MASTER PLAN

BOROUGH OF PENNINGTON
NEW JERSEY

5. Utility Services Plan Element

The Utility Services Plan element draft released by the writing team was conditionally adopted by the Planning Board on March 12, 2025, and posted on the Borough website for public comment. Revisions made to address comments received and to ensure consistency with other Plan elements were endorsed by the Planning Board on October 8, 2025. This near-final draft will be available for further public comment prior to final adoption at a public meeting later in 2025.

Contents

Utility Services Plan Element Writing Team

Thanks go to the following people who helped create this draft of the Utility Services Plan element: GP Caminiti, Brian Friedlich, Joann Held, Meredith Moore, Natalie Shivers, Nadine Stern, Mary Ternoey and Rick Smith, with Andy Jackson as chair. Thanks also go to Kati Angerone for her thorough review and many suggestions for improvement of the element.

1. Introduction

The Municipal Land Use Law (MLUL) includes a Utility Services Plan as a permitted Master Plan element. N.J.S.A. 40:55D-28(4) describes the element as follows:

"A utility services plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment, solid waste disposal and provision for other related Utility Services and including any stormwater management plan required pursuant to the provisions of PL.1981, c.32 (C.40:55D-93 et al.)."

Pennington Borough provides many services to its residents and businesses beyond those listed in the MLUL description above. All utility services should be part of the planning process. This element includes services provided by the Department of Public Works and outside entities, including commercial services.

Services provided within the Borough by the Department of Public Works:

1. Operation, management and maintenance of the Pennington Water Department, a public water system, including water supply infrastructure, such as water supply wells, water treatment and water distribution system (i.e., water mains, valves, towers, hydrants, etc.) for the provision of safe and adequate water supply and fire protection for residents, businesses and municipal buildings.
2. Operation, management and maintenance of the wastewater collection system and delivery to the Stony Brook Regional Sewerage Authority (SBRSA) Pennington Wastewater Treatment Plant.
3. Operation, management and maintenance of Borough-owned or controlled stormwater infrastructure (i.e., pipes, inlets, basins, etc.) and provision of stormwater management consistent with applicable federal and state laws.
4. Borough road repairs and maintenance.
5. Snow removal from Borough Streets and Borough owned or controlled properties.
6. Maintenance of Borough Trees, as defined in the Borough's Community Forestry Management Plan developed by the Shade Tree Committee.
7. Garbage collection, including additional fee-based services for bulk waste.
8. Leaves, branches, and lawn and yard waste collection.

Services provided to the Borough by Others:

1. Recycling by the Mercer County Improvement Authority.
2. County road maintenance, including leaf and snow removal by the Roads Section of the Mercer County Department of Transportation & Infrastructure.
3. Electricity from Public Service Electric and Gas (PSEG).
4. Natural Gas from Elizabethtown Gas.
5. Telecommunications by several suppliers.

In preparing this Utility Services Plan element, the writing committee benchmarked the Utility Services Plans in the Master Plans of nearby communities. The Utility Services Plan of the 1998

Pennington Borough Master Plan and the utility services sections in the 2005, 2013 and 2023 Master Plan Reexamination reports were also reviewed, see: https://www.penningtonboro.org/1261/1998-Master-Plan-Updates

The 2023 Master Plan Reexamination report recommended that the water and sewerage data in the 1998 Utility Services element should be revised to reflect current capacities. The updated element should also analyze the need for and show the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and sewerage treatment, solid waste disposal and provision for other related utility services and stormwater management facilities. This element will be helpful to the Borough as it considers likely future development and to what extent it will be served by water, sewerage, flood, solid waste, and stormwater infrastructure and what, if any, upgrades are necessary to ensure adequate service. It should also include electricity and natural gas supply and the installation of communication tools – cable, cell towers and wi-fi. The preparation of this element required coordination with the Director of Public Works.

The vision and goals for the Utility Services Plan element are a subset of the overall Master Plan vision and goals developed by the Master Plan Committee (MPC) and the Citizens Advisory Committee (CAC). The CAC is composed of 15 resident volunteers appointed by the Mayor on October 4, 2023. The role of the CAC is to assist the Planning Board in any area assigned to it, as detailed in NJ MLUL 40:55D-27a. In this case, the CAC is assigned to help the Planning Board develop the Master Plan. Their role is to work with the MPC and with the Committees and Commissions developing draft elements for the Master Plan. CAC members serve as community contacts, obtaining feedback and buy-in as the Plan elements develop.

In the fall of 2023, the MPC and CAC worked together to develop the vision and goals for the updated Master Plan. Their report was reviewed, modified and endorsed by the Planning Board in a public meeting on January 10, 2024. The modified vision and goals were presented to the public at an Open House at Borough Hall on April 10, 2024. Minor revisions were made based on feedback from Borough residents. The resulting list of draft goals was distributed to the teams developing the Master Plan elements as a guide for their discussions. The Utility Services goals in that report were the starting point for the Utility Services Plan element writing team.

2. Utility Services Plan Vision, Goals and Strategies

Pennington Borough's vision for Utility Services is to provide first-class, cost-effective services and safe and reliable water and sanitary systems, in compliance with applicable federal and state laws.

Goals for services provided by the Department of Public Works and Others are:

1. Continue to provide high-quality, cost effective and environmentally conscious utility services for all Pennington residents and businesses.

a. Consider offering some of these services for a fee to Hopewell Township residents whose homes can only be accessed via Borough roads. For example, they may be prepared to pay for water to avoid individual costs for water treatment or well repairs.
b. Ensure that the SBRSA sewerage plant serving Pennington is protected from flooding along Stony Brook.
c. Manage utility assets through maintenance of an up-to-date asset inventory, appropriate assessment of vulnerability and condition, understanding of asset lifecycle, charging adequate fees and rates and capital planning.

2. Continue to provide services in Borough public areas and rights-of-way such as stormwater management, tree management, infrastructure maintenance and upgrades, snowplowing, and road repairs.
   a. Coordinate with Mercer County Department of Transportation & Infrastructure on road maintenance and leaf and snow removal on County Roads in the Borough.
   b. Maintain an up-to-date Community Forestry Management Plan.

3. Continue to maintain and improve water and wastewater systems to ensure uninterrupted service, maximize system capacity, and reduce the long-term cost of municipal ownership.
   a. Improve climate resilience through vulnerability assessment informed infrastructure improvements and redundancy to maintain service during extreme climate change-related events.
   b. Ensure there is sufficient water and sewer capacity to serve new developments, including those associated with the Borough's affordable housing obligation.
   c. Continue the leak detection and water main rehabilitation programs, including lead service line replacements.
   d. Consider connecting to an outside supplier to supplement water supply in emergencies as an alternative to installing a second water tower.
   e. Continue to reduce surface water inflow into the wastewater collection system to ensure efficient use of wastewater treatment facilities.
   f. Improve the understanding of inflow and infiltration of surface water into the ground to maintain groundwater and aquifer quality.

4. Protect water quality for drinking, recreation, irrigation, and natural habitat, maintain Municipal Separate Storm Sewer System (MS4) permit compliance, and meet or exceed current stormwater requirements of N.J.A.C. 7:8.
   a. Maintain an up-to-date stormwater asset inventory, Stormwater Management Plan and Stormwater Pollution Prevention Plan.
   b. Seek all available Federal, State, and County financial assistance to improve stormwater infrastructure to prevent flooding and explore new opportunities to fund provision of stormwater services, such as through a Stormwater Utility.
   c. Reduce stormwater runoff by encouraging a reduction in impervious coverage and consider ordinances that limit impervious surface and lower stormwater management thresholds, especially in areas that are flood prone.
   d. Educate property owners and encourage landscaping for improved water absorption and managing stormwater close to where it falls.

e. Develop and maintain an up-to-date Watershed Improvement Plan, consistent with MS4 requirements, to address water quality and flooding within the Borough's watersheds.
f. Enforce riparian buffers ordinances and encourage enhancement of these areas with native and appropriate vegetation to reduce nonpoint source pollution and reduce flooding.
g. Preserve and enhance riparian zones to minimize flooding, maximize water quality and protect aquatic habitats.
h. Continue to reduce surface water inflow into the wastewater system**.**

