Stormwater Management

Plan

CITY OF SUMMIT

UNION COUNTY, NEW JERSEY

April 2005

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Introduction

This Stormwater Management Plan (MSWMP) document serves as the strategy for the City of Summit ("the City") to address stormwater-related impacts in the City. 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, or increase impervious surface by one-quarter acre or more. 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 base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The plan also addresses the review and update of existing ordinances, the City Master Plan, and other planning documents to allow for project designs that include low impact development techniques. 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, specific stormwater management measures are identified to lessen the impact of existing development.

The combined total of the City's vacant and agricultural land is less than one square mile resulting in exemption from the "Land Use/Build-Out Analysis". The largest, privately-owned, vacant parcel of land is five (5) acres. A list of all vacant parcels in the City can be found in Exhibit 7.

Subsequent to the publication of the Rules, the City received a R9 - Tier A Municipal Stormwater General Permit from the New Jersey Department of Environmental Protection ("the NJDEP") for Authorization to Discharge in April 2004. The Permit is PI ID #: 214933, NJPDES #: NJG0153613 and expiries on February 29, 2009.

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.

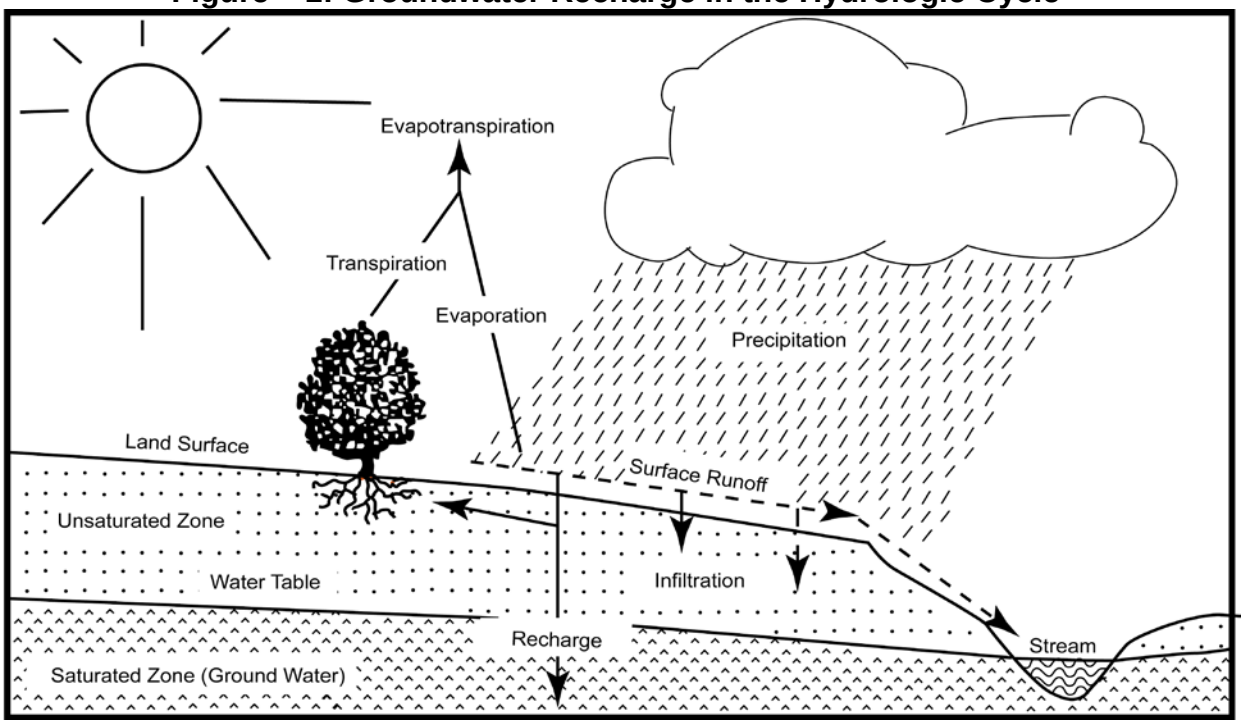
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan 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.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure 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 the 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 – 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, pesticides, 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 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.

Background

The City encompasses 6 square miles in Union County, New Jersey. In recent years the City has been under significant redevelopment pressure. The City is an established, older community with a stable population. The population of the City was recorded as 21,131 in the 2000 census. This is a slight increase from the population of 19,757 as recorded in the 1990 census; however it nearly equals the population of 21,081 as recorded in the 1980 census. The total households recorded for the City was 7,897 in the 2000 census. The total number of households has increased by only 156 units, or 2% since the 1980 census recorded 7,741 units. The City consists of approximately 66 miles of City roads and 15 miles of County roads. The City has approximately 80 miles of sanitary sewers and 30 miles of storm sewers.

The City currently has over 140 acres in recreation and open space as reported in the November 2000 Master Plan. The open space and recreation areas consist of seven (7) City parks, One (1) City nine hole golf course. The City also contains four (4) County parks and three (3) private recreation facilities including Canoe Brook Golf Course, Beacon Hill Club and Summit Tennis Club.

The City is fully developed and does not contain any undeveloped tracts or lots comprising 1 square mile or more. The largest, privately-owned, vacant parcel of land is five (5) acres. The nature of the new development in the City consists of expansion of existing residential structures, removal and replacement of existing residential structures, addition of pools and patios, and renovation or expansion of existing commercial buildings.

The City of Summit is located in the northwestern portion of Union County. The City is bound by the Passaic River and the Township of Chatham along the northern border; by New Jersey Route 24 and the Township of Millburn along the eastern border; by the Borough of New Providence, Township of Berkley Heights and Township of Chatham along the western border; and by New Jersey Route 78, Briant Brook and the Township of Springfield to the south. Figure 2 depicts the City's boundary on the USGS Roselle Quadrangle Map.

The majority of the City lies within the Metropolitan Planning Area (PA-1). This planning area designated to areas that are considered Urban

Redevelopment Area and are not subject to groundwater recharge requirements. Additionally, a small area in the northwest portion of the City along the Passaic River has some areas that are considered PA-5 (Environmentally Sensitive). Lastly, a small area in the southeast portion of the City is designated PA-6 (Park 1st Plan).

The Northern portion of the City is located in the Passaic River Watershed which contains the Passaic River, Martins Brook, Salt Brook and various other unnamed tributaries. The southeastern portion of the City is located in the Rahway River Watershed and contains Briant Brook, Briant Pond and various unnamed tributaries. The southwestern portion of the City is located in the Raritan River Watershed and contains Green Brook and various unnamed tributaries. Exhibit 1 illustrates the location of the various waterways in the City.

Detailed maps of the all watersheds in the City are found in Exhibit 5.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the biological 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. There is one (1) AMNET monitoring site in the City of Summit. The Passaic River is sampled for benthic macroinvertebrates. The site location is as follows:

- Passaic River at Stanley Avenue in Summit

The site was given a moderately impaired rating in the June 2000 AMNET Report. The site is located in Watershed Management Area - 6 and is site ID# AN0229. In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the State. The water quality of the Passaic River is often below the State's criteria particularly for the parameter of Fecal Coliform. As a result, a Total Maximum Daily Loads (TMDLs) for pollutants for the Passaic River will be needed.

A TMDL is the amount of a pollutant that can be accepted by a water body without causing an exceedance of water quality standards or interfering with the ability to use a water body for one or more of its designated uses.

