

The background of the page is a photograph of a residential street, tinted in a solid green color. The image shows a row of houses with lawns and trees in the foreground. The houses are multi-story, and the trees are scattered along the street. The overall scene is a typical suburban neighborhood.

ELEMENT G

# Utilities, Water & Sewer

# G. Utilities, Water, and Sewer Element

## Element Defined

Safe, adequate, and sustainable water and sewer infrastructure is critical to guiding New Castle County's planned growth and development, as well as supporting its residents, businesses, and natural environment. This chapter summarizes how water and sewer utilities are provided in New Castle County in 2020, challenges and opportunities currently faced or anticipated in the future, and projections of future supply and demand. At the end of the chapter are goals, objectives, and strategies for how the County and its partners should best provide these vital services for a sustainable future.

Access to safe, clean, affordable drinking water is critical to quality of life in New Castle County. Our drinking water comes from watersheds, which are areas of land that drain all the streams and rainfall to a single point, such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. Watersheds consists of surface water, like lakes, streams, reservoirs, and wetlands, and all the underlying groundwater. The New Castle County Unified Development Code defines groundwater as the portion of subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. To provide drinking water, groundwater is drawn up from aquifers by public and private wells.

A healthy watershed provides clean drinking water, irrigation and healthy soil for crop production, protection from flooding, and adequate wildlife habitat in addition to providing enjoyment and outdoor recreation opportunities. Unfortunately various forms of pollution, including runoff and erosion, interferes with the health of the watershed. According to the Delaware Water Resouce Center, the major causes of Delaware's surface water quality problems are pathogenic bacteria, nutrient over-enrichment, toxic compounds, and the physical degradation of stream habitats. Delaware's ground waters have also been impacted by nutrients from fertilizers, animal manure, and septic systems; by leakage of contaminants such as petroleum from underground storage tanks; and by salt water intrusion. Protection of the natural resources in our watershed is essential to maintain the health and well being of all living things, both now and in the future.

## What We Heard

During the NCC2050 public involvement process, residents expressed that access to safe, clean, affordable drinking water and wastewater services is important as is maintaining and repairing aging water and sewer infrastructure. Additionally, water pollution, failing retention basins, and flooding were cited as important issues. Green infrastructure and riparian buffers were suggested strategies to address these issues.

*“Water resources are also important for recreation and biodiversity in addition to drinking water and flooding.” –Let’s Talk Workshop: Places and Spaces (November 9, 2020) participant*

# New Castle County Today

## Water Supply

According to the Delaware Department of Natural Resources and Environmental Control (DNREC), in New Castle County, 75% of the drinking water is obtained from surface water sources (rivers, creeks, and streams) and 25% from groundwater, sourced from aquifers supplied by rainfall. The Delaware River Basin and a sub-basin, the Christina River Basin, are the primary sources of all drinking water for New Castle County. This watershed is shared with parts of Pennsylvania and Maryland. New Castle County is downstream of these areas and any impacts to those regions will affect our county.

The Delaware River is the longest un-dammed river in the United States east of the Mississippi, extending 330 miles from the confluence of its East and West branches at Hancock, New York to the mouth of the Delaware Bay where it meets the Atlantic Ocean. The Delaware River Basin provides drinking water to New York, New Jersey, Pennsylvania, and Delaware. **Figure** displays the Delaware River Basin.

The Christina River Basin provides 75% of the drinking for northern New Castle County. The Christina River Basin is a watershed that drains portions of Pennsylvania, Delaware, and Maryland, and includes the Christina River, Brandywine Creek, White Clay Creek, and Red Clay Creek.<sup>15</sup> **Figure** displays the Christina Basin and its sub-watersheds.



Figure G-1: Delaware River Basin;  
Source: Delaware River Basin Commission

<sup>15</sup> Fast Facts: Protecting the Sources of Your Drinking Water, Source Water Program, Division of Water Resources, Delaware Dept. of Natural Resources and Environmental Control, April 2007