5. Reduce the impact of severe storms on fluvial and stormwater flooding in the Borough.
   a. Develop hydrologic and hydraulic analyses of surface waters and stormwater infrastructure in the Borough that are susceptible to frequent flooding, including Lewis Brook and its tributaries.
   b. Identify opportunities for flood mitigation and restoration of the natural floodplain and stormwater infrastructure improvements within the Borough.
   c. Determine best management practices and amendments to ordinances, including stormwater basins, floodplain restoration, removal and reduction of impervious surfaces and green infrastructure, that can be used to slow stormwater, reduce runoff and thereby reduce flooding.
   d. Ensure that Borough ordinances are written to reduce or eliminate disturbance to natural stormwater systems and to use green infrastructure.
   e. Coordinate flooding analyses and identify opportunities for flood mitigation and restoration of the natural floodplain and stormwater infrastructure improvements with local and upstream partners including:
      i) Mercer County Department of Transportation regarding bridges, culverts and stormwater infrastructure within the Borough, particularly along or draining to Lewis Brook. Note that as of 2025, Mercer County is in the planning stages of improving and/or replacing bridge and culvert crossings along Lewis Brook.
      ii) New Jersey Department of Transportation regarding stormwater infrastructure associated with Route 31 and draining to nearby waterways or connecting to Pennington storm systems.
      iii) The Hopewell Valley Regional School District regarding drainage of Central High School facilities into the Lewis Brook watershed.
      iv) Mercer County Park, particularly as it relates to flooding on Stony Brook, which backs up into Lewis Brook. Work with them on beaver management to prevent the exacerbation of localized flooding from beaver dams that can impair the water infrastructure that Pennington relies upon such as the sewer collection system and the Stony Brook Wastewater Treatment Plant.
   f. Identify, characterize, document the history of and map the piped streams or stormwater ditches that could be 'daylighted' to improve aesthetics and the natural functioning of the watershed, reduce flooding and increase green space, all of which have notable health and safety benefits.
   g. Develop a maintenance plan, consistent with or in exceedance of requirements of the MS4 permit, to ensure that stormwater infrastructure such as inlets, pipes and catch basins remain free of debris and that stormwater operation is optimized.

6. Conduct a flood vulnerability assessment on existing and future development that incorporates future floodplains using the New Jersey Department of Environmental Protection's Inland Climate Adjusted Flood Hazard Area.
    a. Chapter 163, Part IV 163-20 of the Borough Code needs to be consistent with State minimum floodplain standards (i.e., New Jersey Flood Hazard Area Control Act rules, N.J.A.C. 7:13 and the Uniform Construction Code N.J.A.C 5:23) and therefore must be updated to reflect amendments to these standards.
    b. Residents need to be made aware of any flood risks to their homes based on updated flood hazard area delineations and as of July 2023 residents and landlords are required by state law to disclose certain flood risks to tenants or prospective buyers.

7. Promote recycling and increase the range of materials that can be recycled.
    a. Continue to promote the County's current recycling program through residential education regarding proper recycling and by making the recycling schedule readily available.
    b. Lobby the Mercer County Improvement Authority to accept more materials for recycling, such as other plastics and polystyrene packaging and work with the Hopewell Valley Green Team to make interim arrangements to recycle materials that are not currently accepted.
    c. Explore and continue alliances with other local/regional organizations (i.e., Hopewell Valley Green Team, Hopewell Valley Regional School District) to establish new or expanded programs to address materials not currently included in existing programs (e.g. metals, plastics other than 1,2 or 5, Styrofoam, construction/demolition debris, window glass, etc.) and host freecycle and repair clinic events that reduce landfill waste. Create a Borough collection site for other items that can be recycled when delivered to recyclers of specific items.
    d. Request that the County collect electronic goods, batteries, and hazardous materials more frequently than every six months.
    e. Investigate whether the Borough can generate income by recycling metals and expanded polystyrene and save money by reducing the volume of waste going to a landfill.
    f. Encourage composting of food waste and other organic material by residents, businesses, and institutions through education on the benefits and best practices. Facilitate participation by establishing compost bins at municipal facilities and schools and make them available to residents.
    g. Ensure the Borough's municipal operations utilize optimal waste management practices. Set a date by which the Borough is 100% paperless, while recognizing that some residents are not comfortable with computers, or don't have access, provide paper options as requested.
    h. Provide recycling bins at all municipal locations including playing fields and parks and wherever trash receptacles are located.

8. Electricity – Public Service Electric and Gas
    a. Work with PSEG to ensure that Pennington is provided with an acceptable level of service and that the distribution system can supply sufficient power as electricity demand

in Pennington increases due to electrification of Borough operations, residences and businesses, and transportation.
   b. Ensure that PSEG makes renewable electricity from all eligible suppliers available to Borough users.
   c. Support the PSEG program to improve supply resilience. Take every opportunity to convert overhead utility lines to underground when making infrastructure improvements.

9. Natural Gas – Elizabethtown Gas
   a. As Pennington moves to electrification, ensure that natural gas supplies will continue to meet needs in the Borough.

10. Telecommunications.
   a. Ensure that Pennington continues to have Borough-wide access to the internet and streaming TV at speeds that are best-in-class.
   b. In recognition that dead zones are a threat to public safety, ensure that comprehensive coverage of cell phone service is available.
   c. Embrace and facilitate the delivery of new technology and services as they become available, while ensuring that the size, location, and appearance of cables and facilities are not visually intrusive.
   d. Borough electronic communications, including virtual meetings and programs, website, social media and email, with residents and businesses should be first class.

3. Background to Services and Service Providers

a. Pennington Department of Public Works
(https://www.penningtonboro.org/1230/Department-of-Public-Works)

The Department of Public Works (DPW) is responsible for maintaining the roads, parks, municipal buildings, and Borough-owned shade trees. The DPW collects municipal waste, as well as leaves, branches and yard waste and clears Borough roads of snow. The public water supply system, the Pennington Water Department (PWD), includes treatment and distribution, is owned and operated by the Borough under the direction of the Superintendent of Public Works as New Jersey licensed water system operator, consistent with federal and state laws. Apart from the main campus of the Pennington School and a few Borough homes, PWD delivers water to all properties in the Borough, as well as several properties in Hopewell Township that straddle the municipal boundary. In 2025, there were 1087 customers made up as follows: 875 single-family homes, 89 multi-family residences, 94 commercial, 15 churches and 14 schools. The system is also responsible for delivering water for fire protection by maintaining the Borough fire hydrants and adequate water pressure, consistent with state law.

DPW staff maintains and operates the Borough's wastewater collection system, consistent with federal and state law, with delivery to the SBRSA treatment plant located on Rocky Hill Road.

b. Water Supply, Treatment and Distribution Systems

The water system consists of approximately 80,000 feet of water main, 367 water main valves, 111 hydrants, four deep wells equipped with turbine and submersible pumps, two packed column treatment units, one packed tray aeration system and a 600,000-gallon standpipe storage tank next to Borough Hall. It supplies 1,087 customers, as described above.

Pennington Borough's water source is the Brunswick Aquifer. Water withdrawals are regulated and permitted by the New Jersey Department of Environmental Protection (NJDEP). This permit, known as a Water Allocation Permit, is renewed every ten years, or sooner if modifications to the permit are proposed. The current Water Allocation Permit #5276 is effective until April 30, 2034. During the permit renewal process, the NJDEP reviews the prior reporting and issues a staff report concerning the allocation and the availability of water from the aquifer being used. The report contains recommendations for modifications and conditions which are incorporated into the renewed permit.

The allocation permit includes a variety of initial, monthly, biennial and general conditions. These conditions require the monitoring of water levels at a multitude of locations, adoption and implementation of water conservation and drought management plans, investigation of valid complaints by users of wells within the zone of influence of the municipal wells and maintaining the unaccounted-for water below 15% of total water use per NJDEP guidance. Unaccounted-for water is the difference between water delivered by the wells and the amount that is recorded by customer meters. Unaccounted-for water may be due to leakage or to inaccurate meters.

The current allocation permit provides for a maximum of 145 million gallons per year, a rate designed to maintain the sustainability of the aquifer in the long term. The monthly allocation maximum is 12.6 million gallons, slightly higher than 1/12th of the annual maximum allocation, allowing some seasonal variation. The maximum instantaneous withdrawal is 777 gallons per minute. This allows the wells to keep up with short-term demand. Night withdrawals are far smaller than those during the day. The withdrawal in 2024 was 90.3 million gallons and the average monthly withdrawal was 7.5 million gallons, about 60% of the maximum. This leaves room for growth in the residential and commercial areas.

