

## Chapter 8

### Water Resources Element

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#### Section 8.1: PURPOSE OF ELEMENT

The Land Use Article of the Maryland Annotated Code, requires a Water Resources Element (WRE) in the Comprehensive Plan that addresses the adequacy of water supply and the suitability of receiving waters for point and non-point discharges. The WRE must evaluate the adequacy and suitability of water resources based on existing and future land use, both within the Town and within the Town's growth area. Thus, the WRE is based on the Land Use and Municipal Growth elements of the Comprehensive Plan. It is also tied to the Community Facilities element (for water and sewer), and to the Plan's environmental goals and policies for protecting water supply and water quality.

#### Section 8.2: Goals and Objectives

##### 8.2.1: Water Supply

- ◆ The Town will provide an adequate supply and a good quality of water for existing and planned development, consistent with the Comprehensive Land Use Plan and with the State's goals and programs for water resources.
  - ❖ The Town will provide and maintain infrastructure including a system of raw water impoundments, filtration plants, pumps, underground and elevated tanks, distribution lines, and other components for water treatment, storage, and delivery.
  - ❖ The Town will consider new study results from USGS, MDE, and other sources as part of the State-mandated six-year Plan review process, and adjust and recommend actions, as appropriate.
  - ❖ The Town will adopt a Water Supply Capacity Management Plan, using MDE's model as input.
- ◆ The Town will implement measures to avoid or minimize risks associated with potential contamination or degradation of water sources from the surface.
  - ❖ The Town will continue to monitor water usage to periodically assess the adequacy of water supply and will continue to make individual and cumulative assessments about the resource demands and impacts associated with development projects.

- ❖ The Town will encourage Cecil County to protect water quality of the streams that the Town depends upon for raw water supply. This includes implementation of the County's plans for rural conservation and preservation, and reforestation. The Town recommends that the County implement the use of 200-foot buffers along stream edges and require reductions in impervious surfaces for future development.

### 8.2.2: Water Quality

- ◆ The Town will strive to achieve MDE's TMDL for point and non-point sources in the Northeast River watershed.
  - ❖ The Town will update the Water Resources Element to incorporate new TMDLs.
  - ❖ The Town will require the use of Best Management Practices (BMPs) for development on infill parcels and in growth areas. BMP's that are effective in phosphorous, nitrogen, and sediment removal will be required. BMPs include, but are not limited to, low impact design, stream setbacks, tree plantings, creation of natural areas around streams and wetlands, minimized impervious surface, avoidance of sensitive areas, and stormwater management.
  - ❖ The Town will require that impervious surfaces be minimized insofar as possible, consistent with the type of land use planned and zoned. High levels of impervious surface will be offset with suitable plantings and large setbacks, especially around associated streams, and wetlands.
  - ❖ The Town will use the Tributary Strategy as a guide for planning and as a consideration in decision-making.
- ◆ The Town will minimize the adverse impacts of development and growth in the watershed and the larger Eastern Shore Basin.
  - ❖ The Town will require that developers identify and map wetland areas on-site and in adjacent areas using the following sources:
    - National wetlands Inventory
    - DNR wetland data layers (GIS)
    - MDE's associated priority preservation and restoration areas
    - Hydric soils maps
    - 100-year floodplain maps

- ❖ The Town will consider new study results from USGS, MDE, and other sources as part of the State-mandated ten-year Plan review process, and adjust and recommend actions, as appropriate.
- ❖ The Town will identify, as part of the on-going planning process, potential sites for wetland and stream mitigation that can be used to mitigate impacts of capital projects where impact avoidance is not possible.
- ❖ The Town will adopt a Wastewater Capacity Management Plan, using MDE's model as input.

### **Section 8.3: WATER SUPPLY**

The Town of North East straddles the geographic fall line that separates the Atlantic Coastal Plain province (composed of unconsolidated sediments) from the Piedmont Plateau province (composed of crystalline rock). In terms of water resources, the Town's dual hydro-geological settings offer two advantages: 1) the potential for high-yield wells from Coastal Plain aquifers, and 2) the potential for raw water impoundments fed by rapidly flowing year-round non-tidal streams, coming out of the Piedmont. While the Town's water system relies on reservoirs of raw water, fed by North East Creek and Little North East Creek, the following review of groundwater supply may be useful for long term planning.

The potential for high-yield groundwater production in the Coastal Plain is substantial. Long term quantity is not a problem. The productivity is about ten times greater than wells in crystalline rock. The peninsula south of Town (between the Northeast and Elk Rivers) is a favorable location for wells, with potential well depths ranging from 30 to 500 feet (brackish water exists at depths greater than 500'). Some large wells in this part of the Coastal Plain can produce over 1000 gallons per minute (gpm).

In and around North East, groundwater is stored in the Potomac group aquifers. Wells that reach the bottom horizons of the aquifer can produce yields of 200 to 500 gpm. Withdrawals of groundwater can cause a "cone of depression" in the immediate area (a lowering of groundwater levels), making the placement, depth, and adequate separation of wells important considerations for planning. Although the Potomac aquifers are confined, they can leak in places, causing shifts and exchanges over time. In general, estimates of groundwater yield in Coastal Plain wells are fairly accurate (and more so than in Piedmont wells).

The quality of the ground water in all of Cecil County is generally acceptable for all uses. The groundwater is soft; many Coastal Plain wells contain iron and have a low pH. All these conditions can be treated. With properly constructed wells, pollution of groundwater poses little problem as the surface geology provides protective filtering of potential contaminants.

### **8.3.1: TOWN WATER SYSTEM**

The Town owns and operates a public water supply system serving the Town and adjacent areas within Cecil County. The existing water system includes two water treatment plants, the Rolling Mill Water Treatment Plant (RMWTP) and the Leslie Water Treatment Plant (LWTP). Finished water is supplied to the Town's distribution system which includes a network of 50 miles of piping, five distribution system finished water storage tanks, three pump stations including two booster pump stations and an emergency raw water pump station, and eight pressure zones. The five finished water storage tanks throughout the system provide a total storage capacity of 2.28 million gallons of storage to meet peak water demands.

### **8.3.2: Raw Water Supply**

The RMWTP is located at the eastern end of Rolling Mill Road. The LRWTP is located at the eastern end of North Leslie Road. The LRWTP withdraws water from the Northeast Creek, and the RMWTP withdraws water from the Little North East Creek. During periods of low creek flows, the LRWTP shuts down, and the difference is made up by water from the RMWTP. The RMWTP is notable as the first surface water direct filtration plant approved for water supply in Maryland.

The Town's water system is regulated by the Maryland Department of the Environment (MDE). Federal and state laws govern the activities of MDE. MDE controls water appropriation of surface and ground waters. "Appropriation" is a withdrawal for use of water from its source of natural occurrence. A public water supply system must obtain a permit from MDE for water appropriation. A water appropriation and use permit will state the permittees allowable daily average of withdrawal, on a yearly basis, and maximum daily withdrawal.

The Town's current water appropriation permit for the RMWTP is:

Daily Average: 1,383,000 gpd (gpd)

Maximum Day: 3,200,000 gpd

The Town's current water appropriation permit for the LRWTP is:

Daily Average: 325,000 gpd

Maximum Day: 620,000 gpd

The Town also has an Emergency Raw Water Pump Station (ERWPS) located on Walnut Street adjacent to the North East Community Park. This pump station can supply water to the RMWTP in case of an emergency.

The Town's appropriation permit for the ERWPS is:

Daily Average: 559,000 gpd

Maximum Day: 3,862,000 gpd

All three of The Town's appropriation permits were effective on May 1, 2004.

Additional details related to the RMWTP and the LWTP are summarized in Table 1. This table includes the actual average daily flow at each plant between 2014-2018, the maximum and average daily permitted flows, and the average and maximum design capacity of each treatment plant.

**Table 8.3.1: Water Treatment Plants**

Water Treatment Plant	Actual Avg. Daily Flow (mgd) (2014-2018)	Max Daily Flow permitted (mgd)	Avg. Daily Flow Permitted (mgd)	Design Capacity: Avg. / Max. (mgd)
Rolling Mill	0.369	3.200	1.383	Phase One: 1.15 / 2.0 Phase Two (future): 2.3 / 4.0
Leslie	0.265	0.620	0.325	0.547 / 0.820
TOTAL	0.634	3.820	1.708	Current: 1.697 / 2.830 With Phase Two: 2.847 / 4.830

#### **Section 8.4: PROJECTED WATER DEMAND FOR THE TOWN AND GROWTH AREA**

In 2019, the Town prepared a 20 Year Water System Master Plan (WMP). The Master Plan's purpose was to evaluate the Town's existing water system, establish future needs and potential shortcomings in the system. The plan also identified the necessary projects over a 20-year timeframe to continue to sustain the Town's water system. To analyze the current and potential demand, the WMP updated an existing growth analysis technique prepared by RK&K in 1996.

Since the WMP seeks to determine where water needs exist for areas that are already developed and for areas where development potential exists, a more rigorous analysis of need was required. For analysis of growth for both commercial and residential needs, the WMP had considered properties that were already occupied that utilized well or non-utility-based water, anticipating future connections would be needed.

Further, the WMP utilized WILAMPCO's demographic projections to 2040 based on the geography of Traffic Analysis Zones (TAZ) issued in 2017. The TAZ data was overlaid on the Town's water system's pressure zones to determine the anticipated projected population to be served. A ratio of non-connected land in both residential and commercial categories was applied to the TAZ areas to determine gpd needs projection for the Growth Area and within the Town's Corporate Boundary. TAZ and Pressure Zone boundaries are provided in Figure 1 below.