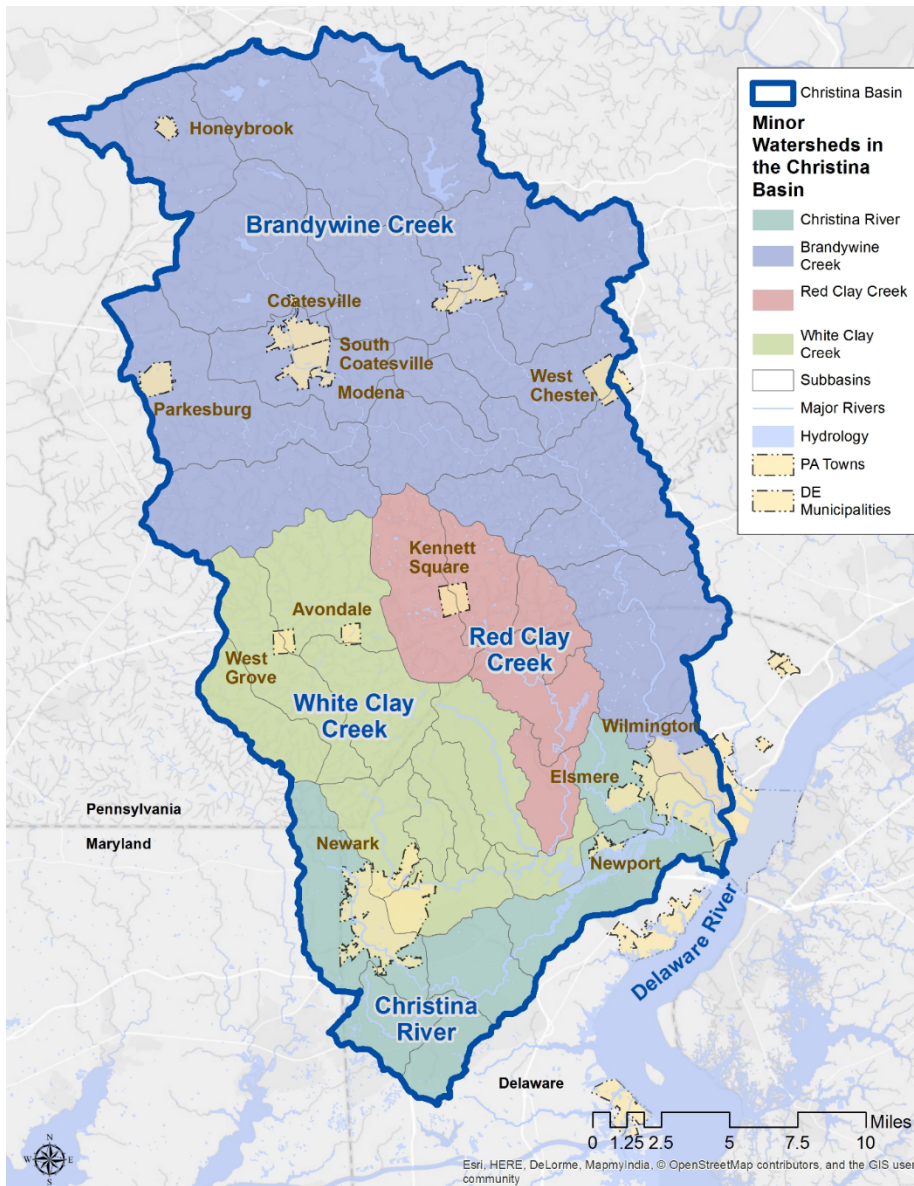


Figure G-2: Christina River Basin; Source: University of Delaware Water Resource Center

In general, water use in New Castle County is fairly consistent; however, southern New Castle County (south of the Chesapeake & Delaware Canal) uses significantly more water for agricultural irrigation while the northern portions of the county tend to have more commercial and industrial users.

## Northern New Castle County

North of the Chesapeake and Delaware (C&D) Canal, 80% of water users receive their drinking water from one of the eight water providers (five are public and three are private). These water providers are responsible for collecting, treating, and distributing water, according to state and federal rules and regulations.<sup>16</sup> Public and private wells provide drinking water to the remaining residents. **Map G-1** displays New Castle County’s water supply areas.

<sup>16</sup> Delaware’s drinking water: Where does it come from and is it safe?, DelawareOnline/Delaware News Journal, Jan. 22, 2020, <https://www.delawareonline.com/story/news/local/2020/01/22/delawares-drinking-water-where-does-come-and-safe/2806669001/>

# Northern New Castle County Water Providers

## Public:

- City of Newark
- City of Wilmington
- Town of Middletown
- Delaware City
- City of New Castle Municipal Services Commission (NCC Water and Light Co.)

## Private:

- Artesian Water Company
- SUEZ Delaware
- Tidewater Utilities

## Water Demand

According to *Water Supply and Demand Projections in Northern New Castle County through 2050* from the University of Delaware Water Resources Center (DWRC), 2020 water demand as recorded by the water providers in northern New Castle County was below normal and ranged between 49 and 66 million gallons per day (mgd). Looking forward to 2021, base demands are selected as the maximum monthly water demand recorded for each provider for the five-year period from 2016 through 2020. Water demands (Table G-1) are projected from 60.8 mgd recorded in 2020 to 65.0 mgd in 2021, 66.3 mgd in 2025, 68.0 mgd in 2030 and 75.1 mgd by 2050. Projected 2024 demands based on 0.5% annual population growth for New Castle County as reported by the Delaware Population Consortium in October 2020.

*Table G-1: Maximum Monthly Water Demand in Northern New Castle County*

**Table 4.** Maximum monthly water demand (mgd) in northern New Castle County, Delaware through 2050

Purveyor	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	2050
Wilmington	17.2	18.4	17.0	17.6	18.3	17.4	18.4	18.5	18.6	18.7	18.8	19.2	19.7	20.2	20.7	21.3
Artesian Water	19.2	19.3	18.6	20.0	21.0	20.8	21	21.1	21.2	21.3	21.4	22.0	22.5	23.1	23.7	24.3
SUEZ DE	20.4	18.9	18.1	21.2	18.2	18.6	21.2	21.3	21.4	21.5	21.6	22.2	22.7	23.3	23.9	24.5
Newark	3.5	3.8	3.3	3.5	3.5	3.5	3.8	3.8	3.8	3.9	3.9	4.0	4.1	4.2	4.3	4.4
New Castle MSC	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7
<b>Total (mgd)</b>	<b>60.8</b>	<b>61.0</b>	<b>57.5</b>	<b>62.8</b>	<b>61.5</b>	<b>60.8</b>	<b>65.0</b>	<b>65.3</b>	<b>65.7</b>	<b>66.0</b>	<b>66.3</b>	<b>68.0</b>	<b>69.7</b>	<b>71.5</b>	<b>73.3</b>	<b>75.1</b>

*Source: Water Supply and Demand Projections in Northern New Castle County through 2050*

Data from 2001-2016 shows that per capita water demand in northern New Castle County has declined from a high of 165 gallons per capita per day (gpcd) in 2001 to 125 gpcd by 2015 and is projected to decline and level off to near 120 gpcd by 2030. The decline in per capita water demand is thought to be based on a variety of factors including growing water conservation by consumers, conservation water rates, rehabilitation of leaking water mains, and maturation of neighborhoods that require less lawn watering. Since per capita water demand is declining and population is projected to level off and slightly decline, the projected water demands in northern New Castle County through 2050 are conservative.