The allocation permit also regulates the maximum pump capacity for each well to prevent the local water level falling below a safe level. Details on the wells are in Table 1. The total capacity of the wells is just above the maximum 777 gallons per minute allocation, so the wells are adequate to meet demand.

There is a significant concern regarding demand for firefighting, both in short-term supply volume and water pressure maintenance. When the Heritage at Pennington development was built a booster station was installed to maintain pressure for the sprinkler system and the fire hydrants. One option to address this concern and increase emergency supply is to construct an additional water tower, possibly on the Public Works site because of its high elevation. A second option is to connect to a nearby NJ American Water supply line. This option would require coordination with Mercer County as it will involve infrastructure change at the Stony Brook bridge that is slated for design and replacement.

Table 1. Pennington Borough water wells.

Well	Capacity (gallons/minute)
6	202
7	190
8	152
9	250
Total	**794**

A comprehensive analysis of field test results, historical operations data and the permitted quantities outlined in the Borough's NJDEP Water Allocation Permit was presented in the Well Capacity Testing Technical Report dated April 2004, which is on file with Public Works. In 2019, Van-Note Harvey Associates prepared an Asset Management Plan (AMP) for PWD, as required by the NJ Water Quality Accountability Act. The AMP has the following purposes:

1. To demonstrate responsible management of the drinking water assets.
2. To communicate and justify funding requirements indicated by the plan.
3. To provide a management roadmap for the utility.
4. To serve as a link between the Pennington Water Department and its customers.

The Asset Management Plan contains an overview of the utility, mission statement, level of service agreement, critical asset list, operation and maintenance strategy, capital investment program, and financial strategies. It also laid out a plan for upgrading all the water lines. Although DPW had planned to conduct this work when roads were being resurfaced, an influx of federal financial support for road repairs from the Inflation Reduction Act led to the roads being resurfaced before the water line replacements could be planned.

The PWD upgrades its treatment infrastructure to ensure that the water quality remains in compliance with the state and federal health and safety regulations, as overseen by the NJDEP. An Annual Drinking Water Quality Report is sent to water customers.

The following is a list of proposals and possibilities that may increase demand for water:

- Landfill property redevelopment
- Blackwell property redevelopment
- Wells Fargo site redevelopment
- 12 North Main Street redevelopment
- Senior Center redevelopment or new use
- Single-family infill/minor subdivisions
- Accessory dwelling units
- School Administration Building (re-use net increase)
- Other subdivision redevelopments or expansions

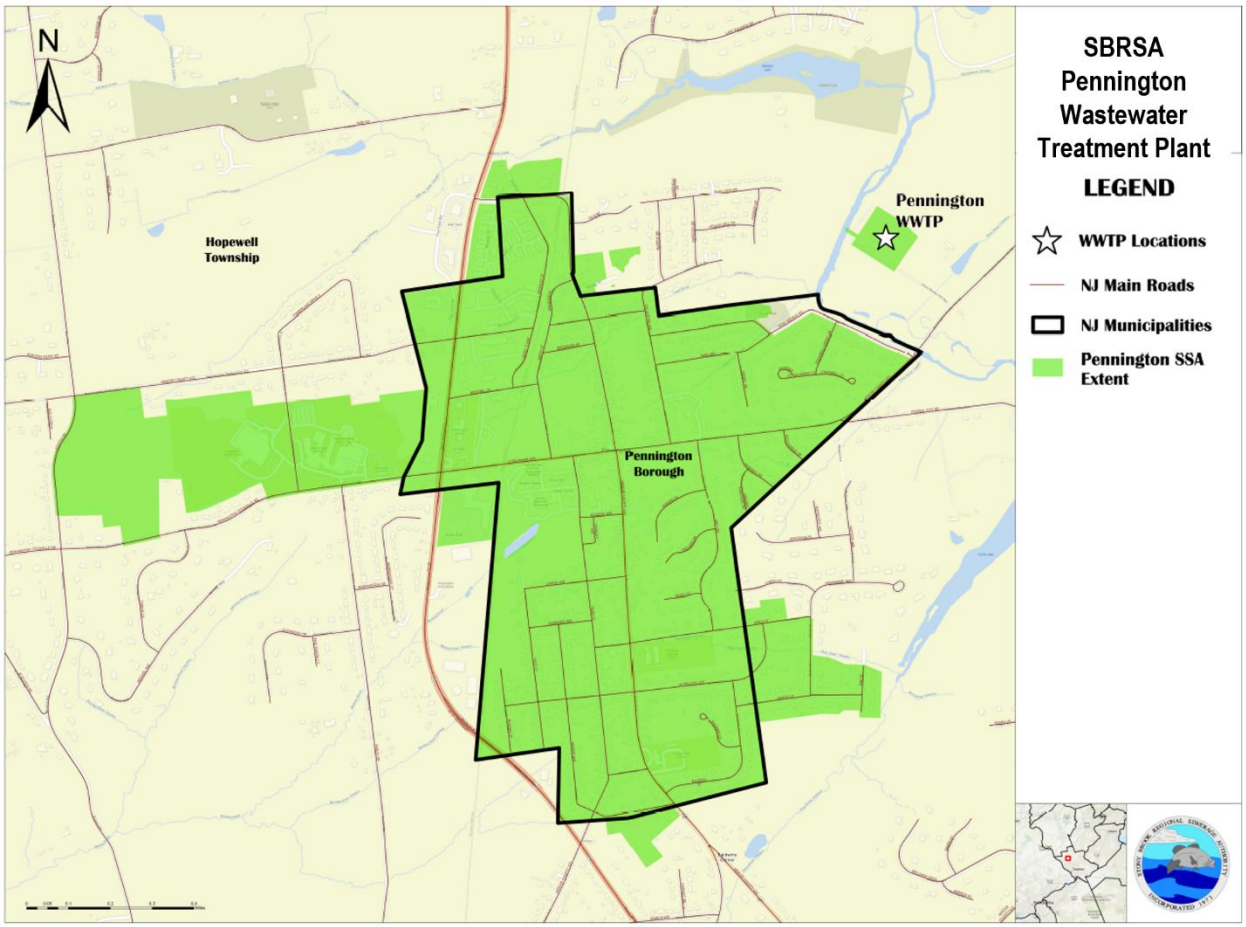
The required water and sewerage treatment capacity should be factored into the Housing Plan and Land Use Plan elements, as well as plans for redevelopment.

c. Sanitary Sewer System and Wastewater Treatment

The sanitary sewer collection system is owned and operated by the Borough under the direction of the Superintendent of Public Works as New Jersey licensed wastewater operator. The system provides sewerage connections to all properties in the Borough, and several properties in Hopewell Township. The system consists of 70,000 feet of sewer main, 315 manholes, five pump stations and an inverted siphon. The NJDEP has set no limit on the capacity of the Borough's collection system. The collector sewers have adequate capacity for their existing and currently planned future use. The sewer main system has a capacity of 1.7 million gallons per day (MGD).

The SBRSA-WWTP became operational in 1984. As of March 2025, the plant has a permitted design capacity of 0.445 MGD. The current 12-month daily average flow is 0.238 MGD. In 2024 the highest single day flow rate was 1.159 million gallons. The additional capacity currently available is 0.183 MGD, which allows for future development within the approved sewer service area (SSA). SBRSA accepts new applications to hook into their system (i.e., Treatment Works Approval applications) on a first-come, first-serve basis, provided the applicant is located within the SSA. Figure 1 shows the Pennington WWTP SSA.

Figure 1. SBRSA Pennington Wastewater Treatment Plant Sewer Service Area Map.



The SSA includes the entirety of Pennington Borough as well as Hopewell Valley Central High School and Timberlane Middle School property as far as Scotch Road, Pennington Market, the Hopewell Township part of Pennington Pointe, the Pennington Public Works complex, and the three streets, Birch, Maple and Oak off East Curlis Avenue in the Township. SBRSA is not typically involved in the municipal and county planning process. NJDEP regulations govern the establishment of the SSA, plant capacity, and Treatment Works Approvals.