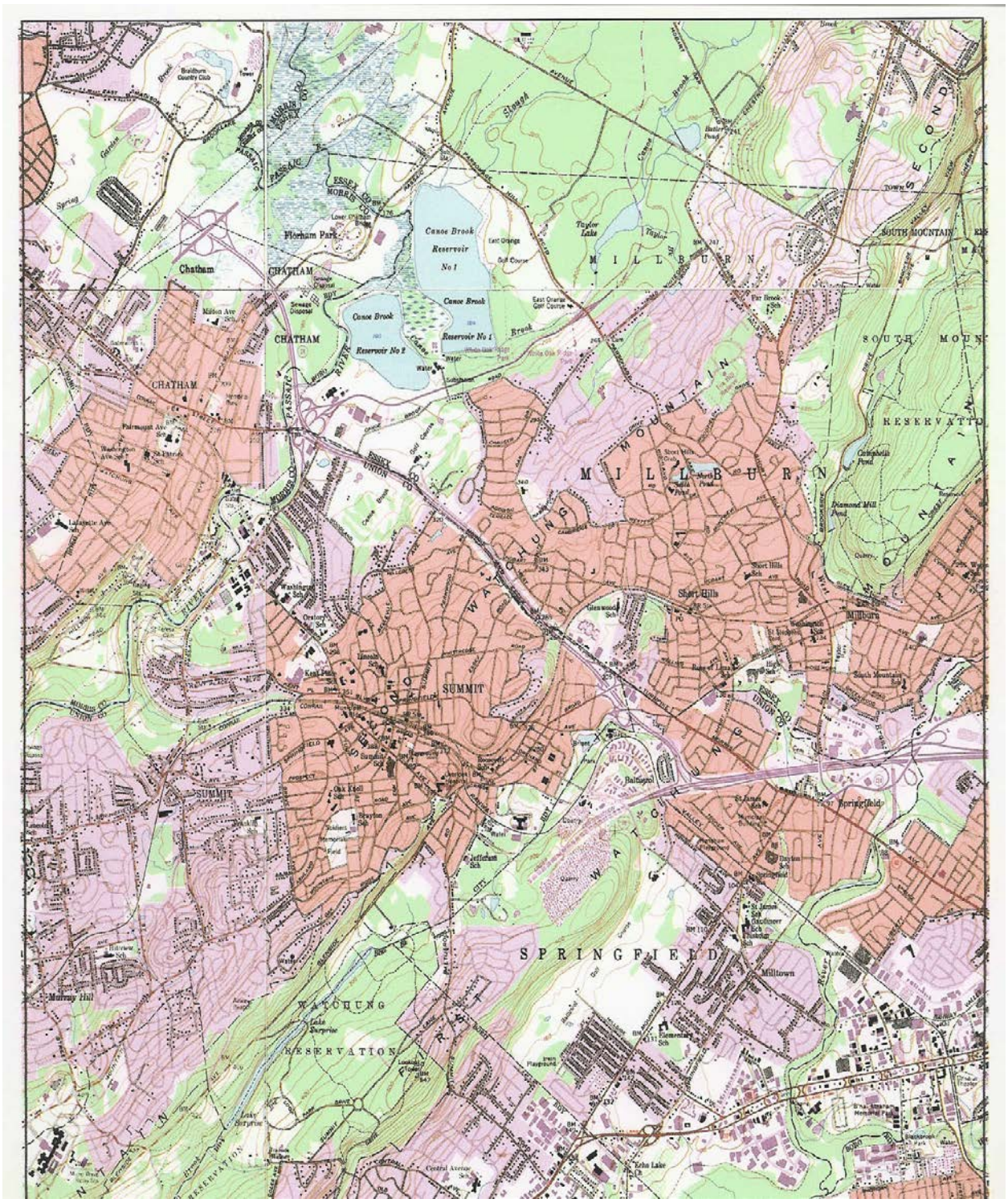


FIGURE – 2 (USGS Roselle Quadrangle)

The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJDEP 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 by the NJDEP 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 Best Management Practices (BMPs).

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (the 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 also 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. The only water body in the City that appears on Sublist 5 is the Passaic River at Stanley Avenue.

The City of Summit is not within a Special Water Resource Protection Area (SWRPA) as it does not contain any Category One (C1) waters or tributaries to Category One waters. Category One waters are waters that receive special protection because of their clarity, color, scenic setting, or other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource. Stormwater Management Rules do not require a buffer for waters other than Category One waters; however the City waters are still subject to Flood Hazard Area Control Act Rules, which require a 25’ buffer on all streams. All developments near a water course are subject to review and approval by the NJDEP for compliance with stream encroachment and wetland regulations.

The City does not contain any HUC 14 drainage areas and has less than one square mile of vacant land available for development; therefore a build-out analysis is not required as part of this MSWMP. Figure 3 shows the location of HUC 14s in New Jersey.

In addition to water quality problems, the City has exhibited severe water quantity problems including flooding, stream bank erosion, and diminished base flow in its streams. Some of the culverts associated with road crossings in the City are undersized. During severe storm events, these undersized culverts do not have adequate capacity, thereby causing a

backwater effect and flooding upstream. During Tropical Storm Floyd in September 1999, the rainfall amounts exceeded the 100-year design storm flows by a significant amount causing major flood damage in certain areas of the City. Mapping of flood zones within the City have been delineated by the Federal Emergency Management Association (FEMA).

Since it is not economically feasible to provide 100-year flood level protection, the City's goals are to be able to limit stream bank erosion and provide flood protection against the more frequent, low-magnitude storm events where possible. Smaller storm events often trigger flooding due to stream flow obstructions, insufficient capacity of some culverts, and inadequate storm pipe capacity.

Both the City and Union County are working together to improve the condition and capacity of various bridges and culverts in the City. Replacement of bridges and culverts will reduce flooding and limit stream bank erosion. The following culverts and bridges are scheduled for replacement starting in January of 2006:

- Prospect Street Culvert
- Ashland Road Culvert
- Blackburn Road Culvert
- Division Avenue Bridge
- Mount Vernon Avenue Bridge

The City is essentially fully developed. Exhibit 2 is the current Zoning Map for the City. Exhibit 3 is the current Land Use Map for the City. Currently the City building trend is toward increasing lot coverage for residential homes including additions, pools, patios and driveways. In an effort to limit soil erosion and stormwater runoff from properties, the City passed a grading and drainage ordinance in May of 2003. This ordinance requires that any increase in stormwater runoff resulting from new impervious cover shall be retained on site. The ordinance requires the use of recharge basins and/or drywells to contain the increase in runoff caused by the various developments. A copy of the Ordinance is provided in Exhibit 4.

The majority of the City is serviced by sanitary sewers and is supplied drinking water by NJ American Water Company. A small portion of the City is serviced by septic systems and individual potable drinking wells. The City's wellhead protection areas can be found in Exhibit 6. Wellhead protection areas are required as part of the MSWMP. Currently the City is composing a wellhead protection ordinance to meet this requirement. The ordinance should be adopted by March of 2006.