# Southern New Castle County

Groundwater drawn from aquifers is the sole source of drinking water in Southern New Castle County. South of the C&D Canal, where there are approximately fourteen major aquifers, all of the water is drawn from public and private wells. According to the *Water Supply and Demand in Southern New Castle County through 2050* report, there are over 4,600 individual wells in southern New Castle County, with the majority located in the areas north of Middletown, Odessa, and Townsend. Other wells include community wells, such as the Mount Pleasant Trailer Park and Cantwell Water Company, and non-community wells to serve area businesses, farms, golf courses, and nurseries.

## Public Community Wells

- Artesian Water Company (26 wells)
- Artesian Water Company, Delaware Correctional Center (4 wells)
- Tidewater Utilities (24 wells)
- Town of Middletown (4 wells)
- Mount Pleasant Trailer Park (2 wells)
- Cantwell Water Company (2 wells)

## Self-Supplied Non-Community Wells (20 wells)

- Transient: Restaurants, stores, hotels, parks
- Non-Transient: Schools, daycare centers, office, factories

## Irrigation Water Supplies

- Farms (26 wells)
- Golf courses, nurseries (1 well)

## Water Demand

The anticipated demand for individual wells is low due to the trend of development towards larger subdivisions (greater than 25 units), which are required by the Unified Development Code (UDC) to be served by public water. The number of individual wells is anticipated to only increase by 0.5 percent through 2050. The anticipated increase in demand for public water corresponds with the projected increase in population over time. The increase in demand for public water is anticipated to peak in 2020 and decrease into 2050. Based on the population projections, there is adequate groundwater available to service the increase in population and associated households. **Table G-2** projects public water demands through 2050 assuming increases in demands coincide with population growth.

Table G-2: Public Water Demand in Southern New Castle County

Year	2010	2020	2030	2040	2050
% increase in population	--	18.0	15.7%	13.6%	11.9%
Population	52,454	61,882	71,589	81,296	91,002
Less population individual wells	14,530	15,266	16,039	16,500	16,650
Population public water supply	37,924	46,616	55,550	64,796	74,352
% increase public water supply		22.9%	19.2%	16.6%	14.7%
<b>Water Purveyor</b>	<b>(mgd)</b>	<b>(mgd)</b>	<b>(mgd)</b>	<b>(mgd)</b>	<b>(mgd)</b>
Artesian Water Co.	2.3	2.8	3.4	3.9	4.5
AWC: DE Correctional Center	1.7	1.7	1.7	1.7	1.7
Tidewater Utilities	1.7	2.1	2.5	2.9	3.3
Middletown	1.7	2.1	2.5	2.9	3.3
Self-Supplied Non-Community Wells	0.3	0.3	0.3	0.3	0.3
<b>Peak Daily Public Water Demand</b>	<b>7.7</b>	<b>9.0</b>	<b>10.4</b>	<b>11.7</b>	<b>13.2</b>
Individual Wells (0.5% /yr)	1.5	1.5	1.5	1.5	1.6
<b>Potable Peak Daily Demand</b>	<b>9.2</b>	<b>10.5</b>	<b>11.9</b>	<b>13.3</b>	<b>14.7</b>
<b>Farm Irrigation (wet)</b>	<b>0.8</b>	<b>1.0</b>	<b>1.1</b>	<b>1.3</b>	<b>1.5</b>
<b>Farm Irrigation (dry)</b>	<b>2.7</b>	<b>3.2</b>	<b>3.8</b>	<b>4.4</b>	<b>5.0</b>

Source: Water Supply and Demand in Southern New Castle County through 2050

The *Water Supply and Demand in Southern New Castle County in 2050* report from (DWRC) shows that water demand for farm irrigation is projected to continue to rise slightly in southern New Castle County. From 2012 to 2017, the number of farms has declined from 374 to 361 and farmland has increased slightly from 64,169 to 67,455 acres in southern New Castle County while irrigated farmland has increased by 510 acres. Since farm irrigation draws mostly from shallow aquifers and public water supplies pump from deeper aquifers, conflicts between the users should be minimized.

**Table G-3** compares water supply and demand for public water providers for 2010 and 2050 population conditions. In 2010, public water suppliers had existing supplies (15.7 mgd) that exceeded peak daily demands (8.2 mgd) thus accounting for a healthy surplus (+7.5 mgd). By 2050, the public water providers are projected to have supplies (15.7 mgd) that exceed the forecasted peak daily demand (13.6 mgd) for a surplus of 2.1 mgd. Surplus/deficit calculations are based upon peak daily supplies in accordance with current DNREC water allocation permits.

Table G-3: Water Supply and Demand in Southern New Castle County (2020-2050)

Water Purveyor	Current Max Daily Allocation (mgd)	2020 Peak Day Demand (mgd)	2030 Peak Day Demand (mgd)	2040 Peak Day Demand (mgd)	2050 Peak Day Demand (mgd)	2020 Surplus/Deficit (mgd)	2030 Surplus/Deficit (mgd)	2040 Surplus/Deficit (mgd)	2050 Surplus/Deficit (mgd)
Artesian Water Co.	8.8	2.8	3.4	3.9	4.5	6.0	5.4	4.9	4.3
AWC: DE Correctional Center	2.1	1.7	1.7	1.7	1.7	0.4	0.4	0.4	0.4
Tidewater Utilities, Inc.	2.7	2.1	2.5	2.9	3.3	0.6	0.2	-0.2	-0.6
Middletown	1.7	2.1	2.5	2.9	3.3	-0.4	-0.8	-1.2	-1.6
Self-Supplied	0.4	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1
<b>Public Water Supply</b>	<b>15.7</b>	<b>9.0</b>	<b>10.4</b>	<b>11.7</b>	<b>13.2</b>	<b>6.7</b>	<b>5.3</b>	<b>4.0</b>	<b>2.5</b>
Individual Wells	1.5	1.5	1.5	1.5	1.6	0.0	0.0	0.0	-0.1
<b>Total Potable Water</b>	<b>17.2</b>	<b>10.5</b>	<b>11.9</b>	<b>13.3</b>	<b>14.7</b>	<b>8.8</b>	<b>2.8</b>	<b>3.4</b>	<b>3.9</b>

