



SCHOOR DEPALMA
Engineers and Consultants

STORMWATER MANAGEMENT PLAN

FOR

BOROUGH OF VICTORY GARDENS MORRIS COUNTY, NEW JERSEY

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1. Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Victory Gardens in Morris County, New Jersey (“the Borough”) to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

A “build-out” analysis has not been included in this plan because the Borough has less than one (1) square mile of land available for development. Additionally, in accordance with NJDEP’s Stormwater Regulations at N.J.A.C. 7:8-4.2(c)10, since the Borough is not required to perform a build out analysis it is also not required to perform a review of its master plan and ordinances, therefore, a list of the sections in the Borough’s land use and zoning ordinances is not included in the Stormwater Management Plan. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, stormwater management measures are identified to lessen the impact of existing development.

2. Goals

The goals of this MSWMP are to:

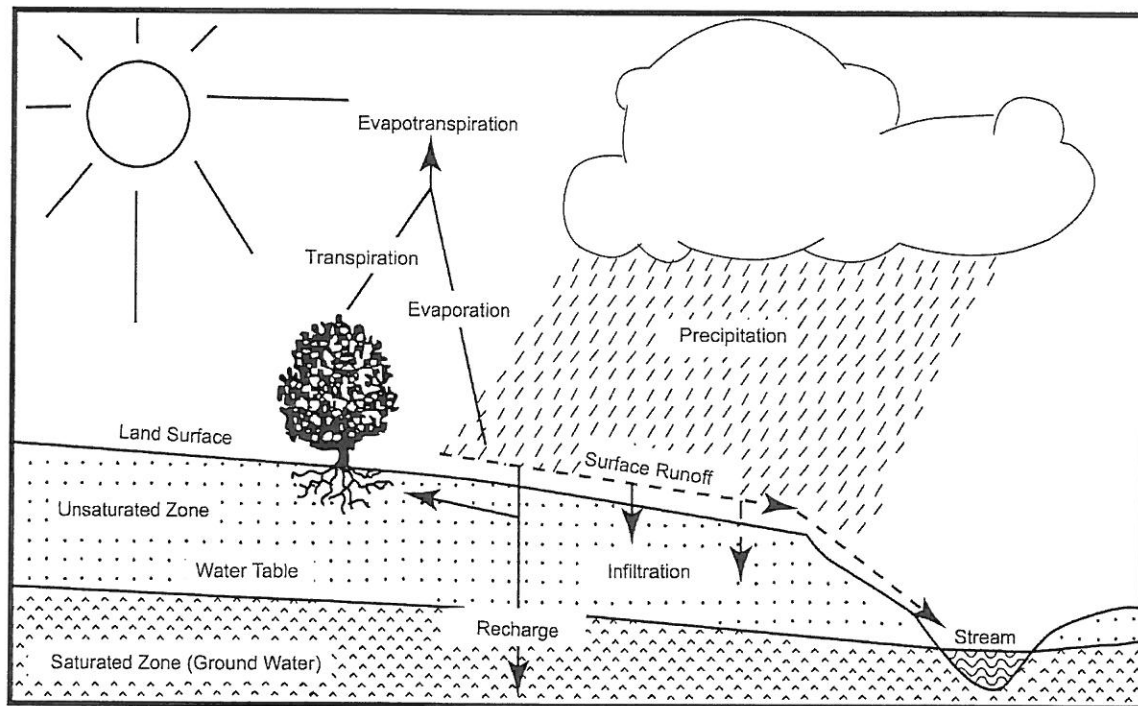
- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

3. Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report GSR-32.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients. In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

4. Background

The Borough encompasses a 0.15 square mile area in central Morris County, New Jersey. Victory Gardens, incorporated in 1951, is Morris County's smallest municipality, both in size and in population. Its history began in 1941, when the federal government purchased 91 acres in Randolph Township and constructed a 300-unit housing project for employees

of the war industry. As of 2000, Victory Gardens is the most densely populated municipality in Morris County.

Between 1990 and 2000, the Borough population has increased at a rate higher than that of Morris County and the State. The population of the Borough has increased from 1,314 in 1990, to 1,546 in 2000, an increase of 232 persons or approximately 18%. The Borough land use is predominately residential, with lesser portions in business and commercial zones. There are no streams or rivers in the Borough. All stormwater is discharged into the County of Morris, Town of Dover, or Randolph Township storm sewers which ultimately discharge to the Rockaway River.

Figure C-2 illustrates the lack of waterways in the Borough. Figure C-3 depicts the Borough boundary on the USGS quadrangle maps.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. NJDEP is required to develop a Total Maximum Daily Load (TMDL) for each pollutant for each impaired waterway. There are no waterways located within the Borough.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

5. Design and Performance Standards

The Borough will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the county for review and approval within 24 months of the effective date of the Stormwater Management Rules.

6. Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area and there are no waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Borough's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

7. Nonstructural Stormwater Management Strategies

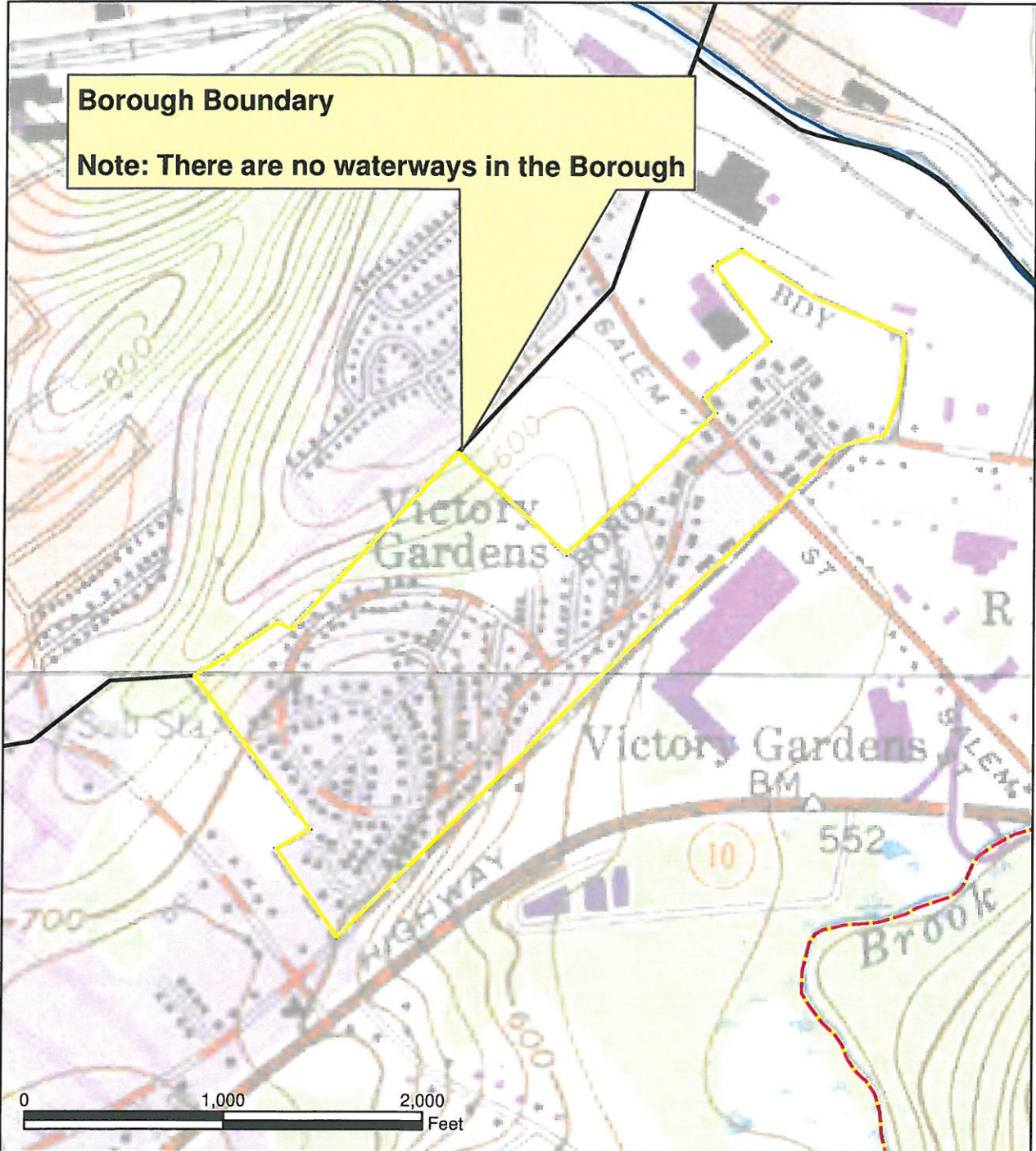
In accordance with NJDEP's Stormwater Regulations at N.J.A.C. 7:8-4.2(c)10, since the Borough is not required to perform a build out analysis it is also not required to perform a review of its master plan and ordinances, therefore, a list of the sections in the Borough's land use and zoning ordinances is not included in the Stormwater Management Plan. An aerial photograph of the Borough is included as Figure C-10 to document that there is less than one (1) square mile of developable land available.

8. Land Use/Build-Out Analysis

The Borough has less than one square mile in size and no developable land remaining; therefore a build-out analysis is not required (see Figure C-10).

9. Mitigation Plans

The Borough has less than one square mile in size and no developable land remaining; therefore the Borough does not propose any mitigation plans (see Figure C-10).



Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
C1 Waters	NJDEP	2003

Figure C-2
Borough and its Waterways

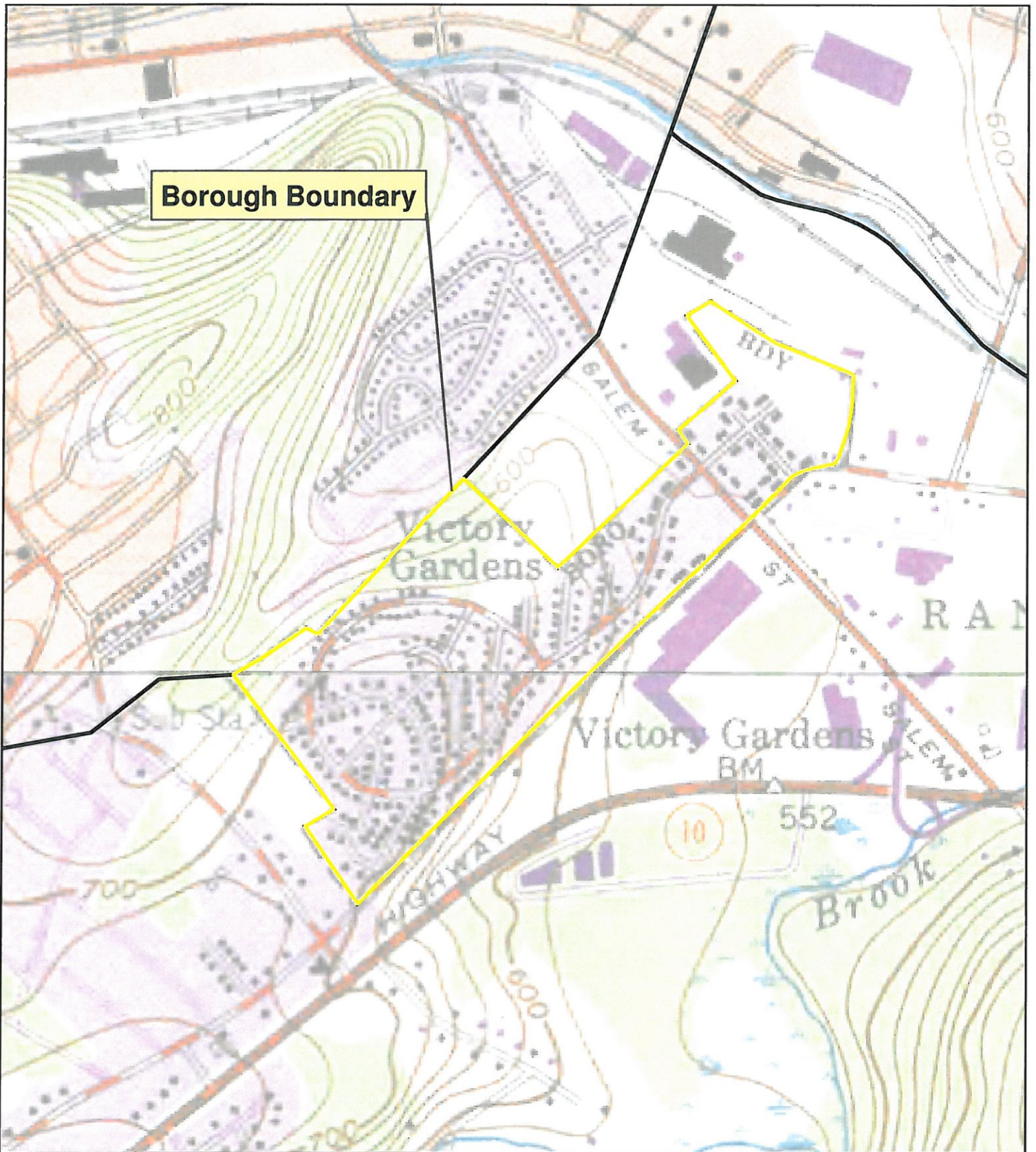
**Borough of Victory Gardens
 Morris County, New Jersey**



Symbol Legend

	Municipal Boundary
C1 Waters	
	FW2-NT
	FW2-TM
	FW2-TMC1
	FW2-TP
	FW2-TPC1

This map was developed using Geographic Information System digital data developed under the auspices of the Department of Environmental Protection, Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.



Data Type	Source	Relevant Time Period
USGS Quadrangles		Feb-Apr 2002
Municipal Boundary	NJDEP	1989

