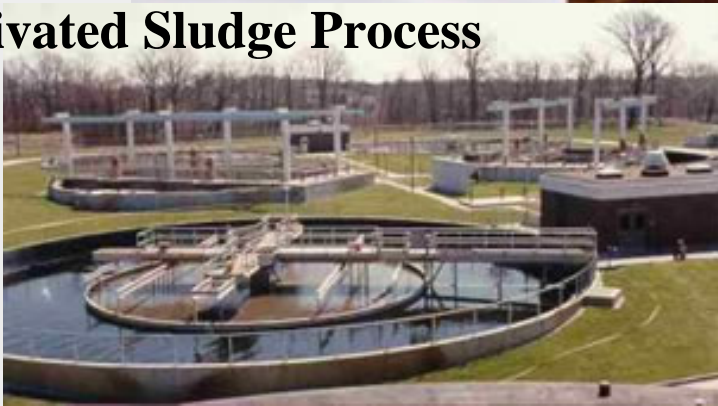




**Activated Sludge Process**



**Engine-generator**



**Subsurface Injection**

# **Making The Link**

**Sewer Service  
Areas**



**Wastewater Treatment  
Plants**

# SB320 – Water Pollution – State Waters

Passed 2004

**-Establishes the Bay Restoration Fund** in the Department of the Environment; The intent is award grants and loans from the fund to upgrade the **Nutrient Removal Technology** at certain WWTP facilities to achieve ENR Status.



**[Enhanced Nutrient Removal Technology** – refers to technology capable of reducing the nitrogen and phosphorous concentrations in wastewater effluent to concentrations not more than 3 milligrams/per liter total nitrogen and not more than 0.3 milligrams per liter total phosphorous, as calculated on an annually average basis.]

**Requires MDE and MDP report on the impact that an ENR upgraded wastewater treatment plant has on Growth in the jurisdiction it serves.**



Report should consist of:

- *Methodology – Growth Calculations*
- *Permit Activity – Residential and Commercial Building Permits*
- *Other Data - Comprehensive Water & Sewer Plans*
- *January 1, 2009 – Report covering 2007*



# January 1, 2009 – Report covering Calendar Year 2007

## ENR Upgraded WWTPs

- ★ ➤ Kent Island
- Easton
- Hurlock
- Celanese

P.131

*Criteria for the Service Area of upgraded facility is as follows:*

- ✓ PFA Status
- ✓ Failing Septic Area
- ✓ Any other sewer connection that would attribute to the net reduction in nutrient loading to the Chesapeake Bay

*KNSG Subdistrict is designated as a Wastewater Priority Area.*



**The BRF Analysis – KNSG WWTP**



310 Bateau Dr, Stevensville, MD 21666

**Owner - Queen Anne's County Dept. Of Public works**  
**Permit - Major Surface Municipal Discharge**  
**(Middle Chesapeake Bay)**  
**Design Flow – 3 MGD**

# **KNSG TIMELINE**

**1981(Oct.) - (Comp. Plan – Construction of a central sewerage system was completed (EPA Grants)**

**1986 (May) – KNSG Sewerage Treatment Plant was re-rated to 1.0 MGD –Plant Loadings and performance were evaluated and showed that effluent parameters could be met at higher hydraulic flows.**

**1990 - Treatment Capacity doubled to 2.0 MGD by constructing a second parallel treatment Train. Phosphorous removal capabilities were added for the entire plant. (State funded)**

**1993 – Two aerobic digesters were added. Unfortunately, the current treatment process is not capable of nitrogen removal.**

**1996 (Dec.) – Pilot project to evaluate constructed wetlands for their BNR ability.**

**Conclusion: The method would not be capable of satisfying the future expanded growth of that service area.**

**1999 – BNR/ENR Planning Completion**

**2004 – BNR/ENR Design Completion**

**2005 (March) – Ground Breaking Ceremony – Construction of the Kent Island ENR Facility**

**2007 (Current) – Construction underway to replace the existing RBC (Rotating Biological Contactors) with a 3.0 MGD activated sludge treatment plant capable of achieving ENR in accordance with the Chesapeake Bay Nutrient Reduction initiatives. The intent is to also utilize UV disinfection. (State Funded)**



# The KNSG WWTP

## Total Project Cost

**Bay Restoration Fund Grant– 6.5 Million**

State Revolving Fund Loan - 18.8 Million

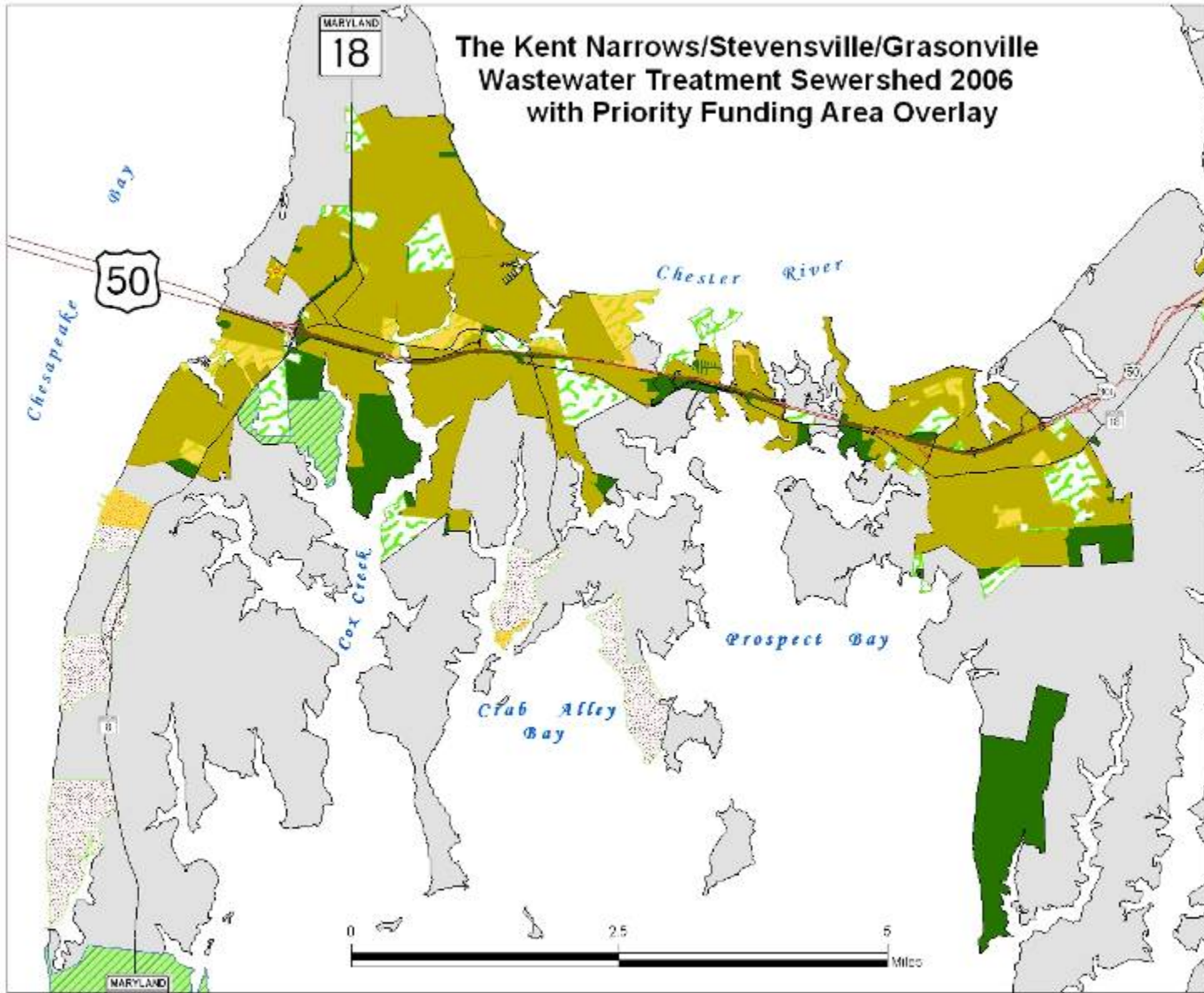
Other State Grants – 7.9 Million

Grand Total – 33.2 Million



Ground breaking ceremony to kick-off construction to upgrade Kent Narrows/Stevensville/Grasonville Wastewater Treatment Plant on March 18, 2005.