For the purposes of the Projected Water Demand portion of this element of the comprehensive plan. The analysis provided in the WMP is being applied.

The Town's water system currently serves approximately 2,800 customers and nearly 9,000 people. In 2018, the average daily production for the system was 643,163 gpd. The Town's single largest water customer is Artesian Water (AW). AW currently has an agreement with the Town to

purchase up to 350,000 gallons of water per day to meet their own needs. The Town of North East also serves the State’s I-95 Rest Stop, which uses an average of 35,000 gpd, although usage varies widely from month-to-month.

Tables 8.4.1 and 8.4.2 summarize the water needed to accommodate existing and future development under the North East Water Master Plan. Data was provided by WILAMPCO and processed using the geography of the Town’s water system pressure zones.

**Table 8.4.1  
Combined, Projected Commercial and Residential Demand Through 2040**

<b>Pressure Zone</b>	<b>2020 Total Growth (gpd)</b>	<b>2030 Total Growth (gpd)</b>	<b>2040 Total Growth (gpd)</b>
Bay View Tank	12,097	42,668	70,917
Bay Berry Tank	5,566	20,230	31,900
Irishtown Tank	13,018	40,932	67,385
Leslie Tank	12,133	38,452	59,789
I-95 Tank	21,154	67,667	109,800
<b>Total</b>	<b>63,969</b>	<b>209,948</b>	<b>339,789</b>

Table 8.4.1 shows projected water demand for the Growth Area. Projected water demand is based on the WMP analysis from WILAMPCO TAZ demographic projections for residential land uses and areal analysis for commercial land uses. GIS was used to calculate the amount of available land area for residential and commercial development. Residential growth was based on integration with the TAZ growth and commercial growth was based on a flat rate of flow to be applied to the amount of available land.

**Table 8.4.2: Residential and Commercial Water Demand 2020 to 2040**

<b>Pressure Zone</b>	<b>2020 Residential Growth (gpd)</b>	<b>2020 Commercial Growth (gpd)</b>	<b>2030 Residential Growth (gpd)</b>	<b>2030 Commercial Growth (gpd)</b>	<b>2040 Residential Growth (gpd)</b>	<b>2040 Commercial Growth (gpd)</b>
Bay View Tank	9,044	3,053	34,271	8,397	57,940	12,977
Bay Berry Tank	2,382	3,184	11,473	8,756	18,367	13,532
Irishtown Tank	10,611	2,407	34,312	6,620	57,154	10,231
Leslie Tank	1,965	10,167	10,491	27,961	16,577	43,212
I-95 Tank	10,311	10,843	37,848	29,819	63,715	46,084
<b>Total</b>	<b>34,313</b>	<b>29,656</b>	<b>128,395</b>	<b>81,553</b>	<b>213,753</b>	<b>126,037</b>

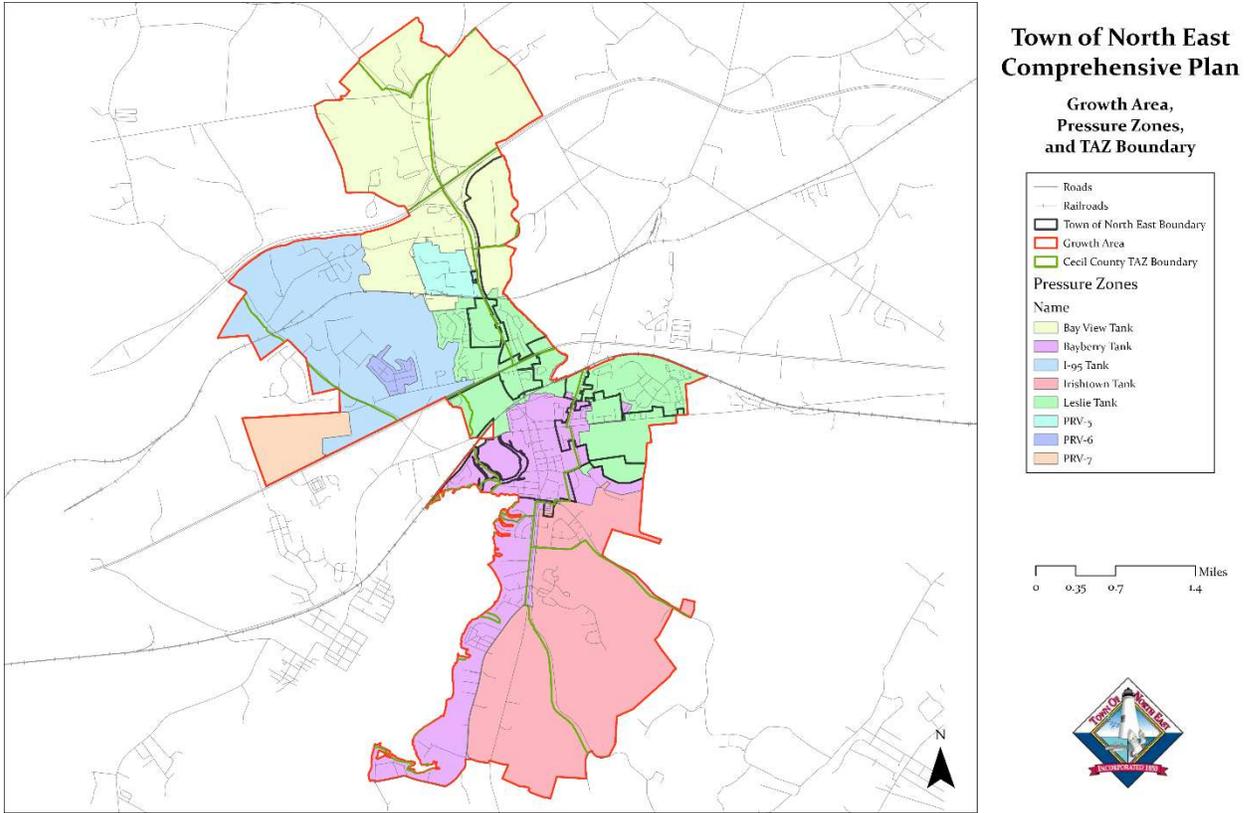


Figure 8.4.1: Town Growth Area, Pressure Zones and TAZ Boundaries

**Section 8.4.1: SUMMARY OF WATER SUPPLY AND DEMAND**

The WMP identified that the 2015 average daily demand for water was 642,000 gpd. The WMP projects an increase in demand by 2040 to be approximately 840,000 gpd. This is approximately 68% growth in demand.

Recent negotiations with Artesian Water have resulted in a water growth map for the Town and AW. As a result, the areas where the Town may provide retail water service have greatly diminished. However, this is offset by the fact that AW shall purchase water from the Town to supplement its own sources of supply to meet their now larger Growth Area. As a result, the water required from the Town will further increase the Town’s water production, as opposed to only providing direct sales to retail customers.

Based on the WMP, the Town needs an additional .340 million gallons per day (mgd) of water for projected residential and commercial growth. (See separate NE 2040 Comp Plan Data Appendix for more detail). Based on the WMP’s proposed system upgrades, the Town shall have design capacity, and an adequately permitted daily flow to serve projected population growth.

**Table 8.4.3 Summary of Water Supply and Demand**

<b>Pressure Zone</b>	<b>2020 Total Growth (gpd)</b>	<b>2030 Total Growth (gpd)</b>	<b>2040 Total Growth (gpd)</b>
Bay View Tank	12,097	42,668	70,917
Bay Berry Tank	5,566	20,230	31,900
Irishtown Tank	13,018	40,932	67,385
Leslie Tank	12,133	38,452	59,789
I-95 Tank	21,154	67,667	109,800
Total	63,969	209,948	339,789
Roundup	64,000	210,000	340,000

The analysis of land for commercial development in the Town and Growth Area, indicates an increase of .237 mgd. The demand from the commercial build out of the Growth Area would exceed the Town's average flow design capacity (even with Phase Two at Rolling Mill) by about 12 percent.

The WMP indicates that both water treatments plants have capacity well above the future average and maximum daily demands. In fact, the Rolling Mill WTP has the capacity to meet the entire water system demand if necessary. The WMP recommends 38 improvement projects to upgrade the system's capacity to transfer the water and meet future capacity requirements. Although this seems like many improvements, their scope and scale vary. Further, the improvements are identified as mainly expansions of capacity and not to meet MDE water compliance (as were addressed in the previous 20-year plan).

#### **8.4.2: WATER SERVICE AREA MAP**

The Town Growth Area is provided in Figure 1. The Growth Area boundary was negotiated with AW to establish what areas the Town will provide retail water service and what areas will be part of the AW service area. Figure 2 shows growth in the service areas in and around North East. The 2019 Cecil County Master Water and Sewer Plan (Amended in October 2022) indicates that Nearly 100 percent of the Growth Area has public water or is planned for water extension to be made by 2028.

