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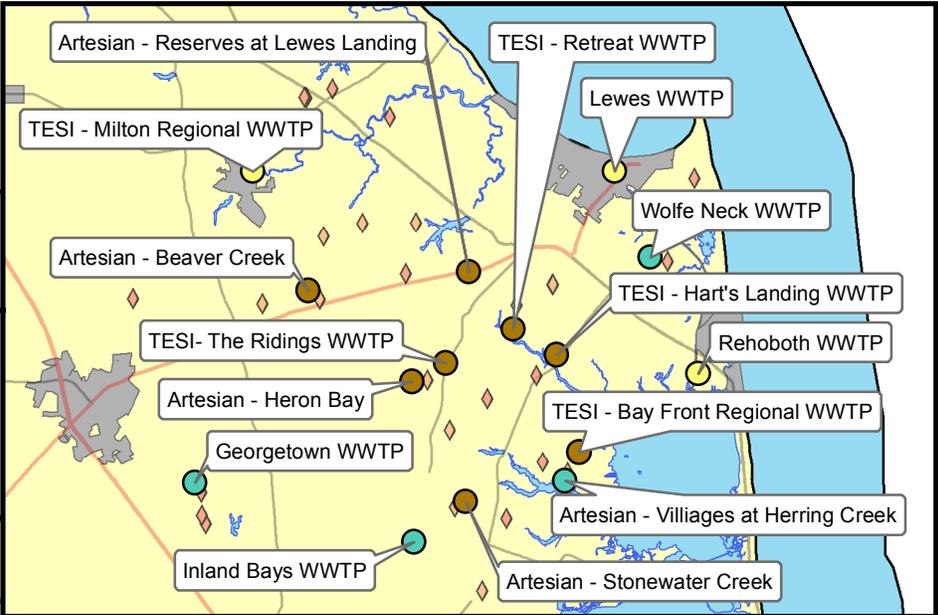
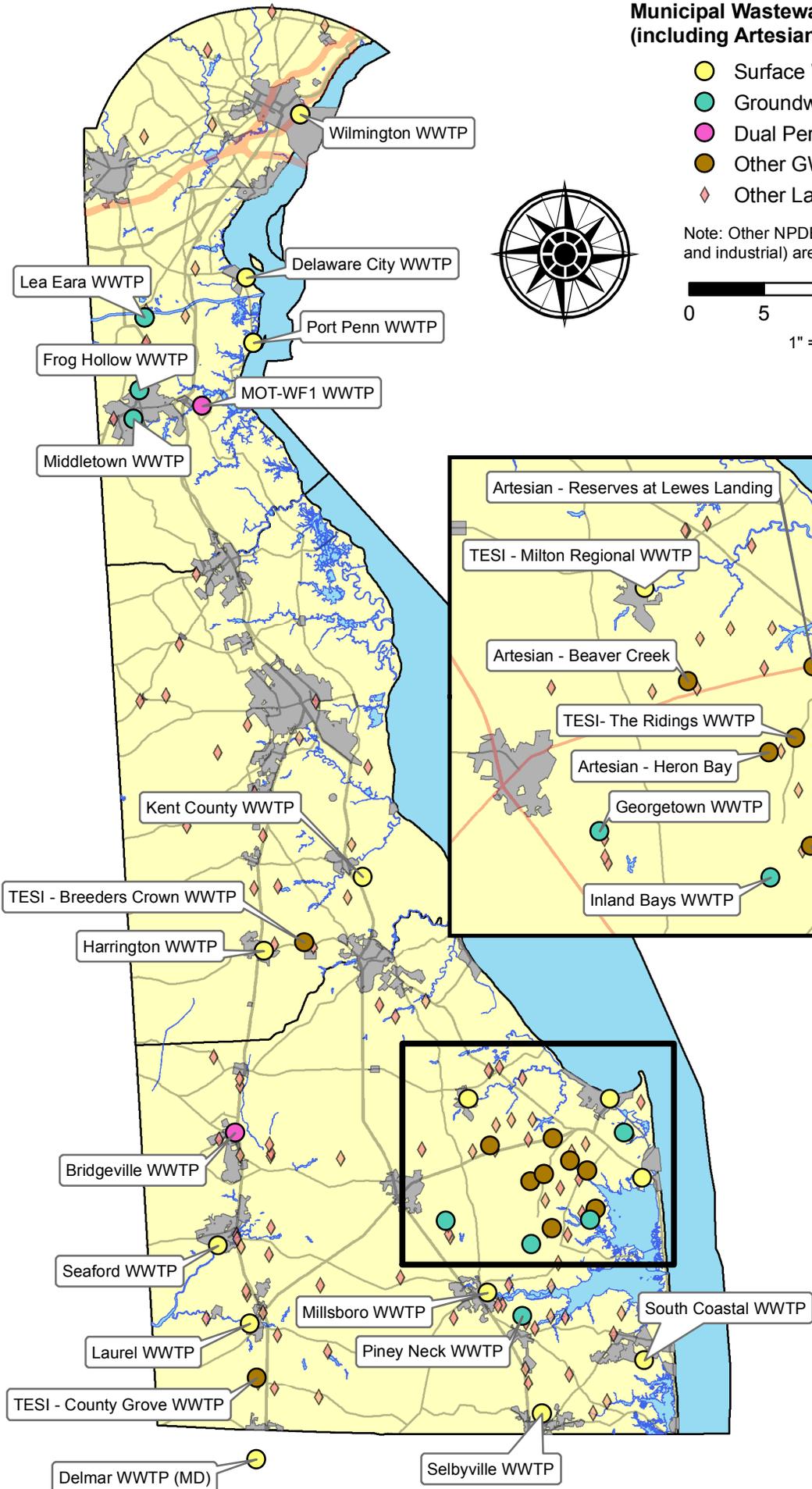
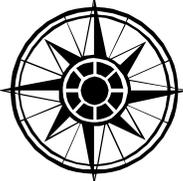
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**Municipal Wastewater Treatment Plants - Permit Type (including Artesian and Tidewater)**

- Surface Water Permit
- Groundwater Permit
- Dual Permit (SW and GW)
- Other GW Permit Types (RIBS, etc)
- ◆ Other Large System GW Permits (Draft)

Note: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.



Inset: 1" = 5 Miles

**Map 1-1**  
**Municipal Wastewater Treatment Plants in Delaware - 2011**  
 (Including Major Private Wastewater Utility Providers)

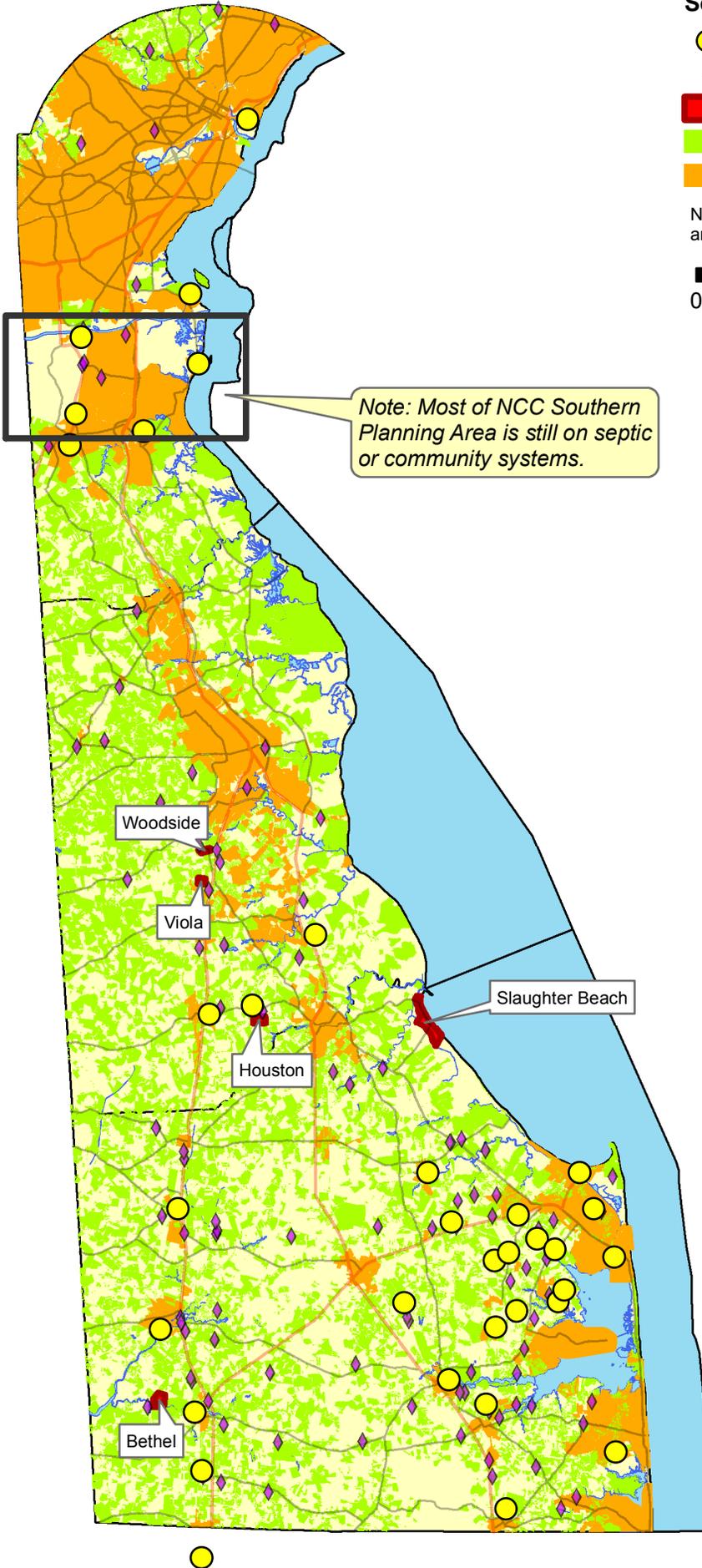
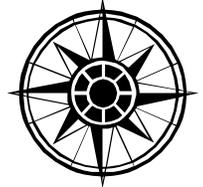


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## Generalized Wastewater Service Areas and Types in Delaware

-  Municipal/Utility WWTPs
-  Other Large System GW Permits (Draft)
-  Non-Sewered Municipalities
-  Parcels on Individual or Shared Septic
-  Serviced Areas

Note: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

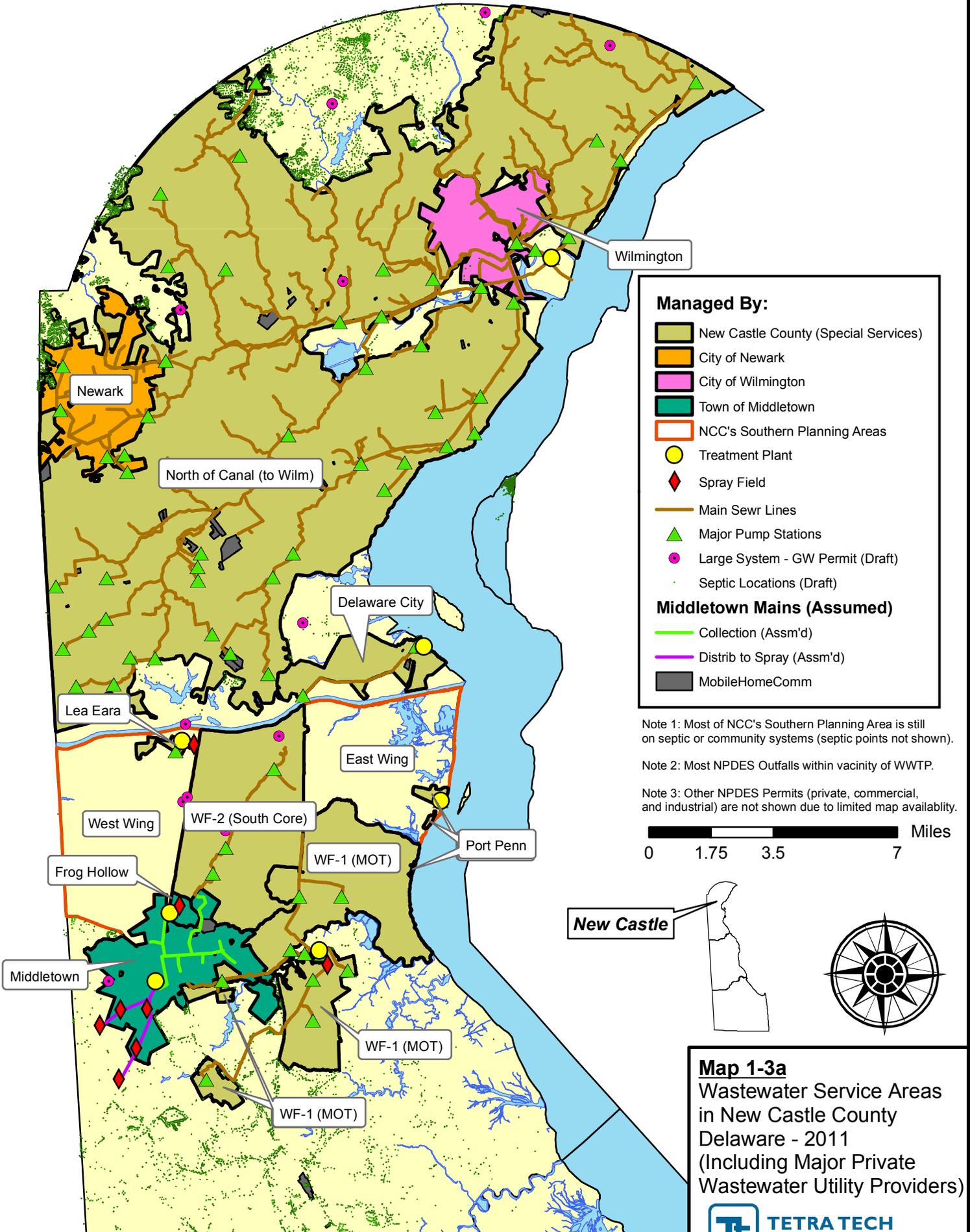


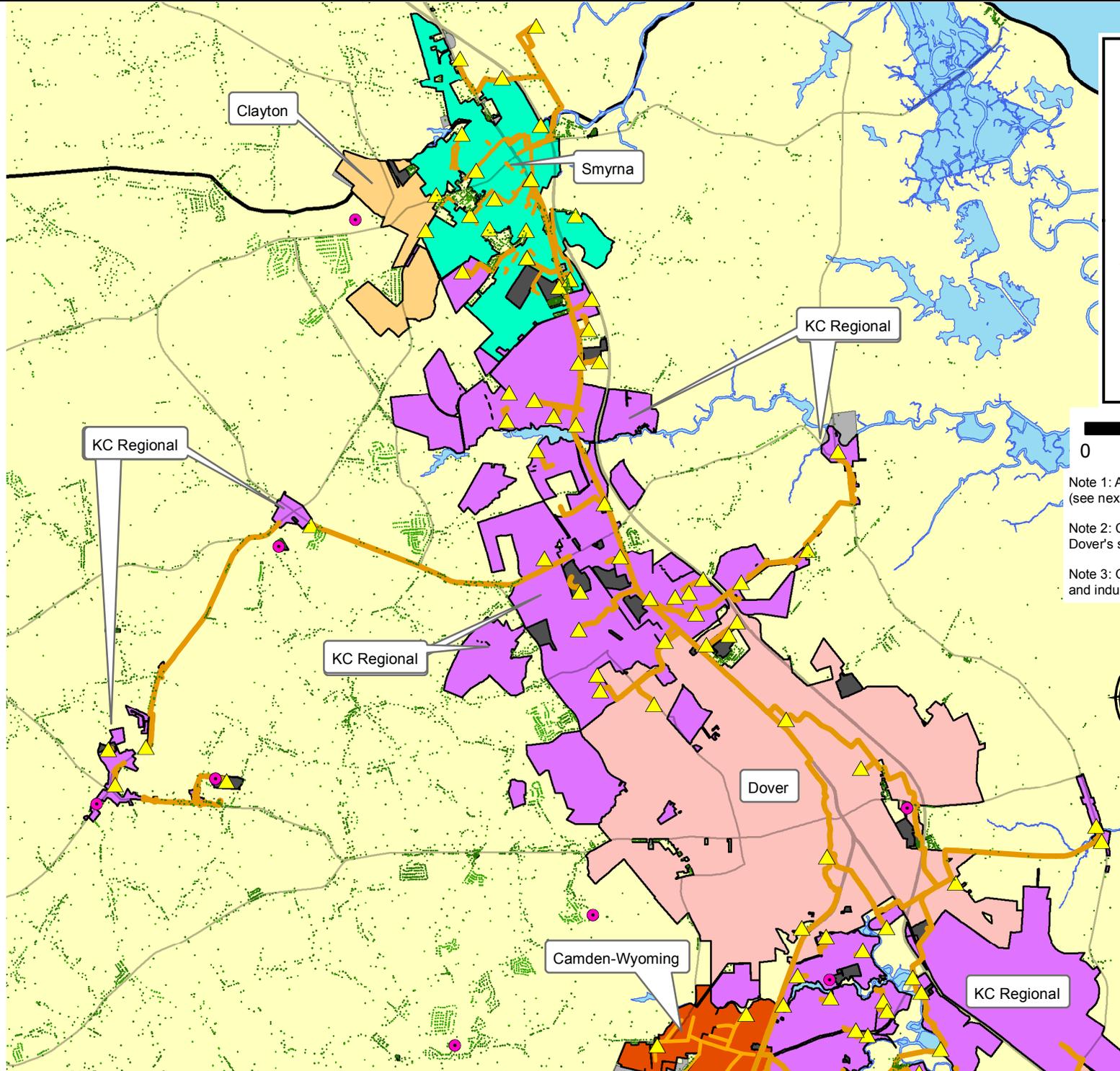
*Note: Most of NCC Southern Planning Area is still on septic or community systems.*

