Town of Westfield

Municipal Stormwater Management Plan

NJDPDES #0150100

PID #168193

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Town of Westfield (Town) to address stormwater management primarily in new development and redevelopment projects that involve greater than 1 acre of disturbance. The development of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations.

This Municipal Stormwater Management Plan contains all of the elements required for completion in 2005 as described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts to project subject to the requirements of N.J.A.C. 7:8 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 base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities. The final component of this plan is a mitigation strategy for when a waiver or exemption of the design and performance standards is required.

With respect to the need for a "build-out" analysis, the Town, through the assistance of the Tax Assessor's office, has identified approximately 308 vacant parcels that are either Municipally owned or privately owned. The total acreage for these parcels is approximately 116.61 Acres. Since the Town's total vacant land is less than one square mile (640 Acres), a build-out analysis is not required.

The MSWMP includes recommendations for the Town that will serve to extend strict stormwater management design and performance standards to new non-residential development. Stormwater management for new residential development is under the jurisdiction of the Residential Site Improvement Standards (RSIS). These recommendations will result in the Town meeting the requirements of the above referenced NJDEP Stormwater Management Rules as required by its NJPDES Tier A Municipal Stormwater General Permit.

Regulatory Framework

According to the United States Environmental Protection Agency (USEPA) polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards. Over land or via storm sewer systems, polluted runoff is discharged, often untreated, directly into local water bodies. When left uncontrolled, this water pollution can result in the destruction of fish, wildlife and aquatic life habitats; a loss in aesthetic value; and threats to public health due to contaminated food, drinking water supplies and recreational waterways.

Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program is a comprehensive two-phased national program for addressing the non-agricultural sources of stormwater discharges, which adversely affect the quality of our nation's waters. The program uses the NPDES permitting mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies.

In response to the requirements of the second phase of the USEPA's national NPDES Phase II regulations published in December 1999, the State of New Jersey developed the Municipal Stormwater Regulation Program. This program addresses pollutants entering our waters from storm drainage systems operated by local, county, state, interstate and federal government agencies. These systems are referred to as "municipal separate storm sewer systems" or MS4s and are regulated under the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules (N.J.A.C. 7:14A). The NJDEP created four (4) NJPDES Stormwater General Permits for the various small Municipal Separate Storm Sewer Systems (MS4s). These general permits include the Tier A Municipal Stormwater General Permit, Tier B Municipal Stormwater General Permit, Public Complex Stormwater General Permit, and the Highway Agency Stormwater General Permit.

For each General Permit, NJDEP has mandated Statewide Basic Requirements (herein referred to as SBRs), which include minimum standards, measurable goals, and implementation schedules. The minimum standards are one or more actions that must be taken to comply with

the requirement of the permit. The measurable goals are the mechanism for reporting to the NJDEP the progress that the Municipality has made to implement the requirements of the permit and are accomplished primarily through the submittal of an Annual Report and Certification. The implementation schedule sets the deadlines for permit compliance.

All municipalities within the State of New Jersey have been identified as either Tier A or Tier B communities depending on population density as determined in the 2000 United States Census. The Town of Westfield id regulated under the NJPDES Stormwater Tier A General Permit, NJPDES No. NJ0141852, with a unique NJPDES permit number assigned to the Town of NJG0150100. Tier A Municipalities are generally located within the more densely settled regions of the State or along or near the Atlantic Ocean. There are currently 467 listed Tier A Municipalities, which contain about 70 percent of New Jersey's land area and 96 percent of New Jersey's population (2000 census). Tier A Municipalities are found in every County. As part of the permit, several SBRs were mandated and an associated implementation schedule was established (refer to Appendix A of this plan for a copy of the Tier A Permit). To satisfy the permit requirements, each Tier A municipality is required to develop, implement and enforce a Stormwater Program. The following SBRs apply to all Tier A municipalities, including the Town of Westfield:

1. **Public Notice -** Municipalities must comply with State and local public notice requirements when providing for public participation in the development and implementation of their stormwater program.