Source: Water Supply and Demand in Southern New Castle County through 2050

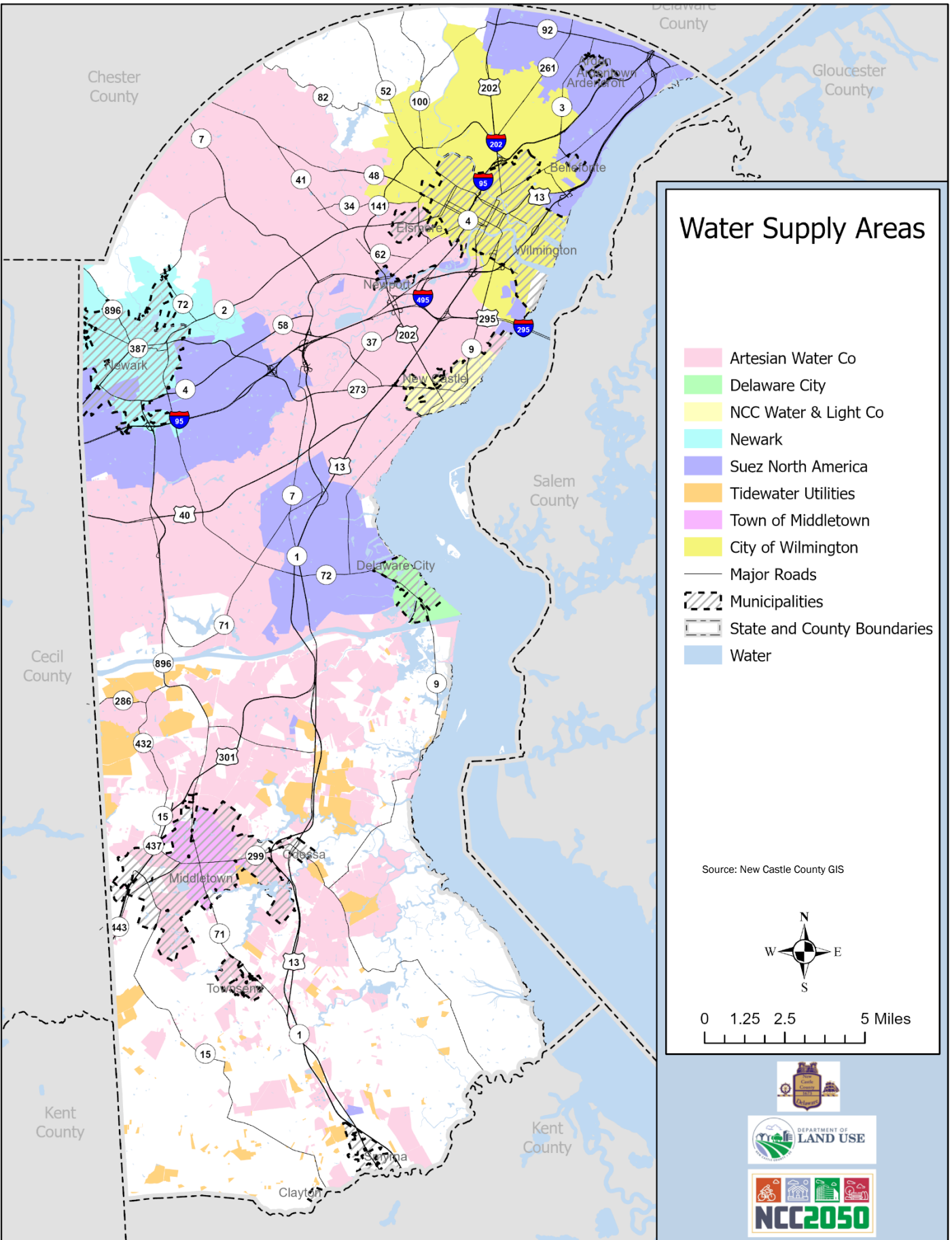
Water Supply and Demand in Southern New Castle County through 2050 also found that there will be sufficient groundwater availability to meet peak demands from public water supply uses based on population growth estimates provided that:

- Public water supply and irrigation wells are pumped in accordance with DNREC water allocation limits. DNREC should continue to monitor demands and water levels from allocated public water supply wells and irrigation wells so as not to diminish the capacity of irrigation wells for producers that wish to sustain farming in southern New Castle County.
- Water providers interconnect between and within systems, add new finished water storage and aquifer storage and recovery, and transport water from aquifers with excess availability south of Townsend to growth areas between Middletown/Odessa and the Chesapeake & Delaware Canal

The DWRC also recommends, to protect the quantity and quality of aquifers that provide sole source drinking water, subdivisions should be served by public water systems rather than by individual wells. As a result, the New Castle County Unified Development Code (UDC)<sup>17</sup> requires that new subdivisions with more than 25 lots be served by public water systems. For purposes of water quantity, quality and security, New Castle County should work with the water purveyors/utilities, and public service commission to look for opportunities for interconnectedness of the system as a whole and to connect to public water supply as part of a strategy to prevent water supply disruptions in those communities of 25+ units that were developed on private well systems prior to the code requirement being added.

<sup>17</sup> Section 40.12.115 and Section 40.22.410

Map G-1: Water Supply Areas



## Climate Change & Saltwater Intrusion in Southern New Castle County

*Water Supply and Demand in Southern New Castle County through 2050* outlined possible impacts of climate change on water in southern New Castle County. A comparison of air temperature data and water demand data in New Castle County showed that water demand increases by 3% for every 1% increase in maximum air temperature. If summer maximum air temperatures are projected to increase by 3° F by 2020-2039 (or 3.3%), then peak water demand may increase 9.9% to 10.1 mgd by 2020-2039 due to warming. By 2050, projected water demands in southern New Castle County will increase 52% due to population growth and 59% if climate change is accounted for.

