EXPERIENCED DEDICATED RESPONSIVE



INVENTORY REPORT PHASE 1 OF THE WATERSHED IMPROVEMENT PLAN

BOROUGH OF BOGOTA BERGEN COUNTY MAY 22, 2025

PERMIT# NJG0151203



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III. ACKNOWLEDGEMENTS

The Borough of Bogota's Watershed Inventory Report has been prepared by Neglia Group.

Neglia Group would like to thank the Mayor and Council of the Borough of Bogota for their continued work on making the Borough of Bogota a safe and healthy community for all of its residents and businesses.

Neglia Group also wishes to acknowledge the following resources which were compiled by the New Jersey Department of Environmental Protection (NJDEP) to help with the preparation of this report:

- New Jersey Watershed Evaluation Tool (NJ-WET)
- > NJDEP Open Data
- MS4 WIP Guidance Webpage
- > TMDL Lookup Tool
- ▶ New Jersey's Integrated Water Quality Assessment Reports 303 (d) List
- New Jersey Environmental Justice Mapping, Assessment, and Protection Tool (EJMAP)
- New Jersey Hydrologic Modeling Database (H&H Database)

IV. INTRODUCTION

The Borough of Bogota (Borough) is located in Bergen County covering 0.76 square miles along the Hackensack River, bordered by the City of Hackensack to the west, the Village of Ridgefield Park to the south, and the Township of Teaneck to the north and east. The Borough has a population of 8,781 people (2020 United States Census) and is a majority urban use land with the highest land use being Residential (67.27%). Over 50% of the Borough's residential land use is comprised of single- or two-family dwellings and commercial/industrial uses comprise approximately 12% of the Borough's land use. Table 1 below depicts the land use breakdown of the Borough (Land Cover 2020).

The vast majority of the Borough of Bogota is located within the Hackensack River (Ft. Lee Road to Oradell Gage) subwatershed of the Watershed Management Area 5 (Hackensack, Hudson, and Pascack), as shown in Figure 1. A portion of the Borough is in Zone AE flood zone as shown in Figure 2.

This watershed improvement report provides a comprehensive understanding of the key defining features of how water flows throughout and into the Borough of Bogota. This report presents information on the existing conditions and infrastructure within the Borough of Bogota and aims to serve as a tool for informed decision-making, planning, and implementation of sustainable watershed management strategies to improve the community, watershed, Hackensack River, and the associated ecosystems.

The figures and tables provided in this report were prepared by geographic information systems (GIS) to provide a full graphical understanding of the stormwater infrastructure owned and operated by the Borough of Bogota. The Borough's infrastructure was mapped by Neglia Group staff between 2023 – 2024 using survey-grade global positioning system (GPS) collection methods and professional GIS drafting methods.

Table 1: Land Use Acreage & Percentage Breakdown				
Туре	Acreage	Percentage		
Residential	344.13	67.27		
Commercial / Industrial	60.77	11.88		
Cemetery / Transportation Utilities	20.72	4.05		
Urban Land	4.17	0.81		
Recreational Land	30.64	5.99		
Forest	9.05	1.77		
Barren Land	14.04	2.74		
Water	28.08	5.49		
Total	511.59	100.00		
Source: Anderson Classification Land Use/ Land Cover 2020				

V. ACRONYMS & DEFINITIONS

ACRONYMS

- "BMP" Best Management Practice
- "DO" Dissolved Oxygen
- ➤ "EPA" U.S. Environmental Protection Agency
- "GIS" Geographic Information System
- "HUC 14" Hydrologic Unit Code 14
- "LIDAR" Light Detection and Ranging
- "MS4" Municipal Separate Storm Sewer System
- "MTD" Manufactured Treatment Device
- "NJPDES" New Jersey Pollutant Discharge Elimination System
- "NJDEP" New Jersey Department of Environmental Protection
- "NJDOT" New Jersey Department of Transportation
- "NJ-WET" New Jersey Watershed Evaluation Tool
- "TDS" Total Dissolved Solids
- "TMDL" Total Maximum Daily Load
- > "TSS" Total Suspended Solids
- "WIP" Watershed Improvement Plan

DEFINITIONS

- ➤ "HUC 14" or "hydrologic unit code 14" means an area within which water drains to a particular receiving surface water body, also known as a subwatershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey. (N.J.A.C. 7:9B)
- "Municipal separate storm sewer" (or MS4 conveyance) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) as defined in more detail at N.J.A.C. 7:14A-1.2.
- "Outfall" means any point source which discharges directly to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