2. **Post-Construction Stormwater Management in New Development and Redevelopment –** Municipalities shall develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that discharge into the municipality's small MS4. In it's post construction program, the municipality shall complete the following:

a. Adopt and reexamine a municipal stormwater management plan (or adopt amendments to an existing municipal stormwater management plan) in accordance with N.J.A.C. 7:8-4.

b. Adopt and implement a municipal stormwater control ordinance or ordinances in accordance with N.J.A.C. 7:8-4. The ordinance(s) will control stormwater from non-residential development and redevelopment projects.

c. Ensure that any residential development and redevelopment projects that are subject to the Residential Site Improvement Standards (RSIS) for stormwater management (N.J.A.C. 5:21-7) comply with those standards (including any exception, waiver, or special area standard that was approved under N.J.A.C. 5:21-3).

d. Where necessary to implement the municipal stormwater management plan, the municipal stormwater control ordinance(s) will also:

    i. Control aspects of residential development and redevelopment projects that are not pre-empted by the RSIS; and

    ii. Set forth special area standards approved by the Site Improvement Advisory Board for residential development or redevelopment projects under N.J.A.C. 5:21-3.5.

e. Ensure adequate long-term operation and maintenance (O&M) of Best Management Practices (BMPs).

f. Enforce, through the stormwater control ordinance(s) or a separate ordinance, compliance with standards set forth in Attachment C of the permit to control passage of solid and floatable materials through storm drain inlets.

g. Require compliance with the applicable design and performance standards established under N.J.A.C. 7:8 for major development, unless:

   i. Those standards do not apply because of a variance or exemption granted under N.J.A.C. 7:8; or

   ii. Alternative standards are applicable under an areawide or Statewide Water Quality Management Plan adopted in accordance with N.J.A.C. 7:15.

3. Local Public Education – Each Municipality shall develop a Local Public Education Program that describes how the municipality will distribute educational information that contains specific information on how educational activities and an educational event will be conducted to satisfy the SBR and BMP topics. The following SBRs are included in the public education program:

a. Distribution of an annual mailing or brochure, provided by the NJDEP, to all residents and businesses of the municipality to cover educational topics such as Stormwater/Nonpoint Source pollution, storm drain inlet labeling, fertilizer/pesticide use, waste disposal, pet waste, litter, wildlife feeding and yard waste.

b. Conduct an annual educational "event" in which the informational brochure is made available to the public.

c. Establish a storm drain inlet-labeling program and label all storm drain inlets in areas operated by the municipality.

4. **Improper Disposal of Waste –** Tier A Municipalities must adopt and enforce the following waste disposal ordinances:

   a. Pet Waste - Requires pet owners or their keepers to immediately and properly dispose of their pet's solid waste deposited on their property or any other property, public or private, not owned or possessed by that person.

   b. Litter - Adopt and enforce a litter ordinance or enforce the existing State litter statute (N.J.S.A 13:1E-99.3).

   c. Improper Disposal of Waste – Prohibits the improper spilling, dumping, or disposal of materials other than stormwater into the small MS4.

   d. Wildlife Feeding - Prohibits the feeding in any public park or on any other property owned or operated by the Tier A Municipality of any wildlife (excluding confined wildlife in zoos, parks, or rehabilitation centers or unconfined wildlife at environmental education centers).

   e. Yard Waste Ordinance / Collection Program - Prohibits placing non-containerized yard wastes in the street and/or the municipality shall develop a yard waste collection and disposal program.

5. **Illicit Connection Elimination and MS4 Outfall Pipe Mapping –** Each Tier A Municipality must complete the following requirements to identify and eliminate illicit connections:

   a. Develop a map showing the end of all MS4 outfall pipes that are operated by the Municipality, and discharge within the Municipality's jurisdiction to a surface water body. This map shall also show the location and name of all surface water bodies receiving discharges and each pipe shall be assigned an alphanumeric identifier. A copy of the map shall be provided to the NJDEP upon request.

b. Each municipality shall also adopt and enforce an ordinance that prohibits illicit connections to the municipality's MS4.

c. Each municipality shall adopt and implement a program to detect and eliminate illicit connections into the MS4. The program, at minimum, must include an initial physical inspection of all its outfall pipes, and further investigate any found to have dry weather flow in accordance with Permit requirements. After the completion of the initial inspection of all outfall pipes, Tier A municipalities shall maintain an ongoing program to detect and eliminate illicit connections.