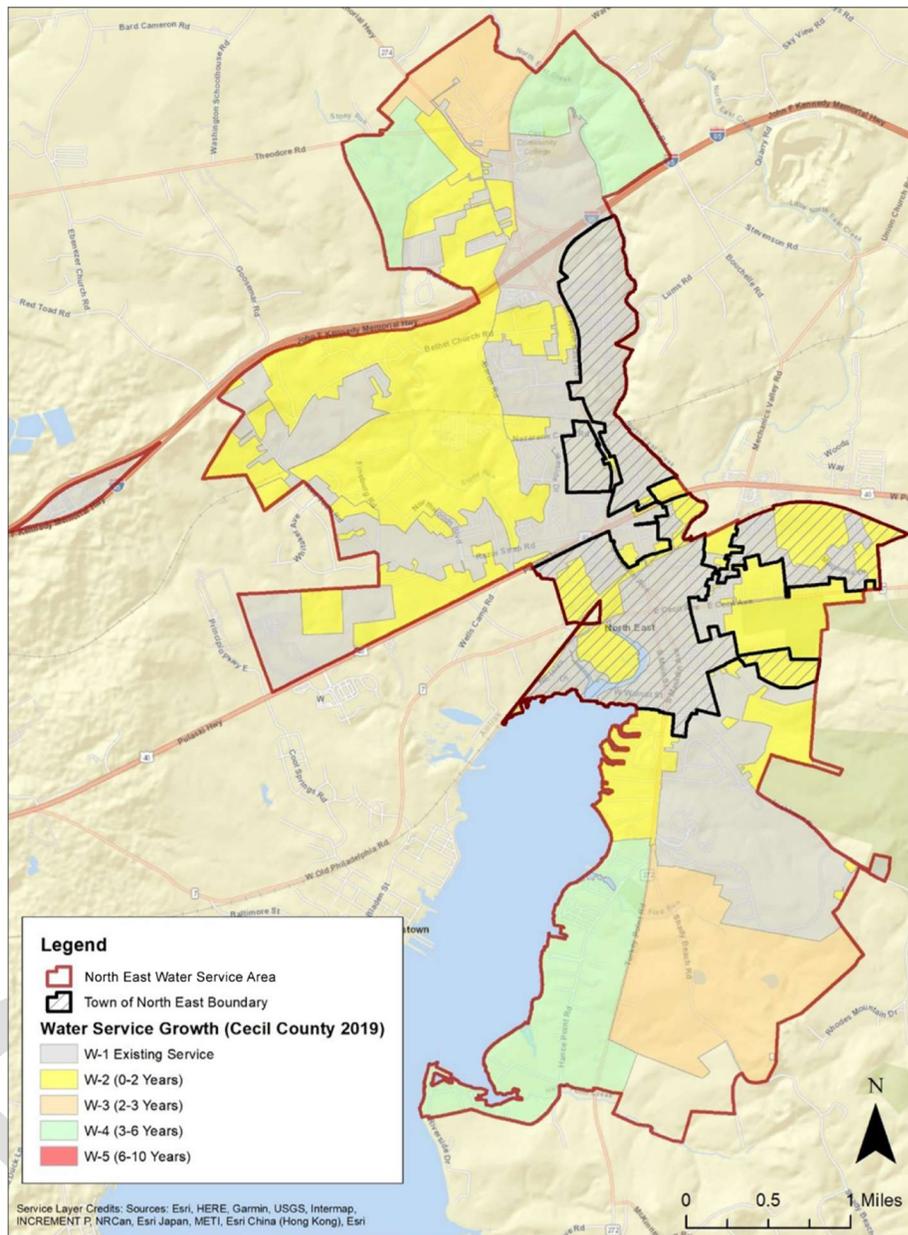


Figure 8.4.2: Water Service Growth

### 8.4.2: CONCLUSION

The Town of North East water system remains in good condition and in compliance with MDE. Growth projections in the WMP determined that additional Town water customers, could require an additional 340,000 gpd. This, combined with the potential AW purchase of 350,000 gpd, could result in the Town needing to serve an additional 690,000 gpd. This would more than double the Town’s average production from 2014 to 2018 (633,430 gpd) over a 20-year period.

## **Section 8.5: WATER QUALITY**

North East is wholly contained within the Northeast River watershed; the river receives pollution discharges from both point and non-point sources in the Town. Point sources, primarily the Town's wastewater treatment plant, are controlled by State permits. Non-point source impacts are not controlled directly via permit, but rather are a consequence of how land is used and how stormwater runoff is managed. North East has experience with water quality issues under its Chesapeake Bay Critical Area Program, where water quality plays a heightened role in the Town's decision-making.

### **8.5.1: POINT SOURCE DISCHARGE FOR NORTHEAST RIVER**

The Northeast River Advanced Wastewater Treatment Plant (WWTP) located at Seneca Point (just south of Charlestown) serves the Town of North East and most of the Growth Area. The WWTP is owned and operated by Cecil County. The WWTP also serves the Town of Charlestown and areas in Cecil County proximate to North East (the I95 Rest Stop, several neighborhoods, institutions, industrial parks, and a shopping center).

### **8.5.2: RECENT AND PLANNED IMPROVEMENTS**

In 2005, the County completed an upgrade of the WWTP for biological nutrient removal (BNR). In 2016, the WWTP was upgraded to Enhanced Nutrient Removal (ENR). The WWTP is currently designed for an annual average flow of 2.0 mgd.

The WWTP has been designed with expansion in mind. Future expansion of the plant will consist of two (2) portions, including physical construction and permit increases. Expansion by physical construction refers to the physical expansion of process equipment to a higher capacity. Permit increases refer to increases in the amount of nutrients that are permitted to be discharged by the Maryland Department of the Environment (MDE).

Physical expansion of the plant will occur in phases. The first phase would expand the plant from the existing 2.0 mgd to 4.5 mgd and would include expansions of process equipment, equalization, and sludge handling. Physical expansion will be triggered by increased demand. According to the County, it is very likely this expansion will be required by 2030. Engineering planning completed for future upgrades indicates the plant could be expanded even further, at its current site, possibly more than 10 mgd.

Regarding permit expansion, as part of the most recent discharge permit, MDE granted conditional authorization for a three-step increase in the plant's design flow from 2.0 mgd to 3.0 mgd, 3.17 mgd, and 3.7 mgd. Granting of the larger flows is predicated upon the County satisfactorily meeting numerous conditions as outlined in the discharge permit. The WWTP presently has an assigned nutrient allocation (a cap) from MDE of 24,364 lbs/year of total nitrogen (TN) and 1,827 lbs/year total phosphorus (TP). These loading limits are equivalent to operation at 4.0 mg/L TN

and 0.3 mg/L TP at the design capacity of 2.0 mgd. To expand the capacity of the WWTP beyond the permitted flow of 2.0 mgd, the County proposes to maintain the nutrient cap by transferring nitrogen and phosphorus credits to the WWTP under MDE's Nutrient Cap Management and Trading Policy (see Cecil County Master Water & Sewer Plan, dated July 22, 2019).

## **Section 8.6: WWTP Demand**

In 2006, WWTP was treating approximately 0.930 mgd, which was already about one-third higher than the need projected by the State for the year 2020. Concern about capacity led Cecil County to adopt a resolution in 2006 that reserves 0.279 mgd for residential growth and 0.120 mgd for non-residential growth.

As of 2017, the average daily flow at the WWTP was 1.143 mgd. Cecil County projected flows are 2.6 mgd by 2020, 3.4 mgd by 2030, and 3.96 mgd by 2040. As noted previously, the County has plans for expansion of the WWTP via physical construction and permit expansions. Once the WWTP has exceeded 80% of its rated capacity, the County will be required by MDE to develop and implement a Capacity Management Plan.

Official studies prepared by, or for, Cecil County in recent years suggest that sewerage treatment capacity is a key constraint on growth; that absence of adequate sewer will result in lost economic opportunities, sprawl development in the rural areas, and greater environmental harm. See, for example: the County Growth Study, Sage Group (2007); BRAC Report (2007); and the Cecil County State of the County Report (2007).

Figure 8.6.1 shows areas of existing and planned sewer within the Town's Corporate Boundary and within the North East Water Service Area which includes the Growth Area as provided in the Cecil County Water and Sewer Master Plan (CCWSMP) of 2019. Most properties within the Corporate Boundary of the Town have already been sewered. The remaining land for sewer expansion within the Corporate Boundary (as of the 2019 CCWSMP) is indicated in the Ridgely Forest Development. Those areas in the Growth Area without sewer (primarily at the eastern and southern portions of the growth are), are designated for sewer expansion from 2023 through 2029.