The amount of sewage capacity required for a variety of residential, commercial and other buildings and facilities can be found in Table A1 in Appendix A. The table is based on the Projected Flow Criteria as set forth in Subchapter 23 of the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules at N.J.A.C. 7:14A-23, found on the NJDEP Division of Water Quality Treatment website https://dep.nj.gov/dwq/all-division-rules-and-regulations/njpdes/. The table shows wastewater flow criteria for various development types such as single-family homes, duplexes, townhouses, condominiums and apartments with 1-3 bedrooms, restaurants, and various commercial facilities. This is useful for calculating wastewater flow requirements as the Borough strives to meet its affordable housing obligation. The values in the table can be used to determine the sewerage volume requirements for any residential or commercial developments in the Borough when making an application for a TWA pursuant to N.J.A.C. 7:14A-22. Should Pennington Borough require more wastewater treatment capacity than is available at Pennington WWTP, additional capacity must be formally requested from the SBRSA Board of Directors, who will determine if a plant expansion is warranted.

Note that the average daily flow in 1996 was 0.315 MGD. This flow included the actual wastewater flow plus surface water inflow, which is the flow of stormwater and elevated groundwater into the wastewater system. In the third quarter of 1996, the average daily flow at the plant exceeded the permitted plant capacity, and the SBRSA notified the Borough of the excursion. The Borough was aware of the magnitude of the surface water inflow since the mid-1990's and was already part way through a seven-step surface water inflow reduction program. In 1997, the average daily flow was reduced to 0.274 MGD because of the surface water inflow program, including the mainline grouting and the sump pump program, and to a reduction in rainfall over the region. The surface water inflow program continued and included mainline repairs and continued enforcement of the rule against sump pumps being connected to the wastewater system. The current average daily flow of 0.238 MGD speaks to the success of the Public Works surface water inflow program. However, the increasing age of the sewer system coupled with an increase in extreme rainfall events means that the Borough must continue to address surface water inflow.

d. Stormwater Management

The regulation of stormwater by the New Jersey Department of Environmental Protection (NJDEP) falls into three general categories:

1. Management of a municipal separate storm sewer system (MS4) to minimize and slow the flow of stormwater into the storm sewer system, to minimize pollution carried by stormwater and to ensure the storm sewer system is adequately designed and maintained. This is regulated in subchapters 24 and 25 of NJAC 7:14A, New Jersey Pollutant Discharge Elimination System (NJPDES) rules. https://dep.nj.gov/dwq/all-division-rules-and-regulations/njpdes/

2. Management of stormwater runoff from new development and redevelopment in the municipality must meet standards for the management of water quantity, groundwater recharge, water quality and green infrastructure requirements, in consideration of the increasing severity of rainfall events due to climate change. This is regulated by N.J.A.C. 7:8 Stormwater Management.
   https://dep.nj.gov/wp-content/uploads/stormwater/n.j.a.c.-7-8.pdf
3. Regulation of stormwater also impacts flooding. Development and disturbance within the regulatory Flood Hazard Area and associated riparian zones is addressed in the Flood Hazard Area Control Act rules at NJAC 7:13.
   https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_13.pdf

1. Municipal Separate Storm Sewer System MS4 (Tier A Permit)

The Clean Water Act (CWA) was developed in 1972 to expand on the Water Pollution Control Act of 1948. The CWA introduced the National Pollutant Discharge Elimination System (NPDES), an EPA permit program to reduce water pollution by regulating point sources of pollutants discharged into US waters. The EPA authorizes the program to state governments for permitting, administration, and enforcement.

The NJDEP manages the New Jersey Pollutant Discharge Elimination System (NJPDES) permitting program. It is designed to protect New Jersey's ground and surface water by assuring the proper treatment and discharge of wastewater and stormwater from various types of facilities and activities and reducing the amounts of pollutants which may be discharged. In 1990, Phase I addressed stormwater discharges from medium and large municipal separate storm sewer systems (communities of more than 100,000) and discharges associated with industrial activities. In 1999, Phase II came into effect to control pollution discharges from smaller municipal storm sewer systems, highway systems, and other sources. On January 5, 2004, the NJDEP adopted two (2) sets of stormwater rules to help reduce pollution levels caused by stormwater runoff and to help replenish groundwater supplies. From 2004, Municipal Separate Storm Sewer System (MS4) permits were required for most municipalities in the State, including Pennington.

The 1998 Borough Master Plan had recommended the development of a Stormwater Management Plan but the 2004 MS4 permit required the creation of a Municipal Storm Water Management Plan (MSWMP) developed based on the Stormwater Management rules. Pennington's MSWMP was adopted in May 2005. The Plan recommended updates of ordinances. As required by the NJDEP, the Borough of Pennington adopted its Municipal Stormwater Management Plan (MSWMP) in April/May 2005. The Plan addressed groundwater recharge, stormwater quantity, and stormwater quality impacts of large projects to minimize the adverse impact of stormwater runoff and the loss of groundwater recharge. Recommended changes to Chapter 163, Part IV 163-20 of the Borough Code were adopted by ordinance in July 2006. Municipalities are required to reexamine their plan at each subsequent reexamination of the master plan. The MSWMP was reviewed by the Borough Engineer for the 2013 Master Plan reexamination, and it was concluded that there were no required changes at that time. It was again reviewed in the 2023 Master Plan reexamination and updates were recommended.

The MS4 Tier A Permit requires a municipality to develop and maintain a stormwater pollution prevention plan (SPPP) to minimize stormwater-related pollution in the MS4 system. The preparation of an SPPP helps to identify potential sources of pollution and to establish best management practices (BMP) to eliminate such exposure. Pennington created its SPPP in 2020 and it can be found on the Borough website. It includes a map of storm sewer outfalls and a map of the storm sewer system. In 2025, Pennington Borough joined Princeton, Hopewell Township, and Lawrence Township in a collaborative effort to address stormwater management requirements for the Stony Brook Watershed. The Borough Council approved a resolution authorizing participation in this regional initiative to develop a comprehensive Watershed Improvement Plan (WIP). This will help Pennington's to maintain its MS4 Tier A permit.

Following a review of the Tier A permitting program in 2018, changes were made to align the program with updated federal guidelines. Tier B permits were eliminated, and all municipalities were required to meet Tier A requirements after a certain time. The Tier A permit was revised and expanded and came into effect in January 2023. The revised Tier A permit includes the new requirement for a WIP, which has three major deliverables: Watershed Inventory Report due by the end of December 2025, the Watershed Assessment Report due by the end of December 2026 and the Final Watershed Improvement Plan due by the end of November 2027.

2. Stormwater Management

Stormwater regulations have undergone significant changes in the last few years in response to major recent rainstorm events, and in anticipation of similar or more severe events in the future because of climate change. In our area, tropical storm Ida (September 1, 2021) deluged Hopewell Valley with more than 7.44 inches of rain in a 6-hour period, a 500-year storm. According to NJDEP rainfall studies, extreme rainfall events are expected to increase in frequency as the climate warms.

In March 2021, all municipalities in the State were required to adopt new comprehensive stormwater management ordinances consistent with NJDEP stormwater management rules. The new rules implemented more stringent requirements for stormwater control and promoted the use of nonstructural stormwater management techniques. The Borough adopted its new Stormwater Control Ordinance 2021-2 in April 2021. It adopted the best management practices for the use of stormwater management measures, including green infrastructure and nonstructural stormwater management strategies, and resulted in significant changes to Borough Code Chapter 163, Part IV, Tables 5 and 6 in 163-20.5.

The Borough's 2005 Stormwater Management Plan and the associated Borough Code were reviewed in the 2023 Master Plan reexamination, and it was noted that significant changes were likely to be needed soon as the NJDEP were holding discussions at the time of the report on changes to the stormwater management and flood hazard area control act rules. In July 2023, the Inland Flood Protection rules were adopted. These rules incorporated climate change science into the rules by requiring the use of future rainfall amounts when designing for stormwater management. "Calculation of stormwater runoff and groundwater recharge" gives current and future multipliers to be used in New Jersey with NOAA rainfall predictions shown in Figure A2 in the Appendix.

As mentioned above, in 2025, Pennington Borough joined with Princeton, Hopewell Township, and Lawrence Township in a collaborative effort to address stormwater management requirements for the Stony Brook Watershed. The Borough Council approved a resolution authorizing participation in this regional initiative to develop a comprehensive Watershed Improvement Plan (WIP). The partnership will allow the four municipalities to share resources and expertise while working with a respected watershed management firm to collect essential technical data needed to meet state stormwater discharge requirements. Work on the project is expected to be completed by fall 2026, in advance of state deadlines for required reports. The resulting data and recommendations will help Pennington develop effective strategies to improve water quality, address pollutants, and mitigate flooding issues within the Stony Brook Watershed, benefiting both residents and the environment for years to come.