As sea levels rise as a result of climate change, salt water will make its way further inland and into the underground aquifers that supply water for drinking and agricultural uses. This is called saltwater intrusion, or the process of saltwater moving underground into areas of freshwater in an aquifer where water is present, as defined by [DNREC](#). Shallow coastal groundwater aquifers and drinking water sources could be penetrated by salt water and become saline. DNREC has conducted regular monitoring of saltwater intrusion for multiple decades. Data has not indicated any reason for concern. With changes that climate change will bring, a review of adequacy of monitoring program should be considered. More information about intrusion is found in the [Climate Change & Resiliency Element](#).

## Source Water Protection

Source water, including rivers, streams, lakes, reservoirs, springs, and groundwater, provide water to public drinking water supplies and private wells. These areas also include wellhead areas, excellent ground-water recharge potential areas, and surface water supply areas within watersheds. Source water protection is the wise use of land around drinking water sources to reduce risks associated with exposure to contaminated water.

The Source Water Assessment and Protection Program (SWAPP), created as part of the Safe Drinking Water Act Amendments of 1996, has the expressed goal of achieving better protected public drinking water resources by providing local and state governments and the public more information about those resources. DNREC has the lead role in the development and implementation of the Delaware SWAPP. The Delaware Division of Public Health and the Water Resources Agency, Institute for Public Administration at the University of Delaware, closely supports its work.

The State of Delaware Source Water Protection Law of 2001 (7 Del. C. 6081, 6082, 6083) requires local governments with year-round populations of 2,000 or greater to implement measures to protect the quality and quantity of public water supplies within delineated surface water, wellhead, and ground-water recharge areas by 2007. Since 1987, the University of Delaware has administered the Water Resource Protection Area Program for New Castle County. The purpose of the WRPA protection standards in the New Castle County Unified Development Code is to protect the quality and quantity of surface water and groundwater supplies. Under the Unified Development Code, all development within recharge, wellhead, Cockeysville formation, and reservoir water resource protection areas are not permitted to exceed 20% of impervious cover or disturb more than 50%. Applications that propose exceeding either of these thresholds must provide an Environmental Impact Analysis (EIA) and may be subject to Resource Protection Areas Technical Advisory Committee (RPATAC) and Board of Adjustment (BOA) for recommendation and approval which would include conditions to recharge and monitor. Presently, over 20% of New Castle County land area is protected by the WRPA provision of the Unified Development Code.

Map G-2 shows the Water Resource Protection Areas within New Castle County, including wellhead protection areas and recharge areas. A wellhead protection area is the surface and subsurface area surrounding a public water supply well through which contaminants could reach the well. Groundwater recharge areas are defined as areas with very permeable soils where recharge occurs quickly.

# Water Quality

Delaware has established pollution reduction targets for watersheds that do not meet water quality standards set to protect waterways for drinking, fishing, swimming, boating, or to support aquatic life. These targets, or Total Maximum Daily Loads (TMDLs), have also been established for the Chesapeake Bay and its tributaries through the Chesapeake Bay Program under the United States Environmental Protection Agency (EPA), in cooperation with member states and for tributaries of the Delaware Estuary. All major watersheds within southern New Castle County experience impairment due to excess nitrogen and phosphorous. Nitrogen and phosphorus pollution frequently come from wastewater, animal feed lots, and polluted runoff from fertilized crop land and lawns. Vehicle exhaust and industrial sources, such as power plants, also contributes to nitrogen pollution.

A number of governmental agencies and organizations have a role in regulating water supply in Delaware:

DNREC's Water Supply Section is charged with managing and issuing well construction and use permits for wells withdrawing 50,000 gallons per day (gpd) or less and with permitting water withdrawals of over 50,000 gpd. Withdrawals of over 100,000 gpd within the jurisdictional area of the Delaware River Basin Commission (DRBC) must also receive approval from the DRBC. In addition, the Water Supply Section conducts long-term water supply planning, water conservation efforts, and coordinates with other organizations in these pursuits.

The Delaware Water Supply Coordinating Council (WSCC) is charged with developing new water supplies in New Castle County and working cooperatively to manage water supplies more efficiently. The Council includes representatives from the Office of the Governor, several state agencies, the Delaware Geological Survey, the Water Resources Agency at the University of Delaware, the Delaware River Basin Commission, all three county governments, public and private water utilities, local governments, the Delaware Rural Water Association, businesses, citizens groups, and more. The group is chaired by the Secretary of the Department of Natural Resources and Environmental Control (DNREC).

The Water Resources Agency (WRA) at the University of Delaware provides [services](#) to Delaware's governments as the State Water Coordinator, as a voting member of New Castle County Resource Protection Area Technical Advisory Committee (RPATAC), as a local Christina Basin watershed coordinator, and as the lead agency in charge of implementing a Source Water Protection Plan for Delaware's four drinking water intakes.

According to the [City of Wilmington Water Supply Intake story map](#), Source Water Assessment Plans identify source water areas and determine the vulnerability and susceptibility of the source water to contamination. The procedures used in local Source Water Assessment Plans are based on the [Delaware Source Water Assessment Plan](#) which was established in 1999 after the passage of the Safe Drinking Water Act. Source Water Assessments are [publicly available](#) from the Delaware Source Water Protection Program.