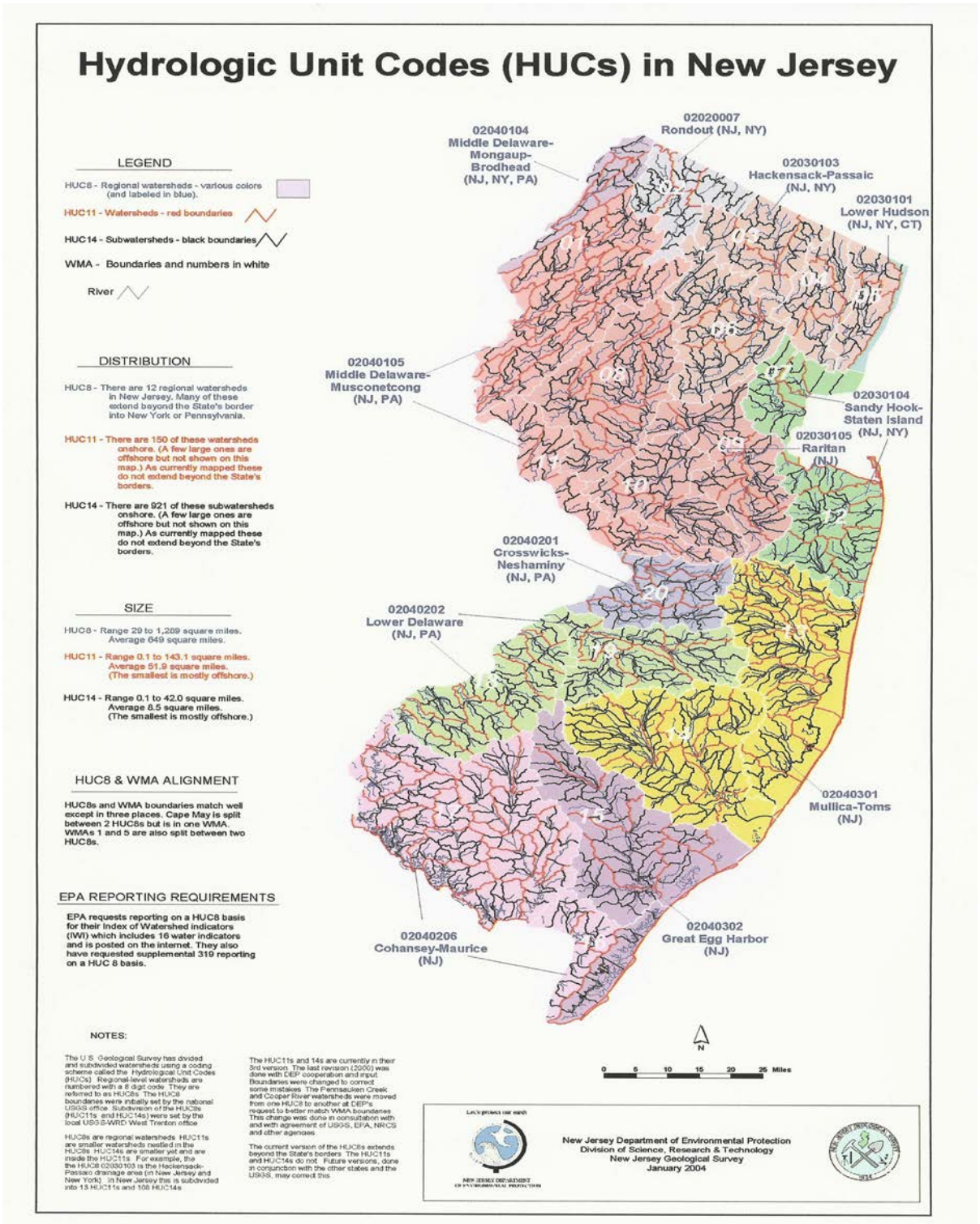

Hydrologic Unit Codes (HUCs) in New Jersey
LEGEND
HUC8 - Regional watersheds - various colors (and labeled in blue).
HUC11 - Watersheds - red boundaries
HUC14 - Subwatersheds - black boundaries
WMA - Boundaries and numbers in white
River
DISTRIBUTION
HUC8 - There are 12 regional watersheds in New Jersey. Many of these extend beyond the State's border into New York or Pennsylvania.
HUC11 - There are 150 of these watersheds onshore. (A few large ones are offshore but not shown on this map.) As currently mapped these do not extend beyond the State's borders.
HUC14 - There are 921 of these subwatersheds onshore. (A few large ones are offshore but not shown on this map.) As currently mapped these do not extend beyond the State's borders.
SIZE
HUC8 - Range 29 to 1,289 square miles. Average 649 square miles.
HUC11 - Range 0.1 to 143.1 square miles. Average 51.9 square miles. (The smallest is mostly offshore.)
HUC14 - Range 0.1 to 42.0 square miles. Average 8.5 square miles. (The smallest is mostly offshore.)
HUC8 & WMA ALIGNMENT
HUC8s and WMA boundaries match well except in three places. Cape May is split between 2 HUC8s but is in one WMA. WMAs 1 and 5 are also split between two HUC8s.
EPA REPORTING REQUIREMENTS
EPA requests reporting on a HUC8 basis for their Index of Watershed Indicators (IWI) which includes 16 water indicators and is posted on the internet. They also have requested supplemental 319 reporting on a HUC 8 basis.
NOTES:
The U.S. Geological Survey has divided and subdivided watersheds using a coding scheme called the Hydrological Unit Codes (HUCs). Regional-level watersheds are numbered with a 8 digit code. They are referred to as HUC8s. The HUC8 boundaries were initially set by the national USGS office. Subdivision of the HUC8s (HUC11s and HUC14s) were set by the local USGS-WRD West Trenton office.
HUC8s are regional watersheds. HUC11s are smaller watersheds nestled in the HUC8s. HUC14s are smaller yet and are inside the HUC11s. For example, the the HUC8 02030103 is the Hackensack-Passaic drainage area (in New Jersey and New York). In New Jersey this is subdivided into 13 HUC11s and 108 HUC14s.
The HUC11s and 14s are currently in their 3rd version. The last revision (2000) was done with DEP cooperation and input. Boundaries were changed to correct some mistakes. The Pennsauken Creek and Cooper River watersheds were moved from one HUC8 to another at DEP's request to better match WMA boundaries. This change was done in consultation with and with agreement of USGS, EPA, NRCS and other agencies.
The current version of the HUC8s extends beyond the State's borders. The HUC11s and HUC14s do not. Future versions, done in conjunction with the other states and the USGS, may correct this.
02040104 Middle Delaware-Mongaup-Brodhead (NJ, NY, PA)
02020007 Rondout (NJ, NY)
02030103 Hackensack-Passaic (NJ, NY)
02030101 Lower Hudson (NJ, NY, CT)
02040105 Middle Delaware-Musconetcong (NJ, PA)
02030104 Sandy Hook-Staten Island (NJ, NY)
02030105 Raritan (NJ)
02040201 Crosswicks-Neshaminy (NJ, PA)
02040202 Lower Delaware (NJ, PA)
02040301 Mullica-Toms (NJ)
02040206 Cohansey-Maurice (NJ)
02040302 Great Egg Harbor (NJ)
N
0 5 10 15 20 25 Miles
New Jersey Department of Environmental Protection
Division of Science, Research & Technology
New Jersey Geological Survey
January 2004

FIGURE – 3

Design and Performance Standards

The City will adopt, as part of its Stormwater Management Ordinance, 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 the loss of groundwater recharge in receiving bodies of water. 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.7:8-6, Safety Standards for Stormwater Management Basins. The Stormwater Management Ordinance will be submitted to Union County for review and approval on or before April 1, 2006.

The Stormwater Management Ordinance will contain provisions and measures that accomplish the following goals:

- Reduce flood damage, including damage to life and property;
- Control and 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

During construction, City inspectors will periodically observe the construction of all Major Developments to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The City is not within a Regional Stormwater Management Planning Area (RSWMP). When a RSWMP is adopted for Union County, the City Stormwater Management Plan will be updated for consistency.

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

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

Nonstructural Stormwater Management Strategies

The City is currently reviewing the Master Plan and Revised General Ordinances. After review a list of the City's land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies will be provided. Once the ordinance texts are completed, they will be submitted to the appropriate review agency within Union County for review and approval by March of 2006. A copy will be sent to the Department of Environmental Protection at the time of submission.

It is noted that some nonstructural stormwater management strategies are presently in place in the Development Regulation Ordinance and the Revised General Ordinances of the City. For example, Environmental Impact Statements are required for all major subdivisions and site plans. There are also ordinances regarding the preservation City trees, soil erosion and grading.

The preservation of mature trees and forested areas is a goal of the City. The City is currently preparing a tree preservation ordinance to protect trees from development on private property.

Additional revisions to the Master Plan may include, but not be limited to the following:

Buffers Section: Require buffer areas along all lot and street lines separating residential uses from arterial and collector streets, separating a nonresidential use from either a residential use or residential zoning district line, and along all street lines where loading and storage areas can be seen from the street. The landscape requirements for these buffer areas in the existing section may not recommend the use of native vegetation. The language of this section can be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Additionally, language may be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces. Also the municipality should determine if this section currently requires the preservation of natural wood tracts and limits land disturbance for new construction.

Cluster Development Section: Provide for a cluster development option to preserve land for public and agricultural purposes, to prevent development on environmentally sensitive areas, and to aid in reducing the cost of providing streets, utilities and services in residential developments. Cluster option is an excellent tool for reducing impervious roads and driveways. The option may allow for smaller lots with smaller front and side yard setbacks than traditional development options. It may also minimize the disturbance of large tracts of land, which is a key nonstructural stormwater management strategy. The cluster option may be amended to require that a percentage of the total tract be preserved as common open space for residential area. For example, an existing cluster option may require that 25 percent of the green or common area be landscaped with trees and/or shrubs. The language can be amended to promote the use of native vegetation, which requires less fertilization and watering than non-native ornamental plants. The cluster option may require public concrete sidewalks to be installed along all streets, however the ordinance may be amended to require paths in open space to be mulched or stone to decrease the impervious area.

Curbs and Gutters Section: Existing ordinances require that concrete curb and gutter, concrete curb, or Belgian block curb be installed along every street within and fronting on a development. This section can be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas.

Drainage, Watercourses and Flood Hazard Areas Section: Existing ordinances require that all streets be provided with inlets and pipes where the same are necessary for proper drainage. This section can be amended to encourage the used of natural vegetated swales in lieu of inlets and pipes.

Driveways and Access ways Section: The existing ordinances describe the procedure for construction of any new driveway or access way to any street. This section can be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

Natural Features Section: The City may propose ordinances that require natural features, such as trees, brooks, swamps, hilltops, and views, be preserved whenever possible, and that care be taken to preserve selected trees to enhance soil stability and landscaped treatment of the area.

Nonconforming Uses, Structures or Lots Section: The City could be revised to require property owners to mitigate the impact of the additional impervious surfaces on their property, unless the stormwater management plan for the development provides for these increases in impervious surfaces. This mitigation effort must address water quality, flooding and groundwater recharge.

Off-site and Off-tract Improvements Section: This ordinance may describe essential off-site and off-tract improvements. Language can be added to this section to require that any off-site and off-tract stormwater management and drainage improvements must conform to the "Design and Performance Standards" described in this plan and provided in the City Code.

Off-street Parking and Loading Section: This section may detail off-street parking and loading requirements. For example, all parking lots with more than 10 spaces and all loading areas may be required to have concrete or granite block curbing around the perimeter of the parking and loading areas. This section may also require that concrete or granite block curbing be installed around all landscaped areas within the parking lot or loading areas. This section can be amended to allow for flush curb with curb stops, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language can be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers. This section can also provide guidance on minimum parking space requirements based on the number of dwelling units and/or gross floor area. The section may allow a developer to demonstrate that fewer spaces would be required, provided area is set aside for additional spaces if necessary. This section can also be amended to allow pervious paving in areas to provide overflow parking, vertical parking structures, smaller parking stalls, and shared parking.

Performance Standards Section: This section can provide for pollution source control and can prohibit materials or wastes from being deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation or wind. It can also require that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

Shade Tree Section: The ordinance may require a minimum of shade trees per lot to be planted in the front yard. In addition to this Section, the City may have a Tree Preservation Ordinance that restricts and otherwise controls the removal of mature trees throughout the City. This ordinance should recognize that the preservation of mature trees and forested areas is a key strategy in the management of environmental resources, particularly watershed management, air quality, and ambient heating and cooling. These sections can set out a "critical footprint area" that extends beyond the driveway and building footprint where clearing of trees cannot occur. This will comply with minimizing land disturbance, which is a nonstructural stormwater management strategy. These sections can be amended to require the identification of forested areas, and that a given percentage of forested areas are protected from disturbance.

Sidewalks Section: The existing ordinance section describes the sidewalk requirements for the City. Although sidewalks may not required along all streets, the City may require them in areas where the probable volume of pedestrian traffic, the development's location in relation to other populated areas and high vehicular traffic, pedestrian access to bus stops, schools, parks, and other public places, and the general type of improvement intended indicate the advisability of providing a pedestrian way. Sidewalks are typically a minimum of four feet wide and constructed of concrete. Language can added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate.

Soil Erosion and Sediment Control Section: This ordinance will require developers to comply with the New Jersey Soil Erosion and Sediment Control Standards and should outline some general design principles, including: whenever possible, retain and protect natural vegetation; minimize and retain water runoff to facilitate groundwater recharge; and, install diversions, sediment basins, and similar required structures prior to any on-site grading or disturbance.

Stormwater Runoff Section: This section should address stormwater runoff by referencing the City's Drainage Ordinance, which should be updated to include all requirements outlined in N.J.A.C. 7:8-5.

Streets Section: This section should describe the requirements for streets in the City. For example, the City may have several street classifications, ranging from "Arterial," which may have a minimum right-of-way of 80 feet, to "Secondary Local," which may have a minimum right-of-way. Street paving widths are a function of the number of units served, whether a street is curbed, whether on-street parking is permitted, whether the interior streets serve lots of 2-acres or larger, and whether on-site topographical constraints allow design flexibility. Depending on these factors, paving width for secondary local streets may range from 20 to 32 feet. This section can encourage developers to limit on-street parking to allow for narrower paved widths. This section can also require that cul-de-sacs have a minimum radius of 50 feet. Language can be added to this section to reduce the minimum radius of cul-de-sac designs. For example, cul-de-sacs with landscaped islands or flush curbs can have a specified minimum radius and be constructed with a reinforced shoulder to accommodate larger equipment and emergency vehicles.