**The Kent Narrows/Stevensville/Grasonville  
Wastewater Treatment Sewershed 2006  
with Priority Funding Area Overlay**



★ Kent Narrows/Stevensville/Grasonville WWTP

**Priority Funding Areas**

- Certified Priority Funding Area
- PEA Comment Area

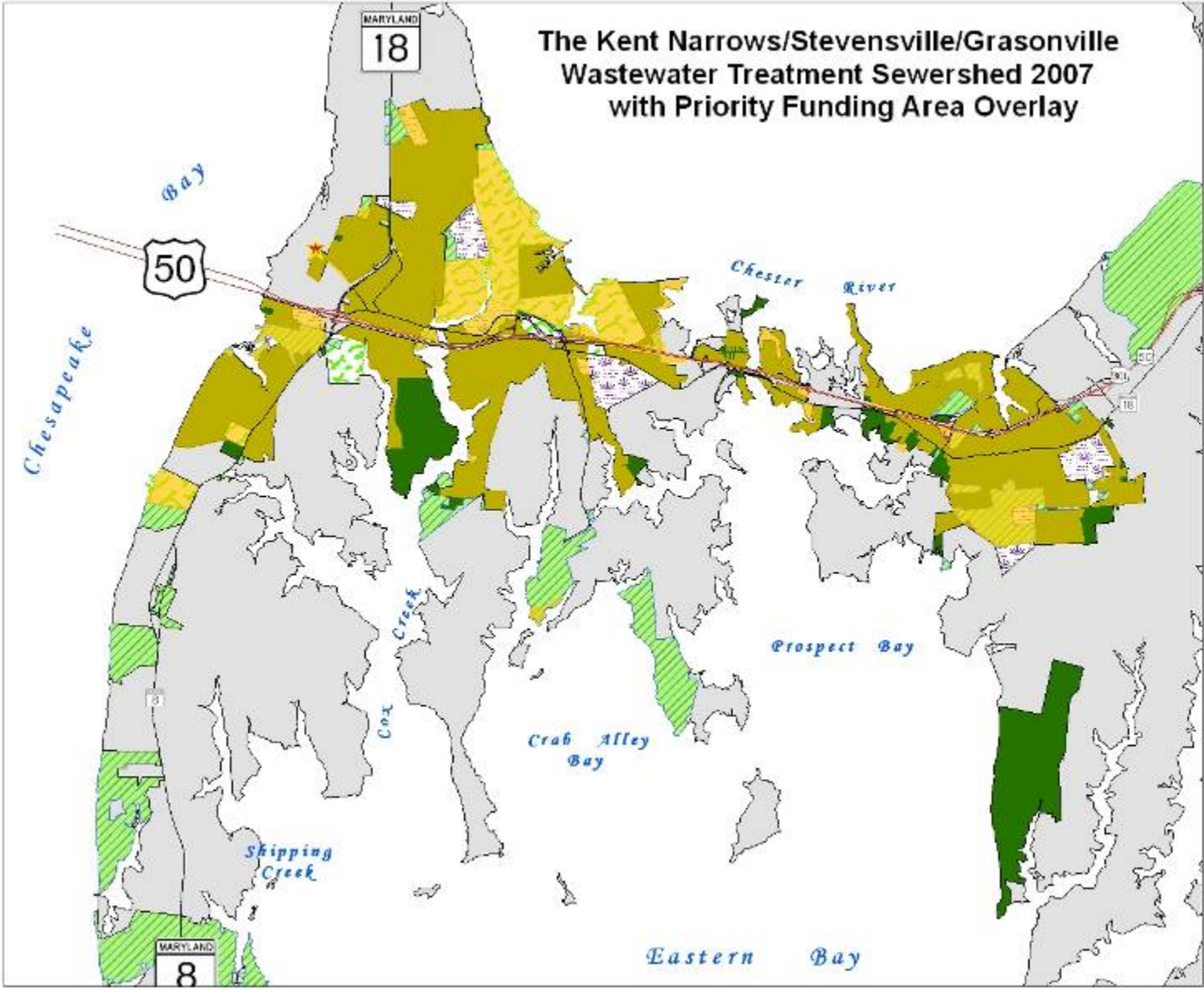
**Sewer Service Categories:**

- NP - No Planned Service
- S1 - Existing Sewer Service (Active Billing Cycle)
- S2 - Service within 1 to 3 yrs.
- S3 - Intended Service within 4 to 10 yrs.
- S4 - Intended Service within 11 to 20 yrs.