Figure C-3

Borough Boundary on USGS Quadrangles

Borough of Victory Gardens Morris County, New Jersey

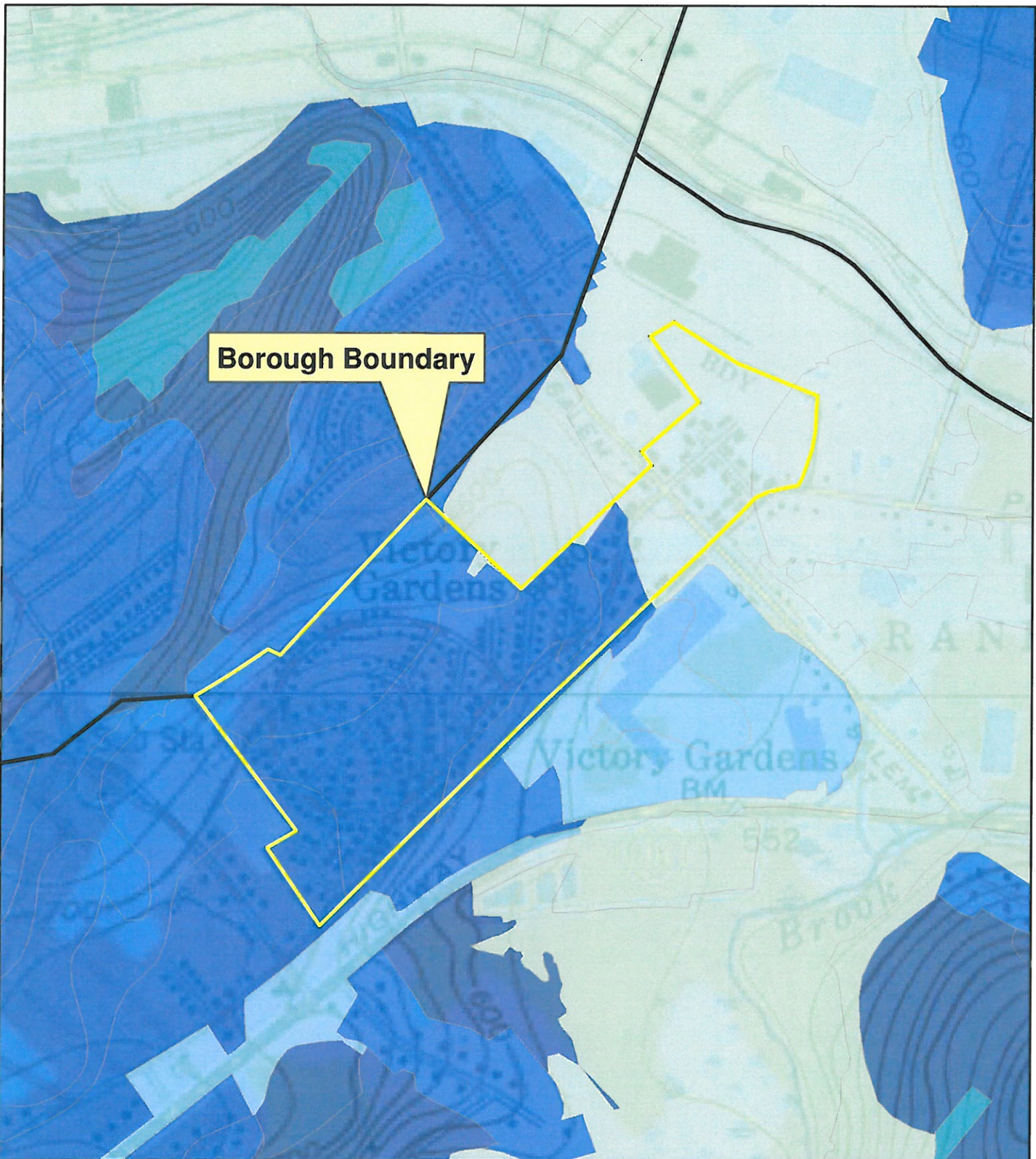
Symbol Legend

 Municipal Boundary

0 1,000 2,000 Feet

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Borough Boundary

Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
Groundwater Recharge Areas	NJDEP	Various