- > "Overburdened community" means a block group with at least 35 percent low-income households; or at least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or at least 40 percent of the households have limited English proficiency.
- "Storm drain inlet" means the point of entry into the storm sewer system.
- "Stormwater" means water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, is captured by separate storm sewers or other sewage or drainage facilities or is conveyed by snow removal equipment.
- "Stormwater facility" means stormwater infrastructure including, but not limited to, catch basins, infiltration basins, detention basins, green infrastructure (GI), filter strips, riparian buffers, infiltration trenches, sand filters, constructed wetlands, wet basins, bioretention systems, low flow bypasses, Manufactured Treatment Devices (MTDs), and stormwater conveyances.
- > "Stormwater interconnections" means the location in which water flows from one MS4 system into another MS4 system that is owned by another entity.
- "Stormwater management basin" means a stormwater management basin as defined in N.J.A.C. 7:8.
- ➤ "Stormwater management measure" means a stormwater management measure as defined in N.J.A.C. 7:8.
- > "Stormwater runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.
- ➤ "Total maximum daily load" or "TMDL" means a total maximum daily load formally established pursuant to Section 7 of the Water Quality Planning Act (N.J.S.A. 58:11A-7) and Section 303(d) of the Clean Water Act, 33 U.S.C. §§12512 et seq. A TMDL is the sum of individual waste load allocations for point sources, load allocations for nonpoint sources of pollution, other sources such as tributaries or adjacent segments, and allocations to a reserve or margin of safety for an individual pollutant.
- ➤ "Waters of the State" means the ocean and its estuaries, all springs, streams and bodies of surface or ground water, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction" (see N.J.A.C. 7:9B-1.4).
- > "Water quality impairments" means that the water body is contaminated by pollutants which prevents the water body from meeting its designated use.

VI. STORMWATER OUTFALL(S)

The Borough of Bogota contains forty-nine (49) outfalls within the Borough limits, as shown in Figure 3. The Borough owns and operates twenty-six (26) of these outfalls. All stormwater within the Borough is discharged into the Hackensack River or to a series of unnamed ditches along the existing railroad tracks.

All outfalls owned and operated by the Borough of Bogota are required to be inspected once every five years per the NJDEP MS4 permit. The Borough continuously maintains and inspects these outfalls in accordance with the NJDEP requirements.

RECEIVING SURFACE WATERS

Twelve (12) of the forty-nine (49) outfalls, or twenty-four percent (24%), located within Bogota drain directly into the Hackensack River. Thirty-Six (36) of the outfalls, or Seventy-Four (74%), drain into unnamed ditches along the railroad tracks that run through the center of the Borough. One (1) outfall owned by the State of New Jersey drains into New Jersey State Highway Route 80, or two percent (2%).

WATER QUALITY CLASSIFICATIONS

There are no waterways in the Borough that are designated as Category One (C1) Waters of the State, and none of the waterways are classified as either trout production or trout maintenance waters. The main waterway is the Hackensack River (SEI – Saline Waters of Estuaries), HUC 02030103180030 above Ft. Lee Road, HUC 02030103180050 below Ft. Lee Road), which flows southerly through the Hackensack Meadowlands several miles to the south, to Newark Bay. The Hackensack River emanates in Rockland County, flows through the Oradell Reservoir system, and passes along Borough's western border. The Hackensack River is classified as SE1 within the second sub classification, which refers to saline estuarine waters that have the ability to support recreation, shellfish harvesting, and warm water fish species, as shown on Figure 5.

VII. STORMWATER INTERCONNECTION(S)

The Borough of Bogota contains MS4 systems owned by Bergen County and the New Jersey Department of Transportation (NJDOT). Additionally, Bogota's stormwater infrastructure is connected to the adjacent Township of Teaneck. These interconnection point locations were found using the municipality boundary and right-of-way for county and state roadways utilizing information from the NJ Office of GIS, NJDEP.

The Borough of Bogota's MS4 infrastructure interconnects into the NJDOT MS4 system at two (2) locations along New Jersey State Highway Route 80. The Borough of Bogota's MS4 infrastructure interconnects into the Bergen County MS4 system at twenty (20) locations. The Borough of Bogota's MS4 infrastructure interconnects into the Township of Teaneck MS4 system at two (2) locations. The Borough of Bogota's MS4 infrastructure interconnections into the varying systems detailed above are illustrated on Figure 6.

Bergen County's MS4 infrastructure discharges into Bogota's MS4 infrastructure at four (4) points, three (3) of which are located at the intersection of E. Main Street and Palisade Avenue. The Township of Teaneck's MS4 infrastructure discharges into the Borough of Bogota's MS4 infrastructure at four (4) points. The interconnections of water flowing into the Borough of Bogota's MS4 system are shown in Figure 7.