# The Kent Narrows/Stevensville/Grasonville Wastewater Treatment Sewershed 2007 with Priority Funding Area Overlay

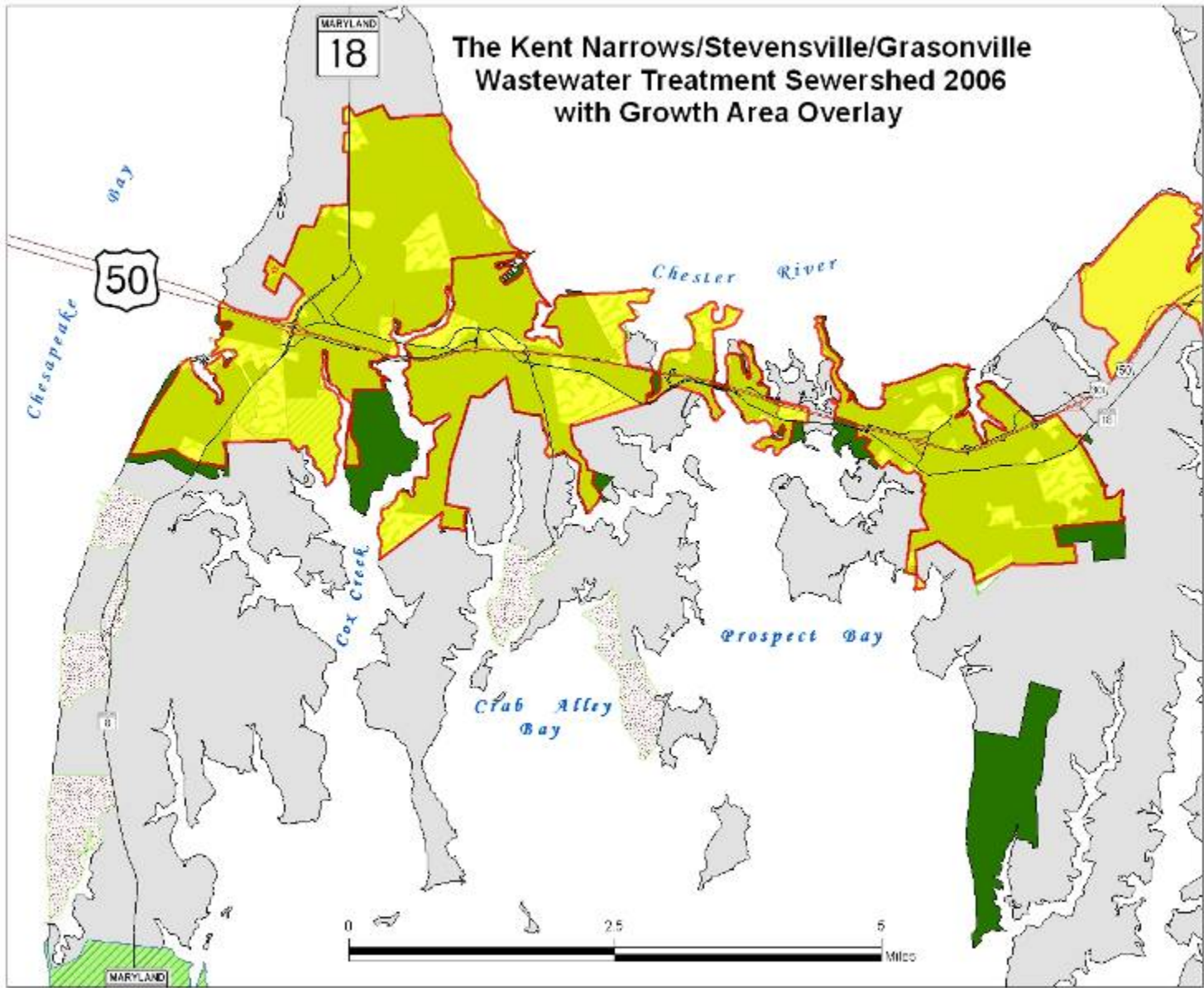


★ Kent Narrows/Stevensville/Grasonville WWTP

- Priority Funding Areas**
- Certified Priority Funding Area
  - PFA Comment Area

- Sewer Service Categories:**
- NP - No Planned Service
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★ Kent Narrows/Stevensville/  
Grasonville WWTP

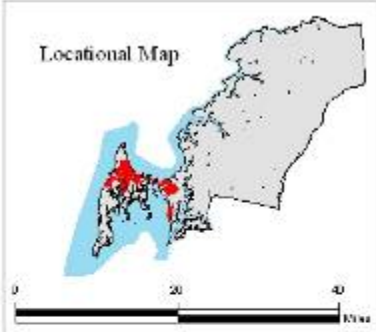
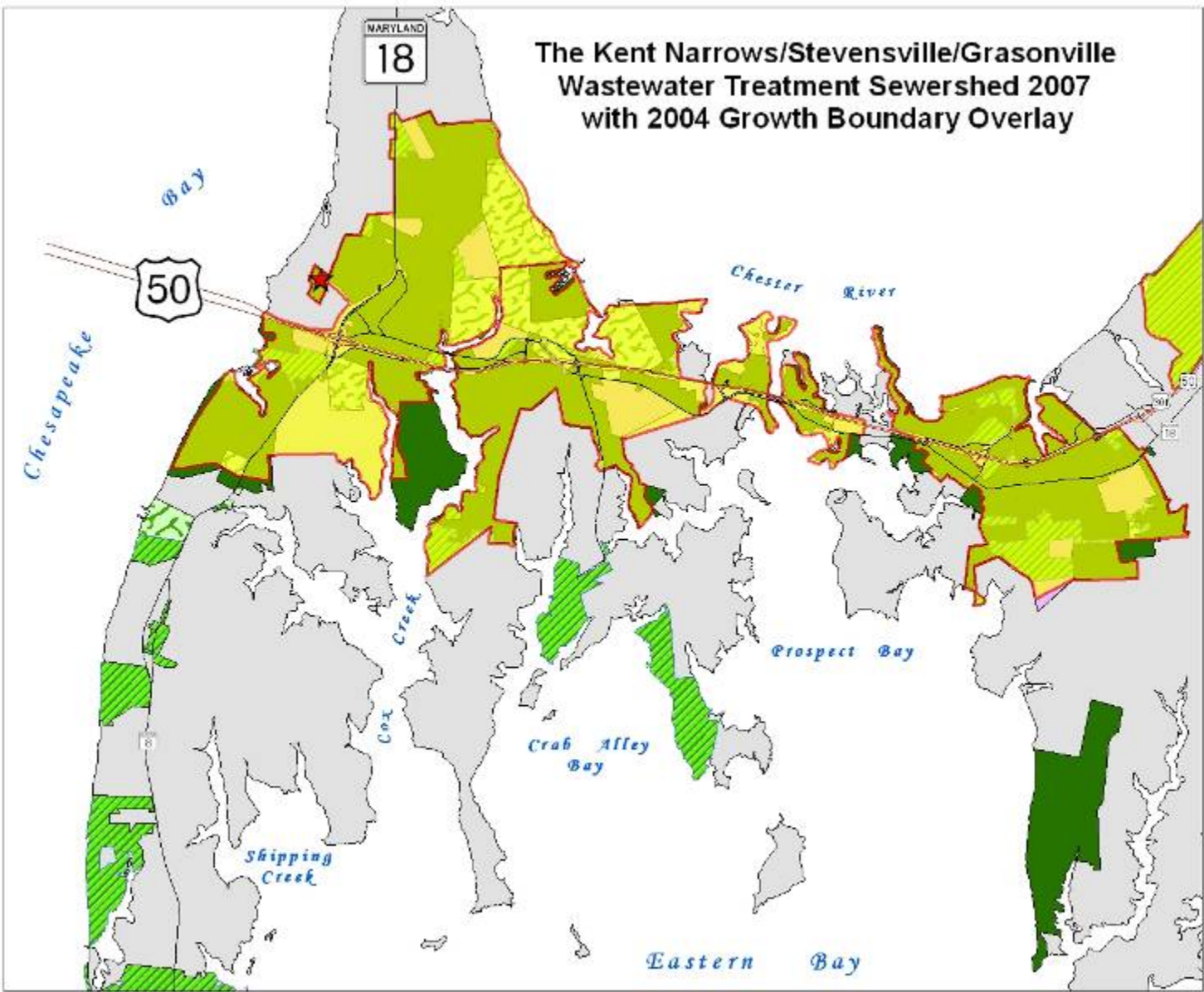
2004 Queen Anne's County  
Growth Area Boundary

- Sewer Service Categories:**
- NP - No Planned Service
  - S1 - Existing Sewer Service (Active Billing Cycle)
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  - S3 - Intended Service within 4 to 10 yrs.
  - S4 - Intended Service within 11 to 20 yrs.