**Map 1-2**  
**Wastewater Service Areas in Delaware - 2011**  
 (Including Major Private Wastewater Utility Providers)



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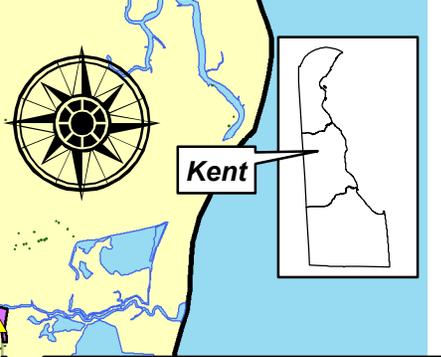
- Kent County
- Clayton
- Smyrna
- Dover
- CWSWA
- Main Pump Stations
- Main Sewer Lines
- Large System - GW Permit (Draft)
- Septic Locations (Draft)
- Mobile Home Communities (Draft)
- DE Municipal Boundaries (Underlay)



Note 1: All waste flows south to Kent County Regional (see next map, Kent - South).

Note 2: Clayton has limited paper sewer maps available. Dover's sewer maps were not requested.

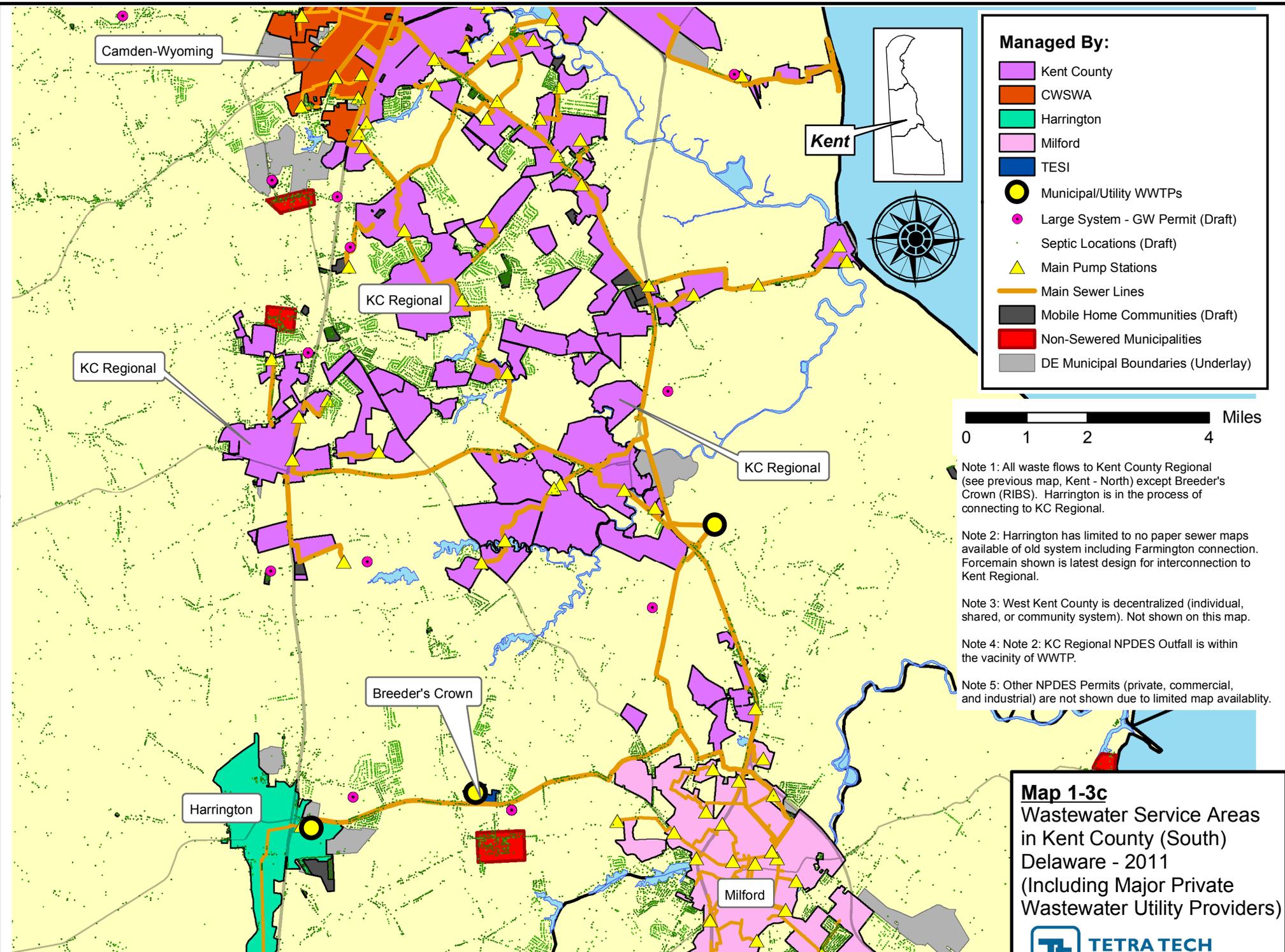
Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.



**Map 1-3b**  
**Wastewater Service Areas**  
**in Kent County (North)**  
**Delaware - 2011**  
**(Including Major Private**  
**Wastewater Utility Providers)**

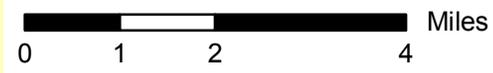
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**Managed By:**

- Kent County
- CWSWA
- Harrington
- Milford
- TESI
- Municipal/Utility WWTPs
- Large System - GW Permit (Draft)
- Septic Locations (Draft)
- Main Pump Stations
- Main Sewer Lines
- Mobile Home Communities (Draft)
- Non-Sewered Municipalities
- DE Municipal Boundaries (Underlay)



Note 1: All waste flows to Kent County Regional (see previous map, Kent - North) except Breeder's Crown (RIBS). Harrington is in the process of connecting to KC Regional.

Note 2: Harrington has limited to no paper sewer maps available of old system including Farmington connection. Forcemain shown is latest design for interconnection to Kent Regional.

Note 3: West Kent County is decentralized (individual, shared, or community system). Not shown on this map.

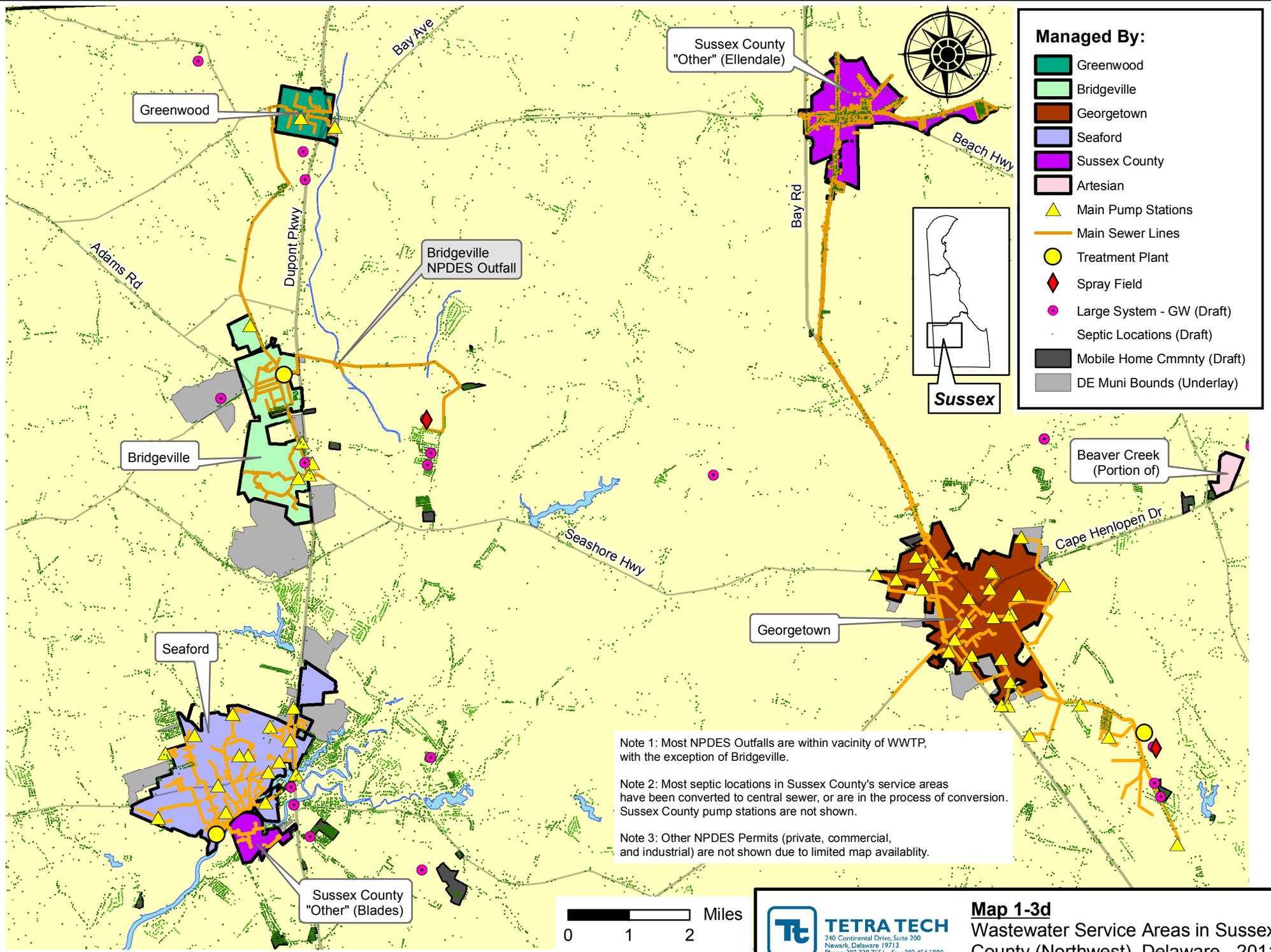
Note 4: Note 2: KC Regional NPDES Outfall is within the vicinity of WWTP.

Note 5: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

**Map 1-3c**  
**Wastewater Service Areas**  
**in Kent County (South)**  
**Delaware - 2011**  
**(Including Major Private**  
**Wastewater Utility Providers)**



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**Managed By:**

- Greenwood
- Bridgeville
- Georgetown
- Seaford
- Sussex County
- Artesian
- Main Pump Stations
- Main Sewer Lines
- Treatment Plant
- Spray Field
- Large System - GW (Draft)
- Septic Locations (Draft)
- Mobile Home Cmmnty (Draft)
- DE Muni Bounds (Underlay)

Note 1: Most NPDES Outfalls are within vicinity of WWTP, with the exception of Bridgeville.

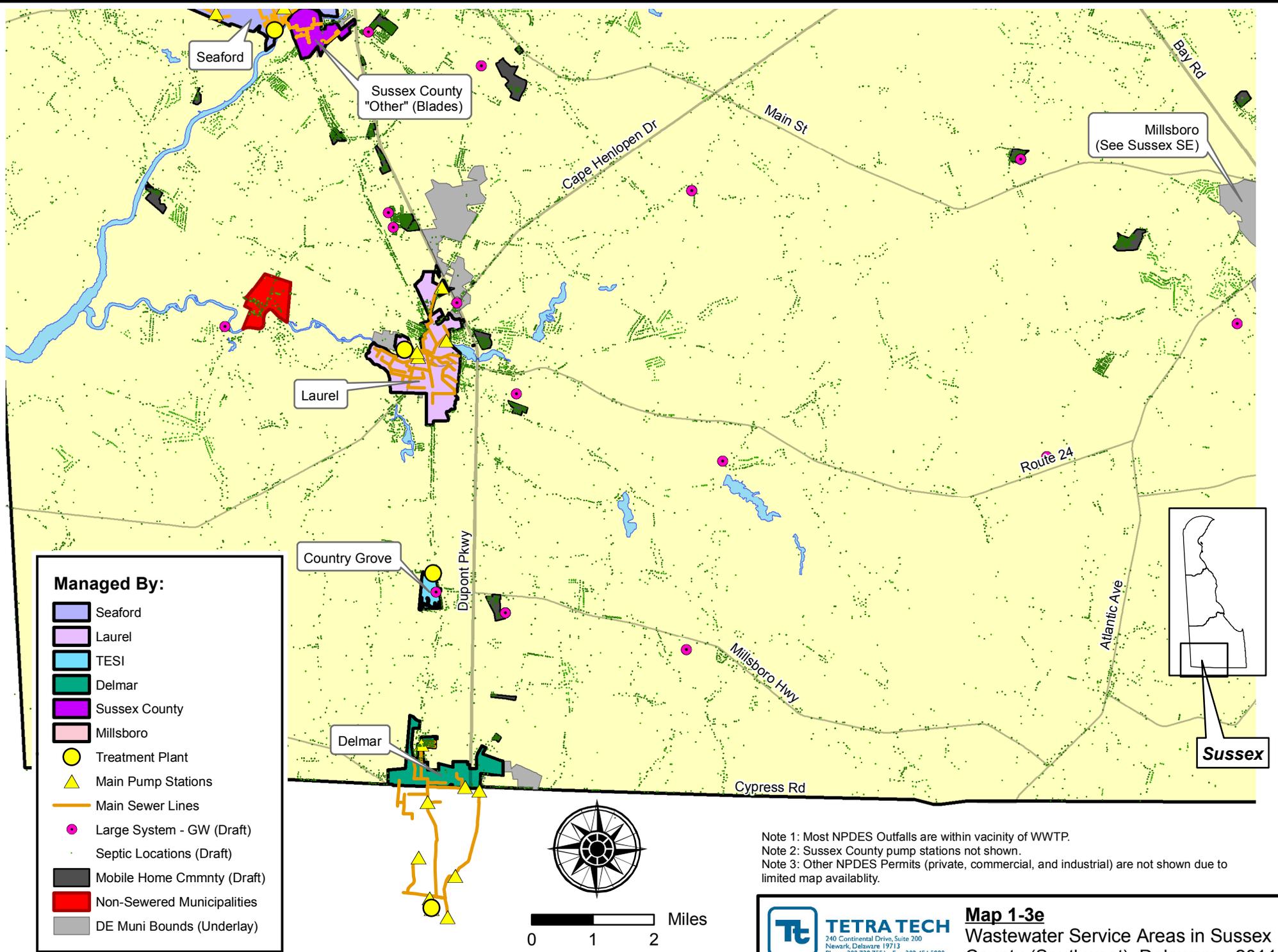
Note 2: Most septic locations in Sussex County's service areas have been converted to central sewer, or are in the process of conversion. Sussex County pump stations are not shown.

Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.

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**Map 1-3d**  
**Wastewater Service Areas in Sussex County (Northwest), Delaware - 2011**  
 (Including Major Private Wastewater Utilities)



**Managed By:**

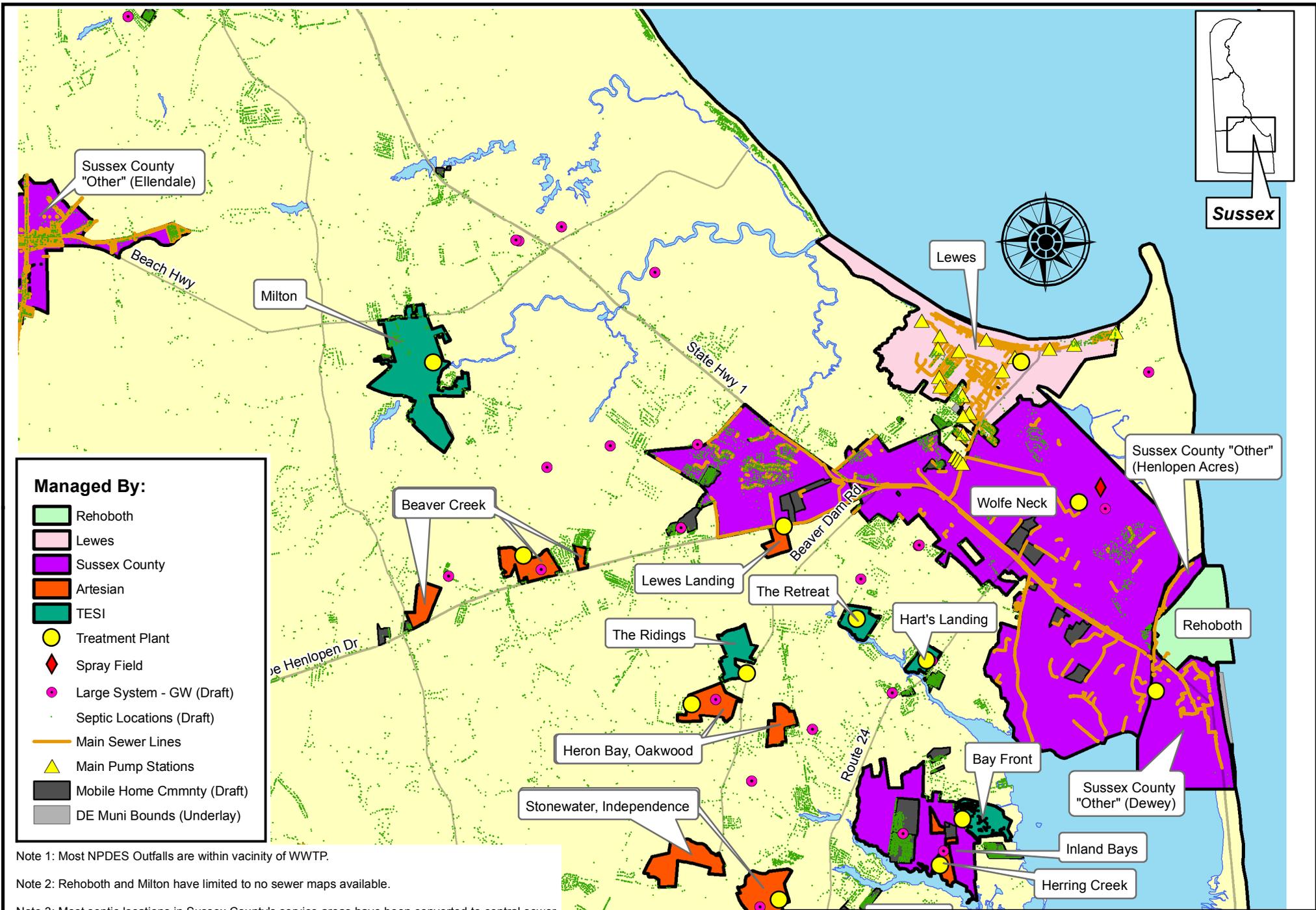
- Seaford
- Laurel
- TESI
- Delmar
- Sussex County
- Millsboro
- Treatment Plant
- Main Pump Stations
- Main Sewer Lines
- Large System - GW (Draft)
- Septic Locations (Draft)
- Mobile Home Cmmnty (Draft)
- Non-Sewered Municipalities
- DE Muni Bounds (Underlay)

Note 1: Most NPDES Outfalls are within vicinity of WWTP.  
 Note 2: Sussex County pump stations not shown.  
 Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.



**Map 1-3e**  
**Wastewater Service Areas in Sussex County (Southwest), Delaware - 2011**  
 (Including Major Private Wastewater Utilities)

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**Managed By:**

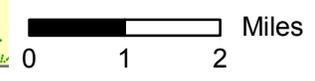
- Rehoboth
- Lewes
- Sussex County
- Artesian
- TESI
- Treatment Plant
- Spray Field
- Large System - GW (Draft)
- Septic Locations (Draft)
- Main Sewer Lines
- Main Pump Stations
- Mobile Home Cmmnty (Draft)
- DE Muni Bounds (Underlay)

Note 1: Most NPDES Outfalls are within vicinity of WWTP.

Note 2: Rehoboth and Milton have limited to no sewer maps available.

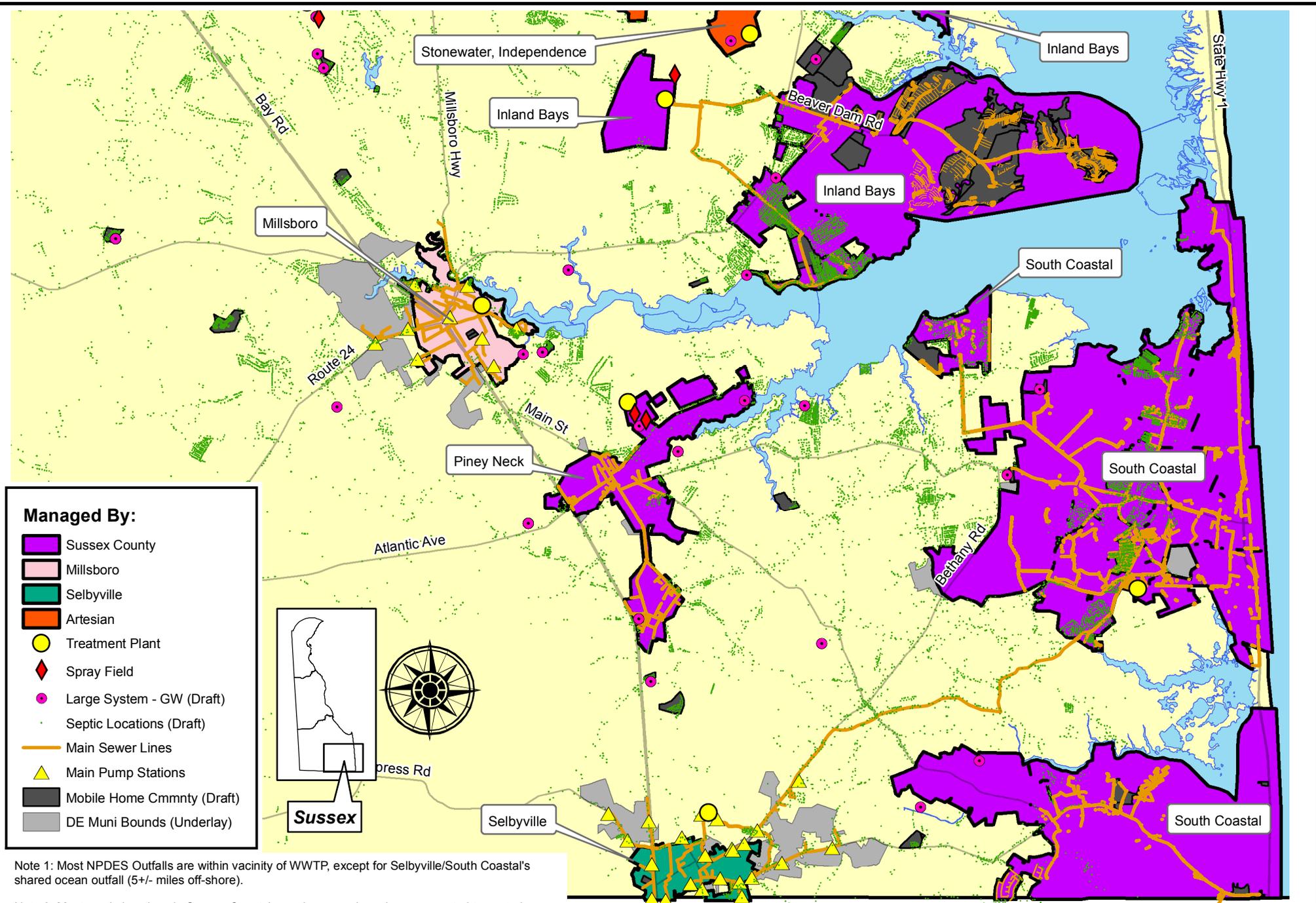
Note 3: Most septic locations in Sussex County's service areas have been converted to central sewer or are in the process of conversion. Sussex County pump stations not shown.

Note 4: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.



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**Map 1-3f**  
**Wastewater Service Areas in Sussex County (Northeast), Delaware - 2011**  
 (Including Major Private Wastewater Utilities)



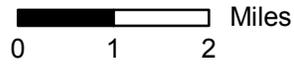
**Managed By:**

- Sussex County
- Millsboro
- Selbyville
- Artesian
- Treatment Plant
- Spray Field
- Large System - GW (Draft)
- Septic Locations (Draft)
- Main Sewer Lines
- Main Pump Stations
- Mobile Home Cmmnty (Draft)
- DE Muni Bounds (Underlay)

Note 1: Most NPDES Outfalls are within vicinity of WWTP, except for Selbyville/South Coastal's shared ocean outfall (5+/- miles off-shore).

Note 2: Most septic locations in Sussex County's service areas have been converted to central sewer, or are in the process of conversion. Sussex County pump stations not shown.

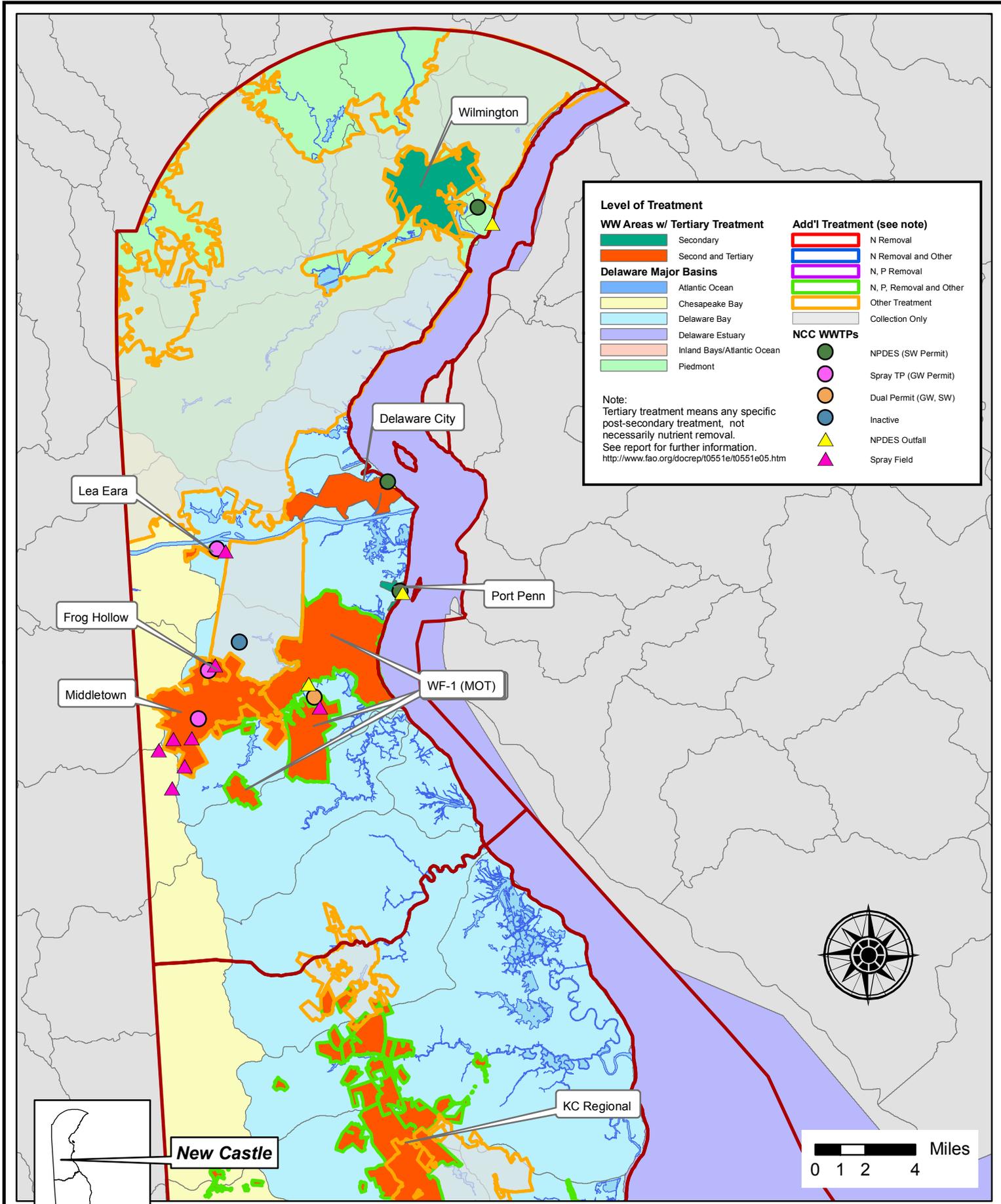
Note 3: Other NPDES Permits (private, commercial, and industrial) are not shown due to limited map availability.