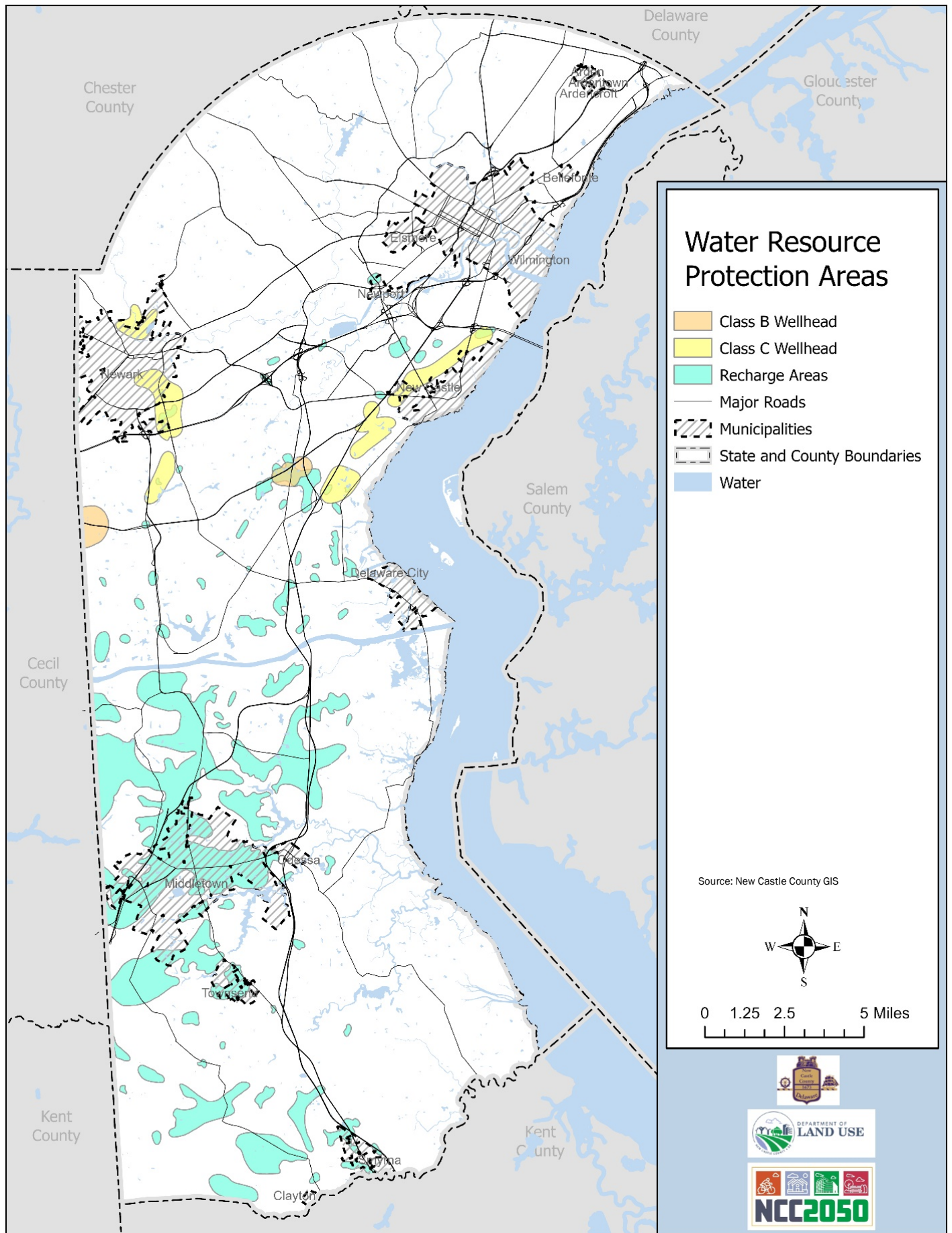
Water utilities are subject to regulation by the Delaware Public Service Commission (PSC). Most aspects of water distribution, including maximum rates, are regulated by the PSC, which is also charged with granting Certificates of Public Convenience and Necessity as appropriate when water utilities wish to expand their service territory.

Surface water quality has improved significantly over the past decade. As a result of increased water quality, fisheries are returning. However, high nitrogen and polychlorinated biphenyls (PCB) levels, which come from industrial chemicals, remain to be addressed. DNREC's Surface Water Discharges Section (SWDS) works to improve surface water quality. The SWDS regulates point sources of pollution including municipal and industrial wastewater treatment systems and their construction, biosolids applications, and stormwater discharges associated with industrial activities. The SWDS is also responsible for issuing regulatory permits under the National Pollutant Discharge Elimination System (NPDES), which require permittees to establish Water Quality Improvement Plans to achieve TMDLs. New Castle County is a

NPDES Permittee and has two approved Water Quality Improvement Plans (WQIPs)—Christina River and Dragon Run.

The DNREC program tasked with protecting groundwater is the Groundwater Discharges Section (GWDS). The GWDS oversees all aspects of the siting, design, and installation of onsite wastewater treatment and disposal systems (known as septic systems).

Map G-2: Water Resources Protection Areas



# Wastewater

New Castle County is responsible for the installation and management of the sewer systems throughout most of the county. New Castle County's Public Works Department, Wastewater Division, designs, builds, and manages the sanitary sewer system and wastewater treatment facilities, consists of over 1,760 miles of sewer, providing service to more 122,000 customers, handling 50 million gallons of water every day. The system includes four wastewater treatment plants and 175 pump stations.<sup>18</sup> The county is divided into 11 Sewer Service Districts, also referred to as Sewer Sanitary Basins. New Castle County is primarily responsible for all sewer lines outside the incorporated municipalities. **Map G-3** displays New Castle County's existing and planned sewer service areas.

In April 2020, the Delaware Department of Natural Resources and Environmental Control (DNREC) produced a [Statewide Assessment of Wastewater Facilities](#) outlining details related to all wastewater facilities in Delaware. At the time of this assessment, DNREC noted that New Castle County is in the early stages of establishing a risk-based asset management program, entering all sewer system evaluation study results into a computerized maintenance management software (CMMS), and analyzed by a custom application which provides Operations and Engineering recommendations and prioritization. The County also uses a program called SCREEN (by Jacobs) that employs CCTV data to develop risk matrix for sewer system and has increased its use of pipe lining technology with a Siemens program to track overflow contributing in a reduction of overflows by 90% since 2019.