### The Kent Narrows/Stevensville/Grasonville Wastewater Treatment Sewershed 2007 with 2004 Growth Boundary Overlay

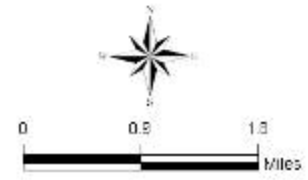


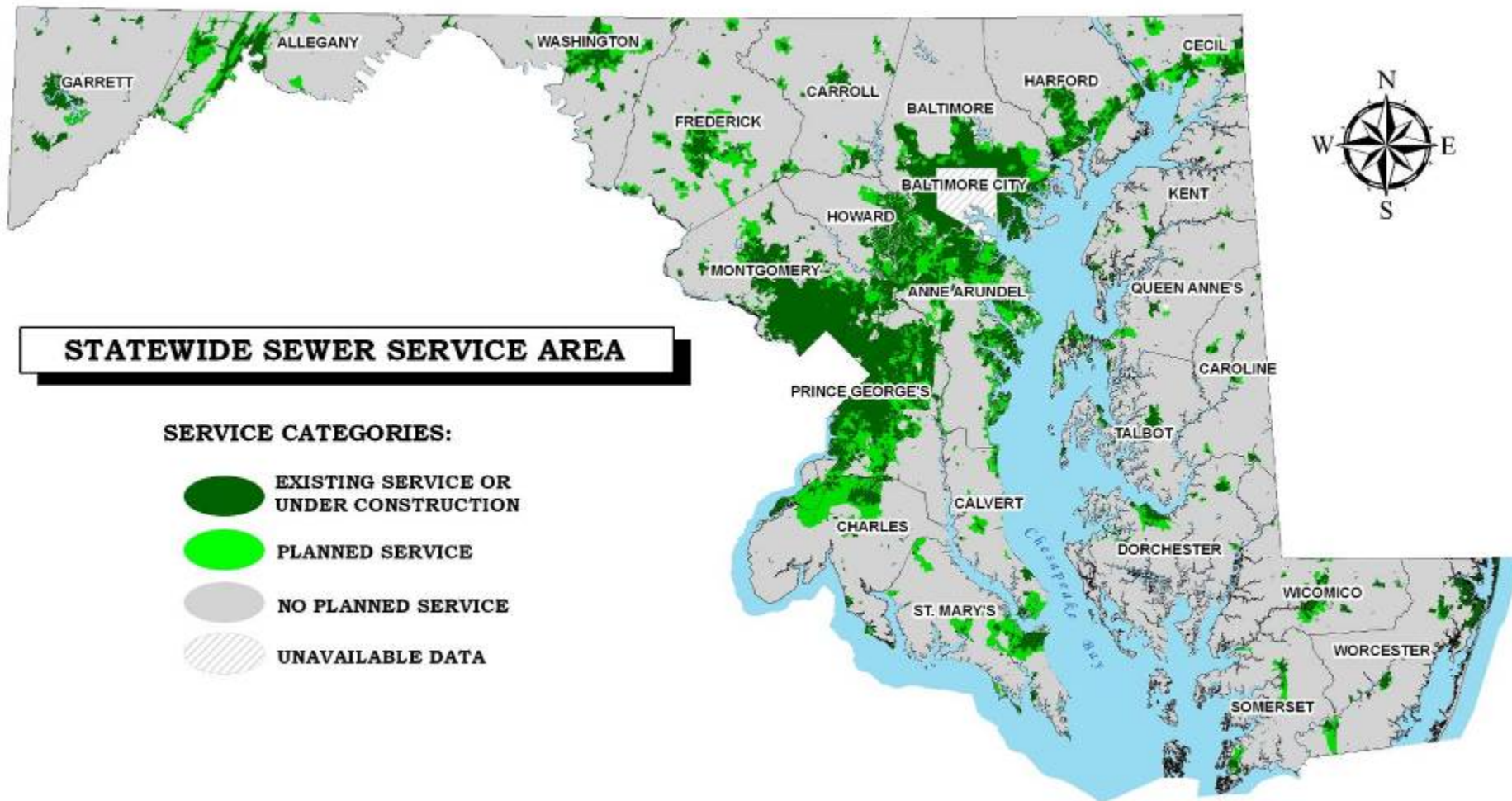
★ Kent Narrows/Stevensville/Grasonville WWTP

2004 Growth Boundary

Sewer Service Categories:

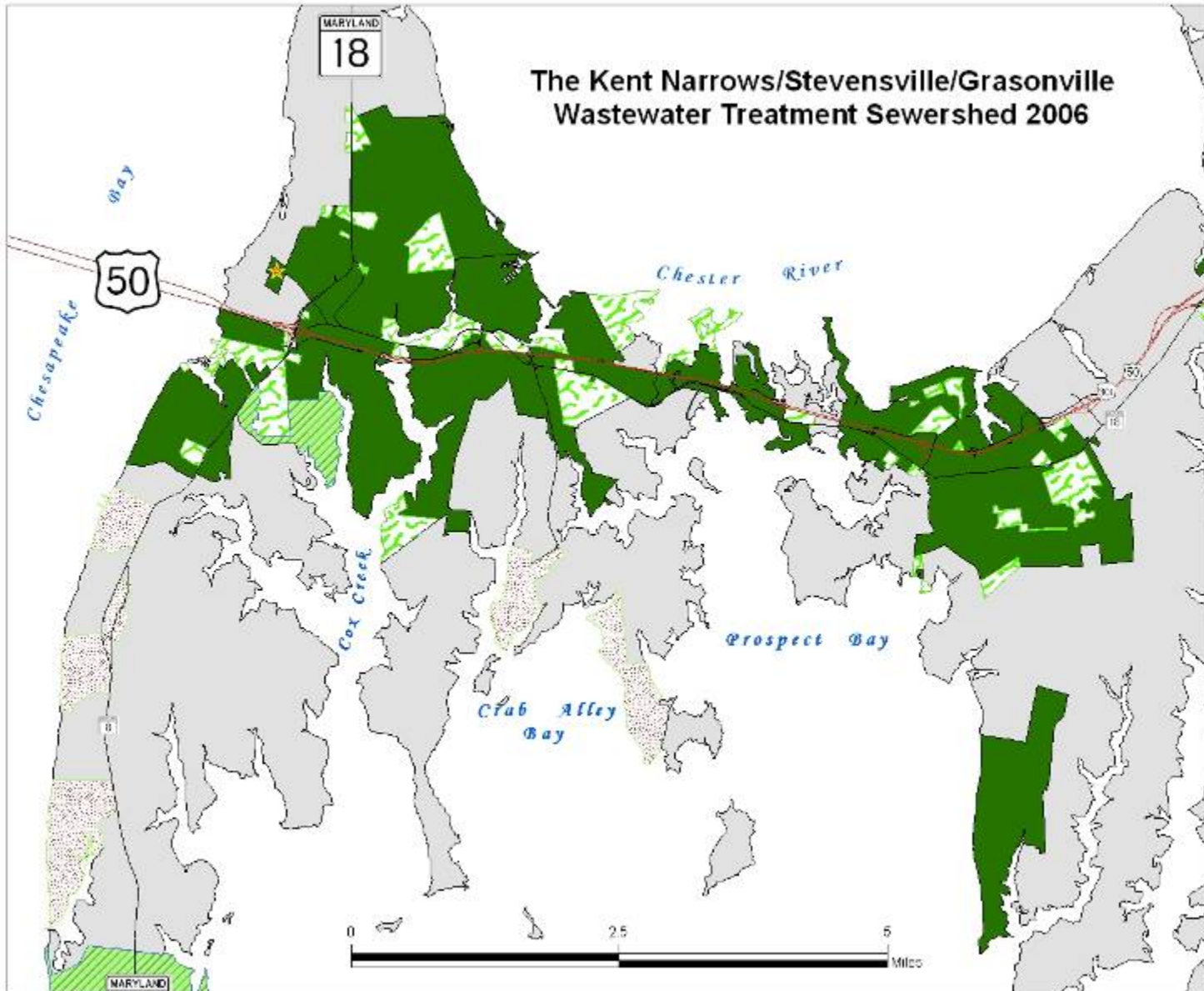
- NP - No Planned Service
- S1 - Existing Sewer Service (Active Utility Account)
- S2 - Service within 1 to 3 yrs. (Service by 2009)
- S3 - Service within 4 to 10 yrs. (Served by 2016)
- S5 - Service beyond a 20 years (Period after 2026)