Mitigation Plans

This mitigation plan is provided for any proposed development that may be granted a variance or exemption from the stormwater management design and performance standards. Any variance or exemption from the standards shall be subject to and conditioned upon the approval of an acceptable mitigation plan. Presented below is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development and for the same performance standard for which the variance or exemption was granted. That is, if the proposed development is in Watershed Management Area #6, the mitigation must be implemented in Watershed Management Area #6. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the City Stormwater Management Plan. The developer must ensure the on-term maintenance of the project, including the maintenance requirements under Chapter 8 and 9 of the NJDEP Stormwater BMP Manual.

   The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the City Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

Groundwater Recharge

- Retrofit any public school site within the City to provide groundwater recharge. The retrofit must not reduce open space or the recreational space on a school site. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit any public park or the City Golf Course to provide groundwater recharge. The retrofit must not reduce open space or the recreational space. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit the DPW site on Chatham Road to provide groundwater recharge. The retrofit must not reduce open space on the site. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit any public parking lot to provide groundwater recharge. The retrofit must not reduce open space on the site. The retrofit must not compromise the utility of the existing parking areas in any way.

Water Quality

- Retrofit any public school site within the City to provide removal of 80 percent of total suspended solids from parking lot runoff. The retrofit must not reduce open space or the recreational space on a school site. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit any public park or the City Golf Course to provide removal of 80 percent of total suspended solids from parking lot runoff. The retrofit must not reduce open space or the recreational space. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit the DPW site on Chatham Road to provide removal of 80 percent of total suspended solids from impervious areas. The retrofit must not reduce open space on the site. The retrofit must not compromise the utility of the existing impervious areas in any way.

- Retrofit any public parking lot to provide removal of 80 percent of total suspended solids from parking lot runoff. The retrofit must not reduce open space on the site. The retrofit must not compromise the utility of the existing parking areas in any way.

Water Quantity

- Retrofit any school site to reduce the peak flow by 80%, 75%, and 50% for the 2, 10, and 100-year storms respectively. The retrofit must not reduce the recreational use of the outdoor space at the site or compromise the utility of the existing parking areas in any way.

- Retrofit any public park site or the City Golf Course to reduce the peak flow by 80%, 75%, and 50% for the 2, 10, and 100-year storms respectively. The retrofit must not reduce the recreational use of the outdoor space or compromise the utility of the existing parking areas in any way.

- Retrofit the DPW site on Chatham Road to reduce the peak flow by 80%, 75%, and 50% for the 2, 10, and 100-year storms respectively. The retrofit must not reduce the utility of the site in any way.

- Retrofit any municipal site to reduce the peak flow by 80%, 75%, and 50% for the 2, 10, and 100-year storms respectively. The retrofit must not reduce the recreational use or open space at the site. The retrofit must not compromise the utility of the existing parking areas in any way.

- Retrofit any public parking lot to reduce the peak flow by 80%, 75%, and 50% for the 2, 10, and 100-year storms respectively. The retrofit must not reduce the open space at the site or compromise the utility of the existing parking areas in any way.

2. If a suitable site cannot be located in the same drainage area as the proposed development, the mitigating project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80% TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

Water Quality

- Re-establish a vegetative buffer along the banks of the Salt Brook to prevent erosion.
- Re-establish a vegetative buffer along the banks of West End Avenue Brook to prevent erosion.

The City may allow a developer to provide funding or partial funding to the City for an environmental enhancement project that has been identified in this Stormwater Management Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

Land Use/Build-Out Analysis

A detailed land use analysis for the City was conducted. The City's zoning and land use maps are shown in Exhibit 2 and Exhibit 3 respectively. Depending upon the State's interpretation of what constitutes "developable land," the City may be required to perform a build-out analysis. If required, the build-out analysis will be completed by April 2006.

EXHIBITS

EXHIBIT 1
Waterway Location Map

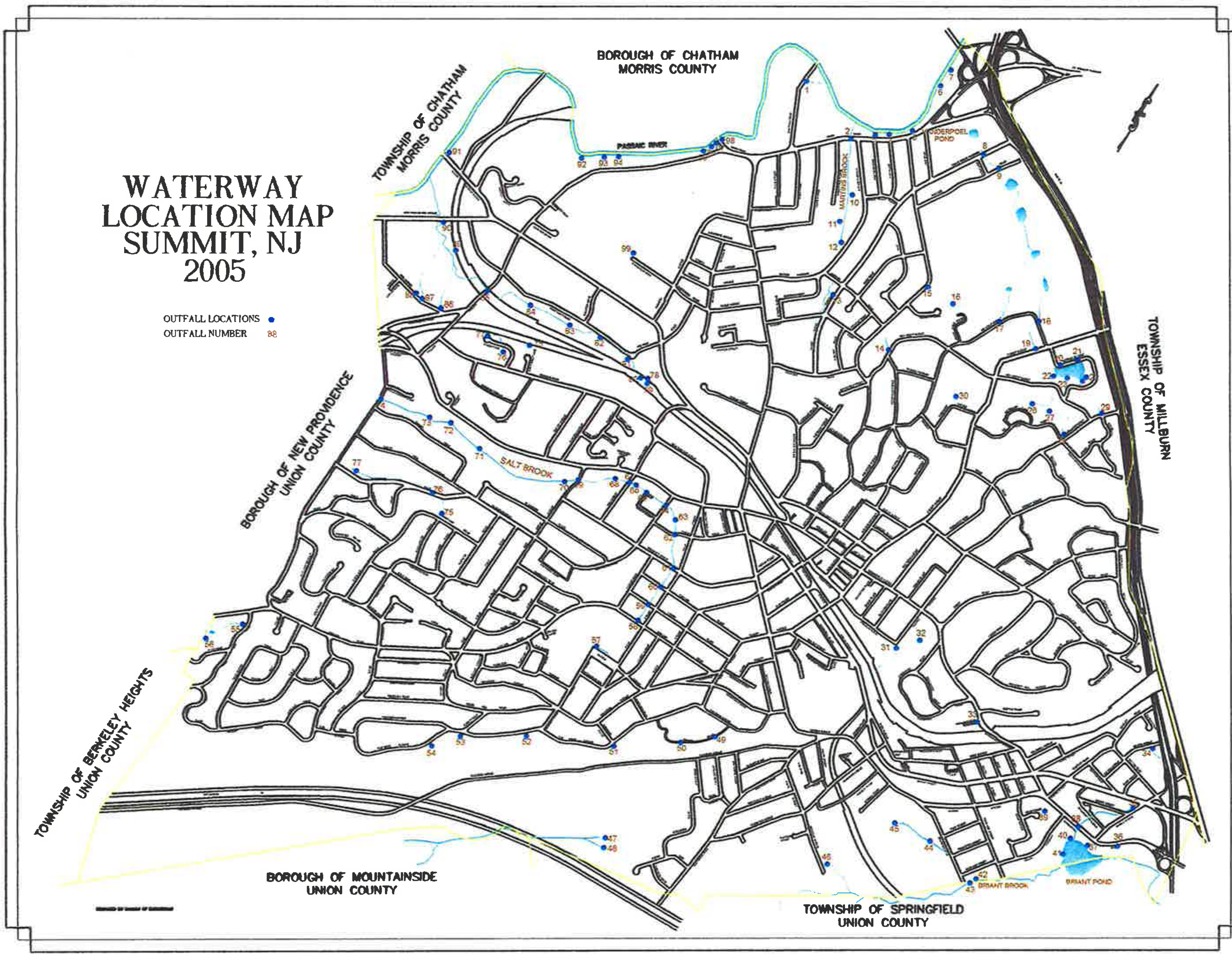

WATERWAY
LOCATION MAP
SUMMIT, NJ
2005
OUTFALL LOCATIONS
OUTFALL NUMBER
BOROUGH OF CHATHAM
MORRIS COUNTY
TOWNSHIP OF CHATHAM
MORRIS COUNTY
BOROUGH OF NEW PROVIDENCE
UNION COUNTY
TOWNSHIP OF BERKELEY HEIGHTS
UNION COUNTY
BOROUGH OF MOUNTAINSIDE
UNION COUNTY
TOWNSHIP OF SPRINGFIELD
UNION COUNTY
TOWNSHIP OF MILLBURN
ESSEX COUNTY
PASSAIC RIVER
SALT BROOK
BRIANT BROOK
BRIANT POND

EXHIBIT 2
Zoning Map of the City

ZONING MAP

CITY OF SUMMIT

UNION COUNTY, NEW JERSEY

October 20, 1998

0 1000 2000

R-43	SINGLE FAMILY RESIDENTIAL
R-25	SINGLE FAMILY RESIDENTIAL
R-15	SINGLE FAMILY RESIDENTIAL
R-10	SINGLE FAMILY RESIDENTIAL
R-6	SINGLE FAMILY RESIDENTIAL
R-5	SINGLE & TWO FAMILY RESIDENTIAL
RAH-1	AFFORDABLE HOUSING
MF	MULTI-FAMILY RESIDENTIAL
MFT	MULTI-FAMILY TOWER RESIDENTIAL
MFT-1	MULTI-FAMILY TOWER RESIDENTIAL-1
TH-1	TOWN HOUSE - 1
TH-2	TOWN HOUSE - 2
NB	NEIGHBORHOOD BUSINESS
B	BUSINESS
B-1	BUSINESS - 1
CRBD	CENTRAL RETAIL BUSINESS DISTRICT
ORC	OFFICE RESIDENTIAL CHARACTER
ORC-1	OFFICE RESIDENTIAL CHARACTER-1
RO60	RESEARCH-OFFICE
PROD	PLANNED RESEARCH OFFICE DEVELOPMENT
PROD-2	PLANNED RESEARCH OFFICE DEVELOPMENT
LI	LIGHT INDUSTRY
PI	PROFESSIONAL-INSTITUTIONAL
PL	PUBLIC LAND
G	GOLF

