

July 18, 2023

Borough of Roosevelt Environmental Commission

# Roosevelt Municipal Water Story

Completed in partial fulfillment of the requirements for Sustainable  
Jersey's Water Story Action

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## Introduction

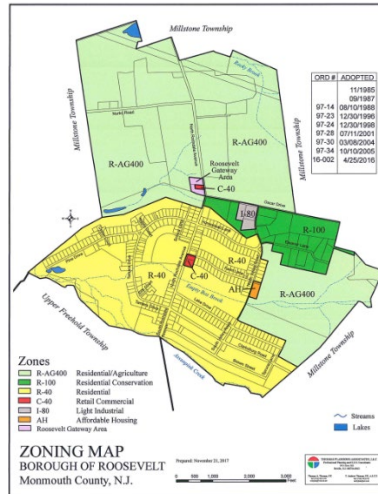
### Background

The Borough of Roosevelt NJ (originally Jersey Homesteads) was carved out of farmlands in Millstone Township, Monmouth County in 1936. It was a planned government resettlement community that included 200 homes, a post office, school, municipal building, cooperative factory and store. Early homebuyers, who came from urban areas such as the Lower East Side in Manhattan, appreciated the opportunity to live in a rural setting. Within its 1.95 square miles, housing lots were clustered in a “downtown” area. Each non-corner lot was backed by green space acreage that later became borough-owned open space, establishing an early ethos of environmental stewardship.



*1937/38 aerial view of Jersey Homesteads<sup>i</sup>*

Much of this open space provides wetland buffers for the many creeks that originate in and/or cross through the borough, providing headwaters to two major rivers: the Delaware and the Raritan. As awareness of the need for environmental protection grew, more forested areas were allowed to grow back, providing the rich ecosystem we enjoy today. The northern and eastern ends of the borough are zoned as preserved farmland with a small section zoned as residential conservation<sup>ii</sup> (a subdivision of existing residential homes and permanently protected open space).



2017 Roosevelt Borough Zoning Map<sup>iii</sup>

The natural water resources afforded by Roosevelt’s historic and continued planned preservation will be discussed in Chapters 1 and 2.

As part of the planned community, a municipal water supply and wastewater treatment facility was designed to serve the downtown area. These services continue to be run today by the municipal government, with more than 94% of the houses utilizing them. The issues involved in maintaining these facilities will be further explored in Chapters 3 and 4.

The Borough is bordered by the Assunpink Wildlife Management Area (NJ Dept. of Environmental Protection) to the south and the Perrineville Lake Park (Monmouth County) on the north-east. The surrounding and borough-owned conservation areas are integral in keeping the total impervious surface level of the borough at 4.69%, below the 10% threshold for a sub-watershed to be considered impaired for water quality<sup>iv</sup>. At the same time, even with these wetland and undeveloped buffers, Roosevelt streets do experience periodic flooding and stormwater run-off which create hazards for drivers and pedestrians, not to mention damage to homes and property. Causes of flooding and potential solutions will be explored in Chapter 5.

### Focus and Outcomes of Our Water Story

The primary focus of this water story is to provide a blueprint for continuing the ethos of working WITH rather than AGAINST nature and our environment. This is as relevant today as it was when Roosevelt was founded, especially since climate change, loss of habitat and biodiversity, and disruption of terrain that is integral to a natural water cycle will progressively impact our way of life. In line with the NJ Department of Environmental Protection<sup>v</sup>, we will need to develop strategies that help mitigate the anticipated increased flooding of our roads and homes and pollution of our wetlands and downstream creeks. This document aims to provide a context for that.

A secondary focus of this water story is to give the current and future residents of Roosevelt Borough a comprehensive understanding, in plain language, of the public health, fiscal, and

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environmental challenges and benefits that guide policy decisions surrounding a publicly owned, town-operated drinking and wastewater facility. These municipal-run water and wastewater treatment facilities are also a part of what makes the Borough of Roosevelt's water story unique.

Long-term outcomes, based on the above foci, are to

- inform residents and policy makers of sustainable, environmentally friendly actions that can be taken to best accommodate our continually changing surface water and stormwater
- provide residents with a comprehensive understanding of the drinking and wastewater systems, including the fiscal, environmental, and public health impacts that result from current and future decisions made by the municipality.

In addition, we are planning on working with the 3rd Grade class in Roosevelt Public School to investigate these foci and generate opportunities for discussion and exploration of potential solutions. Immediate outcomes include a set of lesson plans and student-created projects that they would then present to the community. [Donna's input needed here].

## Chapter One: Water Resources in Roosevelt

### Section One: Roosevelt Hydrologic Setting

Roosevelt sits on a hydrologic divide, encompassing headwater tributaries for both the Delaware River and the Raritan River.

The Borough of Roosevelt is in western Monmouth County, New Jersey. It is geologically in the inner-upland physiographic subdivision of the Atlantic Coastal Plain that runs along the eastern Atlantic coastline and as such, has low elevation (generally less than 200') and is covered mainly with sandy/sandy-loam soil deposits<sup>vi</sup> with minor clay<sup>vii</sup>.

The creeks and tributaries in Roosevelt are part of both the Assunpink Creek and Millstone River basins. Most of the borough is in the **Assunpink Ck (above Assunpink Lake)** sub-watershed area (HUC14 02040105230010) shown in Fig. 1.1, which in turn is in the **Assunpink Creek (above Shipetaukin Ck)** watershed area (HUC11 02040105230). This is part of the **Upper Delaware/Northwest (#4)** water region and the **Central Delaware (#11)** Watershed Management Area (Fig. 1.2) which eventually drains into the Delaware River.

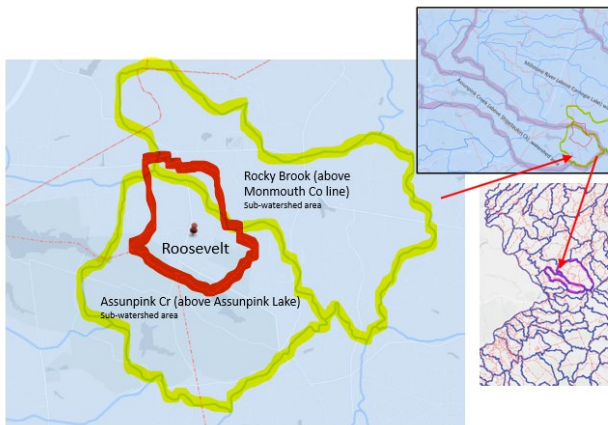


Fig. 1.1: sub-watershed and watershed areas of Roosevelt<sup>viii</sup>

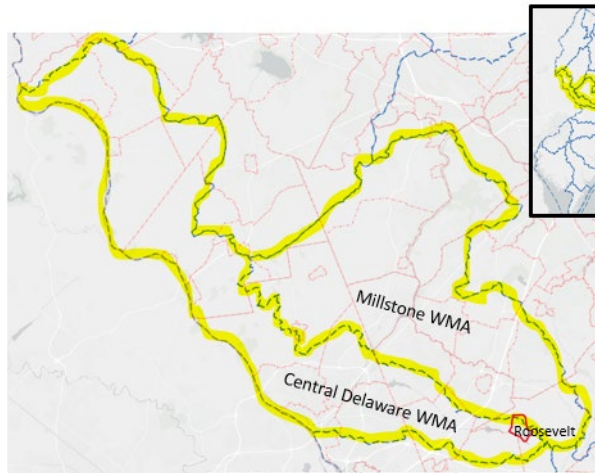


Fig. 1.2 Central Delaware (#11) and Millstone (#10) WMAs

The main waterways in this area are the seven tributaries of the Assunpink Creek which originate in Roosevelt and the three tributaries of the Assunpink Creek/Empty Box Brook which flow into Roosevelt from Millstone Township to the east and out of Roosevelt towards Upper Freehold and Millstone Townships to the west. (Fig. 1.3).

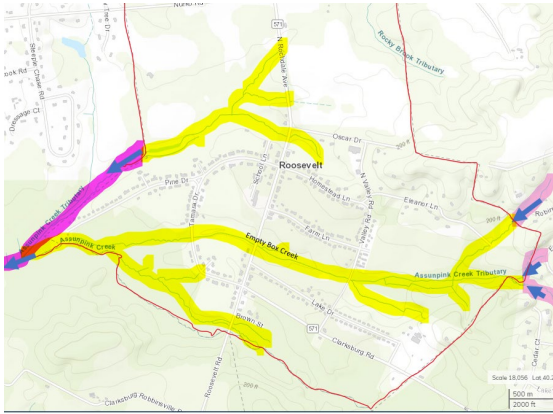


Fig. 1.3: Assunpink Tributaries & Empty Box Brook in Roosevelt<sup>ix</sup>

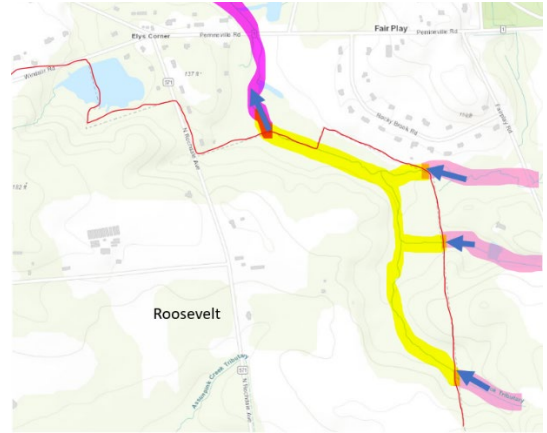


Fig. 1.4: Rocky Brook tributaries in Roosevelt<sup>x</sup>

A smaller section on the northern side of the borough is in the **Rocky Brook (above Monmouth Co line)** and **Rocky Brook (below Monmouth Co line)** sub-watershed areas (HUC14 02030105100040 and HUC14 02030105100050) shown in Fig. 1.1, which is in the **Millstone River (above Carnegie Lake)** watershed area (HUC11 02030105100). This is part of the **Raritan (#2)** water region and **Millstone (#10)** Watershed Management Area (Fig. 2) which eventually drains into the Raritan River. The streams in this area are the three tributaries of Rocky Brook which flow into Roosevelt from Millstone Township to the east and out of Roosevelt towards Millstone Township to the north (Fig. 1.4).

Both Assunpink Creek and Rocky Brook tributaries which flow from Millstone Township originate within Millstone Township and are therefore impacted by any residential or commercial development that happens there.

## Section Two: Surface Water Quality

Many of the Assunpink Creek tributaries in Roosevelt have been classified as FW2-NT-C1. All other creeks which originate in or flow through Roosevelt are classified as FW2-NT.

