

1       **SECTION XIII – STORMWATER MANAGEMENT PLAN ELEMENT**

2  
3                               **NJDPDES #NJG0148245**

4                                       **PID #203101**

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1 **Introduction**

2  
3 This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the  
4 Township of Livingston (Township) to address stormwater management primarily in new  
5 development and redevelopment projects that involve greater than one (1) acre of disturbance.  
6 The development of this plan is required by N.J.A.C. 7:14a-25 Municipal Stormwater  
7 Regulations.

8  
9 This MSWMP contains all of the elements that were required to be completed in 2005 as  
10 described in N.J.D.E.P's Stormwater Management Rules published at N.J.A.C. 7:8. The plan  
11 addresses groundwater recharge, stormwater quantity, and stormwater quality impacts to projects  
12 subject to the requirements of N.J.A.C. 7:8 by incorporating stormwater design and performance  
13 standards for new major development, defined as projects that disturb one acre or more of land.  
14 These standards are intended to minimize the adverse impact of stormwater runoff on water  
15 quality and water quantity and the loss of groundwater recharge that provides base flow in  
16 receiving water bodies. The plan describes long-term operation and maintenance measures for  
17 existing and future stormwater facilities. The final component of this plan is a mitigation strategy  
18 to be applied when a waiver or exemption of the design and performance standards is required.

19  
20 The Planning Board has performed a detailed land use analysis which shows that there are only  
21 84 acres that are available for development under the current zoning regulations.

22  
23 The MSWMP includes recommendations that will serve to extend strict stormwater management  
24 design and performance standards to new non-residential development. Stormwater management  
25 for new residential development is under the Residential Site Improvement Standards (RSIS).  
26 These recommendations will result in the Township meeting the requirements of the NJDEP  
27 Stormwater Management Rules as required by its New Jersey Pollutant Discharge Elimination  
28 System (NJPDES) Tier A Municipal Stormwater General Permit.

29  
30 **Regulatory Framework**

31  
32 According to the United States Environmental Protection Agency (USEPA) polluted stormwater  
33 runoff is a leading cause of impairment of the nearly 40 percent of surveyed U.S. water bodies  
34 which do not meet water quality standards. Over land, or via storm sewer systems, polluted  
35 runoff is discharged, often untreated, directly into local water bodies. When left uncontrolled,  
36 this water pollution can result in the destruction of fish, wildlife, and aquatic life habitats; a loss  
37 in aesthetic value; and threats to public health due to contaminated food, drinking water supplies,  
38 and recreational waterways.

39  
40 Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination  
41 System (NPDES) Stormwater Program is a comprehensive two-phased national program for  
42 addressing the non-agricultural sources of stormwater discharges which adversely affect the  
43 quality of our nation's waters. The program uses the NPDES permitting mechanism to require the  
44 implementation of controls designed to prevent harmful pollutants from being washed into local  
45 water bodies by stormwater runoff.

46  
47 In response to the requirements of the USEPA's national NPDES Phase II regulations published  
48 in December 1999, the State of New Jersey developed the Municipal Stormwater Regulation

1 Program. This program addresses pollutants entering our waters from storm drainage systems  
2 operated by local, county, state, interstate, and federal government agencies. These systems are  
3 referred to as "municipal separate storm sewer systems" or "MS4s" and are regulated under the  
4 NJPDES Rules (N.J.A.C. 7:14A). The NJDEP created four (4) NJPDES Stormwater General  
5 Permits for small Municipal Separate Storm Sewer System (MS4s). These general permits are  
6 the Tier A Municipal Stormwater General Permit, Tier B Municipal Stormwater General Permit,  
7 the Public Complex Stormwater General Permit, and the Highway Agency Stormwater General  
8 Permit.  
9

10 For each General Permit, NJDEP has mandated Statewide Basic Requirements (SBRs), which  
11 include minimum standards, measurable goals, and implementation schedules. The minimum  
12 standards are one or more actions that must be taken to comply with the permit. The measurable  
13 goals are the mechanism for reporting to the NJDEP the progress that the municipality has made  
14 to implement the requirements of the permit. Reporting is accomplished primarily through the  
15 submission of an Annual Report and Certification. The implementation schedule sets the  
16 deadlines for permit compliance.  
17

18 All municipalities within the State have been classified as either Tier A or Tier B communities,  
19 depending on population density as determined in the 2000 United States Census. The Township  
20 is regulated under NJPDES Stormwater Tier A General Permit No. NJ0141852, with a unique  
21 NJPDES permit number of NJG0148245 assigned to the Township.  
22