6. Solids and Floatable Controls – Each Tier A municipality must take the following actions to reduce the amount of solids and floatable materials from entering surface waters:

a. Street Sweeping - Municipalities shall sweep all municipally owned curbed streets with storm drains that have a posted speed limit of 35 miles per hour (mph) or less in predominantly commercial areas at a minimum of once each month (conditions permitting).

b. Storm Drain Inlets – Municipalities are require to retrofit existing storm drain inlets to meet standards listed in Attachment C of the Tier A permit (Appendix A).

c. Stormwater Facility Maintenance - Develop and implement a stormwater facility maintenance program for cleaning and maintenance of all stormwater facilities in accordance with permit requirements.

d. Road Erosion Control Maintenance - Develop a roadside erosion control maintenance program to identify and repair erosion along streets operated by the municipality. Tier A Municipalities are also required to regularly inspect and maintain the stability of shoulders, embankments, ditches and soils along these roadways to protect against erosion.

e. Outfall Pipe Stream Scouring Remediation - Develop and implement a stormwater outfall pipe scouring detection, remediation and maintenance program to detect and control localized stream and stream bank scouring in the vicinity of outfall pipes operated by the municipality.

7. Maintenance Yard Operations (including maintenance activities at Ancillary Operations)

a. De-icing Material Storage - A permanent structure must be constructed with an impermeable floor (completely roofed and walled) for the storage of salt, and other de-icing materials. Once constructed, the municipalities is required to regularly inspect and maintain the structure in accordance with permit requirements

b. Fueling Operations - Develop and implement standard operating procedures (SOPs) for vehicle fueling, and receiving of bulk fuel in accordance with the requirements listed in Attachment D of the Tier A Permit (Appendix A).

c. Vehicle Maintenance - Develop and implement SOPs for vehicle maintenance and repair activities that occur at municipal maintenance yard operations.

d. Good Housekeeping Practices - Implement good housekeeping procedures for all materials or machinery listed in the Inventory Requirements for Municipal Maintenance Yard Operations prepared in accordance with Attachment D of the Tier A permit (Appendix A).

8. Employee Training – Each Tier A Municipality shall develop and conduct an annual employee training program to include at minimum the topics and programs specified in the development and implementation of the SBRs specified in the Tier A permit. Each requirement listed in the Tier A permit has a specific implementation scheduled based on the effective date of permit authorization. This implementation schedule is summarized in Table 1.

Table 1 Tier A Permit Requirement Implementation Schedule for the Town of Westfield	
Implementation Schedule	Permit Requirement
April 1, 2004	Ensure public notice requirements are met when developing and implementing the municipal stormwater program
April 1, 2004	Ensure major development projects comply with RSIS
April 1, 2004	Ensure adequate O&M of BMPs on municipal property
April 1, 2005	Develop and Implement Town Stormwater Management Plan
April 1, 2005	Develop and Implement Stormwater Pollution Prevention Plan
April 1, 2005	Ensure new municipal storm drain inlets meet design standards
April 1, 2005	Establish Local Public Education Program
April 1, 2005	Implement Solids and Floatable Controls program, including street sweeping, storm drain inlet retrofits, stormwater facility maintenance and roadside erosion control
April 1, 2005	Adopt and comply with Maintenance Yard Operations Plan
April 1, 2005	Implement Employee Training Program
April 1, 2005	Implement a municipal storm drain inlet labeling program
May 2, 2005	Submit first Annual Report and Certification to NJDEP
October 1, 2005	Adopt and enforce improper waste disposal ordinances
October 1, 2005	Adopt and enforce Illicit Connections ordinance and implement Illicit Connection Elimination Program
October 1, 2005	Adopt and implement Roadside Erosion Control Program and Outfall Pipe Stream Scouring Detection, Remediation and Maintenance Program
April 1, 2006	Ensure adequate O&M of BMPs on private property
April 1, 2006	Adopt stormwater control ordinances
April 1, 2006	Ensure new storm drain inlets meet design standards for all projects
April 1, 2007	Label 50% of municipal storm drain inlets
April 1, 2007	Complete mapping of one sector of MS4 outfall pipes
April 1, 2009	Label all municipal storm drain inlets
April 1, 2009	Complete mapping of all MS4 outfall pipes
April 1, 2009	Complete NJDEP's Illicit Connection Inspection Program