As shown in Fig. 1.5, creeks and tributaries in Roosevelt are classified as FW2-NT (freshwater which may be subject to man-made wastewater discharges, with no trout). In accordance with N. J. A. C. 7:9B Surface Water Quality Standards, the primary use of these streams in Roosevelt is for “maintenance, migration and propagation of the natural and established biota”.

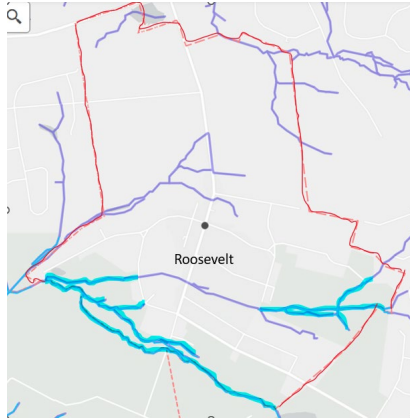


Fig. 1.5 Roosevelt Surface Water Designations: FW2-NT (blue) & FW2-NT-C1(turquoise)<sup>xi</sup>



Fig. 1.6 Stream buffer and current land use<sup>xii</sup>

Furthermore, much of the Assunpink tributaries (highlighted in turquoise) have been given a C1 (Category 1) antidegradation designation indicating those bodies of water are “*protected from any measurable change to existing water quality because of their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resources.*” (Bureau of Environmental Analysis, Restoration and Standards, Surface Water Quality Standards (SWQS)). C1 streams are required to have a 300-foot buffer and non-C1 (C2) streams are required to have a 50-foot buffer from each bank side.

The municipal code<sup>xiii</sup> and master plan<sup>xiv</sup> specifies a minimum 50-foot buffer but also requires that stream buffers include adjacent 100-year floodplain areas, wetlands and wetland transition areas, based on the recommendations from the Natural Resources inventory report<sup>xv</sup>. The Impervious Cover Assessment and Reduction Action Plan<sup>xvi</sup> that was prepared in 2020 for Roosevelt Borough by The Watershed Institute similarly recommends a 150-foot buffer for C2 streams in order to provide stream corridor protection. There are currently only a small number of properties that not in compliance with this increased buffer recommendation (Fig. 1.6).

### Section Three: National Wild and Scenic Rivers

Roosevelt does not have any streams or river segments that are part of, or contribute to, a National Wild and Scenic River.

Although no Roosevelt streams are part of the National Wild and Scenic River program, the Assunpink Creek (which includes tributaries with headwaters in Roosevelt) does flow into the Delaware river in Trenton (river mile 118.45), downstream from Jacobs Creek (Fig. 1.7) in Hopewell Township (river mile 140.50) where the Lower Delaware Wild and Scenic River designation ends. If this designated river segment is expanded downstream, it could potentially be impacted by the Roosevelt headwaters.



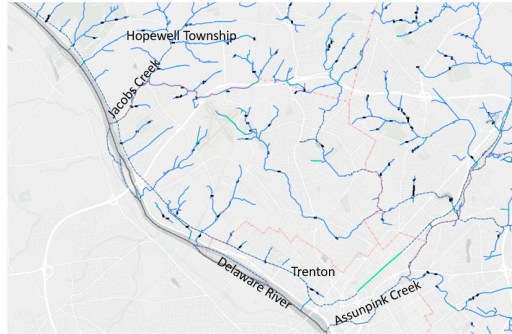


Fig. 1.7: Jacobs Creek to Assunpink Creek<sup>xvii</sup>

#### Section Four: Wetlands

All of Roosevelt's creeks are encompassed within wetlands-designated areas, creating ecosystems for many plants and animals.

The relatively flat landscape allows riparian wetlands to be created along all the streams, and as seen in Fig. 1.8, there are large swaths in Roosevelt that have been designated as freshwater wetlands with intermediate resource value as of 2015 (NJDEP Land Use/Land Cover).

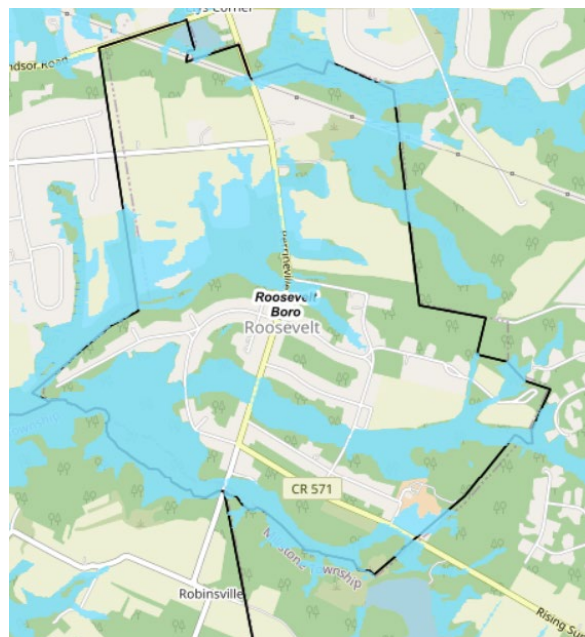
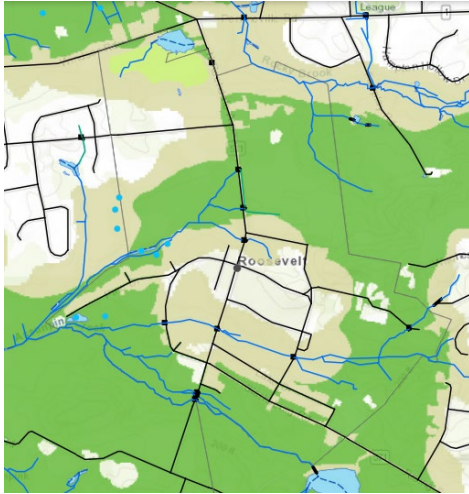


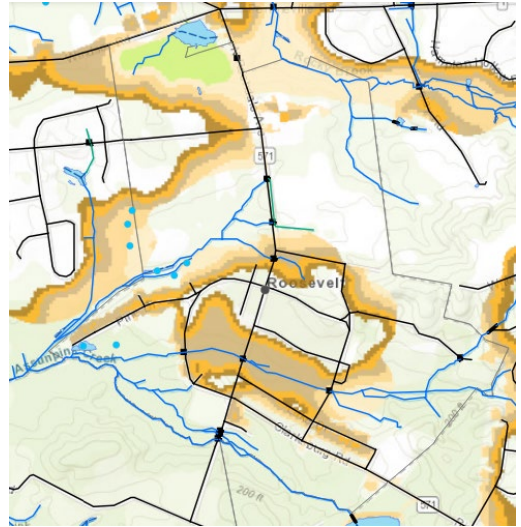
Fig. 1.8: Wetlands identified in NJDEP 2015 Land Use/Land Cover mapping

These wetlands support a variety of native and invasive flora<sup>xviii</sup> including *Botrychium oneidense* (Bluntlobe Grapefern) and other native ferns. It is also the habitat for many native faunae, and in particular, a likely habitat for the wood turtle - listed in 1979 as a threatened species in New Jersey. Much of Roosevelt's southern border is the Assunpink Wildlife Management Area, which has been designated as Terrestrial Wildlife Habitat Preserved Land - New Jersey Open

Space. Furthermore, as part of the Central CHANJ (Connecting Habitat Across NJ) Action Region<sup>xix</sup>, cores (habitats) and corridors (connecting cores) have been identified in Roosevelt, as shown in Fig. 1.9. Most of Roosevelt outside of the central residential area serves as core habitats connected by corridors that run through those residential areas. Also shown in the upper (northern) part of the borough is a CHANJ Stepping Stone, a smaller core that wildlife can use as habitat while moving between larger cores. The ease of access that animals have within those corridors is shown in Fig. 1.10, with darker shades indicating more difficult movement.



*Fig. 1.9: CHANJ cores (green), corridors (tan/grey), and stepping stone (light green) areas*



*Fig. 1.10: CHANJ corridor gradients*

## Section Five: Water Quality Monitoring

The Roosevelt Environmental Commission's Stream Monitoring Team collects monthly samples as part of the Watershed Institute's StreamWatch program.

The Stream Monitoring Team of the Roosevelt Environmental Commission was established in 2016 with support from the AmeriCorps New Jersey Watershed Ambassadors Program who provided training to a group of local volunteers to conduct biological and habitat assessments by collecting and identifying macroinvertebrates. In 2021, the team began working with the Watershed Institute's StreamWatch Chemical Action Team to conduct monthly testing of nitrate and orthophosphate concentrations, pH, turbidity, and dissolved oxygen levels at a designated site on Empty Box Brook. In addition, the team documents habitat information such as weather, air and water temperature, algal bloom, aquatic vegetation, wildlife observations, floatable observations, water odor and color and any other relevant data<sup>xx</sup>.

Using the StreamWatch Water Quality Assessment Framework<sup>xxi</sup>, water samples collected between September 18, 2021 and September 18, 2022, were analyzed (results averaged across that time shown below). For more information, contact the Stream Monitoring team.

Chemical/Physical Parameters	Score
Water Temperature	Excellent
Nitrate Average	Excellent
Phosphate Average	Poor
PH Average	Poor
Turbidity Average	Fair
Dissolved Oxygen	Excellent

In addition, over the course of the year the team noted sightings of insects (water strider, water skimmer, butterflies), frogs, birds (blue jay, turkey vulture) and deer. They also noted floating debris including leaf clumps, tan/white/orange/brown foam, twigs/branches, and some man-made trash. Along the banks they observed a continued build-up of invasive Japanese Stiltweed<sup>xxii</sup>.

A Total Maximum Daily Load (TMDL) in Roosevelt Borough (known as *Rocky Brook (above Monmouth Co line)*) is within the Millstone/Raritan watershed area. The EPA<sup>xxiii</sup> is responsible for calculating the maximum amount of a pollutant allowed in an impaired waterbody when that pollutant is discovered in the waterbody. A TMDL determines a pollutant reduction target and allocates load reductions for the pollutant source(s) in order to meet the state's Water Quality Standards for public health and healthy ecosystems.

The latest report, from 2016 gives data for the Total Phosphorus (TP) and Total Suspended Solids (TSS) impairments in the non-tidal Raritan River Basin<sup>xxiv</sup>.