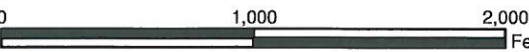


Figure C-4

Groundwater Recharge Areas in the Borough

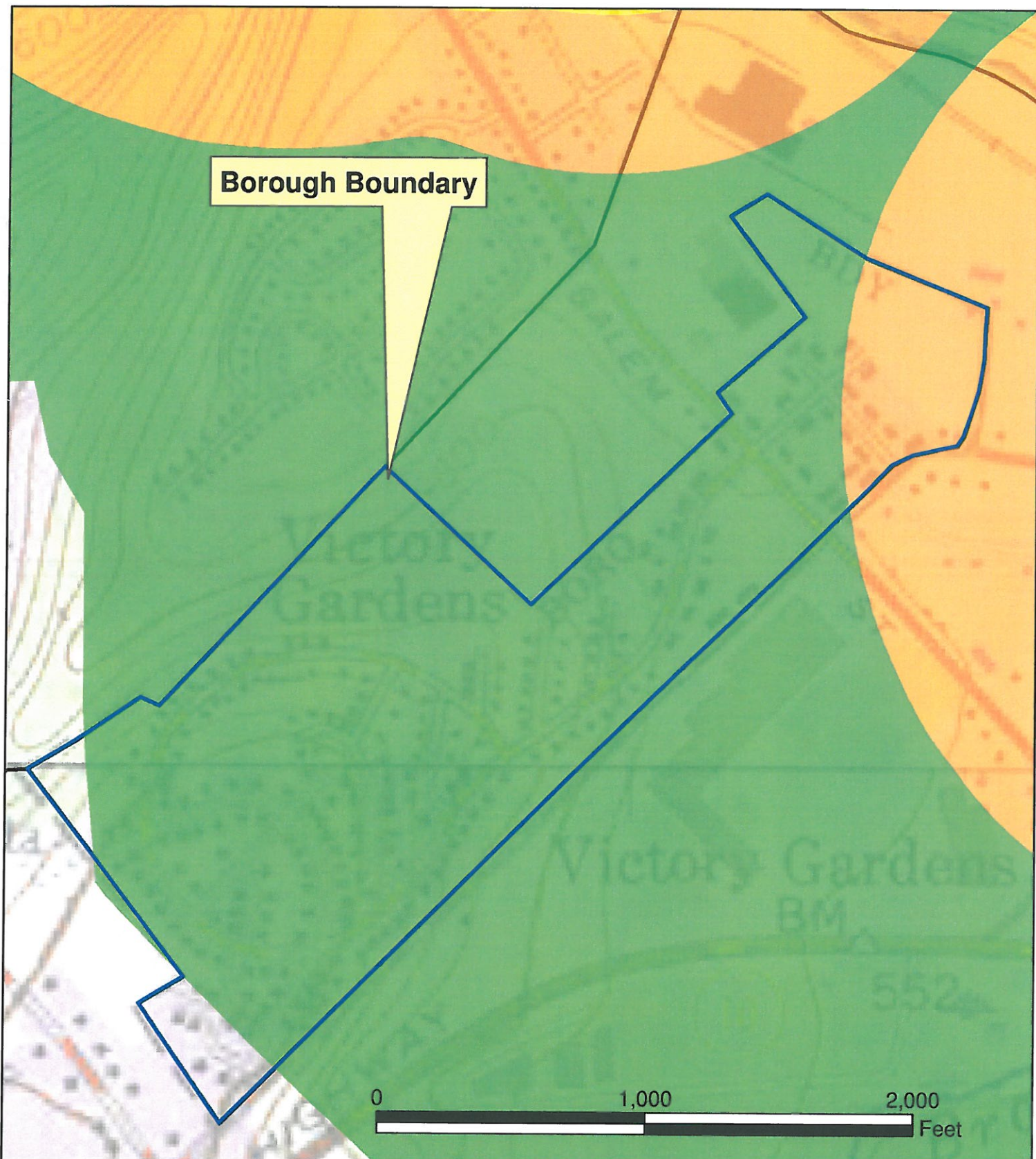
**Borough of Victory Gardens
Morris County, New Jersey**

Symbol Legend

	Municipal Boundary
Ground Water Recharge Areas	
	0.00 in/yr
	0.01 - 9.00 in/yr
	9.01 - 12.00 in/yr
	12.01 - 16.00 in/yr
	16.01 - 22.74 in/yr



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Data Type	Source	Relevant Time Period
USGS Quadrangles	USGS	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
Wellhead Protection Areas	NJDEP	2004 (Updated)