23 Tier A Municipalities are generally located within the more densely settled regions of the State  
24 or along or near the Atlantic Ocean. There are currently 467 listed Tier A Municipalities, which  
25 aggregate about 70 percent of New Jersey's land area and 96 percent of New Jersey's population  
26 (2000 census). Tier A Municipalities are found in every county. As part of the permit, several  
27 SBRs were mandated and an associated implementation schedule was established (refer to  
28 Appendix A of this Plan for a copy of the Tier A Permit). To satisfy the permit requirements,  
29 each Tier A municipality is required to develop, implement, and enforce a Stormwater Program.  
30 The following SBRs apply to all Tier A municipalities, including the Township:  
31

32 **1. Public Notice** - Municipalities must comply with State and local public notice  
33 requirements when providing for public participation in the development and implementation  
34 of their stormwater program.  
35

36 **2. Post Construction Stormwater Management in New Development and**  
37 **Redevelopment** - Municipalities shall develop, implement, and enforce a program to address  
38 stormwater runoff from new development and redevelopment projects that discharge into the  
39 municipality's small MS4. In its post construction program, the municipality shall complete  
40 the following:  
41

42 a. Adopt an MSWMP (or reexamine and adopt amendments to an existing MSWMP) in  
43 accordance with N.J.A.C. 7:8-4.  
44

45 b. Adopt and implement a municipal stormwater control ordinance or ordinances in  
46 accordance with N.J.A.C. 7:8-4. The ordinance(s) will control stormwater from non-  
47 residential development and redevelopment projects.  
48

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

5  
6 d. Where necessary for implementation of the MSWMP, the municipal stormwater  
7 control ordinance(s) will also:

8  
9 i. Control aspects of residential development and redevelopment projects that are not  
10 pre-empted by the RSIS; and

11  
12 ii. Set forth special area standards approved by the Site Improvement Advisory Board  
13 for residential development or redevelopment projects under N.J.A.C. 5:21-3.5.

14  
15 e. Ensure adequate long-term operation and maintenance (O&M) of Best Management  
16 Practices (BMPs).

17  
18 f. Enforce, through stormwater control ordinance(s) or a separate ordinance, compliance  
19 with standards, set forth in Attachment C of the permit, to control passage of solid and  
20 floatable materials through storm drain inlets.

21  
22 g. Require compliance with the applicable design and performance standards established  
23 under N.J.A.C. 7:8 for major development, unless:

24  
25 i. Those standards do not apply because of a variance or exemption granted under  
26 N.J.A.C. 7:8; or

27  
28 ii. Alternative standards are applicable under an area-wide or Statewide Water  
29 Quality Management Plan adopted in accordance with N.J.A.C. 7:15.

30  
31 **3. Local Public Education** - Each municipality shall develop a local public education  
32 program that describes how the municipality will distribute educational information that  
33 contains specific information on how educational activities and an educational event will be  
34 conducted to satisfy the SBR and BMP topics. The following SBRs shall be included in the  
35 public education program:

36  
37 a. Distribution of an annual mailing or brochure, provided by the NJDEP, to all residents  
38 and businesses of the municipality to cover educational topics such as storm water/non-  
39 point source pollution, storm drain inlet labeling, fertilizer/pesticide use, waste disposal,  
40 pet waste, litter, wildlife feeding, and yard waste.

41  
42 b. Conduct an annual educational "event" in which the informational brochure is made  
43 available to the public.

44  
45 c. Establish a storm drain inlet labeling program and label all storm drain inlets in areas  
46 operated by the municipality.  
47

1 **4. Improper Disposal of Waste** - Tier A municipalities must adopt and enforce the  
2 following waste disposal ordinances:

3  
4 a. Pet Waste - Require pet owners or pet keepers to immediately and properly dispose of  
5 their pet's solid waste deposited on their property, or any other property, public or private,  
6 not owned or possessed by that person.

7  
8 b. Litter - Adopt and enforce a litter ordinance or enforce the existing State litter statute  
9 (N.J.S.A. 13:1E-99.3).

10  
11 c. Improper Disposal of Waste - Prohibit the improper spilling, dumping, or disposal of  
12 materials other than stormwater into the small MS4.

13  
14 d. Wildlife Feeding - Prohibit the feeding in any public park or on any other property  
15 owned or operated by the municipality of any wildlife (excluding confined wildlife in  
16 zoos, parks, or rehabilitation centers or unconfined wildlife at educational centers).

17  
18 e. Yard Waste Ordinance / Collection Program - Prohibit placing non-containerized yard  
19 wastes in the street and/or the municipality shall develop a yard waste collection and  
20 disposal program.