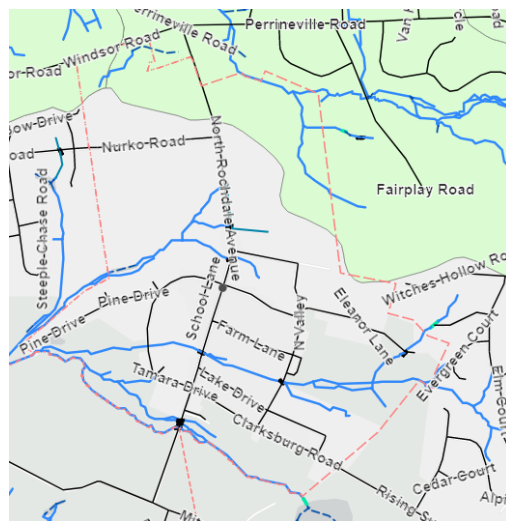


Fig. 1.11: TMDL area (in green) for Rocky Brook

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At this time, it appears that no TMDL requirements have been developed for creeks within the **Assunpink Ck (above Assunpink Lake)** watershed area.

## Chapter Two: Community Access to Water

### Section One: Water Use

The Roosevelt Environmental Commission maintains the Ron Filepp Woodland Trail which provides open public access to the Empty Box Brook, which runs the width of Roosevelt.

The principal community access to water within Roosevelt is provided by the Roosevelt Woodland Trail (Fig. 2.1), which runs alongside Empty Box Brook (a tributary of Assunpink Creek) through the width of the borough. Approximately half is owned by the Borough (administered by the Borough Council) and the other half by Assunpink with a clause that the Borough is in charge of maintaining it. The trail is mulched, with small bridges over wet/swampy stretches. It is frequented by many of the Borough residents throughout the day and open to all.



*Fig. 2.1: Trail map of Ron Filepp Roosevelt Woodland Trail*

In addition, trails in Perrineville Lake Park, which border Roosevelt on the north-east, provide open public access to Rocky Brook, and trails in the Assunpink Wildlife Management Area, which borders Roosevelt on the south-west, provide open public access to Assunpink Creek.

### Section Two: Recreational Fishing

Roosevelt does not have any recreational fishing water bodies but Rocky Brook and Assunpink Creek tributaries which flow through the borough do drain into nearby lakes that are used for fishing.

Although there are no state-monitored recreational fishing water bodies within Roosevelt proper, the borough borders on Assunpink Creek which drains into Assunpink Lake<sup>xxv</sup>, home to Largemouth Bass, Chain Pickerel, Bluegill Sunfish, and Brown Bullhead. There are currently no

NJ Fish Consumption Advisories eating restrictions on any of these four fish caught in that lake<sup>xxvi</sup>. There are however restrictions on Largemouth Bass and Bluegill Sunfish in Peddie Lake some of the Rocky Brook tributaries that flow through Roosevelt. In addition, there are restrictions on Channel Catfish and American Eel in Lake Mercer at Edinburg, which is downstream from some of the tributaries of the Assunpink Creek that originate in or flow through Roosevelt.

### Section Three: Harmful Algal Blooms

Roosevelt has no recreational lakes within the borough borders, and there has been no evidence of harmful algal blooms.
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There are three recreational lakes (Assunpink, Stone Tavern, and Rising Sun) in the Assunpink Wildlife Management Area which borders Roosevelt Borough. As of July 22, 2022, no Harmful Algal Blooms (HABs) were found in any of these three water bodies<sup>xxix</sup>.



## Chapter Three: Drinking Water Supply and Quality

### Section One: Public Drinking Water Supply

The Roosevelt Water Department provides drinking water to 95% of the borough.

Ninety-five percent of residents of Roosevelt Borough receive their drinking water from a publicly owned, town-controlled water company. As part of the original design of the borough's residential and industrial zoning, a water supply system was built, drawing from two deep artesian wells with a 75,000 gallon reserve tank and five miles of water main pipes.



Fig. 3.1: Water purifying plant in 1936/7<sup>xxx</sup>

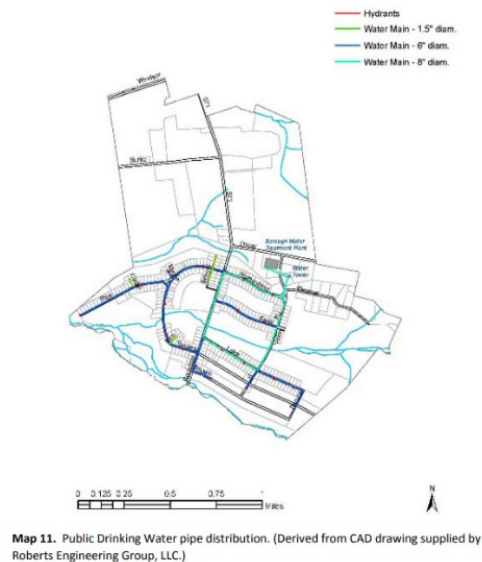


Fig. 3.2: Water mains<sup>xxxii</sup>

In 2016, the municipality, with assistance from the NJ Department of Environment created an Asset Management Plan<sup>xxxii</sup> which allowed them to overhaul the entire water utility. This included painting and raising the water tank and replacing the water mains and filters. At this time, about 70% of the mains have been replaced as local streets have been repaved .

The current facility includes 302 non-lead service lines<sup>xxxiv</sup> and two wells (472' deep and 438' deep) which tap into the Potomac-Raritan-Magothy Aquifer System & the Upper Potomac-Raritan-Magothy aquifer, part of the Coastal Plains Aquifer system. The water quality from this aquifer is "satisfactory except for local excessive iron concentrations [as much as 460 milligrams per liter (mg/L)]".<sup>xxxv</sup>

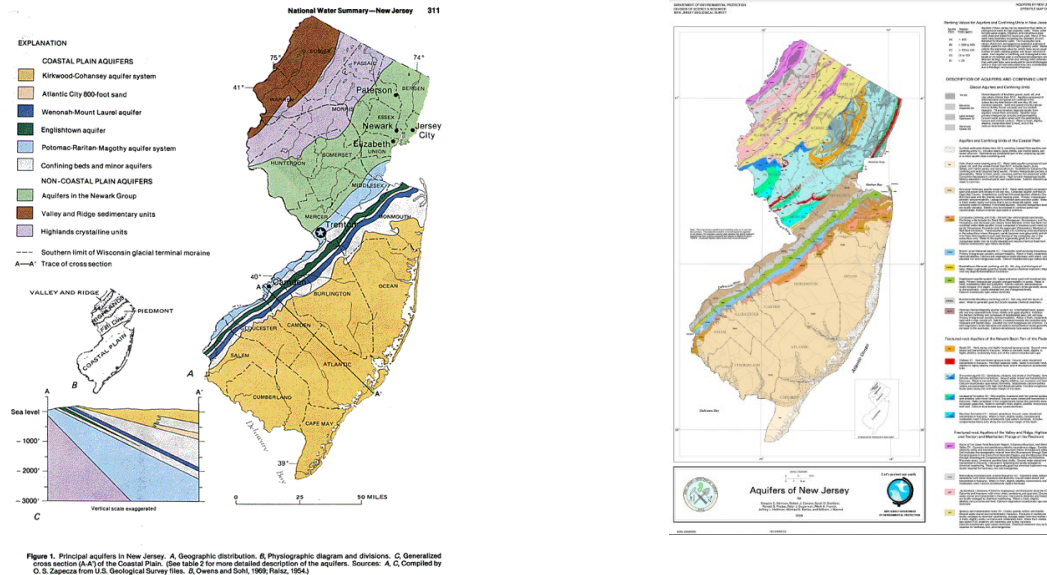


Fig. 2.1: Aquifer maps of New Jersey<sup>xxxvi</sup>

NJDEP map<sup>xxxvii</sup>

The most recent (2023) Annual Drinking Water Quality Report<sup>xxxviii</sup> indicates that there are no violations for barium, copper, lead, nitrate, disinfection byproducts (TTHM, HAA5) and chlorine (test results below). The report also gave “Low” susceptibility ratings for both aquifer wells for pathogens, nutrients pesticides, volatile organic compounds. inorganics, radionuclides, radon, and a “Medium” susceptibility ratings for disinfection byproduct precursors (the latter may form when the disinfectants that are used to treat the water react with dissolved organic material in the surface water).

TEST RESULTS						
Contaminant	Violation Y/N	Level Detected	Units of Measurement	MC LG	MCL	Likely Source of Contamination
<b>Inorganic Contaminants:</b>						
Barium Test results Yr. 2021	N	0.027	ppm	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper Test results Yr. 2022 Result at 90 <sup>th</sup> Percentile	N	0.25 No samples exceeded the action level	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead Test results Yr. 2022 Result at 90 <sup>th</sup> Percentile	N	ND No samples exceeded the action level	ppb	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits
Nitrate (as Nitrogen) Test results Yr. 2022	N	0.7	ppm	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
<b>Disinfection Byproducts:</b>						
TTHM Total Trihalomethanes Test results Yr. 2022	N	Range = 5 Highest detect = 5	ppb	N/A	80	By-product of drinking water disinfection
HAA5 Haloacetic Acids Test results Yr. 2022	N	Range = 1 - 2 Highest detect = 2	ppb	N/A	60	By-product of drinking water disinfection
<b>Regulated Disinfectants</b>		<b>Level Detected</b>		<b>MRDL</b>		<b>MRDLG</b>
Chlorine Test results Yr. 2022		Range = 0.2 – 1.2 ppm Average = 0.7 ppm		4.0 ppm		4.0 ppm

Chlorine: Water additive used to control microbes.



All households that are hooked up to the water system pay a bi-monthly combined metered water and sewer fee starting at \$372.00. As with any small, publicly owned, town-controlled water company, there are both benefits and challenges to this arrangement<sup>xxxix</sup>. Since 2018,

of H2O Services LLC, who ensures that the standards for water quality, delivery and public reporting are met each year.

## Section Two: Lead in Drinking Water

The latest drinking water quality tests indicated that no samples exceeded the allowable level of lead.

As reported in the most recent Annual Drinking Water Quality Report (2022) <sup>xl</sup> (test results in above section) there are no lead contamination violations. It should be noted however that this testing stops at the pipes that lead into private homes, many of which were built in the 1930s when lead solder was commonly used. It is recommended that all private homeowners test their tap water to verify the safety and potability of their water, and newer test kits may also look for per- and polyfluoroalkyl substances (PFAS or ‘forever’ chemicals) in drinking water. If lead is suspected in tap water, let the water run for a minute before using (especially if tap has not been turned on for a few hours) or use a water filter system designed to filtrate impurities<sup>xli</sup>.

The most recent (December 2022) lead report<sup>xlii</sup> conducted in the Roosevelt Public School is now available on the school district’s website.

## Section Three: Private Wells for Water Supply

A small number of residences on the northern end of Roosevelt Borough use private wells for their water supply.