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**Map 1-3g**  
**Wastewater Service Areas in Sussex County (Southeast), Delaware - 2011**  
 (Including Major Private Wastewater Utilities)

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**Level of Treatment**

**WW Areas w/ Tertiary Treatment**

- Secondary
- Second and Tertiary

**Delaware Major Basins**

- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

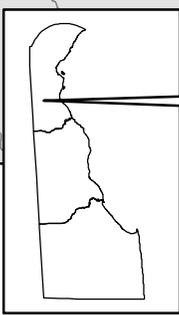
**Add'l Treatment (see note)**

- N Removal
- N Removal and Other
- N, P Removal
- N, P, Removal and Other
- Other Treatment
- Collection Only

**NCC WWTPs**

- NPDES (SW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW, SW)
- Inactive
- NPDES Outfall
- Spray Field

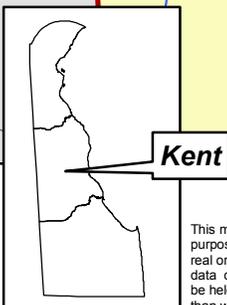
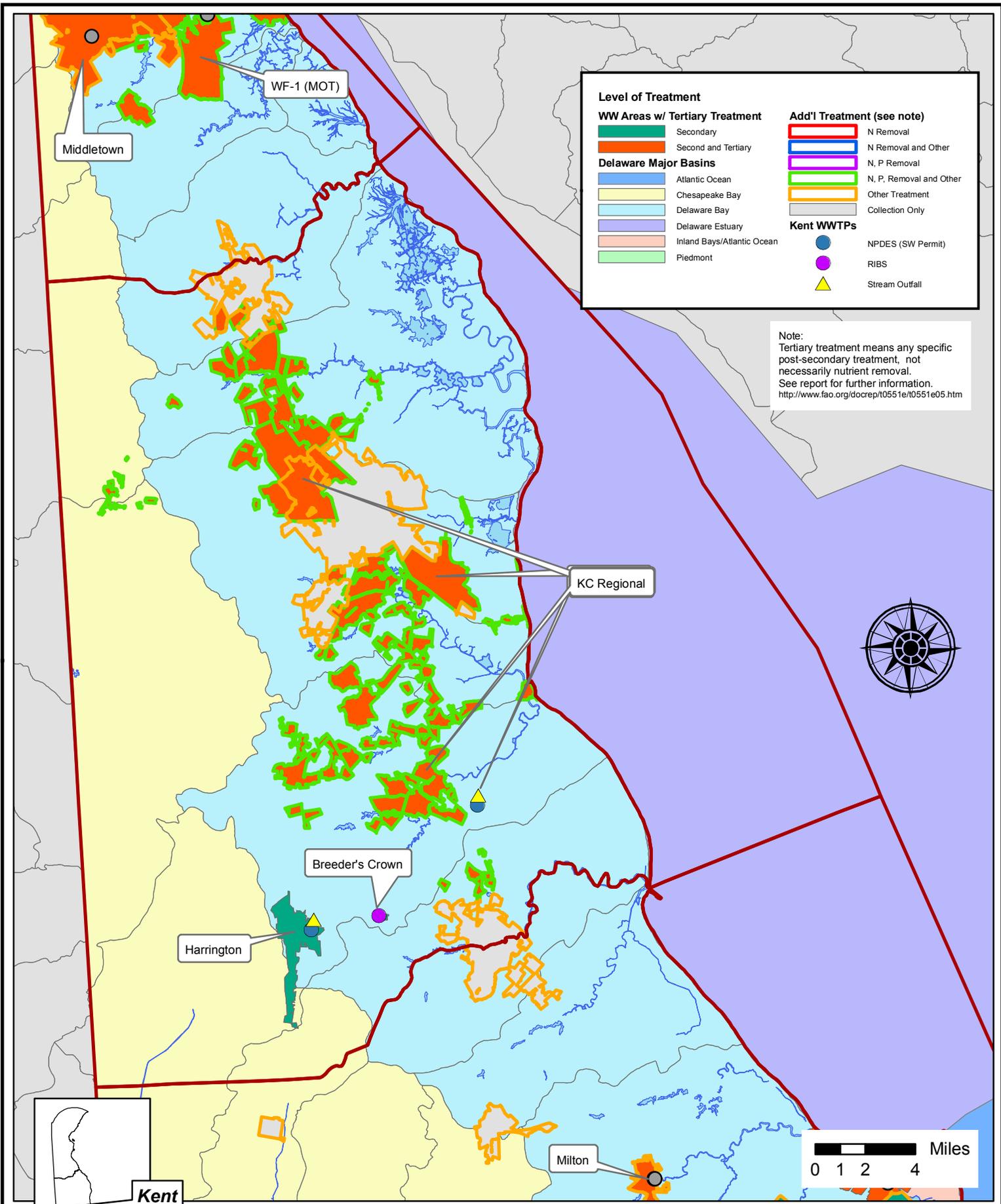
**Note:**  
Tertiary treatment means any specific post-secondary treatment, not necessarily nutrient removal.  
See report for further information.  
<http://www.fao.org/docrep/t0551e/t0551e05.htm>



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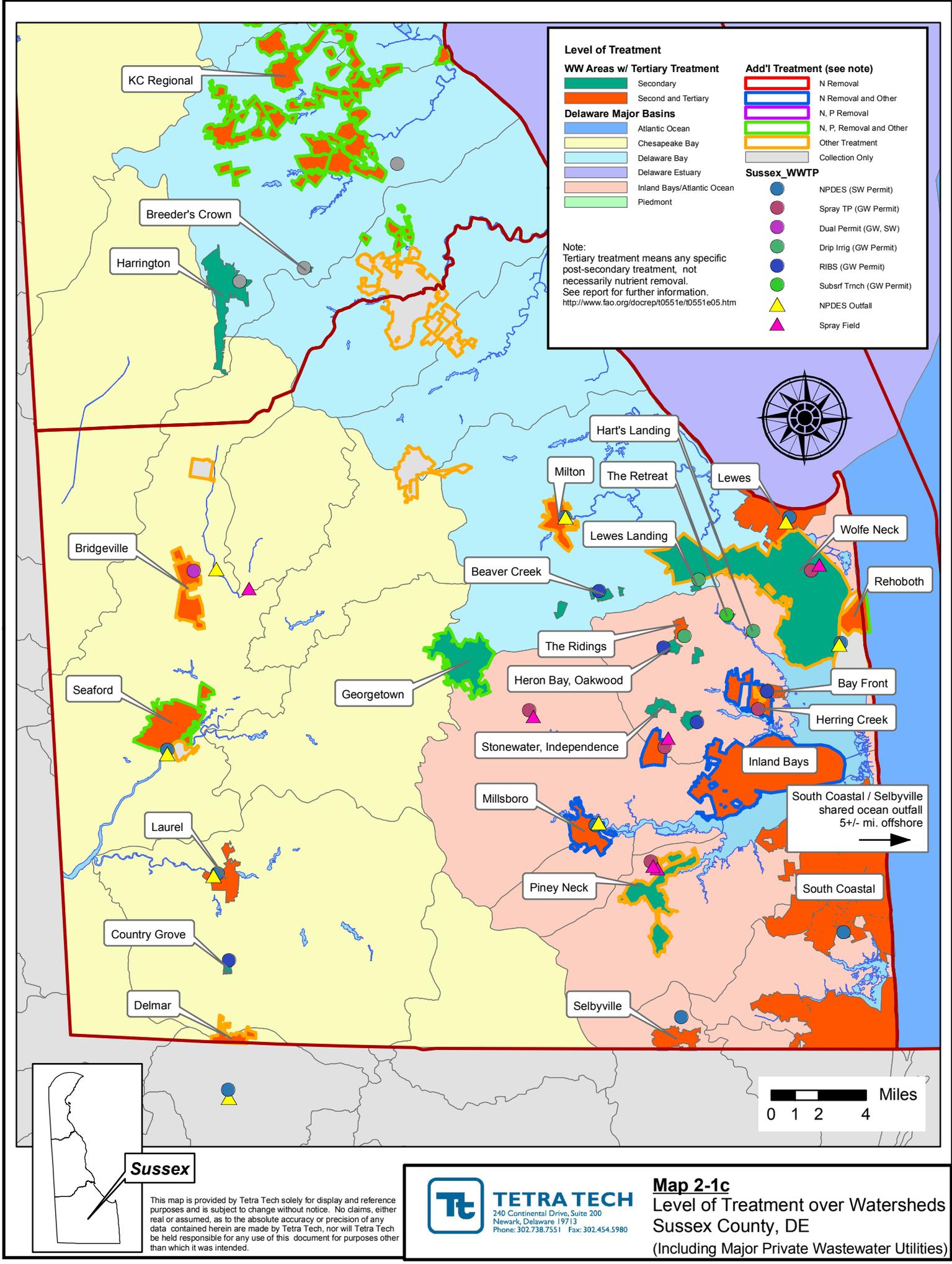
**Map 2-1a**  
**Level of Treatment over Watersheds**  
**New Castle County, DE**  
 (Including Major Private Wastewater Utilities)



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**Map 2-1b**  
 Level of Treatment over Watersheds  
 Kent County, DE  
 (Including Major Private Wastewater Utilities)



**Level of Treatment**

**WW Areas w/ Tertiary Treatment**

- Secondary
- Second and Tertiary

**Delaware Major Basins**

- Atlantic Ocean
- Chesapeake Bay
- Delaware Bay
- Delaware Estuary
- Inland Bays/Atlantic Ocean
- Piedmont

**Add'l Treatment (see note)**

- N Removal
- N Removal and Other
- N, P Removal
- N, P, Removal and Other
- Other Treatment
- Collection Only

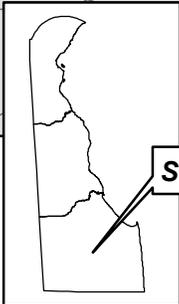
**Sussex\_WWTP**

- NPDES (SW Permit)
- Spray TP (GW Permit)
- Dual Permit (GW, SW)
- Drip Irrig (GW Permit)
- RIBS (GW Permit)
- Subsrf Trnch (GW Permit)
- NPDES Outfall
- Spray Field

Note:  
Tertiary treatment means any specific post-secondary treatment, not necessarily nutrient removal.  
See report for further information.  
<http://www.fao.org/docrep/t0551e/t0551e05.htm>



South Coastal / Selbyville shared ocean outfall 5+/- mi. offshore  
→

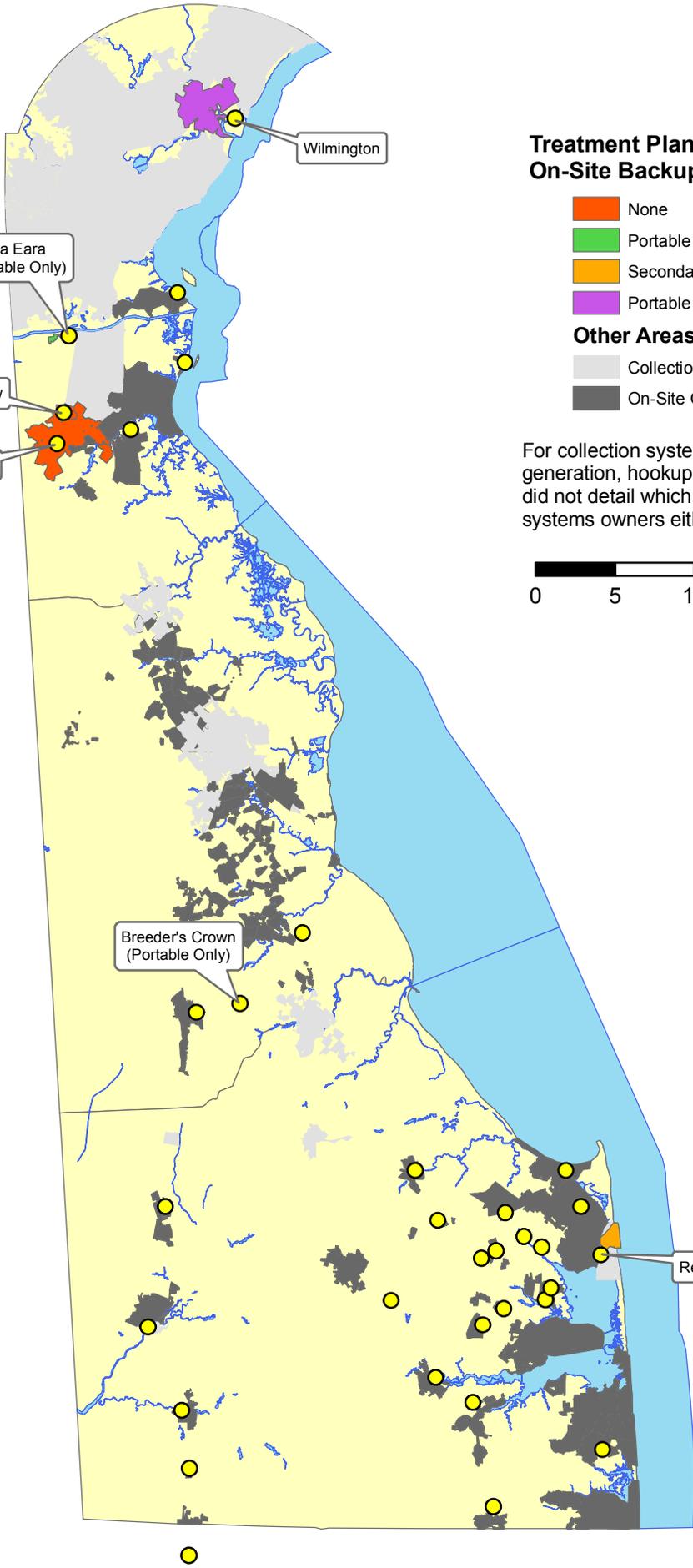


**Sussex**

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**Map 2-1c**  
**Level of Treatment over Watersheds**  
**Sussex County, DE**  
 (Including Major Private Wastewater Utilities)



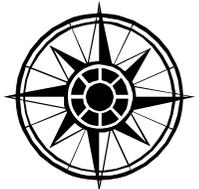
**Treatment Plants without On-Site Backup Power Generation**

- None
- Portable Generator Only
- Secondary Feed Only
- Portable Gen, Secondary Feed

**Other Areas**

- Collection Only
- On-Site Generation

For collection systems, most pump stations have on-site power generation, hookups for portable generators, or both. This survey did not detail which pump stations had on-site generators. All systems owners either own or have access to a portable generator.



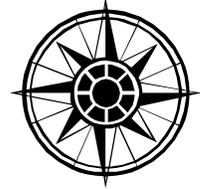
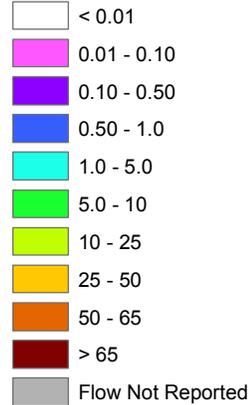
**Map 2-2**  
**Treatment Plant Backup Power Delaware - 2011**  
 (Including Major Private Wastewater Utility Providers)



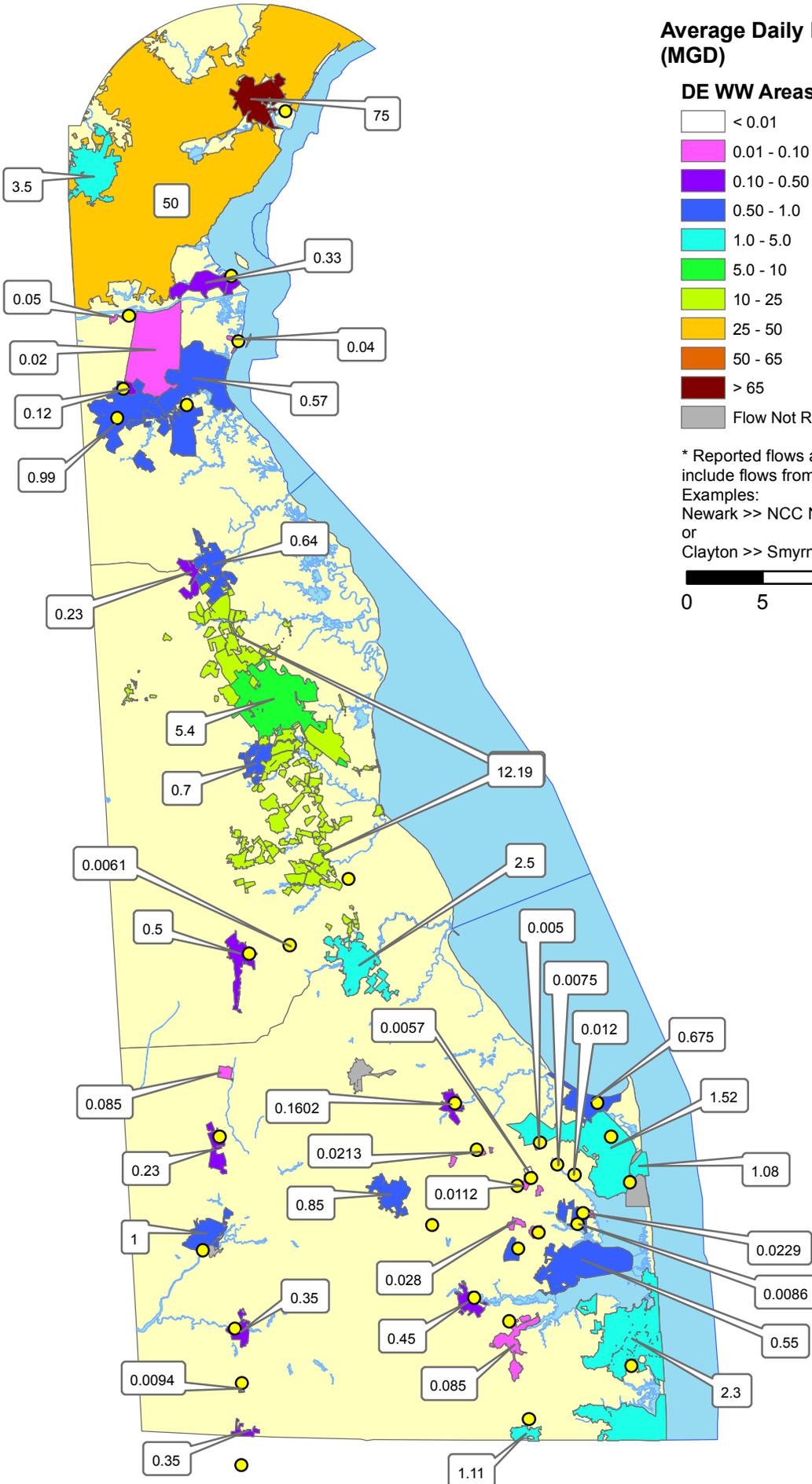
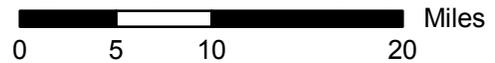
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**Average Daily Flows \*  
(MGD)**