VIII. DRAINAGE AREA(S) FOR STORMWATER OUTFALLS AND STORMWATER INTERNONNECTIONS

This report delineates the drainage areas that are conveying stormwater runoff to outfalls and upstream connections to the Borough's MS4 infrastructure. The drainage area delineations can identify the quantity of stormwater runoff conveyed into the Borough's system and aid in identifying capacity issues and illicit connections in the stormwater piping network

STORM DRAIN INLETS AND MANHOLES

The Borough of Bogota owns and operates four hundred and twenty-seven (427) stormwater inlets and catch basins and one hundred and seventy (170) manholes that discharge stormwater runoff into the waterways referenced above located within the Borough. Bogota uses uses ArcGIS to manage and visualize the MS4 infrastructure. Figure 8 illustrate the stormwater structures owned and operated by the Borough of Bogota and all stormwater interconnections that convey stormwater runoff into the Borough's MS4 system.

The stormwater inlets and catch basins owned and operated by the Borough of Bogota are required to be inspected once every five years per the NJDEP MS4 permit. The Borough maintains a list of inlets that require cleaning and repair. The Borough cleans and implements repairs on stormwater infrastructure on a regular basis, in accordance with the MS4 permit.

OUTFALL AND UPSTREAM CONNECTIONS DRAINAGE AREA METHODOLOGY

The Neglia Group utilized AUTOCAD Civil 3D software and LIDAR aerial information to model/delineate the drainage areas for the outfalls, upstream interconnection points, manholes, stormwater inlets, and catch basins. The stormwater collection infrastructure, in conjunction with the existing stormwater pipe network linework, and one-foot contour information, from LIDAR, were used to cumulatively delineate both overland flow and pipe flow for each drainage area.

The delineation procedure outlined above is approximate due to survey limitations and insufficient data for manholes and inlets owned by other entities within the Borough. Future procedures can be refined to improve the drainage area delineation process by incorporating county and state data, upon mapping completion of their respective infrastructure.

The Watershed Delineation Map is provided on Figure 9.

IX. WATER QUALITY IMPAIRMENTS AND TMDLS

As per the U.S. Environmental Protection Agency, a TMDL is the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet and continue to meet water quality standards for that particular pollutant. A TMDL determines a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant.

Pollutant sources are characterized as either point sources that receive a waste load allocation (WLA), or nonpoint sources that receive a load allocation (LA). For purposes of assigning WLAs, point sources include all sources subject to regulation under the National Pollutant Discharge Elimination System (NPDES) program, e.g., wastewater treatment facilities, some stormwater discharges and concentrated animal feeding operations (CAFOs). For purposes of assigning LAs, nonpoint sources include all remaining sources of the pollutant as well as natural background sources. TMDLs must also account for seasonal variations in water quality and include a margin of safety (MOS) to account for uncertainty in predicting how well pollutant reductions will result in meeting water quality standards. Each pollutant causing a waterbody to be impaired or threatened is referred to as a waterbody/pollutant combination, and typically a TMDL is developed for each waterbody/pollutant combination.

The objective of a TMDL is to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken, and water quality standards achieved. The TMDL process is important for improving water quality because it serves as a link in the chain between water quality standards and implementation of control actions designed to attain those standards.

All contributing sources of the pollutants (point and nonpoint sources) are identified, and they are allocated a portion of the allowable load that usually contemplates a reduction in their pollution discharge in order to help solve the problem. Natural background sources, seasonal variations and a margin of safety are all taken into account in the allocations. The approach normally used to develop a TMDL for a particular waterbody or watershed consists of five activities:

- Selection of the pollutant(s) to consider.
- Estimation of the waterbody's assimilative capacity (i.e., loading capacity).
- Estimation of the pollutant loading from all sources to the waterbody.
- Analysis of current pollutant load and determination of needed reductions to meet assimilative capacity.
- Allocation (with a margin of safety) of the allowable pollutant load among the different pollutant sources in a manner such that water quality standards are achieved.

Based on an inquiry to the NJDEP's TMDL Look-Up Tool, provided by the Bureau of Nonpoint Pollution, there are two (2) TMDLs in the Borough of Bogota, as shown in Figure 10. These TMDLs are Nickel and Total Phosphorus.

The Hackensack River (Ft. Lee Road to Oradell Gage) subwatershed of the Watershed Management Area 5 (Hackensack, Hudson, and Pascack) has (3) water quality impairments, as shown in Figure 11. The impairments are benzo(a) pyrene (PAHs), polychlorinated biphenyls (PCBs) in fish tissue, and PH and Turbidity. A small portion of the Borough of Bogota is also located within the subwatershed Overpeck Creek, which has two (2) water quality impairments of Escherichia Coli (E. COLI) and polychlorinated biphenyls (PCBs) in fish tissue.

X. NON-MUNICIPALLY OWNED OR OPERATED STORMWATER FACILITIES

The non-municipally owned or operated stormwater facilities were identified utilizing the New Jersey Hydrologic Modeling Database (H&H Database). A search of the Borough of Bogota limits did not yield any results in the H & H Database. Additionally, the Borough has sixteen (16) privately owned outfalls along with commercial and residential properties with on-site conveyance systems.