There are 23 residences (6.2%) which rely on private wells for their water, all located on northern/eastern end of the borough on the following roads:

- Eleanor Lane: 12 residences
- North Valley Road: 3 residences
- Nurko Road (within Roosevelt borders): 4 residences
- North Rochdale Avenue: 4 residences/farms

Those residences which are on private wells are expected to meet the requirements for testing when selling their homes as specified in the Private Well Testing Act, N.J.S.A. 58:12A-26 et seq. (PWTA)<sup>xliii</sup>. It is recommended however that private wells are tested once a year to ensure that the water their families are drinking is safe<sup>xliv</sup>. There are no local or county programs to assist in this, however home water testing kits that test for a range of contaminants (not just hardness) are available for purchase from places like Home Depot, Walmart or Amazon.

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## Chapter Four: Wastewater

### Section One: Sewage Facilities

A municipal sewage facility is used by most of the residents of Roosevelt.

A wastewater treatment plant and sewage lines (Figs. 4.1, 4.2) were included in the initial plan for the community, located on the far western border of the borough, at the end of Pine Drive (#85). Since 2018, Roosevelt Water Department has outsourced the operation and maintenance of the wastewater treatment facility to Lyons Environmental Services, LLC. As with the drinking water service, the wastewater treatment facility is used by 95% of Roosevelt residents. The remaining 5% of residents and farms in the northern section of the borough rely on private septic systems.



*Fig. 4.1: Construction of sewage treatment plant in 1936/7<sup>xlv</sup>*



**Map 10.** Sanitary Sewer pipe distribution. (Derived from CAD drawing supplied by Roberts Engineering Group, LLC.)

*Fig. 4.2: Sewage lines<sup>xlvi</sup>*

As the result of a recent engineering report on the Trickling Filters and Alternatives at Wastewater Treatment Plant<sup>xlvii</sup>, it is anticipated that the trickling filters will need to be

Upgrading the current system will also ensure that it will be able to meet anticipated upcoming NJ DEP standards for phosphate levels by 2025. In addition, a recent scoping of the sewage lines indicates there is some amount of compromise to those pipes and they are being infiltrated by groundwater. Residents are encouraged to attend Borough Council meetings for more information as solutions are proposed and carried out.

## Section Two: Combined Sewer Overflow Systems

Roosevelt does not have a CSO system.

Roosevelt does not have a Combined Sewer Overflow (CSO) system, but instead uses a municipal separate storm sewer system (MS4).

## Section Three: Septic Systems

A small number of residences on the northern end of Roosevelt Borough use septic systems for their wastewater.

As above in the section on private wells, there are 23 residences (6.2%) which rely on their own septic systems, all located on northern end of the borough. The Borough of Roosevelt does not require testing of septic systems for a house to sell, however many buyers will do this (often because their mortgage companies require it).

## Section Four: Discharges to Water

Roosevelt Borough's municipal wastewater treatment plant is a regulated discharge site. There are three other known contaminated sites.

The municipal wastewater treatment facility is regulated by the New Jersey Pollutant Discharge Elimination System (NJPDES, ID number NJ0022918.001A) as shown in Fig. 4.3. It discharges into Assunpink Creek. The NJPDES Surface Water Renewal Permit is effective 4/1/2020 through 3/31/2025 and NJPDES S2G-Sludge Quality Category 2 General Permit is effective 1/1/2019 through 12/31/2023, as reported in the latest DEP Standard Compliance Inspection<sup>xlix</sup>.

There are no NJPDES Regulated Facility Locations and no Groundwater Contamination Areas in Roosevelt. There are however, three Known Contaminated Sites (Fig. 4.4). The first, at the former Roosevelt Auto & Truck Service has an active remediation permit. The other two are private residential areas and contamination at these sites is likely due to old home heating oil tanks.

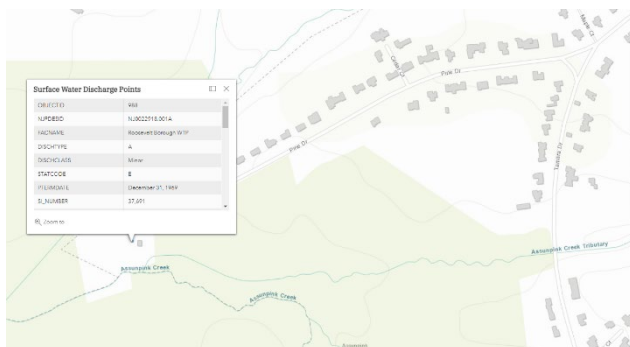


Fig. 4.3: Waste Treatment Plant discharge site<sup>l</sup>

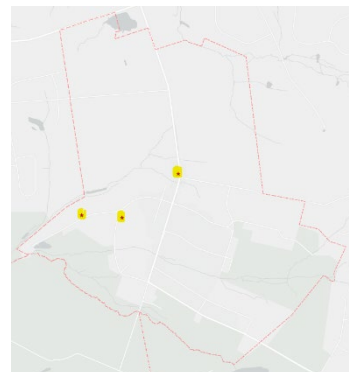


Fig. 4.4: Known Contaminated Sites<sup>li</sup>

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## Chapter Five: Stormwater and Flooding

### Section One: Municipal Stormwater Management

Roosevelt Borough is a Tier B Municipal Separate Storm Sewer System (MS4) municipality, and as such, currently has minimal NJDEP stormwater ordinance requirements.

As a small, low-density, rural municipality, Roosevelt Borough is classified for a Tier B MS4 permit from the state. The designated Municipal Stormwater Coordinator is Carmela Roberts, president of Roberts Engineering Group, LLC. A map of the current storm drain system is shown in Fig. 5.1.

Roosevelt Borough's stormwater management plan was updated in April 2021 and can be found in section 1.61 of the Zoning code<sup>liv</sup>. As a Tier B municipality, there are relatively few state-required annual inspections or enforcements of ordinances beyond maintaining borough roadway drains and medallions and keeping records of municipal DEP car washing, etc. However, if/when the state does away with the tier system and moves all municipalities to a Tier A level, this would mean more stringent code enforcement obligations and require a more rigorous and comprehensive set of standard operating procedures as well as a Storm Pollution Prevention Plan (SPPP)<sup>liii</sup>.

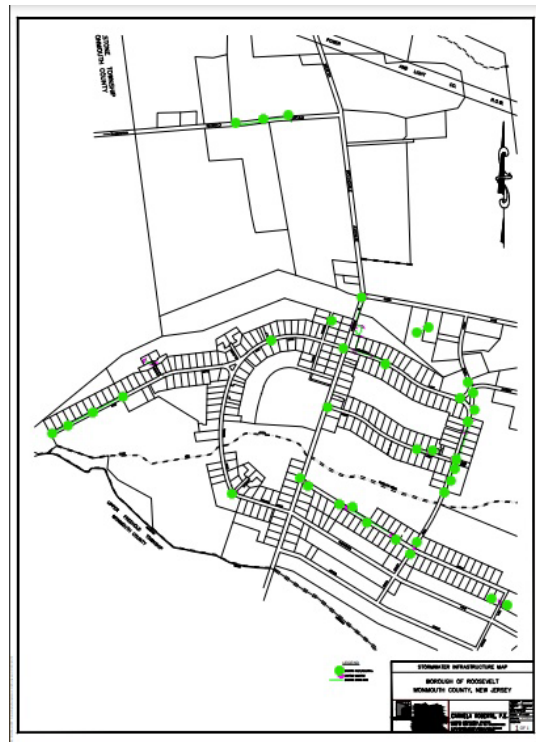


Fig. 5.1: Storm Drain map<sup>liv</sup>

The 2020 Impervious Cover Assessment<sup>lv</sup> report recommends a number of stormwater reduction projects including bioswales (at the Congregation Anshei Roosevelt and Post Office), rain gardens (at Action Packaging Automation facility, Roosevelt Public School) and porous pavement (at the school). These steps (based on Watershed Institute models) would return stormwater to the natural water cycle and keep pollutants from entering downstream waters.<sup>lvi</sup> Similarly, the NJ Department of Environmental Protection has a new campaign to encourage municipalities to use green infrastructure over other methods as a stormwater mitigation solution<sup>lvii</sup>.

More recently, the Environmental Commission has been running a stormwater drain adoption campaign<sup>lviii</sup>, enlisting volunteers to monitor, clear, and maintain one or more street drains near their homes. The Borough does vacuum the drains at least once a year.

## Section Two: Flooding Concerns

As an inland municipality, Roosevelt Borough is subject to riverine (fluvial non-tidal) flooding caused by stormwater runoff from severe rainfalls or snowmelts.

FEMA flood maps identify Zone A flood areas surrounding the Assunpink Creek and Rocky Brook tributaries that border Roosevelt (Figs 5.2 & 5.3). These areas indicate ‘Special Flood Hazard’ zones that have a 1% or greater annual chance of equaling or exceeding the Base Flood Elevation (BFE) of surface water. However, as noted in the NJDEP’s proposed Flood Hazard Area (FHA) standards<sup>lix</sup>, these maps are based on historical records which cannot take factors like climate change or the rapid increase of impervious surfaces into account and need expanded hazard areas (Fig. 5.4). Additionally, Roosevelt is bordered by higher elevation areas on the west and south (Fig. 5.5), causing the municipality to become a natural low-elevation basin for run-off from these areas.