**DE WW Areas**



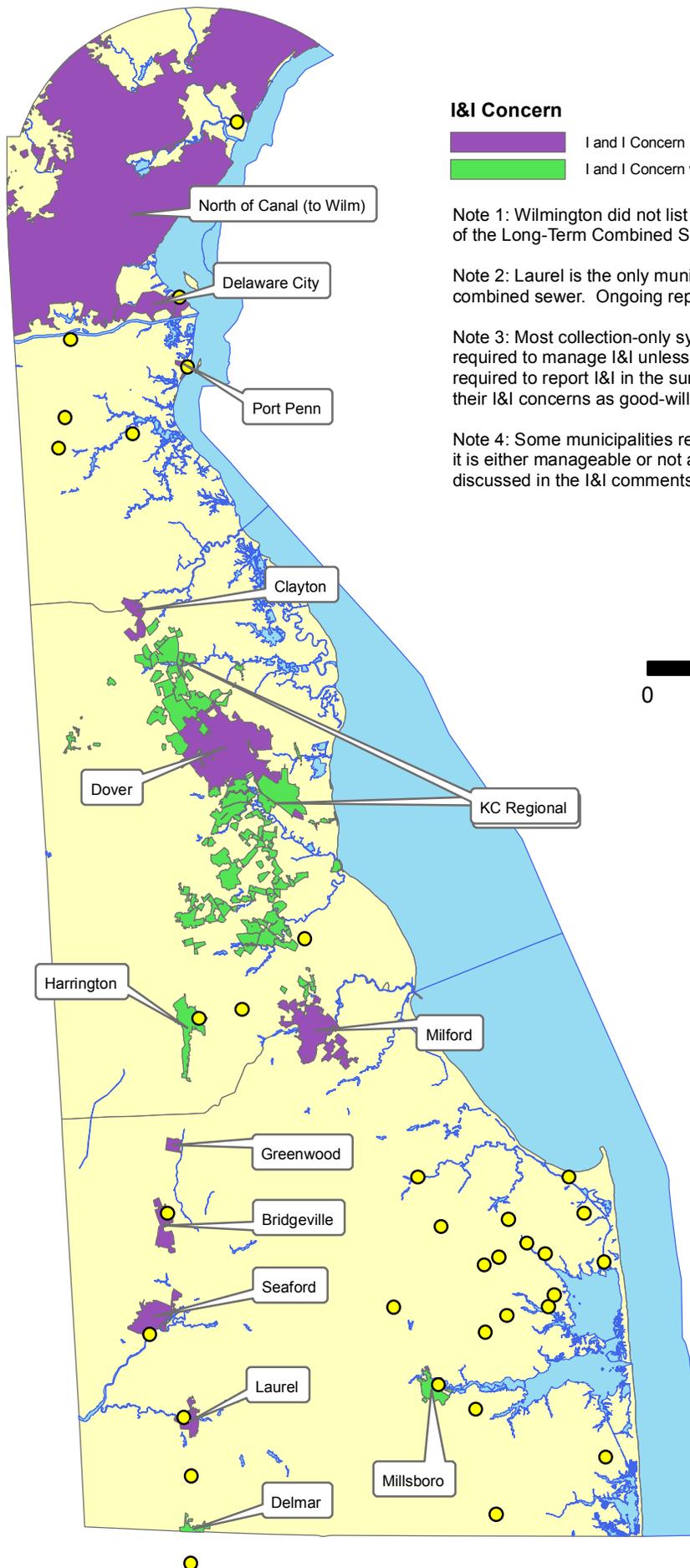
\* Reported flows are cumulative and include flows from contract/satellite users,  
Examples:  
Newark >> NCC North of Canal >> Wilmington  
or  
Clayton >> Smyrna >> Kent County Regional



**Map 2-3**  
Average Daily Wastewater  
Flows by Service Area  
Delaware - 2011  
(Including Major Private  
Wastewater Utility Providers)



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**I&I Concern**

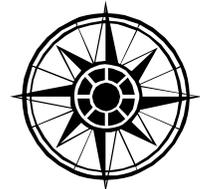
- I and I Concern
- I and I Concern w/ Plant Exceedence

Note 1: Wilmington did not list I & I as a problem in consideration of the Long-Term Combined Sewer Control Strategy.

Note 2: Laurel is the only municipality besides Wilmington that reported combined sewer. Ongoing replacement is part of Laurel's I & I strategy.

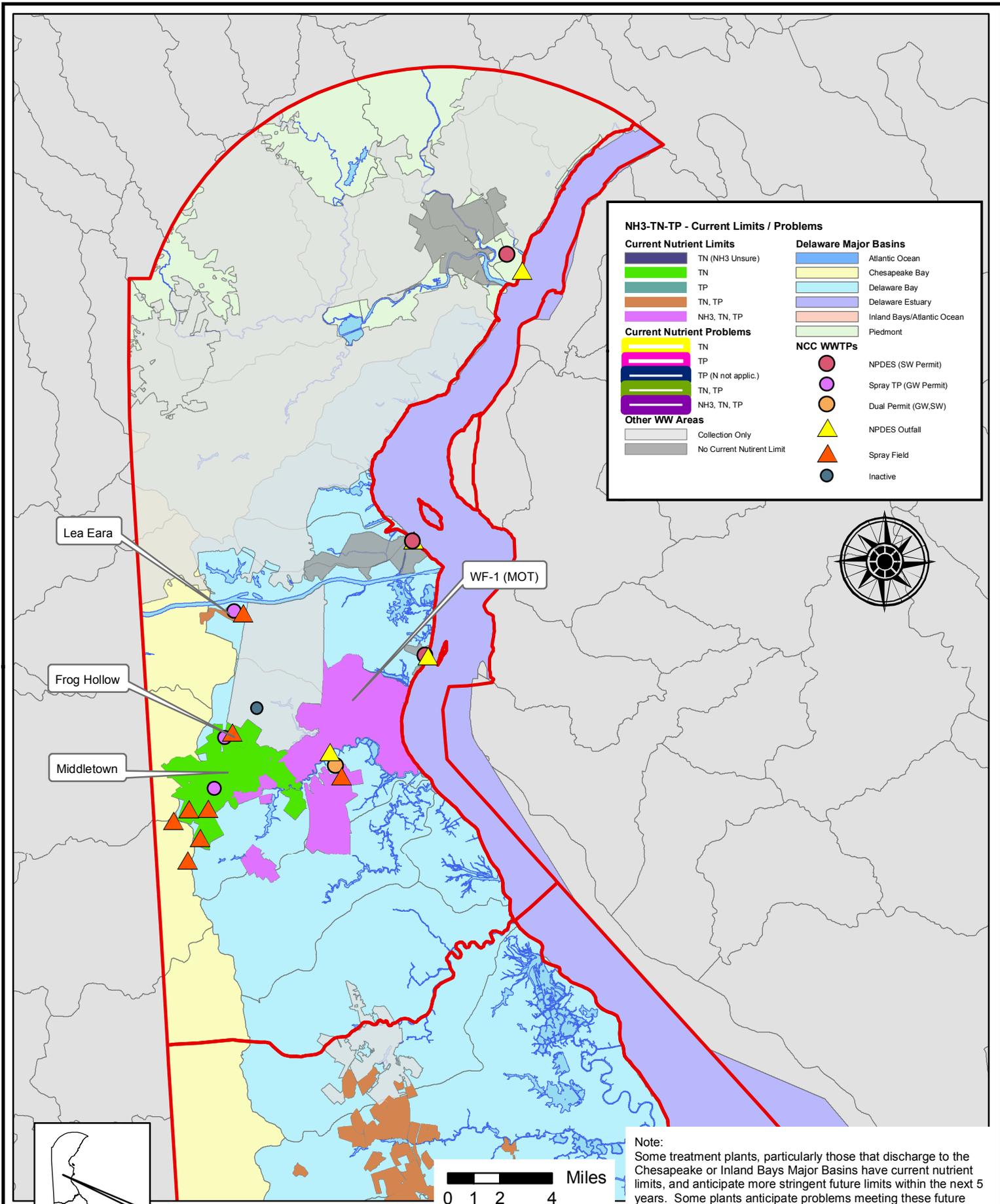
Note 3: Most collection-only systems (contract users) are not required to manage I&I unless requested by the treatment provider, and were not required to report I&I in the survey. Most collection-only systems reported their I&I concerns as good-will towards the state-wide assessment.

Note 4: Some municipalities reported having I & I but feel it is either manageable or not a concern. This is further discussed in the I&I comments or the report.



**Map 2-4**  
 Service Areas with  
 Inflow & Infiltration Concern  
 Delaware - 2011  
 (Including Major Private  
 Wastewater Utility Providers)





**NH3-TN-TP - Current Limits / Problems**

Current Nutrient Limits		Delaware Major Basins	
[Dark Blue]	TN (NH3 Unsure)	[Light Blue]	Atlantic Ocean
[Green]	TN	[Yellow]	Chesapeake Bay
[Light Green]	TP	[Light Blue]	Delaware Bay
[Dark Green]	TN, TP	[Purple]	Delaware Estuary
[Orange]	NH3, TN, TP	[Light Blue]	Inland Bays/Atlantic Ocean
[Pink]	NH3, TN, TP	[Light Green]	Piedmont
Current Nutrient Problems		NCC WWTPs	
[Yellow]	TN	[Red Circle]	NPDES (SW Permit)
[Pink]	TP	[Purple Circle]	Spray TP (GW Permit)
[Dark Blue]	TP (N not applic.)	[Orange Circle]	Dual Permit (GW,SW)
[Light Green]	TN, TP	[Yellow Triangle]	NPDES Outfall
[Dark Green]	NH3, TN, TP	[Orange Triangle]	Spray Field
[Grey]	Inactive	[Blue Circle]	Inactive
Other WW Areas			
[Light Grey]	Collection Only		
[Dark Grey]	No Current Nutrient Limit		

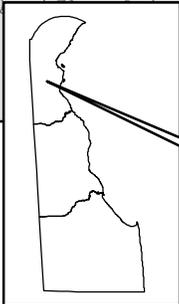


Lea Eara

Frog Hollow

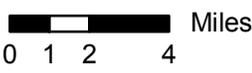
Middletown

WF-1 (MOT)



**New Castle**

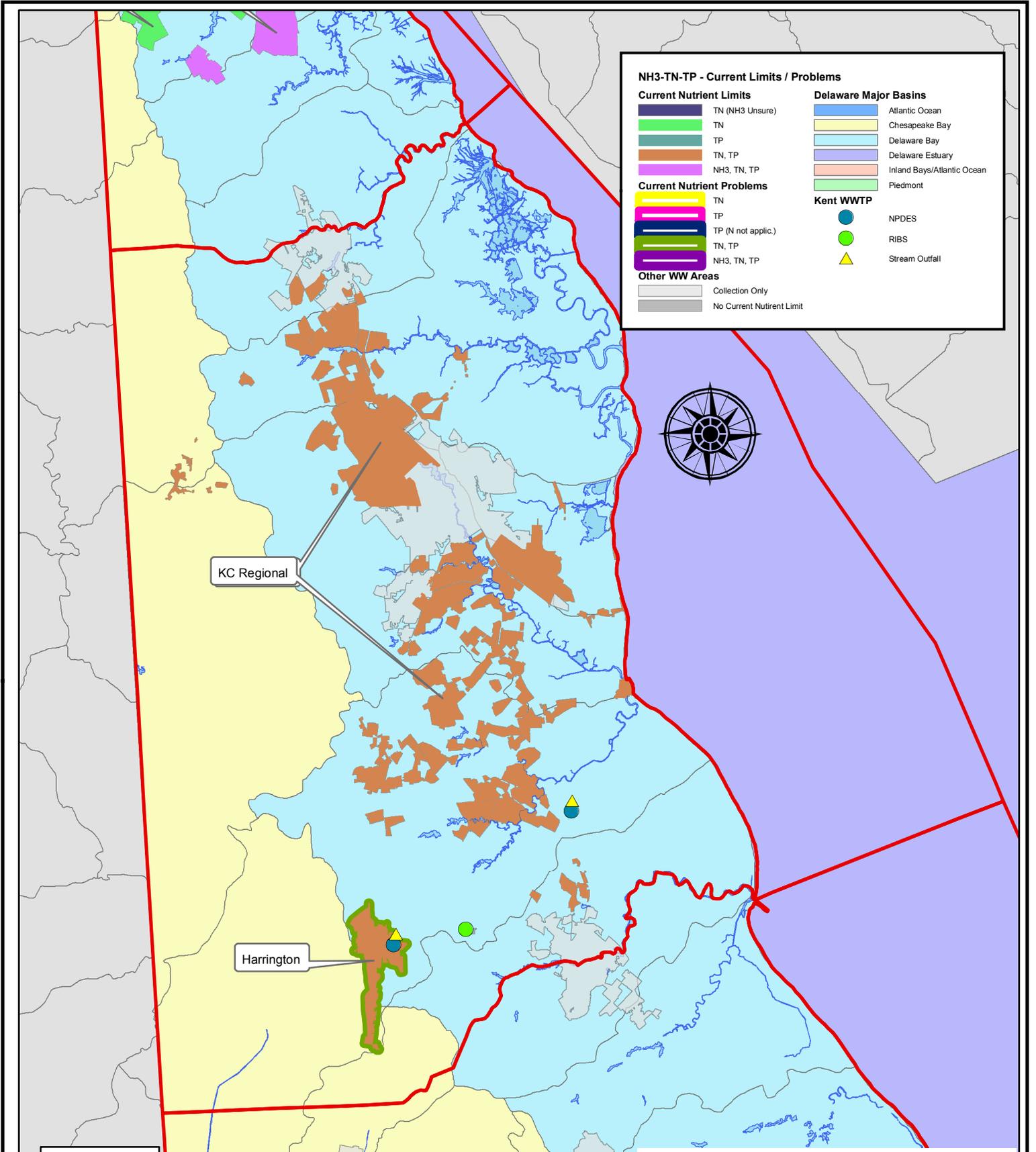
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Note:  
Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.

