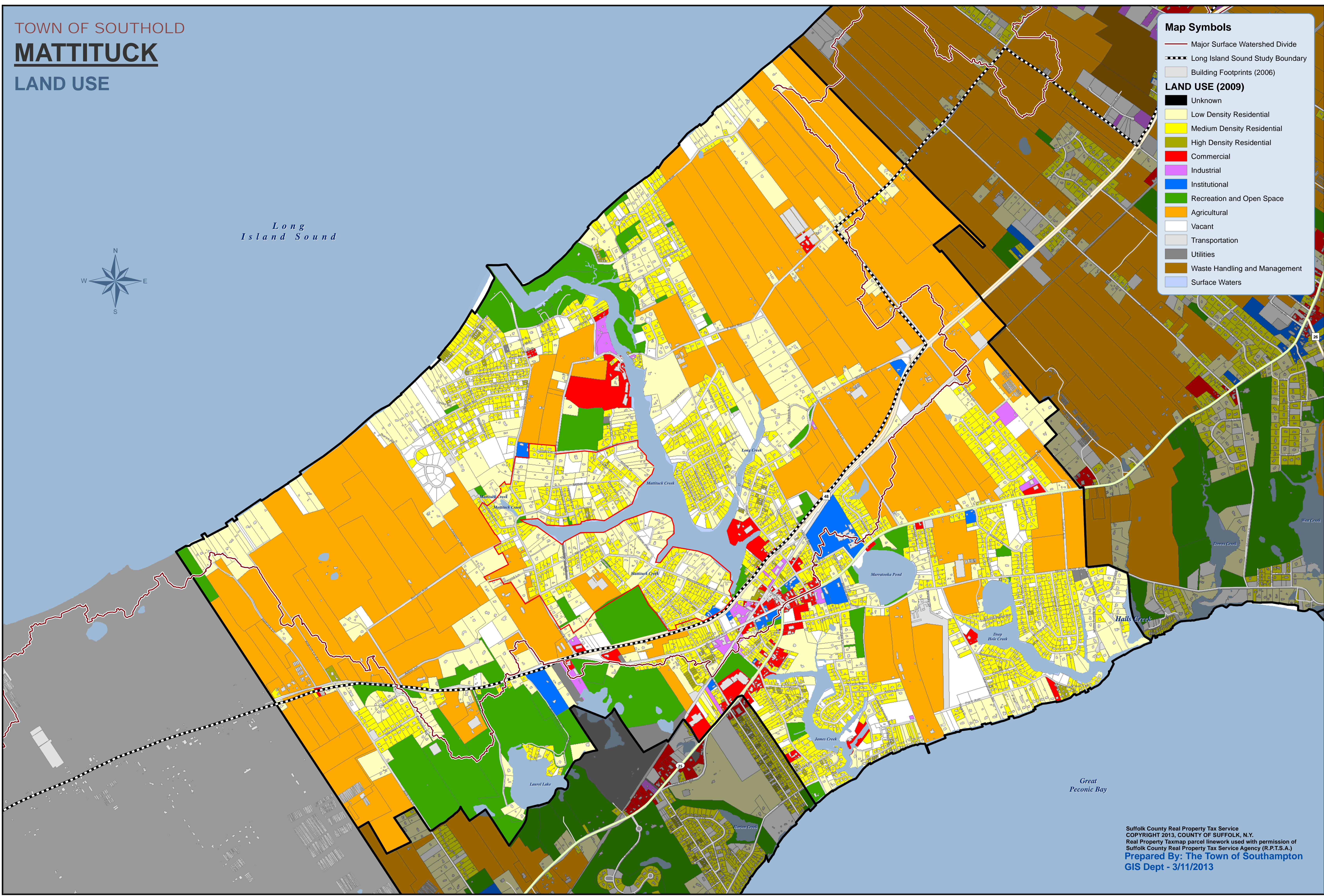
TOWN OF SOUTHOLD  
**MATTITUCK**  
 LAND USE