### The Kent Narrows/Stevensville/Grasonville Wastewater Treatment Sewershed 2006



Locational Map



★ Kent Narrows/Stevensville/Grasonville WWTP

**Sewer Service Categories:**

- NP - No Planned Service
- S1 - Existing Sewer Service (Active Billing Cycle)
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# The Kent Narrows/Stevensville/Grasonville Wastewater Treatment Sewershed 2007

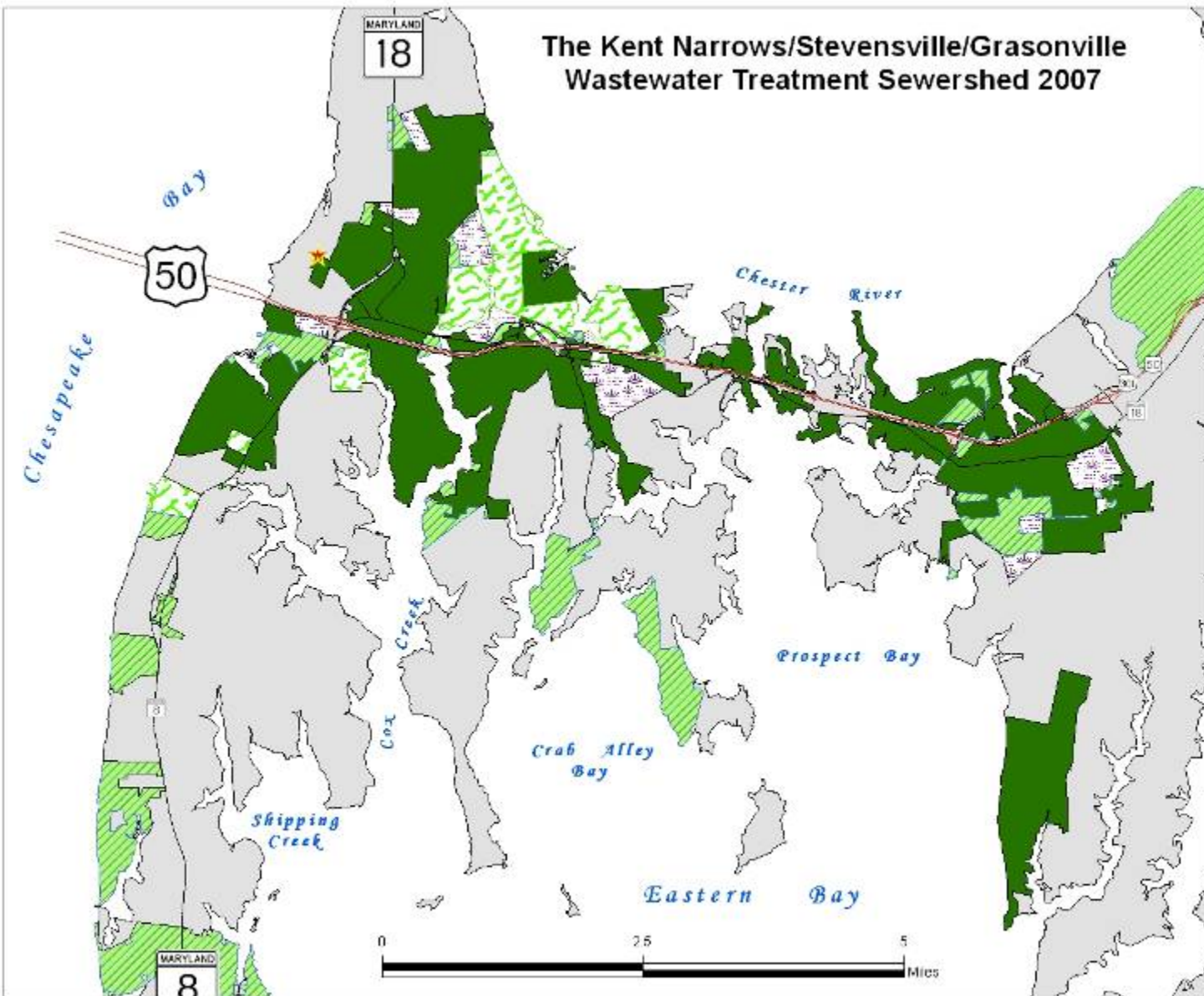
Locational Map



★ Kent Narrows/Stevensville/Grasonville WWTP

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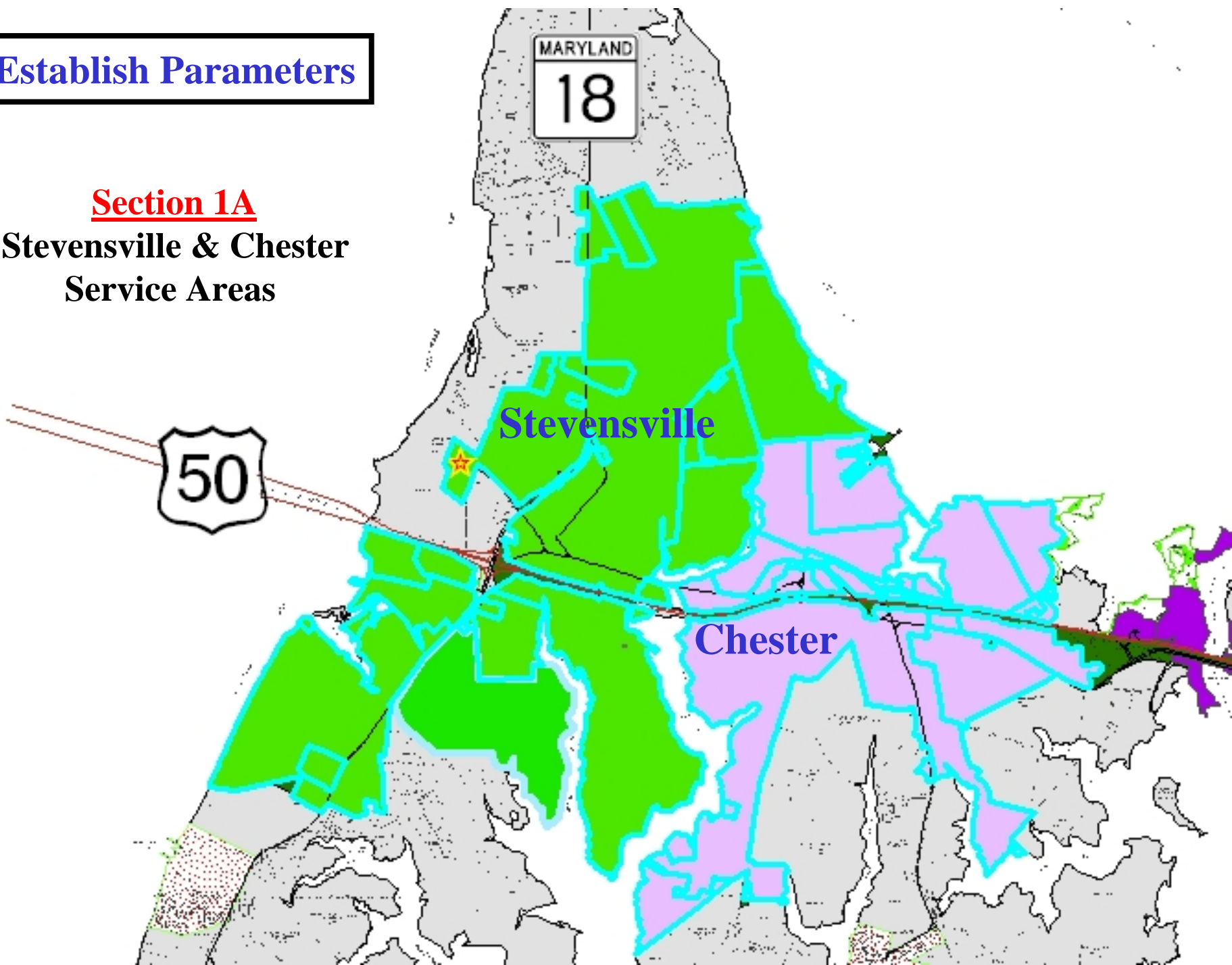