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**Map 2-5a**  
**Current Nutrient Limits/Problems over Watersheds in New Castle County, DE**  
(Including Major Private Wastewater Utilities)

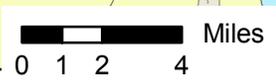


**NH3-TN-TP - Current Limits / Problems**

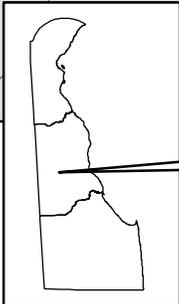
<b>Current Nutrient Limits</b>	<b>Delaware Major Basins</b>
■ TN (NH3 Unsure)	■ Atlantic Ocean
■ TN	■ Chesapeake Bay
■ TP	■ Delaware Bay
■ TN, TP	■ Delaware Estuary
■ NH3, TN, TP	■ Inland Bays/Atlantic Ocean
	■ Piedmont
<b>Current Nutrient Problems</b>	<b>Kent WWTP</b>
■ TN	● NPDES
■ TP	● RIBS
■ TP (N not applic.)	▲ Stream Outfall
■ TN, TP	
■ NH3, TN, TP	
<b>Other WW Areas</b>	
■ Collection Only	
■ No Current Nutrient Limit	

KC Regional

Harrington



**Note:**  
 Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.

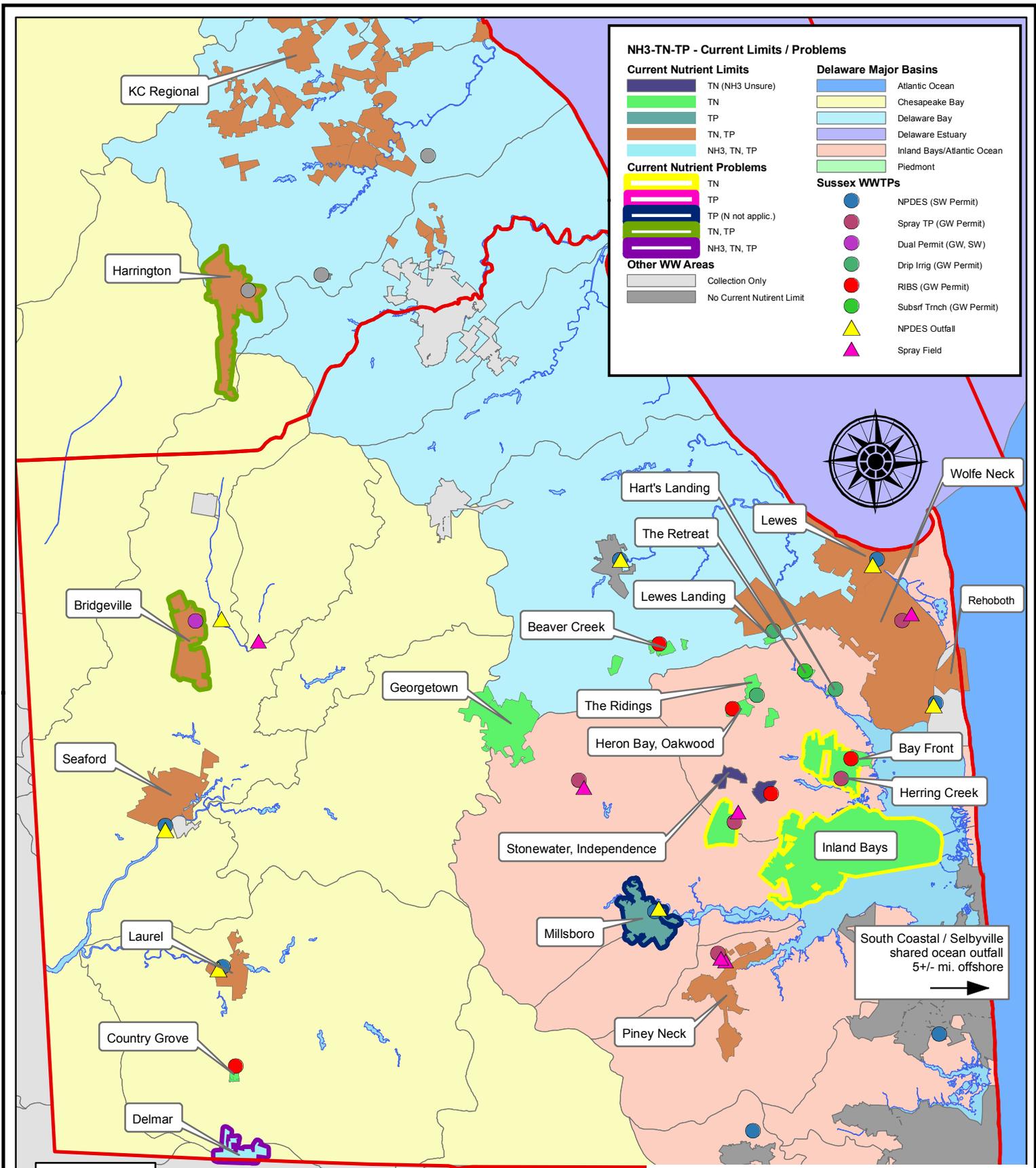


**Kent**

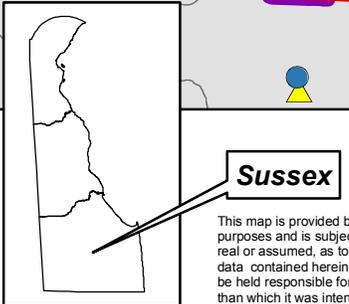
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**Map 2-5b**  
**Current Nutrient Limits/Problems over Watersheds in Kent County, DE**  
 (Including Major Private Wastewater Utilities)



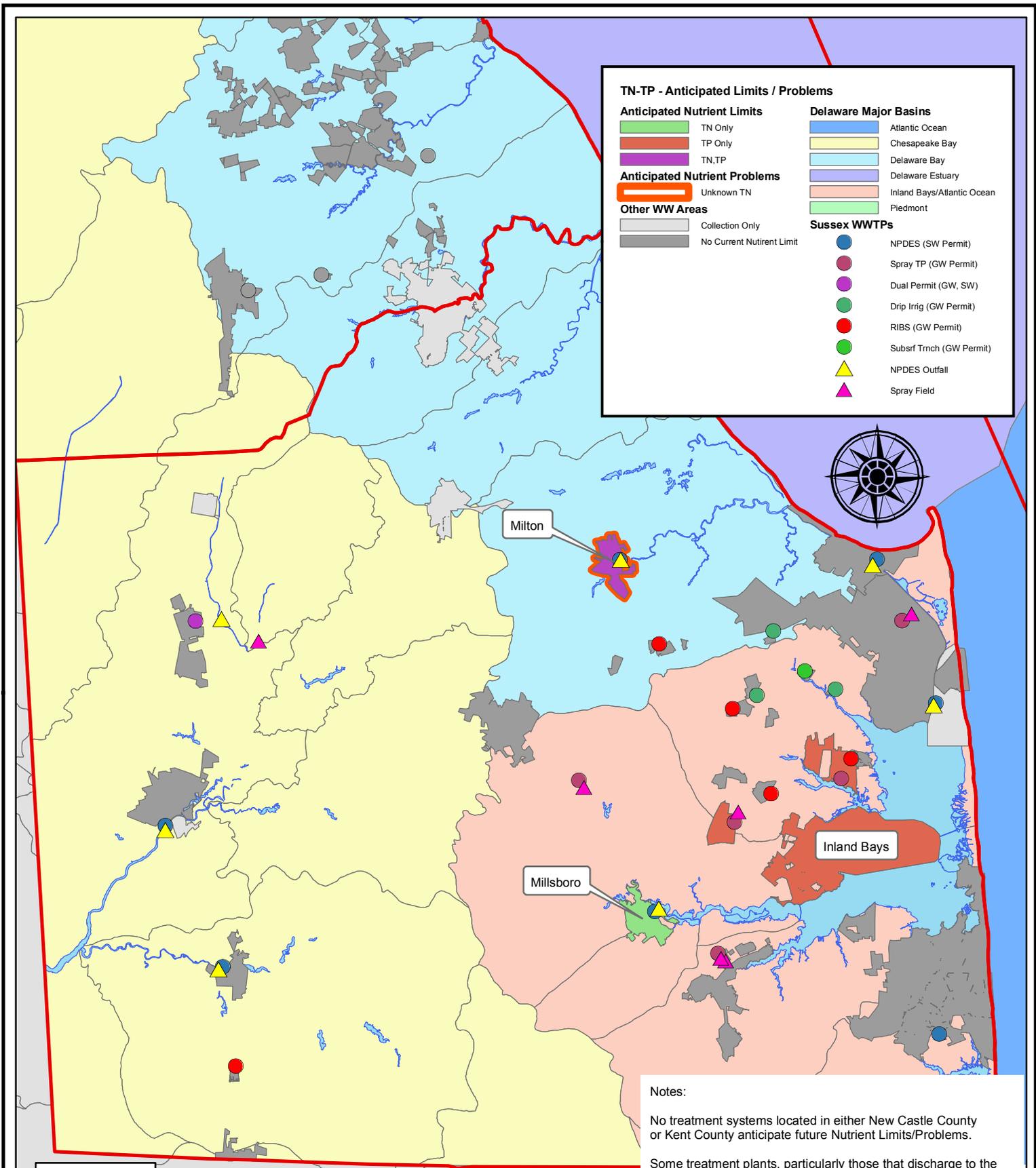
Note:  
 Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.



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**Map 2-5c**  
**Current Nutrient Limits/Problems over Watersheds in Sussex County, DE**  
 (Including Major Private Wastewater Utilities)



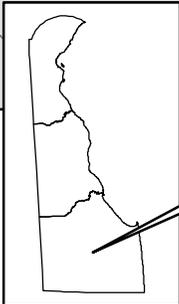
**TN-TP - Anticipated Limits / Problems**

<b>Anticipated Nutrient Limits</b>	<b>Delaware Major Basins</b>
<span style="display:inline-block; width:15px; height:10px; background-color:lightgreen; border:1px solid black;"></span> TN Only	<span style="display:inline-block; width:15px; height:10px; background-color:lightblue; border:1px solid black;"></span> Atlantic Ocean
<span style="display:inline-block; width:15px; height:10px; background-color:orange; border:1px solid black;"></span> TP Only	<span style="display:inline-block; width:15px; height:10px; background-color:yellow; border:1px solid black;"></span> Chesapeake Bay
<span style="display:inline-block; width:15px; height:10px; background-color:purple; border:1px solid black;"></span> TN,TP	<span style="display:inline-block; width:15px; height:10px; background-color:lightblue; border:1px solid black;"></span> Delaware Bay
<span style="display:inline-block; width:15px; height:10px; background-color:orange; border:1px solid black; border-style:dashed;"></span> Unknown TN	<span style="display:inline-block; width:15px; height:10px; background-color:purple; border:1px solid black;"></span> Delaware Estuary
<b>Other WW Areas</b>	<span style="display:inline-block; width:15px; height:10px; background-color:lightpink; border:1px solid black;"></span> Inland Bays/Atlantic Ocean
<span style="display:inline-block; width:15px; height:10px; background-color:grey; border:1px solid black;"></span> Collection Only	<span style="display:inline-block; width:15px; height:10px; background-color:lightgreen; border:1px solid black;"></span> Piedmont
<span style="display:inline-block; width:15px; height:10px; background-color:grey; border:1px solid black;"></span> No Current Nutrient Limit	<b>Sussex WWTPs</b>
	<span style="display:inline-block; width:10px; height:10px; background-color:blue; border-radius:50%; border:1px solid black;"></span> NPDES (SW Permit)
	<span style="display:inline-block; width:10px; height:10px; background-color:purple; border-radius:50%; border:1px solid black;"></span> Spray TP (GW Permit)
	<span style="display:inline-block; width:10px; height:10px; background-color:purple; border-radius:50%; border:1px solid black;"></span> Dual Permit (GW, SW)
	<span style="display:inline-block; width:10px; height:10px; background-color:green; border-radius:50%; border:1px solid black;"></span> Drip Irrig (GW Permit)
	<span style="display:inline-block; width:10px; height:10px; background-color:red; border-radius:50%; border:1px solid black;"></span> RIBS (GW Permit)
	<span style="display:inline-block; width:10px; height:10px; background-color:green; border-radius:50%; border:1px solid black;"></span> Subsrf Trnch (GW Permit)
	<span style="display:inline-block; width:10px; height:10px; background-color:yellow; border:1px solid black;"></span> NPDES Outfall
	<span style="display:inline-block; width:10px; height:10px; background-color:purple; border:1px solid black;"></span> Spray Field

**Notes:**

No treatment systems located in either New Castle County or Kent County anticipate future Nutrient Limits/Problems.

Some treatment plants, particularly those that discharge to the Chesapeake or Inland Bays Major Basins have current nutrient limits, and anticipate more stringent future limits within the next 5 years. Some plants anticipate problems meeting these future limits, as discussed in the narrative report.

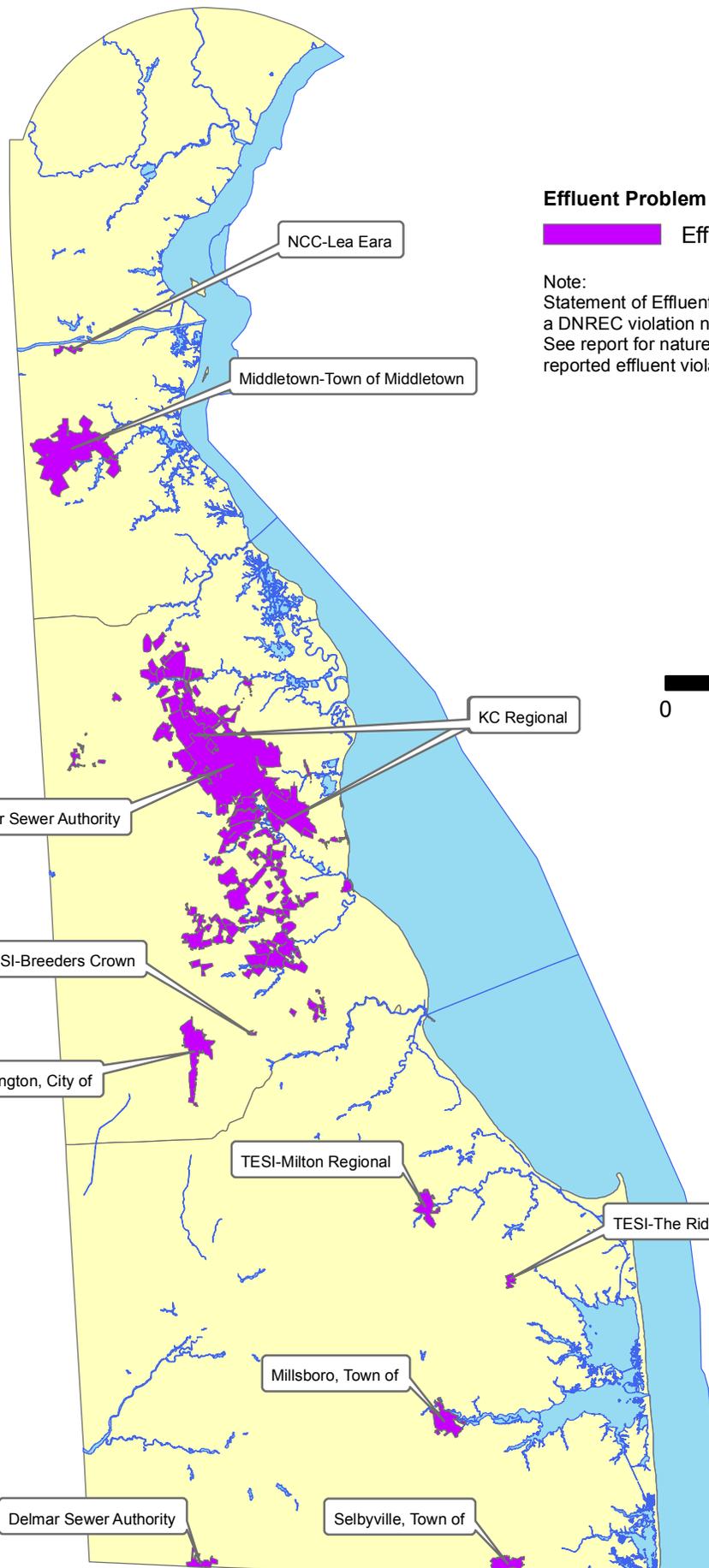


**Sussex**

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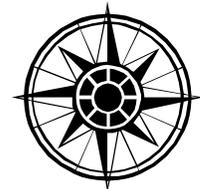
**Map 2-6a**  
**Anticipated Nutrient Limits/Problems over Watersheds in Sussex County, DE (Including Major Private Wastewater Utilities)**