*Long  
 Island Sound*

**Map Symbols**

-  Major Surface Watershed Divide
-  Long Island Sound Study Boundary
-  Building Footprints (2006)
- LAND USE (2009)**
-  Unknown
-  Low Density Residential
-  Medium Density Residential
-  High Density Residential
-  Commercial
-  Industrial
-  Institutional
-  Recreation and Open Space
-  Agricultural
-  Vacant
-  Transportation
-  Utilities
-  Waste Handling and Management
-  Surface Waters



# MATTITUCK

## SOILS - DRAINAGE CLASS

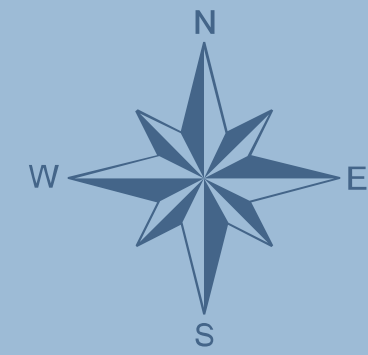
**Map Symbols**

- Major Surface Watershed Divide
- Long Island Sound Study Boundary

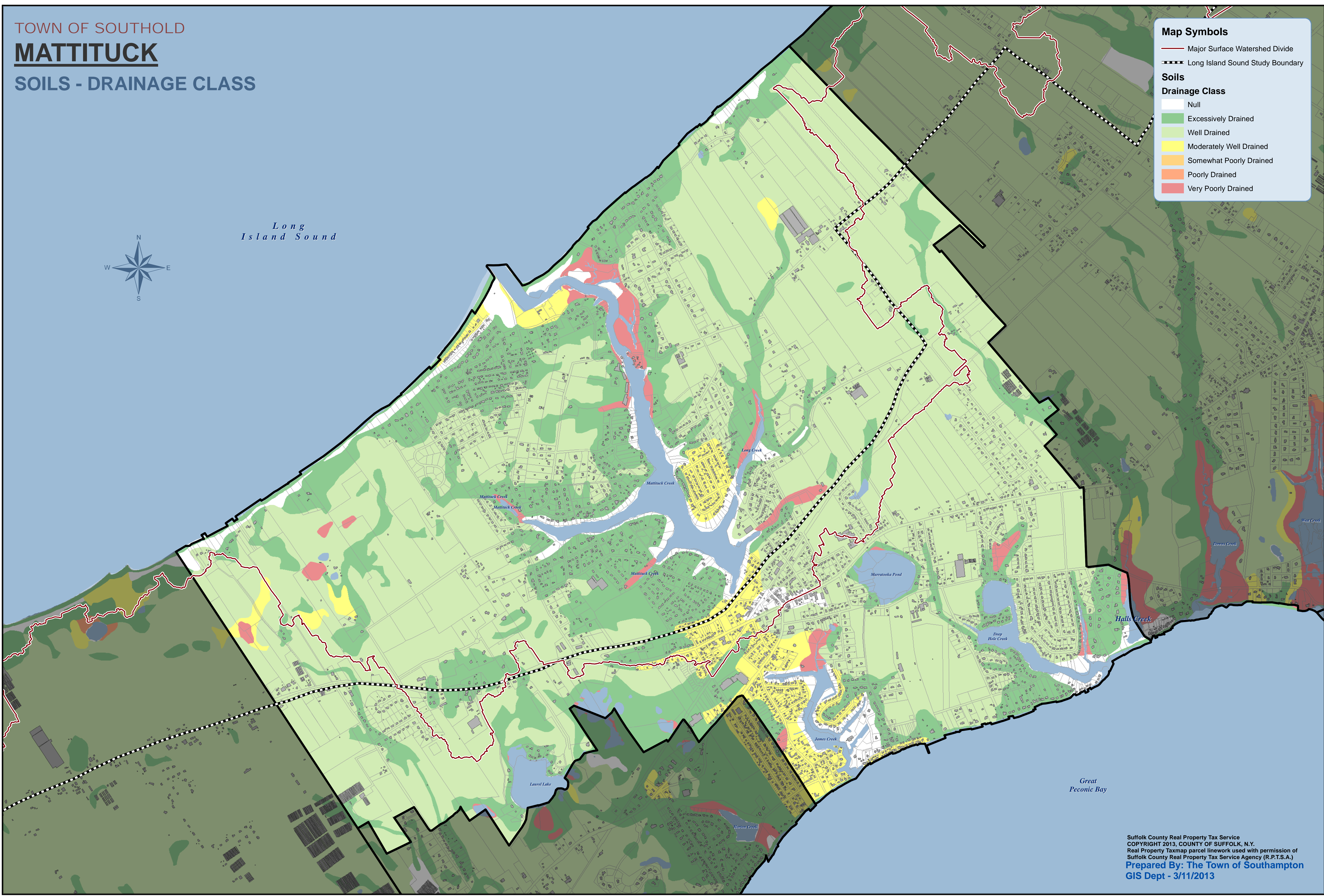
**Soils**

**Drainage Class**

- Null
- Excessively Drained
- Well Drained
- Moderately Well Drained
- Somewhat Poorly Drained
- Poorly Drained
- Very Poorly Drained

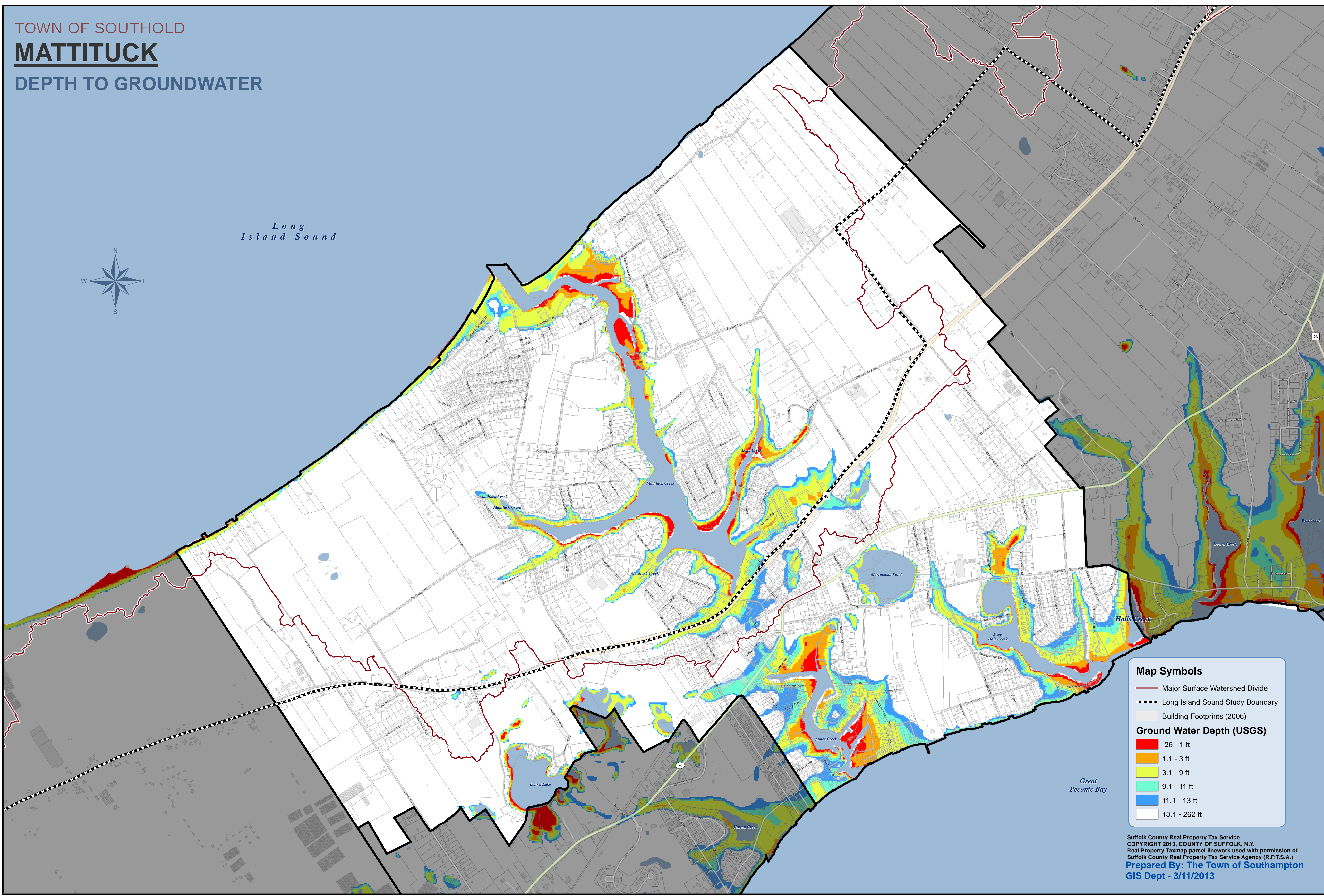
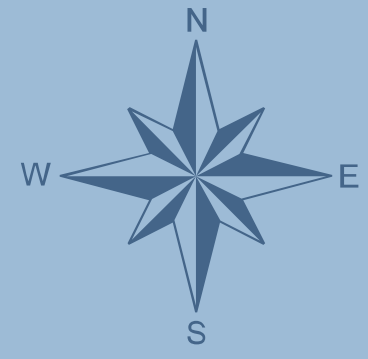