Figure C-5
Wellhead Protection Areas
in the Borough

Borough of Victory Gardens
Morris County, New Jersey

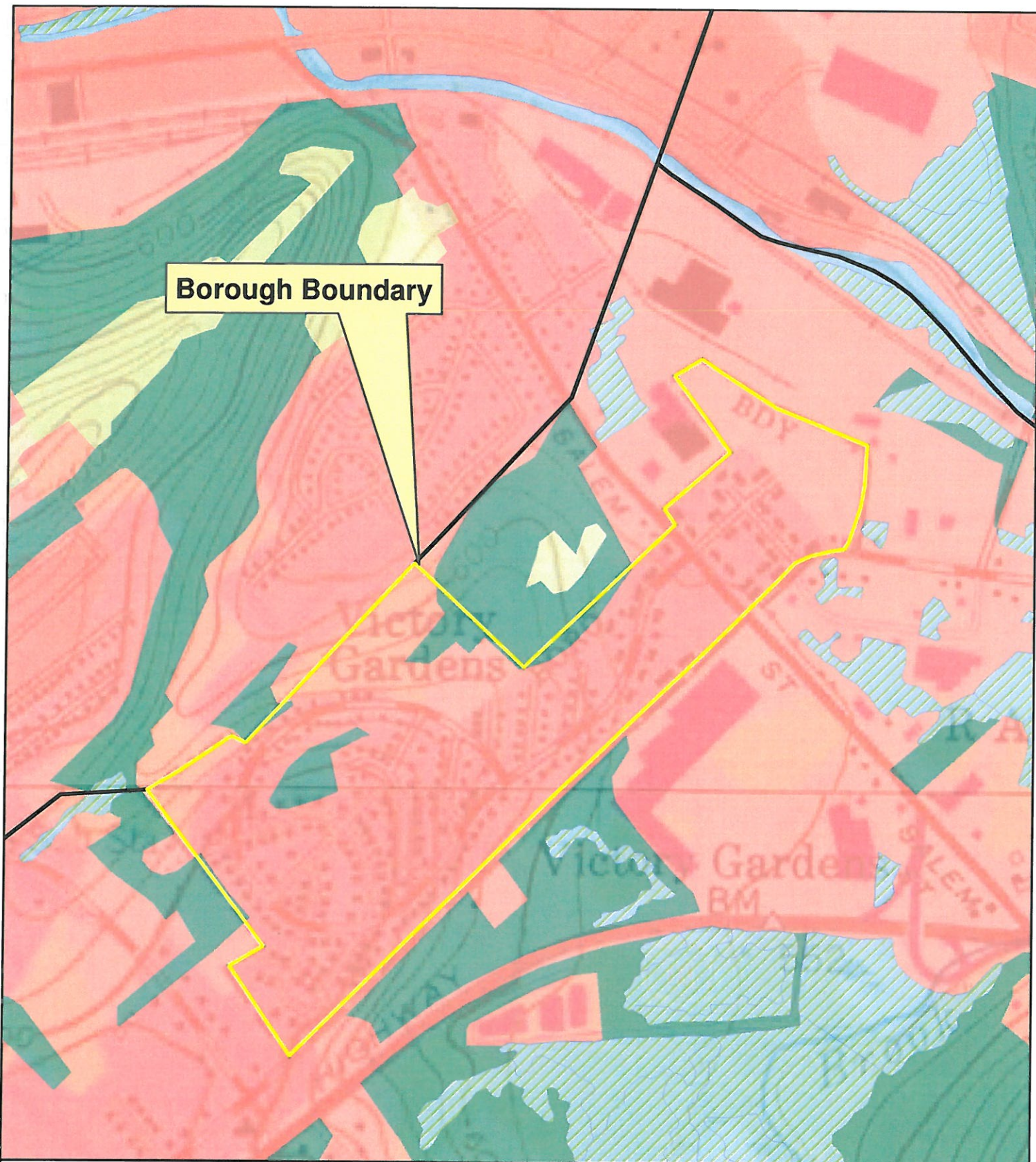
Symbol Legend

-  Municipal Boundary
- Wellhead Protection Areas**
-  2 Year
-  5 Year
-  12 Year



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Borough Boundary

Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
Land Use/ Land Cover	NJDEP	1995/1997