N.J.A.C. 7:8-4.3 (a) states that a municipality shall adopt a municipal stormwater management plan as an integral part of its master plan. Pennington's MSWMP has so far been a separate document from the Master Plan and has been included by reference. N.J.A.C. 7:8-4.3 (e) states that within one year of the adoption of a regional stormwater management plan, each municipality within the planning area shall amend their MSWMP and stormwater control ordinances to implement the regional plan.

For Pennington Borough, a critical element of any stormwater management plan is to eliminate the flooding that occurred along the course of Lewis Brook during the recent extreme storms Ida (2021) and Debby (2024) and is likely to occur in future extreme rainfall events. Floods occurred at several intersections, Route 31 and West Delaware Avenue, Green Street and Broemel Place, North Main Street and Brookside Avenue, and Eglantine Avenue and East Franklin Avenue. Flooding also occurred on the Blackwell property and in the back yards of houses on East Franklin Avenue and on Lewis Brook Road in Hopewell Township. The most likely cause of the flooding is that previously installed stormwater management assets are inadequate to handle higher rainfall amounts and the various bridges, tunnels, culverts and pipes through which Lewis Brook and its tributaries flow are too small for the higher levels of rainfall seen recently. All infrastructure improvements by the Borough, NJDOT or Mercer County to correct these should take into account how the resulting modified flow impacts infrastructure further downstream by using a hydrologic and hydraulic model for the entire reach of Lewis Brook as such consideration is required by state regulations.

Ida was an extreme storm event that caused significant flooding in Pennington Borough. An excellent report "Ida Remnants Strike New Jersey" by David A,. Robinson, the NJ State Climatologist, dated Oct. 26, 2021, provided rainfall data in Hopewell Township for different periods during Ida, as shown in Table 2. Hopewell Township had some of the highest rain amounts in the state.

A major goal of the Watershed Institute led initiative is to reduce flooding and improve water quality along the course of Stony Brook and its tributaries. Addressing the issues on Lewis Brook should be included in the initiative for Pennington Borough. One option to improve water quality and reduce flooding would be to retain and delay the flow of stormwater runoff using stormwater best management practices (BMPs) such as stormwater detention basins and green

infrastructure. Two possible locations for detention basins are at the landfill and at the Blackwell property, with part of the Pennington School wooded area on Green Street adjacent to Lewis Brook.

Table 2. Tropical Storm Ida Remnants Rainfall, Sept 1-2, 2021
https://climate.rutgers.edu/stateclim/?target=Ida

Peak volumes recorded on September 1, with average recurrence intervals (ARI, see Table A2)

Peak 6-hour period: 7.44 inches ending 10:35 pm.	ARI 500 years
Peak 3-hour period: 5.90 inches ending 8:55 pm.	ARI 1000 years
Peak 2-hour period: 5.16 inches ending 8:40 pm.	ARI 1000 years
Peak 1-hour period: 3.29 inches ending 7:55 pm.	ARI 200 years
Hopewell Township total 9.13 inches	

Note that the time periods overlap. The peak 1-hour is included in the 2-, 3- and 6-hour.

It remains to be seen whether the new collaborative effort to address stormwater management for Stony Brook Watershed influences the decision on whether we should create a stormwater utility to pay for improvements and maintenance of the Borough's storm sewer system.

3. Flood Hazard Area Control

Three components of a flood hazard area are:

1. "Riparian zone" means the land and vegetation adjacent to a regulated water. Depending on the classification of the water, the extent of the zone from the stream bed can be 50, 150 or 300 feet.
2. "Floodway" means land which is mathematically determined to be needed for the channel and adjacent land to convey water resulting from a 100-year flood.
3. "Flood hazard area" means land which lies below the peak water surface elevation that will occur in a design flood. For a delineated water, this is 2 feet above the State delineation. For other streams it is 125% of the 100-year flood based on NOAA with future multipliers.

The adopted Flood Hazard Area Control Rules can be found in NJAC 7:13:
https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_13.pdf

NJAC 7:13 Subchapter 3 gives six methods for determining the extent of the floodway and flood hazard area for rivers and streams in New Jersey. Method 1 applies to NJDEP delineated waters, while Method 2 applies to FEMA delineated waters. For waters that are both NJDEP delineated, and FEMA delineated, the flood hazard area is the higher of the elevations determined by Methods 1 and 2. Methods 5 or 6 would apply to Lewis Brook since it is not NJDEP or FEMA delineated. Method 6 is more accurate than the approximate Method 5 but requires a detailed study.

Method 1 for NJDEP delineated waters, which includes Stony Brook:

1. The flood hazard area design flood elevation shall be equal to two feet above the design flood elevation shown on the flood profile adopted as part of the Department delineation,

unless subsequent to July 17, 2023, the Department revises a flood profile in accordance with N.J.A.C. 7:13-3.8 to account for changes in flood elevations due to increased precipitation, in which case the flood hazard area design flood elevation is that which is shown on the revised flood profile;
2. The floodway limit is that which is shown on the flood maps adopted as part of the Department delineation.

As of May 2025, there have been no changes to Method 1.

In method 6 for a regulated water in a fluvial flood hazard area (such as Lewis Brook), the flood hazard area design flood elevation is determined as summarized here:

1. A hydrologic analysis shall be performed to determine the peak flow rate for the anticipated future 100-year flood for the regulated water using the "future" adjustment factors listed in Table 3.6B of NJAC 7:13 (the same as Table 5.6 in NJAC 7.8). It is 1.36 for Mercer County.
2. A hydraulic analysis, such as a standard step backwater analysis, shall be performed to determine the flood hazard area design flood elevation using 125 percent of the anticipated future 100-year peak flow rate determined pursuant in 1 above.

e. Recycling

In 1967 the Mercer County Improvement Authority (MCIA, www.mcianj.org) was created under the County Improvement Authorities Law to undertake certain projects for the benefit of the residents of Mercer County. The mission of the MCIA is to serve the needs of Mercer County and to improve the quality of life for the residents by providing programs and services for the County, Municipalities, school and fire districts, and not-for-profits in the areas of financing, project management, redevelopment, solid waste and recycling.

The MCIA oversees the proper disposal of Mercer County's solid waste and manages a curbside recycling program to ensure a cleaner and safer environment. The rules for recycling can be found on the MCIA recycling website (http://mcianj.org/recycling). The program collects clean and dry:

- Paper
  - Mixed Paper, Office Paper & Window Envelopes
  - Corrugated Cardboard (flatten boxes and/or cut into manageable bundles)
  - Telephone Books & "Soft" Cover Books
  - Hard Cover Books (Hard cover must be removed)
- Glass
  - Glass Food & Beverage Jars/Bottles (all colors)
- Aluminum and Metal
  - Aluminum & Metal Beverage Containers
  - Metal Cans
- Plastics with #1, #2, #5 Symbols
  - Milk Jugs & Plastic Beverage Bottles and beverage caps
  - Detergent & Shampoo Containers
  - Juice Boxes & Juice/Beverage Cartons
  - Yogurt, condiment and to-go containers
  - Amber colored medicine bottles.

The MCIA also organizes a Household Hazardous Waste and Electronic collection periodically at the Dempster Fire School, 350 Lawrence Station Road in Lawrenceville, and a Document Shredding event twice a year at 651 South Broad Street Parking lot 4 in Trenton.

Hopewell Township has an Electronics Collection and Paper Shredding event and a Metals collection event periodically, both at the Hopewell Township Public Works facility. Pennington Borough Residents may participate in this collection.

The Hopewell Valley Green Team organizes collections of a variety of items not on the MCIA list (May through October) in conjunction with the Pennington Farmers Market. The Green Team has also assembled a list of ways to recycle or dispose of many items that are not collected by MCIA, see:https://hopewellvalleygreenteam.org/recycling/recycling-tips/ for tips and a schedule of collection dates. A link to their annual Reuse & Recycle in Hopewell Valley schedule can be found on this website. It contains web links to many organizations that will receive items for recycling or reuse.

The Pennington Borough Environmental Commission is currently looking for a program that will collect and compost food waste.