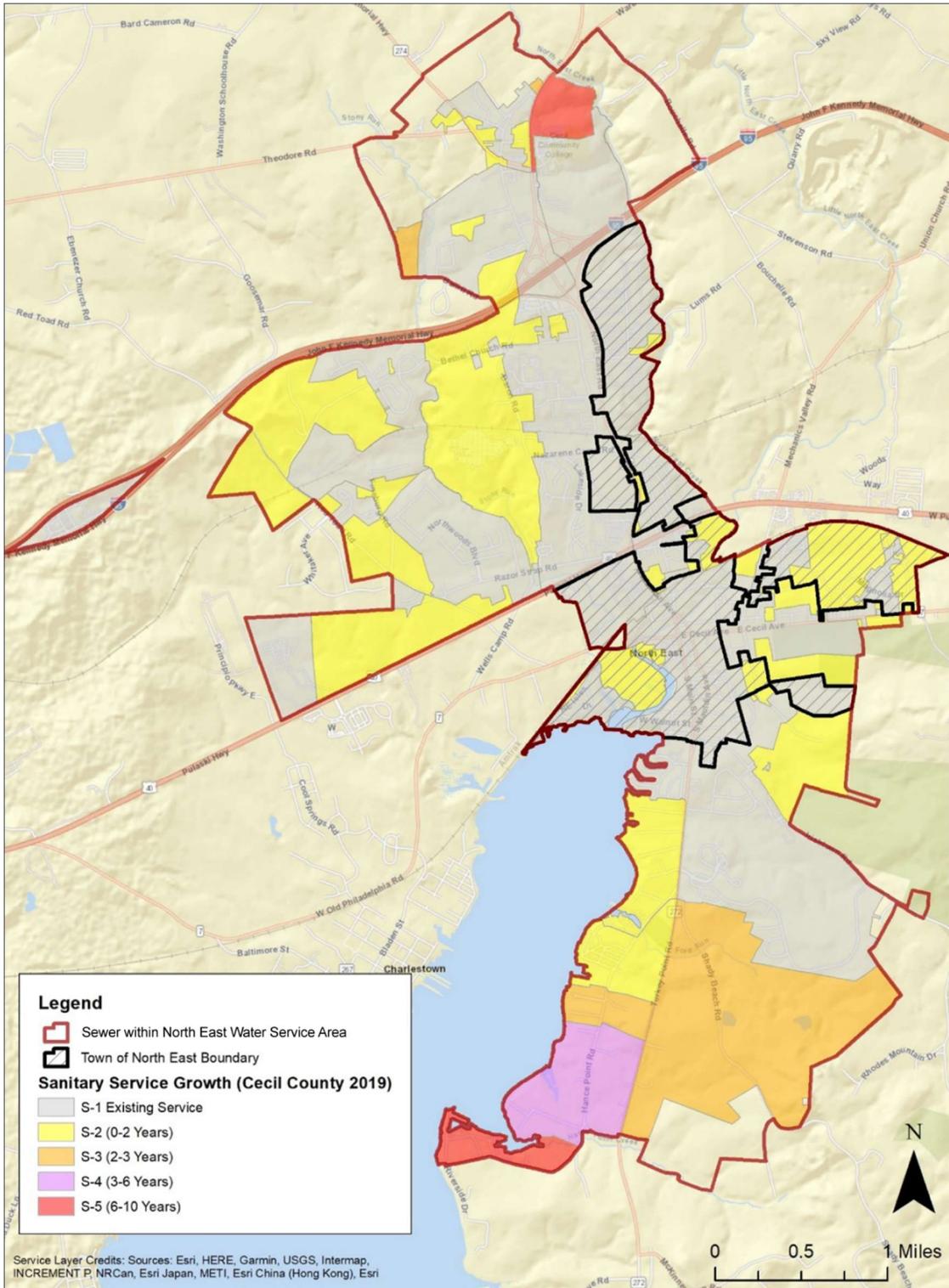


Figure 8.6.1: Sanitary Service Growth

The projected sewer demand for the Town and its Growth Area is summarized in Table 8.5.1. This table presents data for the Town using a combination of the constant share scenario as indicated in Chapter 9 for residential use and areal analysis of undeveloped residential land. Population and households are projected at 220 gpd per household based on the demographics.

Non-residential uses are presented based on the WMP calculations for developable commercial and industrial land. This analysis identifies demand as 1,000 gpd per acre after reductions had been made for environmentally sensitive lands and net out for roads and setbacks. Non-residential usage has been projected cumulatively and is added to the residential totals based on population projections for this element.

**Table 8.5.1: Projected Sewer Demand**

	2020	2025	2030	2035	2040	2045
Population	3,620	3,725	3,934	4,185	4,045	4,619
Households (2.64 pph)*	1,371	1,411	1,490	1,585	1,532	1,750
Residential Sewer (220 gpd)	301,620	310,417	327,833	348,750	337,083	385,000
Commercial / Industrial Acres	15	26	26	22	22	N/A
Commercial / Industrial Sewer Use (1,000 gpd/Acre)	14,828	25,949	25,949	22,242	22,242	N/A
Cumulative Commercial Use	14,828	40,777	66,725	88,967	111,209	111,209
Total Anticipated Use (gpd)	320,828	351,193	394,558	437,717	448,292	496,126
% of permitted capacity <sup>4</sup>	39%	43%	48%	54%	55%	61%

\*2019 Cecil County persons per household (pph) 2.64

## Section 8.6: Growth Summary

Based on the 2045 projections, the Town needs approximately .496 mgd of sewer for growth at the Constant Share of population growth and cumulative analysis of non-residential land. The Northeast River Advanced WWTP should have adequate capacity under its planned upgrades, which will be triggered by demand and planned for a maximum of 9.1mgd. The County controls the allocation of treatment capacity, thus there are no concrete assurances as to how the WWTP will be shared between the County and the Towns of North East and Charlestown. However, based on mutual Town and County planning goals for growth and annexation (see the Municipal Growth element), it is reasonable to expect County support for the Town's needs.



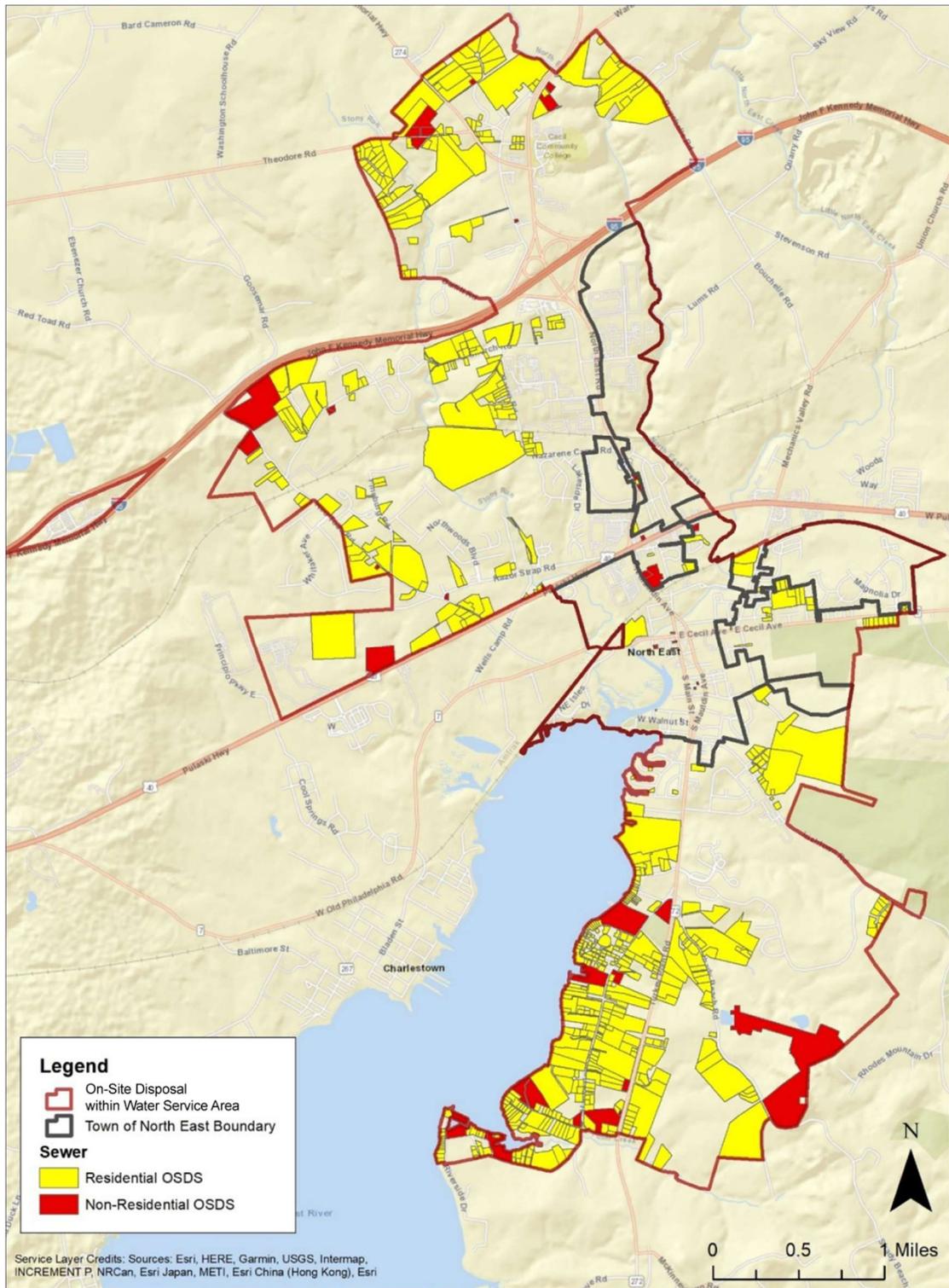


Figure 8.6.1: On-Site Disposal Systems

An estimation of non-residential OSDS nutrient loading is based land used based area analysis. The following acreage for non-residential OSDS was derived from the MDP Assessment Parcels:

Commercial Land Use	104 acres.
Industrial Land Use	55 acres.

The MDP Guidance calculation for non-residential loading is as follows:

1. Acres of Non-Residential Land on Septic x Avg. Flow/Acre = gpd
2. gpd/1,000,000 = Millions of gallons per day (mgd)

Then, using the total mgd just found, plug into:

$$\text{mgd} \times 40 \text{ mg/L of N} \times 8.34 \times 0.4 \times 365$$

The result of this analysis is as follows:

Commercial	658 lbs./year
Industrial	134 lbs./year
<hr/>	
Total: 792 lbs. nitrogen loading per year.	

Based on the analyses above, the Growth Area is estimated to generate approximately 7,654 pounds per year in nitrogen via discharge from OSDS.

Table 6.8 in the draft 2010 Cecil County Comprehensive Plan presents a 42,183 lbs. nitrogen loading for the Northeast River watershed. It is estimated that the Town contributes approximately 18% to this total. The Town will cooperate with Cecil County in efforts to limit and minimize OSDS impacts both within the Growth Area and within the watershed.

## Section 8.7: NON-POINT SOURCES

### *STORMWATER RUNOFF*

Non-point source pollution involves the pollutants that wash off the land and into the Northeast River and its Creeks. The watershed contains 40,400 acres. Nearly 49 percent of the watershed is forested and nearly 31 percent is agriculture. Residential development is about 20 percent, with 85 percent of that acreage consisting of either low density or very low-density development (sprawl growth on septic systems).