AMENDED:
9/5/01- ORD #01-2486
10/16/01- ORD #01-2501
12/18/01- ORD #01-2511
10/1/02- ORD #02-2544
9/3/03- ORD #03-2570
12/2/03- ORD #03-2580
2/24/04- ORD #04-2587
10/19/04- ORD #04-2602

CITY OF SUMMIT DIVISION OF ENGINEERING

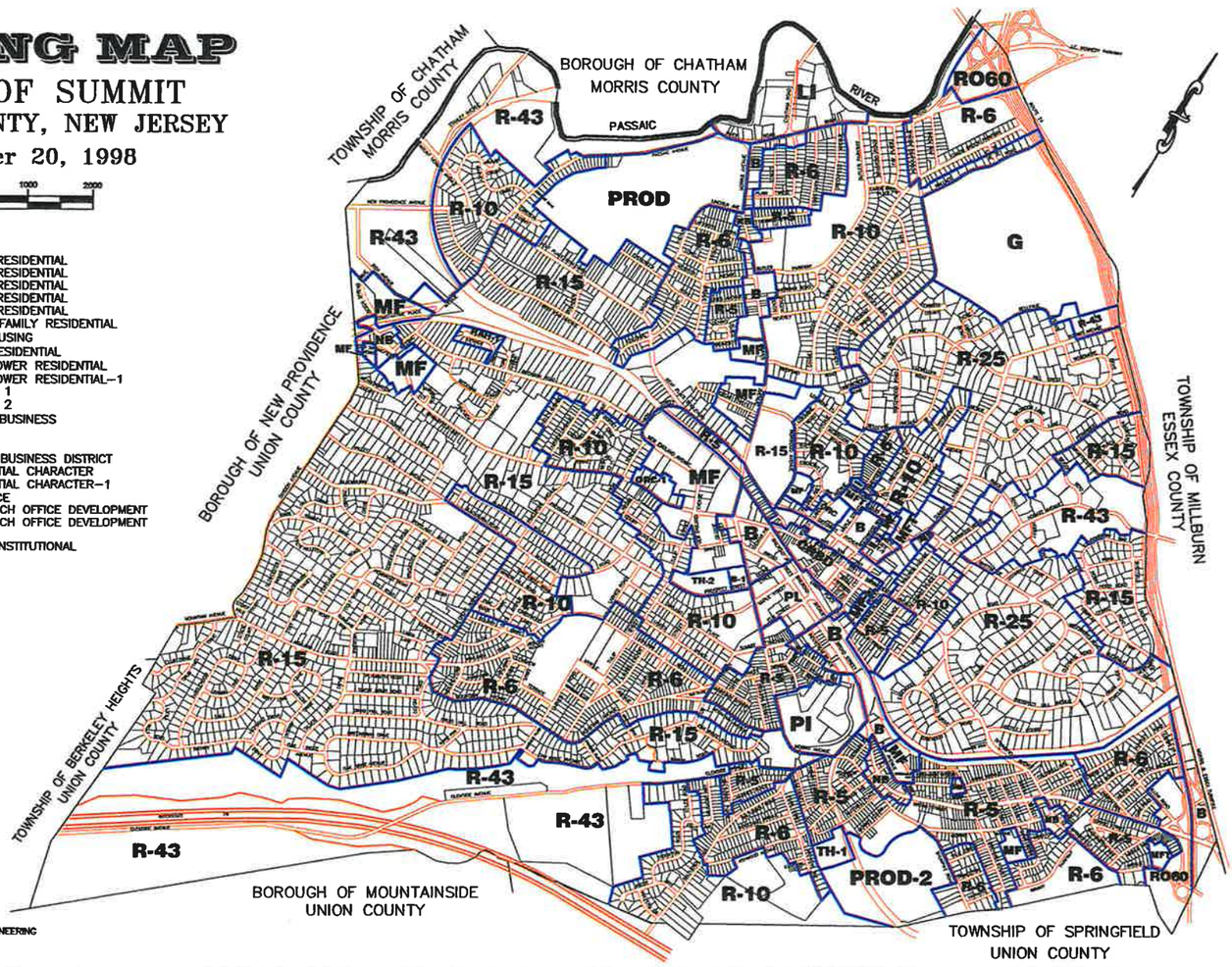


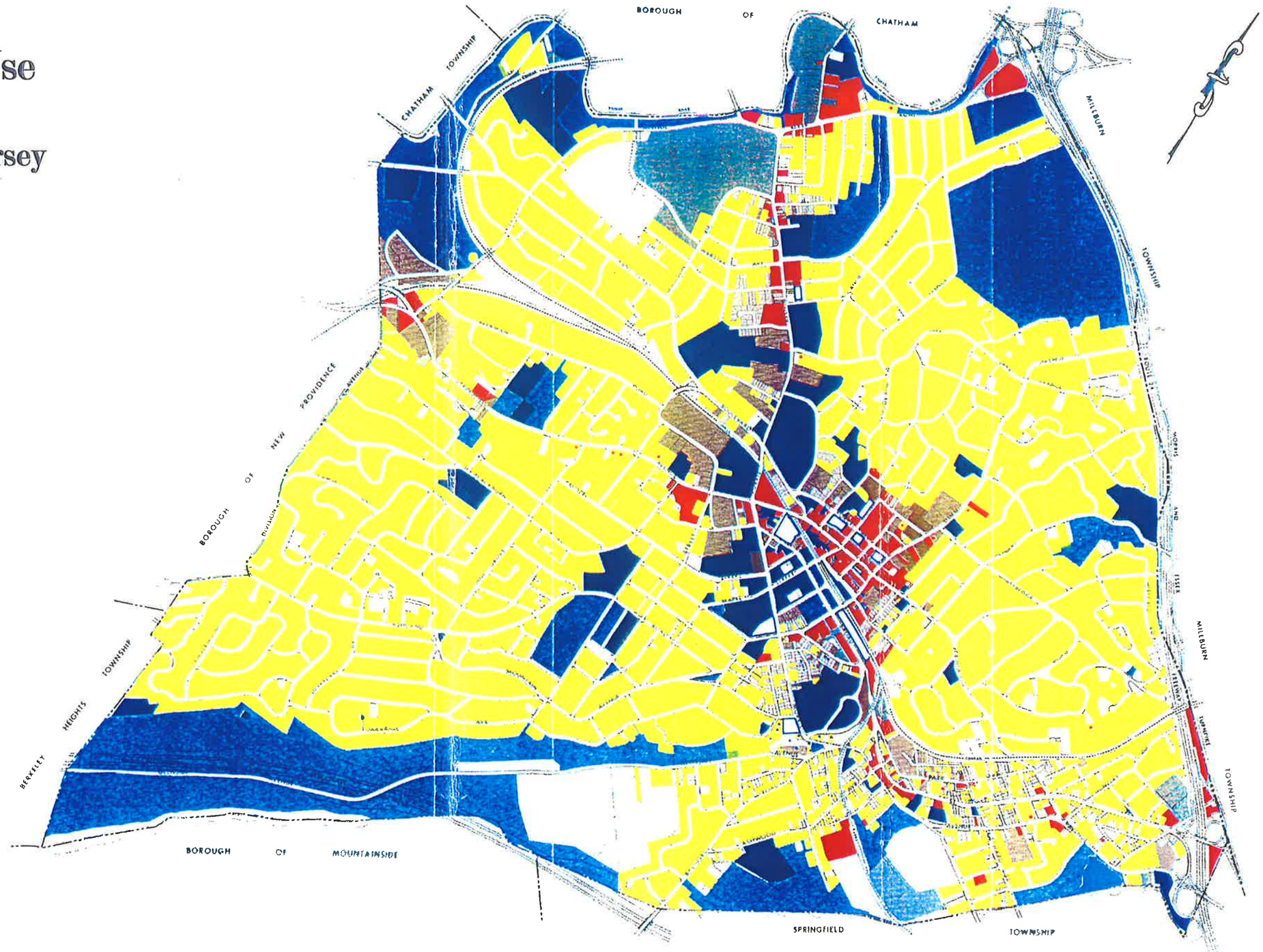
EXHIBIT 3
Land Use Map

Existing Land Use
City of Summit
Union County, New Jersey

Legend

- Single Family Residential
- Two Family Residential
- Multifamily Residential
- Mid Rise Residential
- Residential - Home Occupation
- Mixed Commercial/Residential
- Commercial
- Industrial
- Public - Quasi-Public
- Public Parking Lots
- Private Parking Lots
- Overlook Hospital Owned Parcels
- Parks and Recreation

0 800 1600 2400
400 400 1200 2000 2800
SCALE IN FEET



Prepared by Heyer, Gruel & Associates, PA

EXHIBIT 4
Grading and Drainage Ordinance

Ordinance #:	**03-2561**
Introduction Date:	5/6/03
Hearing Date:	5/20/03
Passage Date:	5/20/03

AN ORDINANCE TO AMEND AN ORDINANCE ENTITLED: "AN ORDINANCE TO ESTABLISH THE 1998 DEVELOPMENT REGULATIONS ORDINANCE," passed October 20, 1998 and as amended and supplemented. *(Lot grading and drainage controls)*

WHEREAS, the Planning Board adopted a Master Plan in November 2000; and

WHEREAS, the Master Plan "recommended that building permit regulations include a grading plan requirement for all new construction and/or renovation".