Long  
Island Sound



TOWN OF SOUTHOLD  
**MATTITUCK**  
 DEPTH TO GROUNDWATER

*Long  
 Island Sound*



**Map Symbols**

- Major Surface Watershed Divide
- Long Island Sound Study Boundary
- Building Footprints (2006)

**Ground Water Depth (USGS)**

- 26 - 1 ft
- 1.1 - 3 ft
- 3.1 - 9 ft
- 9.1 - 11 ft
- 11.1 - 13 ft
- 13.1 - 262 ft

Suffolk County Real Property Tax Service  
 COPYRIGHT 2013, COUNTY OF SUFFOLK, N.Y.  
 Real Property Taxmap 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 - 3/11/2013

TOWN OF SOUTHOLD  
**MATTITUCK**  
 IMPAIRED WATER

**Map Symbols**

- Major Surface Watershed Divide
- Long Island Sound Study Boundary
- Building Footprints (2006)
- DEC Impaired Water Bodies (303D)

**TMDLs**

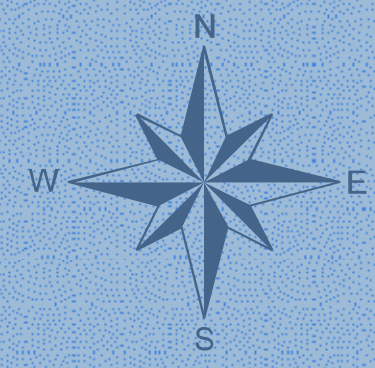
- Peconic Nitrogen
- Peconic Pathogen
- Shellfish Pathogen