# Establish Parameters

## Section 1A

Stevensville & Chester  
Service Areas





**(1) Improved Parcels**

**"NFMIMPVL"  $\geq 10,000.00$**

**(2) (All Improved Residential Parcels)**

**("LU" = 'A' OR "LU" = 'R' OR "LU" = 'TH' OR "LU" = 'U') AND "ACRES"  $< 20$  AND "NFMIMPVL"  $\geq 10000$**





# Queen Anne's County 2006

Section: 1A  
Stevensville & Chester  
Service Areas

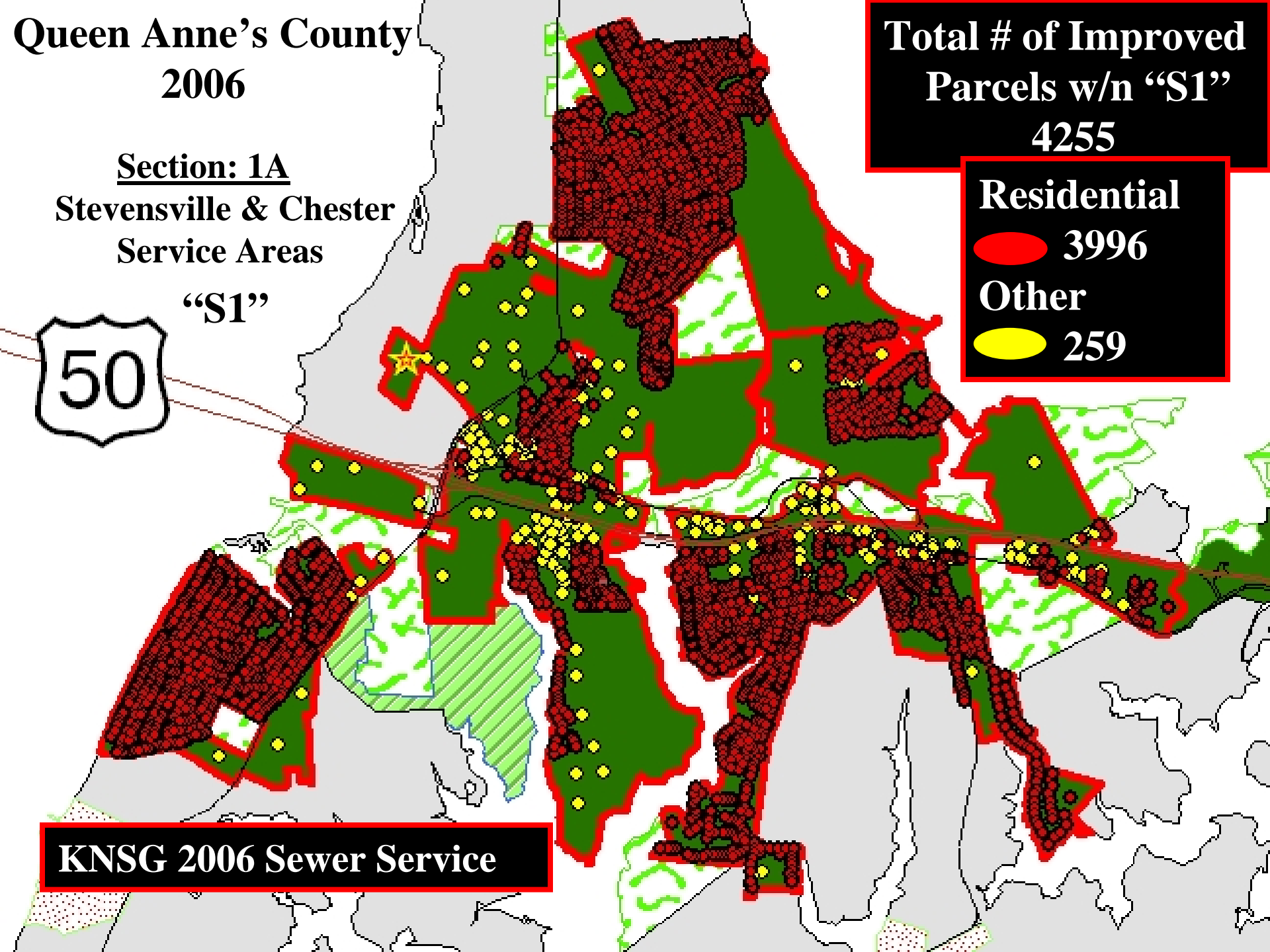
“S1”



**Total # of Improved  
Parcels w/n “S1”  
4255**

**Residential  
3996**  
**Other  
259**

**KNSG 2006 Sewer Service**



# Queen Anne's County 2007

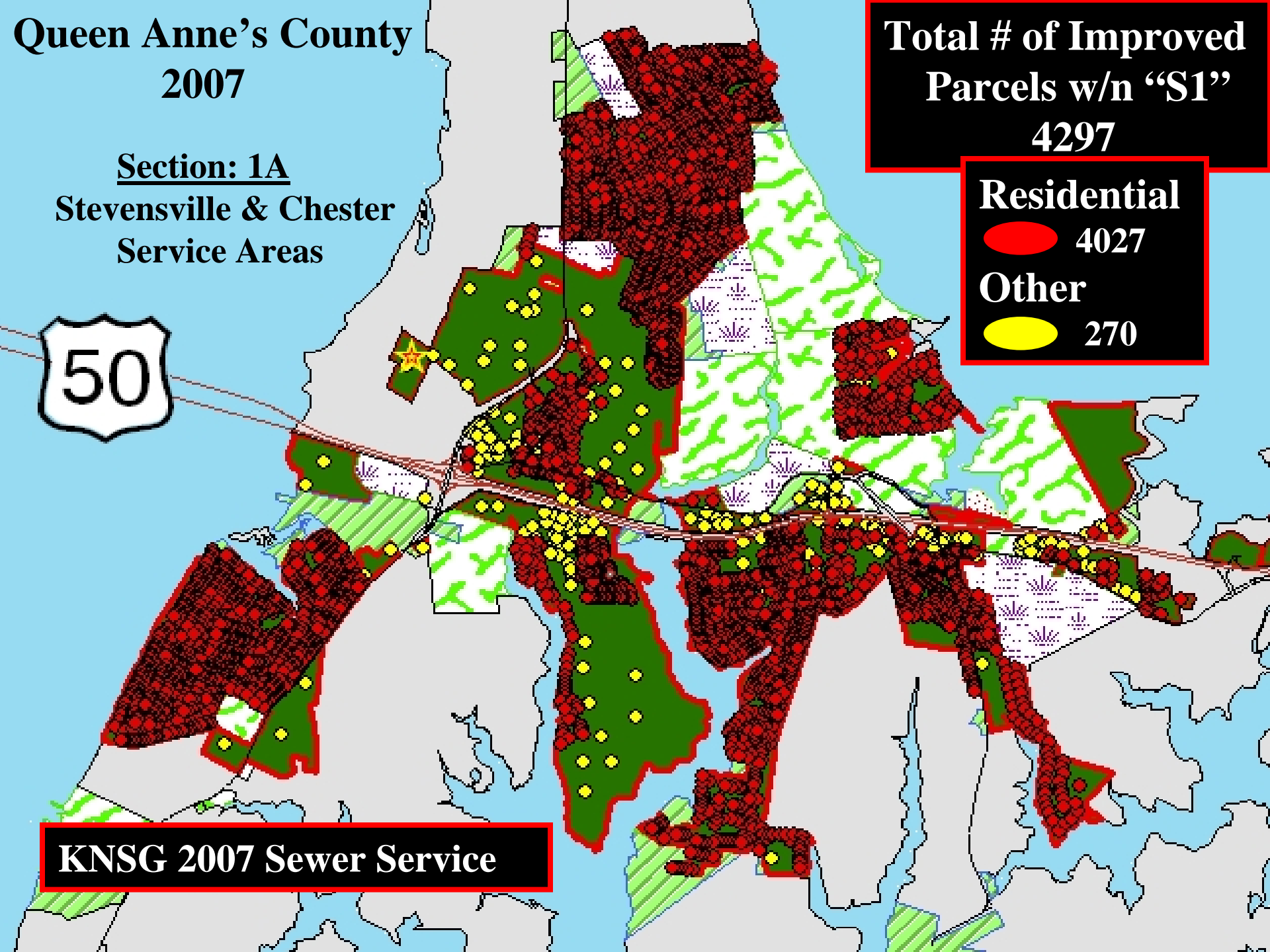
Section: 1A  
Stevensville & Chester  
Service Areas