**Effluent Problem**

 Effluent Problem Reported

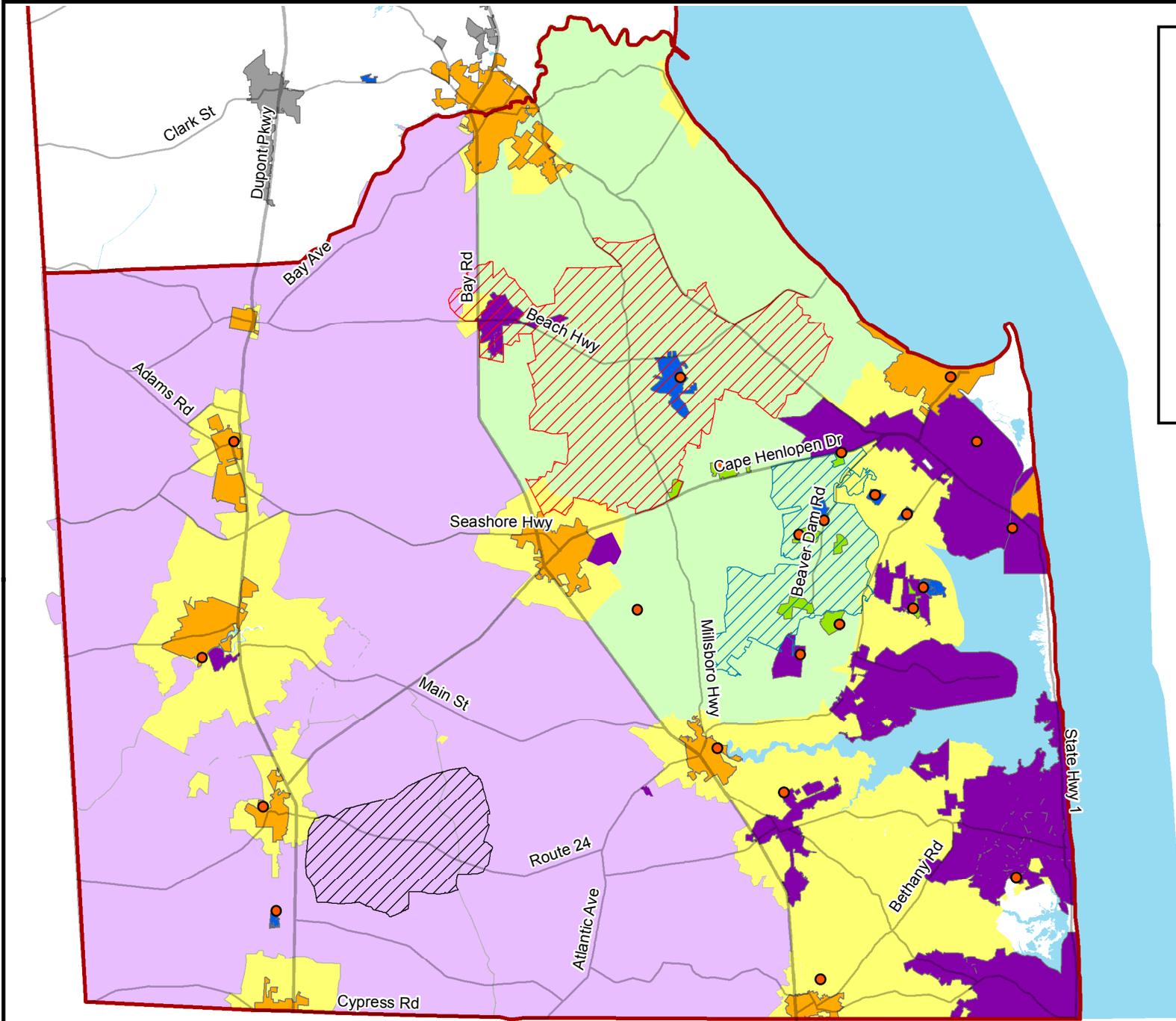
Note:  
Statement of Effluent Problems may not indicate a DNREC violation notice or non-compliance. See report for nature of effluent problems. Most of the reported effluent violations were temporary and instantaneous.



**Map 2-7a**  
Effluent Problems  
Delaware - 2011  
(Including Major Private  
Wastewater Utility Providers)

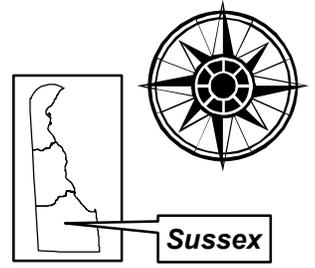


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**Legend**

- Municipal District
- Artesian District
- Artisian - ANSWRF Planning Area
- Tidewater (TESI) District
- TESI - Wandendale Planning Area
- TESI - Trussum Planning Area
- Sussex County District
- Sussex Anticipated Growth Areas
- Sussex Western Planning Area
- Sussex North Planning Area
- Other
- WWTP



Notes:  
 Municipal Limits may not match Sewer Area Limits or CPCN Areas.  
 Data is as of December 2010 through March 2011, and may not reflect current status.  
 Data was provided by Sussex County, Artesian, and Tidewater.  
 "Missing" areas, such as Cape Henlopen area were not provided in the data set.



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**Map 3-1a**  
 Planning and Growth Areas in Sussex County Delaware - 2011  
 (Including Major Private Wastewater Utilities)

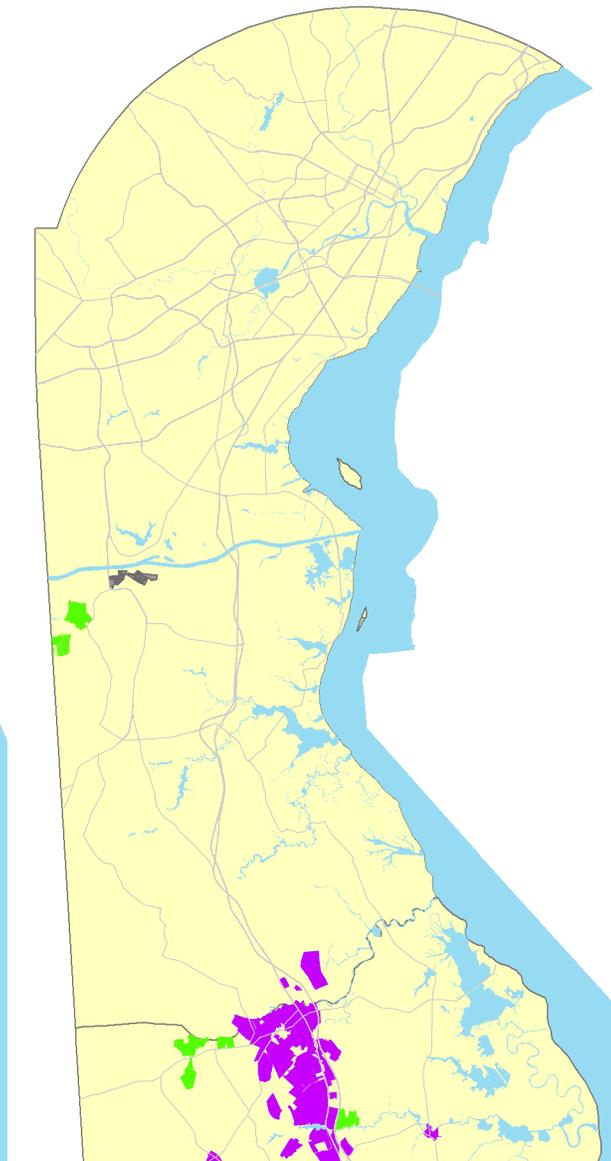
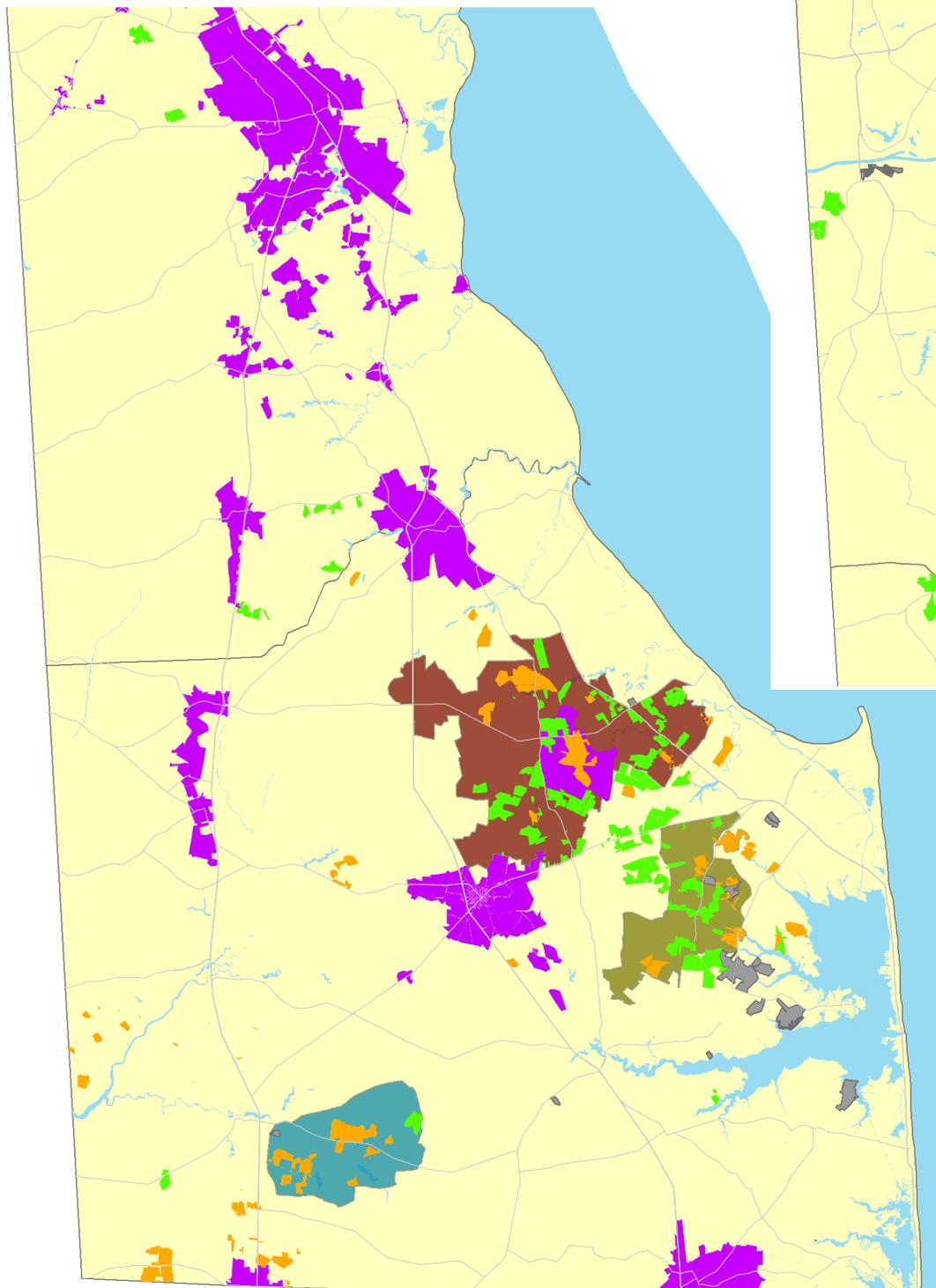
## Legend

### CPCN Areas

-  Municipal (Town or County)
-  Artesian
-  Tidewater (TESI)
-  Other (Small Private Facilities)

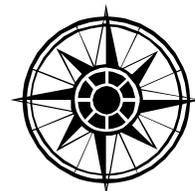
### Private Planning Areas

-  Artesian - ANSWRF Planning Area
-  TESI - Trussum Planning Area
-  TESI - Wandendale Planning Area



Notes:  
CPCN Areas were downloaded from Delaware's Public Service Commission website between December 2010 and March 2011.

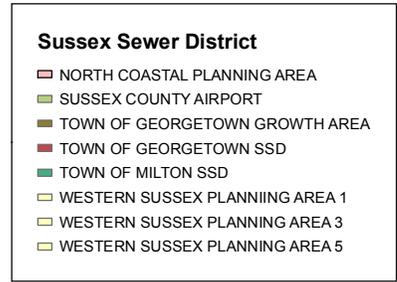
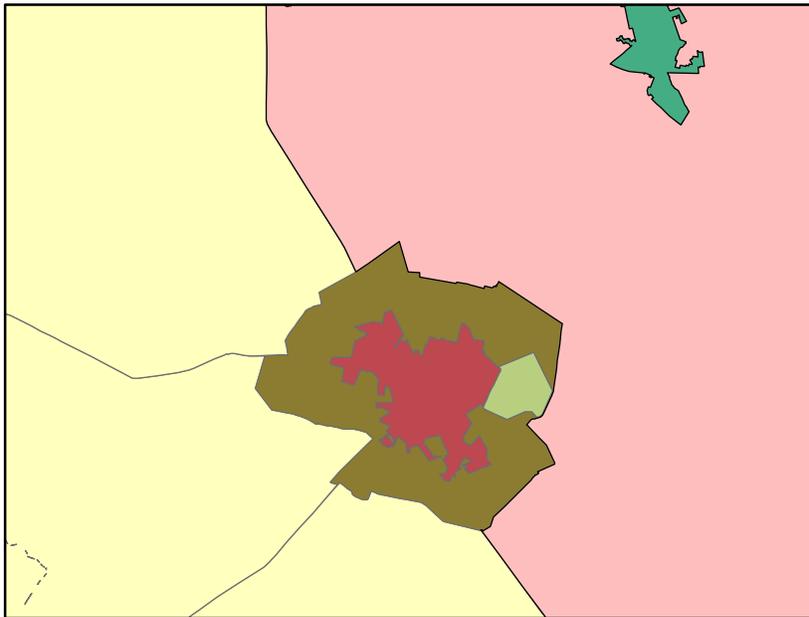
Data may not reflect current status of data or CPCN Areas.



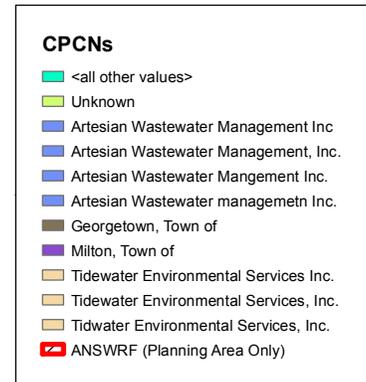
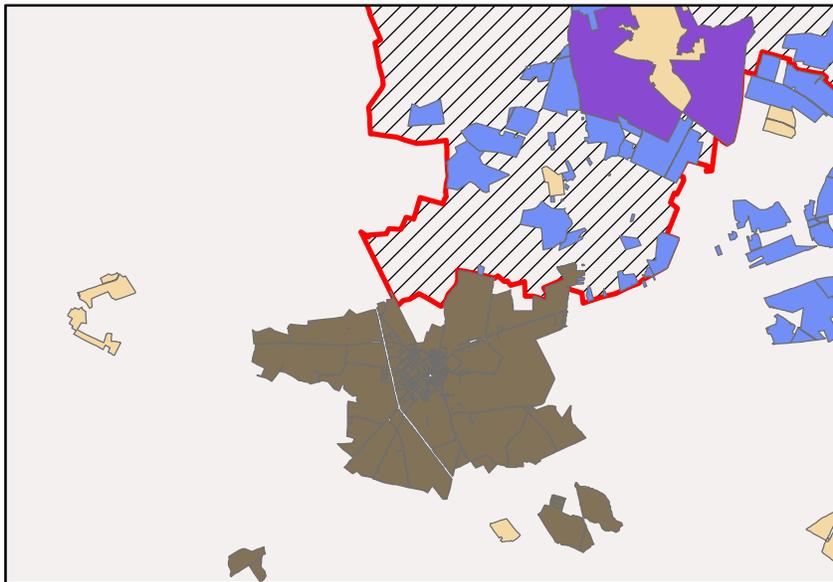
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**Map 3-1b**  
CPCN Areas  
Delaware - 2011  
(Including Major Private  
Wastewater Utility Providers)



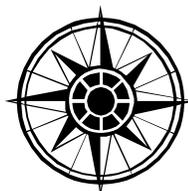


Town of Gergetown and Milton Service Area & Growth Area per Sussex County's Sewer District Shapefile



This area is shown as an example of the discrepancy between municipal boundaries and CPCN areas on record at the PSC. It is not specific to this area and is typical throughout the state.