There are private companies that will assist municipalities with the management of waste that is not currently recycled such as scrap metal, various plastics, food waste and compost. Pennington will continue to explore ways to meet their goal of increasing the range of materials that can be recycled. This has the combined benefit of reducing the impact of waste on the environment while reducing the cost to the Borough of landfill tipping fees.

f. County Road and Bridge Maintenance – Mercer County Department of Public Works, Highway Division

The Superintendent of Public Works of Mercer County manages the operation of the Highway Division under the supervision of the County Administrator to enhance the quality of life for Mercer County residents by ensuring a safe, efficient and reliable transportation system.

The Division is responsible for 180 miles of County routes, handling ice control, snow removal, leaf pickup, deer carcass removal, pothole repairs, milling and resurfacing, asset condition management, and utility and contractor road work permit oversight. County roads in or feeding Pennington are CR 640 – Pennington Road, South and North Main Street, CR 546 – South Main Street to Lawrenceville-Pennington Road, CR 631 – Ingleside Avenue, CR 624 – Pennington-Titusville Road, West and East Delaware Avenue, and CR 623 – Pennington-Harbourton Road.

g. Electricity and Natural Gas

Background

In New Jersey, there are five electricity utility companies and four gas utility companies. To avoid overlap, the NJ Board of Public Utility Services (NJBPU) has defined the electricity and

gas territories where the Utility Services can operate. Maps of the territories can be found on the NJDEP GIS website: Electric Utility Services Territory Map of New Jersey | NJDEP Open Data and Gas Utility Services Territory Map of New Jersey | NJDEP Open Data. Electricity is supplied to Pennington Borough by Public Service Electric and Gas (PSEG) and gas is supplied by Elizabethtown Gas (ETG).

New Jersey deregulated the energy utility industry in 1999, dividing energy services into supply and distribution. Customers can choose both electricity and gas providers and utility companies deliver them for a fee. Bills are split into two parts, energy and distribution. For each utility, there are many energy suppliers that a customer can select to provide electricity or gas. The website https://nj.gov/njpowerswitch/suppliers/ is provided by the NJBPU to let residents and businesses know which third party suppliers (TPS) are licensed to sell electricity or gas in a utility's territory and inform them about the rules if a TPS is selected. If no TPS is selected, the utility becomes the supplier by default but will still list energy and distribution separately on their bills. Note that the Utility Services buy their electricity and gas from a variety of suppliers. As of May 2025, there were 80 choices of suppliers for electricity in the PSEG territory and 38 for gas in ETG territory.

Balancing the generation of electricity with customer demand is a complex process. Near constant voltage must be maintained to avoid damaging equipment (voltage too high or too low) or brownouts (too low) and the phase of the alternating current needs to be the same across all connected suppliers. The lower 48 states of the USA are divided into three interconnections;

- The Eastern Interconnection, covering the area east of the Rocky Mountains and a portion of the Texas panhandle.
- The Western Interconnection, covering the area from the Rocky Mountains to the west.
- The Electric Reliability Council of Texas (ERCOT), covering most of Texas.

These operate largely independently from each other with limited transfers of electricity between them. The Eastern and Western Interconnections in the United States are also linked with Canada's power grid. The interconnections help maintain the reliability of the grid by providing multiple routes for power to flow and allowing generators to supply electricity to many load centers. This redundancy helps prevent transmission line or power plant failures from causing interruptions in service to retail customers.

New Jersey is in the Eastern Interconnection and its real-time electricity supply is managed by PJM, a regional transmission organization https://www.pjm.com. PJM coordinates the movement of wholesale electricity across 13 states. It has over 1100 members, both suppliers and distributors, and manages the interconnectivity requests for new suppliers. Except for very high demand periods, there is more generation capacity available than is needed to meet demand. However, this is beginning to change as data centers and AI are starting to consume a large amount of electricity. At any point in time, suppliers are chosen through a time-based bidding process. Constantly available power such as nuclear and combined-cycle natural gas form the base of the supply, with intermittent (e.g., solar and wind) and higher cost peaking power coming lower down the order. Power can also come from storage such as pumped hydro (e.g. Yards Creek in NJ) and an increasing number of battery installations. Adding batteries to solar and wind plants moves them towards the constantly available power category and takes them up the order. The price charged for electricity by a utility is similar throughout the year as the peaks and

troughs due to changes in short term demand are balanced out. This may not be the case with smaller suppliers who may choose to pass on higher costs at peak periods to customers, The fine print in agreements should be read.

Gas supply is easier to manage than electricity as pressure (gas equivalent of voltage) can be managed by valves and pressure regulators. The gas is delivered by pipeline from wells in gas-producing locations after processing in gas plants to control delivered gas heat capacity and to remove toxins. Because of the extensive use of gas for heating, the demand for gas is much higher in the winter than in the summer. Across the country, winter demand is 33% higher than in summer. To keep the production of gas wells similar throughout the year, demand and supply are balanced by storing a portion of the gas produced in the summer and recovering it from storage for sale in the winter. About 85% is stored via wells in depleted natural gas or oil fields, 10% in aquifers and 5% in salt caverns. New Jersey has few natural gas reserves, does not produce natural gas, and does not have any large-scale gas storage. All the gas we use comes via pipelines from the Gulf States or from Appalachian shale gas producers.

The above paragraphs are to give background for policies and goals for electricity and gas in Pennington Borough. The US Energy Information Administration is an excellent resource, and information about all forms of energy can be found at https://www.eia.gov/energyexplained/ .

Policies and Goals for Electricity and Natural Gas

As a result of passing Resolution 2021-3.4 in March 2021, it is the policy of the Borough of Pennington to become carbon neutral in all its operations by 2035. The 4th component of the 2021 resolution committed the Environmental Commission to use the Borough's efforts to become carbon neutral to educate and encourage Borough residents and businesses to become carbon neutral. In 2025, the Borough received a grant from NJBPU to help the Environmental Commission develop a Community Energy Plan. The plan will create an inventory of energy use by type across the Borough, and the resulting carbon emissions. The plan will then make recommendations on how residents can move their energy usage from fossil fuels to zero-CO_2 sources. In most cases this means changing from natural gas to electricity for domestic heating and cooking and moving transportation to electric vehicles. Goals for this topic will be found in the Green Buildings and Environmental Sustainability Plan element.

The success of the program will depend in part on the success of New Jersey's policy to have its electricity generation be carbon neutral by 2035. Electricity is defined as secondary energy, because its CO_2 production depends on the primary energy sources used in its generation. Electricity generation in New Jersey results in about 0.5 lbs of CO_2 per kWh due to the input energy mix. This is more than the 0.4 lbs of CO_2 per kWh of heat from a modern high efficiency condensing gas furnace so converting before the NJ electricity generation drops below 0.4 lbs of CO_2 per kWh would be a step in the wrong direction. Pennington is committed to meeting goals that are science-based regardless of direction changes at the Federal level. Residents should be encouraged to keep the pressure on the state to move to carbon neutrality.

There are several ways to move Pennington's electricity use towards carbon neutrality regardless of the progress the state is making.

1. Encourage residents, businesses and churches to select "green-energy-only" suppliers from the list in the PSEG territory in the NJ Power Switch website above.
2. Encourage residents to sign up for Community Solar suppliers.
3. Reduce barriers to the installation of solar panels on all Pennington Borough lots.
4. Borough administration should reconsider a Government Energy Aggregation (GEA) program for Pennington (see https://nj.gov/njpowerswitch/gea/). A GEA program allows municipalities to aggregate the energy requirements of residential, commercial and municipal customers so they can purchase electricity (or gas) from a third-party supplier at reduced prices. The supplier should be chosen for its high renewable energy content.

h. Telecommunications

Internet, TV and Telephone

Internet and TV services can be provided in six ways. Three use direct connections to buildings; Fiber-optic uses light pulses through fine strands of glass and offers the fastest and widest bandwidth; Coaxial TV cable with a central copper wire uses electricity to deliver the signal and is generally not as fast and has a smaller bandwidth than fiber-optic; Older telephone wires can be used for DSL (Direct Subscriber Line) services, which are slower and limited in bandwidth but may have a lower installation cost and lower monthly fees. All three with direct connections can provide services to landline telephones. The three non-connected alternatives are direct wireless, satellite and via cell towers to handheld devices. Direct wireless uses a base station to transmit the internet over radio waves directly to a receiver located on the building. The receiver needs a good line of sight to the base station and the signal may be affected by the weather and distance from the station. Satellite services are often used in rural areas which are out if reach of fiber and cable services. It too can be affected by the weather. Finally, many people are "cutting the cable" altogether and opting for services from cell towers to mobile phones. Internet downloads can be slow unless the handheld device can connect to Wi-Fi. With 5G, speeds are improving.