Figure C-6

Borough's Existing Land Use

**Borough of Victory Gardens
Morris County, New Jersey**

Symbol Legend

Municipal Boundary

Land Use

AGRICULTURE

BARREN LAND

FOREST

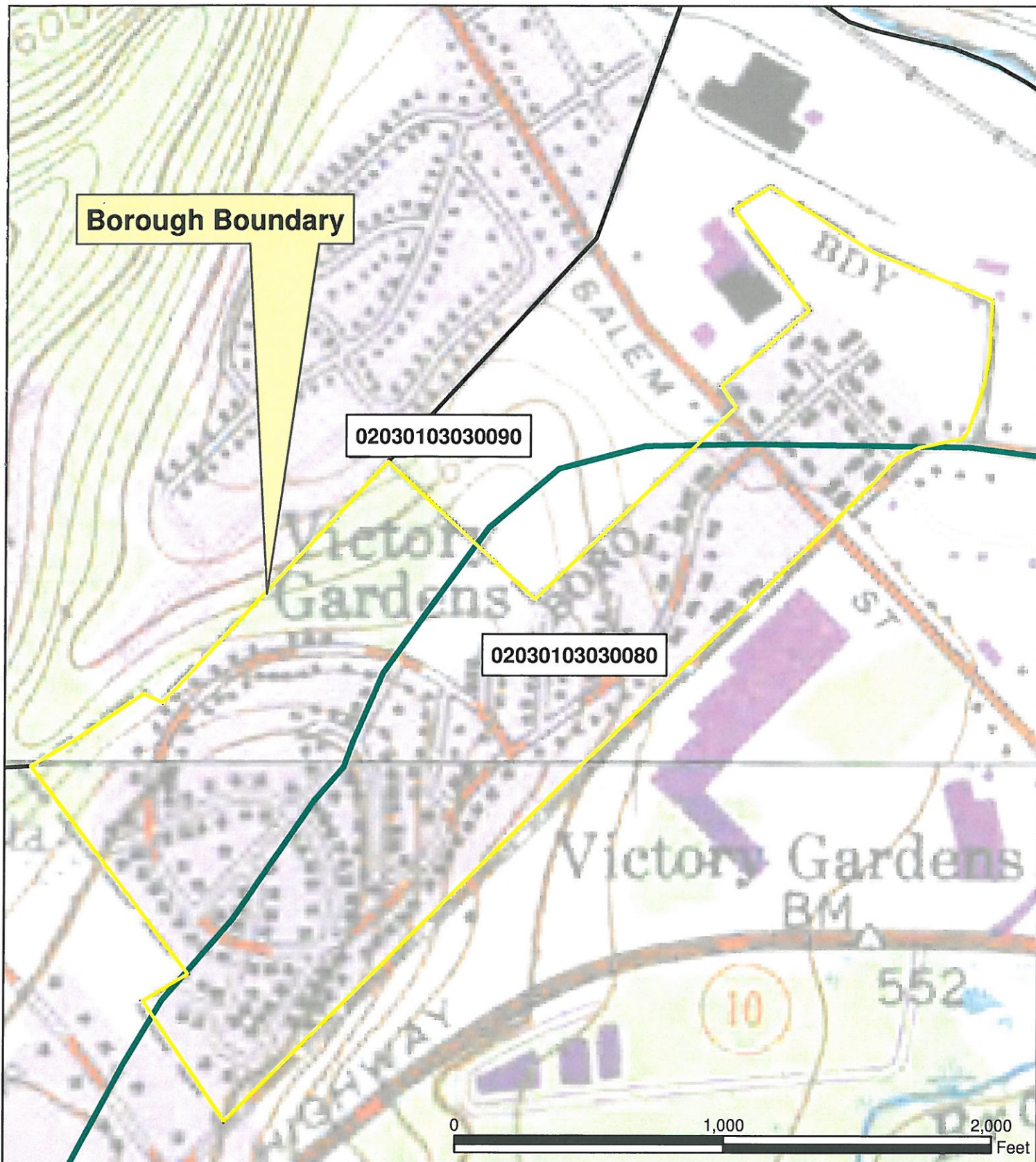
URBAN

WATER

WETLANDS





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Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
HUC14	NJDEP	2000

Figure C-7
Hydrologic Units (HUC14)
Within the Borough
Borough of Victory Gardens
Morris County, New Jersey

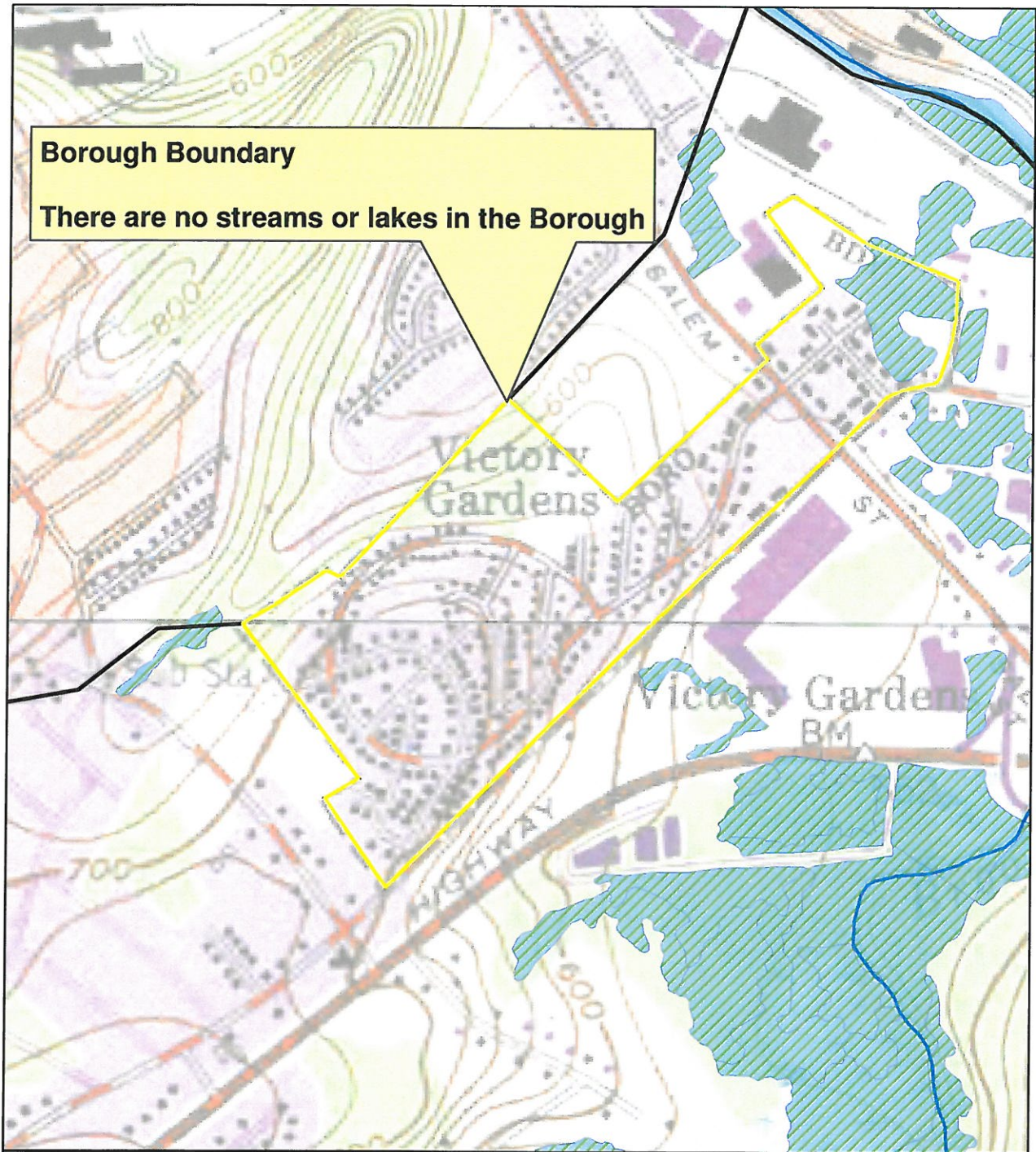
Symbol Legend

-  NJDEP Huc 14
-  Municipal Boundary



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Borough Boundary
There are no streams or lakes in the Borough

Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
Wetlands	NJDEP	1986
Lakes	NJDEP	1986
Streams	NJDEP	1998

Figure C-9

**Wetlands and Water Land Uses
 within the Borough**

**Borough of Victory Gardens
 Morris County, New Jersey**

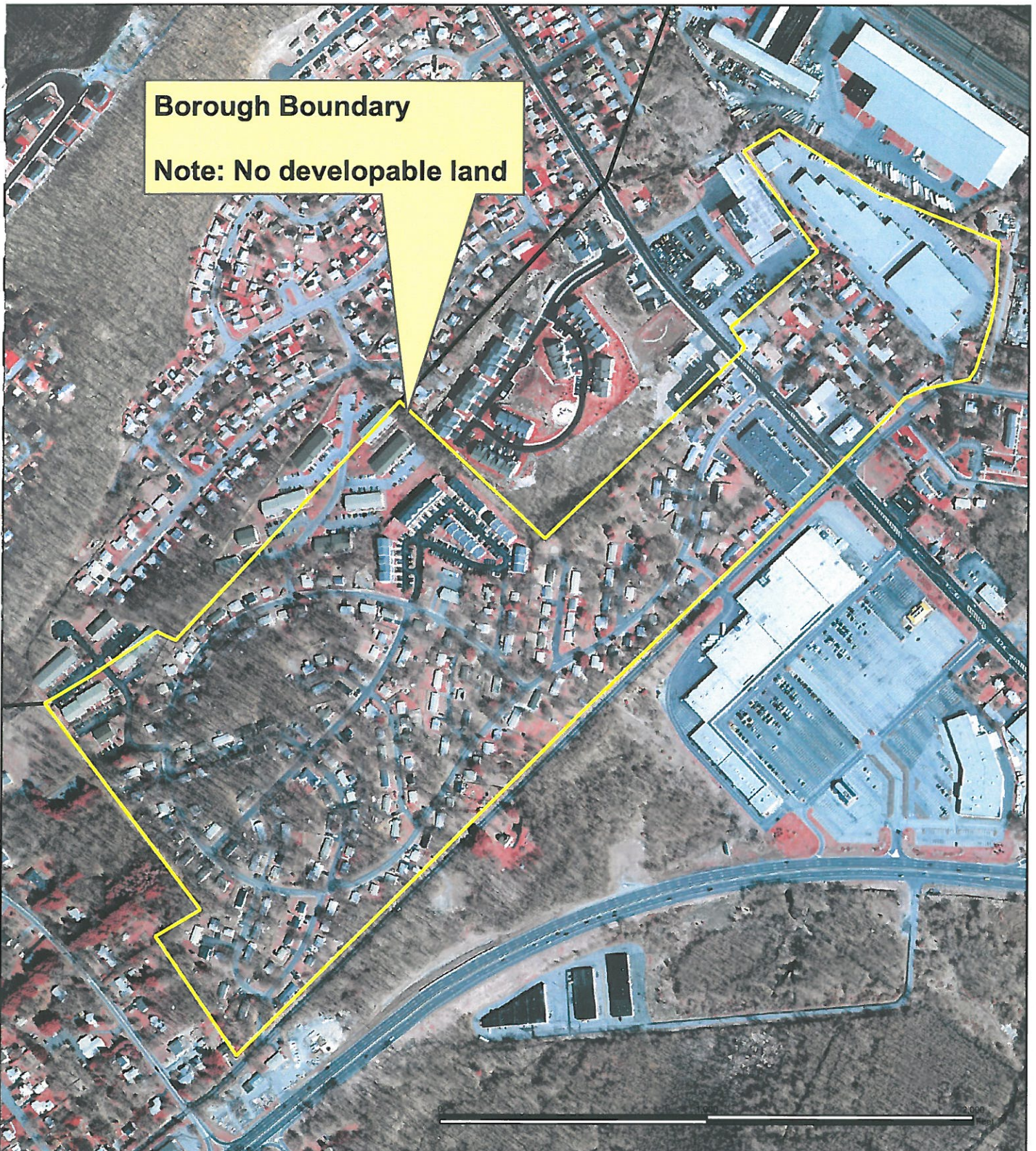
Symbol Legend

- Streams
- Lakes
- Wetlands
- Municipal Boundary



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Borough Boundary
Note: No developable land

Data Type	Source	Relevant Time Period
USGS Quad	UGSG	Feb-Apr 2002
Municipal Boundary	NJDEP	1989
Zoning Districts	Morris County GIS	



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Figure C-10
Aerial Photograph
of the Borough
Borough of Victory Gardens
Morris County, New Jersey