The Town of North East makes up only three percent of the watershed. The Town’s Growth Area (5,923 acres outside the Town limits) amounts to an additional 17 percent of the watershed. Figure 8.7.1 indicates the watershed, Growth Area, and corporate boundary of the Town. For land use and land cover details of the Growth Area see Chapter 9, Municipal Growth Element Section 9.2.2.



example, achieving MDE's TMDL literally required forestation of most of the watershed). This second method, however, is useful for understanding the dynamics involved when land changes (for example) from agriculture- to-urban, or from forest-to-agriculture.

Table 8.7.1 summarizes the non-point impacts of existing conditions for the Town of North East and for the Town's Growth Area for total nitrogen, total phosphorous, and sediment. The results of both estimation methods are included for information, but the impervious surface equations are the results used as a basis for the Water Resources element. Table 14 summarizes the non-point impacts of post-growth and development conditions for the Town of North East and for the Town's Growth Area for total nitrogen, total phosphorous, and sediment. Again, the results of both estimation methods are included for information, but the impervious surface equations are used as a basis for the Water Resource element.

### *Impervious Surface/Rainfall Equation*

This method involves three equations:

- Step 1: determine the watershed's runoff coefficient
- Step 2: use the coefficient, the annual inches of rainfall, and the runoff probability factor (0.9), to determine the annual runoff
- Step 3: use the annual runoff, pollutant concentration, acreage, and a metric conversion factor to determine the annual load of TN and TP

The equations were used to estimate pollutant loads for existing conditions and for post-growth and development conditions. Certain assumptions were made in assigning future land use. Basically, 55 percent of agricultural and forest land (45 percent is saved for environmental and open space needs) is allocated to the following future land uses: 44 percent used for residential, 26 percent used for commercial, and 26 percent is used for industrial.

### *Land Use Coefficient Method*

This method involves the land use loading coefficients developed by the Tributary Strategies (2006 data), and the acres of land use in the Town of Growth area (pre- and post-development). Future land use was assigned as described in the above paragraph.

## **8.7.2: Conclusions of the Impervious Surface Method**

- Existing Conditions – Town of North East:
  - o For Total Nitrogen, the Town produces about 419 pounds per month. This is about 7 percent of the non-point TMDL (6229 pounds per month)
  - o For Total Phosphorous, the Town produces about 54 pounds per month. This is about 17 percent of the non-point TMDL (314 pounds per month)
- Existing Conditions – Town and Growth Area
  - o For Total Nitrogen, the area produces about 2502 pounds per month. This is about

- 40 percent of the non-point TMDL (6229 pounds per month)
  - o For Total Phosphorous, the area produces about 325 pounds per month. This is about 104 percent of the non-point TMDL (314 pounds per month).
- Post Growth and Development – Town of North East:
  - o For Total Nitrogen, the Town produces about 567 pounds per month. This is about 9 percent of the non-point TMDL (6229 pounds per month)
  - o For Total Phosphorous, the Town produces about 74 pounds per month. This is about 23 percent of the non-point TMDL (314 pounds per month)
- Post Growth and Development – Town and Growth Area
  - o For Total Nitrogen, the area produces about 3212 pounds per month. This is about 52 percent of the non-point TMDL (6229 pounds per month)
  - o For Total Phosphorous, the area produces about 418 pounds per month. This is about 133 percent of the non-point TMDL (314 pounds per month)

As the major Town and Growth Area within the watershed, comprising 20 percent of the watershed, the Town of North East can reasonably claim a large share of the TMDL. Based on the above results, the Town can fully develop within today's corporate limits (through infill and redevelopment) and produce a very low 9 percent of the TMDL for nitrogen, and a low 23 percent of the TMDL for phosphorous.

The non-point problem is primarily with the Growth Area, where a large amount of forest will be used for growth. This land use change will have a high impact on non-point phosphorous and nitrogen loadings in the watershed. Still, with full development in the Town and its Growth Area, the nitrogen loads will be only 52 percent of the TMDL. Phosphorous, on the other hand, will rise to 133 percent of the TMDL.

This suggests a two-fold strategy for the Town to achieve water quality goals in the Growth Area:

- 1) Encourage preservation of as much forest as possible. For residential development, higher net densities can result in significant forest retention on each development site. For commercial and industrial uses, a program for reforestation within the watershed (or for payment of fees for tree planting) could be used to offset loss of forest land on developing sites. Site design could also be used to save on-site trees.
- 2) Maximize efforts to control sediment during and after construction and follow through with timely inspection and enforcement actions. Since most phosphorous enters the waterways attached to sediment, sediment controls will help minimize phosphorous loadings.

Urban best management practices include a variety of methods for controlling non-point sources of pollution. The success of preventing runoff pollutants from entering waterways depends on selecting the right practice, making sure it is properly constructed in the proper location, and following up with maintenance over the long term. Controls for sediment and phosphorous can be very effective. Up to 100 percent of suspended solids and 30 to 80 percent of phosphorous can be eliminated, depending on specific circumstances.

A program for requiring state-of-the-art BMPs for new development on forested sites may be able to bring development of the Growth Area within the limits of the TMDL for phosphorous. If a 50 percent reduction is achieved, the post-development phosphorous loadings for the Town and Growth Area will fall to about 67 percent of the TMDL.

8.7.1, Non-Point Nutrient Loading, provides non-point nutrient load summaries for total nitrogen and total phosphorus for the Northeast River watershed, the Growth Area, and the Town of North East.

**Table 8.7.1: Non-Point Nutrient Loading**

<u>Non-Point Nutrient Loading<sup>1</sup></u>						
<u>Total Nitrogen</u>					<u>Nonpoint TMDL</u>	
<u>2009</u>	<u>Septic</u>	<u>nonpoint</u>	<u>TN total</u>	<u>TP</u>	<u>TN</u>	<u>TP</u>
<u>Watershed</u>	<u>42,183</u>	<u>412,346</u>	<u>454,529</u>	<u>32,841</u>	<u>74,749</u>	<u>3,763</u>
<u>Growth Area</u>	<u>15,862</u>	<u>37,991</u>	<u>53,853</u>	<u>4,015</u>		
<u>North East</u>	<u>0</u>	<u>7,477</u>	<u>7,477</u>	<u>917</u>		
<u>GA + NE</u>	<u>15,862</u>	<u>45,468</u>	<u>61,330</u>	<u>4,932</u>	<u>74,749</u>	<u>3,763</u>
<u>2030 Projected Non point Nutrient Loading</u>						
<u>Watershed</u>	<u>33,298</u>	<u>261,600</u>	<u>294,898</u>	<u>23,421</u>		
<u>Growth Area</u>	<u>0<sup>2</sup></u>	<u>35,592</u>	<u>35,592</u>	<u>3,899</u>		
<u>North East</u>	<u>0</u>	<u>7,511</u>	<u>7,511</u>	<u>1,003</u>		
<u>GA + NE</u>	<u>0</u>	<u>43,103</u>	<u>43,103</u>	<u>4,902</u>	<u>74,749</u>	<u>3,763</u>

1 all loads in lbs/yr.

2 figures are from 2010 Cecil County Draft Comprehensive Plan reflecting 2007 data.

3 The Growth Area is scheduled for sewer service and existing OSDS will be retired achieving net gains in nonpoint loads.

Table 8.7.2 Seneca Point WWTP Loads, provides point source nutrient loading summaries at the Seneca Point Wastewater Treatment Plant for total nitrogen and total phosphorus for the Growth Area, the Town of North East, and a combined total. A combined point and non-point load summary are also provided.

**Table 8.7.2: Seneca Point WWTP Loads**

<b>Seneca Point WWTP Loads (operating at ENR levels 11 out of 12 months, 2009)<sup>1</sup></b>									
<u>2009 Demand</u>	<u>Existing Nutrient load (lbs/yr)</u>		<u>Nutrient Load Cap<sup>2</sup> (lbs/yr)</u>		<u>2030 North East Demand (lbs/yr)</u>		<u>2030 Growth Area Demand (lbs/yr)</u>		
	<u>mgd</u>	<u>TN</u>	<u>TP</u>	<u>TN</u>	<u>TP</u>	<u>TN</u>	<u>TP</u>	<u>TN</u>	<u>TP</u>
<u>0.95<sup>1</sup></u>	<u>7,106<sup>3</sup></u>	<u>1,329</u>	<u>24,364</u>	<u>1,827</u>					
<u>0.95</u>	<u>7,057<sup>4</sup></u>	<u>1,336</u>							
<u>2.58<sup>5</sup></u>							<u>19,084</u>	<u>3,613</u>	
<u>1.57<sup>6</sup></u>							<u>11,613</u>	<u>2,198</u>	
<u>0.32</u>					<u>2,365</u>	<u>448</u>			
<b><u>Total</u></b>	<u>7,057</u>	<u>1,336</u>			<u>2,365</u>	<u>448</u>	<u>30,697<sup>5,6</sup></u>	<u>5,811<sup>5,6</sup></u>	
<u>2030 Theoretical Summary</u>									
<u>5.42</u>	<u>40,119</u>	<u>7,595</u>	<u>These loads reflect theoretical maximum loads</u>						
<u>Loads based on Table 7 from MGE (planned loads)</u>									
<u>2010 total demand</u>				<u>2030 total demand</u>					
<u>353,760 gpd</u>				<u>717,640 gpd</u>					
<u>TN (lbs/yr)</u>		<u>TP (lbs/yr)</u>		<u>TN (lbs/yr)</u>		<u>TP (lbs/yr)</u>			
<u>2,611</u>		<u>494</u>		<u>5,303</u>		<u>1,004</u>			
<u>Combined Point and Nonpoint Loads 2030</u>									
		<u>Point Loads</u>		<u>Nonpoint Loads</u>		<u>TMDL cap for watershed</u>			
		<u>TN (lbs/yr)</u>	<u>TP (lbs/yr)</u>	<u>TN (lbs/yr)</u>	<u>TP (lbs/yr)</u>	<u>TN (lbs/yr)</u>	<u>TP (lbs/yr)</u>		
<u>North East</u>		<u>5,303</u>	<u>1,004</u>	<u>7,511</u>	<u>1,003</u>				
<u>Growth Area</u>		<u>30,697</u>	<u>5,811</u>	<u>35,592</u>	<u>3,899</u>				
<b><u>Total</u></b>		<u>36,000</u>	<u>6,815</u>	<u>43,103</u>	<u>4,902</u>	<u>74,749</u>	<u>3,763</u>		