NOW, THEREFORE, BE IT ORDAINED BY THE COMMON COUNCIL OF THE CITY OF SUMMIT, as follows:

Section 1. That the above entitled ordinance shall be amended and supplemented by a new **Section 5-9A GRADING AND SOIL EROSION CONTROLS,** as follows:

5.9A GRADING AND SOIL EROSION CONTROLS

5.9A-1. Lot Grading

All property development shall be designed to provide proper grading and erosion control, including the prevention of sedimentation and/or damage to on-site and off-site property, as established herein.

a. Lot grading standards and requirements are necessary to help control drainage on a site or to channel that drainage to either naturally occurring or constructed storm drainage systems in an approved manner.

b. No land area shall be disturbed by any person or entity such that:

(1) The rate of storm water runoff occurring at the area is increased over what occurs prior to the disturbance.

(2) The drainage of adjacent areas is adversely affected.

(3) Soil erosion during and after development is increased over what naturally occurs.

(4) Soil absorption and ground water recharge capacity of the area is decreased below what occurs there under existing conditions.

(5) The natural drainage pattern of the area is altered in a significantly adverse manner.

(6) The grade and/or elevation of the site is altered contrary to Section 5.10-4.

c. The following standards and requirements shall be read in conjunction with the overall standards and requirements found in Section 5.6, DRAINAGE, and Section 5.15A REGULATIONS FOR DEVELOPMENT WITHIN STEEP SLOPE AREAS.

5.9A-2. Grading permit required.

a. A grading permit is required prior to land disturbance or construction. This permit shall be considered a "prior approval" under the Uniform Construction Code, and no construction permit application shall be issued unless the applicant has obtained the required grading permit.

b. Exemptions from requirement.

(1) Any development which has received site plan or subdivision approval from the Planning Board or Board of Adjustment, provided, however, that individual lots for one or two-family dwellings included within any approved subdivision shall not be exempt.

(2) Land disturbance of less than 600 square feet, and land disturbance for the purpose of constructing an addition less than 600 square feet to an existing single-family dwelling, provided that there are no environmentally sensitive areas such as but not limited to steep slopes, wetlands, streams or bodies of water located in the area to be graded or disturbed.

c. The City Engineer may waive the requirement for a permit and/or a grading plan based on the specific land disturbance and site conditions.

d. All properties exempt from a grading permit, or for which the City Engineer grants a waiver, are subject to Section 5.9A-1.

5.9A-3. Grading plan preparation and contents

a. The lot grading and soil erosion control plan shall be prepared by a land surveyor or professional engineer or landscape architect licensed by the State of New Jersey.

b. The plan must detail how all requirements of Section 5.9A-1b will be met. If the site currently has a drainage problem as the result of previous development, the plan must also propose a method to address these existing conditions.

c. Two copies of the plan shall be submitted to the City Engineer together with two copies of an application for a lot grading permit (which application form shall be available through the Office of the City Engineer) and the required fee. A copy of the application and plan will be returned to the applicant after review.

d. The lot grading and soil erosion and sediment control plan shall contain the following information:

(1) Date

(2) North arrow; scale; block and lot number of the subject property (or properties); name and address of record owner; name, address, license number and seal of the person preparing the plan.

(3) Complete lot boundary line information based on a current survey prepared by a New Jersey licensed land surveyor.

(4) Building setback lines, lines of existing streets, easements affecting the property and any areas dedicated to public use.

(5) Location of existing and proposed buildings and structures, if any, including walls, fences, culverts and bridges. Spot elevations as to all such structures shall be provided. Structures to be removed shall be indicated by dashed lines.

(6) Location of all existing and proposed storm drainage structures. The information shall include proposed methods of controlling foundation drains, sump pump discharges, and on-site storm water, and may include grading, use of underground leaders to storm water systems or dry wells, and other similar or related methods.

(7) Spot elevations for slopes of 0% to 5%, and existing contours at one -foot intervals where slopes are greater than 5% and less than 10%, and five-foot intervals where slopes are 10% or greater. Existing contours shall be shown by dashed lines.

(8) Proposed contours with similar intervals. Proposed contours shall be shown by solid lines. All changes in grade proposed on site or adjacent to the building must be delineated on the grading plan.

(9) Location of existing rock outcroppings, high points, watercourses, depressions, ponds, marshes, wooded areas and other significant natural features.

(10) Driveways, roads, curbs, sidewalks and other paved areas, along with the proposed use of land, buildings and other structures.

(11) Existing and proposed utility locations.

(12) Landscaping plans showing existing vegetation to remain and all areas to be seeded or planted. Size and type of proposed trees and shrubs shall be indicated. All trees eight inches DBH (diameter at 4.5 feet from ground) or greater shall be shown.

(13) Silt fencing, hay bales, and such other soil conservation methods as may be required shall be provided downstream of all areas of disturbance. Soil conservation and sediment control measures shall conform to The Standards and Specifications for Soil Erosion and Sediment Control of the New Jersey State Soil Conservation Committee.

(14) Such other information as may be required by the City Engineer in order to determine that the requirements of this section have been met.

(15) Narrative describing the existing conditions and any proposed improvements as a result of the change in grade.

5.9A-4. Time for Action.

The City Engineer shall review and approve, conditionally approve or deny the lot grading permit application within 30 days of the date on which a complete application is submitted. Otherwise, the application for a grading permit shall be deemed to be approved.

5.9A-5. Grading permit fee.

Each applicant for a grading permit under this section shall submit a review fee payable to the City of Summit in the amount of $100.

5.9A-6. Construction requirements.

a. The applicant shall construct or install soil erosion and sediment control protective measures as required by the City Engineer or by the Somerset-Union Soil Conservation District prior to any site development work at the start of construction.

b. The applicant shall notify the City Engineer prior to commencing construction, and at such other times as may be required in the grading permit approval.

c. The applicant shall grade the property and install any required control measures as may be shown on the approved grading plan or as specified in the grading permit, or both, and shall obtain final grading approval from the City Engineer.

d. All soil erosion and sediment control protective measures shall be maintained operational throughout the project or until such time as the City Engineer authorizes removal.

5.9A-6. Enforcement Officer.

The requirements of this ordinance shall be enforced by the City Engineer who shall inspect or require inspection of the work.

a. The City Engineer may order correction or modification of any conditions found that were not as stated in any application, or any work that does not conform to the approved grading plan or permit, or both, and may refuse to approve further work unless and until satisfactory corrections or modifications are in place.

b. The City Engineer shall notify the property owner in writing of any such orders or refusals, with copies also provided to the Zoning Officer and the Construction Official.

c. The City Engineer may seek such other penalties as provided in Article 10.

Section 2. That **Subsection 5.24 Exemptions of Section 5.24 SOIL EROSION AND SEDIMENT CONTROL** of the above entitled ordinance, shall be deleted:

~~**5.24-2 Exemptions**~~

~~The following activities are specifically exempt from the Soil Erosion and Sediment Control provisions:~~

~~a. Land disturbance associated with the construction of a single-family house unless such house is a part of a proposed subdivision, site plan, zoning variance, or construction permit application involving two or more such single-family houses.~~

~~b. Land disturbance of 5,000 square feet or less of the surface area of land for the accommodation of construction for which the standard Building Code of the State of New Jersey would require a construction permit.~~

~~c. Use of land for gardening primarily for home consumption.~~

~~d. Percolation tests and/or soil borings.~~

Section 3. That **Section 5.10 HEIGHT** of the above entitled ordinance, shall be amended to add a new subsection as follows:

5.10-4 For any new building or for any addition over 600 square feet in area, the grade plane existing at the adoption of Section 5.9A GRADING AND SOIL EROSION CONTROLS may not be altered in any way so as to achieve a conforming height or number of stories greater than that which the existing grade plane would otherwise provide.

Section 4. If any section, paragraph, subdivision, clause or provision of this ordinance shall be adjudged invalid, such adjudication shall apply only to the section, paragraph, subdivision, clause or provision invalidated, and the remainder of this ordinance shall be valid and enforceable.

Section 5. All Ordinances or parts of Ordinances inconsistent herewith are hereby repealed. This Ordinance shall be effective upon final passage and publication according to law.