## Northern New Castle County

North of the C&D Canal, most dwellings are connected to the public sewer system. The generated sewage within this area is conveyed through a network of sanitary sewer pipes and pump stations via nine major interceptor lines to the Wilmington Wastewater Treatment Plant. On-lot septic systems are largely confined to the northwest portion of the Brandywine Hundred on land zoned Suburban Estate.

## Southern New Castle County

South of the C&D Canal, there are four sewer service providers.

- New Castle County
- Middletown
- Smyrna
- Clayton

Sewer infrastructure is largely limited to the central core area of the Southern New Castle County Master Plan. The Department of Public Works provides sewer service to unincorporated New Castle County as well as the municipalities of Odessa and Townsend. The Lea Eara Farms subdivision, which is located in the west, was provided sewer service by the County upon failure of the subdivision's private treatment plant. Middletown, Smyrna, and Clayton have constructed and manage their own sewer infrastructure. There is currently a small portion of the Town of Middletown that is connected to the County's sewer infrastructure.

In areas of New Castle County where sewer service is not available, onsite wastewater facilities, more commonly known as septic systems, are constructed. In reviewing both DNREC Septic permits and property that receives public sewer service (Public Works data), we estimate that there are roughly 13,000 active septic systems in the unincorporated areas of New Castle County.<sup>19</sup>

When comparing a typical lot developed on septic to one on public sewer, the University of Delaware has found that the septic lot potentially delivers 95% more nitrogen (typically in the form of nitrates)

---

<sup>18</sup> New Castle County Public Works Department, as of November 2021

<sup>19</sup> Analysis performed on sewer billing data compared to the septic permit data provided by DNREC.

contamination to ground water than the sewered lot.<sup>20</sup> Prolonged nitrate exposure, through drinking water exceeding regulatory limits potentially leads to infant methemoglobinemia (blood disorder), colorectal cancer, thyroid disease, and neural tube defects.<sup>21</sup> Averting unnecessary health risks resulting from potential contamination of drinking water has been an important element in New Castle County land use policy and regulations dating back about 30 years. Incentives to develop on sewer and limitations for developing with on-site wastewater treatment have been adopted by New Castle County Council to protect existing and future residents.

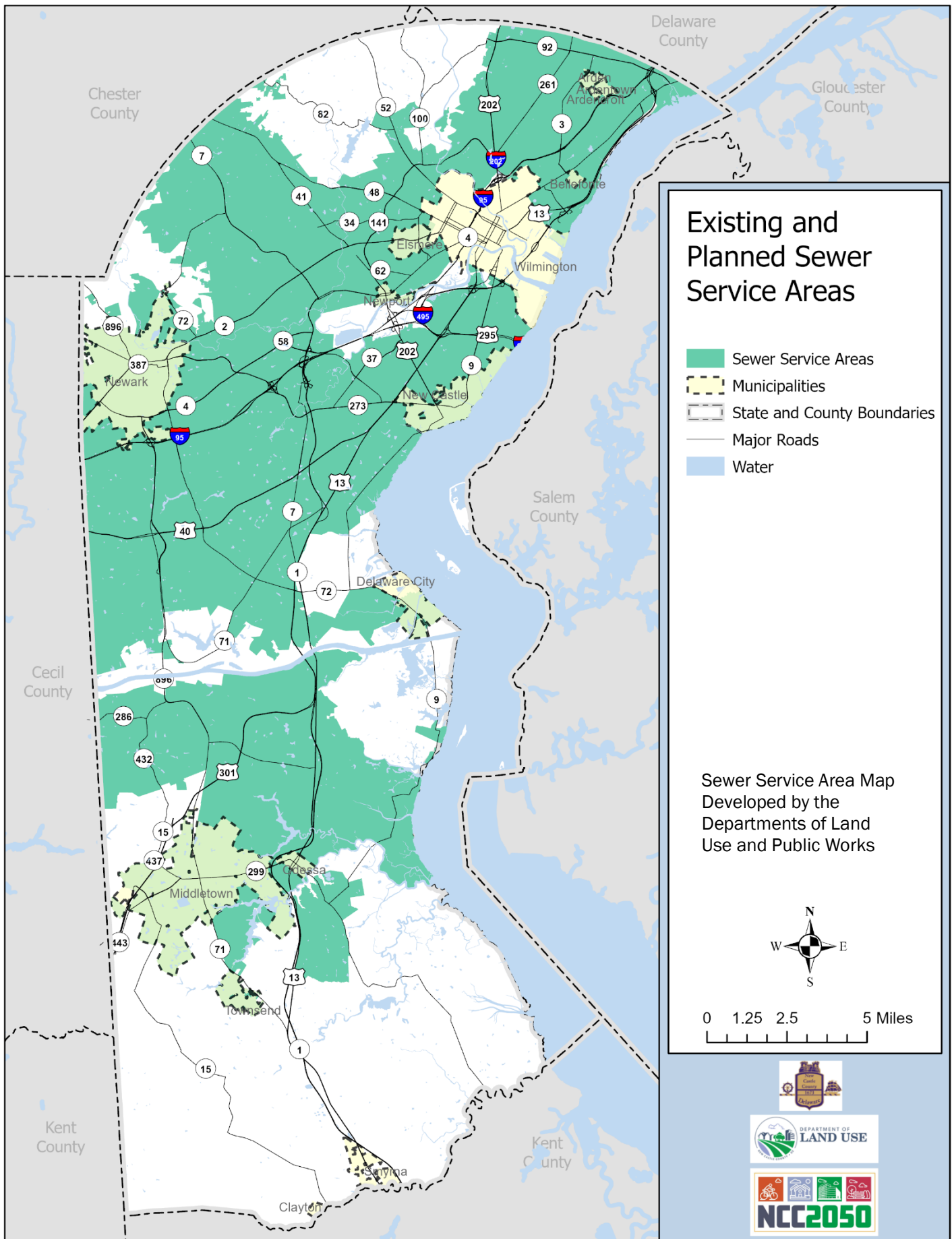
As New Castle County looks to the future, it must continue to protect our water resources, take deliberate actions to improve ground water quality by providing an efficient and effective public sanitary sewer service. In instances where public sanitary sewer service is not an option, the County must work with DNREC to assure that the systems installed are high quality systems that are inspected at a regular basis.