Fig. 5.2: Firm 2020 flood hazard areas<sup>lix</sup>



Fig. 5.3: NJ Flood Indicator Tool<sup>lxi</sup>



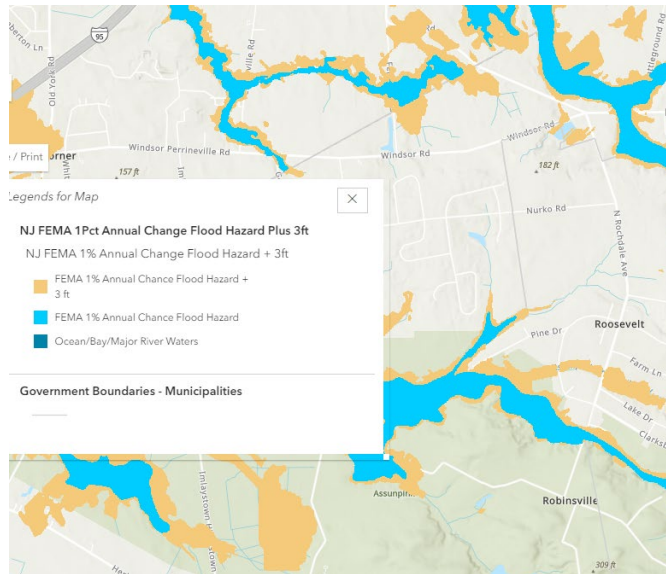


Fig. 5.4: FEMA +3ft flood hazard<sup>lxii</sup>

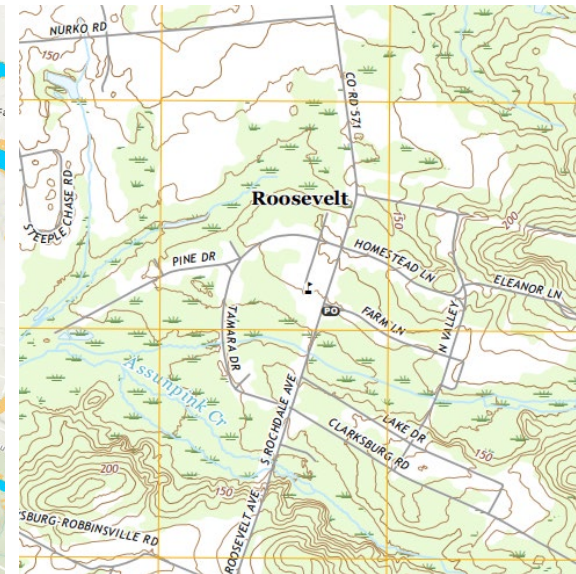


Fig. 5.5: USGS Topographical Map<sup>lxiii</sup>

As noted by residents, properties on Tamara Drive, Pine Drive and North Valley Road have also reported flooding issues, and these flood events are better captured in the FEMA 1% Annual Chance Flood Hazard + 3 ft (Fig. 5.3) proposed by the new FHA standards. One area of concern is the flooding on Nurko Rd., where fields in the farm the on the north side appear to be creating a build-up of silt in the culvert which then causes the fields on the farm on the south side to flood over the roadway. The Borough Council will be working with the farmers and the State Agricultural Development Commission on this.<sup>lxiv</sup>

A second area of concern is the apparent degradation of a drainpipe that was installed by the developer of a cluster of houses in the 1980s on the east side of North Valley Road and connected the sump pumps from those houses to the municipal storm system<sup>lxv</sup>. As a result, during heavy rains, the stormwater system often backs up onto the roadway as well as into the basements of these homes. Plans are underway to address this with funding from the NJ Department of Transportation Fiscal Year Municipal Aid Program.

In June, 2022, Ch. 14 “Flood Damage Prevention”<sup>lxvi</sup> of the municipal code was updated and approved, in line with the NJ DEP’s proposed Inland Flood Protection Rule . It designates the Borough’s Zoning Officer to also assume duties as the Floodplain Administrator.

According to the Climate Snapshots provided by Rutgers University, there is no Built Infrastructure Assets Exposure<sup>lxviii</sup> and the Borough of Roosevelt has no infrastructure (e.g. wastewater treatment facilities, energy generation locations, bridges, evacuation routes and rail lines) that has exposure to flooding. The Borough’s two designated shelters: the School and the Borough Hall are not listed as exposed to either built infrastructure assets or critical assets in the Critical Assets Exposure<sup>lxix</sup>.



There is no Public Health Exposure<sup>lxx</sup> in Roosevelt Borough and the three known contaminated sites 40 N. Rochdale Ave. (formerly Roosevelt Auto & Truck Service), 6 Tamara Dr., and 50 Pine Dr. are not listed as exposed. The Natural and Working Lands Exposure<sup>lxxi</sup> in Roosevelt includes:

- 48 out of 333 Interior Wetlands acres
- 37 out of 372 Open Space acres
- 0 out of 245 Agricultural Lands acres
- 1 out of 347 Forest acres.

The Vulnerable Populations Exposure<sup>lxxii</sup> snapshot indicates no exposure to either 1% or 0.2% annual chance flood based on Socioeconomic Status, Household Composition & Disability, Minority Status & Language, or Housing & Transportation. The following data from the 2020 Census is used in this report:

- Total Population: 808
- Total Housing Units: 299
- Average Municipal Household Income: \$36,803
- Total Municipality Acres: 1,247
- Total Urban Area (Acres): 244
  - Urban Area Impacted by 1% Annual Chance Flood: 0 Acres (0.16%)
  - Urban Area Impacted by 0.2% Annual Chance Flood: 0 Acres (0.16%)

The 2015 Environmental Resources Inventory<sup>lxxiii</sup> prepared for Roosevelt noted many signs of erosion on Empty Box Brook, including headcutting, sediment deposition, bed scour, bank failure, widening and aggrading. Many of the trees in Roosevelt's woodlands surrounding our streams have died within the last decade, most likely due to hydraulic changes in the soil. To be good stewards to this land we need to study and develop a plan to monitor the flow of water in this area. This continues to be a priority for the Environmental Commission.

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# THE ROOSEVELT WATER STORY

BOROUGH OF ROOSEVELT ENVIRONMENTAL COMMISSION

MAY 2023

COMPLETED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SUSTAINABLE JERSEY'S WATER  
STORY ACTION

Sustainable Jersey is a non-profit organization whose mission is to “Empower New Jersey communities to build a better world for future generations with the tools, training and financial incentives necessary to pursue critical sustainability initiatives.” Roosevelt is currently certified with them at the Bronze level.

A decorative rectangular box with a light gray gradient background. It features several realistic water droplets of various sizes, some with highlights and shadows, scattered around the text. The droplets are most concentrated in the top-left and bottom-right corners.

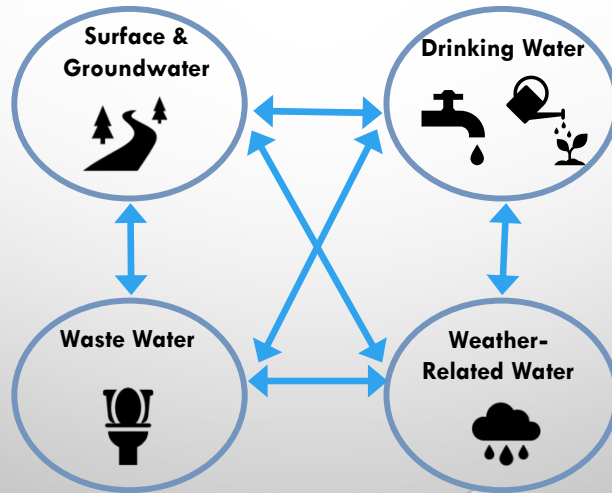
## WHY DO WE NEED TO KNOW ABOUT ROOSEVELT'S WATER?

- So we can take sustainable, environmentally friendly actions that best accommodate our continually changing surface water and stormwater.
- So we have a comprehensive understanding of our drinking and wastewater systems, including the fiscal, environmental, and public health impacts that result from current and future decisions made by the municipality.

The primary focus of this water story is to provide a blueprint for continuing Roosevelt's long-standing ethos of working WITH rather than AGAINST nature and our environment, even more relevant today as climate change, loss of habitat and biodiversity, and disruption of terrain that is integral to a natural water cycle will progressively impact our way of life. We will need to develop strategies that help mitigate the anticipated increased flooding of our roads and homes and pollution of our wetlands and downstream creeks. This document aims to provide a context for those discussions.

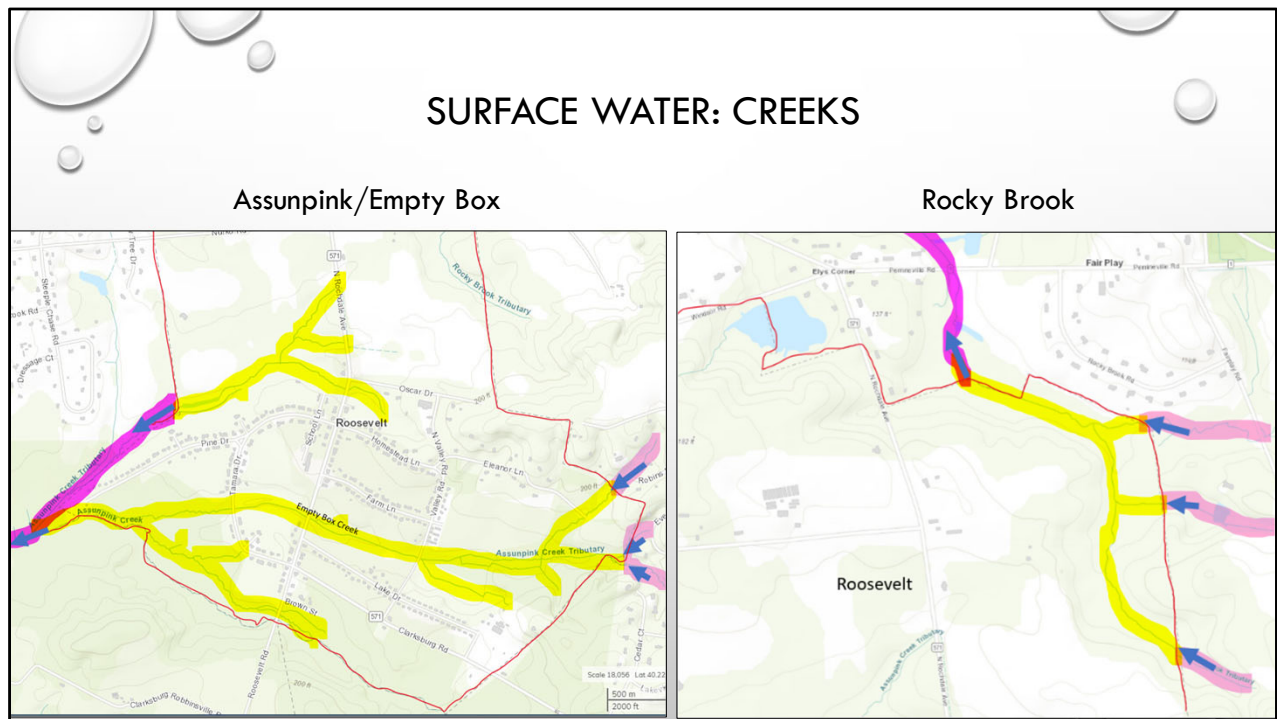
A secondary focus of this water story is to give the current and future residents of Roosevelt Borough a comprehensive understanding, in plain language, of the public health, fiscal, and environmental challenges and benefits that guide policy decisions surrounding a publicly owned, town-operated drinking and wastewater facility. These municipal-run water and wastewater treatment facilities are also a part of what makes the Borough of Roosevelt's water story unique.