21  
22 **5. Illicit Connection Elimination and MS4 Outfall Pipe Mapping** - Each Tier A  
23 Municipality must complete the following requirements to identify and eliminate illicit  
24 connections:

25  
26 a. Develop a map showing the end of all MS4 outfall pipes that are operated by the  
27 Municipality, and discharge within the municipality's jurisdiction to a surface water body.  
28 The map shall show the location and name of all surface water bodies receiving  
29 discharges and each pipe shall be assigned an alphanumeric identifier. A copy of the map  
30 shall be provided to the NJDEP upon request.

31  
32 b. Each municipality shall also adopt and enforce an ordinance that prohibits illicit  
33 connections to the municipality's MS4.

34  
35 c. Each municipality shall adopt and implement a program to detect and eliminate illicit  
36 connections into the MS4. The program, at minimum, must include an initial inspection  
37 of all outfall pipes, and further investigate any found to have dry weather flow in  
38 accordance with Permit requirements. After the completion of the initial inspection of all  
39 outfall pipes, Tier A municipalities shall maintain an ongoing program to detect and  
40 eliminate illicit connections.

41  
42 **6. Solids and Floatable Controls** - Each Tier A municipality must take the following actions  
43 to reduce the amount of solids and floatable materials from entering surface waters.

44  
45 a. Street Sweeping - Municipalities shall sweep all municipally owned curbed streets with  
46 storm drains that have a posted speed limit of 35 miles per hour (mph) or less in  
47 predominantly commercial areas at a minimum of once each month (conditions  
48 permitting).

1 b. Storm Drain Inlets - Municipalities are required to retrofit existing storm drain inlets to  
2 meet standards listed in Attachment C of the Tier A Permit (Appendix A).

3  
4 c. Stormwater Facility Maintenance - Develop and implement a stormwater facility  
5 maintenance program for cleaning and maintaining all stormwater facilities in accordance  
6 with permit requirements.

7  
8 d. Road Erosion Control Maintenance - Develop a roadside erosion control maintenance  
9 program to identify and repair erosion along streets operated by the municipality. Tier A  
10 municipalities are also required to regularly inspect and maintain the stability of  
11 shoulders, embankments, ditches, and soils along these roadways to protect against  
12 erosion.

13  
14 e. Outfall Pipe Stream Scouring Remediation - Develop and implement a stormwater  
15 outfall pipe scouring detection, remediation and maintenance program to detect and  
16 control localized stream and stream bank scouring in the vicinity of all outfall pipes  
17 operated by the municipality.

18  
19 **7. Maintenance Yard Operations (Including Maintenance Activities at Ancillary**  
20 **Operations)** - Tier A Municipalities are required to comply with the following maintenance  
21 yard operation requirements:

22  
23 a. De-icing Material Storage - A permanent structure must be constructed with an  
24 impermeable floor (completely roofed and walled) for the storage of salt, and other de-  
25 icing materials. Once constructed, the municipality is required to regularly inspect and  
26 maintain the structure in accordance with permit requirements.

27  
28 b. Fueling Operations - Develop and implement standard operating procedures (SOPs) for  
29 vehicle fueling and receiving of bulk fuel deliveries in accordance with the requirements  
30 listed in Attachment D of the Tier A Permit (Appendix A).

31  
32 c. Vehicle Maintenance - Develop and implement SOPs for vehicle maintenance and  
33 repair activities that occur at municipal maintenance yard operations.

34  
35 d. Good Housekeeping Practices - Implement good housekeeping procedures for all  
36 materials and machinery listed in the Inventory Requirements for Municipal Maintenance  
37 Yard Operations prepared in accordance with Attachment D of the Tier A permit  
38 (Appendix A).

39  
40 e. Employee Training - Each Tier A municipality shall develop and conduct an annual  
41 employee training program to include at minimum the topics and programs specified in  
42 the development and implementation of the SBRs specified in the Tier A permit. Each  
43 requirement listed in the Tier A permit has a specific implementation schedule based on  
44 the effective date of permit authorization. This implementation schedule is summarized  
45 in Table XIII-1.

46

**Table XIII-1  
Tier A Permit Requirement Implementation Schedule for the Township of  
Livingston**

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 Township Stormwater Management Plan.
April 1,2005	Develop and Implement SPPP.
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 programs, 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.
Oct. 1,2005	Adopt and enforce improper waste disposal ordinances.
Oct. 1,2005	Adopt and enforce Illicit Connections ordinance and implement Illicit Connection Elimination Program.
Oct. 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 Report.