---

<sup>20</sup> Southern New Castle County Wastewater Plan (September 27, 2019)

<sup>21</sup> Based on a peer reviewed article in the Journal of Environmental Research and Public Health (July 23, 2018), and published online at the US National Library of Medicine, National Institutes of Health  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6068531/>

Map G-3: Existing and Planned Sewer Service Areas



## Approved Sewer Projects

Wastewater projects approved under the 2022 New Castle County Capital Budget includes:

1. Brandywine Interceptor Renovation: Project includes rehabilitation, repair and replacement of the existing Brandywine Interceptor to convey existing wastewater flows. This is a phased project commencing with the Alopocas Portion of the interceptor.
2. Christina River Force Main (CRFM): 20% Design of a new CRFM asset to provide redundancy and support to the existing CRFM. The project consists of both a parallel pipe design and assessment, protection, and rehabilitation measures to the existing CRFM.
3. Delaware City Industrial Expansion: Design and construct a regional wastewater system to serve commercial and industrial development within and around the Delaware City Industrial Refinery. The southern portion of the system was completed in September 2021. The northern portion of the system, serving the areas along Governor Lea Road are currently under design.
4. Edgemoor System Rehabilitation: Wastewater asset rehabilitation in Phase 2 of Brandywine Hundred Rehabilitation communities, including excavated repairs focusing on limited capacity sub-basins and operational needs.
5. Lea Eara Farms Wastewater Treatment Plant Closure: This project consists of the decommissioning and closure of the Lea Farms WWTP. The Lea Eara Farms force main was previously completed and was placed in operation. Restoration of the WWTP will occur subsequent to the decommission phase.
6. North Delaware Interceptor: The project consists of the continued assessment of existing interceptor system serving the North Delaware sanitary system located along Governor Prinze Boulevard. The project also includes planning, design and construction for trunkline replacement through the Claymont Transit Center Redevelopment project and the future Naaman's Interceptor Realignment
7. Southern Sewer Service Area: Design and construction of the wastewater system supporting Southern New Castle County including treatment and disposal upgrades serving planned growth through 2050. Regional system construction as required by growth rate and Land Use planning efforts.
8. White Clay System Rehabilitation: Includes the investigation, rehabilitation and/or replacement sanitary sewer assets.

## Looking Forward

New Castle County has been blessed with clean water supply sources that adequately supplies the needs of our residents into the future. It is of utmost importance that we protect these assets to protect the public health. We should achieve this by encouraging development where sewer infrastructure is present with ample protections for our water resource protection areas, while dissuading development in areas without sewer infrastructure. The County has developed the following Goals, Objectives and Strategies based on the analysis and conditions above, the Deep Dive Session on infrastructure<sup>22</sup> as well as other public input received during the NCC2050 planning process.

---

<sup>22</sup> Deep Dive Session 3: Infrastructure: Transportation, Water & Sewer and Hazard Mitigation

# Related Goals, Objectives, and Strategies

3. Goal: Clean water is available to all residents now and in the future.

3.1. Objective: Continue to ensure water services and potable water supply is sufficient to meet demand.

3.1.1 Strategy: Continue to work with the Water Supply Coordinating Council, DNREC and the Water Resources Center at the University of Delaware to monitor the water supply, evaluate changing demands and influences, and ensure availability now and for future generations.

3.1.2 Strategy: Consider additional safeguards for Water Resource Protection Areas (WRPAs) and the public water supply.

3.1.3 Strategy: New Castle County government leads by example and community partnerships, implementing water-saving techniques and best practices, such as low-water landscaping, water-saving technology in buildings, rain barrel program, etc.

3.1.4 Strategy: Work with water purveyors, utilities, and public service commission to look for opportunities to connect to public water supply as part of a strategy to prevent water supply disruptions in those communities of 25+ units that were developed on private well system prior to the code requirement being added.

3.1.5 Strategy: Work with water purveyors interconnect between and within systems, add new finished water storage and aquifer storage and recovery, and transport water from aquifers with excess availability south of Townsend to growth areas between Middletown/Odessa and the Chesapeake & Delaware Canal.

3.1.6 Strategy: Work with DNREC to monitor demands and water levels from allocated public water supply wells and irrigation wells so as not to diminish the capacity of irrigation wells for producers that wish to sustain farming in southern New Castle County.

3.2. Objective: Continue to maintain efficient and effective sanitary sewer service in existing areas served by sewer and extend service to new areas, as planned, to meet growth demands in a sustainable manner.

3.2.1 Strategy: Encourage new development within Sewer Service Areas and regulate septic use for low-density development consistent with County Septic Policy.

3.2.2. Strategy: Delineate a Growth Area Boundary and amend the Sewer Service Area Map to include areas planned and not planned for sewer service (including definitions that provide clarity and predictability).

3.2.3. Strategy: Designate areas for growth and areas for preservation, working collaboratively with the Office of State Planning Coordination

3.2.4. Strategy: New Castle County and incorporated towns should continue coordination and collaboration on development, infrastructure, and policies to support efficient/effective provision of sewer and water, including using joint planning areas.

3.2.5 Strategy: Update Chapter 38 (which covers sewers and sewage disposal) and Public Works policies to achieve consistency with the UDC and the NCC2050 Comprehensive Plan.