**Total # of Improved  
Parcels w/n "S1"  
4297**

**Residential  
4027**  
**Other  
270**

**KNSG 2007 Sewer Service**





<b>Stevensville &amp; Chester Improved Parcels 2006</b>	Parcel Count	% Improved Parcels in "S1"
Agricultural	10	0.24%
Apartments	2	0.05%
Commercial	174	4.09%
Commercial Condominium	9	0.21%
Commercial Residential	10	0.24%
Exempt	9	0.21%
Exempt Commercial	36	0.85%
Industrial	7	0.16%
Residential	3026	71.21%
Residential Condominium	962	22.61%
Town House	6	0.14%
<b>Total</b>	4255	100.00%

<b>Stevensville &amp; Chester Improve Parcels 2007</b>	Parcel Count	% Improved Parcels in "S1"
Agricultural	10	0.23%
Apartments	2	0.05%
Commercial	188	4.38%
Commercial Condominium	9	0.21%
Commercial Residential	10	0.23%
Exempt	9	0.21%
Exempt Commercial	36	0.84%
Industrial	7	0.16%
Residential	3053	71.05%
Residential Condominium	967	22.50%
Town House	6	0.14%
<b>Total</b>	4297	100.00%

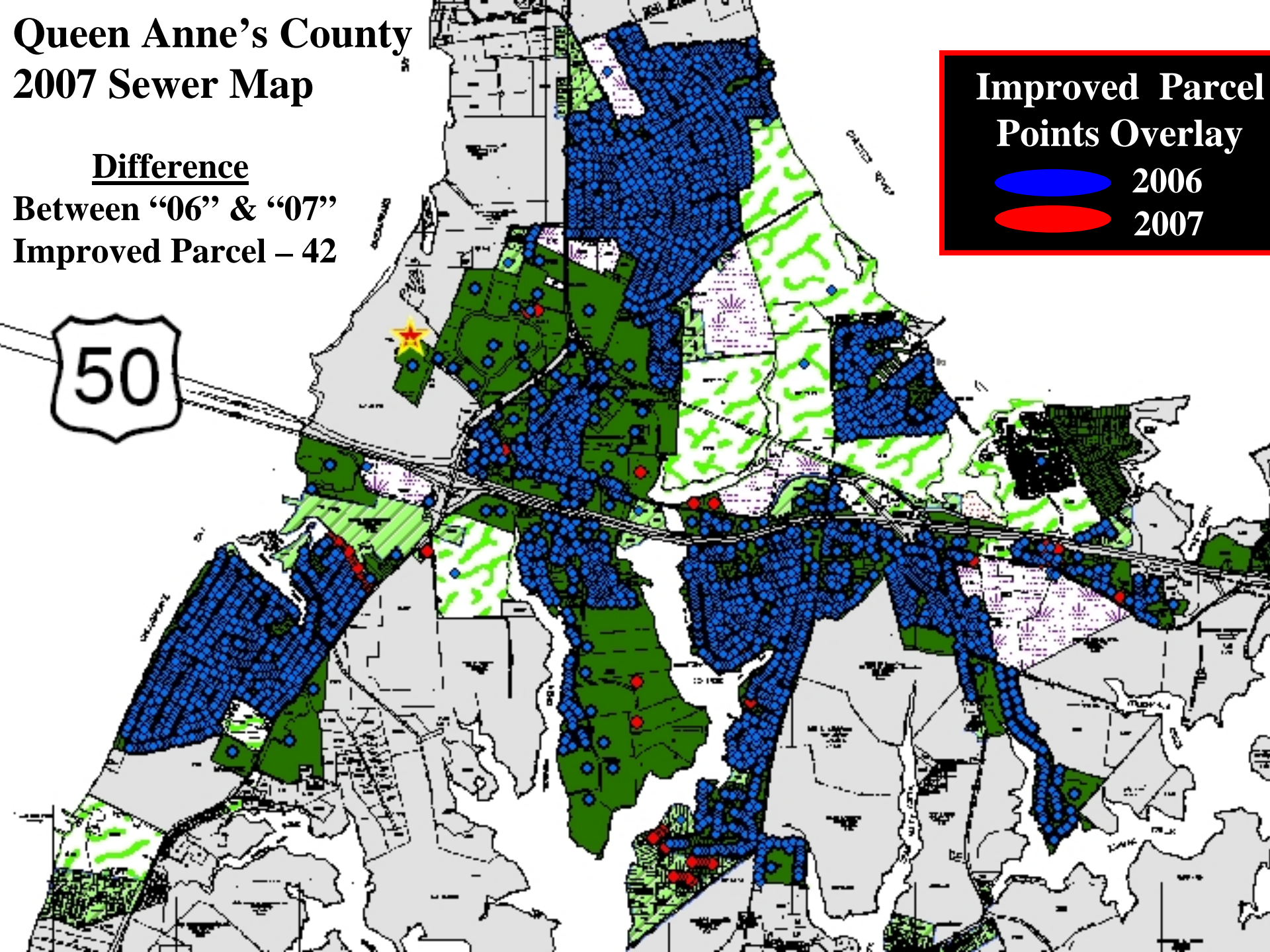
# Queen Anne's County 2007 Sewer Map

## Difference

Between "06" & "07"  
Improved Parcel - 42

**Improved Parcel  
Points Overlay**

	2006
	2007



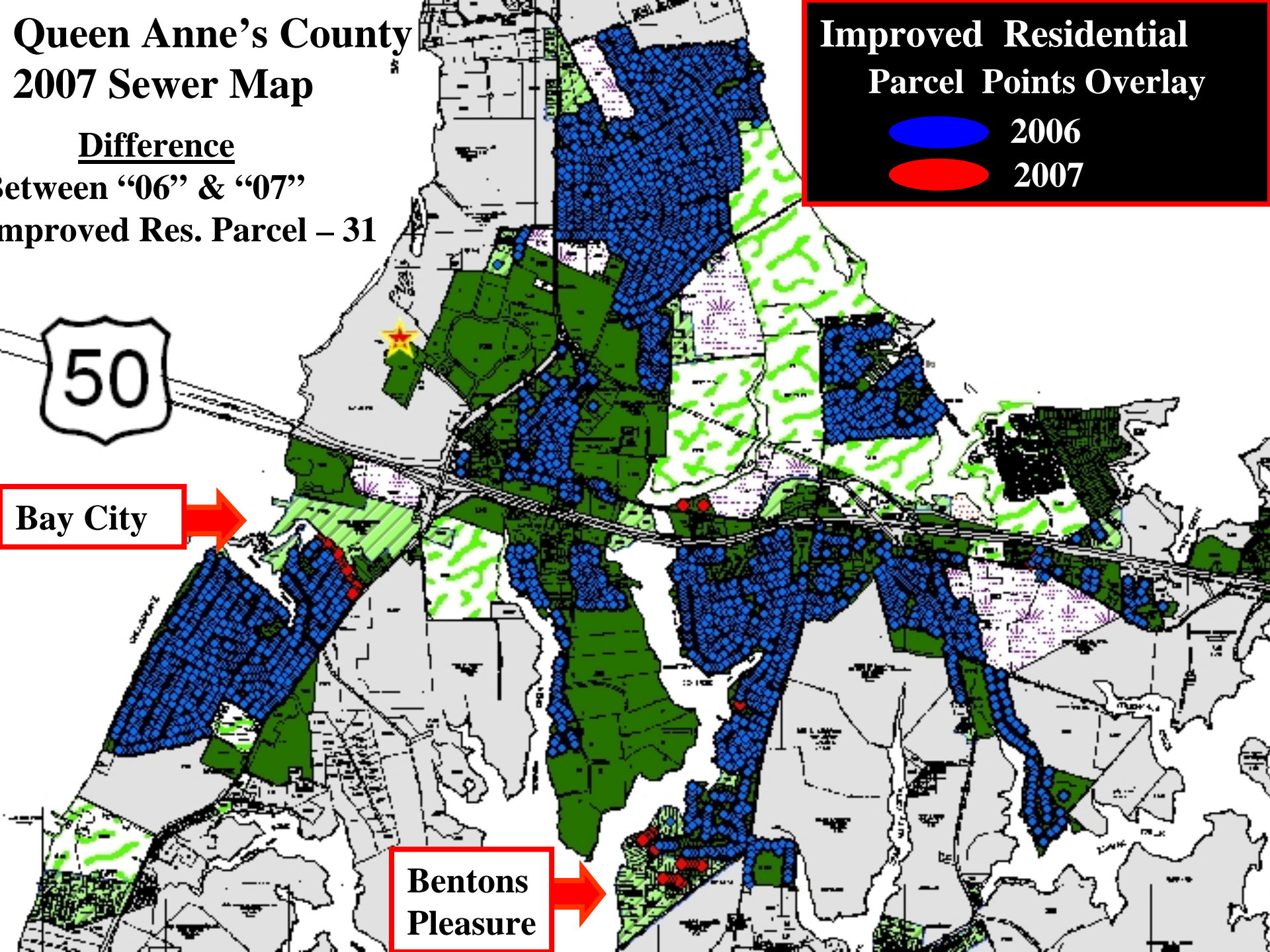


# Queen Anne's County 2007 Sewer Map

Difference  
between "06" & "07"  
Improved Res. Parcel - 31

**Improved Residential  
Parcel Points Overlay**

-  2006
-  2007



**Bay City** →

**Bentons  
Pleasure** →

### (3) (*Other*' Improved Parcels)

*For example, the improvement value may be well over \$10,000 but the acreage is greater than 20 acres.*



- Agricultural**
- Apartments**
- Commercial**
- Commercial Condominium**
- Commercial Residential**
- Exempt**
- Exempt Commercial**
- Industrial**
- Residential**







**2006**

**2007**

**Note: “Other Improved Parcels” that have changed from an “S1” Sewer Service Designation from one year to the next need to be examined very closely to determine what is actually happening on the ground.**



# 2006 Detailed Breakdown

2006 KNSG Service Area	Total # of Parcels in "S1"	Total # Improved Parcels "S1"	Total # Improved Residential Parcel "S1"	Total # Improved "Other" Parcels
<b>CHESTER</b>	1892	1792	1689	156
GRASONVILLE	1461	1277	1185	92
KENT NARROWS	709	599	290	309