1  
2 **General Requirements for Stormwater Management Planning**

3  
4 Subchapter 2 of N.J.A.C. 7:8 includes general requirements for municipal and regional  
5 stormwater management planning. For municipal stormwater management planning the  
6 requirements are, at a minimum, applicable to management of stormwater related impacts of  
7 major developments, defined in this case as new non-residential development or redevelopment  
8 projects that ultimately disturb one or more acres of land. Accordingly, this stormwater  
9 management plan shall be designed in the context of the following goals for major  
10 developments:

- 11
- 12 • reduce flood damage, including damage to life and property;
  - 13 • minimize, to the extent practical, any increase in stormwater runoff from any new
  - 14 development;
  - 15 • reduce soil erosion from any development or construction project;
  - 16 • assure the adequacy of existing and proposed culverts and bridges, and other in-stream
  - 17 structures;
  - 18 • maintain groundwater recharge;

- 1 • prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- 2 • maintain the integrity of stream channels for their biological functions, as well as for
- 3 drainage;
- 4 • minimize pollutants in stormwater runoff from new and existing development to restore,
- 5 enhance, and maintain the chemical, physical, and biological integrity of the waters of the
- 6 state, to protect public health, to safeguard fish and aquatic life and scenic and ecological
- 7 values, and to enhance the domestic, municipal, recreational, industrial, and other uses of
- 8 water; and
- 9 • protect public safety through the proper design and operation of stormwater basins.

10  
11 To achieve these goals for new development and redevelopment projects, Ordinance No. 11-  
12 2006, adding a new Article XIX “Stormwater Control” To Chapter 170 Land Use of The Code  
13 the Township, was adopted by the Township on March 20, 2006. This ordinance (Appendix B)  
14 outlines specific stormwater design and performance standards for new development;  
15 preventative and corrective maintenance strategies to ensure long-term effectiveness of  
16 stormwater management facilities; and safety standards for stormwater infrastructure to be  
17 implemented to protect public safety. Furthermore, the above goals will be considered should  
18 additional ordinances related to storm water-related water quality, groundwater recharge, and  
19 water quantity impacts of existing land uses be considered by the Township. Issues with  
20 stormwater impacts of replacement and/or reconstruction of buildings and residences on existing  
21 lots will be evaluated and the need for additional regulation of such considered. Additionally,  
22 consideration of developing new ordinances regarding grading on single family residential lots  
23 and for management of steep slopes for the purpose of improved stormwater management will be  
24 considered. Finally, consideration will be given, in cooperation with the property owners, NRCS,  
25 Soil Conservation District, and affected stakeholders, to mechanisms for improved management  
26 of stormwater runoff and groundwater recharge associated with existing and new open space and  
27 under-utilized properties.

28  
29 According to N.J.A.C. 7:8 5.5(h), special water resource protection areas shall be established  
30 along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams  
31 that drain into or upstream of the Category One (C1) waters as shown on the USGS Quadrangle  
32 Maps or in the County Soil Surveys, within the associated Hydrologic Unit Code 14 (HUC 14)  
33 drainage. Figure XIII-1 (Appendix C) illustrates the location of HUC14s and water bodies within  
34 the Township. As there are currently no C1 waters within the Township, or within the same HUC  
35 14 downstream of the Township, there are no special water resource protection areas designated  
36 in Livingston.

37  
38 Table XIII-2 includes a breakdown of the drainage areas within each of the HUC 14s in the  
39 Township, by percent of the Township and by percent of the total HUC 14 within the  
40 Township.



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**Table XIII-2  
Township of Livingston HUC 14s**

<b>HUC 14</b>	<b>Total Sq Miles</b>	<b>Sq Miles Inside Twp</b>	<b>Percent of Twp</b>	<b>Percent of HUC14 in Twp</b>
Canoe Brook	12.01	4.95	35.16%	41.22%
Passaic R Upr (Columbia Rd to 40d 45m)	8.41	1.85	13.14%	22.00%
Passaic R Upr (HanoverRR to ColumbiaRd)	8.56	5.88	41.76%	68.69%
Passaic R Upr (Rockaway to Hanover RR)	6.89	1.40	9.94%	20.32%
Total:	35.87	14.08	100%	