Dated: May 20, 2003

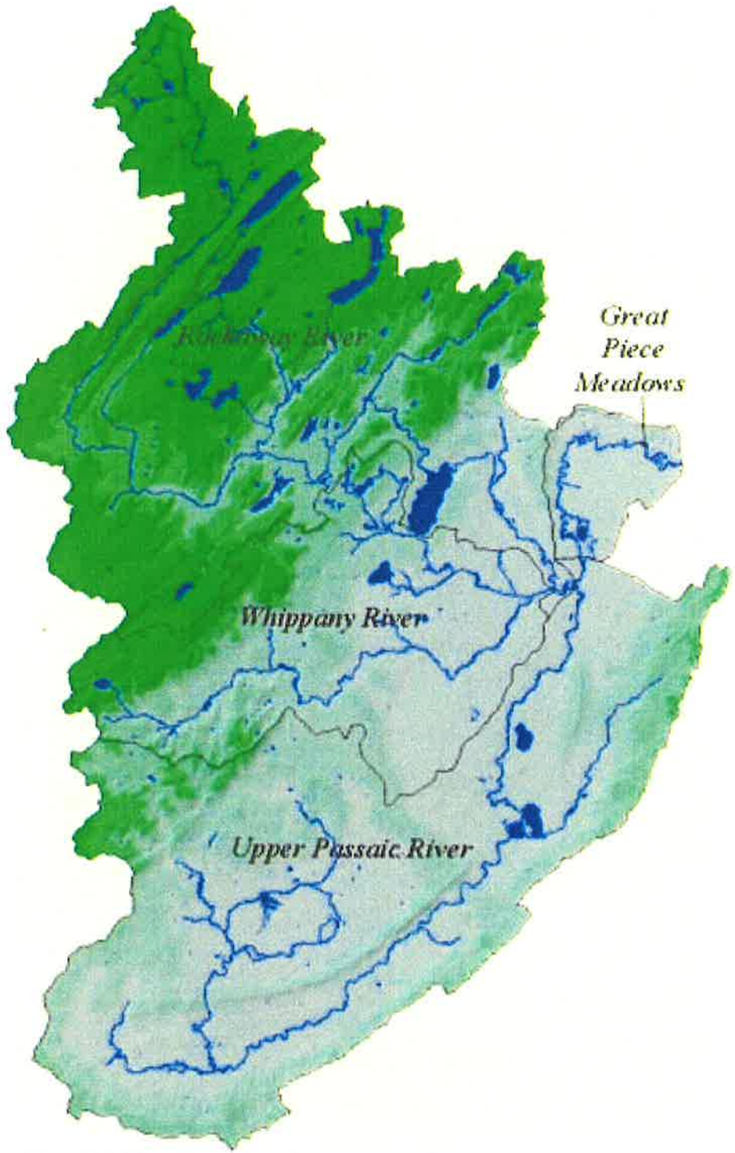
I, David L. Hughes, City Clerk of the City of Summit, do hereby certify that the foregoing ordinance was duly passed by the Common Council of said City at a regular meeting held on Tuesday evening, May 20, 2003.

City Clerk

Approved:

Mayor

EXHIBIT 5
Watershed Management Area Map

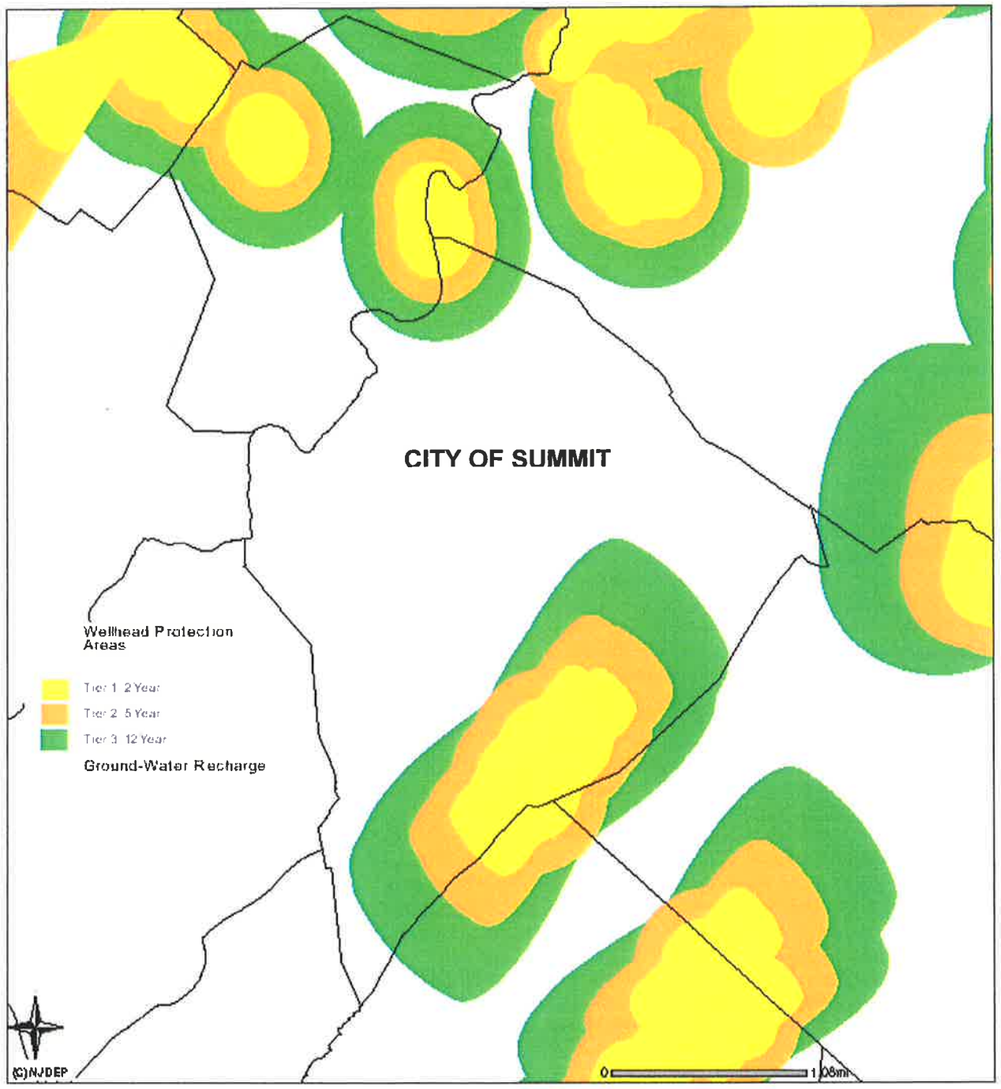


Watershed Management Area #6 – Upper & Mid Passaic, Whippany, Rockaway

WATERSHED MANAGEMENT AREA MAP

N.T.S.

EXHIBIT 6
Wellhead Protection Area Map



WELLHEAD PROTECTION AREA MAP

N.T.S.

EXHIBIT 7
List of Vacant Parcels in the City

TAXING DISTRICT 18 SUMMIT CITY COUNTY 20 UNION

PROPERTY ID	PROPERTY LOCATION	CLASS	OWNERS NAME & ADDRESS
403 30	4 PLAIN ST	1	AURNHAMMER REALTY, LLC 1547 HARVEST LANE MANASQUAN, N. J. 08736
404 1	541 MORRIS AVE.	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
404 3	553 MORRIS AVE.	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDI FARMS,PO 1000 MADISON, N. J. 07940
404 4	555 MORRIS AVE.	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
404 10	567 MORRIS AVE	1	SMYTHE VOLVO, INC.%J.D.SMYTHE P.O. BOX 489 SUMMIT, NJ 07902
404 22	27 PLAIN ST.	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
507 22	MORRIS AVE	1	491 MORRIS AVENUE, LLC 491 MORRIS AVE SUMMIT, N J 07901
601 4	50 STANLEY AVENUE	1	YOUNG, HARRY & YOUNG, PHILIP EUGENE 44 STANLEY AVENUE SUMMIT, N. J. 07901
701 92	171 PASSAIC AVENUE	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
701 93	173 PASSAIC AVE	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
701 94	177 PASSAIC AVENUE	1	THE SUMMIT PROPERTY COMPANY, L.L.C. ONE GIRALDA FARMS,PO 1000 MADISON, N. J. 07940
1405 40	35 BEEKMAN RD	1	COMSTOCK ASSOCIATES, L.L.C. 382 SPRINGFIELD AVENUE SUMMIT, N J 07901
1702 23	14 HILLVIEW TERR	1	BLASI, JOHN R & MARY W 14 HILLVIEW TERRACE SUMMIT, N J 07901
1905 10	5 MAPLE ST	1	BOURAS PROPERTIES, LLC 25 DE FOREST AVENUE SUMMIT, N. J. 07901
2201 1.01	37 RIDGE ROAD	1	YODER, THOMAS B. & JEAN O. 39 RIDGE ROAD SUMMIT, N J 07901
2403 8	68 TEMPLAR WAY 7	1	OWENS, NANCY G. TRUSTEE 38 LONG POINT DRIVE AMELIA ISLAND, FL 32034
2403 18	8 TEMPLAR WAY	1	THOLE, MRS B J 10 TEMPLAR WAY SUMMIT, N J 07901
2406 1	8 FRIAR TUCK CIRCLE	1	JOHNSON, GLENN W JR 10 FRIAR TUCK CIRCLE SUMMIT, N J 07901