1 Source: Cecil County Department of Public Works; CBP data reports two-year average flows of 0.954 mgd for 2006 – 2007 (available data)

2 Tributary Strategy Point Source Cap for major facilities

3 Nutrient loads actual “end-of-pipe” loads (sampled)

4 Nutrient loads calculated by formula

5 Based on Theoretical Demand from all vacant residential lands plus all vacant commercial and industrial lands

6 Based on mixed use employment development on all Forested land

## **Section 8.8: Suitable Receiving Waters**

The Northeast River is the only option for North East as a “receiving water” body. All non-point flows that are not infiltrated eventually reach the Chesapeake Bay via the North East River. MDE has established TMDL caps for nitrogen and phosphorous that analysis has shown will not be exceeded in the near term. The “near term” includes the next six-year interval until the North East Comprehensive Plan is required to be updated. The WRE will be updated at that time with information provided by MDE and Cecil County. If any material issues or concerns affect this finding of “suitability,” appropriate changes will be made at that time.

Based on the WWTP’s current actual level of performance, e.g. ENR<sup>1</sup>, available capacity shown on the point source load table<sup>2</sup>, and County plans to secure a new permit that is written for greater capacity it is anticipated that even over the long term, the North East River will be a suitable receiving water for point source discharges. County efforts at nutrient trading will also play a role in that discussion [over which the Town has no direct control]. However, the Town will be a partner with Cecil County and MDE in finding appropriate workable solutions.

The nonpoint phosphorus loadings, especially for the watershed, suggest a greater problem for “suitability.” Clearly, steps will need to be taken to reduce nonpoint source loadings. Changes to stormwater management regulations and practices will need to be carefully monitored, and a watershed-based strategy for enhanced nonpoint control may need to be developed. Such an effort will also require a partnership among all affected jurisdictions.

## **Section 8.9: Source Water Protection**

In June 2005, the Maryland Department of Environment prepared a Source Water Assessment (SWA) study as mandated by the Safe Drinking Water Act. The study was conducted for the Northeast Creek [which supplies water to two water treatment plants that served about 5,200 people in and around the Town of North East].

Northeast Creek and its tributary Little Northeast Creek flows south and east forming the Northeast River. The intake structure for the Leslie Water Treatment Plant withdraws water from Northeast Creek upstream of the confluence with Little Northeast Creek. Water is pumped to a 1-million-gallon raw water reservoir and then flows by gravity to the Leslie Water Treatment Plant. The intake structure for the Rolling Mill Treatment Plant is downstream of the confluence of the Little Northeast Creek and Northeast Creek. A third intake has been completed for the tidal area of Northeast River near the Town Park on Walnut Street.

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<sup>1</sup> Cecil County Department of Public Works, CBP data

<sup>2</sup> Northeast Advanced Wastewater Treatment Plant Feasibility Study 2008

The source water protection area for the Town of North East's intakes encompasses approximately 46 square miles (29,804 acres) of mixed land use with over 60% of cropland and pasture. Approximately 20% of the watershed extends into Pennsylvania.

Potential sources of contamination include point and non-point sources, including transportation, agriculture, on-site septic systems, and runoff from developed areas. Non point sources (agricultural and urban runoff) are the largest sources of contaminants in the watershed. There are several minor municipal and industrial discharges in Pennsylvania, and a quarry and a superfund remediation site at the Mechanic Valley Trade Center in Maryland's portion of the source water assessment area. Cecil County landfill (Hog Hill) is also located within the watershed of the backup intake in the tidal portion of Northeast River. The relatively low percentage of forested land within the watershed (about 30%) and continued forest loss to development present treatment and management challenges for producing safe water.

Turbidity, nutrient enrichment, and algal blooms are issues of primary concern. High turbidity levels are associated with erosion and transport of sediment during storm flows. The network of major roads (I-95 and Route 40) and rail lines near the Town's intakes put this water supply at significant risk to impacts from potential hazardous materials spills<sup>3</sup>.

North East recognizes these concerns and has been working cooperatively with State, County, and private parties to implement a comprehensive set of protection policies that incorporate and build upon many of the policies and regulations that are already in place. Stream buffers, steep slope buffers, non-tidal wetland buffers and the Chesapeake Bay Critical Area mandated buffers all address and restrict land use activities that could have negative impacts on the Town's water supply sources.

### **8.9.1: Recommendations for Source Water Protection**

- The Town of North East should take a lead role in forming a local watershed planning team to develop and implement strategies to protect Northeast Creek as a drinking water source.
- A formal or informal agreement should be developed to engage officials from jurisdictions in Maryland and Pennsylvania on an ongoing basis.
- Encourage broad stakeholder participation, including soil conservation districts, County Planning and Zoning, transportation officials, community associations, chambers of commerce and other business organizations, the Cecil County farm bureau and individual farmers and environmental groups.
- Establish clear and achievable goals, objectives, and milestones to ensure the highest quality raw water.

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<sup>3</sup> Much of the language and many of the facts included in this section were paraphrased from the draft 2010 Cecil County Comprehensive Plan's Water Resources Element.

- A well thought out plan for being notified of hazardous material spills, and strategy for responding is critical to ensuring safe water for the Town of North East.
- Erect road signs in strategic locations to alert the public that they are entering a drinking water watershed.
- Continue monitoring for fecal coliform and E.coli in raw water.
- Increase monitoring of nutrient loads in raw water.
- Create a body responsible for periodic field surveys of the watershed to ensure there are no new sources of contaminants.
- The Cecil County Soil Conservation District and Pennsylvania Districts should continue to develop projects to reduce pathogens and nutrients from animal waste from entering upstream tributaries. Stream fencing and establishing forested riparian buffers are particularly helpful.
- The soil and erosion control and stormwater management regulations and practices in the Pennsylvania Townships within the watershed should be reviewed and compared with Maryland's standards.
- The Town should work closely with the County's Technical Advisory Group [to encourage the application of progressive stormwater management practices to reduce future impacts (erosion and sediment transport, temperature impacts and oils, other contaminants, salts from road runoff) and runoff from new development.

### **8.9.2: Existing Measures**

A Town/County emergency response plan is in place that includes the Town's water company, Severn Trent. It details actions to be taken in the event of different emergencies. That plan is subject to further review and refinement.

### **Section 8.10: The Town of North East Municipal Separate Storm Sewer System (MS4) Stormwater Management Program.**

The National Pollutant Discharge Elimination System (NPDES) permit program was established in 1972 under the federal Clean Water Act (CWA). The CWA requires point sources that discharge pollutants into waters of the United States (U.S.) to obtain coverage under an NPDES permit. An NPDES permit establishes certain terms and conditions to discharge pollutants to receiving waters in order to protect water quality. Congress added Section (402) p to the CWA in 1987 in response to the need to address pollution from stormwater discharges from municipal systems.

The U.S. Environmental Protection Agency (EPA) promulgated NPDES municipal separate storm sewer system (MS4) regulations in two phases beginning in 1990. The Phase I regul

ations established requirements for stormwater discharges for 11 categories of industrial activity and for MS4s serving populations of 100,000 or greater. In Maryland, ten jurisdictions and the Maryland Department of Transportation, State Highway Administration (MDOT-SHA) are covered under individual Phase I MS4 stormwater permits. These permits require the implementation of best management practices and various programs to reduce pollution discharges. The permits are effective for five-year terms unless administratively continued. Reissued permits establish requirements that build upon previous progress and help Maryland to reach its Chesapeake Bay total maximum daily load (TMDL) pollution reduction requirements. Learn more about Maryland's Chesapeake Bay Clean-up Plan [here](#).

In December 1999, the EPA promulgated the Phase II MS4 regulations to address pollution discharges from small MS4s in urbanized areas (UA). The Phase II Final Rule also required the NPDES permitting authority to evaluate additional small MS4s located outside of UA's that should be regulated. Maryland expanded its MS4 permit program by issuing two general permits, one for municipalities (2003) and one for state and federal agencies (2004) operating small MS4s. These permits were reissued in 2018.

In that 2018 Phase II Permit issuance, The Town of North East was identified by the Maryland Department of the Environment to be a permit holder. These permits require implementation of six minimum control measures:

1. public education and outreach
2. public involvement and participation
3. illicit discharge detection and elimination
4. construction site stormwater runoff control
5. post construction stormwater management
6. pollution prevention and good housekeeping

In addition to the six control measures, permit holders are required to generate a certain amount of Impervious Acre Credits (IAC) for the purpose of impervious area restoration.

The Town of North East is responsible for generating x amount of IACs within the five year cycle of the permit. Additionally, annual reports are due to the Maryland Department of the Environment to provide updates on IAC generation and the six minimum control measures.