## WE'RE TALKING ALL ASPECTS OF ROOSEVELT'S WATER



The water story covers the many roles that water plays here in Roosevelt, including the water that is piped into and out of our homes, the water above and below our ground, and natural precipitation that has both positive and negative impacts on us.

And like the water-cycle you probably learned in school, all these roles are interconnected and have implications for each other.



Most of the surface water in Roosevelt is in our creeks, which are kept filled by groundwater in Millstone Township and Roosevelt.

Assunpink Creek tributaries originate in Millstone Township as well as originating within our borders. Assunpink Creek then flows westward into Assunpink Lake, and then into Mercer Lake in West Windsor, before eventually emptying into the Delaware River in Trenton.

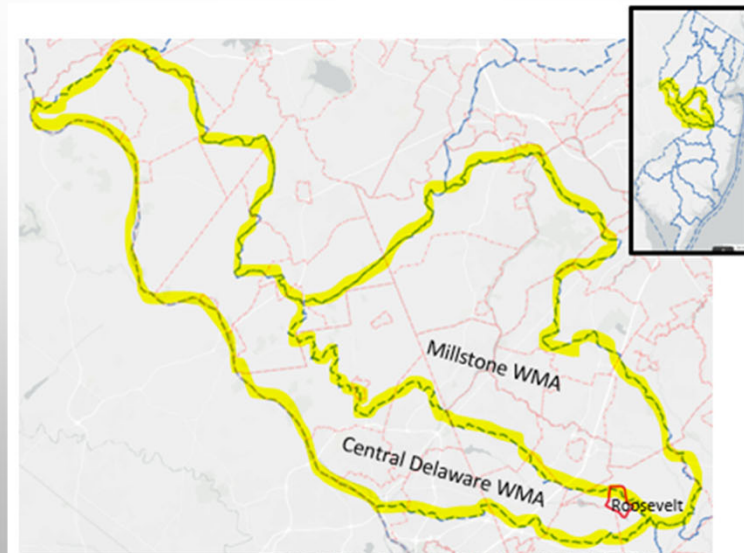
Rocky Brook tributaries, on the north-eastern side of Roosevelt, originate in Millstone Township and flow northward, up into Peddie Lake in Hightstown then joining with the Millstone River in Cranbury. The Millstone River then flows into Carnegie Lake in Princeton, before eventually emptying into the Raritan River in Manville.

As they say, what happens in Millstone Twp doesn't stay in Millstone Twp and we are impacted by what our upstream neighbor puts into these creeks. And what happens in Roosevelt doesn't stay in Roosevelt; and depending on

which creek you put your little toy sailboat in, it may end up in the Delaware Bay or in the Raritan Bay.



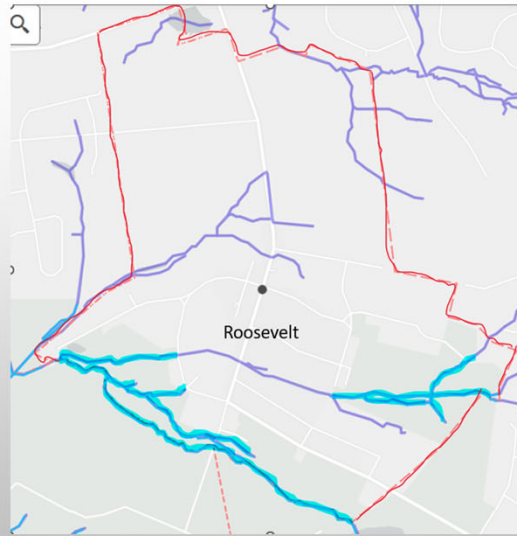
## SURFACE WATER: FEEDING WATERSHEDS



The geographic area that defines where surface water flows to is called a watershed. A watershed encompasses all the surface water bodies like brooks and creeks which eventually drain into a larger body of water such as an ocean-bound river. As we just saw, Roosevelt sits on a hydrologic divide, encompassing headwater tributaries for both the Delaware River and the Raritan River. We are part of 2 watershed management areas: Central Delaware, which includes Assunpink Creek, and the Millstone WMA which includes Rocky Brook.

As a headwaters area, we are part of a much bigger water story, and what we put into our creeks impacts downstream neighbors.

## SURFACE WATER: CREATING HABITAT FOR FLORA & FAUNA WITH FW2-NT CREEKS



The surface water in Roosevelt is important to the wildlife that we all appreciate. The government has codes to describe the different types of surface water bodies such as creeks in accordance with the wildlife they support.

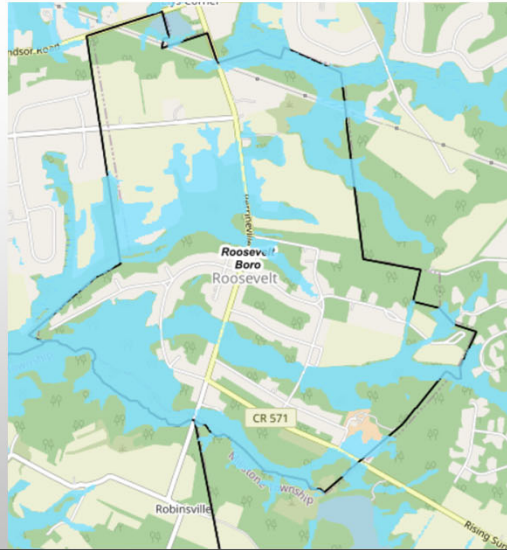
The Assunpink Creek tributaries which flow through land owned by the Assunpink Wildlife Management Area in Roosevelt, shown in turquoise, is classified as Freshwater, non-trout, category 1 -- FW2-NT-C1 .

Freshwater, non-trout, category 1 streams have a 300-ft buffer requirement to protect the flora and fauna there. This was recommended in the original natural resources inventory report and has been in the master plan since 2004

The other creeks which originate in or flow through Roosevelt are classified as FW2-NT category 2, shown in blue.

Roosevelt has a history of good environmental stewardship.

## SURFACE WATER: CREATING HABITAT FOR FLORA & FAUNA WITH WETLANDS



Geologically, Roosevelt is bordered by higher elevations on the west and south, and that makes it bit like a flat basin for water. In general, the water table in Roosevelt is high in much of the borough, in addition to the riparian (riverbank) wetlands along all the streams. These freshwater wetlands are crucial in supporting both native, and unfortunately invasive, plants and animals.

These wetlands also provide corridors for animals to move through, which further supports these species.

Wetland buffers which are left undeveloped and not built on continue to be needed to protect the quality of our water bodies as well as provide habitats for flora and fauna that live around them.

## SURFACE WATER: MONITORING HEALTHY HABITAT FOR FLORA & FAUNA

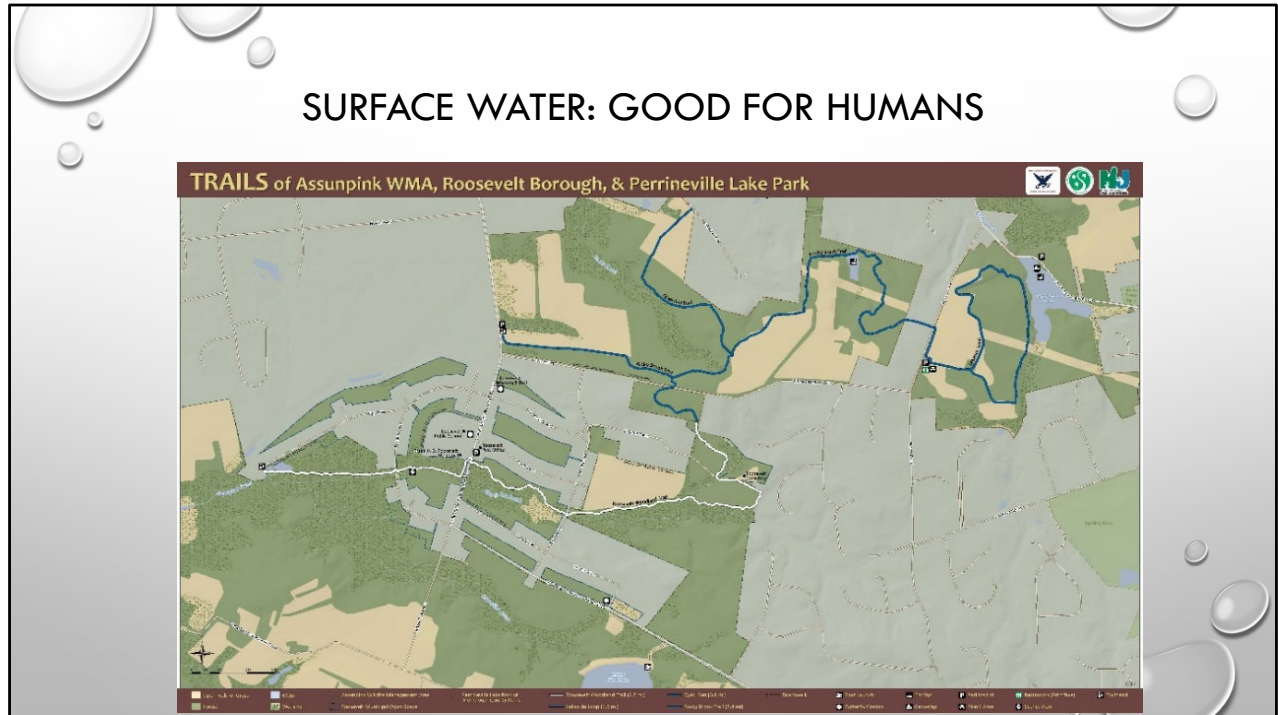
Chemical/Physical Parameters	Score
Water Temperature	Excellent
Nitrate Average	Excellent
Phosphate Average	Poor
Ph Average	Poor
Turbidity Average	Fair
Dissolved Oxygen	Excellent

The Roosevelt Environmental Commission's Stream Monitoring Team collects monthly samples as part of the Watershed Institute's StreamWatch program.

Water samples which were collected between September 18, 2021 and September 18, 2022 from a spot on Empty Box, were analyzed using the StreamWatch Water Quality Assessment Framework, - and here are the results averaged across that time period. For more information, contact the Stream Monitoring team which is headed by Mary Tulloss.