General Requirements for Stormwater Management Planning

Subchapter 2 of N.J.A.C. 7:8 includes general requirements for municipal and regional stormwater management planning. For municipal stormwater management planning the requirements are, at a minimum, applicable to management of stormwater related impacts of major developments, defined in this case as new non-residential development or redevelopment projects that ultimately disturb one or more acres of land. Consideration will be given to defining

applicable as also including projects within at least ¼ acre of new impervious cover. Accordingly, this stormwater management plan shall be designed in the context of the following goals for major development:

- 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 for new development and redevelopment projects, this plan outlines specific stormwater design and performance standards for new development; preventative and corrective maintenance strategies to ensure long-term effectiveness of stormwater management facilities; and safety standards for stormwater infrastructure to be implemented to protect public safety. Furthermore, the above goals will be considered should additional ordinances related to stormwater-related water quality, groundwater recharge, and water quantity impacts of existing land uses be considered by the Town. Issues with stormwater impacts of replacement and/or reconstruction of buildings and residences on existing lots will be evaluated and the need for

additional regulation of such considered. Additionally, consideration of developing new ordinances regarding grading on single family residential lots and for management of steep slopes for the purpose of improved stormwater management will be considered. Finally, consideration will be made in cooperation with the property owners, NRCS, Soil Conservation District, and affected stakeholders, of mechanisms for improved management of stormwater runoff and groundwater recharge associated with existing and new open space and underutilized properties.

According to N.J.A.C. 7:8 5.5(h) special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One (C1) waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated Hydrologic Unit Code 14 (HUC 14) drainage. Figure 1 illustrates the location of HUC14s and water bodies within the Town. As there are currently no C1 waters within the Town, or within the same HUC14 downstream of the Town, there are no special water resource protection areas designated in Westfield.

Table 2 includes a breakdown of the drainage areas within each of the HUC14s in the Town, by percent of the Town and by percent of the total HUC14 within the Town.

Table 2
Town of Westfield HUC 14s

HUC 14	Total Sq. Miles	Sq. Miles Inside Twp.	Percent Of Twp.	Percent of HUC14 in Twp.
Green Bk (N. Plainfield gage to Blue Bk)	2.54	0.00	0.06%	0.17%
Nomahegan Brook	5.24	1.59	23.76%	30.38%
Rahway R (Robinsons Br. To Kenilworth Blvd)	9.84	1.66	24.79%	16.87%
Robinsons Br Rahway R (below Lake Ave)	9.62	3.43	51.20%	35.66%
Spring Lake Fork of Bound Brook	7.16	0.02	0.23%	0.22%
	34.40	6.70	100%	

Long Term Goals of the MSWMP

As discussed in the Regulatory Framework Section of this document the municipal stormwater permitting program was founded in response to requirements in the Federal Clean Water Act (CWA). For surface waters of the state, the CWA goals are in part expressed in policy and standards included in N.J.A.C. 7:9B Surface Water Quality Standards. The standards include requirements for maintenance and protection of the designated uses of surface waters of the state and where economically feasible, are attained wherever these uses are not precluded by natural conditions. Where the instream water quality parameters exceed the applicable state water quality criteria, the water is considered impaired, and the NJDEP may be required to develop a Total Maximum Daily Load (TMDL) for those pollutants for that waterway. When the non-point source pollution component of the TMDL is considered to be contributing to exceedance of water quality parameters action may be necessary by the Town regarding addressing stormwater related impacts of existing land uses.