Cable services are delivered to Pennington residents via the utility poles, which are owned by PSEG. The larger cables at the top of the poles deliver electricity. Lower down the poles are fiber-optic, coaxial cables and telephone wires. Service providers pay fees to the utility to use the poles. Pennington is served by eight TV and internet providers, four of which have 100 % coverage and four have partial coverage.

There are several cell phone service providers in Pennington. Service is generally reliable but there are pockets where one provider has a better signal than another.

Regulation of Wireless Telecommunication Facilities

There have been two recent changes to the regulation of wireless telecommunication facilities. The first, a federal law, prohibits municipalities from denying a request by an "eligible facility" to modify an existing wireless tower or base station if such a change does not "substantially change" the physical dimensions of the tower or base station. The term "substantial change" is

not defined by the law. Until regulation or case law is issued on this topic, the Borough will need to carefully interpret this on a case-by-case basis.

The second regulatory change is an amendment to the Municipal Land Use Law, N.J.S.A. 40:55D- 46.2. This new section states that applications for collocated equipment on a wireless communications support structure shall not be subject to site plan review provided three requirements are met: 1) the structure must have been previously approved; 2) the collocation shall not increase the overall height of the support structure by more than 10 percent, will not increase the width of the support structure, and shall not increase the existing equipment compound to more than 2,500 square feet; and 3) the collocation shall comply with all of the terms and conditions of the original approval and must not trigger the need for variance relief. Borough ordinances should be revised to reflect federal law.

It is anticipated that providers of fifth-generation wireless technology ("5G") will seek to install wireless facilities, typically on utility poles and lampposts, throughout the region. 5G offers subscribers much faster data speeds and, with that, new and enhanced technological capabilities. The Borough should take appropriate steps to control and regulate the implementation of 5G technology by adopting ordinances which implement processes and regulate, among other things, the size, location, and appearance of 5G wireless facilities.

4. Relationship with Regional Utility Plans

a. Hopewell Township Master Plan

Hopewell Township approved its current Utility Services Plan element on November 19, 2009. (https://www.hopewelltwp.org/DocumentCenter/View/8622/Utility-Services-Plan-Element---Adopted-November-19-2009-)

The plan covered the lack of interest in developing public sewers throughout the Township due to the concern that it would bring uncontrolled growth. Sewers for larger individual developments are connected to Ewing Lawrence Sewerage Authority (ELSA) and Stony Brook Regional Sewerage Authority (SBRSA). Similarly, there was no interest in a township wide water supply. The plan acknowledged that there were a few residences on the borders of Hopewell and Pennington Boroughs that were connected to the borough systems. Larger developments are served by the NJ American Water Company.

There was no mention of Utility Services in the 2021 Master Plan Reexamination report. There was also no mention of other services besides sewer and water in the Township Master Plan.

b. Mercer County Master Plan

Mercer County adopted a Wastewater Management Plan (WMP) in October 2013. (https://www.mercercounty.org/home/showpublisheddocument/1154/636058398453800000) The plan reports that Pennington Borough adopted its own WMP on October 8, 2009, and incorporated it by reference. According to the County WMP, the Pennington Borough WMP

expired on October 8, 2015. The Mercer County Planning Department submitted an update to the Mercer County WMP, as required by the NJDEP, six years from the date of adoption of the current plan, i.e., October 9, 2019. As part of that process, the three municipalities (including Pennington) which had previously been working from their own adopted municipal WMPs joined the county-wide WMP. The county-wide WMP update is currently under review by NJDEP. Until the update is adopted, the 2013 Mercer County WMP and associated Sewer Service Area (SSA) mapping remain in full force and effect. See: (https://www.mercercounty.org/departments/planning/wastewater-management-planning)

Mercer County is in the process of developing a Stormwater Management Plan, but its website only contains a link to the NJ Plan, see below. Mercer County is not involved in the purveyance of potable water and does not have a potable water plan.

c. New Jersey Department of Environmental Protection Water Quality Management Planning (https://www.nj.gov/dep/wqmp/index.html)

The role of the program is to advance Water Quality Management through the coordination of planning and permitting activities. This will be achieved through the following efforts:

- Technical Support: Working with counties and private property owners on Sewer Service Area amendments, Wastewater Management Plans, consistency assessments and other related water quality management planning issues;
- Planning and Implementation: Managing water quality planning grants; overall statewide water quality planning through the Continuing Planning Process;
- Coordination: Coordinating activities among The Division of Water Quality, The Division of Water Supply and Geosciences, Land Use Management, other DEP programs, the regulated community and planning agencies across the state.

The Water Quality Management Rule, N.J.A.C. 7:15, is effective as of November 7, 2016.

5. Relationship with Other Plan Elements in the Master Plan

The Utility Services Plan impacts and is impacted by other Master Plan elements as follows:

Land Use Plan Element. This plan relates to the Borough's zoning and potential redevelopment areas. Utility needs will be impacted by the Borough's development and redevelopment plans and the ability to redevelop or develop is also contingent on the capacity of various utilities. Stormwater hazards are addressed in the Climate Change-Related Hazard Vulnerability Assessment (CCRHVA), which is part of the Land Use Plan.

Housing Plan Element. The Borough has identified areas of redevelopment which have the opportunity for high density housing, including housing that is designated affordable. The ability of utility services to serve this development/redevelopment must be evaluated as well as the impact of these developments on existing utility services.

Economic Development Plan Element. This Plan considers all aspects of commerce and economic development in the Borough, some of which may impact Utility Services.

Conservation Plan Element. The Conservation Plan incorporates the Borough's Community Forestry Management Plan by reference and impacts the Department of Public Works.

Green Buildings and Environmental Sustainability Plan Element (GBESE). Several goals and strategies in the GBESE are aimed at reducing the Borough's contributions to climate change. The GBESE includes the Community Energy Plan, which is under development, and a significant part of that plan is focused on transportation energy use and greenhouse gas emissions via electrification. This will increase the demand for electricity, which will need to be matched by a growth in PSEG supply.

Appendix A

Figure A1. NJ DEP table of water treatment capacity requirements for various sewerage sources. From Subchapter 23 of the N.J.A.C. 7:14A New Jersey Pollutant Discharge Elimination System (NJPDES) Rules.

https://dep.nj.gov/dwq/all-division-rules-and-regulations/njpdes/ .

Type of Establishment	Measurement Unit	Gallons Per Day
Residential Dwellings (single family home, duplex units, townhouses, condominiums, apartments)		
1 bedroom unit	Per Dwelling	150
2 bedroom unit	Per Dwelling	225
3 bedroom unit or larger	Per Dwelling	300
1 bedroom unit (age restricted)	Per Dwelling	110
2 bedroom unit (age restricted)	Per Dwelling	170
3 bedroom unit (age restricted)	Per Dwelling	225
Transit dwelling units		
Hotels	Bedroom	75
Lodging houses and tourist homes	Bedroom	60
Motels and tourist cabins	Bedroom	60
Boarding houses (max. permitted occupancy)	Boarder	50
Camps		

Figure A1 (continued)

Campground/mobile rec. vehicle/tent	Site	100
Parked mobile trailer site	Site	200
Children's camps	Bed	50
Labor camps	Bed.	40
Day camps--no meals	Person	15
Restaurants (including washrooms and turnover)		
Average restaurant	Seat	35
Bar/cocktail lounges	Seat	20
Fast food restaurant	Seat	15
24 hour service restaurant	Seat	50
Curb service/drive-in restaurant	car space	50
Clubs		
Residential	Member	75
Nonresidential	Member	35
Racquet club	(per court per hour)	80
Bathhouse with shower	Person	25
Bathhouse without shower	Person	10
Institutions (includes staff)		
Hospitals	Bed	175
Assisted living facility	Bed	100
Skilled nursing facility	Bed	75
Other institutions	Bed	125
Schools (includes staff)		

Figure A1 (continued)

No shower or cafeteria	Student	10
With cafeteria	Student	15
With cafeteria and showers	Student	20
With cafeteria, showers and laboratories	Student	25
Boarding	Student	75
Automobile service stations		
	per filling position	125
Service bays	per bay	50
Mini-market	Sq. Ft.	0.100
Miscellaneous		
Office buildings (gross area)	Sq. Ft.	0.100
Stores and shopping centers (gross area)	Sq. Ft.	0.100
Factories/warehouses (add process wastewater)	Employee	25
with showers, (add process wastewater)	Employee	40
Laundromats	Per machine	580
Bowling alleys	Alley	200
Picnic Parks (restrooms only)	Person	10
Picnic Parks with showers	Person	15
Fairgrounds (based upon average attendance)	Person	5
Assembly halls	Seat	3
Airports (based on passenger use)	Passenger	3

Figure A1 (continued)

Churches (worship area only)	Seat	3
Theater (indoor)	Seat	3
Dinner theater	Seat	20
Catering/Banquet Hall	Person	20
Sports stadium	Seat	3
Visitor Center	Visitor	5
Multi-member swimming pool	Person	15

Figure A2. Precipitation frequency (PF) estimates for Pennington from NOAA's National Weather Service Hydrometeorological Design Studies Center with average recurrence intervals (ARI). https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=nj
PF estimates are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval.