The following section of the report highlights the MS4 efforts the Town of North East has completed in the 2018-2023 Phase II Permit Cycle. Since North East was not a Phase II permit holder when the last Comprehensive Plan was completed in 2012, this section will also focus on the future of the Town's MS4 program.

**8.10.1 Town of North East Impervious Acreage Credits (IACs)**

The general logic to Impervious Acreage Credits is for the Town of North East to invest in environmental projects that generate environmental good to help counteract the amount of impervious structures located within the town. Impervious structures such as parking lots, sidewalks, etc. are generally seen as environmentally harmful due to their inability to soak up stormwater run-off. In 2018 when the Town was enrolled into MS4, a baseline study was conducted to determine the Town’s impervious acreage total, what was treated by environmental devices (known as Best Management Practices aka BMPS), and what was untreated by BMPS. The permit required IACs equal to 20% of untreated impervious surface.

Description	Acres
Total impervious acres of jurisdiction covered under this permit	249.13
Total impervious acres treated by stormwater water quality best management practices (BMPs)	118.63
Total impervious acres treated by BMPs providing partial water quality treatment	29.12
Total impervious acres treated by nonstructural practices (e.g., rooftop disconnections, non-rooftop disconnections, or vegetated swales)	40.80
Total impervious acres untreated in the jurisdiction	130.50
Twenty percent of this total area (restoration requirement)	26.10

As a result, the following data was populated:

In obtain the 26.10 IACs needed for the 2018-2023 cycle, the Town of North East formed a partnership with the Cecil Land Trust. Cecil Land Trust completed 1795 linear feet of stream restoration located within the North East Creek Watershed. The project generated the 26.10 IACs in which the Town of North East purchased the IACs from the developers.

The following map outlines the project area:

EXHIBIT 1

**North East Creek Watershed - Long Green Farms  
Stream Restoration Site Overview**

Cecil County, Maryland

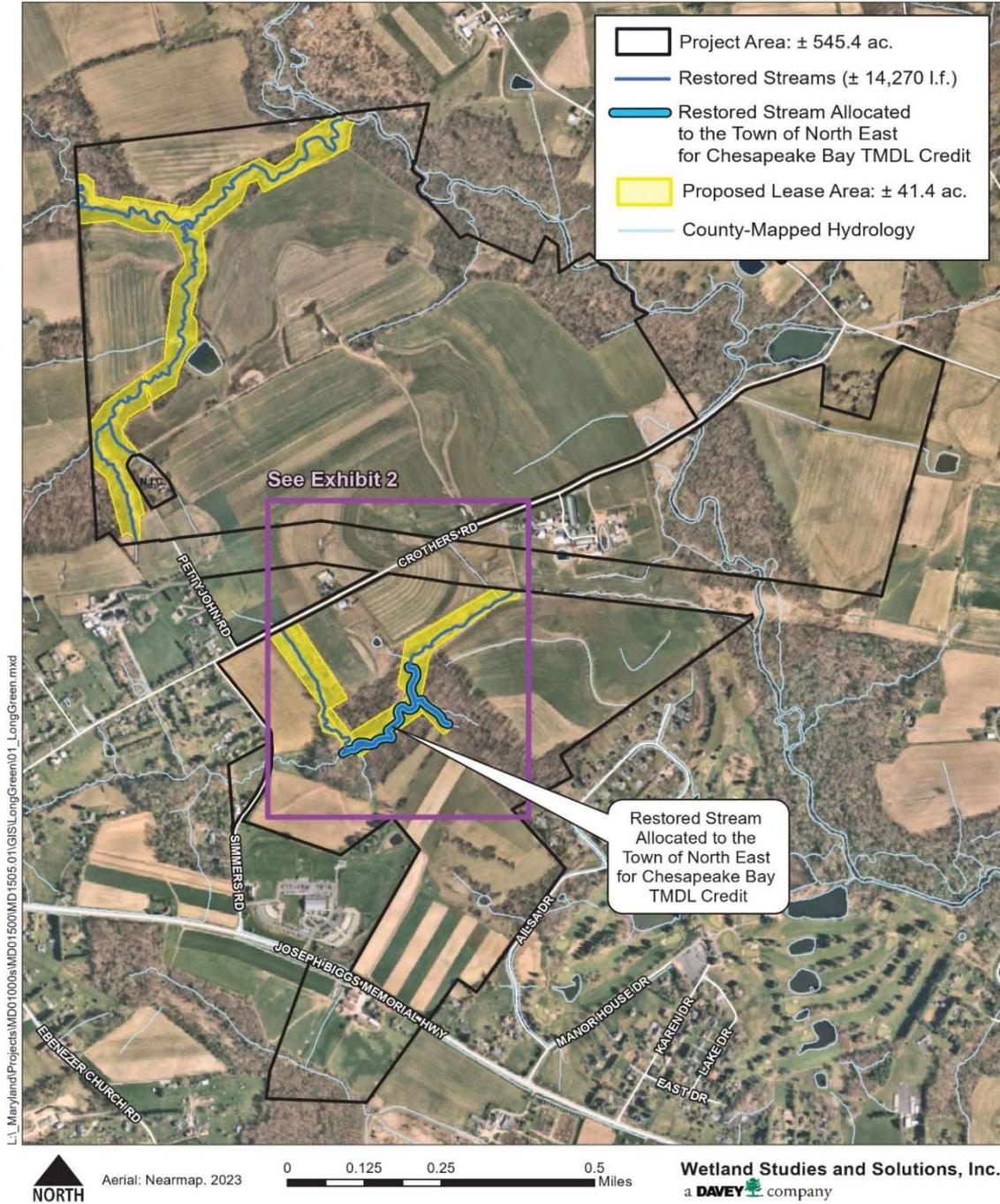
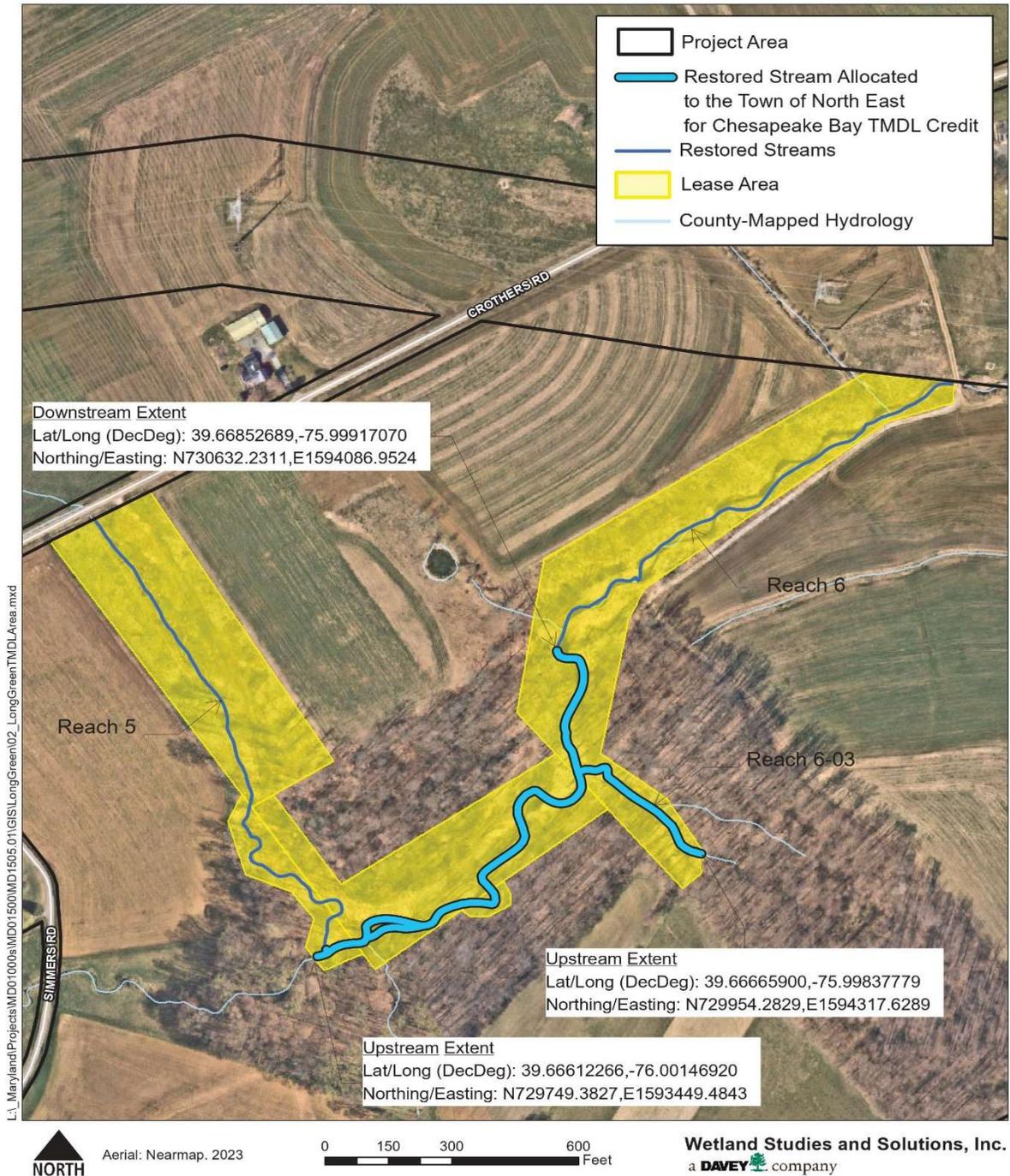


EXHIBIT 2

**North East Creek Watershed - Long Green Farms  
Stream Restoration TMDL Area**

Cecil County, Maryland



### *A. The Future of IACs Generation*

For the foreseeable future, the Town of North East will be an MS4 Phase II Permit Holder. This means that every MS4 cycle (five years), the Town of North East will need to generate IACs to remain compliant with the Maryland Department of the Environment. Moving forward, the Town of North East's model is to identify, design, bid, and create projects internally rather than relying on external partners. The goal of future MS4 projects is to create aesthetically pleasing environmental projects that generate IACs in areas such as our Community Park, the North East Preserve, neighborhood streambanks, and other water-oriented locations within our community. Projects such as stream restoration, shoreline restoration, rain garden installations, native wildlife protection, and stormwater infrastructure repairs will all serve as projects for the Town. These projects will not only produce the required IACs but also provide beautiful locations for residents and tourists to enjoy for years to come.