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 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 (http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist.htm) 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.

Stormwater Discussion

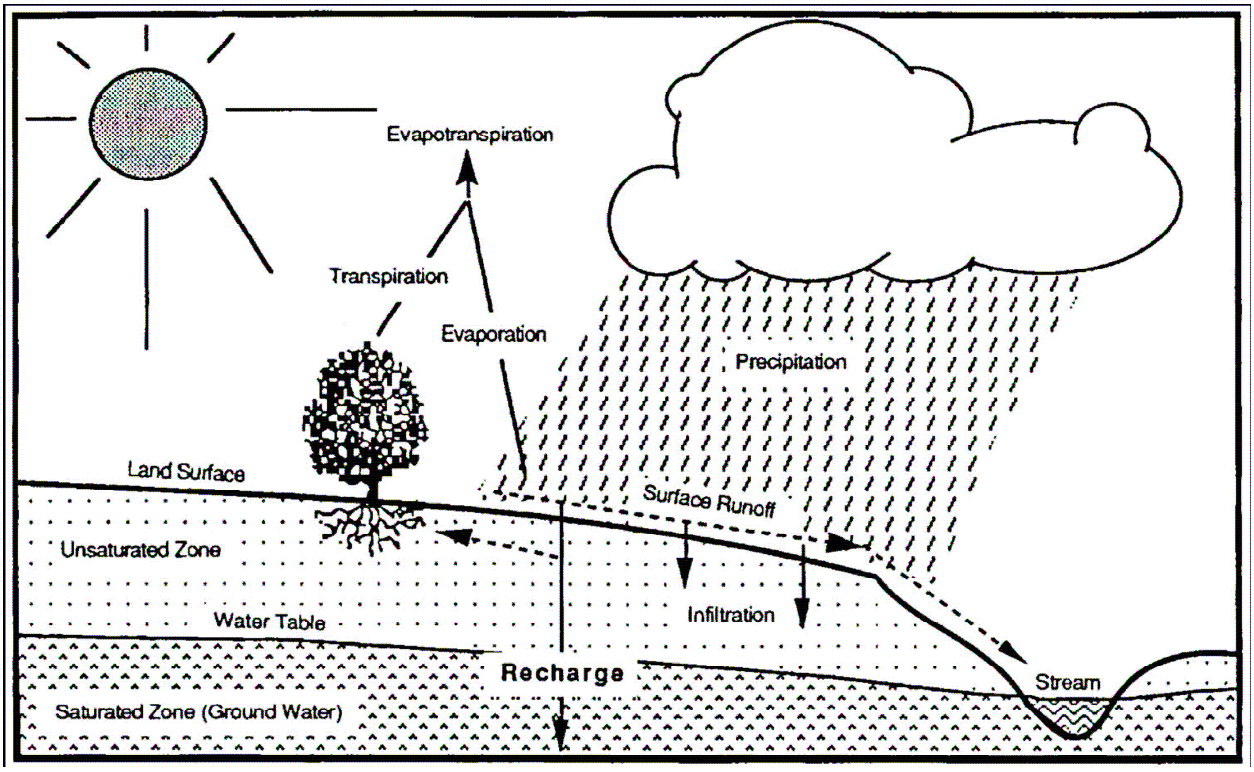

Figure 2 – Schematic of Hydrologic Cycle

The NJDEP has developed a wealth of stormwater management information both as background for development of the stormwater rules at N.J.A.C. 7:8 and as support for implementaton of the municipal stormwater permitting program. This information has been made readily available on the NJDEP stormwater website at www.njstormwater.org. The full text of the NJ Stormwater BMP manual can be found on that website. Of particular relevance to this section of the MSWMP is Chapter 1 of the manual entitled "Impacts of Development on Runoff", from which the following information was excerpted.

Land development can dramatically alter the hydrologic cycle 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.

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.

As well as 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.