PROSPECT BAY	357	317	316	1
<b>STEVENSVILLE</b>	2660	2463	2307	156
<b>Total</b>	<b>7079</b>	<b>6448</b>	<b>5787</b>	<b>714</b>

**Note: Chester & Stevensville Improved Res. Parcels - 3996**



# 2007 Detailed Breakdown

2007 KNSG Service Area	Total # of Parcels in "S1"	Total # Improved Parcels "S1"	Total # Improved Residential Parcel	Total # Improved "Other" Parcels
<b>CHESTER</b>	<b>1902</b>	<b>1808</b>	<b>1705</b>	<b>104</b>
GRASONVILLE	1483	1312	1212	100
KENT NARROWS	700	591	282	300
PROSPECT BAY	356	316	315	1
<b>STEVENSVILLE</b>	<b>2692</b>	<b>2489</b>	<b>2322</b>	<b>167</b>
<b>TOTALS</b>	<b>7133</b>	<b>6516</b>	<b>5836</b>	<b>672</b>

**Note: Chester & Stevensville Improved Res. Parcels - 4027**

# Changes in Improved Parcels from 2006 to 2007

2006 KNSG Service Areas	% Improved Parcels in "S1"	% Improved Residential Parcels in "S1" Served	2007 KNSG Service Areas	% Improved Parcels in "S1"	% Improved Residential Parcels in "S1" Served
CHESTER	27.79%	29.19%	CHESTER	27.75%	29.20%
GRASONVILLE	19.80%	20.48%	GRASONVILLE	20.14%	20.77%
KENT NARROWS	9.29%	5.01%	KENT NARROWS	9.07%	4.83%
PROSPECT BAY	4.92%	5.46%	PROSPECT BAY	4.85%	5.40%
STEVENSVILLE	38.20%	39.87%	STEVENSVILLE	38.20%	39.79%
TOTALS	100.00%	100.00%	TOTALS	100.00%	100.00%

Overall this data reflects a .3% change in Improved Residential Parcels between 2006 and 2007.



# **Conclusion:**

**Concerning the matter of the impact of growth during the calendar years of 2006 and 2007, as it relates to the Kent Narrows/Stevensville & Grasonville WWTP and its service area:**

- **The sewer service area experienced some significant changes in the sewer service designations, particularly where the subdistricts of Stevensville and Chester coincide.**
- **Overall there was an increase in Improved Residential Parcels at rate of .3%. The increase was most notably shown in the subdistrict of Grasonville.**
- **Based on the total number of improved residential parcels in the KNSG Subdistrict, the Sewer Supply Demand is as follows:**

**5787 in 2006 = 1,446,750 gpd**

**5836 in 2007 = 1,459,000 gpd**

**This information is consistent with the KNSG WWTP reporting a current flow of approximately 1,600,000 gpd.**