**Long Term Goals of the MSWMP**

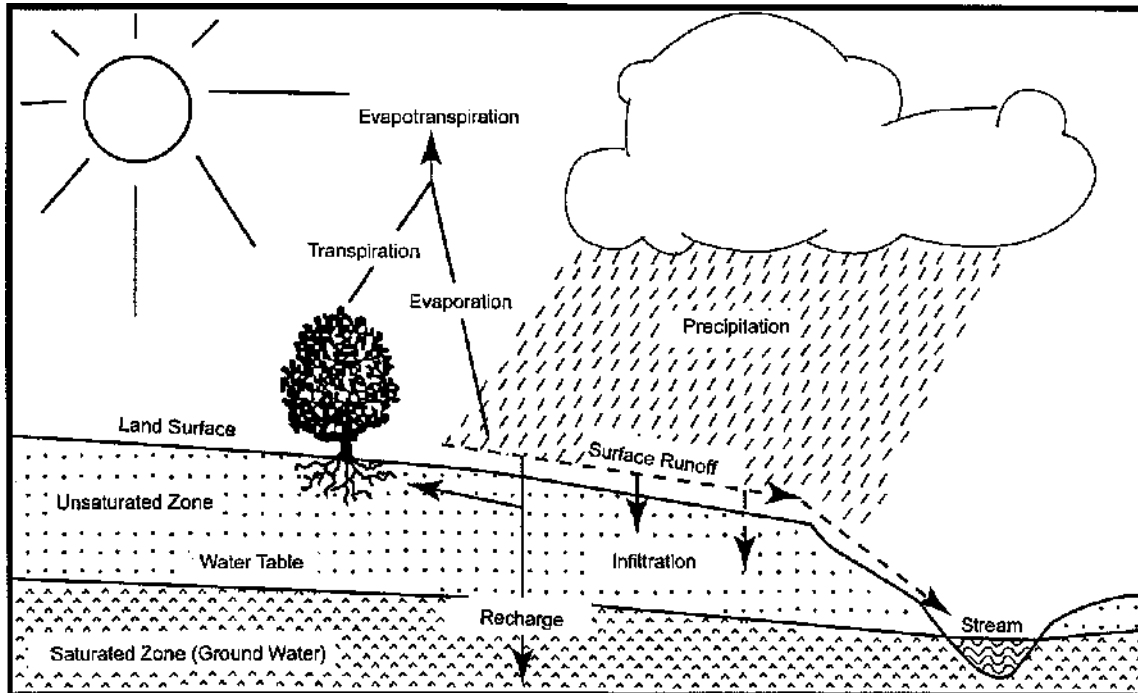
As discussed in this Plan under Regulatory Framework, the municipal stormwater permitting program was founded in response to requirements in the Federal Clean Water Act (CWA). For surface waters of the State, the CWA goals are in part expressed in policy and standards included in N.J.A.C. 7:9B Surface 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 in-stream 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 may be necessary for the Township to take action 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 non-point sources which include 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, available at <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 identifies waters, impaired or threatened by pollutants, for which one or more TMDLs are needed.

1 **Stormwater Discussion**

2  
3 **Figure XIII-2 - Schematic of Hydrologic Cycle**



5  
6 Source: New Jersey Geological Survey Report GSR-32.

7  
8 The NJDEP has developed a wealth of stormwater management information both as background  
9 for development of the stormwater rules published as N.J.A.C. 7:8 and as support for  
10 implementation of the municipal stormwater permitting program. This information is readily  
11 available on the NJDEP stormwater website [www.njstormwater.org](http://www.njstormwater.org). The full text of the NJ  
12 Stormwater BMP manual can be found on that website. Of particular relevance to this portion of  
13 the MSWMP is Chapter 1 of the manual, entitled "Impacts of Development on Runoff", from  
14 which the following information was derived

15  
16 Land development can dramatically alter the hydrologic cycle (illustrated above in Figure XIII-2)  
17 of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either  
18 directly intercept precipitation or draw that portion that has infiltrated into the ground and return  
19 it to the atmosphere through evapotranspiration. Development can remove this beneficial  
20 vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration  
21 and infiltration rates. Clearing and grading a site can remove depressions that store rainfall.  
22 Construction activities may also compact the soil and diminish its infiltration ability, resulting in  
23 increased volumes and rates of stormwater runoff from the site. Impervious areas that are  
24 connected to each other through gutters, channels, and storm sewers can transport runoff more  
25 quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-  
26 runoff response of the drainage area, causing flow in downstream waterways to peak faster and  
27 higher than under natural conditions. These increases can create new, and aggravate existing,  
28 downstream flooding and erosion problems and increase the quantity of sediment in the channel.  
29 Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by  
30 storm sewers that discharge runoff directly into a stream. Increases in impervious area can also

1 decrease opportunities for infiltration, which, in turn, reduces stream base flow and groundwater  
2 recharge. Reduced base flows and increased peak flows produce greater fluctuations between  
3 normal and storm flow rates, which can increase channel erosion. Reduced base flows can also  
4 negatively impact the hydrology of adjacent wetlands and the health of biological communities  
5 that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which  
6 some species cannot adapt.

7  
8 In addition to increases in runoff peaks and volumes, and loss of groundwater recharge, land  
9 development often results in the accumulation of pollutants on the land surface that runoff can  
10 mobilize and transport to streams. New impervious surfaces and cleared areas created by  
11 development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal  
12 wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids,  
13 hydrocarbons, pathogens, and nutrients.