Town Background

The Town of Westfield is predominantly a residential community comprising an area of 6.75 square miles. It is located in central Union County and is bordered by 6 Municipalities: Mountainside Borough and Springfield Township to the north, Garwood Borough and Cranford Township to the east, Scotch Plains Township to the west and Clark township to the south. The Town is bisected east to west by New Jersey Route 28, which serves as the main hub for commercial businesses. In recent years the Town has experienced moderate population growth. According to the 2000 census, the Town of Westfield has a population of 29,644, increasing 2.7 percent from 28,870 in 1990. This population increase has resulted in a moderate increased demand for new development; changes in the landscape have most likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 1 (Appendix C) illustrates the waterways in the Town. Figure 5 (Appendix C) depicts the Town boundary on the USGS quadrangle maps.

The Town has experienced some water quantity problems, however these have generally been associated with storm events involving substantial precipitation. These areas are located in the vicinity of the Town's outfall pipes, in addition to areas of open channel flow. In some instances, localized street flooding has occurred during these events due to the exceedance of maximum design inlet capacity. The Town will continue to monitor these locations in order to determine if capital improvement projects are warranted.

Watersheds

Westfield lies within the Rahway River drainage basin with several tributaries of the Rahway River System within its borders. Generally the Town drains to the southwest where multiple tributaries form the Robinsons Branch of the Rahway River system, which flows south to Arthur Kill. The Robinsons Branch of the Rahway River flows through the southern portion of the Town while the Nomahegan Brook parallels the Town's Northern boundary and briefly crosses the northeastern corner of Westfield. In addition Westfield also has a small portion of an uncoded tributary to the Winding Brook located along the southwest municipal line. All tributaries within the Town inevitable drain to the Rahway River system. In accordance with Sublist 5 of the New Jersey Integrated Water Quality Monitoring and Assessment Report the waterways within the Town borders are not listed as impaired. However, portions of the Robinsons Branch downstream of Westfield are listed as having both an arsenic and phosphorous impairment. Based on the 2004 Integrated List, available water quality data indicates a need for development of TMDL's for portions of the Rahway River down stream of Westfield. Currently the need for action in the Town regarding the impairment of the surrounding waterways has not been established by the NJDEP or the USEPA is not known at this time.

A review of the New Jersey Department of Environmental Protection (NJDEP) GIS surface water coverage files indicates that the NJDEP has classified all surface waters in Westfield as "FW2-NT". This indicates that the waterways of the Town do not support trout, an indicator species used by NJDEP to broadly assess water quality (NJDEP 1998).

The NJDEP has divided the state into 20 Watershed Management Areas (WMA), which conform to topographic and geologic boundaries. Westfield falls within two distinct WMAs, highlighted below:

- WMA 7, Arthur Kill
- WMA 9, Lower Raritan, South River and Lawrence (Northwestern Corner of the Town)

The NJ State GIS currently indicates that there are wellhead protection areas within the Town of Westfield. These areas extend from Shadowlawn Drive in central Westfield to the Mountainside border to the north. Additionally, wellhead protection areas extend from Clark Township into

southern Westfield. Currently, five (5) New Jersey public community water supply wells have been identified. One (1) non-community water supply well has also been identified and is located in the northeast corner of the Town. Due to these wells the Town exhibits extensive coverage of the 2, 5 and 12 Year Time of Travel Protection Areas. Figure 3 illustrates both the well locations and the associated well protection area.

Protection of groundwater resources is an important part of stormwater management. It requires protection of aquifer recharge areas, where permeable soils and natural drainage patterns permit the infiltration of surface runoff into the underlying geologic structure. Protection of aquifer recharge areas requires, for example, limitations on impervious coverage, and proper management of contaminated stormwater to assure that recharge areas remain open to infiltration of suitable quality water. Groundwater recharge areas have been delineated in the Town and are illustrated on Figure 4. Recharge infiltration rates within the Town are primarily between 10 to 12 inches per year, with scattered areas exhibiting 13 to 20 inches per year. The central business district along Route 28 exhibits little to no groundwater recharge due to the extent of impervious coverage.