The next anticipated Phase II Permit cycle will be 2025-2030, with 2024 serving as an administrative extension to the previous permit. All IAC actions conducted in 2024 will be credited to the 2025-2030 permit. The Town is awaiting direction from MDE regarding the number of IACs required for the next cycle.

#### **8.10.2: Prong #1 – Public Education and Outreach**

The Town of North East is required to engage in public education and outreach to better inform citizens about the importance of stormwater management. Activities include:

- Tabling at various public events to provide literature on responsible stormwater management for residents.
- Speaking to students at local schools about the importance of stormwater management.
- Updating the Town website to feature educational materials on stormwater management and illicit discharge.
- Creating an online illicit discharge report form for citizens to anonymously report violations.
- Passing a Stormwater Management Ordinance that holds citizens accountable for behaviors such as illicit discharge and dumping. The entire article can be accessed [here](#).

The Town of North East will continue to provide education to the general public through tabling at public events, classroom visits, website and social media postings, and any other effective avenues to inform the general public.

### **8.10.3: Prong #2 – Public Involvement and Participation**

Similar to public education and outreach, the public involvement and participation prong requires the Town of North East to hold at least five events annually that engage the community in activities producing environmental benefits. Recent events include:

- The clean-up of the North East Community Park after the Cecil County Salute to Veterans event conducted by the High Five Initiative.
- Involvement in the Cecil County Wade-In Event handled by the Cecil County Department of Stormwater Management.
- Various trash clean-ups hosted by the North East Rotary Club.
- North East Middle School “Day of Service” where students assist Town staff in plantings and mulching.
- North East River clean-up in partnership with Bay Venture Outfitters and the High Five Initiative.
- Water quality testing and observation handled by the Town’s non-profit partner, the Elk Neck and North East Watershed Association (ENERWA).

The Town of North East will continue to leverage partnerships to host or participate in public events that bring the community together to learn about stormwater management.

### **8.10.4 Prong 3 – Illicit Discharge Detection and Elimination**

The Town of North East is committed to proactively identifying and preventing illicit discharge that could result in harmful substances entering our local bodies of water. In addition to providing an illicit discharge report form for citizens to use, the Town conducts inspections of all stormwater outfalls to ensure that no illicit discharge is entering our local water bodies.

In the previous permit cycle, 35 outfalls were screened, and none showed evidence of illicit discharge. Per permit requirements, the Town of North East is required to screen at least 20% of their total outfalls annually, with the goal of screening 100% of all outfalls by the end of each permit cycle. The report can be found in on page 10-35.

For the foreseeable future, outfall inspection will remain an obligation for the Town, so appropriate resources will continue to be dedicated to this program. The Town is currently partnered with the Elk and North East River Watershed Association (ENERWA) to conduct the dry outfall screenings. If illicit discharge is detected, the Town will investigate further with the appropriate parties, such as environmental engineers.

### **8.10.5: Prong 4 and 5 – Construction Site Stormwater Runoff Control and Post-Construction Stormwater Management**

The management of construction sites is critical to any MS4 program due to the high risk of loose sediments and dirt running off into bodies of water. Fortunately, the Town of North East has an agreement with Cecil County Government, which handles both construction site runoff control and post-construction stormwater management. The Town is grateful for this partnership, as the time and resources required to manage these two prongs can be substantial. The Town anticipates that this partnership will continue for the foreseeable future.

Additionally, the Town of North East's Maintenance Department are all accredited with the Maryland Department of the Environment's Responsible Personnel Certification for erosion and sediment control.

The Town's most recent Outfall inspection 2018-2013 MS4 Cycle is illustrated on Figure 8.10.1 following this page.

### **8.10.6: Prong #6 – Pollution Prevention and Good Housekeeping**

The Town of North East is required to have plans in place for managing internal incidents such as oil spills, gasoline leaks, and chemical usage. The Town's Maintenance Department poses the highest risk for environmental damage due to the storage of various oils, gasoline, chemicals, and road salt. To ensure these substances are stored and used responsibly, housekeeping plans are developed following environmental best practices. These plans guide maintenance staff on proper storage, usage, and procedures for handling spills. Additionally, the Maintenance Department receives annual training on environmentally responsible practices for handling these substances in the field. The Town will continue to allocate resources to proper chemical housekeeping and staff training in the future.

### **8.10.7: Conclusion**

The MS4 program is a critical component of the Town of North East's governance. This program ensures that harmful substances do not pollute our water-oriented community, which many people rely upon. At its core, the Town aims to develop environmental projects that generate IACs while also providing positive impacts for tourism and beautification. As projects are developed, the Town is committed to achieving high levels of stakeholder engagement by educating the public, participating in events, properly training town staff, performing routine inspections, and strengthening community partnerships. Through these ongoing efforts, the Town strives to preserve the valuable resource of our bodies of water.

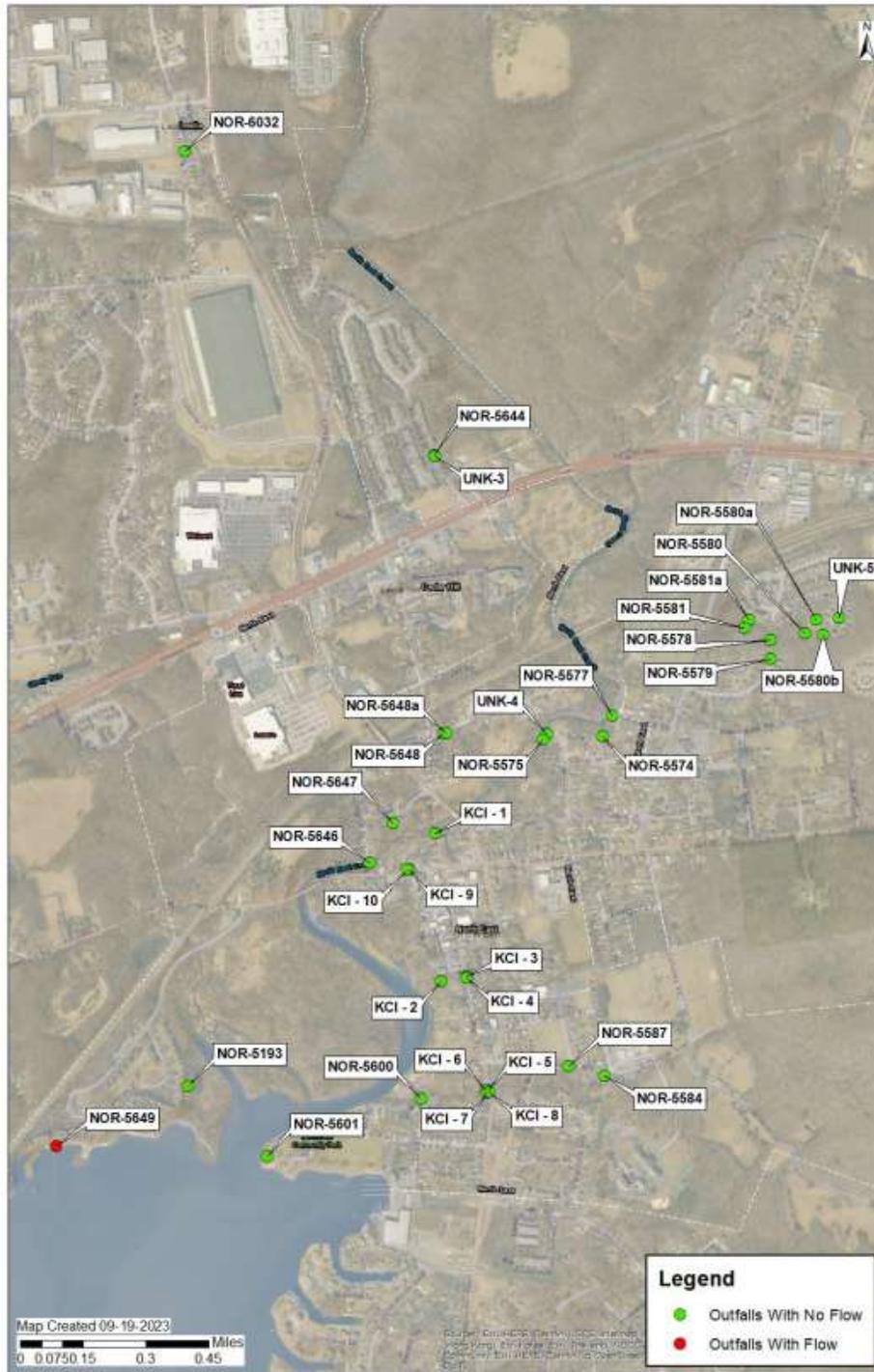


Figure 8.10.1 Outfall Inspection Map Conducted by KCI Engineering 2018-2023 MS4 Cycle: All outfalls passed inspection.