14  
15 As well as increasing pollutant loading, land development can adversely affect water quality and  
16 stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or  
17 stored in detention or retention basins can become heated and raise the temperature of the  
18 downstream waterway, adversely affecting cold water fish species such as trout. Development  
19 can remove trees along stream banks that normally provide shading, stabilization, and leaf litter  
20 that falls into streams and becomes food for the aquatic community.

## 21 22 **Township Background**

23  
24 The Township is a suburban community in western Essex County. Adjacent Essex County  
25 communities are Roseland Borough, West Orange Township and Millburn Township. To the  
26 west are two Morris County communities, the Township of East Hanover and the Borough of  
27 Florham Park. The Township is a primarily residential community, of approximately 14 square  
28 miles, with limited light industry and business and office properties. The Township is traversed  
29 east to west by Route 10. Its major retail and general business areas are along Northfield Avenue,  
30 Livingston Avenue and Mt. Pleasant Avenue (Route 10) In the western and northwestern areas  
31 of the Township are a regional mall, commercial and educational facilities, a light industrial  
32 base, and a few shopping centers. In recent years the Township has experienced moderate  
33 population growth. According to the 2000 census, the Township of Livingston then had a  
34 population of 27,391; an increase of 2.9 percent from 26,609 in 1990. In January of 2005 the  
35 population was estimate to have further increased to 29,296 based upon certificates of occupancy  
36 issued for new construction.

## 37 38 **Watersheds**

39  
40 Livingston lies within the Passaic River drainage basin. The Township borders on that river, and  
41 contains several tributaries of the Passaic River System. Generally, the Township drains to the  
42 south. There, multiple tributaries form the Slough and Canoe brooks that flow directly to the  
43 Passaic River to the west. Several smaller tributaries in the western portion of the Township also  
44 feed into the river, which flows north around the Watchung Mountains and eventually into  
45 Newark Bay. The South Branch of the Foulertons Brook extends across the northern border of  
46 the Township and flows north through Roseland and into the Passaic River. All tributaries within  
47 the Township ultimately drain to the Passaic River system.

1 In addition, Livingston also houses a New Jersey American Water Company reservoir in the  
2 westerly area, and two more reservoirs are located just outside the southern border of the  
3 Township between Canoe Brook and Slough Brook.  
4

5 The New Jersey Integrated Water Quality Monitoring and Assessment Report identifies several  
6 waterways within or near Township borders as impaired (Sub-list 4) and having the need for  
7 development of a TMDL (Sub-list 5). Based on the 2004 Integrated List, available water quality  
8 data indicates a need for development of TMDL's for Slough Brook and Canoe Brook to be  
9 protective of Benthic Macroinvertebrates. There is also a Sub-list 4 impairment listed for fecal  
10 coliform on a portion of the Canoe Brook. There are several TMDLs (phosphorus, dissolved  
11 solids, total suspended solids) needed for the portion of the Passaic River that runs along the East  
12 Hanover border of Livingston. In addition, there are also TMDLs needed for the Passaic River  
13 for temperature, dissolved oxygen, pH, nitrate, and unionized ammonia.  
14

15 A review of the New Jersey Department of Environmental Protection (NJDEP) GIS surface  
16 water coverage files indicates that the NJDEP has classified all surface waters in Livingston as  
17 "FW2-NT". This indicates that the waterways of the Township do not support trout, an indicator  
18 species used by NJDEP to broadly assess water quality (NJDEP 1998).  
19

20 The NJDEP has divided the State into 20 Watershed Management Areas (WMA), which  
21 conform to topographic and geologic boundaries. Livingston falls within one distinct WMA:  
22 WMA 6, Upper Passaic, Whippany and Rockaway.  
23

24 The NJ State GIS currently indicates that there are wellhead protection areas covering most of  
25 the Township. Currently, twenty-two (22) public community water supply wells have been  
26 identified within the Township borders, in addition to several others of other communities in  
27 close proximity along the Passaic River. Due to these wells, the Township exhibits extensive  
28 coverage of 2, 5, and 12-Year Time of Travel Protection Areas. Figure XIII-3 (Appendix C)  
29 illustrates both the well locations and the associated well protection areas.  
30

31 Protection of groundwater resources is an important part of stormwater management. It entails  
32 protection of aquifer recharge areas where permeable soils and natural drainage patterns permit  
33 the infiltration of surface runoff into the underlying geologic structure. Protection of aquifer  
34 recharge areas requires, for example, limitations on impervious coverage, and proper  
35 management of contaminated stormwater to assure that recharge areas remain open to infiltration  
36 of suitable quality water. However, groundwater recharge areas for Essex County have not been  
37 delineated by NJDEP.  
38