Wetlands

Wetlands are important natural features that serve a number of purposes. Wetlands act as natural filtering systems for the surface waters that pass through them; they also provide flood control and offer diverse wildlife habitat. The wetlands in Westfield are mainly found along portions of the Robinsons Branch in the southwest corner of the Town and along the Nomahegan Brook to the northeast. A review of the NJDEP GIS generally identifies these areas as deciduous wooded systems.

Land Use

Westfield is a suburban community, with limited industrial development along the eastern municipal line. The most common land use in the Town is single family residential. The 2000 Census indicates that there are 10,819 housing units in the Town. Over 40 percent of the housing units were constructed prior to 1940. These residential housing units are predominantly single-family detached units. Commercial activities are predominantly located along Route 28 and extend from the Scotch Plains border to the center of the Town.

Topography

The topography of Westfield generally slopes southwest to the municipal line with elevations ranging from 200 feet above mean sea level to 40 feet above sea level. The highest areas within Town are located in the northwest corner and can be attributed to the transitioning surface relief of the Watchung Mountains located along the northwest boundary of Union County. Figure 5 depicts the Town boundary on the U.S. Geological Survey Topographic map.

Soils

As identified by the Rutgers Engineering Soil Survey of New Jersey there are two (2) major soil types within the Town. These include glacial ground moraine, the predominate soil type found within the Town and alluvial deposits generally found along low-lying areas which parallel the Robinsons Branch, Nomahegan Brook and other associated tributaries. Glacial ground moraine is composed primarily of sand and silt with a mixture of clay, gravel, cobbles and boulders. Along the northern boundary the glacial ground moraine is a transitional deposit with higher sand and gravel content. From approximately central Westfield to the southern boundary the ground moraine is dominated by fine sands and silt sized particles. The underlying bedrock formation is typically soft red shale with sporadic beds of red sandstone. On average the depth to bedrock is between 20 to 30 feet with depths exceeding 50 feet possible.

Design and Performance Standards

The Town of Westfield 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 applicability of the Stormwater Control Ordinance is limited to non-residential developments that ultimately involve one or more acres of disturbance as defined by N.J.A.C. 7:8. The design and performance standards in the ordinance 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 Union County for review and approval. During and after construction, Town inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

As indicated on the State Plan Policy Map, the Town is located within the Metropolitan Planning Area (PA1). Groundwater recharge is only applicable to projects located on vacant lands or on undeveloped portions of previously developed sites. Appropriate stormwater management measures will be enforced on those portions of undeveloped land where improvements are intended.

Plan Consistency

The Town is not currently within an adopted Regional Stormwater Management Planning Area (RSWMP). If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated, as appropriate, to be consistent with those programs. 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 applications. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

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

Nonstructural Stormwater Management Strategies

The Town has analyzed its vacant land inventory. Currently, there are approximately 308 parcels totaling 116.61 Acres of Municipally owned and privately owned property, less than one square mile (640 Acres). Figure 6 depicts the existing Land Use map for the Town. Accordingly, the

Town is not required to evaluate the Master Plan for the incorporation of nonstructural stormwater management strategies.

Land Use/Build-Out Analysis

The Town, in cooperation with the Tax Assessor's office, has analyzed its current vacant land inventory. At present, there are approximately 308 parcels totaling 116.61 Acres of Municipally owned and privately owned property. Since the Town's total vacant land is less than one square mile (640 Acres), a build-out analysis is not required.

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. 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 Municipal Stormwater Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

    a. The applicant can select one of the following projects 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 Town Engineer. The mitigation project must be coordinated with the Town Council and Town Engineer to determine the most appropriate project.

Water Quality and Water Quantity:

• Stream cleaning, removal of accumulated sediment and restoration of the channel located along Rahway Avenue, in the vicinity of St. Helen's Church.

• Stream cleaning, removal of accumulated sediment, removal of overgrown vegetation and restoration of the channel located behind Edison School, draining from Shackamaxon Drive through Tamaques Park, to along Rahway Avenue. removal of overgrown vegetation in the drainage way east of North Academy Street.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation 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.

Water Quality:

• Establish a vegetated buffer along sections of Tamaques Park Pond, Mindowaskin Pond and/or Brightwood Park Pond, as a geese and wildlife control measure.