Keeping our water bodies healthy contributes to healthy local environments as well as healthy watersheds downstream

## SURFACE WATER: GOOD FOR HUMANS

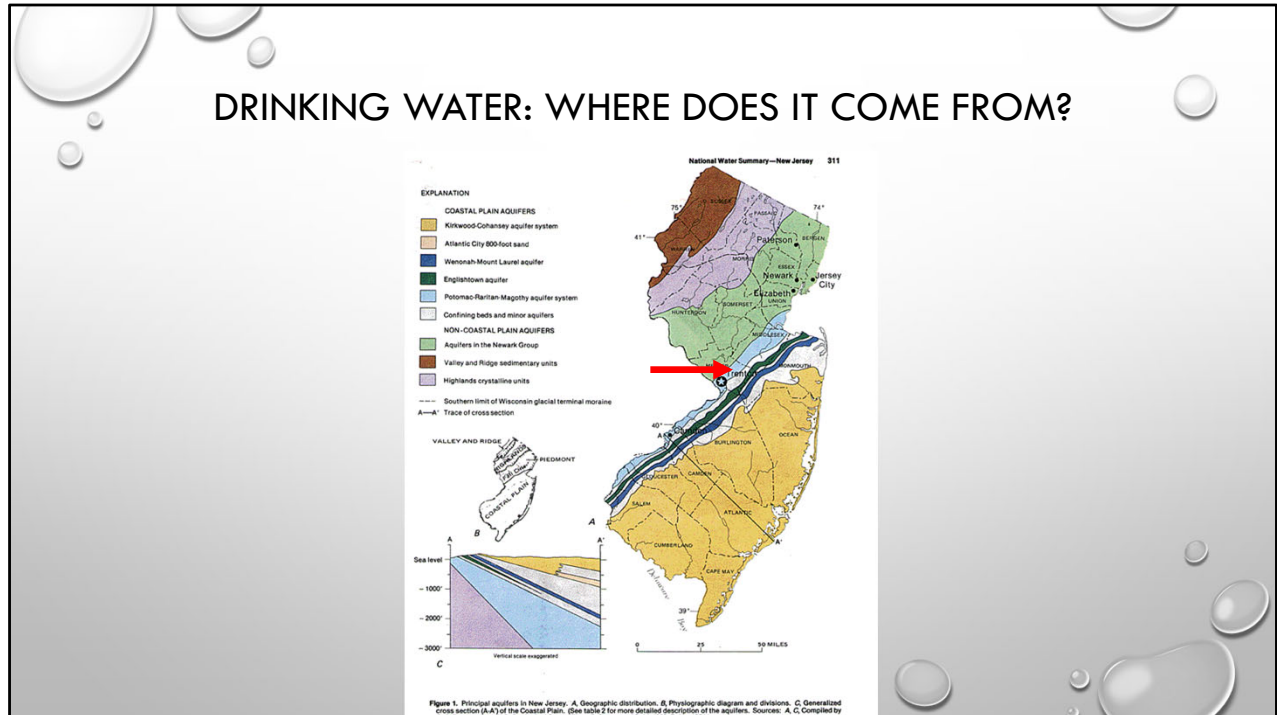


Another positive aspect of our water is that it gives us a way to reduce stress and boost creativity when we walk along our creeks and brooks. The Roosevelt Woodland Trail provides open public access alongside the Empty Box Brook, running the width of Roosevelt. The land is owned by Roosevelt Borough and Assunpink WMA and the trail is maintained by the Environmental Commission and volunteers like you.

Perrineville Lake Park, owned by Monmouth County park system, provides access to Rocky Brook.

We are fortunate to have so much access to our water bodies, as this contributes greatly to the quality of life for those who live in Roosevelt

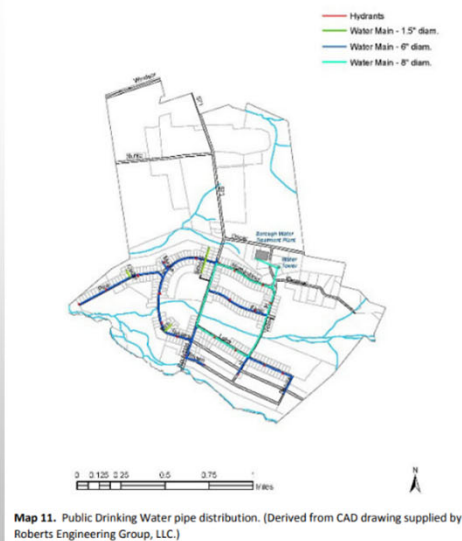
## DRINKING WATER: WHERE DOES IT COME FROM?



Roosevelt sits on the Potomac-Raritan-Magothy & Upper Potomac-Raritan-Magothy aquifer system, which is part of the large Coastal Plains Aquifer system

Again, we are part of a much bigger water story

## DRINKING WATER: ROOSEVELT WATER TREATMENT UTILITY



The Roosevelt Water Department pumps water from 2 wells that tap into the Potomac-Raritan-Magothy aquifer systems, and this provides treated drinking water to 95% of the borough homes.

The water treatment facility upgraded in 2015 – since then, continued work on water mains as streets have been repaved

It is currently operated and maintained by John Holden of H2O Services LLC, who makes sure we meet all regulations and reporting requirements.

The water utility was an integral part of the planned Jersey Homesteads community. Today, as a small, publicly owned, town-controlled water company, there are both benefits and challenges, as regulatory requirements and maintenance costs continue to rise.



## DRINKING WATER: MONITORING POTABLE WATER FOR BOROUGH RESIDENTS

TEST RESULTS						
Contaminant	Violation Y/N	Level Detected	Units of Measurement	MC LG	MCL	Likely Source of Contamination
<b>Inorganic Contaminants:</b>						
Barium Test results Yr. 2021	N	0.027	ppm	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper Test results Yr. 2022 <u>Result at 90<sup>th</sup> Percentile</u>	N	0.25 <u>No samples exceeded the action level</u>	ppm	1.3	AL=1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead Test results Yr. 2022 <u>Result at 90<sup>th</sup> Percentile</u>	N	ND <u>No samples exceeded the action level</u>	ppb	0	AL=15	Corrosion of household plumbing systems; erosion of natural deposits
Nitrate (as Nitrogen) Test results Yr. 2022	N	0.7	ppm	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
<b>Disinfection Byproducts:</b>						
TTHM Total Trihalomethanes Test results Yr. 2022	N	Range = 5 Highest detect = 5	ppb	N/A	80	By-product of drinking water disinfection
HAA5 Haloacetic Acids Test results Yr. 2022	N	Range = 1 - 2 Highest detect = 2	ppb	N/A	60	By-product of drinking water disinfection
<b>Regulated Disinfectants</b>		<b>Level Detected</b>	<b>MRDL</b>		<b>MRDLG</b>	
Chlorine Test results Yr. 2022		Range = 0.2 - 1.2 ppm Average = 0.7 ppm		4.0 ppm		4.0 ppm

Chlorine: Water additive used to control microbes.

Federal and state regulations mandate that any public drinking water is free of lead (outlined in red) and other harmful chemicals.

This is the 2023 Drinking Water Quality Report, which is available on the Borough website, and thanks to John Holden it shows that no samples exceeded the allowable level of lead.

NOTE - the water utility is not responsible for the pipes into private homes. Given the common use of lead solder in water pipes in older homes, it is recommended that homeowners test their tap water. Newer test kits may also look for per- and polyfluoroalkyl substances (PFAS or 'forever' chemicals) in drinking water. If you are worried about lead you can let your water run for a few minutes before using it if it has been sitting for a while.

## WASTEWATER: ROOSEVELT SEWAGE FACILITIES



As with the public water system, a municipal sewage facility is used by most of the residents of Roosevelt. The wastewater treatment plant is a regulated discharge site and is currently in compliance with NJ Pollutant Discharge Elimination System requirements.

The municipal wastewater treatment facility discharges treated water to an area which drains into Assunpink Lake and the Assunpink Creek watershed. If the NJ DEP adopts more stringent levels for pollutants such as phosphorus then upgrades to the treatment plant will likely be needed.

NOTE – much the current 80-year-old wastewater treatment facility (for example the trickling filter component) is at the end of its lifespan. For more information on how this is being addressed, please read recent Borough Council minutes and attend upcoming meetings as solutions are developed.

A decorative rectangular box with a light gray gradient background. It features several realistic water droplets of various sizes, some with highlights and shadows, scattered around the text. The title 'PRIVATE WELLS AND SEPTIC SYSTEMS' is centered at the top in a bold, black, sans-serif font. Below it is a bulleted list of four items, each preceded by a black dot. The list items are: 'Eleanor Lane: 12 residences', 'North Valley Road: 3 residences', 'Nurko Road (within Roosevelt borders): 4 residences', and 'North Rochdale Avenue: 4 residences/farms'.

## PRIVATE WELLS AND SEPTIC SYSTEMS

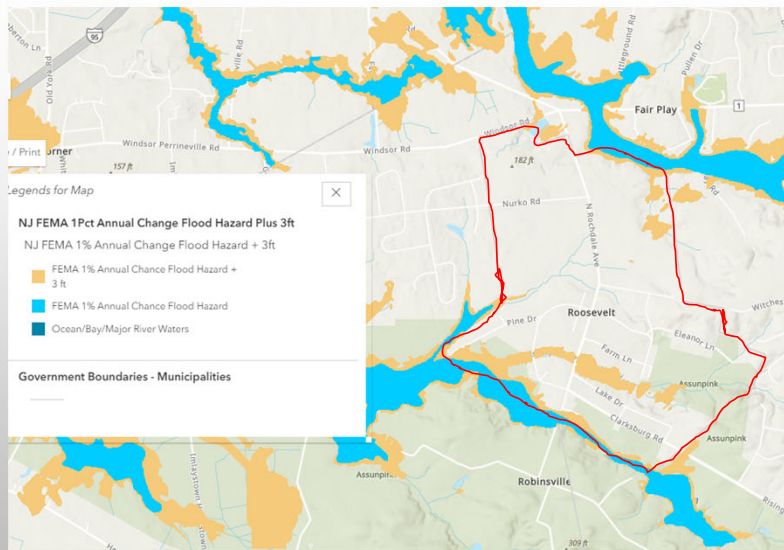
- Eleanor Lane: 12 residences
- North Valley Road: 3 residences
- Nurko Road (within Roosevelt borders): 4 residences
- North Rochdale Avenue: 4 residences/farms

Twenty-three residences on the northern side of Roosevelt Borough use private wells which pump their drinking water from deeper groundwater; and have their own septic systems that seep water back into the local water table.

It is the responsibility of these homeowners to maintain the potability and quality of their drinking water. Water testing is only required when selling their homes. Yearly testing is suggested. There are no local or county programs to assist in this but as mentioned before, water test kits are available for households to purchase.

Furthermore, the Borough of Roosevelt does not require testing of septic systems for a house to sell, however many buyers (and/or their mortgage companies) require it.

## WEATHER-RELATED WATER: FLOOD WATER



Some of the negative aspects of water in Roosevelt, involve flooding, as many of you are aware.