### 39 **Wetlands**

40  
41 Wetlands are important natural features that serve a number of purposes. Wetlands act as natural  
42 filtering systems for the surface waters that pass through them; they also provide flood control  
43 and offer diverse wildlife habitat. The wetlands in Livingston are mainly found along the Passaic  
44 River and along the Slough and Canoe Brooks. A review of the NJDEP GIS generally identifies  
45 these areas as deciduous wooded or herbaceous systems.  
46  
47  
48

1 **Land Use**

2  
3 The most common land use in this suburban community is single family residential. The 2000  
4 Census indicates that there were then 9,457 housing units in the Township. The January 2005  
5 local estimate was 9,931 units. Over 80 percent of the housing units were constructed prior to  
6 1970. These residential housing units are predominately single-family detached units.  
7 Commercial activities are predominantly located along Livingston Ave, Eisenhower Pkwy,  
8 Route 10, and Northfield Rd.  
9

10 **Topography**

11  
12 The topography of Livingston generally slopes to the west towards the Passaic River, with  
13 elevations ranging from 540 down to 200 feet above mean sea level. The highest areas within the  
14 Township are located in the northwest corner and can be attributed to the transitioning surface  
15 relief of the Watchung Mountains located east of the border. A smaller peak of about 440 feet is  
16 located in the northern area of the Livingston. Figure XIII-4 (Appendix C) depicts the Township  
17 boundary on the U.S. Geological Survey Topographic map.  
18

19 **Soils**

20  
21 As identified by the SGS State Soil Geographic Database, the Township contains four main soil  
22 types: Urban Land-Dunellen-Riverhead; Boonton-Urban Land-Wethersfield; Urban Land-  
23 Boonton-Wethersfield; and Urban Land-Parsippany-Haledon.  
24

25 The northwestern part of the Township contains Urban Land-Dunellen-Riverhead soils. These  
26 soils are nearly level to strongly sloping, deep and very deep, well drained gravelly, sandy loams.  
27 These soils formed in sandy stratified glacial outwash on outwash plains and terraces and on  
28 river and stream terraces. These soils are categorized as non-hydric and listed under hydrological  
29 group B; meaning that they have a moderate infiltration rate when thoroughly wetted, are  
30 moderately deep to deep, moderately well drained to well drained soils with moderately fine to  
31 moderately coarse textures, as well as having a moderate rate of water transmission.  
32

33 Spanning from the southwest corner of the Township through the center of the Township to the  
34 northeast corner are Boonton-Urban Land-Wethersfield soils. These soils are gently sloping to  
35 very steep, well drained and moderately well drained, very deep and deep gravelly loams formed  
36 in acid, reddish sandstone, shale, basalt bedrock. These soils occur on upland glacial till plains  
37 and ridges. These soils are non-hydric and are categorized under hydrological group C; meaning  
38 it has a slow infiltration rate when thoroughly wetted, often due to a layer that impedes  
39 downward movement of water or moderately fine to fine texture, as well as a slow rate of water  
40 transmission.  
41

42 The southeastern portion of the Township contains Urban Land-Boonton-Wethersfield soil.  
43 These soils are described as gently sloping to moderately steep; well drained and moderately  
44 well drained. It contains very deep and deep gravelly loams formed in acid, reddish sandstone,  
45 shale, basalt and conglomerate glacial till over shale and basalt bedrock. These soils occur on  
46 upland glacial till plains and ridges and are non-hydric. These soils are in hydrologic group C.  
47

1 The western segment of the Township contains Urban Land-Parsippany-Haledon soils. These  
2 soils are described as nearly level to strongly sloping, poorly drained and somewhat poorly  
3 drained, very deep silt loams. Parsippany soils are poorly drained and formed in stratified, silty,  
4 old lake sediments in depressions and on low, level areas. Haledon soils formed in sandstone,  
5 shale and basalt glacial till over shale and basalt bedrock along drainage ways, on broad till  
6 plains and ridges, and at the bases of till plains and ridges. Haledon soils are in hydrologic group  
7 C and are non hydric. Parsippany soils are hydric and are classified under hydrologic group C/D  
8 meaning that the soils have the same drained conditions as group C and undrained conditions of  
9 group D. Group D soils have a high runoff potential, and a very slow infiltration rate when  
10 thoroughly wetted. They chiefly consist of clay soils that have a high swelling potential, soils  
11 that have a permanent high water table, soils that have a claypan or clay layer at or near the  
12 surface, and shallow soils over nearly impervious material. They have a very slow rate of water  
13 transmission/penetration.