Additionally, Bergen County has MS4 systems that convey stormwater runoff through the Borough of Bogota on River Road (CR41). The County systems includes four (4) outfalls within the Borough. Finally, the New Jersey Department of Transportation (NJDOT) has an MS4 system that traverses through the south of the Borough to New Jersey State Highway Route 80 with one (1) outfall.

XI. OVERBURNDED COMMUNITIES

As per the New Jersey Watershed Evaluation Tool (NJ-WET), the Borough of Bogota contains one hundred percent (100%) overburdened communities, as shown in Table 2 below and Figure 12. Municipalities with large numbers of overburdened communities often struggle with limited financial resources to maintain and expand the stormwater infrastructure in that area. Furthermore, these communities are susceptible to disproportionately high environmental and public health stressors, therefore, these areas are more susceptible to health disparities during national disasters such as flooding.

The Borough of Bogota works tirelessly to ensure that the disparities caused by the high percentage of overburdened communities are mitigated to the highest extent possible. The Borough regularly does activities to promote the wellness of the residents by hosting community wellness days and wellness programs for adults and seniors. The Borough distributed copies of information publications provided by the New Jersey Department of Environmental Protection to all residents and businesses within the Borough, regarding stormwater infrastructure. The Borough also conducts at least once per year, an educational effort in the form of an informational "event" possibly in concert with a municipal festival, fair, or holiday celebration, to go over the borough's stormwater management facilities and what residents can do to not interfere with drains. The Borough also took steps to label all storm drain inlets in streets or public parking areas to develop their long-term maintenance program and map the location of the inlets.

Addressing the stormwater infrastructure needs of overburdened communities is essential for improving resilience, protecting public health, and ensuring environmental justice. Investing in modern, sustainable stormwater management practices—such as green infrastructure, permeable surfaces, and improved drainage systems—can help reduce flooding and protect water quality in overburdened communities.

Table 2: Overburdened Communities Percentage					
Туре	Acreage	Percentage			
Low Income and Minority	63.82	12.48			
Minority	447.76	87.52			
Total	511.59	100.00			
Source: NJDEP Open Data					

XII. IMPERVIOUS AREA

The impervious area occupies approximately sixty-nine percent (69%) of the Borough's footprint. Figure 13 and Table 3 below show the impervious coverage of the Borough of Bogota.

Table 1: Land Use Acreage & Percentage Breakdown				
Туре	Acreage	Percentage		
Building	93.37	18.25		
Road	90.30	17.65		
Other	170.99	33.42		
Total Impervious	354.66	69.33		
Non-Impervious	156.92	30.67		
Total	511.58	100		
Source: NJDEP Open Data				

As early as 1976, scientific literature suggested a link between the impervious cover within a watershed and the stream ecosystem impairments. Schueler first proposed a model in 2004 using the impervious coverage to diagnose the severity of future streams issues within the urban watersheds. The impervious cover model designates urban streams into four (4) categories; sensitive, impacted, non-supporting, and urban drainage. Scheler expanded upon this model in a paper published in 2009 after nearly 250 research studies were undertaken.

A sensitive stream is when its watershed has an impervious cover of less than ten percent (10%) and is able to generally retain the hydrologic function and support good to excellent aquatic diversity. Impacted streams have an impervious coverage of ten percent (10%) to twenty-five (25%). These watercourse exhibit signs of stream health decline have fair aquatic diversity. Non-supporting streams have an impervious coverage between twenty-five percent (25%) and sixty percent (60%) and no longer support their hydraulic function, channel stability, habitat, water quality of biological diversity. Non-supporting streams often are so degraded that it is difficult for the stream to make a full recovery. Urban drainage streams have an impervious coverage of sixty percent (60%) or higher and have become so degraded that they generally only function as a conduit for flood waters. Urban drainage streams consistently have poor water quality, highly unstable channels and poor habitat and biodiversity scores. Many of these streams are beyond repair that they disappear altogether by becoming earthworks and / or being enclosed into storm drain enclosures.

The high percentage of impervious cover within the Borough of Bogota would suggest that the waterways within its border are impaired as urban drainage streams.

XIII. CONCLUSION

The Watershed Inventory Report serves as a record for the stormwater infrastructure, water quality data, stream classifications, and additional relevant information for a complete understanding of the MS4 information within the Borough of Bogota.

All the data compiled for this report has been compiled by GIS experts through the preparation of digital mapping techniques. The prepared maps can be utilized as a continued reference, as detailed this report. As phase one of the watershed improvement plan, this report will be used to create the Watershed Assessment Report which will identify areas of potential concern along with water quality improvement projects could potentially be implemented.

XIV. REFRENCES

DATA SOURCES

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