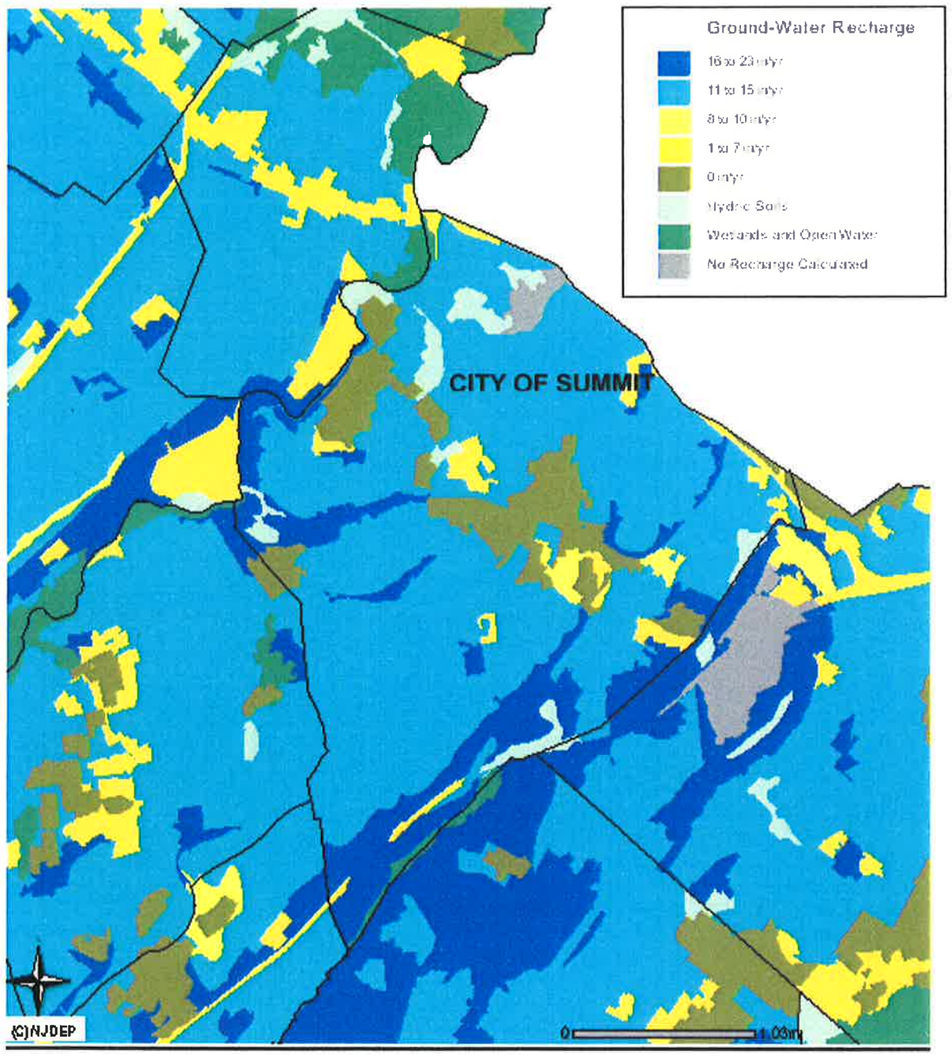
PROPERTY ID	PROPERTY LOCATION	CLASS	OWNERS NAME & ADDRESS
2501 10	9 ESSEX ROAD	1	TAGGART,E.M,MOLE,H.E.III,MOLE,M.C. 40 HILLCREST AVENUE SUMMIT, N J 07901
2801 31	73 BLACKBURN PLACE	1	NYCUM, R S & H S 77 BLACKBURN PLACE SUMMIT, N J 07901
2802 5	626 SPRINGFIELD AVENUE	1	BLECKNER FAMILY, L.L.C. 626 SPRINGFIELD AVE SUMMIT, N J 07901
2902 10	22 SUNSET DRIVE	1	KREUZER, JAMES H. & LESLIE W. 20 SUNSET DRIVE SUMMIT, N J 07901
3009 3	8 PEMBROKE ROAD	1	LOVETT-STANZIONE, JUANITA P. 47 COLT RD SUMMIT, N J 07901
3101 9	21 COLT ROAD	1	RICHARDSON, R T & M M 17 COLT ROAD SUMMIT, N J 07901
3106 3	4 CRESTWOOD AVE	1	RALL, VIVIAN E 2530 POCOCK RD FALLSTON, MARYLAND 21047
3106 5	117 ASHLAND	1	117 ASHLAND CORPORATION 111 ASHLAND AVE SUMMIT, N J 07901
3204 18	17 SAYRE ST	1	CARVALHO, JOSE & MANUELA 36 MARIGOLD LANE MARLBORO, NJ 07746
3307 56	4 WALNUT ST	1	VETUSCHI, DANTE V & VETUSCHI, MARY P.O. BOX 473 SUMMIT, NJ 07901.0473
3401 50	73 EDGEWOOD RD	1	SITARZ,ANNELIESE & SITARZ,ELIZABETH 69 EDGEWOOD RD SUMMIT, N J 07901
3501 9	30 ARGYLE COURT	1	MONTAG,TK & JM 5-12-6 MINAMI-AZABU MINATO-KU TOKYO, JAPAN 106 0047 00000
3501 29	49 PROSPECT HILL AVE	1	MONTAG,TK & JM 5-12-6 MINAMI-AZABU MINATO-KU TOKYO, JAPAN 106 0047 00000
3502 17	34 PROSPECT HILL AVENUE	1	MORIARTY, MARY EILEEN 20 PROSPECT HILL AVE SUMMIT, N J 07901
3602 3	129 SPRINGFIELD AVE	1	MELLUSI,ROBERT & COSMO 133 WAVERLY AVENUE MILLINGTON, NEW JERSEY 07946
3603 11	27 CLARK STREET	1	ANGIUONI,ERRICO&ANGIUONI,BERNADETTE 18 TWOMBLY DRIVE SUMMIT, N J 07901
3703 4	10 GROVE STREET L 4.01	1	DIAZ, RAMON C & GLADYS 7 WASHINGTON AVE SUMMIT, N J 07901

TAXING DISTRICT 18 SUMMIT CITY COUNTY 20 UNION

PROPERTY ID	PROPERTY LOCATION	CLASS	OWNERS NAME & ADDRESS
3703 5	6 GROVE STREET	1	LA VECCHIA, SALVATORE & JOSEPHINE 20-20A MIDDLE AVE SUMMIT, N J 07901
3704 7	52 BROAD STREET	1	ZOTTI, LEONARD & LINA 54 BROAD ST SUMMIT, N J 07901
3704 10	7 GROVE STREET	1	ALATARY, A. & ROSELLE A. M. 48 BROAD ST SUMMIT, N J 07901
3704 21.01	25 GROVE STREET	1	CURIALE, NICOLINO 235 MORRIS AVENUE SUMMIT, NJ 07901
3706 8	41 BROAD ST	1	PRISCO,J,SR.&J.,JR. T/A JRP REALTY 44 MIDDLE AVENUE SUMMIT, N. J. 07901
3801 6	48 SPRINGFIELD AVENUE	1	CHIDESTER JOINT VENTURE 820 MORRIS TURNPIKE SHORT HILLS, NJ 07078
3801 7	36 SPRINGFIELD AVENUE	1	K & K DEVELOPERS, INC. 820 MORRIS TURNPIKE SHORT HILLS, N.J. 07078
3901 11	15 NORTH STREET	1	ZOTTE, JOSEPHINE %ALEXANDER, B.Z. 104 KILLINGTON WILLIAMSBURG, VA 23188
3909 34	114 ORCHARD STREET	1	CALABRESE, JOHN A & JOYCE F 112 ORCHARD ST SUMMIT, N J 07901
3915 1	74 MORRIS AVENUE	1	PILGRIM BAPTIST CHCH %TINA RUSSELL 60 CRESTVIEW AVE VAUX HALL, N. J. 07088
4002 19	40 ORCHARD STREET	1	ALONSO, ALBERT & ZULMA A 17716 SW 27TH CT MIRAMAR FL 33029
4009 20	148 BROAD ST	1	SIMPSON, ANDERSON & DOROTHY 146-148 BROAD ST SUMMIT, N J 07901
4101 32	47 SHUNPIKE RD	1	CELGENE CORP.ATTN:ACCOUNT PAYABLE 86 MORRIS AVE.%J.CLOUTIER SUMMIT, NJ 07901
4204 19	113 ASHWOOD AVE	1	DAPERO, ELISA J 115 ASHWOOD AVE SUMMIT, N J 07901
4209 3	11 RUSSELL PL	1	FAITOUTE, WILLIAM R & GLORIA P 119 OAK RIDGE AVENUE SUMMIT, N J 07901
4301 19	124 ASHWOOD AVE.	1	GINOCCHIO, MELISSA ANN,TRUSTEE 122 ASHWOOD AVENUE SUMMIT, N. J. 07901
4701 16.01	PINE GROVE AVENUE (REAR)	1	HANDER, O. BEN 30 COLT ROAD SUMMIT, N. J. 07901
4702 5	114 PINE GROVE AVE	1	CORNOG, ELWOOD C JR & JUDITH M 30 COLONY DRIVE SUMMIT, N J 07901

PROPERTY ID	PROPERTY LOCATION	CLASS	OWNERS NAME & ADDRESS
4803 11.01	205 GLENSIDE AVE	1	NEW JERSEY-AMERICAN WATER COMPANY 3906 CHURCH RD.PO BOX5088 MOUNT LAUREL, N.J. 08054
4803 12	249 GLENSIDE AVE	1	TIRRITO, JOSEPH & JEAN & TIRRITO,M. 25 BLACKSTONE DRIVE LIVINGSTON, N. J. 07039
5202 4	15 PORTLAND ROAD	1	OFFRAY, CLAUDE V JR & GLORIA 21 PORTLAND RD SUMMIT, N J 07901
5203 6	233 ASHLAND RD	1	GIBSON, H T JR & C M 231 ASHLAND RD SUMMIT, N J 07901
5203 15	14 CLEVELAND ROAD	1	GIBSON, CAROLYN M 231 ASHLAND RD SUMMIT, N J 07901
5204 11	281 ASHLAND RD	1	HAGEMAN, ROBERT A. & LOIS D. 112 COLT ROAD SUMMIT, N J 07901
5305 9	6 HIGHLAND DRIVE	1	SHEEHAN, MARY K. 65 ROTARY DRIVE SUMMIT, N J 07901
5601 2.01	360 MOUNTAIN AVE	1	FISH, FLORENCE E. 358 ASHLAND ROAD SUMMIT, NJ 07901

EXHIBIT 8
Groundwater Recharge Areas in the City



GROUNDWATER RECHARGE AREAS IN THE CITY

N.T.S.