14

### 15 **Design and Performance Standards**

16

17 The Township has adopted the design and performance standards for stormwater management  
18 measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on  
19 water quality and water quantity and loss of groundwater recharge in receiving water bodies. The  
20 applicability of ARTICLE XIX “STORMWATER CONTROL” of Chapter 170 "Land Use" of  
21 the Code of the Township is limited to non-residential developments that involve disturbance of  
22 one or more acres. The design and performance standards in the ordinance include the language  
23 for maintenance of stormwater management measures consistent with the stormwater  
24 management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety  
25 standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.  
26 The Stormwater Control Ordinance was submitted to Essex County for review and approval on  
27 March 21, 2006. Township staff will observe construction of projects to ensure that the  
28 stormwater management measures are constructed and function as designed.

29

### 30 **Plan Consistency**

31

32 The Township is not currently within an adopted Regional Stormwater Management Planning  
33 Area (RSWMP). If any RSWMPs or TMDLs are developed in the future, this Municipal  
34 Stormwater Management Plan will be updated, as appropriate, to be consistent with those  
35 programs. The MSWMP is consistent with the RSIS at N.J.A.C. 5:21. The Township will utilize  
36 the most current update of the RSIS in the stormwater management review of residential  
37 applications. This MSWMP will be updated to be consistent with any future updates to the RSIS.

38

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

43

### 44 **Nonstructural Stormwater Management Strategies**

45

46 N.J.A.C. 7:8 requires that the Township review the Master Plan, Official Map and ordinances  
47 for incorporation of nonstructural stormwater management strategies. As necessary, the  
48 Township will revise land use and zoning ordinances and incorporate NJDEP's nonstructural

1 stormwater management strategies. Once the ordinance texts are completed, they will be  
2 submitted to Essex County for review and approval within 24 months of the effective date of the  
3 NJPDES Stormwater Permit (April 1, 2006). A copy will be sent to the NJDEP at the time of  
4 submission.

### 5 6 **Land Use/Build-Out Analysis**

7  
8 The Township of Livingston is almost fully developed, with well-established residential  
9 neighborhoods and business districts. In keeping with the goals of the Master Plan, the Township  
10 plans to preserve and strengthen its positive aspects. Thus, extensive substantial new  
11 development or redevelopment is not expected. A land use analysis performed by the Planning  
12 Board shows that there are only 84 acres that are available for development under the current  
13 zoning regulations. Since the total undeveloped area is less than 1 square mile (640 acres) a  
14 Build-Out analysis for this MSWMP is not required.

### 15 16 **Mitigation Plan**

17  
18 Municipal stormwater management plans must incorporate design and performance standards  
19 that are as protective as those outlined in the State Stormwater Management Rules or alternative  
20 standards in an adopted regional stormwater management plan. These design and performance  
21 standards focus on three areas: maintaining groundwater recharge from proposed development,  
22 minimizing the proposed development's impact on flooding, and minimizing the proposed  
23 development's water quality impact on State waters. Some projects have unique, site-specific  
24 conditions that prevent strict compliance with the performance standards. In order for the  
25 municipality to grant a waiver or exemption from strict compliance with the groundwater  
26 recharge and stormwater runoff quality and quantity requirements, the MSWMP must include a  
27 mitigation process documented in a mitigation plan contained within the MSWMP. However,  
28 mitigation should not be an option until it is clearly demonstrated that on-site compliance is not  
29 practical. The mitigation plan must identify the measures required to offset any potential impact  
30 created by granting the waiver or exemption to the performance standards. Several strategies can  
31 be used to mitigate a development project and its impacts. Applicants can: identify, design, and  
32 implement a compensating measure to mitigate impacts; complete a project identified by the  
33 municipality as equivalent to the environmental impact created by the exemption or variance; or,  
34 provide funding for municipal projects that would address existing stormwater impacts.

35  
36 If the applicant for a proposed development demonstrates to the satisfaction of the reviewing  
37 Board that on-site compliance with the stormwater performance standards as outlined in this  
38 MSWMP is not practical, the Board will entertain a request for a waiver or exemption from said  
39 standards. In order to obtain the waiver or exemption from strict compliance with the  
40 groundwater recharge, stormwater quantity and/or stormwater quality requirements as outlined in  
41 this MSWMP and the Township ordinances, the applicant must provide mitigation in accordance  
42 with the requirements established in the mitigation plan. The Township has not developed a  
43 mitigation plan as of the date of this MSWMP. Therefore, the Township cannot entertain any  
44 requests for a waiver or exemption from said stormwater performance standards.