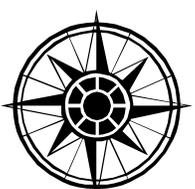
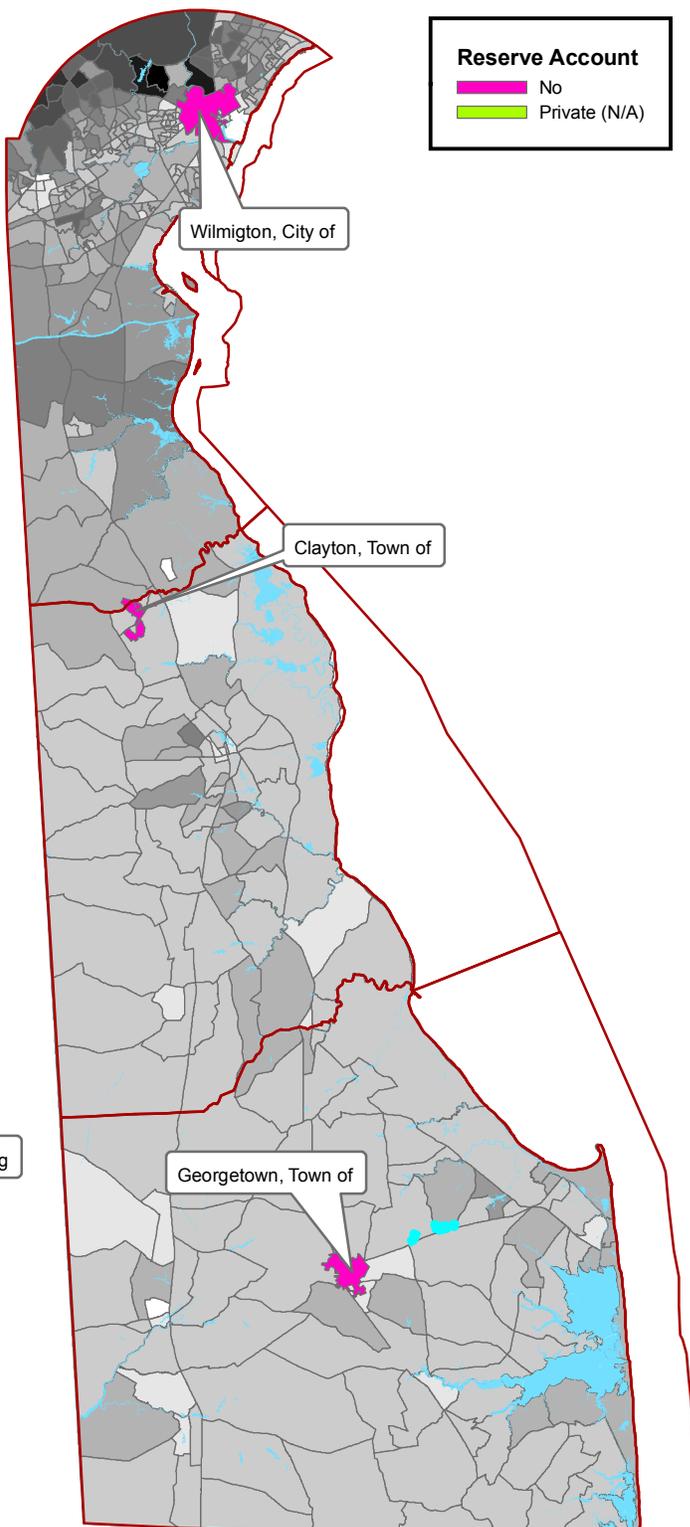
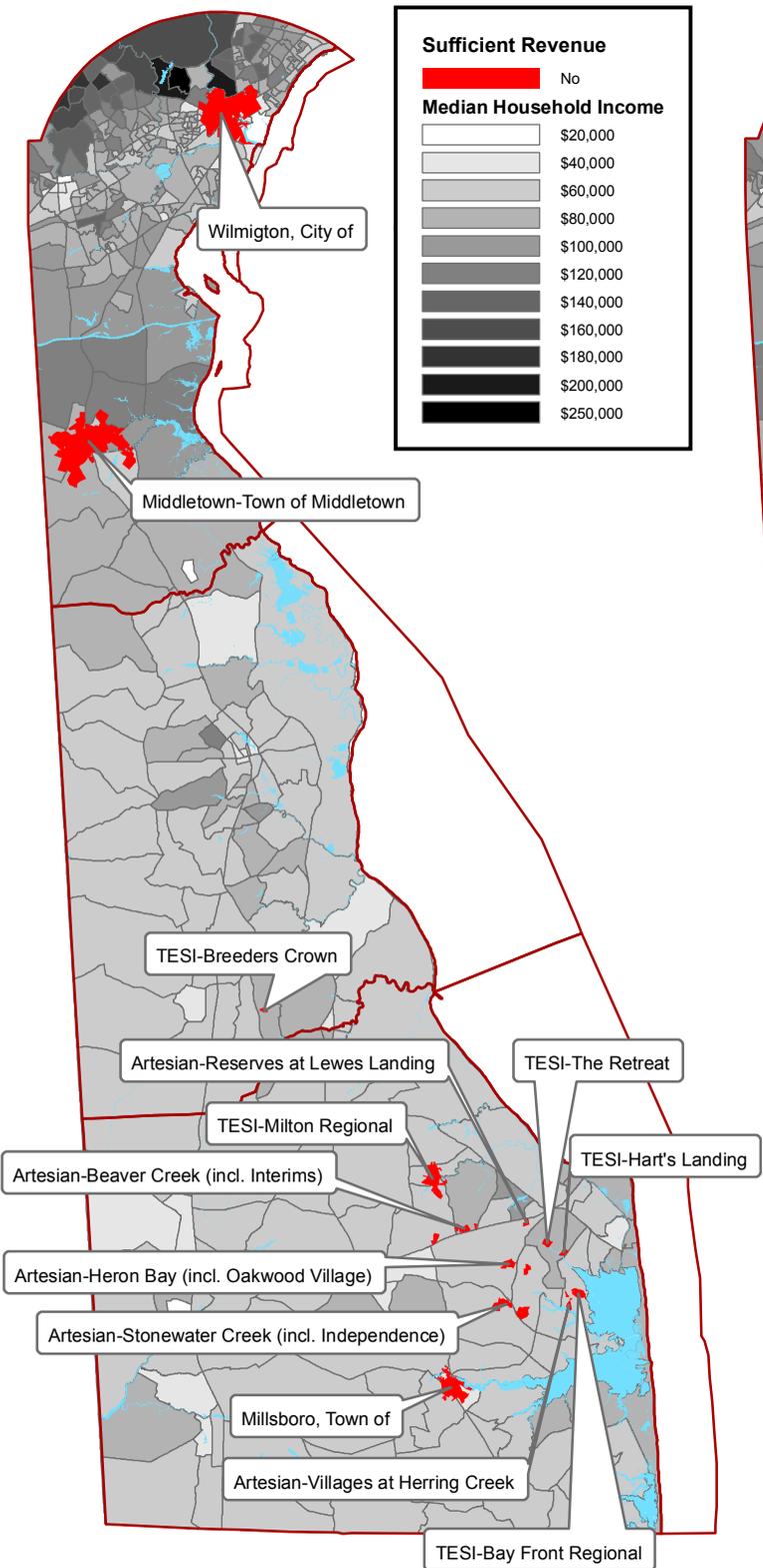
Town of Georgetown, Milton, and Surrounding Areas by CPCN per PSC shapefile (w/ Artesian Planning Area underlay)



**Map 3-1c**

Map of Georgetown Area  
Sussex County vs. CPCN's  
Sewer Coverage Area





Note:  
 Sufficient Revenue and Reserve Account Maps are reflective of the interview period (Dec 2010 through March 2011) and may not reflect current status.

**Map 4-1**  
 Sufficient Revenue to WW over MHI;  
 Reserve Dedicated to WW over MHI  
 (Census 2000 w/ CPI floated to 2010)  
 Delaware - 2011



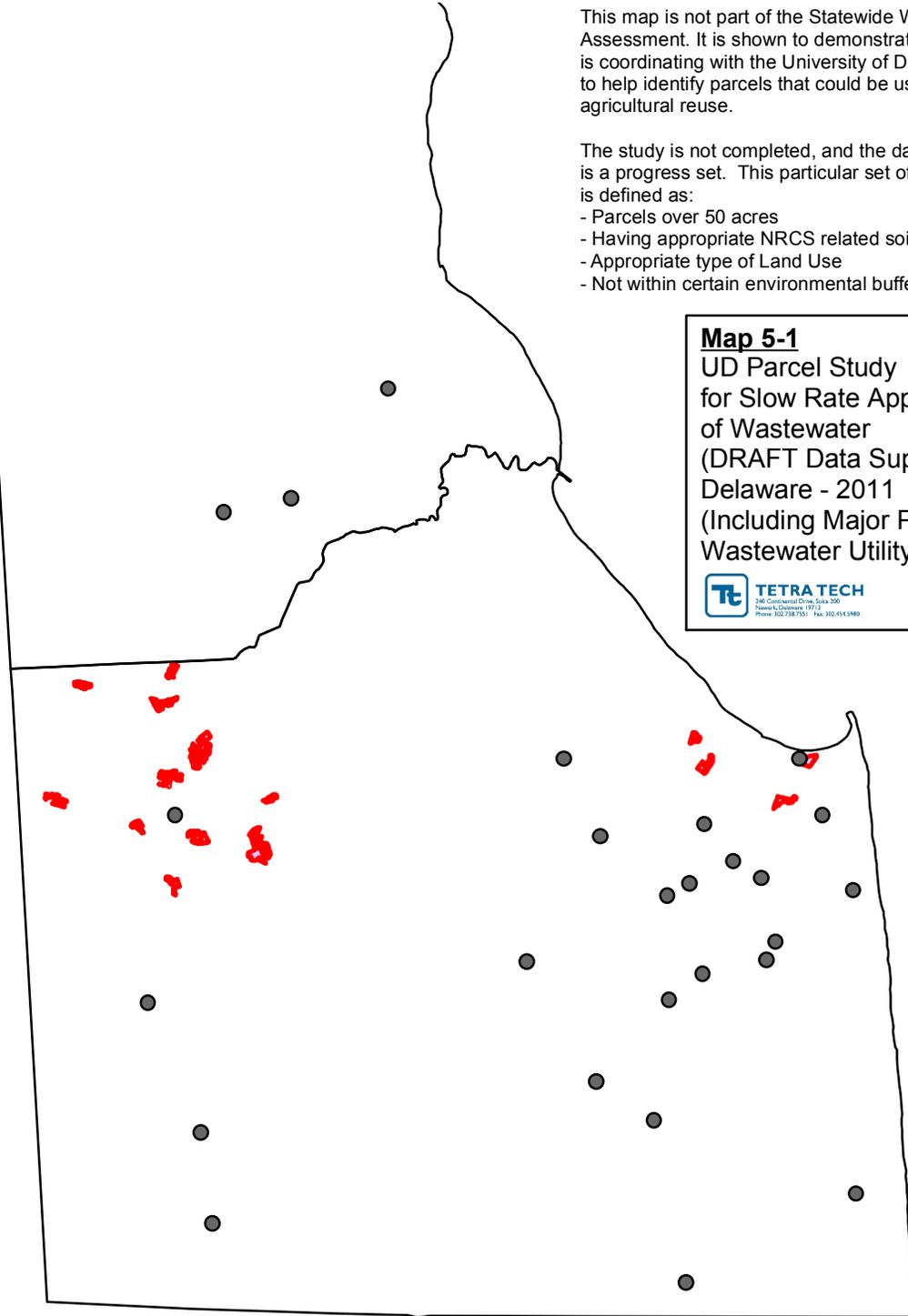
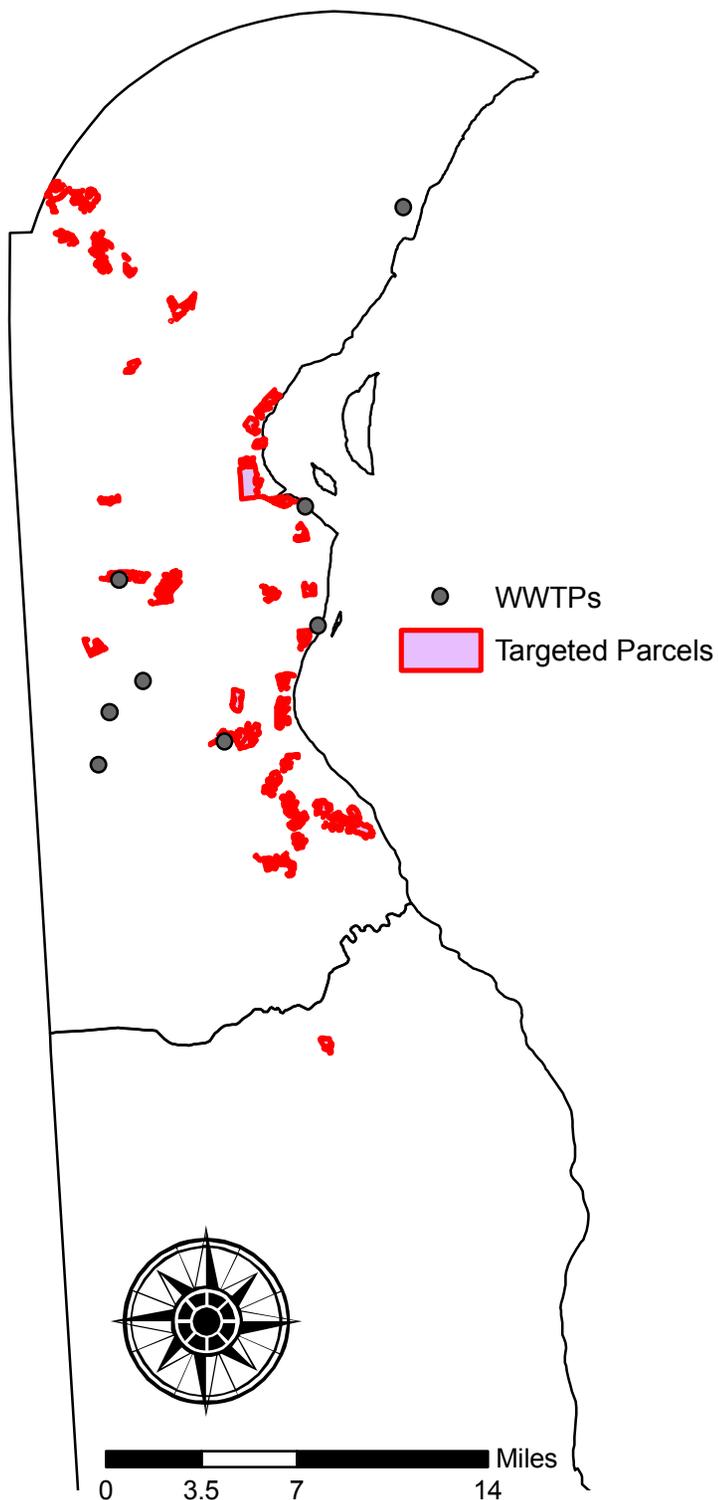
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This map is not part of the Statewide Wastewater Assessment. It is shown to demonstrate that the State is coordinating with the University of Delaware to help identify parcels that could be used for agricultural reuse.

The study is not completed, and the data provided is a progress set. This particular set of parcels is defined as:

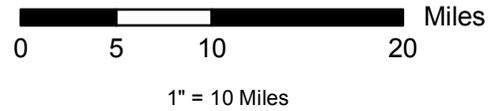
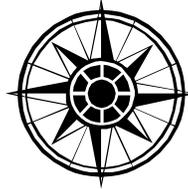
- Parcels over 50 acres
- Having appropriate NRCS related soils
- Appropriate type of Land Use
- Not within certain environmental buffers

**Map 5-1**  
UD Parcel Study  
for Slow Rate Application  
of Wastewater  
(DRAFT Data Supplied by UD)  
Delaware - 2011  
(Including Major Private  
Wastewater Utility Providers)



# Legend

- ★ VisitedMHPs-2010Survey
- ▲ LargeSystem
- MobileHomeComm
- DEWWserviceareas



Twin Maples  
Mobile Home Park

Paris Investments, Inc

St. Jones Reserve

Hill Top and Spoonbill Drive

Chelesa Villa  
Subdivision

Grants Way  
(Moore-Grant  
Subdivision Sanitation)

Morningside Village  
(Wheatley Farms)

County Seat Gardens (Garden Estates)

Walkers Meadow (Mill)

Fishermill Trailer Park

Mobile Gardens MHP  
(Hollyview)

Layton's Riveara

Briarwood Manor

Scottsdale MHP

Pepper Ridge

**Map 6-1**  
Visited Mobile Home Parks  
Delaware - 2011



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