**TMDL Strategy Areas**

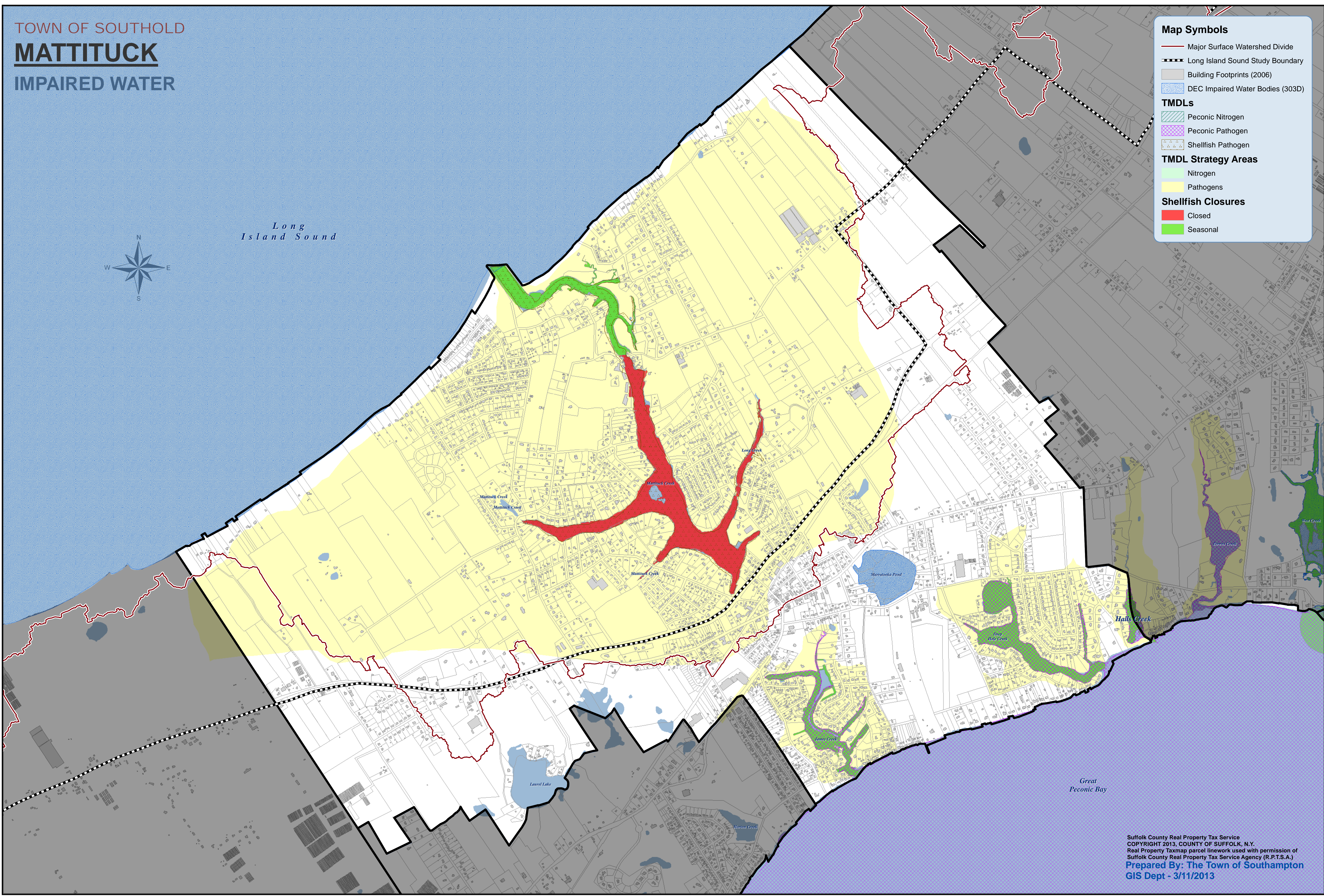
- Nitrogen
- Pathogens

**Shellfish Closures**

- Closed
- Seasonal

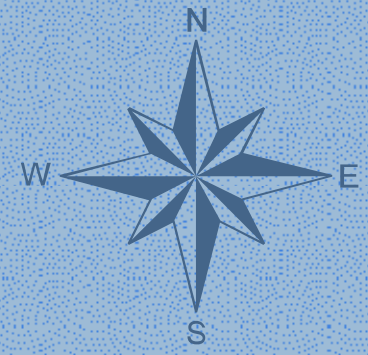


*Long Island Sound*



TOWN OF SOUTHOLD  
**MATTITUCK**  
 INFLUENCE ZONES

*Long  
 Island Sound*



**Map Symbols**

- Major Surface Watershed Divide
- Long Island Sound Study Boundary
- Building Footprints (2006)
- DEC Impaired Water Bodies (303D)

**TMDLs**

- Peconic Nitrogen
- Peconic Pathogen
- Shellfish Pathogen

**Areas Contributing Groundwater to Surface Water (SCDHS)**

**YEARS**

- 0-2 years
- 2-5 years
- 5-10 years
- 10-25 years
- 25-50 years