As an inland municipality, Roosevelt Borough is subject to riverine (fluvial non-tidal) flooding caused by stormwater runoff from severe rainfalls or snowmelts.

New NJ DEP maps extend FEMA flood zones, shown in blue, by 3 ft, so more areas in Roosevelt are identified as flood zone hazards, shown in orange. This has implications for our infrastructure and any flood insurance.

Climate change and continued development of impervious surfaces in Roosevelt, and also upstream in Millstone Twp, will create more flooding

## WEATHER-RELATED WATER: STORMWATER



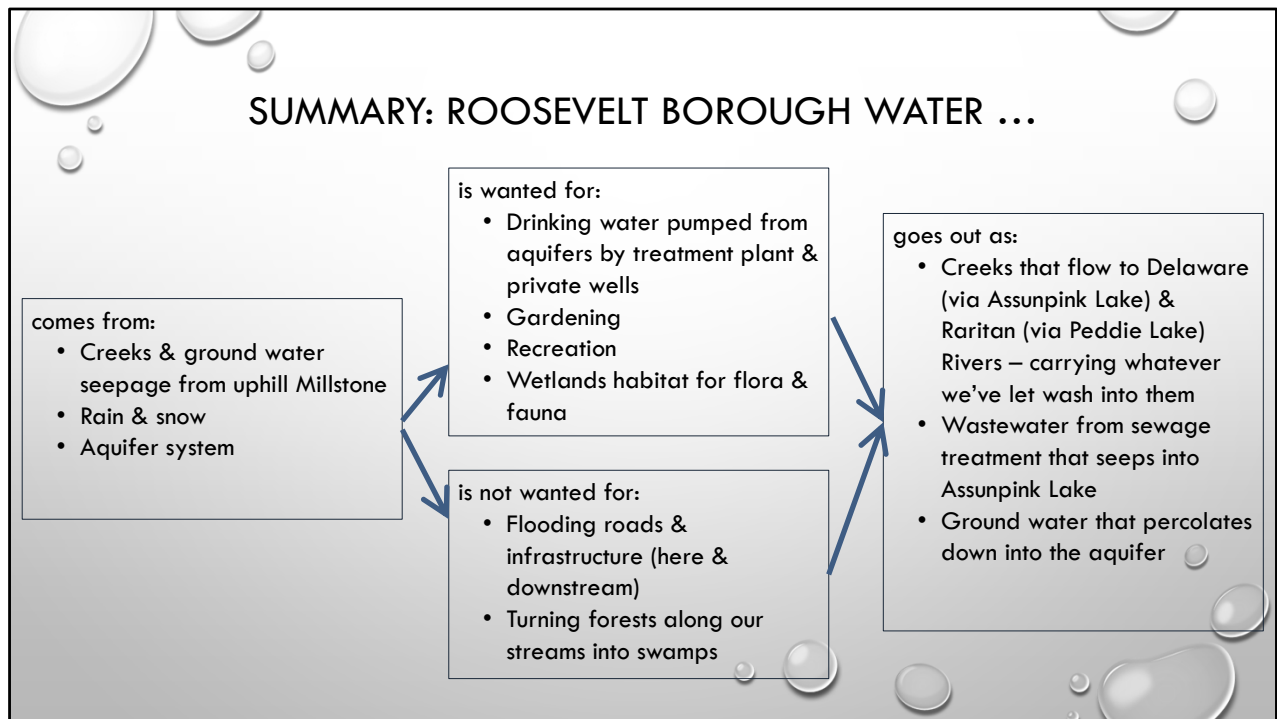
This is a simplified map of current storm drain system, which is part of the municipal stormwater management plan that was updated in April 2021 and is part of the Zoning code.

Until very recently, Roosevelt Borough was a Tier B Municipal Separate Storm Sewer System (MS4) municipality, and as such, had minimal NJDEP stormwater ordinance requirements. NJ DEP is doing away with the tiered system and all municipalities will be expected to meet more stringent Tier A requirements for maintaining, monitoring, operating and reporting their stormwater systems.

As a reminder, the state has stormwater requirements to ensure that stormwater from one town does not carry pollutants (run-off from impervious surfaces, fertilizers used on lawns, etc.) into our ground water and creeks, and does not cause flooding in downstream towns. The new regulations stress the importance of letting precipitation seep into the ground rather than get carried off, by using what they call green infrastructure such as rain gardens and bioswales.

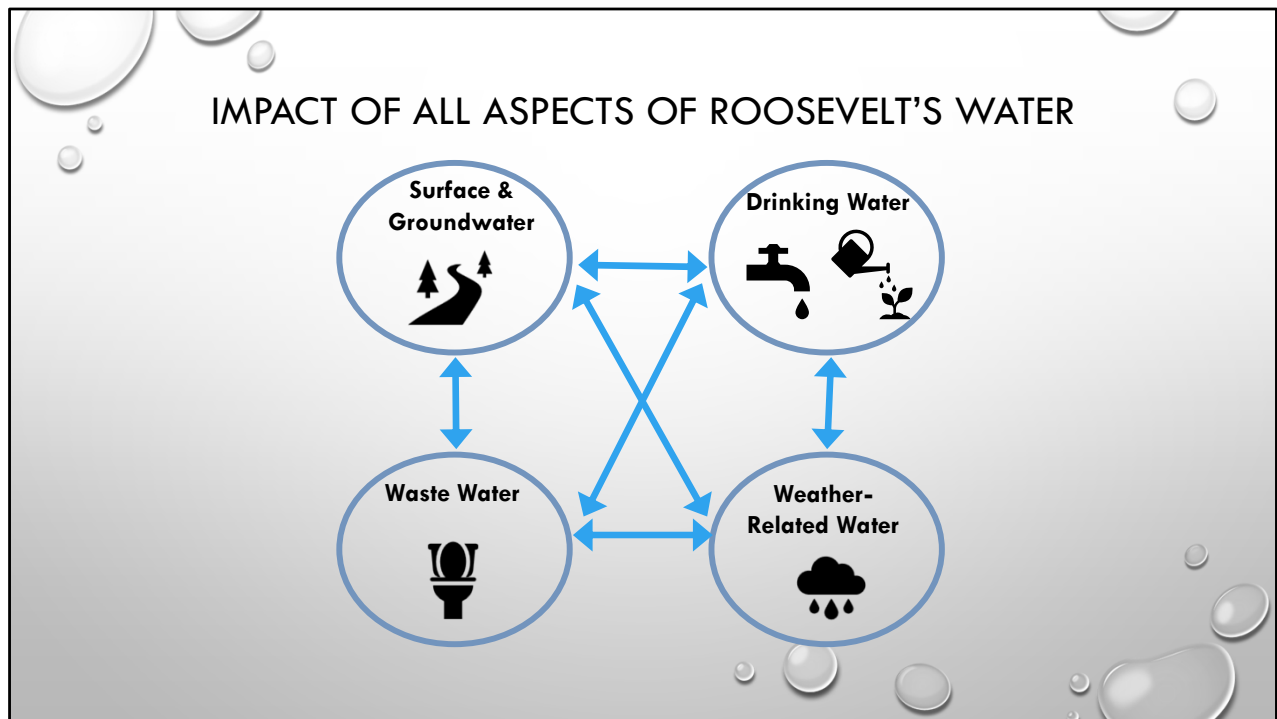
Stormwater flooding will continue to occur and become more frequent and more damaging as predicted climate change creates more and more extreme weather conditions.

Another problem - as we mentioned before, Roosevelt has a lot of riparian wetlands along all of our creeks and brooks. The upside is that this supports a variety of flora and fauna. The downside is that these wetlands are pretty much saturated, and water from any major storm that is not caught by the storm drains has nowhere else to go but flooding into the surrounding woods and turning those woods into swamps with lots of dying trees. This is a natural process but it is something we have an impact on as we create impervious surfaces with our buildings and driveways, etc. that cause excess water to flow into the wetlands rather than percolate through the ground. We can't just blame the beavers.



To summarize: Roosevelt's water story is part of a much bigger water story. The story starts as Millstone Township groundwater, as a regional aquifer system, and as precipitation produced by an unpredictable climate. The story ends in the Delaware and Raritan Rivers and all downstream communities in between. And much of the story takes place here in Roosevelt, where it is necessary for our lives (and the lives of all of Roosevelt's flora and fauna). But like any good drama, there is also the constant threat of damage and destruction.





There are many ways that these aspects all impact each other

1. The surface water in our creeks evaporates into clouds, creating precipitation that waters our lawns and gardens, however stormwaters may flood these creeks, causing them to overflow their banks and create more wetland areas in what was previously forest
2. Surface water may also get backed up when our beavers build dams in Assunpink Lake, which may flood into our wastewater treatment plant
3. Our creeks provide necessary habitats for our flora and fauna as well as a place of relaxation for us, however, this can only happen if we keep them clean of pollutants that run-off from our lawns, gardens roads and buildings. And also encourage our neighbors in Millstone Township to do the same
4. For homes on private well systems, groundwater provides them with drinking water, however during drought periods when the groundwater is not being recharged with precipitation, then these wells can potentially be pumped dry. Even those of us using the public water system may be impacted by state-wide restrictions if there is an

extended drought or extreme-heat weather cycle.

5. If our wastewater treatment system has points of failure along the pipes or in the facility itself, then polluted sewage will mix with the surface water and/or flow downstream into neighboring city drinking water. Additionally, if stormwater infiltrates the sewage pipes, then the facility has to process stormwater as well as wastewater which is costly

## YOUR JOB

1. Read the Roosevelt Water Story draft: [rooseveltnj.us/images/EC/EC-documents/Roosevelt-Water-Story-2023.pdf](https://rooseveltnj.us/images/EC/EC-documents/Roosevelt-Water-Story-2023.pdf)
2. Verify the information in the draft (we welcome corrections)
3. Identify which issues you think are important and how they should be prioritized
4. Send an email with all comments/feedback to [environmental@rooseveltnj.us](mailto:environmental@rooseveltnj.us)
5. Get involved!

So how will we write the next chapters of the Roosevelt water story? And what would we like you to do?

To start – read and comment on the draft on the environmental commission website – [rooseveltnj.us/boards-commissions/environmental-commission](https://rooseveltnj.us/boards-commissions/environmental-commission)

Then – get involved and let us know what issues you think are most important and how you think they should be prioritized and addressed.

QUESTIONS? COMMENTS? FEEDBACK?

[environmental@rooseveltnj.us](mailto:environmental@rooseveltnj.us)

Our email address is [environmental@rooseveltnj.us](mailto:environmental@rooseveltnj.us)