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.340** (0.309-0.376)	**0.406** (0.369-0.448)	**0.482** (0.436-0.532)	**0.538** (0.486-0.593)	**0.606** (0.544-0.668)	**0.656** (0.586-0.724)	**0.706** (0.628-0.780)	**0.752** (0.665-0.833)	**0.809** (0.709-0.901)	**0.853** (0.741-0.956)
10-min	**0.543** (0.493-0.600)	**0.649** (0.589-0.716)	**0.772** (0.698-0.852)	**0.860** (0.777-0.948)	**0.966** (0.867-1.06)	**1.04** (0.934-1.15)	**1.12** (0.997-1.24)	**1.19** (1.05-1.32)	**1.28** (1.12-1.43)	**1.34** (1.17-1.50)
15-min	**0.679** (0.617-0.750)	**0.816** (0.741-0.901)	**0.977** (0.883-1.08)	**1.09** (0.983-1.20)	**1.22** (1.10-1.35)	**1.32** (1.18-1.46)	**1.42** (1.26-1.57)	**1.50** (1.33-1.67)	**1.61** (1.41-1.79)	**1.69** (1.46-1.89)
30-min	**0.931** (0.845-1.03)	**1.13** (1.02-1.24)	**1.39** (1.26-1.53)	**1.58** (1.42-1.74)	**1.81** (1.63-2.00)	**1.99** (1.78-2.20)	**2.17** (1.93-2.40)	**2.34** (2.07-2.59)	**2.56** (2.25-2.86)	**2.73** (2.37-3.06)
60-min	**1.16** (1.05-1.28)	**1.41** (1.28-1.56)	**1.78** (1.61-1.96)	**2.05** (1.85-2.26)	**2.42** (2.17-2.66)	**2.70** (2.41-2.98)	**2.99** (2.66-3.30)	**3.28** (2.90-3.64)	**3.68** (3.22-4.10)	**3.99** (3.46-4.47)
2-hr	**1.41** (1.27-1.56)	**1.72** (1.55-1.90)	**2.17** (1.96-2.40)	**2.52** (2.27-2.78)	**3.00** (2.69-3.31)	**3.39** (3.02-3.74)	**3.79** (3.35-4.19)	**4.20** (3.69-4.65)	**4.78** (4.15-5.32)	**5.23** (4.50-5.86)
3-hr	**1.55** (1.40-1.72)	**1.88** (1.70-2.10)	**2.39** (2.15-2.66)	**2.78** (2.50-3.09)	**3.33** (2.97-3.70)	**3.77** (3.35-4.19)	**4.24** (3.73-4.72)	**4.72** (4.12-5.27)	**5.40** (4.64-6.05)	**5.94** (5.05-6.69)
6-hr	**1.96** (1.77-2.19)	**2.38** (2.14-2.65)	**3.00** (2.70-3.35)	**3.51** (3.14-3.90)	**4.25** (3.77-4.72)	**4.86** (4.28-5.40)	**5.52** (4.82-6.14)	**6.23** (5.38-6.94)	**7.26** (6.15-8.13)	**8.11** (6.78-9.14)
12-hr	**2.37** (2.15-2.66)	**2.88** (2.60-3.22)	**3.66** (3.29-4.09)	**4.32** (3.87-4.82)	**5.31** (4.70-5.91)	**6.16** (5.41-6.87)	**7.10** (6.16-7.91)	**8.14** (6.95-9.10)	**9.69** (8.11-10.9)	**11.0** (9.06-12.5)
24-hr	**2.74** (2.52-2.99)	**3.31** (3.05-3.62)	**4.21** (3.87-4.60)	**4.97** (4.55-5.42)	**6.10** (5.55-6.65)	**7.08** (6.38-7.70)	**8.15** (7.28-8.87)	**9.33** (8.25-10.2)	**11.1** (9.65-12.1)	**12.6** (10.8-13.8)
2-day	**3.17** (2.92-3.47)	**3.84** (3.53-4.21)	**4.88** (4.48-5.35)	**5.75** (5.26-6.29)	**7.02** (6.37-7.65)	**8.09** (7.29-8.81)	**9.25** (8.27-10.1)	**10.5** (9.31-11.5)	**12.4** (10.8-13.6)	**13.9** (12.0-15.3)
3-day	**3.36** (3.10-3.67)	**4.06** (3.74-4.44)	**5.14** (4.73-5.61)	**6.03** (5.52-6.57)	**7.31** (6.66-7.95)	**8.39** (7.60-9.11)	**9.54** (8.58-10.4)	**10.8** (9.62-11.8)	**12.6** (11.1-13.8)	**14.1** (12.3-15.5)
4-day	**3.55** (3.28-3.86)	**4.29** (3.96-4.67)	**5.40** (4.98-5.87)	**6.30** (5.80-6.85)	**7.61** (6.95-8.25)	**8.68** (7.90-9.41)	**9.84** (8.89-10.7)	**11.1** (9.93-12.0)	**12.8** (11.4-14.0)	**14.3** (12.6-15.6)
7-day	**4.16** (3.85-4.52)	**5.00** (4.62-5.43)	**6.20** (5.72-6.74)	**7.19** (6.62-7.81)	**8.61** (7.89-9.33)	**9.79** (8.93-10.6)	**11.0** (10.0-12.0)	**12.4** (11.2-13.4)	**14.3** (12.7-15.6)	**15.9** (14.0-17.3)
10-day	**4.74** (4.42-5.12)	**5.67** (5.27-6.12)	**6.93** (6.44-7.48)	**7.95** (7.37-8.58)	**9.39** (8.67-10.1)	**10.6** (9.71-11.4)	**11.8** (10.8-12.7)	**13.0** (11.9-14.1)	**14.8** (13.4-16.1)	**16.3** (14.6-17.7)
20-day	**6.41** (6.02-6.83)	**7.60** (7.14-8.10)	**9.08** (8.52-9.68)	**10.2** (9.60-10.9)	**11.8** (11.1-12.6)	**13.1** (12.2-13.9)	**14.3** (13.3-15.2)	**15.6** (14.4-16.6)	**17.3** (15.8-18.5)	**18.6** (16.9-19.9)
30-day	**7.98** (7.55-8.43)	**9.42** (8.91-9.95)	**11.0** (10.4-11.6)	**12.2** (11.6-12.9)	**13.9** (13.0-14.6)	**15.1** (14.2-15.9)	**16.3** (15.3-17.2)	**17.5** (16.3-18.5)	**19.0** (17.7-20.2)	**20.2** (18.7-21.5)
45-day	**10.2** (9.66-10.7)	**12.0** (11.4-12.6)	**13.8** (13.1-14.5)	**15.2** (14.4-15.9)	**16.9** (16.0-17.8)	**18.2** (17.2-19.2)	**19.5** (18.3-20.5)	**20.6** (19.4-21.8)	**22.1** (20.7-23.4)	**23.2** (21.7-24.5)
60-day	**12.2** (11.6-12.8)	**14.3** (13.6-15.0)	**16.3** (15.5-17.1)	**17.8** (17.0-18.7)	**19.7** (18.7-20.7)	**21.1** (20.0-22.2)	**22.4** (21.2-23.5)	**23.6** (22.3-24.8)	**25.1** (23.6-26.4)	**26.1** (24.5-27.5)